



Vertical Alignment

Mathematics

Grade 5

Grade 4	Grade 5	Grade 6
Introduction		
<p>§111.1. Implementation of Texas Essential Knowledge and Skills for Mathematics, Elementary, Adopted 2012.</p> <p><i>Source: The provisions of this §111.1 adopted to be effective September 10, 2012, 37 TexReg 7109.</i></p> <p>§111.6. Grade 4, Adopted 2012.</p>	<p>§111.1. Implementation of Texas Essential Knowledge and Skills for Mathematics, Elementary, Adopted 2012.</p> <p><i>Source: The provisions of this §111.1 adopted to be effective September 10, 2012, 37 TexReg 7109.</i></p> <p>§111.7. Grade 5, Adopted 2012.</p>	<p>§111.25. Implementation of Texas Essential Knowledge and Skills for Mathematics, Middle School, Adopted 2012.</p> <p><i>Source: The provisions of this §111.25 adopted to be effective September 10, 2012, 37 TexReg 7109.</i></p> <p>§111.26. Grade 6, Adopted 2012.</p>
<p>The desire to achieve educational excellence is the driving force behind the Texas essential knowledge and skills for mathematics, guided by the college and career readiness standards. By embedding statistics, probability, and finance, while focusing on computational thinking, mathematical fluency, and solid understanding, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.</p>	<p>The desire to achieve educational excellence is the driving force behind the Texas essential knowledge and skills for mathematics, guided by the college and career readiness standards. By embedding statistics, probability, and finance, while focusing on computational thinking, mathematical fluency, and solid understanding, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.</p>	<p>The desire to achieve educational excellence is the driving force behind the Texas essential knowledge and skills for mathematics, guided by the college and career readiness standards. By embedding statistics, probability, and finance, while focusing on computational thinking, mathematical fluency, and solid understanding, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.</p>
<p>The process standards describe ways in which students are expected to engage in the content. The placement of the process standards at the beginning of the knowledge and skills listed for each grade and course is intentional. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. The process standards are integrated at every grade level and course. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing</p>	<p>The process standards describe ways in which students are expected to engage in the content. The placement of the process standards at the beginning of the knowledge and skills listed for each grade and course is intentional. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. The process standards are integrated at every grade level and course. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing</p>	<p>The process standards describe ways in which students are expected to engage in the content. The placement of the process standards at the beginning of the knowledge and skills listed for each grade and course is intentional. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. The process standards are integrated at every grade level and course. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing</p>

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<p>given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, algorithms, paper and pencil, and technology and techniques such as mental math, estimation, number sense, and generalization and abstraction to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, computer programs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.</p>	<p>given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, algorithms, paper and pencil, and technology and techniques such as mental math, estimation, number sense, and generalization and abstraction to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, computer programs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.</p>	<p>given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, algorithms, paper and pencil, and technology and techniques such as mental math, estimation, number sense, and generalization and abstraction to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, computer programs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.</p>
<p>For students to become fluent in mathematics, students must develop a robust sense of number. The National Research Council's report, "Adding It Up," defines procedural fluency as "skill in carrying out procedures flexibly, accurately, efficiently, and appropriately." As students develop procedural fluency, they must also realize that true problem solving may take time, effort, and perseverance. Students in Grade 4 are expected to perform their work without the use of calculators.</p>	<p>For students to become fluent in mathematics, students must develop a robust sense of number. The National Research Council's report, "Adding It Up," defines procedural fluency as "skill in carrying out procedures flexibly, accurately, efficiently, and appropriately." As students develop procedural fluency, they must also realize that true problem solving may take time, effort, and perseverance. Students in Grade 5 are expected to perform their work without the use of calculators.</p>	<p>The primary focal areas in Grade 6 are number and operations; proportionality; expressions, equations, and relationships; and measurement and data. Students use concepts, algorithms, and properties of rational numbers to explore mathematical relationships and to describe increasingly complex situations. Students use concepts of proportionality to explore, develop, and communicate mathematical relationships. Students use algebraic thinking to describe how a change in one quantity in a relationship results in a change in the other. Students connect verbal, numeric, graphic, and symbolic representations of relationships, including equations and inequalities. Students use geometric properties and relationships, as well as spatial reasoning, to model and analyze situations and</p>

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		<p>solve problems. Students communicate information about geometric figures or situations by quantifying attributes, generalize procedures from measurement experiences, and use the procedures to solve problems. Students use appropriate statistics, representations of data, and reasoning to draw conclusions, evaluate arguments, and make recommendations. While the use of all types of technology is important, the emphasis on algebra readiness skills necessitates the implementation of graphing technology.</p>
<p>The primary focal areas in Grade 4 are use of operations, fractions, and decimals and describing and analyzing geometry and measurement. These focal areas are supported throughout the mathematical strands of number and operations, algebraic reasoning, geometry and measurement, and data analysis. In Grades 3-5, the number set is limited to positive rational numbers. In number and operations, students will apply place value and represent points on a number line that correspond to a given fraction or terminating decimal. In algebraic reasoning, students will represent and solve multi-step problems involving the four operations with whole numbers with expressions and equations and generate and analyze patterns. In geometry and measurement, students will classify two-dimensional figures, measure angles, and convert units of measure. In data analysis, students will represent and interpret data.</p>	<p>The primary focal areas in Grade 5 are solving problems involving all four operations with positive rational numbers, determining and generating formulas and solutions to expressions, and extending measurement to area and volume. These focal areas are supported throughout the mathematical strands of number and operations, algebraic reasoning, geometry and measurement, and data analysis. In Grades 3-5, the number set is limited to positive rational numbers. In number and operations, students will apply place value and identify part-to-whole relationships and equivalence. In algebraic reasoning, students will represent and solve problems with expressions and equations, build foundations of functions through patterning, identify prime and composite numbers, and use the order of operations. In geometry and measurement, students will classify two-dimensional figures, connect geometric attributes to the measures of three-dimensional figures, use units of measure, and represent location using a coordinate plane. In data analysis, students will represent and interpret data.</p>	<p>Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.</p>

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<p>4.1 Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:</p>	<p>5.1 Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:</p>	<p>6.1 Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:</p>
<p>4.1A</p> <p>Apply mathematics to problems arising in everyday life, society, and the workplace.</p> <p>Apply</p> <p>MATHEMATICS TO PROBLEMS ARISING IN EVERYDAY LIFE, SOCIETY, AND THE WORKPLACE</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems ◦ Measuring angles ◦ Understanding decimals and addition and subtraction of decimals ◦ Building foundations for addition and 	<p>5.1A</p> <p>Apply mathematics to problems arising in everyday life, society, and the workplace.</p> <p>Apply</p> <p>MATHEMATICS TO PROBLEMS ARISING IN EVERYDAY LIFE, SOCIETY, AND THE WORKPLACE</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals ◦ Understanding and generating expressions and equations to solve problems ◦ Representing and solving problems with perimeter, area, and volume ◦ Organizing, representing, and interpreting 	<p>6.1A</p> <p>Apply mathematics to problems arising in everyday life, society, and the workplace.</p> <p>Apply</p> <p>MATHEMATICS TO PROBLEMS ARISING IN EVERYDAY LIFE, SOCIETY, AND THE WORKPLACE</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Using operations with integers and positive rational numbers to solve problems ◦ Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships ◦ Using expressions and equations to represent relationships in a variety of contexts

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<p>4.1B</p> <p>Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.</p> <p>Use</p> <p>A PROBLEM-SOLVING MODEL THAT INCORPORATES ANALYZING GIVEN INFORMATION, FORMULATING A PLAN OR STRATEGY, DETERMINING A SOLUTION, JUSTIFYING THE SOLUTION, AND EVALUATING THE PROBLEM-SOLVING PROCESS AND THE REASONABLENESS OF THE SOLUTION</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems ◦ Measuring angles ◦ Understanding decimals and addition and subtraction of decimals ◦ Building foundations for addition and subtraction of fractions 	<p>5.1B</p> <p>Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.</p> <p>Use</p> <p>A PROBLEM-SOLVING MODEL THAT INCORPORATES ANALYZING GIVEN INFORMATION, FORMULATING A PLAN OR STRATEGY, DETERMINING A SOLUTION, JUSTIFYING THE SOLUTION, AND EVALUATING THE PROBLEM-SOLVING PROCESS AND THE REASONABLENESS OF THE SOLUTION</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals ◦ Understanding and generating expressions and equations to solve problems ◦ Representing and solving problems with perimeter, area, and volume ◦ Organizing, representing, and interpreting sets of data 	<p>6.1B</p> <p>Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.</p> <p>Use</p> <p>A PROBLEM-SOLVING MODEL THAT INCORPORATES ANALYZING GIVEN INFORMATION, FORMULATING A PLAN OR STRATEGY, DETERMINING A SOLUTION, JUSTIFYING THE SOLUTION, AND EVALUATING THE PROBLEM-SOLVING PROCESS AND THE REASONABLENESS OF THE SOLUTION</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Using operations with integers and positive rational numbers to solve problems ◦ Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships ◦ Using expressions and equations to represent relationships in a variety of contexts ◦ Understanding data representation

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<p>4.1C</p> <p>Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.</p> <p>Select</p> <p>TOOLS, INCLUDING REAL OBJECTS, MANIPULATIVES, PAPER AND PENCIL, AND TECHNOLOGY AS APPROPRIATE, TO SOLVE PROBLEMS</p> <p>Select</p> <p>TECHNIQUES, INCLUDING MENTAL MATH, ESTIMATION, AND NUMBER SENSE AS APPROPRIATE, TO SOLVE PROBLEMS</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems ◦ Measuring angles ◦ Understanding decimals and addition and subtraction of decimals ◦ Building foundations for addition and 	<p>5.1C</p> <p>Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.</p> <p>Select</p> <p>TOOLS, INCLUDING REAL OBJECTS, MANIPULATIVES, PAPER AND PENCIL, AND TECHNOLOGY AS APPROPRIATE, TO SOLVE PROBLEMS</p> <p>Select</p> <p>TECHNIQUES, INCLUDING MENTAL MATH, ESTIMATION, AND NUMBER SENSE AS APPROPRIATE, TO SOLVE PROBLEMS</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals ◦ Understanding and generating expressions and equations to solve problems ◦ Representing and solving problems with perimeter, area, and volume ◦ Organizing, representing, and interpreting 	<p>6.1C</p> <p>Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.</p> <p>Select</p> <p>TOOLS, INCLUDING REAL OBJECTS, MANIPULATIVES, PAPER AND PENCIL, AND TECHNOLOGY AS APPROPRIATE, TO SOLVE PROBLEMS</p> <p>Select</p> <p>TECHNIQUES, INCLUDING MENTAL MATH, ESTIMATION, AND NUMBER SENSE AS APPROPRIATE, TO SOLVE PROBLEMS</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Using operations with integers and positive rational numbers to solve problems ◦ Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships ◦ Using expressions and equations to represent relationships in a variety of contexts

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<p>4.1D</p> <p>Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.</p> <p>Communicate</p> <p>MATHEMATICAL IDEAS, REASONING, AND THEIR IMPLICATIONS USING MULTIPLE REPRESENTATIONS, INCLUDING SYMBOLS, DIAGRAMS, GRAPHS, AND LANGUAGE AS APPROPRIATE</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems ◦ Measuring angles ◦ Understanding decimals and addition and subtraction of decimals ◦ Building foundations for addition and subtraction of fractions • TxCCRS: <ul style="list-style-type: none"> • IX. Communication and Representation 	<p>5.1D</p> <p>Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.</p> <p>Communicate</p> <p>MATHEMATICAL IDEAS, REASONING, AND THEIR IMPLICATIONS USING MULTIPLE REPRESENTATIONS, INCLUDING SYMBOLS, DIAGRAMS, GRAPHS, AND LANGUAGE AS APPROPRIATE</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals ◦ Understanding and generating expressions and equations to solve problems ◦ Representing and solving problems with perimeter, area, and volume ◦ Organizing, representing, and interpreting sets of data • TxCCRS: <ul style="list-style-type: none"> • IX. Communication and Representation 	<p>6.1D</p> <p>Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.</p> <p>Communicate</p> <p>MATHEMATICAL IDEAS, REASONING, AND THEIR IMPLICATIONS USING MULTIPLE REPRESENTATIONS, INCLUDING SYMBOLS, DIAGRAMS, GRAPHS, AND LANGUAGE AS APPROPRIATE</p> <p>Note(s):</p> <ul style="list-style-type: none"> • The mathematical process standards may be applied to all content standards as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Using operations with integers and positive rational numbers to solve problems ◦ Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships ◦ Using expressions and equations to represent relationships in a variety of contexts ◦ Understanding data representation • TxCCRS: <ul style="list-style-type: none"> • IX. Communication and Representation

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<p>4.1E</p> <p>Create and use representations to organize, record, and communicate mathematical ideas.</p> <p>Create, Use</p> <p>REPRESENTATIONS TO ORGANIZE, RECORD, AND COMMUNICATE MATHEMATICAL IDEAS</p> <p>Note(s):</p> <ul style="list-style-type: none"> The mathematical process standards may be applied to all content standards as appropriate. TxRCFP: <ul style="list-style-type: none"> Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems Measuring angles Understanding decimals and addition and subtraction of decimals Building foundations for addition and subtraction of fractions TxCCRS: <ul style="list-style-type: none"> IX. Communication and Representation 	<p>5.1E</p> <p>Create and use representations to organize, record, and communicate mathematical ideas.</p> <p>Create, Use</p> <p>REPRESENTATIONS TO ORGANIZE, RECORD, AND COMMUNICATE MATHEMATICAL IDEAS</p> <p>Note(s):</p> <ul style="list-style-type: none"> The mathematical process standards may be applied to all content standards as appropriate. TxRCFP: <ul style="list-style-type: none"> Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals Understanding and generating expressions and equations to solve problems Representing and solving problems with perimeter, area, and volume Organizing, representing, and interpreting sets of data TxCCRS: <ul style="list-style-type: none"> IX. Communication and Representation 	<p>6.1E</p> <p>Create and use representations to organize, record, and communicate mathematical ideas.</p> <p>Create, Use</p> <p>REPRESENTATIONS TO ORGANIZE, RECORD, AND COMMUNICATE MATHEMATICAL IDEAS</p> <p>Note(s):</p> <ul style="list-style-type: none"> The mathematical process standards may be applied to all content standards as appropriate. TxRCFP: <ul style="list-style-type: none"> Using operations with integers and positive rational numbers to solve problems Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships Using expressions and equations to represent relationships in a variety of contexts Understanding data representation TxCCRS: <ul style="list-style-type: none"> IX. Communication and Representation
<p>4.1F</p> <p>Analyze mathematical relationships to connect and communicate mathematical ideas.</p> <p>Analyze</p> <p>MATHEMATICAL RELATIONSHIPS TO CONNECT AND COMMUNICATE MATHEMATICAL IDEAS</p>	<p>5.1F</p> <p>Analyze mathematical relationships to connect and communicate mathematical ideas.</p> <p>Analyze</p> <p>MATHEMATICAL RELATIONSHIPS TO CONNECT AND COMMUNICATE MATHEMATICAL IDEAS</p>	<p>6.1F</p> <p>Analyze mathematical relationships to connect and communicate mathematical ideas.</p> <p>Analyze</p> <p>MATHEMATICAL RELATIONSHIPS TO CONNECT AND COMMUNICATE MATHEMATICAL IDEAS</p>

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<p>4.1G</p> <p>Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.</p> <p>Display, Explain, Justify</p> <p>MATHEMATICAL IDEAS AND ARGUMENTS USING PRECISE MATHEMATICAL LANGUAGE IN WRITTEN OR ORAL COMMUNICATION</p> <p>Note(s):</p> <ul style="list-style-type: none"> The mathematical process standards may be applied to all content standards as appropriate. TxRCFP: <ul style="list-style-type: none"> Developing fluency with efficient use of the 	<p>5.1G</p> <p>Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.</p> <p>Display, Explain, Justify</p> <p>MATHEMATICAL IDEAS AND ARGUMENTS USING PRECISE MATHEMATICAL LANGUAGE IN WRITTEN OR ORAL COMMUNICATION</p> <p>Note(s):</p> <ul style="list-style-type: none"> The mathematical process standards may be applied to all content standards as appropriate. TxRCFP: <ul style="list-style-type: none"> Developing an understanding of and fluency 	<p>6.1G</p> <p>Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.</p> <p>Display, Explain, Justify</p> <p>MATHEMATICAL IDEAS AND ARGUMENTS USING PRECISE MATHEMATICAL LANGUAGE IN WRITTEN OR ORAL COMMUNICATION</p> <p>Note(s):</p> <ul style="list-style-type: none"> The mathematical process standards may be applied to all content standards as appropriate. TxRCFP: <ul style="list-style-type: none"> Using operations with integers and positive

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<p>four arithmetic operations on whole numbers and using this knowledge to solve problems</p> <ul style="list-style-type: none"> ◦ Measuring angles ◦ Understanding decimals and addition and subtraction of decimals ◦ Building foundations for addition and subtraction of fractions • TxCCRS: <ul style="list-style-type: none"> • IX. Communication and Representation 	<p>with addition, subtraction, multiplication, and division of fractions and decimals</p> <ul style="list-style-type: none"> ◦ Understanding and generating expressions and equations to solve problems ◦ Representing and solving problems with perimeter, area, and volume ◦ Organizing, representing, and interpreting sets of data • TxCCRS: <ul style="list-style-type: none"> • IX. Communication and Representation 	<p>rational numbers to solve problems</p> <ul style="list-style-type: none"> ◦ Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships ◦ Using expressions and equations to represent relationships in a variety of contexts ◦ Understanding data representation • TxCCRS: <ul style="list-style-type: none"> • IX. Communication and Representation

Comparing and Ordering Numbers

<p>4.2 <i>Number and operations. The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to:</i></p>	<p>5.2 <i>Number and operations. The student applies mathematical process standards to represent, compare, and order positive rational numbers and understand relationships as related to place value. The student is expected to:</i></p>	<p>6.2 <i>Number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to:</i></p>
<p>4.2C Compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols >, <, or =.</p>	<p>5.2B Compare and order two decimals to thousandths and represent comparisons using the symbols >, <, or =.</p>	<p>6.2D Order a set of rational numbers arising from mathematical and real-world contexts.</p>

Grade 4**Supporting Standard**

Compare, Order

WHOLE NUMBERS TO 1,000,000,000

Including, but not limited to:

- Whole numbers (0 – 1,000,000,000)
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Place value – the value of a digit as determined by its location in a number, such as ones, tens, hundreds, one thousands, ten

Grade 5**Readiness Standard**

Compare, Order

TWO DECIMALS TO THOUSANDTHS

Including, but not limited to:

- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Place value – the value of a digit as determined by its location in a number such as ones, tens, hundreds, one thousands, ten thousands, etc.
- Compare numbers – to consider the value of

Grade 6**Readiness Standard**

Order

A SET OF RATIONAL NUMBERS ARISING FROM MATHEMATICAL AND REAL-WORLD CONTEXTS

Including, but not limited to:

- Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
- Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Integers – the set of counting (natural numbers), their opposites, and zero { $-n$, ..., -3, -2, -1, 0, 1, 2, 3, ..., n }. The set of integers is denoted by the symbol Z .
- Rational numbers – the set of numbers that

Grade 4	Grade 5	Grade 6
<p>thousands, etc.</p> <ul style="list-style-type: none"> • Compare numbers – to consider the value of two numbers to determine which number is greater or less or if the numbers are equal in value ◦ Relative magnitude of a number describes 	<p>two numbers to determine which number is greater or less or if the numbers are equal in value</p> <ul style="list-style-type: none"> ◦ Relative magnitude of a number describes the size of a number and its relationship to another number. 	<p>can be expressed as a fraction $\frac{a}{b}$, where a and b are integers and $b \neq 0$, which includes the subsets of integers, whole numbers, and counting (natural) numbers (e.g., -3, 0, 2, $-\frac{1}{2}$, $\frac{11}{7}$, $0.\overline{23}$, etc.). The set of</p>

Grade 4

- the size of a number and its relationship to another number.
- Compare two numbers using place value charts.
 - Compare digits in the same place value positions beginning with the greatest value.
 - If these digits are the same, continue to the next smallest place until the digits are different.
 - Numbers that have common digits but are not equal in value (different place values)
 - Numbers that have a different number of digits
- Compare two numbers using a number line.
 - Number lines (horizontal/vertical)
 - Proportionally scaled number lines (pre-determined intervals with at least two labeled numbers)
 - Open number lines (no marked intervals)
- Order numbers – to arrange a set of numbers based on their numerical value
- Numbers increase from left to right on a horizontal number line and from bottom to top on a vertical number line.
 - Points to the left of a specified point on a horizontal number line are less than points to the right.
 - Points to the right of a specified point on a horizontal number line are greater than points to the left.
 - Points below a specified point on a vertical number line are less than points above.

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- Compare two decimals using place value charts.
 - Compare digits in the same place value position beginning with the greatest place value.
 - If these digits are the same, continue to the next smallest place until the digits are different.
 - Numbers that have common digits but are not equal in value (different place values)
 - Numbers that have a different number of digits
- Compare two decimals using a number line.
 - Number lines (horizontal/vertical)
 - Proportionally scaled number lines (pre-determined intervals with at least two labeled numbers)
 - Open number lines (no marked intervals)
- Order numbers – to arrange a set of numbers based on their numerical value
- Numbers increase from left to right on a horizontal number line and from bottom to top on a vertical number line.
 - Points to the left of a specified point on a horizontal number line are less than points to the right.
 - Points to the right of a specified point on a horizontal number line are greater than points to the left.
 - Points below a specified point on a vertical number line are less than points above.
 - Points above a specified point on a vertical number line are greater than

Grade 6

- 2 1
- rational numbers is denoted by the symbol \mathbb{Q} .
 - Various forms of positive and negative rational numbers
 - Whole numbers
 - Integers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Place value – the value of a digit as determined by its location in a number such as ones, tens, hundreds, one thousands, ten thousands, etc.
 - Order numbers – to arrange a set of numbers based on their numerical value
 - Number lines (horizontal/vertical)
 - Numbers increase from left to right on a horizontal number line and from bottom to top on a vertical number line.
 - Points to the left of a specified point on a horizontal number line are less than points to the right.
 - Points to the right of a specified point on a horizontal number line are greater than points to the left.
 - Points below a specified point on a vertical number line are less than points above.
 - Points above a specified point on a vertical number line are greater than points below.
 - Quantifying descriptor in mathematical and real-world problem situations (e.g., between two given numbers, greatest/least, ascending/descending, tallest/shortest, warmest/coldest, fastest/slowest, longest/shortest, heaviest/lightest, closest/farthest, oldest/youngest, etc.)

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- Points above a specified point on a vertical number line are greater than points below.
- Order a set of numbers on a number line.
- Order a set of numbers on an open number line.
- Quantifying descriptors (e.g., between two given numbers, greatest/least, ascending/descending, tallest/shortest, warmest/coldest, fastest/slowest, longest/shortest, heaviest/lightest, closest/farthest, oldest/youngest, etc.)

Represent

COMPARISONS OF WHOLE NUMBERS TO 1,000,000,000 USING THE SYMBOLS $>$, $<$, OR $=$

Including, but not limited to:

- Whole numbers (0 – 1,000,000,000)
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Comparative language and symbols
 - Inequality words and symbols
 - Greater than ($>$)
 - Less than ($<$)
 - Equality words and symbol
 - Equal to ($=$)

Note(s):

- Grade Level(s):

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points below.

- Order two decimals on a number line.
- Order two decimals on an open number line.
- Quantifying descriptors (e.g., between two given numbers, greatest/least, ascending/descending, tallest/shortest, warmest/coldest, fastest/slowest, longest/shortest, heaviest/lightest, closest/farthest, oldest/youngest, etc.)

Represent

COMPARISONS OF WHOLE NUMBERS TO 1,000,000,000 USING THE SYMBOLS $>$, $<$, OR $=$

Including, but not limited to:

- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Comparative language and symbols
 - Inequality words and symbols
 - Greater than ($>$)
 - Less than ($<$)
 - Equality words and symbol
 - Equal to ($=$)

Note(s):

- Grade Level(s):
 - Grade 4 compared and ordered whole numbers to 1,000,000,000 and represented comparisons using the symbols $>$, $<$, or $=$.

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Note(s):

- Grade Level(s):
 - Grade 5 compared and ordered two decimals to the thousandths place and represented the comparisons using the symbols $>$, $<$, or $=$.
 - Grade 8 will order a set of real numbers arising from mathematical and real-world contexts.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using operations with integers and positive rational numbers to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation
 - X. Connections

Grade 4	Grade 5	Grade 6
<ul style="list-style-type: none"> ◦ Grade 3 compared and ordered whole numbers up to 100,000 and represented comparisons using the symbols $>$, $<$, or $=$. ◦ Grade 5 will compare and order two decimals to thousandths and represent comparisons using the symbols $>$, $<$, or $=$. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding decimals and addition and subtraction of decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 	<ul style="list-style-type: none"> ◦ Grade 4 compared and ordered decimals using concrete and visual models to the hundredths. ◦ Grade 5 introduces comparing and ordering two decimals to the thousandths place. ◦ Grade 6 will order a set of rational numbers arising from mathematical and real-world contexts. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP <ul style="list-style-type: none"> ◦ Grade Level Connections (reinforces previous learning and/or provides development for future learning) • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 	
<p>4.2F</p> <p>Compare and order decimals using concrete and visual models to the hundredths.</p> <p><i>Supporting Standard</i></p> <p>Compare, Order</p> <p>DECIMALS USING CONCRETE AND VISUAL MODELS TO THE HUNDREDTHS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers (0 – 1,000,000,000) <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$ ◦ Whole numbers – the set of counting 		

Grade 4

(natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$

- Decimals (less than or greater than one to the tenths and hundredths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Place value – the value of a digit as determined by its location in a number such as ones, tens, hundreds, one thousands, ten thousands, etc.
- Comparative language and symbols
 - Inequality words and symbols
 - Greater than ($>$)
 - Less than ($<$)
 - Equality words and symbol
 - Equal to ($=$)
- Compare numbers – to consider the value of two numbers to determine which number is greater or less or if the numbers are equal in value
 - Relative magnitude of a number describes the size of a number and its relationship to another number.
 - Compare two decimals using place value charts.
 - Compare digits in the same place value position beginning with the greatest place value.
 - If these digits are the same, continue to the next smallest place until the digits are different.
 - Numbers that have common digits but are not equal in value (different

Grade 5**Grade 6**

Grade 4

place values)

- Numbers that have a different number of digits
- Compare two decimals with various concrete and visual models.
 - Number lines, decimal disks, decimal grids, base-10 blocks, money, etc.
- Order numbers – to arrange a set of numbers based on their numerical value
- Order three or more decimals with various concrete and visual models.
 - Quantifying descriptors (e.g., between two given numbers, greatest/least, ascending/descending, tallest/shortest, warmest/coldest, fastest/slowest, longest/shortest, heaviest/lightest, closest/farthest, oldest/youngest, etc.)
 - Number lines, decimal disks, decimal grids, base-10 blocks, money, etc.

Note(s):

- Grade Level(s):
 - Grade 4 introduces comparing and ordering decimals using concrete and visual models to the hundredths.
 - Grade 5 will compare and order two decimals to thousandths and represent comparisons using the symbols $>$, $<$, or $=$.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding decimals and addition and subtraction of decimals
- TxCCRS:
 - I. Numeric Reasoning

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Grade 4	Grade 5	Grade 6
<ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections 		
Representing and Relating Numbers Using Number Lines		
<p>4.2 <i>Number and operations. The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to:</i></p>		<p>6.2 <i>Number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to:</i></p>
<p>4.2H</p> <p>Determine the corresponding decimal to the tenths or hundredths place of a specified point on a number line.</p> <p>Supporting Standard</p> <p>Determine</p> <p>THE CORRESPONDING DECIMAL TO THE TENTHS OR HUNDREDTHS PLACE OF A SPECIFIED POINT ON A NUMBER LINE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers (0 – 1,000,000,000) <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., <i>n</i>} ◦ Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., 		

Grade 4 $n\}$

- Decimals (less than or greater than one to the tenths and hundredths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- All decimals, to the tenths or hundredths place, can be located as a specified point on a number line.
 - Characteristics of a number line
 - A number line begins as a line with predetermined intervals (or tick marks) with positions/numbers labeled.
 - A minimum of two positions/numbers should be labeled.
 - Numbers on a number line represent the distance from zero.
 - The distance between the tick marks is counted rather than the tick marks themselves.
 - The placement of the labeled positions/numbers on a number line determines the scale of the number line.
 - Intervals between position/numbers are proportional.
 - When reasoning on a number line, the position of zero may or may not be placed.
 - When working with larger numbers, a number line without the constraint of distance from zero allows the ability to “zoom-in” on the relevant section of the number line.
 - Number lines extend infinitely in both

Grade 5**Grade 6**

Grade 4

directions (arrows indicate the number line continues infinitely).

- Numbers increase from left to right on a horizontal number line and from bottom to top on a vertical number line.
 - Points to the left of a specified point on a horizontal number line are less than points to the right.
 - Points to the right of a specified point on a horizontal number line are greater than points to the left.
 - Points below a specified point on a vertical number line are less than points above.
 - Points above a specified point on a vertical number line are greater than points below.
- Characteristics of an open number line
 - An open number line begins as a line with no intervals (or tick marks) and no positions/numbers labeled.
 - Numbers/positions are placed on the empty number line only as they are needed.
 - When reasoning on an open number line, the position of zero is often not placed.
 - When working with larger numbers, an open number line without the constraint of distance from zero allows the ability to “zoom-in” on the relevant section of the number line.
 - The placement of the first two numbers on an open number line determines the scale of the number line.
 - Once the scale of the number line has been established by the placement of

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Grade 4

the first two numbers, intervals between additional numbers placed are approximately proportional.

- The differences between numbers are approximated by the distance between the positions on the number line.
- Open number lines extend infinitely in both directions (arrows indicate the number line continues infinitely).
- Numbers increase from left to right on a horizontal number line and from bottom to top on a vertical number line.
 - Points to the left of a specified point on a horizontal number line are less than points to the right.
 - Points to the right of a specified point on a horizontal number line are greater than points to the left.
 - Points below a specified point on a vertical number line are less than points above.
 - Points above a specified point on a vertical number line are greater than points below.
- Landmark (or anchor) numbers may be placed on the open number line to help locate other numbers.
 - Number lines representing values less than one to the tenths place
 - Number lines representing values greater than one to the tenths place
 - Number lines representing values less than one to the hundredths place
 - Number lines representing values greater than one to the hundredths place
 - Number lines representing values between

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Grade 4	Grade 5	Grade 6
<p>tick marks</p> <ul style="list-style-type: none"> Relationship between tenths and hundredths <p>Note(s):</p> <ul style="list-style-type: none"> Grade Level(s): <ul style="list-style-type: none"> Grade 3 represented a number on a number line as being between two consecutive multiples of 10; 100; 1,000; or 10,000 and use words to describe relative size of numbers in order to round whole numbers. Various mathematical process standards will be applied to this student expectation as appropriate. TxRCFP: <ul style="list-style-type: none"> Understanding decimals and addition and subtraction of decimals TxCCRS: <ul style="list-style-type: none"> I. Numeric Reasoning IX. Communication and Representation 		
<p>4.2G</p> <p>Relate decimals to fractions that name tenths and hundredths.</p> <p><i>Readiness Standard</i></p> <p>Relate</p> <p>DECIMALS TO FRACTIONS THAT NAME TENTHS AND HUNDREDTHS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> Whole numbers (0 – 1,000,000,000) 		

Grade 4

- Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
- Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Decimals (less than or greater than one to the tenths and hundredths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Fractions (proper, improper, and mixed numbers)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division.
 - Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
 - Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
 - Mixed number – a number that is composed of a whole number and a fraction
- Various concrete and visual models
 - Number line (horizontal/vertical)
 - Number line representing values less than one

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Grade 4

- Number line representing values greater than one
- Number line representing values between tick marks
- Area model (tenths and hundredths grids)
 - Decimals and fractions of the same whole
 - Decimals and fractions less than one
 - Decimals and fractions greater than one
- Decimal disks
 - Decimals and fractions of the same whole
 - Decimals and fractions less than one
 - Decimals and fractions greater than one
- Base-10 blocks
 - Decimals and fractions to same whole
 - Decimals and fractions less than one
 - Decimals and fractions greater than one
- Money
 - Decimal and fraction relationships of a dollar
- Fraction language

Note(s):

- Grade Level(s):
 - Grade 4 introduces relating decimals to fractions that name tenths and hundredths.
 - Grade 6 will use equivalent fractions, decimals, and percents to show equal parts of the same whole.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding decimals and addition and subtraction of decimals
- TxCCRS:
 - I. Numeric Reasoning

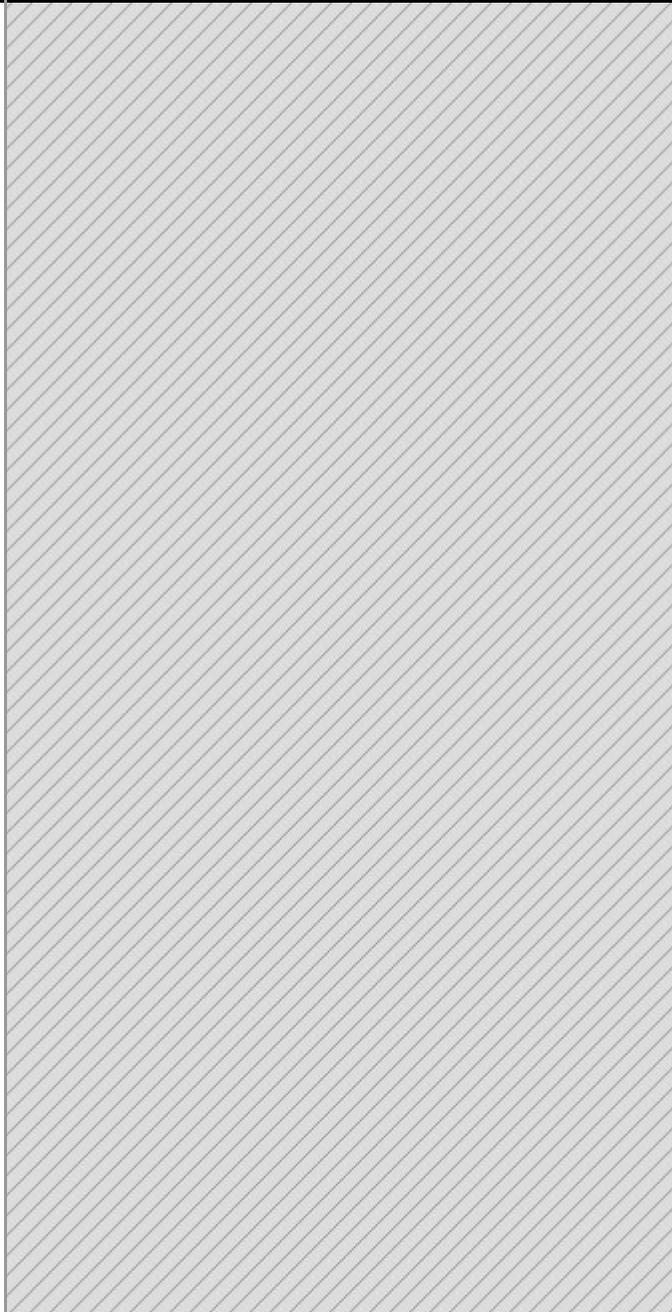
Grade 5**Grade 6**

Grade 4	Grade 5	Grade 6
<ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections 		
<p>4.2E</p> <p>Represent decimals, including tenths and hundredths, using concrete and visual models and money.</p> <p><i>Supporting Standard</i></p> <p>Represent</p> <p>DECIMALS, INCLUDING TENTHS AND HUNDREDTHS, USING CONCRETE AND VISUAL MODELS AND MONEY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers (0 – 1,000,000,000) <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n} ◦ Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n} • Decimals (less than or greater than one to the tenths and hundredths) <ul style="list-style-type: none"> ◦ Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part • Various concrete and visual models <ul style="list-style-type: none"> ◦ Number lines, decimal disks, decimal grids, base-10 blocks, money, etc. 		<p>6.2B</p> <p>Identify a number, its opposite, and its absolute value.</p> <p><i>Supporting Standard</i></p> <p>Identify</p> <p>A NUMBER, ITS OPPOSITE, AND ITS ABSOLUTE VALUE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Numbers <ul style="list-style-type: none"> ◦ Positive numbers are to the right of zero on a horizontal number line and above zero on a vertical number line. <ul style="list-style-type: none"> • Represented with a (+) symbol or no symbol at all ◦ Negative numbers are to the left of zero on a horizontal number line and below zero on a vertical number line. <ul style="list-style-type: none"> • Represented with a (-) symbol ◦ Zero is neither positive nor negative. • Quantities from mathematical and real-world problem situations are represented with positive and negative numbers. • Relationships between a number and its opposite <ul style="list-style-type: none"> ◦ All numbers have an opposite and are represented with positive and negative values. ◦ Opposite numbers are equidistant from zero

Grade 4

Note(s):

- Grade Level(s):
 - Previous grade levels used the decimal point in money only.
 - Grade 4 introduces representing decimals, including tenths and hundredths, using concrete and visual models and money.
 - Grade 5 will represent the value of the digit in decimals through the thousandths using expanded notation and numerals.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding decimals and addition and subtraction of decimals
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation
 - X. Connections

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- on a number line.
- The opposite of the opposite of a number is the number itself.
- Relationships between a number and its absolute value
 - Absolute value – the distance of a value from zero on a number line
 - Notation for absolute value is $|x|$, where x is any number
 - Distance is always a positive value or zero.
 - The distance of a number from zero is the same as the distance of its opposite from zero.
 - As a positive number decreases, the absolute value of the positive number decreases.
 - As a positive number increases, the absolute value of the positive number increases.
 - As a negative number decreases, the absolute value of the negative number increases.
 - As a negative number increases, the absolute value of the negative number decreases.
 - The absolute value of zero is zero.
- Relationship between a number, its opposite, and its absolute value
 - The absolute value of a number and its opposite are equidistant from zero.
 - The absolute value of a number and the absolute value of its opposite are equivalent.

Note(s):

Grade 4

Grade 5

Grade 6

- Grade Level(s):
 - Grade 4 represented fractions and decimals to the tenths or hundredths as distances from zero on a number line.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Use operations with integers and positive rational numbers to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

6.2C

Locate, compare, and order integers and rational numbers using a number line.

Supporting Standard

Locate, Compare, Order

INTEGERS AND RATIONAL NUMBERS USING A NUMBER LINE

Including, but not limited to:

- Integers – the set of counting (natural numbers), their opposites, and zero $\{-n, \dots, -3, -2, -1, 0, 1, 2, 3, \dots, n\}$. The set of integers is denoted by the symbol Z .
- Rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are integers and $b \neq 0$, which

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includes the subsets of integers, whole numbers, and counting (natural) numbers (e.g., -3, 0, 2, $-\frac{1}{2}$, $\frac{11}{7}$, $0.\overline{23}$, etc.). The set of rational numbers is denoted by the symbol \mathbb{Q} .

- Various forms of positive and negative rational numbers
 - Whole numbers
 - Integers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
- Relationship between equivalence of various forms of rational numbers
- All integers and rational numbers can be located as a specified point on a number line.
 - Characteristics of a number line
 - A number line begins as a line with predetermined intervals (or tick marks) with positions/numbers labeled.
 - A minimum of two positions/numbers should be labeled.
 - Numbers on a number line represent the distance from zero.
 - The distance between the tick marks is counted rather than the tick marks themselves.
 - The placement of the labeled positions/numbers on a number line determines the scale of the number line.
 - Intervals between position/numbers are proportional.
 - When reasoning on a number line, the position of zero may or may not be placed.
 - When working with larger numbers, a

number line without the constraint of distance from zero allows the ability to “zoom-in” on the relevant section of the number line.

- Number lines extend infinitely in both directions (arrows indicate the number line continues infinitely).
- Numbers increase from left to right on a horizontal number line and from bottom to top on a vertical number line.
 - Points to the left of a specified point on a horizontal number line are less than points to the right.
 - Points to the right of a specified point on a horizontal number line are greater than points to the left.
 - Points below a specified point on a vertical number line are less than points above.
 - Points above a specified point on a vertical number line are greater than points below.
- Characteristics of an open number line
 - An open number line begins as a line with no intervals (or tick marks) and no positions/numbers labeled.
 - Numbers/positions are placed on the empty number line only as they are needed.
 - When reasoning on an open number line, the position of zero is often not placed.
 - When working with larger numbers, an open number line without the constraint of distance from zero allows the ability to “zoom-in” on the relevant section of the number line.

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- The placement of the first two numbers on an open number line determines the scale of the number line.
 - Once the scale of the number line has been established by the placement of the first two numbers, intervals between additional numbers placed are approximately proportional.
- The differences between numbers are approximated by the distance between the positions on the number line.
- Open number lines extend infinitely in both directions (arrows indicate the number line continues infinitely).
- Numbers increase from left to right on a horizontal number line and from bottom to top on a vertical number line.
 - Points to the left of a specified point on a horizontal number line are less than points to the right.
 - Points to the right of a specified point on a horizontal number line are greater than points to the left.
 - Points below a specified point on a vertical number line are less than points above.
 - Points above a specified point on a vertical number line are greater than points below.
- Landmark (or anchor) numbers may be placed on the open number line to help locate other numbers.
- Relative magnitude of a number describes the size of a number and its relationship to another number.
- Comparison words and symbols

Grade 4	Grade 5	Grade 6
		<ul style="list-style-type: none"> ◦ Inequality words and symbols <ul style="list-style-type: none"> • Greater than (>) • Less than (<) ◦ Equality words and symbol <ul style="list-style-type: none"> • Equal to (=) • Quantifying descriptor in mathematical and real-world problem situations (e.g., between two given numbers, greatest/least, ascending/descending, tallest/shortest, warmest/coldest, fastest/slowest, longest/shortest, heaviest/lightest, closest/farthest, oldest/youngest, etc.) <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 represented fractions and decimals to the tenths or hundredths as distances from zero on a number line. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Using operations with integers and positive rational numbers to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation
		<p>Representing and Classifying Numbers</p>
		<p>6.2 <i>Number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The</i></p>

Grade 4	Grade 5	Grade 6
		<i>student is expected to:</i>
		<p>6.2A</p> <p>Classify whole numbers, integers, and rational numbers using a visual representation such as a Venn diagram to describe relationships between sets of numbers.</p> <p><i>Supporting Standard</i></p> <p>Classify</p> <p>WHOLE NUMBERS, INTEGERS, AND RATIONAL NUMBERS USING A VISUAL REPRESENTATION</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$ • Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$ • Integers – the set of counting (natural) numbers, their opposites, and zero $\{-n, \dots, -3, -2, -1, 0, 1, 2, 3, \dots, n\}$. The set of integers is denoted by the symbol Z. • Rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are integers and $b \neq 0$, which includes the subsets of integers, whole numbers, and counting (natural) numbers (e.g., $-3, 0, 2, -\frac{1}{2}, \frac{11}{7}, 0.\overline{23}$, etc.). The set of rational numbers is denoted by the symbol Q. • Visual representations of the relationships

Grade 4**Grade 5****Grade 6**

between sets and subsets of rational numbers

To Describe

RELATIONSHIPS BETWEEN SETS OF NUMBERS

Including, but not limited to:

- All counting (natural) numbers are a subset of whole numbers, integers, and rational numbers.
- All whole numbers are a subset of integers and rational numbers.
- All integers are a subset of rational numbers.
- All counting (natural) numbers, whole numbers, and integers are a subset of rational numbers.
- Not all rational numbers are an integer, whole number, or counting (natural) number.
- Terminating and repeating decimals are rational numbers but not integers, whole numbers, or counting (natural) numbers.

Note(s):

- Grade Level(s):
 - Prior to Grade 6 counting (natural) numbers, whole numbers, and positive rational numbers were developed.
 - Grade 6 introduces classifying whole numbers, integers, and rational numbers using a visual representation such as a Venn diagram to describe relationships between sets of numbers.
 - Grade 7 will extend previous knowledge of sets and subsets using a visual representation to describe relationships

Grade 4	Grade 5	Grade 6
		<p>between sets of rational numbers.</p> <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Grade Level Connections (reinforces previous learning and/or provides development for future learning) • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ X. Communication and Representation
		<p>Composing and Decomposing Numbers: Place Value</p>
<p>4.2 <i>Number and operations. The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to:</i></p>	<p>5.2 <i>Number and operations. The student applies mathematical process standards to represent, compare, and order positive rational numbers and understand relationships as related to place value. The student is expected to:</i></p>	
<p>4.2B</p> <p>Represent the value of the digit in whole numbers through 1,000,000,000 and decimals to the hundredths using expanded notation and numerals.</p> <p>Readiness Standard</p> <p>Represent</p> <p>THE VALUE OF THE DIGIT IN WHOLE NUMBERS THROUGH 1,000,000,000 USING EXPANDED</p>	<p>5.2A</p> <p>Represent the value of the digit in decimals through the thousandths using expanded notation and numerals.</p> <p>Supporting Standard</p> <p>Represent</p> <p>THE VALUE OF THE DIGIT IN DECIMALS THROUGH THE THOUSANDTHS USING EXPANDED NOTATION AND NUMERALS</p>	

Grade 4**NOTATION AND NUMERALS**

Including, but not limited to:

- Whole numbers (0 – 1,000,000,000)
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Numeral – a symbol used to name a number
- Digit – any numeral from 0 – 9
- Place value – the value of a digit as determined by its location in a number, such as ones, tens, hundreds, one thousands, ten thousands, etc.
 - One billions place
 - Hundred millions place
 - Ten millions place
 - One millions place
 - Hundred thousands place
 - Ten thousands place
 - One thousands place
 - Hundreds place
 - Tens place
 - Ones place
- Base-10 place value system
 - A number system using ten digits 0 – 9
 - Relationships between places are based on multiples of 10.
 - Moving left across the places, the values are 10 times the position to the right.
 - Moving right across the places, the values are one-tenth the value of the place to the left.

Grade 5

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Numeral – a symbol used to name a number
- Digit – any numeral from 0 – 9
- Place value – the value of a digit as determined by its location in a number, such as ones, tens, hundreds, one thousands, ten thousands, etc.
 - One billions place
 - Hundred millions place
 - Ten millions place
 - One millions place
 - Hundred thousands place
 - Ten thousands place
 - One thousands place
 - Hundreds place
 - Tens place
 - Ones place
 - Tenths place
 - Hundredths place
 - Thousandths place

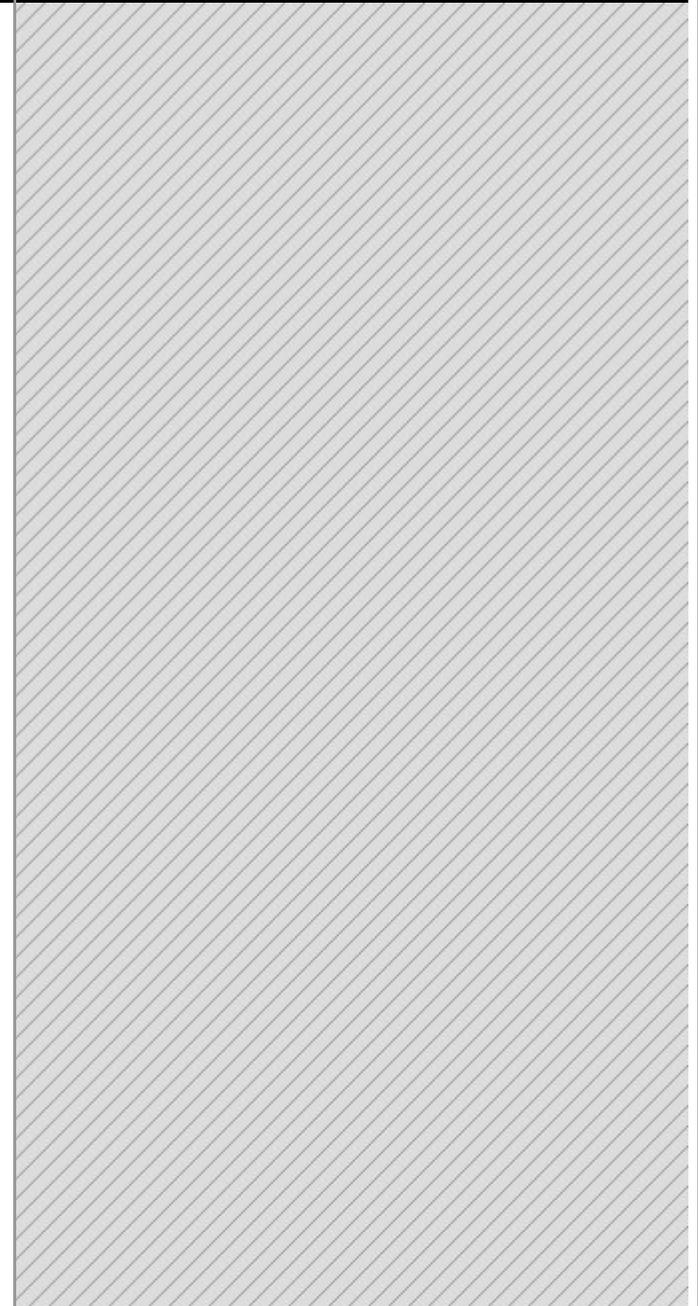
Grade 6

Grade 4

- The magnitude (relative size) of one billion
- Expanded notation – the representation of a number using place value of each digit (e.g., 985,156,789 as $900,000,000 + 80,000,000 + 5,000,000 + 100,000 + 50,000 + 6,000 + 700 + 80 + 9$)
 - Zero may or may not be written as an addend to represent the digit 0 in a number (e.g., 960,908,075 as $900,000,000 + 60,000,000 + 0 + 900,000 + 0 + 8,000 + 0 + 70 + 5$ or $900,000,000 + 60,000,000 + 900,000 + 8,000 + 70 + 5$).
- Standard notation – the representation of a number using digits (e.g., 985,156,789)
 - Period – a three-digit grouping of whole numbers where each grouping is composed of a ones place, a tens place, and a hundreds place, and each grouping is separated by a comma
 - Billions period is composed of the one billions place, ten billions place, and hundred billions place.
 - Millions period is composed of the one millions place, ten millions place, and hundred millions place.
 - Thousands period is composed of the one thousands place, ten thousands place, and hundred thousands place.
 - Units period is composed of the ones place, tens place, and hundreds place.
 - The word “billion” after the numerical value of the billions period is stated when read.
 - A comma between the billions period and the millions period is recorded when written but not stated when read.
 - The word “million” after the numerical value

Grade 5

- Base-10 place value system
 - A number system using ten digits 0 – 9
 - Relationships between places are based on multiples of 10.
 - Moving left across the places, the values are 10 times the position to the right.
 - Moving right across the places, the values are one-tenth the value of the place to the left.
- Multiplying a number by 10 increases the place value of each digit.
- Dividing a number by 10 decreases the place value of each digit.
- The magnitude (relative size) of decimal places through the thousandths
 - The magnitude of one-tenth
 - 0.1 can be represented as 1 tenth.
 - 0.1 can be represented as 10 hundredths.
 - 0.1 can be represented as 100 thousandths
 - The magnitude of one-hundredth
 - 0.01 can be represented as 1 hundredth.
 - 0.01 can be represented as 10 thousandths.
 - The magnitude of one-thousandth
 - 0.001 can be represented as 1 thousandth.
- Expanded notation – the representation of a number using place value (e.g., 985,156,789.782 as $900,000,000 + 80,000,000 + 5,000,000 + 100,000 + 50,000 + 6,000 + 700 + 80 + 9 + 0.7 + 0.08 + 0.002$ or $9(100,000,000) + 8(10,000,000) + 5(1,000,000) + 1(100,000) + 5(10,000) + 6(1,000) + 7(100) + 8(10) + 9 + 7(0.1) + 8(0.01) + 2(0.001)$ or $9(100,000,000) +$

Grade 6

Grade 4

- of the millions period is stated when read.
- A comma between the millions period and the thousands period is recorded when written but not stated when read.
- The word “thousand” after the numerical value of the thousands period is stated when read.
- A comma between the thousands period and the units period is recorded when written but not stated when read.
- The word “unit” after the numerical value of the units period is not stated when read.
- The word “hundred” in each period is stated when read.
- The words “ten” and “one” in each period are not stated when read.
- The tens place digit and ones place digit in each period are stated as a two-digit number when read.
- Zeros are used as place holders between digits as needed to maintain the value of each digit (e.g., 910,608,075).
- Leading zeros in a whole number are not commonly used in standard form, but are not incorrect and do not change the value of the number (e.g., 0,037,564,215 equals 37,564,215).
- Written notation – the representation of a number using written words (e.g., 985,156,789 as nine hundred eighty-five million, one hundred fifty-six thousand, seven hundred eighty-nine)
 - The word “billion” after the numerical value of the billions period is stated when read and recorded when written.
 - A comma between the billions period and

Grade 5

- $$8(10,000,000) + 5(1,000,000) + 1(100,000) + 5(10,000) + 6(1,000) + 7(100) + 8(10) + 9 + 7\left(\frac{1}{10}\right) + 8\left(\frac{1}{100}\right) + 2\left(\frac{1}{1000}\right)$$
- Zero may or may not be written as an addend to represent the digit 0 in a number (e.g., 905,150,089.087 as $900,000,000 + 0 + 5,000,000 + 100,000 + 50,000 + 0 + 0 + 80 + 9 + 0.0 + 0.08 + 0.007$ or $900,000,000 + 5,000,000 + 100,000 + 50,000 + 80 + 9 + 0.08 + 0.007$).
 - Standard notation – the representation of a number using digits (e.g., 985,156,789.782)
 - The whole part of a decimal number is recorded to the left of the decimal point when written and stated as a whole number.
 - The decimal point is recorded to separate the whole part of a decimal number from the fractional part of a decimal number when written and is stated as “and” when read.
 - The fractional part of a decimal number is recorded to the right of the decimal point when written.
 - The fractional part of a decimal number is stated as a whole number with the label of the smallest decimal place value when read (e.g., 0.5 is read as 5 tenths; 0.25 is read as 25 hundredths; 0.625 is read as 625 thousandths; etc.).
 - The “-ths” ending denotes the fractional part of a decimal number.
 - Zeros are used as place holders between the digits of a decimal number as needed, whole part and fractional part, to maintain the value of each digit (e.g., 400.005).

Grade 6

Grade 4

- the millions period is not stated when read but is recorded when written.
- The word “million” after the numerical value of the millions period is stated when read and recorded when written.
- A comma between the millions period and the thousands period is not stated when read but is recorded when written.
- The word “thousand” after the numerical value of the thousands period is stated when read and recorded when written.
- A comma between the thousands period and the units period is not stated when read but is recorded when written.
- The word “unit” after the numerical value of the units period is not stated when read and not recorded when written.
- The word “hundred” in each period is stated when read and recorded when written.
- The words “ten” and “one” in each period are not stated when read and not recorded when written.
- The tens place digit and ones place digit in each period are stated as a two-digit number when read and recorded using a hyphen, where appropriate, when written (e.g., twenty-three, thirteen, etc.).
- The zeros in a whole number are not stated when read and are not recorded when written (e.g., 854,091,005 in standard notation is read and written as eight hundred fifty-four million, ninety-one thousand, five in written notation).
- Multiple representations
 - Standard notation to expanded notation in numerals and expanded notation in

Grade 5

- Leading zeros in a decimal number are not commonly used in standard form, but are not incorrect and do not change the value of the decimal number (e.g., 0,037,564,215.558 equals 37,564,215.558)
- Trailing zeros after a fractional part of a decimal number may or may not be used and do not change the value of the decimal number (e.g., 400.500 equals 400.5).
- Written notation – the representation of a number using written words (e.g., 985,156,789.782 as nine hundred eighty-five million, one hundred fifty-six thousand, seven hundred eighty-nine and seven hundred eighty-two thousandths)
 - The whole part of a decimal number is recorded the same as a whole number with all appropriate unit labels prior to recording the fractional part of a decimal number.
 - The decimal point is recorded as the word “and” to separate the whole part of a decimal number from the fractional part of a decimal number when written and is stated as “and” when read.
 - The fractional part of a decimal number followed by the label of the smallest decimal place value is recorded when written and stated when read.
 - The “-ths” ending denotes the fractional part of a decimal number.
 - The zeros in a decimal number are not stated when read and are not recorded when written (e.g., 854,091,005.026 in standard form is read and written as eight hundred fifty-four million, ninety-one thousand, five and twenty-six thousandths

Grade 6

Grade 4

- numerals to standard notation
- Standard notation to expanded notation in words and numerals and expanded notation in words and numerals to standard notation
- Standard notation to written notation and written notation to standard notation
- Expanded notation in numerals to expanded notation in words and numerals and expanded notation in words and numerals to expanded notation in numerals
- Expanded notation numerals to written notation and written notation to expanded notation in numerals
- Expanded notation in words and numerals to written notation and written notation to expanded notation in words and numerals
- Expanded notation in numerals given out of place value order to standard notation or written notation
- Expanded notation in words and numerals given out of place value order to standard notation or written notation
- Equivalent compositions of numbers with the same value
- Equivalent decompositions of numbers with the same value

Represent

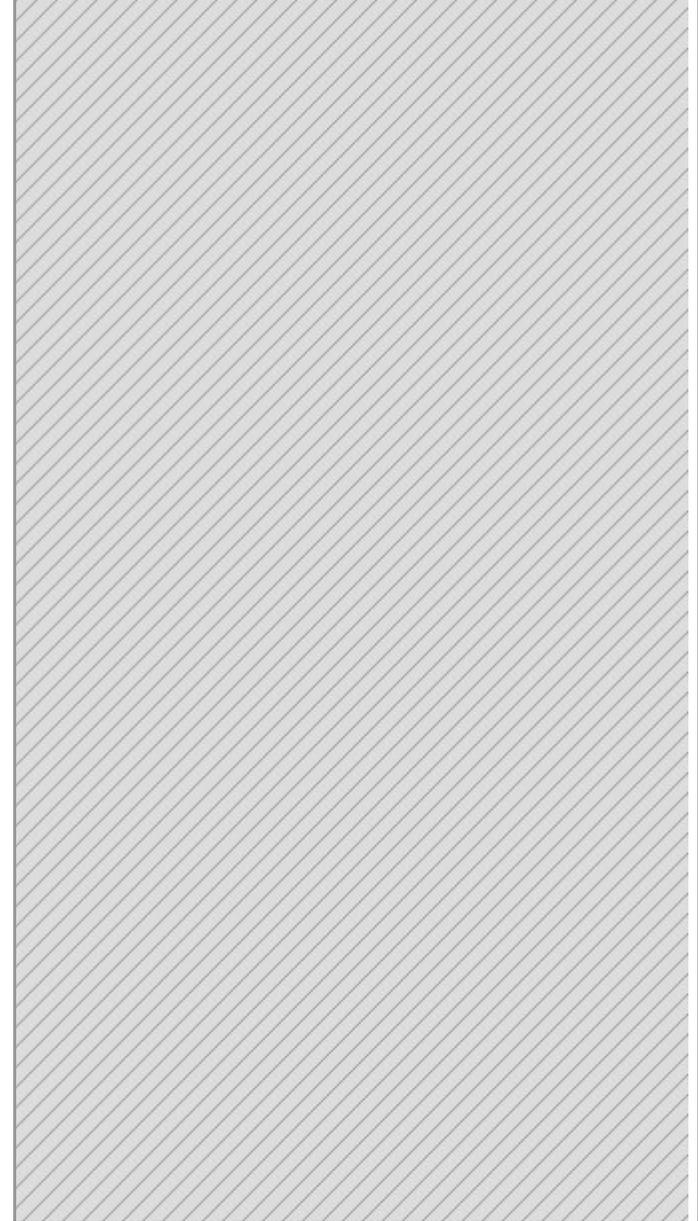
THE VALUE OF THE DIGIT IN DECIMALS TO THE HUNDREDTHS USING EXPANDED NOTATION AND NUMERALS

Including, but not limited to:

Grade 5

- in word form.).
- Equivalent relationships between place value of decimals through the thousandths
- Multiple representations
 - Standard notation to expanded notation in numerals and expanded notation in numerals to standard notation
 - Standard notation to expanded notation in words and numerals and expanded notation in words and numerals to standard notation
 - Standard notation to written notation and written notation to standard notation
 - Expanded notation in numerals to expanded notation in words and numerals and expanded notation in words and numerals to expanded notation in numerals
 - Expanded notation numerals to written notation and written notation to expanded notation in numerals
 - Expanded notation in words and numerals to written notation and written notation to expanded notation in words and numerals
 - Expanded notation in numerals given out of place value order to standard notation or written notation
 - Expanded notation in words and numerals given out of place value order to standard notation or written notation
 - Equivalent compositions of numbers with the same value
 - Equivalent decompositions of numbers with the same value

Note(s):

Grade 6

Grade 4

- Whole numbers (0 – 1,000,000,000)
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Decimals (less than or greater than one to the tenths and hundredths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Numeral – a symbol used to name a number
- Digit – any numeral from 0 – 9
- Place value – the value of a digit as determined by its location in a number, such as ones, tens, hundreds, one thousands, ten thousands, etc.
 - One billions place
 - Hundred millions place
 - Ten millions place
 - One millions place
 - Hundred thousands place
 - Ten thousands place
 - One thousands place
 - Hundreds place
 - Tens place
 - Ones place
 - Tenths place
 - Hundredths place
- Base-10 place value system
 - A number system using ten digits 0 – 9
 - Relationships between places are based on

Grade 5

- Grade Level(s):
 - Grade 4 represented the value of the digit in whole numbers through 1,000,000,000 and decimals to the hundredths using expanded notation and numerals.
 - Grade 4 interpreted the value of each place-value position as 10 times the position to the right and as one-tenth of the value of the place to its left.
 - Grade 4 represented decimals, including tenths and hundredths, using concrete and visual models and money.
 - Grade 5 introduces expanded notation of decimals with a thousandths place.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Grade Level Connections (reinforces previous learning and/or provides development for future learning)
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

Grade 6

Grade 4

multiples of 10.

- Moving left across the places, the values are 10 times the position to the right.
- Moving right across the places, the values are one-tenth the value of the place to the left.
- Multiplying a number by 10 increases the place value of each digit.
- Dividing a number by 10 decreases the place value of each digit.
- The magnitude (relative size) of decimal places through the hundredths
 - The magnitude of one-tenth
 - 0.1 can be represented as 1 tenth.
 - 0.1 can be represented as 10 hundredths.
 - The magnitude of one-hundredth
 - 0.01 can be represented as 1 hundredth.
- Expanded notation – the representation of a number using place value (e.g., 985,156,789.78 as $900,000,000 + 80,000,000 + 5,000,000 + 100,000 + 50,000 + 6,000 + 700 + 80 + 9 + 0.7 + 0.08$ or $9(100,000,000) + 8(10,000,000) + 5(1,000,000) + 1(100,000) + 5(10,000) + 6(1,000) + 7(100) + 8(10) + 9 + 7(0.1) + 8(0.01)$)
 - Zero may or may not be written as an addend to represent the digit 0 in a number (e.g., 905,150,089.08 as $900,000,000 + 0 + 5,000,000 + 100,000 + 50,000 + 0 + 0 + 80 + 9 + 0.0 + 0.08$ or $900,000,000 + 5,000,000 + 100,000 + 50,000 + 80 + 9 + 0.08$).
- Standard notation – the representation of a number using digits (e.g., 985,156,789.78)
 - The whole part of a decimal number is recorded to the left of the decimal point

Grade 5**Grade 6**

Grade 4

when written and stated as a whole number.

- The decimal point is recorded to separate the whole part of a decimal number from the fractional part of a decimal number when written and is stated as “and” when read.
- The fractional part of a decimal number is recorded to the right of the decimal point when written.
- The fractional part of a decimal number is stated as a whole number with the label of the smallest decimal place value when read (e.g., 0.5 is read as 5 tenths; 0.25 is read as 25 hundredths; etc.).
 - The “-ths” ending denotes the fractional part of a decimal number.
- Zeros are used as place holders between digits of a decimal number as needed, whole part and fractional part, to maintain the value of each digit (e.g., 400.05).
- Leading zeros in a decimal number are not commonly used in standard form, but are not incorrect and do not change the value of the decimal number (e.g., 0,037,564,215.55 equals 37,564,215.55).
- Trailing zeros after a fractional part of a decimal number may or may not be used and do not change the value of the decimal number (e.g., 400.50 equals 400.5).
- Written notation – the representation of a number using written words (e.g., 985,156,789.78 as nine hundred eighty-five million, one hundred fifty-six thousand, seven hundred eighty-nine and seventy-eight hundredths)
- The whole part of a decimal number is

Grade 5**Grade 6**

Grade 4

recorded the same as a whole number with all appropriate unit labels prior to recording the fractional part of a decimal number.

- The decimal point is recorded as the word “and” to separate the whole part of a decimal number from the fractional part of a decimal number when written and is stated as “and” when read.
- The fractional part of a decimal number followed by the label of the smallest decimal place value is recorded when written and stated when read.
 - The “-ths” ending denotes the fractional part of a decimal number.
- The zeros in a decimal number are not stated when read and are not recorded when written (e.g., 854,091,005.26 in standard form is read and written as eight hundred fifty-four million, ninety-one thousand, five and twenty-six hundredths in word form).
- Equivalent relationships between place value of decimals through the hundredths
- Multiple representations
 - Standard notation to expanded notation in numerals and expanded notation in numerals to standard notation
 - Standard notation to expanded notation in words and numerals and expanded notation in words and numerals to standard notation
 - Standard notation to written notation and written notation to standard notation
 - Expanded notation in numerals to expanded notation in words and numerals and expanded notation in words and numerals to expanded notation in numerals

Grade 5**Grade 6**

Grade 4

- Expanded notation numerals to written notation and written notation to expanded notation in numerals
- Expanded notation in words and numerals to written notation and written notation to expanded notation in words and numerals
- Expanded notation in numerals given out of place value order to standard notation or written notation
- Expanded notation in words and numerals given out of place value order to standard notation or written notation
- Equivalent compositions of numbers with the same value
- Equivalent decompositions of numbers with the same value

Note(s):

- Grade Level(s):
 - Grade 3 composed and decomposed numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using objects, pictorial models, and numbers, including expanded notation as appropriate.
 - Grade 4 introduces the millions and billions period.
 - Grade 4 introduces representing the value of a decimal to the hundredths using expanded notation and numerals.
 - Grade 5 will represent the value of the digit in decimals through the thousandths using expanded notation and numerals.
 - Various mathematical process standards will be applied to this student expectation

Grade 5

Grade 6

Grade 4

as appropriate.

- TxRCFP:
 - Understanding decimals and addition and subtraction of decimals
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

Grade 5

Grade 6

4.2A

Interpret the value of each place-value position as 10 times the position to the right and as one-tenth of the value of the place to its left.

Supporting Standard

Interpret

THE VALUE OF EACH PLACE-VALUE POSITION AS 10 TIMES THE POSITION TO THE RIGHT AND AS ONE-TENTH OF THE VALUE OF THE PLACE TO ITS LEFT

Including, but not limited to:

- Place value – the value of a digit as determined by its location in a number such as ones, tens, hundreds, one thousands, ten thousands, etc.
 - One billions place
 - Hundred millions place
 - Ten millions place
 - One millions place
 - Hundred thousands place
 - Ten thousands place
 - One thousands place

Grade 4

- Hundreds place
- Tens place
- Ones place
- Base-10 place value system
 - A number system using ten digits 0 – 9
 - Relationships between places are based on multiples of 10.
 - Moving left across the places, the values are 10 times the position to the right.
 - Moving right across the places, the values are one-tenth the value of the place to the left.

Note(s):

- Grade Level(s):
 - Grade 3 described the mathematical relationships found in the base-10 place value system through the hundred thousands place.
 - Grade 5 will represent the value of the digit in decimals through the thousandths using expanded notation and numerals.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding decimals and addition and subtraction of decimals
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

Grade 5**Grade 6****4.2E****Represent decimals, including tenths and hundredths,**

Grade 4

using concrete and visual models and money.

Supporting Standard

Represent

DECIMALS, INCLUDING TENTHS AND HUNDREDTHS, USING CONCRETE AND VISUAL MODELS AND MONEY

Including, but not limited to:

- Whole numbers (0 – 1,000,000,000)
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Decimals (less than or greater than one to the tenths and hundredths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Various concrete and visual models
 - Number lines, decimal disks, decimal grids, base-10 blocks, money, etc.

Note(s):

- Grade Level(s):
 - Previous grade levels used the decimal point in money only.
 - Grade 4 introduces representing decimals,

Grade 5**Grade 6**

Grade 4	Grade 5	Grade 6
<p>including tenths and hundredths, using concrete and visual models and money.</p> <ul style="list-style-type: none"> ◦ Grade 5 will represent the value of the digit in decimals through the thousandths using expanded notation and numerals. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding decimals and addition and subtraction of decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation ◦ X. Connections 		
Representing Fraction Concepts		
<p>4.3 <i>Number and operations. The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to:</i></p>		<p>6.2 <i>Number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to:</i></p>
<p>4.3A Represent a fraction a/b as a sum of fractions $1/b$, where a and b are whole numbers and $b > 0$, including when $a > b$.</p>		<p>6.2E Extend representations for division to include fraction notation such as a/b represents the same number as $a \div b$ where $b \neq 0$.</p>

Supporting Standard

Represent

A FRACTION $\frac{a}{b}$ AS A SUM OF FRACTIONS $\frac{1}{b}$,

WHERE a AND b ARE WHOLE NUMBERS AND $b > 0$, INCLUDING WHEN $a > b$

Including, but not limited to:

- Fractions (proper, improper, or mixed numbers with equal denominators)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division.
 - Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
 - Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
 - Mixed number – a number that is composed of a whole number and a fraction
- Relationship between the whole and the part
 - Numerator – the part of a fraction written above the fraction bar that tells the number of fractional parts specified or being considered
 - Denominator – the part of a fraction written

Supporting Standard

Extend

REPRESENTATIONS FOR DIVISION TO INCLUDE FRACTION NOTATION SUCH AS $\frac{a}{b}$ REPRESENTS

THE SAME NUMBER AS $a \div b$ WHERE $b \neq 0$

Including, but not limited to:

- Division notation
 - Numeric: $a \div b$
 - a represents the dividend.
 - b represents the divisor, where $b \neq 0$.
 - Fraction notation
 - $\frac{a}{b}$ is the algebraic notation for any rational number represented as a fraction.
 - a represents the numerator of the fraction. A numerator denotes the number of equal parts from the whole or set.
 - b represents the denominator of the fraction. A denominator denotes the total number of equal parts in a whole or set.
- Relationship between fraction notation and division
 - $\frac{a}{b}$ is the same as a divided by b , where $b \neq 0$.
- Algebraic: $a \div b = \frac{a}{b} = \left(\frac{a}{1}\right) \left(\frac{1}{b}\right) = a \cdot \frac{1}{b}$
 - The numerator of a fraction is the same as the dividend in a division problem.
 - The denominator of a fraction is the same as the divisor in a division problem.

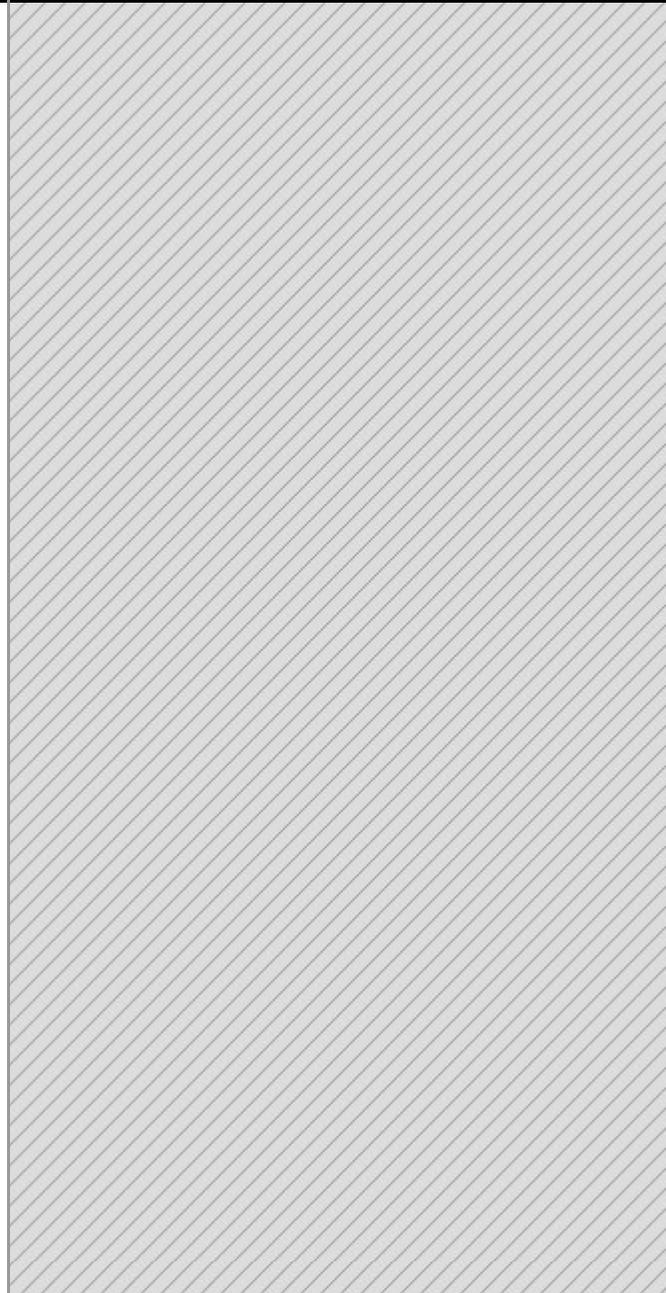
Grade 4

below the fraction bar that tells the total number of equal parts in a whole or set

- Represent fractions using numbers and symbols
- Multiple Representations
 - Concrete models of whole objects
 - Linear model
 - Fraction bars, customary ruler, linking cube trains, folded paper strips, etc.
 - Area models
 - Fraction circles or squares, pattern blocks, etc.
 - Concrete models of a set of objects
 - Pattern blocks, color tiles, counters, etc.
 - Pictorial models
 - Fraction strips, fraction bar models, number lines, etc.

Note(s):

- Grade Level(s):
 - Grade 3 composed and decomposed a fraction $\frac{a}{b}$ with a numerator greater than zero and less than or equal to b as a sum of parts $\frac{1}{b}$.
 - Grade 6 will extend representations for division to include fraction notation such as $\frac{a}{b}$ represents the same number as $a \div b$ where $b \neq 0$.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Building foundations for addition and

Grade 5**Grade 6**

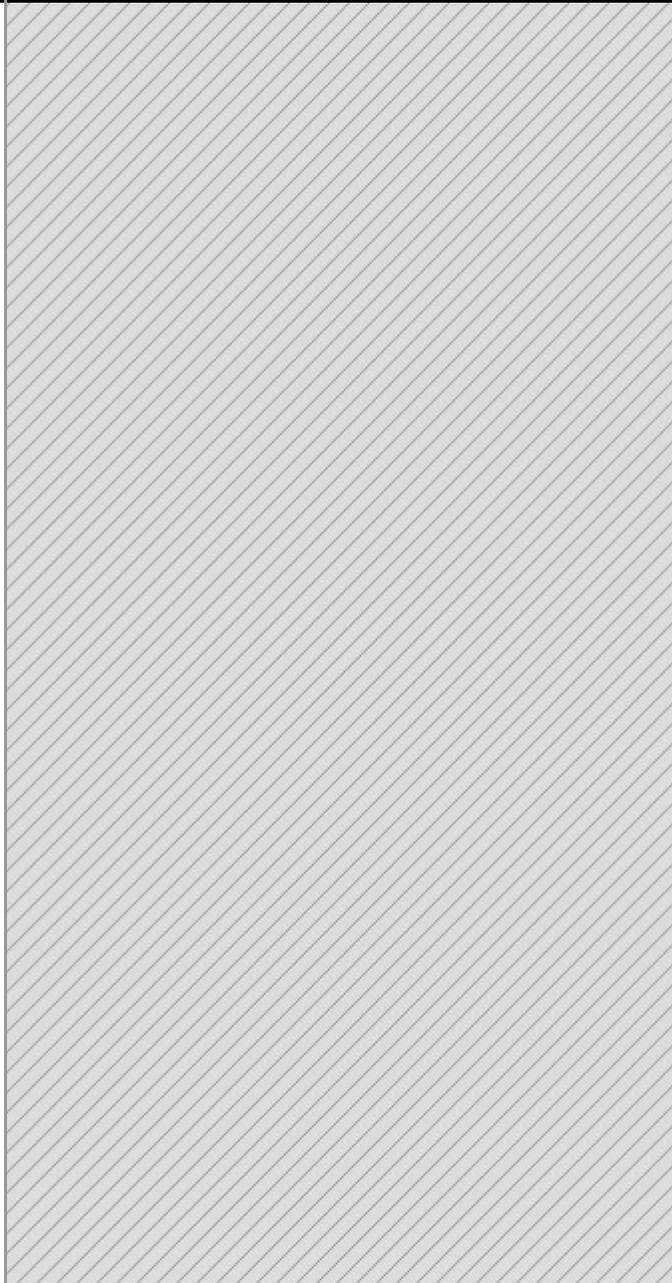
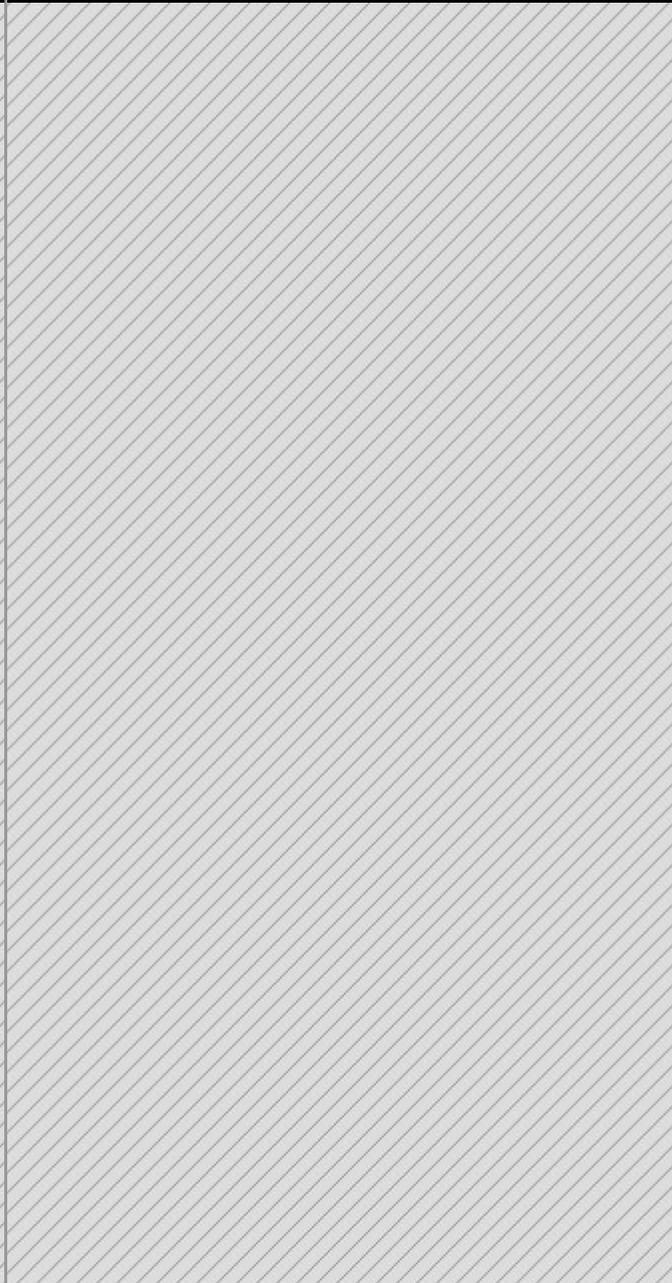
Note(s):

- Grade Level(s)
 - Grade 4 represented a fraction $\frac{a}{b}$ as a sum of fractions $\frac{1}{b}$, where a and b are whole numbers and $b > 0$, including when $a > b$.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using operations with integers and positive rational numbers to solve problems
- TxCCRS:
 - IX. Communication and Representation

Grade 4	Grade 5	Grade 6
subtraction of fractions <ul style="list-style-type: none"> • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 		
<p>4.3B</p> <p>Decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations.</p> <p><i>Supporting Standard</i></p> <p>Decompose</p> <p>A FRACTION IN MORE THAN ONE WAY INTO A SUM OF FRACTIONS WITH THE SAME DENOMINATOR USING CONCRETE AND PICTORIAL MODELS AND RECORDING RESULTS WITH SYMBOLIC REPRESENTATIONS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Fractions (proper, improper, or mixed numbers with equal denominators) <ul style="list-style-type: none"> ◦ Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division. ◦ Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero 		

Grade 4

- Improper fraction – a number in the form $\frac{a}{b}$
where a and b are whole numbers and $a > b$ where b is not equal to zero
- Mixed number – a number that is composed of a whole number and a fraction
- Decompose fractions – to break a value (less than, equal to, or greater than one whole) into smaller fractional parts represented by $\frac{1}{b}$ or multiples of $\frac{1}{b}$, where b represents the number of parts in one whole
- Relationship between the whole and the part
 - Numerator – the part of a fraction written above the fraction bar that tells the number of fractional parts specified or being considered
 - Denominator – the part of a fraction written below the fraction bar that tells the total number of equal parts in a whole or set
- Represent fractions using numbers and symbols
- Multiple decompositions as a sum of fractions with the same denominator
 - Concrete models of whole objects
 - Linear models
 - Fraction bars, customary ruler, linking cube trains, folded paper strips, etc.
 - Area models
 - Fraction circles or squares, pattern blocks, etc.
 - Concrete models of a set of objects
 - Pattern blocks, color tiles, counters, etc.
 - Pictorial models
 - Fraction strips, bar models, number lines,

Grade 5**Grade 6**

Grade 4	Grade 5	Grade 6
<p>etc.</p> <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 3 composed and decomposed a fraction $\frac{a}{b}$ with a numerator greater than zero and less than or equal to b as a sum of parts $\frac{1}{b}$. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Building foundations for addition and subtraction of fractions • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation 		
<p>4.3G</p> <p>Represent fractions and decimals to the tenths or hundredths as distances from zero on a number line.</p> <p>Supporting Standard</p> <p>Represent</p> <p>FRACTIONS AND DECIMALS TO THE TENTHS OR HUNDREDTHS AS DISTANCES FROM ZERO ON A NUMBER LINE</p> <p>Including, but not limited to:</p>		

Grade 4

- Fractions (proper, improper, and mixed numbers)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division.
 - Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
 - Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
 - Mixed number – a number that is composed of a whole number and a fraction
- Decimals (less than or greater than one to the tenths and hundredths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Characteristics of a number line
 - A number line begins as a line with predetermined intervals (or tick marks) with positions/numbers labeled.
 - A minimum of two positions/numbers should be labeled.
 - Numbers on a number line represent the distance from zero.
 - The distance between the tick marks is counted rather than the tick marks themselves.

Grade 5**Grade 6**

Grade 4

- The placement of the labeled positions/numbers on a number line determines the scale of the number line.
 - Intervals between position/numbers are proportional.
- When reasoning on a number line, the position of zero may or may not be placed.
- When working with larger numbers, a number line without the constraint of distance from zero allows the ability to “zoom-in” on the relevant section of the number line.
- Number lines extend infinitely in both directions (arrows indicate the number line continues infinitely).
- Numbers increase from left to right on a horizontal number line and from bottom to top on a vertical number line.
 - Points to the left of a specified point on a horizontal number line are less than points to the right.
 - Points to the right of a specified point on a horizontal number line are greater than points to the left.
 - Points below a specified point on a vertical number line are less than points above.
 - Points above a specified point on a vertical number line are greater than points below.
- Fractions or decimals to the tenths or hundredths as distances from zero on a number line
- Relationship between a fraction represented using a strip diagram to a fraction represented on a number line and the relationship between

Grade 5**Grade 6**

Grade 4

a decimal represented using a strip diagram
to a decimal represented on a number line

- Strip diagram – a linear model used to illustrate number relationships
- Fractions or decimals as distances from zero on a number line greater than 1
 - Point on a number line read as the number of whole units from zero and the fractional or decimal amount of the next whole unit
 - Number line beginning with a number other than zero
 - Distance from zero to first marked increment is assumed even when not visible on the number line.
- Relationship between fractions as distances from zero on a number line to fractional measurements as distances from zero on a customary ruler, yardstick, or measuring tape
 - Measuring a specific length using a starting point other than zero on a customary ruler, yardstick, or measuring tape
 - Distance from zero to first marked increment not counted
 - Length determined by number of whole units and the fractional amount of the next whole unit
- Relationship between fractions and decimals as distances from zero on a number line to fractional and decimal measurements as distances from zero on a metric ruler, meter stick, or measuring tape
 - Measuring a specific length using a starting point other than zero on a metric ruler, meter stick, or measuring tape
 - Distance from zero to first marked increment not counted

Grade 5**Grade 6**

Grade 4

- Length determined by number of whole units and the fractional amount of the next whole unit
- Relationship between distances from zero on a number line, distances from zero on the scale of a bar graph, and heights of the bars within the graph
 - Bar graph – a graphical representation to organize data that uses solid bars that do not touch each other to show the frequency (number of times) that each category occurs

Note(s):

- Grade Level(s):
 - Grade 3 represented fractions greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 using concrete objects and pictorial models, including strip diagrams and number lines.
 - Grade 3 determined the corresponding fraction greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 given a specified point on a number line.
 - Grade 6 will identify a number, its opposite, and its absolute value.
 - Grade 6 will locate, compare, and order integers and rational numbers using a number line.
 - Grade 5 will represent the value of the digit in decimals through the thousandths using expanded notation and numerals.
 - Various mathematical process standards will be applied to this student expectation as appropriate.

Grade 5**Grade 6**

Grade 4	Grade 5	Grade 6
<ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding decimals and addition and subtraction of decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 		
Determining Equivalence and Comparing Part-to-Whole Relationships		
<p>4.3 <i>Number and operations. The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to:</i></p>		<p>6.5 <i>Proportionality. The student applies mathematical process standards to solve problems involving proportional relationships. The student is expected to:</i></p>
<p>4.3C</p> <p>Determine if two given fractions are equivalent using a variety of methods.</p> <p>Supporting Standard</p> <p>Determine</p> <p>IF TWO GIVEN FRACTIONS ARE EQUIVALENT USING A VARIETY OF METHODS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Fractions (proper, improper, or mixed numbers with equal or unequal denominators) <ul style="list-style-type: none"> ◦ Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to 		

Grade 4

name part of an object, part of a set of objects, to compare two quantities, or to represent division.

- Proper fraction – a number in the form $\frac{a}{b}$
where a and b are whole numbers and $a < b$ where b is not equal to zero
- Improper fraction – a number in the form $\frac{a}{b}$
where a and b are whole numbers and $a > b$ where b is not equal to zero
- Mixed number – a number that is composed of a whole number and a fraction
- Relationship between the whole and the part
- Numerator – the part of a fraction written above the fraction bar that tells the number of fractional parts specified or being considered
- Denominator – the part of a fraction written below the fraction bar that tells the total number of equal parts in a whole or set
- Equivalent fractions – fractions that have the same value
- Comparisons of fractions are only valid when referring to the same size whole.
- Variety of methods
 - Equivalency using a number line
 - Equivalency using an area model
 - Equivalency using a strip diagram
 - Strip diagram – a linear model used to illustrate number relationships
 - Equivalency using an arithmetic method

Note(s):

- Grade Level(s):
 - Grade 3 explained that two fractions are

Grade 5**Grade 6**

Grade 4	Grade 5	Grade 6
<p>equivalent if and only if they are both represented by the same point on the number line or represent the same portion of a same size whole for an area model.</p> <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Building foundations for addition and subtraction of fractions • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 		
<p>4.3D</p> <p>Compare two fractions with different numerators and different denominators and represent the comparison using the symbols >, =, or <.</p> <p><i>Readiness Standard</i></p> <p>Compare</p> <p>TWO FRACTIONS WITH DIFFERENT NUMERATORS AND DIFFERENT DENOMINATORS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Fractions (proper, improper, or mixed with equal or unequal denominators) <ul style="list-style-type: none"> ◦ Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to 		

Grade 4

name part of an object, part of a set of objects, to compare two quantities, or to represent division

- Proper fraction – a number in the form $\frac{a}{b}$
where a and b are whole numbers and $a < b$ where b is not equal to zero
- Improper fraction – a number in the form $\frac{a}{b}$
where a and b are whole numbers and $a > b$ where b is not equal to zero
- Mixed number – a number that is composed of a whole number and a fraction
- Relationship between the whole and the part
- Numerator – the part of a fraction written above the fraction bar that tells the number of fractional parts specified or being considered
- Denominator – the part of a fraction written below the fraction bar that tells the total number of equal parts in a whole or set
- Benchmarks
 - Comparisons of fractions are only valid when referring to the same size whole.
- Common denominators
 - Common denominators standardize the size of the pieces; therefore, compare the number of pieces (numerator).
 - Larger numerator → more equal-size fractional pieces → larger fraction
 - Smaller numerator → fewer equal-size fractional pieces → smaller fraction
 - Least common multiple (LCM) – the smallest multiple that two or more numbers have in common
 - Least common denominator (LCD) – the

Grade 5**Grade 6**

Grade 4

least common multiple of the denominators of two or more fractions

- Common numerators
 - Common numerators standardize the number of pieces; therefore, compare the size of each piece (denominator).
 - Larger denominator → smaller fractional piece → smaller fraction
 - Smaller denominator → larger fractional piece → larger fraction
- Least common multiple (LCM) – the smallest multiple that two or more numbers have in common
- Least common numerator – the least common multiple of the numerators of two or more fractions

Represent

THE COMPARISON OF TWO FRACTIONS WITH DIFFERENT NUMERATORS AND DIFFERENT DENOMINATORS USING THE SYMBOLS $>$, $=$, OR $<$

Including, but not limited to:

- Whole numbers (0 – 1,000,000,000)
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Fractions (proper, improper, or mixed numbers with equal or unequal denominators)
 - Fraction – a number in the form $\frac{a}{b}$ where a

Grade 5**Grade 6**

Grade 4

and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division

- Proper fraction – a number in the form $\frac{a}{b}$
where a and b are whole numbers and $a < b$ where b is not equal to zero
- Improper fraction – a number in the form $\frac{a}{b}$
where a and b are whole numbers and $a > b$ where b is not equal to zero
- Mixed number – a number that is composed of a whole number and a fraction
- Relationship between the whole and the part
 - Numerator – the part of a fraction written above the fraction bar that tells the number of fractional parts specified or being considered
 - Denominator – the part of a fraction written below the fraction bar that tells the total number of equal parts in a whole or set
- Comparative language and symbols
 - Inequality words and symbols
 - Greater than ($>$)
 - Less than ($<$)
 - Equality words and symbol
 - Equal to ($=$)

Note(s):

- Grade Level(s):
 - Grade 3 compared two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using

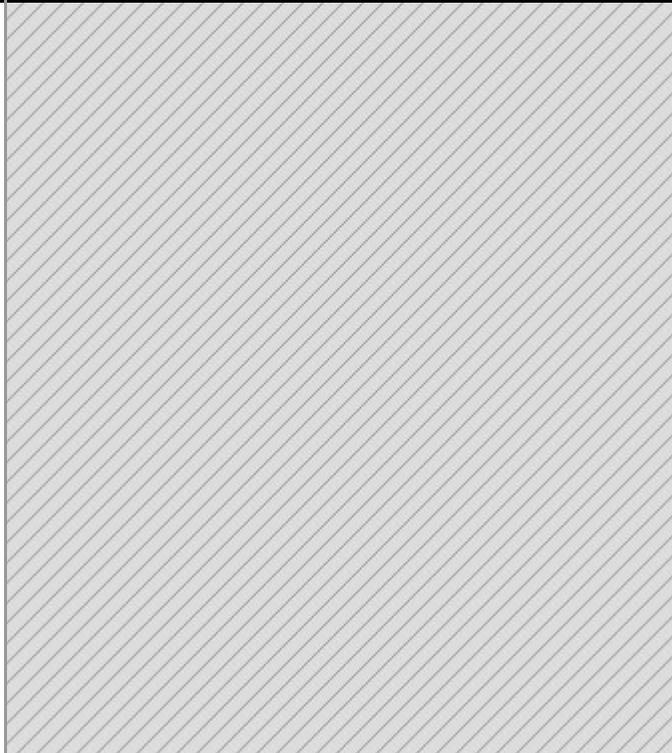
Grade 5**Grade 6**

Grade 4	Grade 5	Grade 6
<p>symbols, words, objects, and pictorial models.</p> <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Building foundations for addition and subtraction of fractions • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation 		
<p>4.2 <i>Number and operations. The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to:</i></p>		
<p>4.2G</p> <p>Relate decimals to fractions that name tenths and hundredths.</p> <p>Readiness Standard</p> <p>Relate</p> <p>DECIMALS TO FRACTIONS THAT NAME TENTHS AND HUNDREDTHS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers (0 – 1,000,000,000) <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of 		<p>6.5C</p> <p>Use equivalent fractions, decimals, and percents to show equal parts of the same whole.</p> <p>Supporting Standard</p> <p>Use</p> <p>EQUIVALENT FRACTIONS, DECIMALS, AND PERCENTS TO SHOW EQUAL PARTS OF THE SAME WHOLE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of

Grade 4

positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }

- Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Decimals (less than or greater than one to the tenths and hundredths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Fractions (proper, improper, and mixed numbers)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to

Grade 5**Grade 6**

numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).

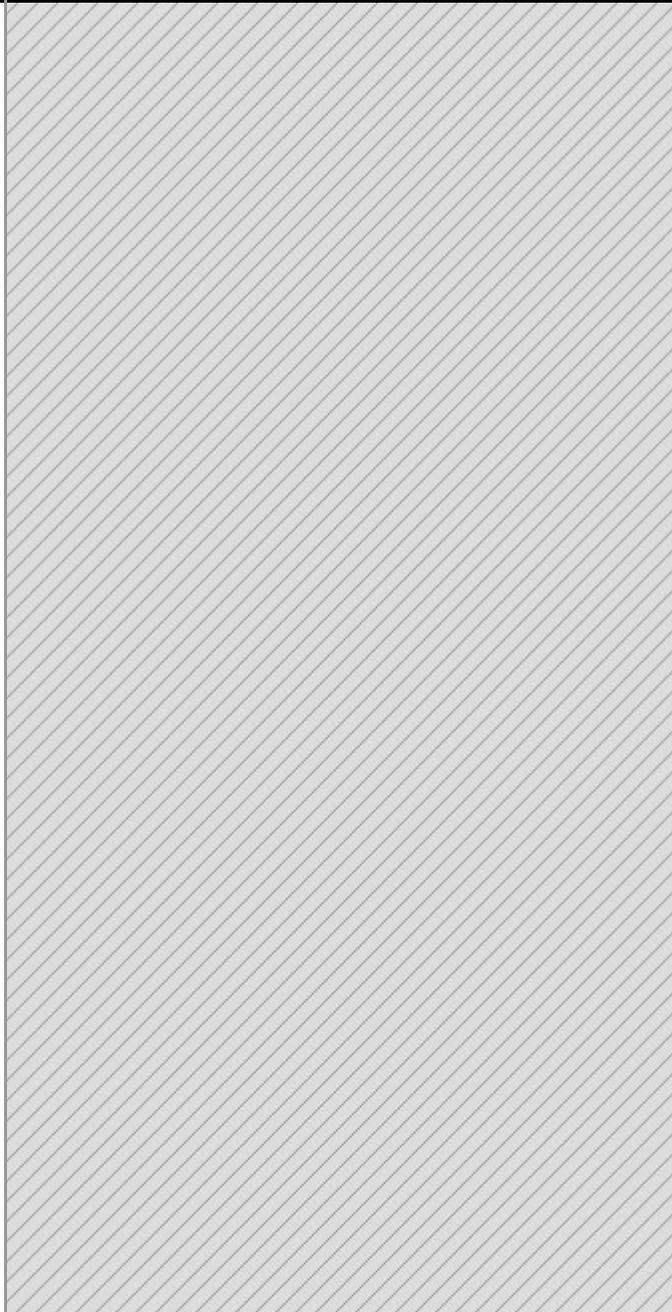
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents (less than or greater than 100%)
 - Percent – a part of a whole expressed in hundredths
- Various representations to show equal parts of the same whole
 - 10 by 10 grid
 - Strip diagram – a linear model used to illustrate number relationships
 - Number line

Grade 4

represent division.

- Proper fraction – a number in the form $\frac{a}{b}$
 - where a and b are whole numbers and $a < b$ where b is not equal to zero
- Improper fraction – a number in the form $\frac{a}{b}$
 - where a and b are whole numbers and $a > b$ where b is not equal to zero
- Mixed number – a number that is composed of a whole number and a fraction
- Various concrete and visual models
 - Number line (horizontal/vertical)
 - Number line representing values less than one
 - Number line representing values greater than one
 - Number line representing values between tick marks
 - Area model (tenths and hundredths grids)
 - Decimals and fractions of the same whole
 - Decimals and fractions less than one
 - Decimals and fractions greater than one
 - Decimal disks
 - Decimals and fractions of the same whole
 - Decimals and fractions less than one
 - Decimals and fractions greater than one
 - Base-10 blocks
 - Decimals and fractions to same whole
 - Decimals and fractions less than one
 - Decimals and fractions greater than one
 - Money
 - Decimal and fraction relationships of a dollar
 - Fraction language

Note(s):

Grade 5**Grade 6**

Note(s):

- Grade Level(s):
 - Grade 6 introduces using equivalent fractions, decimals, and percents to show equal parts of the same whole.
 - Grade 7 will solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

Grade 4	Grade 5	Grade 6
<ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 introduces relating decimals to fractions that name tenths and hundredths. ◦ Grade 6 will use equivalent fractions, decimals, and percents to show equal parts of the same whole. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding decimals and addition and subtraction of decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation ◦ X. Connections 		
Adding and Subtracting Whole Numbers, Decimals, and Rational Numbers		
<p>4.4 <i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	<p>5.3 <i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	
<p>4.4A Add and subtract whole numbers and decimals to the hundredths place using the standard algorithm.</p> <p><i>Readiness Standard</i></p>	<p>5.3A Estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication, or division.</p>	

Grade 4

Add, Subtract

WHOLE NUMBERS AND DECIMALS TO THE HUNDREDTHS PLACE USING THE STANDARD ALGORITHM

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Addition and subtraction of whole numbers
 - Connection between place value and the standard algorithm
 - Standard algorithm
- Decimals (less than or greater than one to the tenths and hundredths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point

Grade 5**Supporting Standard**

Estimate To Determine

SOLUTIONS TO MATHEMATICAL AND REAL-WORLD PROBLEMS INVOLVING ADDITION, SUBTRACTION, MULTIPLICATION, OR DIVISION

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Fractions (proper, improper, or mixed numbers with equal or unequal denominators)

Grade 6

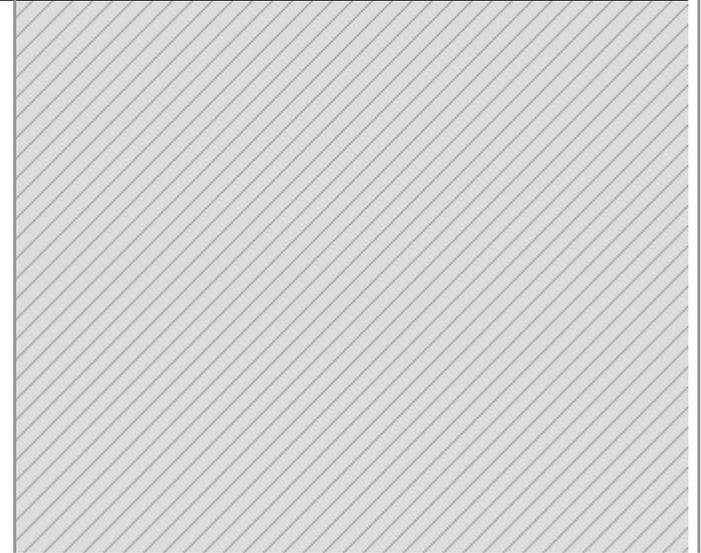
Grade 4

- separating the whole from the part
- Addition and subtraction of decimals
 - Relate addition and subtraction of decimals to the hundredths place using concrete objects and pictorial models to the standard algorithm for adding and subtracting decimals.
 - Trailing zeros – a sequence of zeros in the decimal part of a number that follow the last non-zero digit, and whether recorded or deleted, does not change the value of the number
 - Standard algorithm

Note(s):

Grade 5

- Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division.
- Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
- Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
- Mixed number – a number that is

Grade 6

Grade 4

- Grade Level(s):
 - Grade 3 solved with fluency one-step and two-step problems involving addition and subtraction within 1,000 using strategies based on place value, properties of operations, and the relationship between addition and subtraction.
 - Grade 4 extends adding and subtracting of whole numbers from 1,000 to 1,000,000 and introduces adding and subtracting decimals, including tenths and hundredths.
 - Grade 5 will estimate to determine solutions to mathematical and real-world problems involving addition, subtraction, multiplication, or division.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
 - Understanding decimals and addition and subtraction of decimals
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 5

- composed of a whole number and a fraction
- Unit fraction – a fraction in the form representing the quantity formed by one part of a whole that has been partitioned into b equal parts where b is a non-zero whole number
- Addition
 - Sums of whole numbers
 - Sums of decimals up to the thousandths
 - Sums of fractions with equal and unequal denominators
- Subtraction
 - Differences of whole numbers
 - Differences of decimals with values limited to the thousandths
 - Differences of fractions with equal and unequal denominators
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to three-digit factors by two-digit factors
 - Products of decimals limited to three-digit factors by two-digit factors with products to the hundredths
 - Multiply tenths by tenths (e.g., $0.3 \times 0.7 = 0.21$, $1.2 \times 1.2 = 1.44$, $14.3 \times 1.3 = 18.59$, etc.)
 - Multiply tenths by hundredths or vice versa (e.g., $0.5 \times 0.12 = 0.06$, $1.4 \times 0.15 = 0.21$, $21.4 \times 0.45 = 9.63$, etc.)
 - Multiply tenths by thousandths or vice versa (e.g., $0.4 \times 0.125 = 0.05$, $0.125 \times 8.4 = 1.05$, etc.)

Grade 6

Grade 4**Grade 5****Grade 6**

- Multiply whole numbers by tenths, hundredths, and thousandths or vice versa (e.g., $3 \times 1.3 = 3.9$, $42 \times 7.45 = 312.9$, $7.02 \times 78 = 547.56$, $6 \times 0.125 = 0.75$, etc.)
- Products of fractions where factors are limited to a fraction and a whole number
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Whole numbers with quotients up to four-digit dividends and two-digit divisors
 - Quotients of decimals limited to four-digit dividends and two-digit whole number divisors, with quotients to the hundredths
 - Dividend to the tenths and whole number divisor (e.g., $1.2 \div 24 = 0.05$, $358.8 \div 23 = 15.6$, $721.7 \div 14 = 51.55$, etc.)
 - Dividend to the hundredths and whole number divisor (e.g., $8.68 \div 4 = 2.17$, $8.25 \div 15 = 0.55$, $62.76 \div 12 = 5.23$, etc.)
 - Whole number dividends and whole number divisors (e.g., $3 \div 4 = 0.75$, $10 \div 8 = 1.25$, $1000 \div 16 = 62.5$, etc.)
 - Quotients of fractions where dividend and divisors are limited to whole numbers by unit fractions and unit fractions by whole numbers
- Estimation strategies for solving mathematical and real-world problem situations
 - Estimation – reasoning to determine an

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approximate value

- Vocabulary indicating estimation situations (e.g., about, approximately, estimate, etc.)
- Vocabulary descriptors of the effects of the adjustment on the estimation compared to the actual solution (e.g., about, close, little more/little less, around, approximately, estimated, etc.)
 - Variation of the estimate from the actual solution is dependent upon the magnitude of the adjustment(s) of the actual numbers.
- Front-end method – a type of estimation focusing first on the largest place value in each of the numbers to be computed and then determining if the next smallest place value(s) when grouped should be considered or ignored (compensation)
- Rounding – a type of estimation with specific rules for determining the closest value
 - Round numbers to a common place then compute.
 - Keep one value the same and round the other value to estimate solutions.
- Compatible numbers – numbers that are slightly adjusted to create groups of numbers that are easy to compute mentally
- Multiple operations with various forms of numbers

Note(s):

- Grade Level(s):
 - Grade 4 added and subtracted whole numbers and decimals to the hundredths place using the standard algorithm.

Grade 4	Grade 5	Grade 6
	<ul style="list-style-type: none"> ◦ Grade 5 estimates solutions with whole numbers, fractions, and decimals. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation 	
Adding and Subtracting Fractions and Rational Numbers		
<p>4.3 <i>Number and operations. The student applies mathematical process standards to represent and generate fractions to solve problems. The student is expected to:</i></p>	<p>5.3 <i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	
<p>4.3E</p> <p>Represent and solve addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations.</p> <p>Readiness Standard</p> <p>Represent, Solve</p>	<p>5.3H</p> <p>Represent and solve addition and subtraction of fractions with unequal denominators referring to the same whole using objects and pictorial models and properties of operations.</p> <p>Supporting Standard</p> <p>Represent, Solve</p>	

Grade 4

ADDITION AND SUBTRACTION OF FRACTIONS WITH EQUAL DENOMINATORS USING OBJECTS AND PICTORIAL MODELS THAT BUILD TO THE NUMBER LINE AND PROPERTIES OF OPERATIONS

Including, but not limited to:

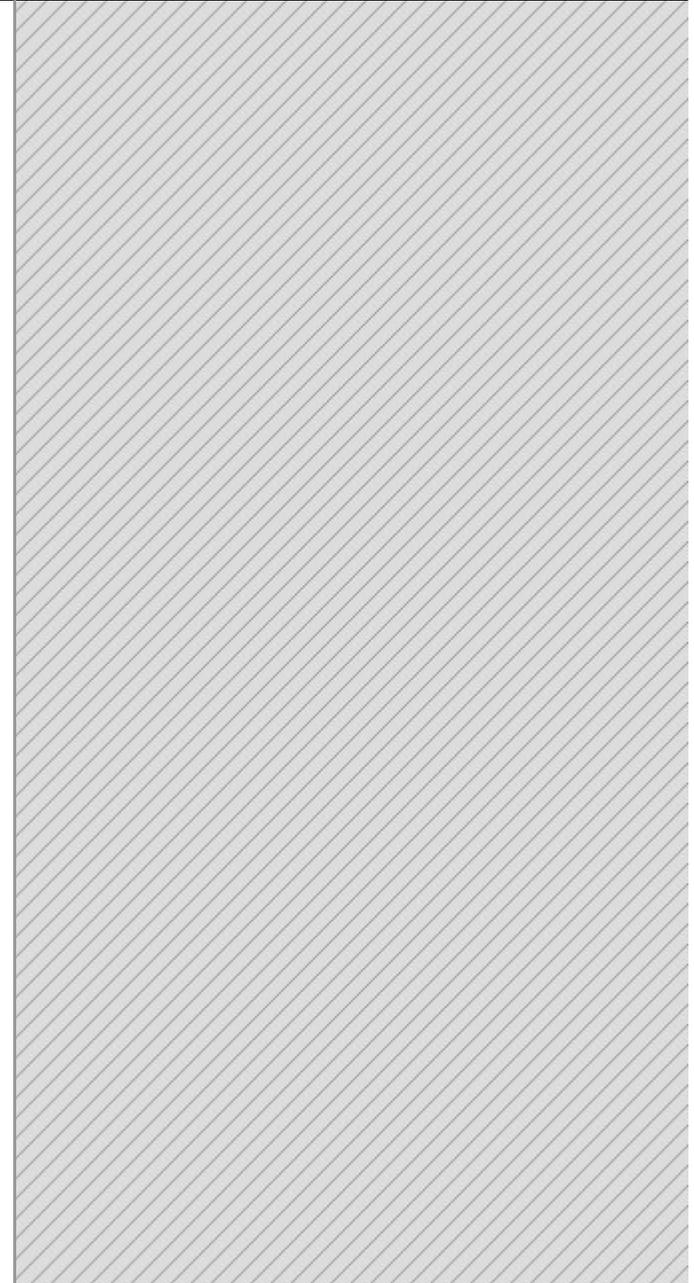
- Fractions (proper, improper, or mixed numbers with equal denominators)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division
 - Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
 - Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
 - Mixed number – a number that is composed of a whole number and a fraction
- Addition
 - Sums of fractions limited to equal denominators
- Subtraction
 - Differences of fractions limited to equal denominators
- Fractional relationships
 - Relationship between the whole and the part
 - Numerator – the part of a fraction written

Grade 5

ADDITION AND SUBTRACTION OF FRACTIONS WITH UNEQUAL DENOMINATORS REFERRING TO THE SAME WHOLE USING OBJECTS AND PICTORIAL MODELS AND PROPERTIES OF OPERATIONS

Including, but not limited to:

- Fractions (proper, improper, or mixed numbers)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division
 - Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
 - Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
 - Mixed number – a number that is composed of a whole number and a fraction
- Addition
 - Sums of fractions with equal or unequal denominators referring to the same whole
- Subtraction
 - Differences of fractions with equal or unequal denominators referring to the same whole
- Fraction relationships
 - Relationship between the whole and the part

Grade 6

Grade 4

above the fraction bar that tells the number of fractional parts specified or being considered

- Denominator – the part of a fraction written below the fraction bar that tells the total number of equal parts in a whole or set
- Referring to the same whole
 - Fractions are relationships and the size or the amount of the whole matters
 - Common whole is needed when adding or subtracting fractions
 - Equivalent fractions with like denominators determined prior to adding or subtracting fractions
- Concrete objects and pictorial models for addition of fractions with equal denominators that build to the number line
 - Pattern blocks and other shapes (circles, squares, rectangles, etc.)
 - Fraction strips and other strip models
- Relationships between concrete objects and pictorial models for addition of fractions with equal denominators, number lines, and properties of operations
- Properties of operations
 - Commutative property of addition – if the order of the addends are changed, the sum will remain the same
 - $a + b = c$; therefore, $b + a = c$
 - Associative property of addition – if three or more addends are added, they can be grouped in any order, and the sum will remain the same
 - $a + b + c = (a + b) + c = a + (b + c)$
- Pattern blocks and other shapes (circles,

Grade 5

- Numerator – the part of a fraction written above the fraction bar that tells the number of fractional parts specified or being considered
- Denominator – the part of a fraction written below the fraction bar that tells the total number of equal parts in a whole or set
- Referring to the same whole
- Fractions are relationships, and the size or the amount of the whole matters.
 - Common whole is needed when adding or subtracting fractions
 - Least common denominator (LCD) – the least common multiple of the denominators of two or more fractions
 - Common denominator determined prior to adding or subtracting fractions
- Concrete objects and pictorial models
 - Pattern blocks and other shapes (circles, squares, rectangles, etc.)
 - Fraction strips and other strip models
 - Number lines
 - Clocks
 - Ratio tables
 - Sets of objects
- Properties of operations
 - Commutative property of addition – if the order of the addends are changed, the sum will remain the same
 - $a + b = c$; therefore, $b + a = c$
 - Associative property of addition – if three or more addends are added, they can be grouped in any order, and the sum will remain the same
 - $a + b + c = (a + b) + c = a + (b + c)$

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Grade 4	Grade 5	Grade 6
<p>squares, rectangles, etc.)</p> <ul style="list-style-type: none"> • Fraction strips and other strip models • Concrete objects and pictorial models for subtraction of fractions with equal denominators that build to the number line • Pattern blocks and other shapes (circles, squares, rectangles, etc.) • Fraction strips and other strip models <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 introduces representing and solving addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations. ◦ Grade 5 will represent and solve addition and subtraction of fractions with unequal denominators referring to the same whole using objects and pictorial models and properties of operations. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Building foundations for addition and subtraction of fractions • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation 	<ul style="list-style-type: none"> • Equation(s) to reflect solution process <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 represented and solved addition and subtraction of fractions with equal denominators using objects and pictorial models that build to the number line and properties of operations. ◦ Grade 5 introduces representing and solving addition and subtraction of fractions with unequal denominators. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 	
<p>4.3F</p> <p>Evaluate the reasonableness of sums and differences</p>	<p>5.3K</p> <p>Add and subtract positive rational numbers fluently.</p>	

Grade 4

of fractions using benchmark fractions 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1, referring to the same whole.

Supporting Standard

Evaluate

THE REASONABLENESS OF SUMS AND DIFFERENCES OF FRACTIONS USING BENCHMARK FRACTIONS 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, AND 1, REFERRING TO THE SAME WHOLE

Including, but not limited to:

- Fractions (proper, improper, or mixed)

Grade 5**Readiness Standard**

Add, Subtract

POSITIVE RATIONAL NUMBERS FLUENTLY

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots\}$

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Grade 4

numbers with equal denominators)

- Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division
- Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
- Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
- Mixed number – a number that is composed of a whole number and a fraction
- Fraction relationships
 - Relationship between the whole and the part
 - Numerator – the part of a fraction written above the fraction bar that tells the number of fractional parts specified or being considered
 - Denominator – the part of a fraction written below the fraction bar that tells the total number of equal parts in a whole or set
 - Referring to the same whole
 - Fractions are relationships and the size or the amount of the whole matters
 - Common whole is needed when adding or subtracting fractions
 - Equivalent fractions with like

Grade 5

n }

- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Fractions (proper, improper, or mixed numbers with equal or unequal denominators)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division.
 - Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
 - Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
 - Mixed number – a number that is composed of a whole number and a fraction
 - Unit fraction – a fraction in the form $\frac{1}{b}$ representing the quantity formed by one part of a whole that has been partitioned into b equal parts where b is a non-zero whole number
- Positive rational numbers – the set of numbers that can be expressed as a fraction

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Grade 4

denominators determined prior to adding or subtracting fractions

- Reasoning with fraction benchmarks with and without models
- Reasoning with fraction benchmarks with and without models within problem situations

Note(s):

- Grade Level(s):
 - Grade 4 evaluates the reasonableness of sums and differences of fractions using benchmark fractions $0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ and 1 , referring to the same whole.
 - Grade 5 will add and subtract positive rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Building foundations for addition and subtraction of fractions
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 5

$\frac{a}{b}$, where a and b are whole numbers, and $b \neq 0$ which includes the subset of whole numbers and counting (natural) numbers (e.g., $0, 2, \frac{11}{7}, 0.\overline{23}$, etc.)

- Fluency – efficient application of procedures with accuracy
- Addition
 - Sums of whole numbers
 - Sums of decimals up to the thousandths
 - Sums of fractions with equal and unequal denominators
- Subtraction
 - Differences of whole numbers
 - Differences of decimals with values limited to the thousandths
 - Differences of fractions with equal and unequal denominators
- Least common denominator (LCD) – the least common multiple of the denominators of two or more fractions
- Common denominator determined prior to adding or subtracting fractions
- Recognition of addition or subtraction in mathematical and real-world problem situations
- Addition and subtraction with various forms of numbers

Note(s):

- Grade Level(s):
 - Grade 4 evaluated the reasonableness of sums and differences of fractions using benchmark fractions $0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}$ and 1

Grade 6

Grade 4	Grade 5	Grade 6
	<p>referring to the same whole.</p> <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ X. Communication and Representation 	
Applying Strategies for Estimation		
<p>4.2 <i>Number and operations. The student applies mathematical process standards to represent, compare, and order whole numbers and decimals and understand relationships related to place value. The student is expected to:</i></p>	<p>5.2 <i>Number and operations. The student applies mathematical process standards to represent, compare, and order positive rational numbers and understand relationships as related to place value. The student is expected to:</i></p>	
<p>4.2D</p> <p>Round whole numbers to a given place value through the hundred thousands place.</p> <p>Supporting Standard</p> <p>Round</p> <p>WHOLE NUMBERS TO A GIVEN PLACE VALUE THROUGH THE HUNDRED THOUSANDS PLACE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers (0 – 1,000,000,000) 	<p>5.2C</p> <p>Round decimals to tenths or hundredths.</p> <p>Supporting Standard</p> <p>Round</p> <p>DECIMALS TO TENTHS OR HUNDREDTHS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Decimals (less than and greater than one to the tenths, hundredths, and thousandths) ◦ Decimal number – a number in the base-10 	

Grade 4

- Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
- Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Rounding – a type of estimation with specific rules for determining the closest value
- Nearest 10; 100; 1,000; 10,000; or 100,000
- Number lines
 - Proportionally scaled number lines (pre-determined intervals)
 - Open number lines (no marked intervals)
 - Relative magnitude of a number describes the size of a number and its relationship to another number.
- Rounding to the nearest 10 on a number line
 - Determine the two consecutive multiples of 10 that the number being rounded falls between.
 - Begin with the value of the original tens place within the number and then identify the next highest value in the tens place.
 - Determine the halfway point between the consecutive multiples of 10.
 - Locate the position of the number being rounded on the number line.
 - Determine if the number being rounded is before, past, or on the halfway point between the consecutive multiples of 10 on the number line.
 - If the number being rounded is before the halfway point on the number line,

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- place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Rounding – a type of estimation with specific rules for determining the closest value
- Nearest tenth or hundredth
- Number lines
 - Proportionally scaled number lines (pre-determined intervals)
 - Open number line (no marked intervals)
 - Trailing zeros – a sequence of zeros in the decimal part of a number that follow the last non-zero digit, and whether recorded or deleted, does not change the value of the number
 - Relative magnitude of a number describes the size of a number and its relationship to another number.
 - Connections between rounding whole numbers on number line to rounding decimals on a number line
- Rounding to the nearest tenth on a number line
 - Determine the two consecutive tenths that the number being rounded falls between.
 - Begin with the value of the original tenths place within the number and then identify the next highest value in the tenths place.
 - Determine the halfway point between the consecutive tenths.
 - Locate the position of the number being rounded on the number line.
 - Determine if the number being rounded is

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Grade 4

round to the value of the original tens place.

- If the number being rounded is past the halfway point on the number line, round to the value of the next highest tens place.
- If the number being rounded is on the halfway point on the number line, round to the value of the next highest tens place.
- Rounding to the nearest 100 on a number line
 - Determine the two consecutive multiples of 100 that the number being rounded falls between.
 - Begin with the value of the original hundreds place within the number and then identify the next highest value in the hundreds place.
 - Determine the halfway point between the consecutive multiples of 100.
 - Locate the position of the number being rounded on the number line.
 - Determine if the number being rounded is before, past, or on the halfway point between the consecutive multiples of 100 on the number line.
 - If the number being rounded is before the halfway point on the number line, round to the value of the original hundreds place.
 - If the number being rounded is past the halfway point on the number line, round to the value of the next highest hundreds place.
 - If the number being rounded is on the

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before, past, or on the halfway point between the consecutive tenths on the number line.

- If the number being rounded is before the halfway point on the number line, round to the value of the original tenths place.
- If the number being rounded is past the halfway point on the number line, round to the value of the next highest tenths place.
- If the number being rounded is on the halfway point on the number line, round to the value of the next highest tenths place.
- Rounding to the nearest hundredth on a number line
 - Determine the two consecutive hundredths that the number being rounded falls between.
 - Begin with the value of the original hundredths place within the number and then identify the next highest value in the hundredths place.
 - Determine the halfway point between the consecutive hundredths.
 - Locate the position of the number being rounded on the number line.
 - Determine if the number being rounded is before, past, or on the halfway point between the consecutive hundredths on the number line.
 - If the number being rounded is before the halfway point on the number line, round to the value of the original hundredths place.

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Grade 4

halfway point on the number line, round to the value of the next highest hundreds place.

- Rounding to the nearest 1,000 on a number line
 - Determine the two consecutive multiples of 1,000 that the number being rounded falls between.
 - Begin with the value of the original thousands place within the number and then identify the next highest value in the thousands place.
 - Determine the halfway point between the consecutive multiples of 1,000.
 - Locate the position of the number being rounded on the number line.
 - Determine if the number being rounded is before, past, or on the halfway point between the consecutive multiples of 1,000 on the number line.
 - If the number being rounded is before the halfway point on the number line, round to the value of the original thousands place.
 - If the number being rounded is past the halfway point on the number line, round to the value of the next highest thousands place.
 - If the number being rounded is on the halfway point on the number line, round to the value of the next highest thousands place.
- Rounding to the nearest 10,000 on a number line
 - Determine the two consecutive multiples of 10,000 that the number being rounded

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- If the number being rounded is past the halfway point on the number line, round to the value of the next highest hundredths place.
- If the number being rounded is on the halfway point on the number line, round to the value of the next highest hundredths place.
- Round a given decimal to the closest tenth or hundredth on a number line.
- Round a given decimal to the greater tenth or hundredth if it falls exactly halfway between the consecutive tenths or hundredths on a number line.
- Money (tenths, hundredths)
 - Relationship between tenths and \$0.10 or a dime
 - Relationship between hundredths and \$0.01 or a penny
- Rounding numerically based on place value
 - Find the place to which you are rounding. Look at the digit of the next lowest place value, the digit to the right of which you are rounding.
 - If the digit in that place is less than 5, then the digit in the rounding place remains the same.
 - If the digit in that place is greater than or equal to 5, then the digit in the rounding place increases by 1.
 - The digit(s) to the right of the place of which you are rounding is replaced with "0".
 - Trailing zeros are not necessary to record in the decimal part of the number.

Note(s):

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Grade 4

falls between.

- Begin with the value of the original ten thousands place within the number and then identify the next highest value in the ten thousands place.
- Determine the halfway point between the consecutive multiples of 10,000.
- Locate the position of the number being rounded on the number line.
- Determine if the number being rounded is before, past, or on the halfway point between the consecutive multiples of 10,000 on the number line.
 - If the number being rounded is before the halfway point on the number line, round to the value of the original ten thousands place.
 - If the number being rounded is past the halfway point on the number line, round to the value of the next highest ten thousands place.
 - If the number being rounded is on the halfway point on the number line, round to the value of the next highest ten thousands place.
- Rounding to the nearest 100,000 on a number line
 - Determine the two consecutive multiples of 100,000 that the number being rounded falls between.
 - Begin with the value of the original hundred thousands place within the number and then identify the next highest value in the hundred thousands place.
 - Determine the halfway point between the

Grade 5

- Grade Level(s):
 - Grade 4 rounded whole numbers to a given place through the hundred thousands place.
 - Grade 4 rounded to the nearest 10, 100, or 1,000 or used compatible numbers to estimate solutions involving whole numbers.
 - Grade 5 introduces rounding decimals to the tenths or hundredths.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP
 - Grade Level Connections (reinforces previous learning and/or provides development for future learning)
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

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consecutive multiples of 100,000.

- Locate the position of the number being rounded on the number line.
- Determine if the number being rounded is before, past, or on the halfway point between the consecutive multiples of 100,000 on the number line.
 - If the number being rounded is before the halfway point on the number line, round to the value of the original hundred thousands place.
 - If the number being rounded is past the halfway point on the number line, round to the value of the next highest hundred thousands place.
 - If the number being rounded is on the halfway point on the number line, round to the value of the next highest hundred thousands place.
- Round a given number to the closest multiple of 10; 100; 1,000; 10,000; or 100,000 on a number line.
- Round a given number to the higher multiple of 10; 100; 1,000; 10,000; or 100,000 if it falls exactly halfway between the multiples on a number line.
- Rounding numerically based on place value
 - Find the place to which you are rounding. Look at the digit of the next lowest place value, the digit to the right of which you are rounding.
If the digit in that place is less than 5, then the digit in the rounding place remains the same.
If the digit in that place is greater than or equal to 5, then the digit in the rounding

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place increases by 1.
The digit(s) to the right of the place of which you are rounding is replaced with "0".

Note(s):

- Grade Level(s):
 - Grade 3 introduced rounding to the nearest 10 or 100 or using compatible numbers to estimate solutions to addition and subtraction problems.
 - Grade 5 will round decimals to the tenths or hundredths.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding decimals and addition and subtraction of decimals
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

4.4

Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:

4.4G

Round to the nearest 10, 100, or 1,000 or use compatible numbers to estimate solutions involving whole numbers.

Grade 5

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Supporting Standard

Round

TO THE NEAREST 10, 100, OR 1,000 TO
ESTIMATE SOLUTIONS INVOLVING WHOLE
NUMBERS

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Addition
 - Sums of whole numbers
- Subtraction
 - Differences of whole numbers
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being

Grade 4

divided by

- Quotients up to four-digit dividends by one-digit divisors
- Recognition of operations in mathematical and real-world problem situations
 - Multi-step problems
- Estimation – reasoning to determine an approximate value
 - Rounding – a type of estimation with specific rules for determining the closest value
 - To the nearest 10; 100; or 1,000
- Number lines
 - Proportionally scaled number lines (pre-determined intervals)
 - Open number line (no marked intervals)
 - Relative magnitude of a number describes the size of a number and its relationship to another number.
 - Rounding to the nearest 10 on a number line
 - Determine the two consecutive multiples of 10 that the number being rounded falls between.
 - Begin with the value of the original tens place within the number and then identify the next highest value in the tens place.
 - Determine the halfway point between the consecutive multiples of 10.
 - Locate the position of the number being rounded on the number line.
 - Determine if the number being rounded is before, past, or on the halfway point between the consecutive multiples of 10 on the number line.

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- If the number being rounded is before the halfway point on the number line, round to the value of the original tens place.
- If the number being rounded is past the halfway point on the number line, round to the value of the next highest tens place.
- If the number being rounded is on the halfway point on the number line, round to the value of the next highest tens place.
- Rounding to the nearest 100 on a number line
 - Determine the two consecutive multiples of 100 that the number being rounded falls between.
 - Begin with the value of the original hundreds place within the number and then identify the next highest value in the hundreds place.
 - Determine the halfway point between the consecutive multiples of 100.
 - Locate the position of the number being rounded on the number line.
 - Determine if the number being rounded is before, past, or on the halfway point between the consecutive multiples of 100 on the number line.
 - If the number being rounded is before the halfway point on the number line, round to the value of the original hundreds place.
 - If the number being rounded is past the halfway point on the number line, round to the value of the next highest

Grade 5**Grade 6**

Grade 4

hundreds place.

- If the number being rounded is on the halfway point on the number line, round to the value of the next highest hundreds place.
- Rounding to the nearest 1,000 on a number line
 - Determine the two consecutive multiples of 1,000 that the number being rounded falls between.
 - Begin with the value of the original thousands place within the number and then identify the next highest value in the thousands place.
 - Determine the halfway point between the consecutive multiples of 1,000.
 - Locate the position of the number being rounded on the number line.
 - Determine if the number being rounded is before, past, or on the halfway point between the consecutive multiples of 1,000 on the number line.
 - If the number being rounded is before the halfway point on the number line, round to the value of the original thousands place.
 - If the number being rounded is past the halfway point on the number line, round to the value of the next highest thousands place.
 - If the number being rounded is on the halfway point on the number line, round to the value of the next highest thousands place.
- Round a given number to the closest multiple of 10; 100; or 1,000 on a number

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Grade 4

line.

- Round a given number to the higher multiple of 10; 100; or 1,000 if it falls exactly halfway between the multiples on a number line.
- Round numbers to a common place then compute.
 - If not designated, find the greatest common place value of all numbers in the problem to determine the place value to which you are rounding (e.g., round to the nearest 10 if only two-digit numbers are being considered in the problem; round to the nearest 100 if only three-digit numbers are being considered in the problem; round to the nearest 1,000 if only four-digit numbers are being considered; round to the nearest 10 if both two-digit and three-digit numbers are being considered in the problem; round to the nearest 100 if both three-digit and four-digit numbers are being considered; etc.).
 - Vocabulary indicating estimation in mathematical and real-world problem situations (e.g., about, approximately, estimate, etc.)
 - Vocabulary descriptors of the effects of the adjustment on the estimation compared to the actual solution (e.g., about, close, little more/little less, around, approximately, estimated, etc.)
 - Variation of the estimate from the actual solution is dependent upon the magnitude of the adjustment(s) of the actual numbers.
- Rounding numerically based on place value

Grade 5**Grade 6**

Grade 4

- Find the place to which you are rounding. Look at the digit of the next lowest place value, the digit to the right of which you are rounding. If the digit in that place is less than 5, then the digit in the rounding place remains the same. If the digit in that place is greater than or equal to 5, then the digit in the rounding place increases by 1. The digit(s) to the right of the place of which you are rounding is replaced with “0”.
- Round numbers to a common place then compute.
 - If not designated, find the greatest common place value of all numbers in the problem to determine the place value to which you are rounding (e.g., round to the nearest 10 if only two-digit numbers are being considered in the problem; round to the nearest 100 if only three-digit numbers are being considered in the problem; round to the nearest 1,000 if only four-digit numbers are being considered; round to the nearest 10 if both two-digit and three-digit numbers are being considered in the problem; round to the nearest 100 if both three-digit and four-digit numbers are being considered; etc.).
 - Vocabulary indicating estimation in mathematical and real-world problem situations (e.g., about, approximately, estimate, etc.)
 - Vocabulary descriptors of the effects of the adjustment on the estimation

Grade 5**Grade 6**

Grade 4

compared to the actual solution (e.g., about, close, little more/little less, around, approximately, estimated, etc.) Variation of the estimate from the actual solution is dependent upon the magnitude of the adjustment(s) of the actual numbers.

- Variation of the estimate from the actual solution is dependent upon the magnitude of the adjustment(s) of the actual numbers.

Use

COMPATIBLE NUMBERS TO ESTIMATE SOLUTIONS INVOLVING WHOLE NUMBERS

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Addition
 - Sums of whole numbers
- Subtraction
 - Differences of whole numbers
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to two-digit

Grade 5**Grade 6**

Grade 4

factors by two-digit factors and up to four-digit factors by one-digit factors

- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients up to four-digit dividends by one-digit divisors
- Recognition of operations in mathematical and real-world problem situations
 - Multi-step problems
- Estimation – reasoning to determine an approximate value
 - Compatible numbers – numbers that are slightly adjusted to create groups of numbers that are easy to compute mentally
- Determine compatible numbers then compute.
 - Vocabulary indicating estimation in mathematical and real-world problem situations (e.g., about, approximately, estimate, etc.)
 - Vocabulary descriptors of the effects of the adjustment on the estimation compared to the actual solution (e.g., about, close, little more/little less, around, approximately, estimated, etc.)
 - Variation of the estimate from the actual solution is dependent upon the magnitude of the adjustment(s) of the actual numbers.

Note(s):

Grade 5**Grade 6**

Grade 4	Grade 5	Grade 6
<ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 3 rounded to the nearest 10 or 100 or use compatible numbers to estimate solutions to addition and subtraction problems. ◦ Grade 5 will round decimals to tenths or hundredths. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation 		
Multiplying Whole Numbers, Decimals, Fractions, and Rational Numbers		
<p>4.4 <i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	<p>5.3 <i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	<p>6.3 <i>Number and operations. The student applies mathematical process standards to represent addition, subtraction, multiplication, and division while solving problems and justifying solutions. The student is expected to:</i></p>

Grade 4	Grade 5	Grade 6
<p>4.4B</p> <p>Determine products of a number and 10 or 100 using properties of operations and place value understandings.</p> <p><i>Supporting Standard</i></p> <p>Determine</p> <p>PRODUCTS OF A NUMBER AND 10 OR 100 USING PROPERTIES OF OPERATIONS AND</p>	<p>5.3B</p> <p>Multiply with fluency a three-digit number by a two-digit number using the standard algorithm.</p> <p><i>Supporting Standard</i></p> <p>Multiply</p> <p>WITH FLUENCY A THREE-DIGIT NUMBER BY A TWO-DIGIT NUMBER USING THE STANDARD ALGORITHM</p>	<p>6.3E</p> <p>Multiply and divide positive rational numbers fluently.</p> <p><i>Readiness Standard</i></p> <p>Multiply, Divide</p> <p>POSITIVE RATIONAL NUMBERS FLUENTLY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> Positive rational numbers – the set of numbers that can be expressed as a fraction

Grade 4

PLACE VALUE UNDERSTANDINGS

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Multiplication of whole numbers
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
- Knowledge of patterns in place value to solve multiplication involving multiples of 10 or 100 (e.g., 98×10 ; 98×100 ; 980×10 ; 980×100 ; $9,800 \times 10$; $9,800 \times 100$; etc.)
- Properties of operations
 - Distributive property of multiplication – if multiplying a number by a sum of numbers, the product will be the same as multiplying

Grade 5

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Fluency – efficient application of procedures with accuracy
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to three-digit factors by two-digit factors
- Recognition of multiplication in mathematical and real-world problem situations
- Automatic recall of basic facts
- Standard algorithm

Grade 6

$\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).

- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents converted to equivalent decimals or fractions for multiplying or dividing fluently
 - Percent – a part of a whole expressed in hundredths
- Fluency – efficient application of procedures with accuracy
- Relationship between dividing by a fraction and multiplying by its reciprocal
 - Reciprocal – a quantity that is used to multiply by a given quantity which results in the product of one

Note(s):

Grade 4

the number by each addend and then adding the products together

- $a \times (b + c) = (a \times b) + (a \times c)$
- Multiplying a number by 10 is equal to multiplying each place value digit by 10.
- Multiplying a number by 100 is equal to multiplying each place value digit by 100.
- Commutative property of multiplication – if the order of the factors are changed, the product will remain the same
 - $a \times b = c$; therefore, $b \times a = c$
- Place value understanding
 - When multiplying a number by 10, the product is 10 times larger meaning that each digit in the number shifts 1 place value position to the left, leaving a zero in the ones place to show groups of tens.
 - When multiplying a number by 100, the product is 100 times larger meaning that each digit in the number shifts 2 place value positions to the left, leaving zeros in the ones place and tens place to show groups of hundreds.

Note(s):

- Grade Level(s):
 - Grade 3 represented multiplication facts by using a variety of approaches such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line, and skip counting.
 - Grade 3 recalled facts to multiply up to 10 by 10 with automaticity and recalled the corresponding division facts.
 - Grade 5 will multiply with fluency a three-digit number by a two-digit number using

Grade 5

Note(s):

- Grade Level(s):
 - Grade 4 determined products of a number and 10 or 100 using properties of operations and place value understandings.
 - Grade 4 represented the product of 2 two-digit numbers using arrays, area models, or equations, including perfect squares through 15 by 15.
 - Grade 4 used strategies and algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number and to multiply a two-digit number by a two-digit number. Strategies may have included mental math, partial products, and the commutative, associative, and distributive properties.
 - Grade 4 solved with fluency one- and two-step problems involving multiplication and division, including interpreting remainders.
 - Grade 6 will multiply and divide positive rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate
- TxRCFP:
 - Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

Grade 6

- Grade Level(s):
 - Grade 6 introduces multiplying and dividing positive rational numbers fluently.
 - Grade 7 will add, subtract, multiply, and divide rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using operations with integers and positive rational numbers to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

Grade 4

the standard algorithm.

- Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

4.4C

Represent the product of 2 two-digit numbers using arrays, area models, or equations, including perfect squares through 15 by 15.

Supporting Standard

Represent

THE PRODUCT OF 2 TWO-DIGIT NUMBERS
USING ARRAYS, AREA MODELS, OR EQUATIONS,
INCLUDING PERFECT SQUARES THROUGH 15
BY 15

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting

Grade 5**Grade 6**

Grade 4

(natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$

- Multiplication of whole numbers
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of two-digit factors by two-digit factors
- Arrays
 - Arrangement of a set of objects in rows and columns
- Area models
 - Arrangement of squares/rectangles in a grid format
 - Connect factors as length and width, and the product as the area
- Equations
 - Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other
 - Factor \times factor = product
 - Product = factor \times factor
 - Multiplication is commutative
 - $14 \times 18 = 252$
 - $18 \times 14 = 252$
 - $252 = 14 \times 18$
 - $252 = 18 \times 14$
 - Perfect squares (through 15×15)
 - Factors of a perfect square are the same
 - Models of perfect squares result in a square
 - Equations of perfect squares
 - Factor \times same factor = product
 - Product = factor \times same factor

Note(s):

Grade 5**Grade 6**

Grade 4

- Grade Level(s):
 - Grade 3 used strategies and algorithms, including the standard algorithm, to multiply a two-digit number by a one-digit number. Strategies may include mental math, partial products, and the commutative, associative, and distributive properties.
 - Grade 5 will multiply with fluency a three-digit number by a two-digit number using the standard algorithm.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - II.D. Algebraic Reasoning – Representations
 - IX. Communication and Representation

4.4D

Use strategies and algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number and to multiply a two-digit number by a two-digit number. Strategies may include mental math, partial products, and the commutative, associative, and distributive properties.

Supporting Standard

Grade 5**Grade 6**

Grade 4

Use

STRATEGIES AND ALGORITHMS, INCLUDING THE STANDARD ALGORITHM, TO MULTIPLY UP TO A FOUR-DIGIT NUMBER BY A ONE-DIGIT NUMBER AND TO MULTIPLY A TWO-DIGIT NUMBER BY A TWO-DIGIT NUMBER. STRATEGIES MAY INCLUDE MENTAL MATH, PARTIAL PRODUCTS, AND THE COMMUTATIVE, ASSOCIATIVE, AND DISTRIBUTIVE PROPERTIES

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Multiplication of whole numbers
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
- Strategies and algorithms for multiplication
 - Mental math
 - Accurate computation without the aid of paper, pencil, or other tools
 - Partial products
 - Decomposing the factor(s) into smaller parts, multiplying the parts, and combining the intermittent parts

Grade 5**Grade 6**

Grade 4

- Properties of operations
 - Commutative property of multiplication – if the order of the factors are changed, the product will remain the same
 - $a \times b = c$; therefore, $b \times a = c$
 - Associative property of multiplication – if three or more factors are multiplied, they can be grouped in any order, and the product will remain the same
 - $a \times b \times c = (a \times b) \times c = a \times (b \times c)$
 - Distributive property of multiplication – if multiplying a number by a sum of numbers, the product will be the same as multiplying the number by each addend and then adding the products together
 - $a \times (b + c) = (a \times b) + (a \times c)$
- Standard algorithm
 - Standardized steps or routines used in computation
- Connections between strategies and operations
- Equation(s) to reflect solution process

Note(s):

- Grade Level(s):
 - Grade 3 used strategies and algorithms, including the standard algorithm, to multiply a two-digit number by a one-digit number. Strategies may include mental math, partial products, and the commutative, associative, and distributive properties.
 - Grade 5 will multiply with fluency a three-digit number by a two-digit number using the standard algorithm.
 - Various mathematical process standards will be applied to this student expectation

Grade 5**Grade 6**

Grade 4

as appropriate.

- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - II.D. Algebraic Reasoning – Representations
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 5

Grade 6

4.4H

Solve with fluency one- and two-step problems involving multiplication and division, including interpreting remainders.

Readiness Standard

Solve

WITH FLUENCY ONE- AND TWO-STEP PROBLEMS INVOLVING MULTIPLICATION AND DIVISION, INCLUDING INTERPRETING REMAINDERS

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting

Grade 4

(natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$

- Fluency – efficient application of procedures with accuracy
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients up to four-digit dividends by one-digit divisors
 - Quotients may include remainders
- Recognition of multiplication and division in mathematical and real-world problem situations
- Automatic recall of basic facts
- One- and two-step problem situations
- Standard algorithm for multiplication
- Standard algorithm for division
- Remainder dependent upon the mathematical or real-world situation
 - Various ways to record remainder
 - Ignore the remainder
 - Add one to the quotient
 - Remainder is the answer
- Equation(s) to reflect solution process

Grade 5**Grade 6**

Grade 4	Grade 5	Grade 6
<p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 introduces solving with fluency one- and two-step problems involving multiplication and division, including interpreting remainders. ◦ Grade 5 will multiply with fluency a three-digit number by a two-digit number using the standard algorithm. ◦ Grade 5 will solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm. ◦ Various mathematical process standards will be applied to this student expectation as appropriate • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation 		
	<p>5.3D</p> <p>Represent multiplication of decimals with products to the hundredths using objects and pictorial models, including area models.</p> <p><i>Supporting Standard</i></p>	

Represent

MULTIPLICATION OF DECIMALS WITH PRODUCTS TO THE HUNDREDTHS USING OBJECTS AND PICTORIAL MODELS, INCLUDING AREA MODELS

Including, but not limited to:

- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of decimals limited to three-digit factors by two-digit factors with products to the hundredths
 - Multiply tenths by tenths (e.g., $0.3 \times 0.7 = 0.21$, $1.2 \times 1.2 = 1.44$, $14.3 \times 1.3 = 18.59$, etc.)
 - Multiply tenths by hundredths or vice versa (e.g., $0.5 \times 0.12 = 0.06$, $1.4 \times 0.15 = 0.21$, $21.4 \times 0.45 = 9.63$, etc.)
 - Multiply tenths by thousandths or vice versa (e.g., $0.4 \times 0.125 = 0.05$, $0.125 \times 8.4 = 1.05$, etc.)
 - Multiply whole numbers by tenths, hundredths, and thousandths or vice versa (e.g., $3 \times 1.3 = 3.9$, $42 \times 7.45 = 312.9$, $7.02 \times 78 = 547.56$, $6 \times 0.125 =$

Grade 4**Grade 5****Grade 6**

0.75, etc.)

- Multiplying by a lesser factor results in lesser products.
- Connections between whole number multiplication and decimal multiplication
- Base-10 place value system
 - A number system using ten digits 0 – 9
 - Relationships between places are based on multiples of 10.
 - Moving left across the places, the values are 10 times the position to the right.
 - Moving right across the places, the values are one-tenth the value of the place to the left.
- Place value relationships to determine products
- Objects and pictorial models
 - Area models
 - Decimal grids
 - Number lines
 - Ratio tables

Note(s):

- Grade Level(s):
 - Grade 5 introduces representing multiplication of decimals with products to the hundredths using objects and pictorial models, including area models.
 - Grade 6 will multiply and divide positive rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing an understanding of and fluency with addition, subtraction, multiplication,

Grade 4	Grade 5	Grade 6
	<p>and division of fractions and decimals</p> <ul style="list-style-type: none"> • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 	
<p>4.4 <i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	<p>5.3 <i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	<p>6.3 <i>Number and operations. The student applies mathematical process standards to represent addition, subtraction, multiplication, and division while solving problems and justifying solutions. The student is expected to:</i></p>
	<p>5.3E</p> <p>Solve for products of decimals to the hundredths, including situations involving money, using strategies based on place-value understandings, properties of operations, and the relationship to the multiplication of whole numbers.</p> <p>Readiness Standard</p> <p>Solve</p> <p>FOR PRODUCTS OF DECIMALS TO THE HUNDREDTHS, INCLUDING SITUATIONS INVOLVING MONEY, USING STRATEGIES BASED ON PLACE-VALUE UNDERSTANDINGS, PROPERTIES OF OPERATIONS, AND THE RELATIONSHIP TO THE MULTIPLICATION OF WHOLE NUMBERS</p> <p>Including, but not limited to:</p>	<p>6.3E</p> <p>Multiply and divide positive rational numbers fluently.</p> <p>Readiness Standard</p> <p>Multiply, Divide</p> <p>POSITIVE RATIONAL NUMBERS FLUENTLY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.). • Various forms of positive rational numbers <ul style="list-style-type: none"> ◦ Whole numbers

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- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of decimals limited to three-digit factors by two-digit factors with products to the hundredths
 - Multiply tenths by tenths (e.g., $0.3 \times 0.7 = 0.21$, $1.2 \times 1.2 = 1.44$, $14.3 \times 1.3 = 18.59$, etc.)
 - Multiply tenths by hundredths or vice versa (e.g., $0.5 \times 0.12 = 0.06$, $1.4 \times 0.15 = 0.21$, $21.4 \times 0.45 = 9.63$, etc.)
 - Multiply tenths by thousandths or vice versa (e.g., $0.4 \times 0.125 = 0.05$, $0.125 \times 8.4 = 1.05$, etc.)
 - Multiply whole numbers by tenths, hundredths, and thousandths or vice versa (e.g., $3 \times 1.3 = 3.9$, $42 \times 7.45 = 312.9$, $7.02 \times 78 = 547.56$, $6 \times 0.125 = 0.75$, etc.)
- Multiplying by a lesser factor results in lesser products.
- Connections between whole number multiplication and decimal multiplication
- Base-10 place value system
 - A number system using ten digits 0 – 9

- Decimals (less than or greater than one)
- Fractions (proper, improper, and mixed numbers)
- Percents converted to equivalent decimals or fractions for multiplying or dividing fluently
 - Percent – a part of a whole expressed in hundredths
- Fluency – efficient application of procedures with accuracy
- Relationship between dividing by a fraction and multiplying by its reciprocal
 - Reciprocal – a quantity that is used to multiply by a given quantity which results in the product of one

Note(s):

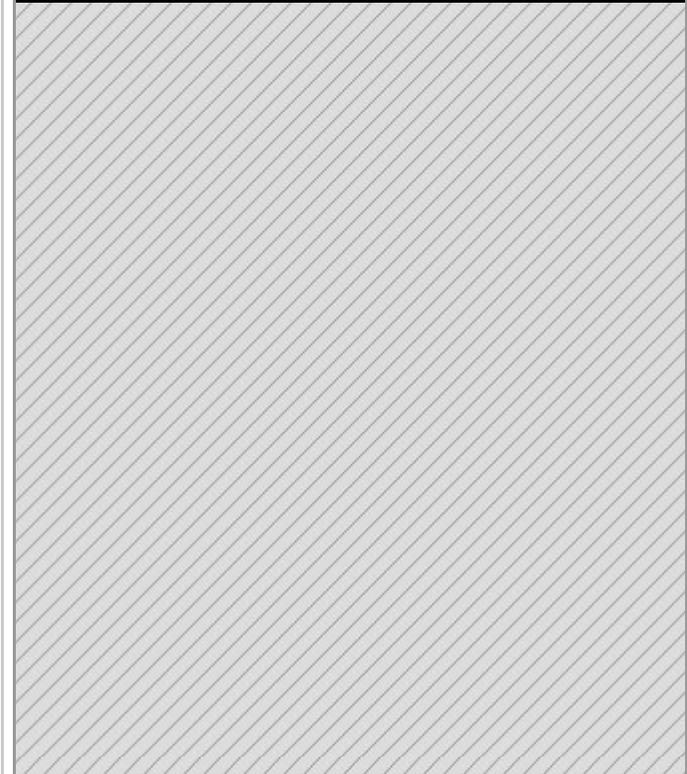
- Grade Level(s):
 - Grade 6 introduces multiplying and dividing positive rational numbers fluently.
 - Grade 7 will add, subtract, multiply, and divide rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using operations with integers and positive rational numbers to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

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- Relationships between places are based on multiples of 10.
 - Moving left across the places, the values are 10 times the position to the right.
 - Moving right across the places, the values are one-tenth the value of the place to the left.
- Place value relationships to determine products
- Properties of operations
 - Commutative property of multiplication – if the order of the factors are changed, the product will remain the same
 - $a \times b = c$; therefore, $b \times a = c$
 - Associative property of multiplication – if three or more factors are multiplied, they can be grouped in any order, and the product will remain the same
 - $a \times b \times c = (a \times b) \times c = a \times (b \times c)$
 - Distributive property of multiplication – if multiplying a number by a sum of numbers, the product will be the same as multiplying the number by each addend and then adding the products together
 - $a \times (b + c) = (a \times b) + (a \times c)$
- Strategies for multiplication
 - Distributive property for partial products
 - Doubling and halving
 - Relate multiplication (associative property) to numerical notation
 - Ratio tables
- Equation(s) to reflect solution process

Note(s):

- Grade Level(s):
 - Grade 5 introduces solving for products of

Grade 4	Grade 5	Grade 6
	<p>decimals to the hundredths, including situations involving money, using strategies based on place-value understandings, properties of operations, and the relationship to the multiplication of whole numbers.</p> <ul style="list-style-type: none"> ◦ Grade 6 will multiply and divide positive rational numbers fluently. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation ◦ X. Connections 	
	<p>5.3I</p> <p>Represent and solve multiplication of a whole number and a fraction that refers to the same whole using objects and pictorial models, including area models.</p> <p><i>Supporting Standard</i></p> <p>Represent, Solve</p> <p>MULTIPLICATION OF A WHOLE NUMBER AND A FRACTION THAT REFERS TO THE SAME WHOLE USING OBJECTS AND PICTORIAL MODELS, INCLUDING AREA MODELS</p>	

Grade 4

Grade 5

Grade 6

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Fractions (proper, improper, or mixed numbers)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division
 - Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
 - Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
 - Mixed number – a number that is composed of a whole number and a fraction
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products limited to a whole number and a fraction that refers to the same whole
- Fraction relationships

Grade 4**Grade 5****Grade 6**

- Relationship between the whole and the part
- Numerator – the part of a fraction written above the fraction bar that tells the number of fractional parts specified or being considered
- Denominator – the part of a fraction written below the fraction bar that tells the total number of equal parts in a whole or set
- Referring to the same whole
 - Fractions are relationships, and the size or the amount of the whole matters.
- Concrete objects and pictorial models
 - Pattern blocks and other shapes
 - Skip counting
 - Fraction bars
 - Number lines
 - Area models
 - Strip diagrams
 - Strip diagram – a linear model used to illustrate number relationships
- Equation(s) to reflect solution process

Note(s):

- Grade Level(s):
 - Grade 5 introduces representing and solving multiplication of a whole number and a fraction that refers to the same whole using objects and pictorial models, including area models.
 - Grade 6 will multiply and divide positive rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.

Grade 4	Grade 5	Grade 6
	<ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 	
		<p>6.3B</p> <p>Determine, with and without computation, whether a quantity is increased or decreased when multiplied by a fraction, including values greater than or less than one.</p> <p><i>Supporting Standard</i></p> <p>Determine</p> <p>WITH AND WITHOUT COMPUTATION, WHETHER A QUANTITY IS INCREASED OR DECREASED WHEN MULTIPLIED BY A FRACTION, INCLUDING VALUES GREATER THAN OR LESS THAN ONE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.). • Positive fractions less than one <ul style="list-style-type: none"> ◦ Written as $\frac{a}{b}$ where a is less than b, where $b \neq 0$

Grade 4

Grade 5

Grade 6

- Located between 0 and 1 on a number line,
 $0 < \frac{a}{b} < 1$
- Fractions greater than one
 - Written as $\frac{a}{b}$ where a is greater than b ,
where $b \neq 0$
 - Located to the right of 1 on a number line,
 $\frac{a}{b} > 1$
- Product of a given positive rational number and a positive fraction less than one
 - Various forms of given positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents converted to equivalent decimals or fractions for multiplying or dividing
 - Percent – a part of a whole expressed in hundredths
 - A quantity is decreased when multiplied by a positive fraction less than one.
- Product of a given positive rational number and a fraction greater than one
 - Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents converted to equivalent decimals or fractions for multiplying or dividing
 - A quantity is increased when multiplied by a positive fraction greater than one.

Grade 4	Grade 5	Grade 6
		<ul style="list-style-type: none"> • Generalizations of fraction computations <ul style="list-style-type: none"> ◦ A quantity is increased when a positive rational number is multiplied by a fraction greater than one. ◦ A quantity is decreased when a positive rational number is multiplied by a fraction less than one. <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 6 introduces determining, with and without computation, whether a quantity is increased or decreased when multiplied by a fraction, including values greater than or less than one. ◦ Grade 7 will apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Using operations with integers and positive rational numbers to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation
Dividing Whole Numbers, Decimals, Fractions, and Rational Numbers		
4.4	5.3	6.3

Grade 4	Grade 5	Grade 6
<p><i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	<p><i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	<p><i>Number and operations. The student applies mathematical process standards to represent addition, subtraction, multiplication, and division while solving problems and justifying solutions. The student is expected to:</i></p>
		<p>6.3A</p> <p>Recognize that dividing by a rational number and multiplying by its reciprocal result in equivalent values.</p> <p>Supporting Standard</p> <p>Recognize</p> <p>THAT DIVIDING BY A RATIONAL NUMBER AND MULTIPLYING BY ITS RECIPROCAL RESULT IN EQUIVALENT VALUES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.). • Various forms of positive rational numbers <ul style="list-style-type: none"> ◦ Whole numbers ◦ Decimals (less than or greater than one) ◦ Fractions (proper, improper, and mixed numbers)

Grade 4

Grade 5

Grade 6

- Percents converted to equivalent decimals or fractions for multiplying or dividing
 - Percent – a part of a whole expressed in hundredths
- Reciprocal – a quantity that is used to multiply by a given quantity which results in the product of one
- Relationship between multiplication and division
 - Dividing a number a by a given number b is equivalent to multiplying a by the reciprocal of b .
 - Algebraic: $a \div b = \frac{a}{b} = \left(\frac{a}{1}\right) \left(\frac{1}{b}\right) = a \cdot \frac{1}{b}$
- Relationships between equivalent positive rational number representations

Note(s):

- Grade Level(s):
 - Grade 3 determined a quotient using the relationship between multiplication and division.
 - Grade 7 will add, subtract, multiply, and divide rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using operations with integers and positive rational numbers to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 4**4.4E**

Represent the quotient of up to a four-digit whole number divided by a one-digit whole number using arrays, area models, or equations.

Supporting Standard

Represent

THE QUOTIENT OF UP TO A FOUR-DIGIT WHOLE NUMBER DIVIDED BY A ONE-DIGIT WHOLE NUMBER USING ARRAYS, AREA MODELS, OR EQUATIONS

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Division of whole numbers
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients up to four-digit dividends by one-digit divisors
 - Quotients may include remainders
- Relationships between multiplication and division to help in solution process

Grade 5**5.3C**

Solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm.

Supporting Standard

Solve

WITH PROFICIENCY FOR QUOTIENTS OF UP TO A FOUR-DIGIT DIVIDEND BY A TWO-DIGIT DIVISOR USING STRATEGIES AND THE STANDARD ALGORITHM

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Proficiency – the mathematical ability to reason, apply, understand, compute, and engage in meaningful mathematics
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients of whole numbers up to four-digit dividends and two-digit divisors

Grade 6**6.3E**

Multiply and divide positive rational numbers fluently.

Readiness Standard

Multiply, Divide

POSITIVE RATIONAL NUMBERS FLUENTLY

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents converted to equivalent decimals or fractions for multiplying or dividing fluently
 - Percent – a part of a whole expressed in hundredths
- Fluency – efficient application of procedures with accuracy
- Relationship between dividing by a fraction and multiplying by its reciprocal
- Reciprocal – a quantity that is used to multiply by a given quantity which results in the product of one

Grade 4

- $a \div b = c$, so $b \times c = a$
- Recognition of division in mathematical and real-world problem situations
- Representations of quotients
 - Arrays
 - Arrangement of a set of objects in rows and columns
 - Area models
 - Arrangement of squares/rectangles in a grid format
 - Connect factors as length and width, and the product as the area
 - Equations
 - Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other
 - Dividend \div divisor = quotient
 - Quotient = dividend \div divisor
 - Division is not commutative even though multiplication is commutative.

Note(s):

Grade 5

- Recognition of division in mathematical and real-world problem situations
- Automatic recall of basic facts
- Relationships between multiplication and division to help in solution process
 - $a \div b = c$, so $b \times c = a$
- Division structures
 - Partitive division
 - Total amount known
 - Number of groups known
 - Size or measure of each group unknown
 - Quotative division (also known as Measurement division)
 - Total amount known
 - Size or measure of each group known
 - Number of groups unknown
- Relationships between division and multiples of 10
 - When the value of the dividend increases by a multiple of 10 and the value of the divisor remains the same, then the value of the quotient is multiplied by the same multiple

Grade 6

Note(s):

- Grade Level(s):
 - Grade 6 introduces multiplying and dividing positive rational numbers fluently.
 - Grade 7 will add, subtract, multiply, and divide rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using operations with integers and positive rational numbers to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

Grade 4	Grade 5	Grade 6
<ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 3 solved one-step and two-step problems involving multiplication and division within 100 using strategies based on objects; pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts. ◦ Grade 5 will solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ II.D. Algebraic Reasoning – Representations ◦ IX. Communication and Representation 	<p>of 10.</p> <ul style="list-style-type: none"> ◦ When the value of the dividend remains the same and the value of the divisor is multiplied by a multiple of 10, then the value of the quotient is divided by the same multiple of 10. ◦ When the value of both the dividend and the divisor are multiplied by the same multiple of 10, the quotient remains the same. <ul style="list-style-type: none"> • Decomposing division problems into partial quotients • Ratio tables • Strip diagram <ul style="list-style-type: none"> ◦ Strip diagram – a linear model used to illustrate number relationships • Standard algorithm using the distributive method <ul style="list-style-type: none"> ◦ Record steps that relate to the algorithm used including distributing the value in the quotient according to place value. • Standard algorithm • Remainder dependent upon the mathematical and real-world problem situation <ul style="list-style-type: none"> ◦ Various ways to record remainder <ul style="list-style-type: none"> • Ignore the remainder • Add one to the quotient • Remainder is written as a fraction or decimal • Remainder is the answer • Conversion of remainder into smaller units • Equation(s) to reflect solution process <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 represented the quotient of up to a 	
<p>4.4F</p> <p>Use strategies and algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor.</p> <p><i>Supporting Standard</i></p> <p>Use</p>		

Grade 4

STRATEGIES AND ALGORITHMS, INCLUDING THE STANDARD ALGORITHM, TO DIVIDE UP TO A FOUR-DIGIT DIVIDEND BY A ONE-DIGIT DIVISOR

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients up to four-digit dividends by one-digit divisors
 - Quotients may include remainders
- Recognition of division in mathematical and real-world problem situations
- Automatic recall of basic facts
- Relationships between multiplication and division to help in solution process
 - $a \div b = c$, so $b \times c = a$
- Division structures
 - Partitive division
 - Total amount known
 - Number of groups known
 - Size or measure of each group unknown
 - Quotative division (also known as

Grade 5

four-digit whole number divided by a one-digit whole number using arrays, area models, or equations.

- Grade 4 used strategies, including the standard algorithm, to divide a four-digit whole number dividend by a one-digit whole number divisor.
- Grade 4 solved with fluency one- and two-step problems involving multiplication and division, including interpreting remainders.
- Grade 6 will multiply and divide positive rational numbers fluently.
- Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 6

Grade 4

Measurement division)

- Total amount known
- Size or measure of each group known
- Number of groups unknown
- Relationship between division and multiples of 10
 - When the value of the dividend increases by a multiple of 10 and the value of the divisor remains the same, then the value of the quotient is multiplied by the same multiple of 10.
- Strategies and algorithms for division
 - Decomposing division problem situations into partial quotients (using numbers that are compatible with the divisor)
 - Standard algorithm using the distributive method
 - Record steps that relate to the algorithm used including distributing the value in the quotient according to place value.
 - Standard algorithm
- Equation(s) to reflect solution process

Note(s):

- Grade Level(s):
 - Grade 4 introduces using strategies and algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor.
 - Grade 5 will solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm.
 - Various mathematical process standards will be applied to this student expectation as appropriate.

Grade 5**Grade 6**

Grade 4

- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

4.4H

Solve with fluency one- and two-step problems involving multiplication and division, including interpreting remainders.

Readiness Standard

Solve

WITH FLUENCY ONE- AND TWO-STEP PROBLEMS INVOLVING MULTIPLICATION AND DIVISION, INCLUDING INTERPRETING REMAINDERS

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Fluency – efficient application of procedures

Grade 5**Grade 6**

Grade 4

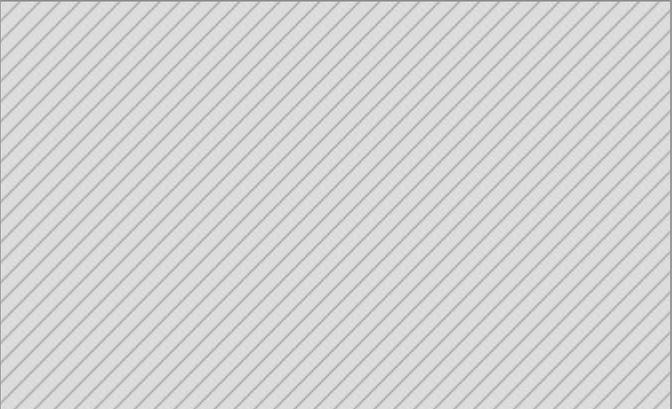
with accuracy

- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients up to four-digit dividends by one-digit divisors
 - Quotients may include remainders
- Recognition of multiplication and division in mathematical and real-world problem situations
- Automatic recall of basic facts
- One- and two-step problem situations
- Standard algorithm for multiplication
- Standard algorithm for division
- Remainder dependent upon the mathematical or real-world situation
 - Various ways to record remainder
 - Ignore the remainder
 - Add one to the quotient
 - Remainder is the answer
- Equation(s) to reflect solution process

Note(s):

- Grade Level(s):

Grade 5**Grade 6**

Grade 4	Grade 5	Grade 6
<ul style="list-style-type: none"> ◦ Grade 4 introduces solving with fluency one- and two-step problems involving multiplication and division, including interpreting remainders. ◦ Grade 5 will multiply with fluency a three-digit number by a two-digit number using the standard algorithm. ◦ Grade 5 will solve with proficiency for quotients of up to a four-digit dividend by a two-digit divisor using strategies and the standard algorithm. ◦ Various mathematical process standards will be applied to this student expectation as appropriate • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation 		
	<p>5.3F</p> <p>Represent quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using objects and pictorial models, including area models.</p> <p><i>Supporting Standard</i></p> <p>Represent</p>	

QUOTIENTS OF DECIMALS TO THE HUNDREDTHS, UP TO FOUR-DIGIT DIVIDENDS AND TWO-DIGIT WHOLE NUMBER DIVISORS, USING OBJECTS AND PICTORIAL MODELS, INCLUDING AREA MODELS

Including, but not limited to:

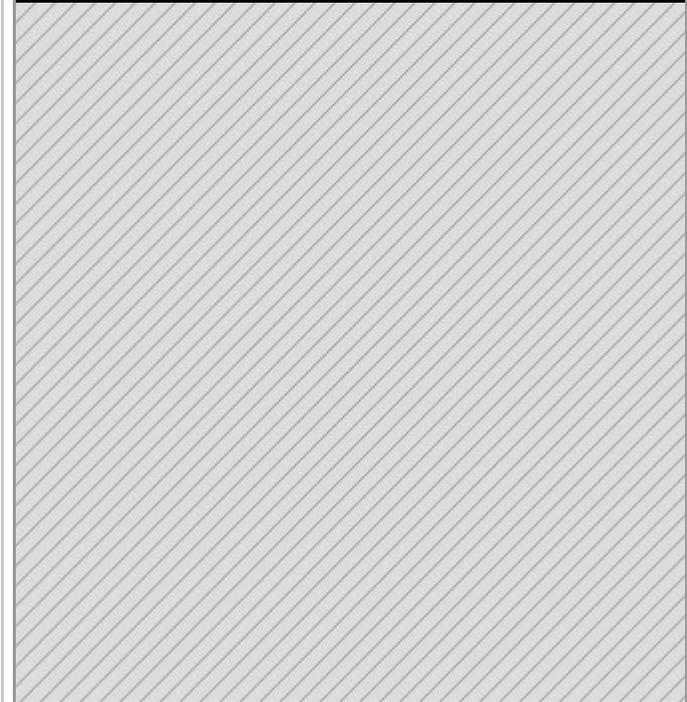
- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Decimals (less than and greater than one to the tenths and hundredths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients of decimals limited to four-digit dividends and two-digit whole number divisors, with quotients to the hundredths
 - Dividend to the tenths and whole number divisor (e.g., $1.2 \div 24 = 0.05$, $358.8 \div 23 = 15.6$, $721.7 \div 14 = 51.55$, etc.)
 - Dividend to the hundredths and whole

Grade 4**Grade 5****Grade 6**

number divisor (e.g., $8.68 \div 4 = 2.17$,
 $8.25 \div 15 = 0.55$, $62.76 \div 12 = 5.23$, etc.)

- Whole number dividends and whole number divisors (e.g., $3 \div 4 = 0.75$, $10 \div 8 = 1.25$, $1000 \div 16 = 62.5$, etc.)
- Relationships between multiplication and division to help in solution process
 - $a \div b = c$, so $b \times c = a$
- Connections between division of whole numbers and division with decimals
 - Decimal quotients will have the same digits as whole number quotients when the number of digits in the dividend and number of digits in the divisor of both the decimal problem and whole number problem are the same.
- Base-10 place value system
 - A number system using ten digits 0 – 9
 - Relationships between places are based on multiples of 10.
 - Moving left across the places, the values are 10 times the position to the right.
 - Moving right across the places, the values are one-tenth the value of the place to the left.
- Place value relationships to determine quotients
- Objects and pictorial models
 - Base-10 blocks
 - Area models
 - Decimal grids
 - Number lines
 - Ratio tables
- Equation(s) to reflect solution process

Note(s):

Grade 4	Grade 5	Grade 6
	<ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 5 introduces representing quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using objects and pictorial models, including area models. ◦ Grade 6 will multiply and divide positive rational numbers fluently. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 	
	<p>5.3G</p> <p>Solve for quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using strategies and algorithms, including the standard algorithm.</p> <p><i>Readiness Standard</i></p> <p>Solve</p> <p>FOR QUOTIENTS OF DECIMALS TO THE HUNDREDTHS, UP TO FOUR-DIGIT DIVIDENDS AND TWO-DIGIT WHOLE NUMBER DIVISORS, USING STRATEGIES AND ALGORITHMS, INCLUDING THE STANDARD ALGORITHM</p>	

Grade 4**Grade 5****Grade 6**

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n }
 - Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n }
- Decimals (less than and greater than one to the tenths and hundredths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients of decimals limited to four-digit dividends and two-digit whole number divisors, with quotients to the hundredths
 - Dividend to the tenths and whole number divisor (e.g., $1.2 \div 24 = 0.05$, $358.8 \div 23 = 15.6$, $721.7 \div 14 = 51.55$, etc.)
 - Dividend to the hundredths and whole number divisor (e.g., $8.68 \div 4 = 2.17$, $8.25 \div 15 = 0.55$, $62.76 \div 12 = 5.23$, etc.)
 - Whole number dividends and whole number divisors (e.g., $3 \div 4 = 0.75$, $10 \div 8 = 1.25$, $1000 \div 16 = 62.5$, etc.)

Grade 4**Grade 5****Grade 6**

- Relationships between multiplication and division to help in solution process
 - $a \div b = c$, so $b \times c = a$
- Connections between division of whole numbers and division with decimals
 - Decimal quotients will have the same digits as whole number quotients when the number of digits in the dividend and number of digits in the divisor of both the decimal problem and whole number problem are the same.
- Base-10 place value system
 - A number system using ten digits 0 – 9
 - Relationships between places are based on multiples of 10.
 - Moving left across the places, the values are 10 times the position to the right.
 - Moving right across the places, the values are one-tenth the value of the place to the left.
- Place value relationships to determine quotients
- Division structures
 - Partitive division
 - Total amount known
 - Number of groups known
 - Size or measure of each group unknown
 - Quotative division (also known as Measurement division)
 - Total amount known
 - Size or measure of each group known
 - Number of groups unknown
- Decomposing division problems into partial quotients
- Standard algorithm using the distributive method

Grade 4**Grade 5****Grade 6**

- Record steps that relate to the algorithm used including distributing the value in the quotient according to place value.
- Standard algorithm
- Remainder dependent upon the mathematical and real-world problem situation
 - Various ways to record remainder
 - Ignore the remainder
 - Add one to the quotient
 - Remainder is written as a decimal
 - Remainder is the answer
 - Conversion of remainder into smaller units
- Equation(s) to reflect solution process

Note(s):

- Grade Level(s):
 - Grade 5 introduces solving for quotients of decimals to the hundredths, up to four-digit dividends and two-digit whole number divisors, using strategies and algorithms, including the standard algorithm.
 - Grade 6 will multiply and divide decimals fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 4	Grade 5	Grade 6
<p>4.4 <i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for whole number computations and decimal sums and differences in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	<p>5.3 <i>Number and operations. The student applies mathematical process standards to develop and use strategies and methods for positive rational number computations in order to solve problems with efficiency and accuracy. The student is expected to:</i></p>	<p>6.3 <i>Number and operations. The student applies mathematical process standards to represent addition, subtraction, multiplication, and division while solving problems and justifying solutions. The student is expected to:</i></p>
	<p>5.3J Represent division of a unit fraction by a whole number and the division of a whole number by a unit fraction such as $\frac{1}{3} \div 7$ and $7 \div \frac{1}{3}$ using objects and pictorial models, including area models.</p> <p>Supporting Standard</p> <p>Represent</p> <p>DIVISION OF A UNIT FRACTION BY A WHOLE NUMBER AND THE DIVISION OF A WHOLE NUMBER BY A UNIT FRACTION USING OBJECTS AND PICTORIAL MODELS, INCLUDING AREA MODELS</p>	<p>6.3E Multiply and divide positive rational numbers fluently.</p> <p>Readiness Standard</p> <p>Multiply, Divide</p> <p>POSITIVE RATIONAL NUMBERS FLUENTLY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole

Grade 4

Grade 5

Grade 6

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Fractions (unit fractions)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division
 - Unit fraction – a fraction in the form $\frac{1}{b}$ representing the quantity formed by one part of a whole that has been partitioned

numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).

- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents converted to equivalent decimals or fractions for multiplying or dividing fluently
 - Percent – a part of a whole expressed in hundredths
- Fluency – efficient application of procedures with accuracy
- Relationship between dividing by a fraction and multiplying by its reciprocal
 - Reciprocal – a quantity that is used to multiply by a given quantity which results in the product of one

Note(s):

Grade 4**Grade 5****Grade 6**

into b equal parts where b is a non-zero whole number

- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients limited to a unit fraction by whole number and a whole number by a unit fraction
- Fraction relationships
 - Relationship between the whole and the part
 - Numerator – the part of a fraction written above the fraction bar that tells the number of fractional parts specified or being considered
 - Denominator – the part of a fraction written below the fraction bar that tells the total number of equal parts in a whole or set
 - Referring to the same whole
 - Fractions are relationships, and the size or the amount of the whole matters.
- Division structures
 - Partitive division
 - Total amount known
 - Number of groups known
 - Size or measure of each group unknown
 - Quotative division (also known as Measurement division)
 - Total amount known
 - Size or measure of each group known
 - Number of groups unknown

- Grade Level(s):
 - Grade 6 introduces multiplying and dividing positive rational numbers fluently.
 - Grade 7 will add, subtract, multiply, and divide rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using operations with integers and positive rational numbers to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

Grade 4**Grade 5****Grade 6**

- Concrete objects and pictorial models
 - Strip diagrams
 - Strip diagram – a linear model used to illustrate number relationships
 - Clocks
 - Number lines
 - Adapted area models (e.g., brownie pan method)

Note(s):

- Grade Level(s):
 - Grade 5 introduces representing division of a unit fraction by a whole number and the division of a whole number by a unit fraction such as $\frac{1}{3} \div 7$ and $7 \div \frac{1}{3}$ using objects and pictorial models, including area models.
 - Grade 6 will multiply and divide positive rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

5.3L

Divide whole numbers by unit fractions and unit fractions by whole numbers.

Readiness Standard

Divide

WHOLE NUMBERS BY UNIT FRACTIONS AND
UNIT FRACTIONS BY WHOLE NUMBERS

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Fractions (unit fractions)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division.
 - Unit fraction – a fraction in the form $\frac{1}{b}$ representing the quantity formed by one part of a whole that has been partitioned into b equal parts where b is a non-zero whole number
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being

Grade 4**Grade 5****Grade 6**

divided by

- Quotients of fractions where dividend and divisors are limited to whole numbers by unit fractions and unit fractions by whole numbers
- Fraction relationships
 - Relationship between the whole and the part
 - Numerator – the part of a fraction written above the fraction bar that tells the number of fractional parts specified or being considered
 - Denominator – the part of a fraction written below the fraction bar that tells the total number of equal parts in a whole or set
 - Referring to the same whole
 - Fractions are relationships, and the size or the amount of the whole matters.
- Division structures
 - Partitive division
 - Total amount known
 - Number of groups known
 - Size or measure of each group unknown
 - Quotative division (also known as Measurement division)
 - Total amount known
 - Size or measure of each group known
 - Number of groups unknown
- Division strategies
 - Partitive
 - Ratio tables

Note(s):

- Grade Level(s):
 - Grade 5 introduces dividing whole numbers

Grade 4	Grade 5	Grade 6
	<p>by unit fractions and unit fractions by whole numbers.</p> <ul style="list-style-type: none"> ◦ Grade 6 will multiply and divide positive rational numbers fluently ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 	
		Applying Operations with Integers and Rational Numbers
		<p>6.3 <i>Number and operations. The student applies mathematical process standards to represent addition, subtraction, multiplication, and division while solving problems and justifying solutions. The student is expected to:</i></p>
		<p>6.3C</p> <p>Represent integer operations with concrete models and connect the actions with the models to standardized algorithms.</p> <p><i>Supporting Standard</i></p> <p>Represent</p>

INTEGER OPERATIONS WITH CONCRETE MODELS

Including, but not limited to:

- Integers – the set of counting (natural numbers), their opposites, and zero $\{-n, \dots, -3, -2, -1, 0, 1, 2, 3, \dots, n\}$. The set of integers is denoted by the symbol Z .
- Operations
 - Add, subtract, multiply, and/or divide
- Verbal actions expressed symbolically and vice versa
- Concrete models and pictorial representations
 - Number lines (horizontal/vertical)
 - Two-color counters

Connect

THE ACTIONS OF INTEGER OPERATIONS WITH THE CONCRETE MODELS TO STANDARDIZED ALGORITHMS

Including, but not limited to:

- Integer operations include using the additive inverse for subtraction by adding the opposite of the integer following the subtraction.
- Various representations of multiplication
- Various representations of division
- Connections between the actions of models for integer operations to standardized algorithms for integer operations
 - Standardized algorithms of operations
 - Addition
 - If a pair of addends has the same sign, then the sum will have the sign of both addends.

Grade 4**Grade 5****Grade 6**

- If a pair of addends has opposite signs, then the sum will have the sign of the addend with the greatest absolute value.
- Subtraction
 - A subtraction problem may be rewritten as an addition problem by adding the opposite of the integer following the subtraction symbol and then applying the rules for addition.
- Multiplication
 - If a pair of factors has the same sign, then the product is positive.
 - If a pair of factors has opposite signs, then the product is negative.
- Division
 - If the dividend and divisor have the same sign, then the quotient is positive.
 - If the dividend and divisor have opposite signs, then the quotient is negative.

Note(s):

- Grade Level(s):
 - Grade 6 introduces representing integer operations with concrete models and connecting the actions with the models to standardized algorithms.
 - Grade 7 will add, subtract, multiply, and divide rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using operations with integers and positive rational numbers to solve problems

Grade 4	Grade 5	Grade 6
		<ul style="list-style-type: none"> • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation ◦ X. Connections
		<p>6.3D</p> <p>Add, subtract, multiply, and divide integers fluently.</p> <p><i>Readiness Standard</i></p> <p>Add, Subtract, Multiply, Divide</p> <p>INTEGERS FLUENTLY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Integers – the set of counting (natural numbers), their opposites, and zero $\{-n, \dots, -3, -2, -1, 0, 1, 2, 3, \dots, n\}$. The set of integers is denoted by the symbol Z. • Fluency – efficient application of procedures with accuracy • Various representations of multiplication • Various representations of division • Generalizations of integer operations <ul style="list-style-type: none"> ◦ Addition and subtraction <ul style="list-style-type: none"> • If a pair of addends has the same sign, then the sum will have the sign of both addends. • If a pair of addends has opposite signs, then the sum will have the sign of the addend with the greatest absolute value. • A subtraction problem may be rewritten as an addition problem by adding the opposite of the integer following the

Grade 4**Grade 5****Grade 6**

subtraction symbol, and then applying the rules for addition.

- Multiplication and division
 - If two rational numbers have the same sign, then the product or quotient is positive.
 - If two rational numbers have opposite signs, then the product or quotient is negative.
 - When multiplying or dividing two or more rational numbers, the product or quotient is positive if there are no negative signs or an even number of negative signs.
 - When multiplying or dividing two or more rational numbers, the product or quotient is negative if there is one negative sign or an odd number of negative signs.

Note(s):

- Grade Level(s):
 - Grade 6 introduces adding, subtracting, multiplying, and dividing integers fluently.
 - Grade 7 will add, subtract, multiply, and divide rational numbers fluently.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using operations with integers and positive rational numbers to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

6.3E

Multiply and divide positive rational numbers fluently.

Readiness Standard

Multiply, Divide

POSITIVE RATIONAL NUMBERS FLUENTLY

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents converted to equivalent decimals or fractions for multiplying or dividing fluently
 - Percent – a part of a whole expressed in hundredths
- Fluency – efficient application of procedures with accuracy
- Relationship between dividing by a fraction and multiplying by its reciprocal
 - Reciprocal – a quantity that is used to multiply by a given quantity which results in the product of one

Note(s):

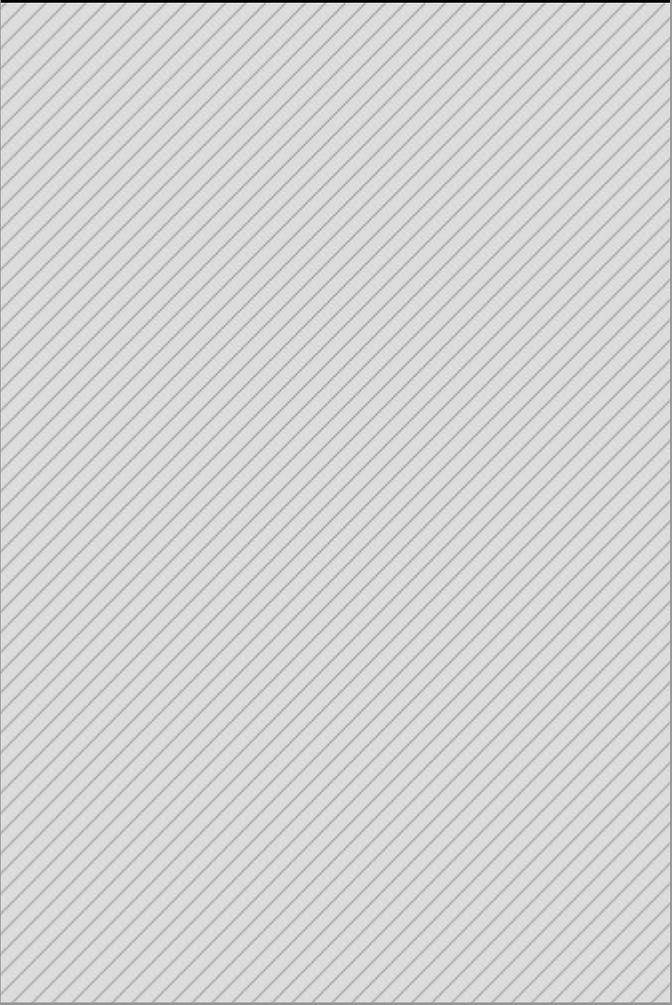
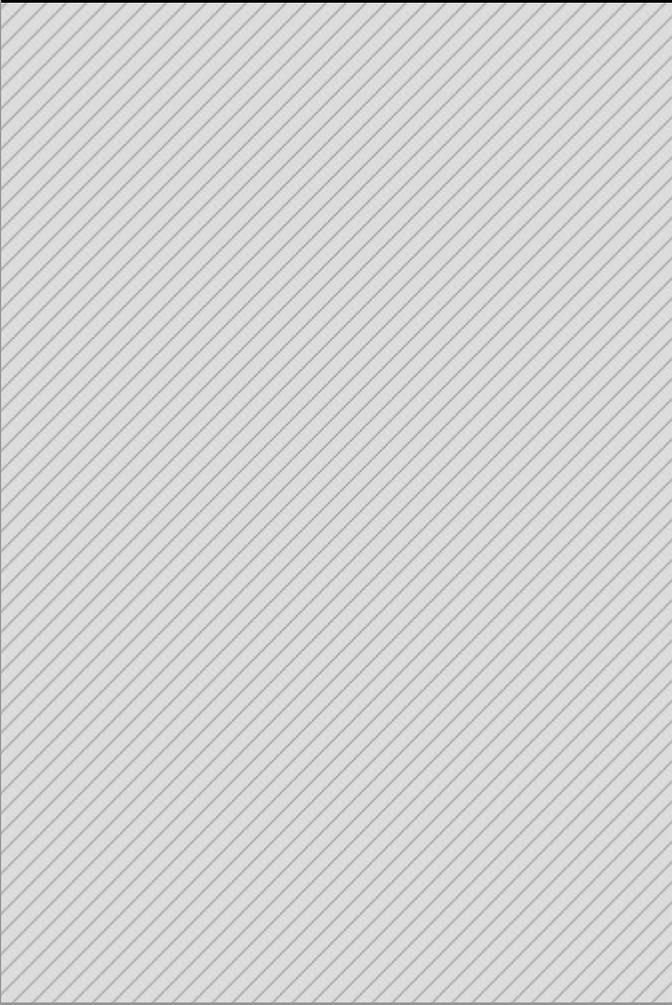
Grade 4	Grade 5	Grade 6		
		<ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 6 introduces multiplying and dividing positive rational numbers fluently. ◦ Grade 7 will add, subtract, multiply, and divide rational numbers fluently. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Using operations with integers and positive rational numbers to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 		
		Connecting Counting and Divisibility		
<p>4.5 <i>Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>	<p>5.4 <i>Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>			
	<p>5.4A Identify prime and composite numbers.</p> <p><i>Supporting Standard</i></p>			

Identify

PRIME AND COMPOSITE NUMBERS

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Prime number – a whole number with exactly two factors, 1 and the number itself
- Composite number – a whole number with more than two factors
- Special numbers
 - 2 is the only even prime number.
 - 1 is the only common factor in all of the factor pairs of prime numbers.
 - 1 is neither prime nor composite.
 - 0 is neither prime nor composite.
 - 0 cannot be expressed as a product of primes.
 - 0×0 and/or $0 \times$ any number yields an infinite number of factor pairs that have the product 0.
- Various representations to identify prime and composite numbers
 - Arrays
 - Generalizations from arrays used to determine if a number is prime or composite
 - Composite numbers have more than two different rectangular arrays that can

Grade 4	Grade 5	Grade 6		
	<p>be made.</p> <ul style="list-style-type: none"> ◦ Prime numbers have exactly two different rectangular arrays that can be made. ◦ Organizational factor lists <ul style="list-style-type: none"> • Generalizations from organizational factor lists used to determine if a number is prime or composite ◦ Composite numbers have more than two factors. ◦ Prime numbers have exactly two factors. <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 5 introduces identifying prime and composite numbers. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Grade Level Connections (reinforces previous learning and/or provides development for future learning) • TxCCRS: <ul style="list-style-type: none"> • IX. Communication and Representation 			
				
				
Representing Problem Situations with the Equal Sign				
4.5 <i>Algebraic reasoning. The student applies</i>	5.4 <i>Algebraic reasoning. The student applies</i>	6.7 <i>Expressions, equations, and relationships. The</i>		

Grade 4	Grade 5	Grade 6
<p><i>mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>	<p><i>mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>	<p><i>student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>
<p>4.5A</p> <p>Represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity.</p> <p>Readiness Standard</p> <p>Represent</p> <p>MULTI-STEP PROBLEMS INVOLVING THE FOUR OPERATIONS WITH WHOLE NUMBERS USING STRIP DIAGRAM AND EQUATIONS WITH A LETTER STANDING FOR THE UNKNOWN QUANTITY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n} ◦ Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n} 	<p>5.4B</p> <p>Represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity.</p> <p>Readiness Standard</p> <p>Represent, Solve</p> <p>MULTI-STEP PROBLEMS INVOLVING THE FOUR OPERATIONS WITH WHOLE NUMBERS USING EQUATIONS WITH A LETTER STANDING FOR THE UNKNOWN QUANTITY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n} ◦ Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n} • Addition <ul style="list-style-type: none"> ◦ Sums of whole numbers 	<p>6.7B</p> <p>Distinguish between expressions and equations verbally, numerically, and algebraically.</p> <p>Supporting Standard</p> <p>Distinguish</p> <p>BETWEEN EXPRESSIONS AND EQUATIONS VERBALLY, NUMERICALLY, AND ALGEBRAICALLY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Expression – a mathematical phrase, with no equal sign, that may contain a number(s), a variable(s), and/or an operator(s) • Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other • Various representations of expressions and equations <ul style="list-style-type: none"> ◦ Verbally ◦ Numerically ◦ Algebraically <p>Note(s):</p>

Grade 4

- Addition
 - Sums of whole numbers
- Subtraction
 - Differences of whole numbers
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients of whole numbers up to four-digit dividends by one-digit divisors
 - Quotients may include remainders
- Representations of an unknown quantity in an equation
 - Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other
 - Any single letter to represent the unknown quantity (e.g., $24 - 8 = y$, etc.)
 - Equal sign at beginning or end and unknown in any position
- Recognition of addition, subtraction, multiplication, and/or division in mathematical and real-world problem situations
- Representation of problem situations with strip diagrams and equations

Grade 5

- Subtraction
 - Differences of whole numbers
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to three-digit factors by two-digit factors
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Whole numbers with quotients up to four-digit dividends and two-digit divisors
- Representations of an unknown quantity in an equation
 - Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other
 - Any single letter to represent the unknown quantity (e.g., $24 - 8 = y$, etc.)
 - Equal sign at beginning or end and unknown in any position
- Recognition of addition, subtraction, multiplication, and/or division in mathematical and real-world problem situations
- Representation of problem situations with equations
 - Relationship between quantities represented and problem situation
- Addition and subtraction problem structures
 - Join problems

Grade 6

- Grade Level(s):
 - Grade 5 represented and solved multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using expressions and equations to represent relationships in a variety of contexts
- TxCCRS:
 - II. Algebraic Reasoning
 - IX. Communication and Representation

Grade 4

- Strip diagram – a linear model used to illustrate number relationships
- Relationship between quantities represented and problem situation
- Addition and subtraction problem structures
 - Join problems
 - Start unknown
 - Change unknown
 - Result unknown
 - Separate problems
 - Start unknown
 - Change unknown
 - Result unknown
 - Part-part-whole problems
 - Part unknown
 - Whole unknown
 - Compare problems
 - Difference unknown
 - Larger part unknown
 - Smaller part unknown
- Multiplicative structures
 - Product unknown
 - Factor unknown
- Division structures
 - Partitive division
 - Total amount known
 - Number of groups known
 - Size or measure of each group unknown
 - Quotative division (also known as Measurement division)
 - Total amount known
 - Size or measure of each group known
 - Number of groups unknown
- Multi-step problem situations

Note(s):

Grade 5

- Start unknown
- Change unknown
- Result unknown
- Separate problems
 - Start unknown
 - Change unknown
 - Result unknown
- Part-part-whole problems
 - Part unknown
 - Whole unknown
- Compare problems
 - Difference unknown
 - Larger part unknown
 - Smaller part unknown
- Multiplicative structures
 - Product unknown
 - Factor unknown
- Division structures
 - Partitive division
 - Total amount known
 - Number of groups known
 - Size or measure of each group unknown
 - Quotative division (also known as Measurement division)
 - Total amount known
 - Size or measure of each group known
 - Number of groups unknown
- Multi-step problem situations

Note(s):

- Grade Level(s):
 - Grade 4 represented multi-step problems involving the four operations with whole numbers, using strip diagrams and equations with a letter standing for the unknown quantity.

Grade 6

Grade 4	Grade 5	Grade 6
<ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 3 represented one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations. ◦ Grade 3 represented and solved one- and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations. ◦ Grade 3 determined the unknown whole number in a multiplication or division equation relating three whole numbers when the unknown is either a missing factor or product. ◦ Grade 5 will represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ II.D. Algebraic Reasoning – Representations ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation 	<ul style="list-style-type: none"> ◦ Grade 6 will distinguish between expressions and equations verbally, numerically, and algebraically. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding and generating expressions and equations to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation 	
		Representing Problem Situations with Equations and Inequalities

Grade 4	Grade 5	Grade 6
		<p>6.9 <i>Expressions, equations, and relationships. The student applies mathematical process standards to use equations and inequalities to represent situations. The student is expected to:</i></p>
		<p>6.9A Write one-variable, one-step equations and inequalities to represent constraints or conditions within problems.</p> <p><i>Supporting Standard</i></p> <p>Write</p> <p>ONE-VARIABLE, ONE-STEP EQUATIONS AND INEQUALITIES TO REPRESENT CONSTRAINTS OR CONDITIONS WITHIN PROBLEMS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other • Inequality – a mathematical statement composed of algebraic and/or numeric expressions set apart by an inequality symbol • Variable – a letter or symbol that represents a number <ul style="list-style-type: none"> ◦ One variable on one side of the equation or inequality • Coefficient – a number that is multiplied by a variable(s) <ul style="list-style-type: none"> ◦ Whole numbers ◦ Integers

Grade 4**Grade 5****Grade 6**

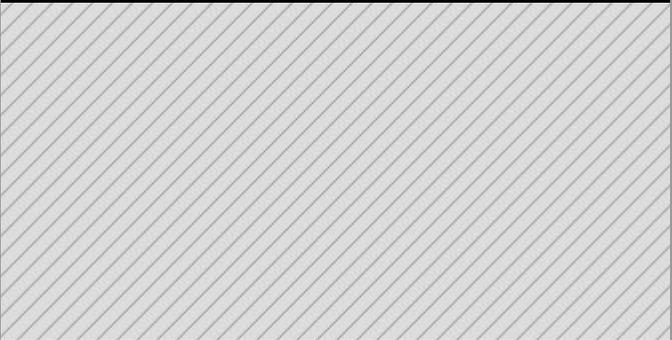
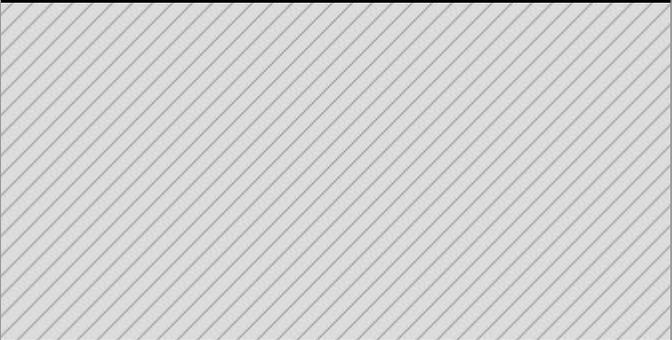
- Products of integers limited to an integer by an integer
- Decimals (less than or greater than one)
 - Limited to positive decimal values
- Fractions (proper, improper, and mixed numbers)
 - Limited to positive fractional values
- Constant – a fixed value that does not appear with a variable(s)
 - Whole numbers
 - Integers
 - Decimals (less than or greater than one)
 - Positive or negative decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Positive or negative fractional values
- Solution set – a set of all values of the variable(s) that satisfy the equation or inequality
 - Constraints or conditions
- Distinguishing between equations and inequalities
 - Characteristics of equations
 - Equates two expressions
 - Equality of the variable
 - One solution
 - Characteristics of inequalities
 - Shows the relationship between two expressions in terms of $>$, \geq , \leq , or \neq
 - Inequality of the variable
 - One or more solutions
- Equality and inequality words and symbols
 - Equal to, =
 - Greater than, $>$
 - Greater than or equal to, \geq
 - Less than, $<$

Grade 4**Grade 5****Grade 6**

- Less than or equal to, \leq
- Not equal to, \neq
- Relationship of order of operations within an equation or inequality
 - Order of operations – the rules of which calculations are performed first when simplifying an expression
 - Parentheses/brackets: simplify expressions inside parentheses or brackets in order from left to right
 - Exponents: rewrite in standard numerical form and simplify from left to right
 - Limited to positive whole number exponents
 - Multiplication/division: simplify expressions involving multiplication and/or division in order from left to right
 - Addition/subtraction: simplify expressions involving addition and/or subtraction in order from left to right
- One-variable, one-step equations from a problem situation
- One-variable, one-step inequalities from a problem situation

Note(s):

- Grade Level(s):
 - Grade 6 introduces writing one-variable, one-step equations and inequalities to represent constraints or conditions within problems.
 - Grade 7 will write one-variable, two-step equations and inequalities to represent constraints or conditions within problems.
 - Various mathematical process standards will be applied to this student expectation

Grade 4	Grade 5	Grade 6
		<p>as appropriate.</p> <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Using expressions and equations to represent relationships in a variety of contexts • TxCCRS: <ul style="list-style-type: none"> ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation
		<p>6.9B</p> <p>Represent solutions for one-variable, one-step equations and inequalities on number lines.</p> <p><i>Supporting Standard</i></p> <p>Represent</p> <p>SOLUTIONS FOR ONE-VARIABLE, ONE-STEP EQUATIONS AND INEQUALITIES ON NUMBER LINES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other • Inequality – a mathematical statement composed of algebraic and/or numeric expressions set apart by an inequality symbol • Variable – a letter or symbol that represents a number <ul style="list-style-type: none"> ◦ One variable on one side of the equation or inequality • Coefficient – a number that is multiplied by a

Grade 4**Grade 5****Grade 6**

- variable(s)
- Whole numbers
- Integers
 - Products of integers limited to an integer by an integer
- Decimals (less than or greater than one)
 - Limited to positive decimal values
- Fractions (proper, improper, and mixed numbers)
 - Limited to positive fractional values
- Constant – a fixed value that does not appear with a variable(s)
- Whole numbers
- Integers
- Decimals (less than or greater than one)
 - Positive or negative decimal values
- Fractions (proper, improper, and mixed numbers)
 - Positive or negative fractional values
- Solution set – a set of all values of the variable(s) that satisfy the equation or inequality
- Constraints or conditions
- Distinguishing between equations and inequalities
- Characteristics of equations
 - Equates two expressions
 - Equality of the variable
 - One solution
- Characteristics of inequalities
 - Shows the relationship between two expressions in terms of $>$, \geq , \leq , or \neq
 - Inequality of the variable
 - One or more solutions
- Equality and inequality words and symbols
- Equal to, =

Grade 4**Grade 5****Grade 6**

- Greater than, >
- Greater than or equal to, ≥
- Less than, <
- Less than or equal to, ≤
- Not equal to, ≠
- Representations of solutions to one-step equations and inequalities on a number line
 - Closed circle
 - Equal to, =
 - Greater than or equal to, ≥
 - Less than or equal to, ≤
 - Open circle
 - Greater than, >
 - Less than, <
 - Not equal to, ≠

Note(s):

- Grade Level(s):
 - Grade 6 introduces representing solutions for one-variable, one-step equations and inequalities on number lines.
 - Grade 7 will represent solutions for one-variable, two step equations and inequalities on number lines.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using expressions and equations to represent relationships in a variety of contexts
- TxCCRS:
 - IX. Communication and Representation

6.9C

Write corresponding real-world problems given one-variable, one-step equations or inequalities.

Supporting Standard

Write

CORRESPONDING REAL-WORLD PROBLEMS
GIVEN ONE-VARIABLE, ONE-STEP EQUATIONS
OR INEQUALITIES

Including, but not limited to:

- Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other
- Inequality – a mathematical statement composed of algebraic and/or numeric expressions set apart by an inequality symbol
- Variable – a letter or symbol that represents a number
 - One variable on one side of the equation or inequality
- Coefficient – a number that is multiplied by a variable(s)
 - Whole numbers
 - Integers
 - Products of integers limited to an integer by an integer
 - Decimals (less than or greater than one)
 - Limited to positive decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Limited to positive fractional values
- Constant – a fixed value that does not appear

Grade 4**Grade 5****Grade 6**

- with a variable(s)
 - Whole numbers
 - Integers
 - Decimals (less than or greater than one)
 - Positive or negative decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Positive or negative fractional values
- Solution set – a set of all values of the variable(s) that satisfy the equation or inequality
 - Constraints or conditions
- Distinguishing between equations and inequalities
 - Characteristics of equations
 - Equates two expressions
 - Equality of the variable
 - One solution
 - Characteristics of inequalities
 - Shows the relationship between two expressions in terms of $>$, \geq , \leq , or \neq
 - Inequality of the variable
 - One or more solutions
- Equality and inequality words and symbols
 - Equal to, =
 - Greater than, $>$
 - Greater than or equal to, \geq
 - Less than, $<$
 - Less than or equal to, \leq
 - Not equal to, \neq
- Relationship of order of operations within an equation or inequality
 - Order of operations – the rules of which calculations are performed first when simplifying an expression
 - Parentheses/brackets: simplify

Grade 4**Grade 5****Grade 6**

expressions inside parentheses or brackets in order from left to right

- Exponents: rewrite in standard numerical form and simplify from left to right
 - Limited to positive whole number exponents
- Multiplication/division: simplify expressions involving multiplication and/or division in order from left to right
- Addition/subtraction: simplify expressions involving addition and/or subtraction in order from left to right
- Corresponding real-world problem situation from a one-variable, one-step equation
- Corresponding real-world problem situation from a one-variable, one-step inequality

Note(s):

- Grade Level(s):
 - Grade 6 introduces writing corresponding real-world problems given one-variable, one-step equations or inequalities.
 - Grade 7 will write a corresponding real-world problem given a one-variable, two-step equation or inequality.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using expressions and equations to represent relationships in a variety of contexts
- TxCCRS:
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation
 - X. Connections

Grade 4	Grade 5	Grade 6
Representing and Solving Problems with Equations and Inequalities		
<p>4.5 <i>Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>	<p>5.4 <i>Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>	<p>6.10 <i>Expressions, equations, and relationships. The student applies mathematical process standards to use equations and inequalities to solve problems. The student is expected to:</i></p>
<p>4.5A</p> <p>Represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity.</p> <p>Readiness Standard</p> <p>Represent</p> <p>MULTI-STEP PROBLEMS INVOLVING THE FOUR OPERATIONS WITH WHOLE NUMBERS USING STRIP DIAGRAMS AND EQUATIONS WITH A LETTER STANDING FOR THE UNKNOWN QUANTITY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n} ◦ Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n} 	<p>5.4B</p> <p>Represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity.</p> <p>Readiness Standard</p> <p>Represent, Solve</p> <p>MULTI-STEP PROBLEMS INVOLVING THE FOUR OPERATIONS WITH WHOLE NUMBERS USING EQUATIONS WITH A LETTER STANDING FOR THE UNKNOWN QUANTITY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n} ◦ Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n} • Addition <ul style="list-style-type: none"> ◦ Sums of whole numbers 	<p>6.10A</p> <p>Model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts.</p> <p>Readiness Standard</p> <p>Model, Solve</p> <p>ONE-VARIABLE, ONE-STEP EQUATIONS AND INEQUALITIES THAT REPRESENT PROBLEMS, INCLUDING GEOMETRIC CONCEPTS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other • Inequality – a mathematical statement composed of algebraic and/or numeric expressions set apart by an inequality symbol • Variable – a letter or symbol that represents a number <ul style="list-style-type: none"> ◦ One variable on one side of the equation or inequality

Grade 4

- Addition
 - Sums of whole numbers
- Subtraction
 - Differences of whole numbers
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Quotients of whole numbers up to four-digit dividends by one-digit divisors
 - Quotients may include remainders
- Representations of an unknown quantity in an equation
 - Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other
 - Any single letter to represent the unknown quantity (e.g., $24 - 8 = y$, etc.)
 - Equal sign at beginning or end and unknown in any position
- Recognition of addition, subtraction, multiplication, and/or division in mathematical and real-world problem situations
- Representation of problem situations with strip diagrams and equations

Grade 5

- Subtraction
 - Differences of whole numbers
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to three-digit factors by two-digit factors
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Whole numbers with quotients up to four-digit dividends and two-digit divisors
- Representations of an unknown quantity in an equation
 - Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other
 - Any single letter to represent the unknown quantity (e.g., $24 - 8 = y$, etc.)
 - Equal sign at beginning or end and unknown in any position
- Recognition of addition, subtraction, multiplication, and/or division in mathematical and real-world problem situations
- Representation of problem situations with equations
 - Relationship between quantities represented and problem situation
- Addition and subtraction problem structures
 - Join problems

Grade 6

- Coefficient – a number that is multiplied by a variable(s)
 - Whole numbers
 - Integers
 - Products of integers limited to an integer by an integer
 - Decimals (less than or greater than one)
 - Limited to positive decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Limited to positive fractional values
- Constant – a fixed value that does not appear with a variable(s)
 - Whole numbers
 - Integers
 - Decimals (less than or greater than one)
 - Positive or negative decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Positive or negative fractional values
- Solution set – a set of all values of the variable(s) that satisfy the equation or inequality
 - Constraints or conditions
- Distinguishing between equations and inequalities
 - Characteristics of equations
 - Equates two expressions
 - Equality of the variable
 - One solution
 - Characteristics of inequalities
 - Shows the relationship between two expressions in terms of $>$, \geq , \leq , or \neq
 - Inequality of the variable
 - One or more solutions
- Equality and inequality words and symbols

Grade 4

- Strip diagram – a linear model used to illustrate number relationships
- Relationship between quantities represented and problem situation
- Addition and subtraction problem structures
 - Join problems
 - Start unknown
 - Change unknown
 - Result unknown
 - Separate problems
 - Start unknown
 - Change unknown
 - Result unknown
 - Part-part-whole problems
 - Part unknown
 - Whole unknown
 - Compare problems
 - Difference unknown
 - Larger part unknown
 - Smaller part unknown
- Multiplicative structures
 - Product unknown
 - Factor unknown
- Division structures
 - Partitive division
 - Total amount known
 - Number of groups known
 - Size or measure of each group unknown
 - Quotative division (also known as Measurement division)
 - Total amount known
 - Size or measure of each group known
 - Number of groups unknown
- Multi-step problem situations

Note(s):

Grade 5

- Start unknown
- Change unknown
- Result unknown
- Separate problems
 - Start unknown
 - Change unknown
 - Result unknown
- Part-part-whole problems
 - Part unknown
 - Whole unknown
- Compare problems
 - Difference unknown
 - Larger part unknown
 - Smaller part unknown
- Multiplicative structures
 - Product unknown
 - Factor unknown
- Division structures
 - Partitive division
 - Total amount known
 - Number of groups known
 - Size or measure of each group unknown
 - Quotative division (also known as Measurement division)
 - Total amount known
 - Size or measure of each group known
 - Number of groups unknown
- Multi-step problem situations

Note(s):

- Grade Level(s):
 - Grade 4 represented multi-step problems involving the four operations with whole numbers, using strip diagrams and equations with a letter standing for the unknown quantity.

Grade 6

- Equal to, =
- Greater than, >
- Greater than or equal to, \geq
- Less than, <
- Less than or equal to, \leq
- Not equal to, \neq
- Relationship of order of operations within an equation or inequality
 - Order of operations – the rules of which calculations are performed first when simplifying an expression
 - Parentheses/brackets: simplify expressions inside parentheses or brackets in order from left to right
 - Exponents: rewrite in standard numerical form and simplify from left to right
 - Limited to positive whole number exponents
 - Multiplication/division: simplify expressions involving multiplication and/or division in order from left to right
 - Addition/subtraction: simplify expressions involving addition and/or subtraction in order from left to right
- Models to solve one-variable, one-step equations (concrete, pictorial, algebraic)
- Models to solve one-variable, one-step inequalities (concrete, pictorial, algebraic)
- Solutions to one-variable, one-step equations from a problem situation
- Solutions to one-variable, one-step inequalities from a problem situation
- Solutions to one-variable, one-step equations from geometric concepts
- Solutions to one-variable, one-step inequalities from geometric concepts

Grade 4

- Grade Level(s):
 - Grade 3 represented one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations.
 - Grade 3 represented and solved one- and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations.
 - Grade 3 determined the unknown whole number in a multiplication or division equation relating three whole numbers when the unknown is either a missing factor or product.
 - Grade 5 will represent and solve multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - II.D. Algebraic Reasoning – Representations
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 5

- Grade 6 will distinguish between expressions and equations verbally, numerically, and algebraically.
- Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and generating expressions and equations to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 6

Note(s):

- Grade Level(s):
 - Grade 5 represented and solved multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity.
 - Grade 7 will model and solve one-variable, two-step equations and inequalities.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using expressions and equations to represent relationships in a variety of contexts
- TxCCRS:
 - I. Numeric Reasoning
 - III.C. Geometric Reasoning – Connections between geometry and other mathematical content strands
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation
 - X. Connections

6.10B

Determine if the given value(s) make(s) one-variable, one-step equations or inequalities true.

Supporting Standard

Determine

IF THE GIVEN VALUE(S) MAKE(S) ONE-VARIABLE,

Grade 4**Grade 5****Grade 6**

ONE-STEP EQUATIONS OR INEQUALITIES TRUE

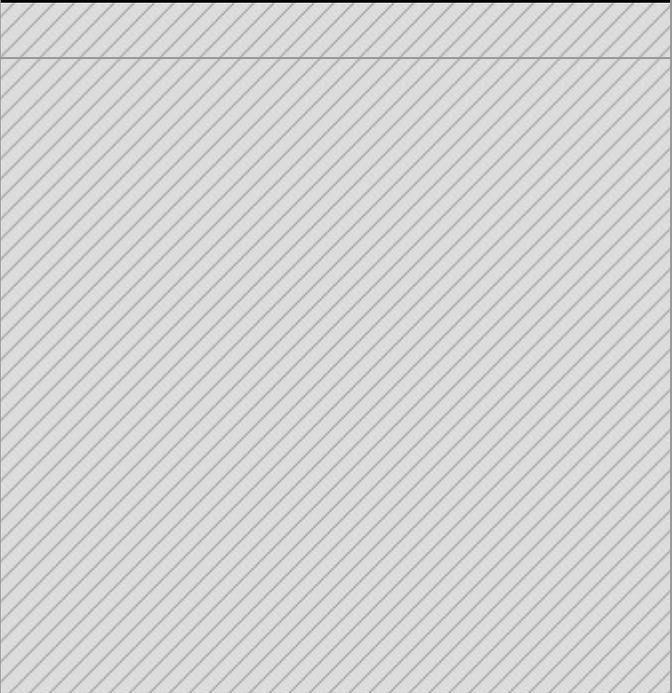
Including, but not limited to:

- Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other
- Inequality – a mathematical statement composed of algebraic and/or numeric expressions set apart by an inequality symbol
- Variable – a letter or symbol that represents a number
 - One variable on one side of the equation or inequality
- Coefficient – a number that is multiplied by a variable(s)
 - Whole numbers
 - Integers
 - Products of integers limited to an integer by an integer
 - Decimals (less than or greater than one)
 - Limited to positive decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Limited to positive fractional values
- Constant – a fixed value that does not appear with a variable(s)
 - Whole numbers
 - Integers
 - Decimals (less than or greater than one)
 - Positive or negative decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Positive or negative fractional values
- Solution set – a set of all values of the variable(s) that satisfy the equation or

Grade 4**Grade 5****Grade 6**

- inequality
 - Constraints or conditions
- Distinguishing between equations and inequalities
 - Characteristics of equations
 - Equates two expressions
 - Equality of the variable
 - One solution
 - Characteristics of inequalities
 - Shows the relationship between two expressions in terms of $>$, \geq , \leq , or \neq
 - Inequality of the variable
 - One or more solutions
- Equality and inequality words and symbols
 - Equal to, =
 - Greater than, $>$
 - Greater than or equal to, \geq
 - Less than, $<$
 - Less than or equal to, \leq
 - Not equal to, \neq
- Relationship of order of operations within an equation or inequality
 - Order of operations – the rules of which calculations are performed first when simplifying an expression
 - Parentheses/brackets: simplify expressions inside parentheses or brackets in order from left to right
 - Exponents: rewrite in standard numerical form and simplify from left to right
 - Limited to positive whole number exponents
 - Multiplication/division: simplify expressions involving multiplication and/or division in order from left to right
 - Addition/subtraction: simplify expressions

Grade 4	Grade 5	Grade 6
		<p>involving addition and/or subtraction in order from left to right</p> <ul style="list-style-type: none"> • Evaluation of given value(s) as possible solutions of one-variable, one-step equations • Evaluation of given value(s) as possible solutions of one-variable, one-step inequalities <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 5 represented and solved multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity. ◦ Grade 7 will determine if the given value(s) make(s) one-variable, two-step equations and inequalities true. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Using expressions and equations to represent relationships in a variety of contexts • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation
	Describing and Simplifying Numerical Expressions	
	<p>5.4 <i>Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The</i></p>	<p>6.7 <i>Expressions, equations, and relationships. The student applies mathematical process standards to develop concepts of expressions and equations.</i></p>

Grade 4	Grade 5	Grade 6
	<i>student is expected to:</i>	<i>The student is expected to:</i>
	<p>5.4E</p> <p>Describe the meaning of parentheses and brackets in a numeric expression.</p> <p>Supporting Standard</p> <p>Describe</p> <p>THE MEANING OF PARENTHESES AND BRACKETS IN A NUMERIC EXPRESSION</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Expression – a mathematical phrase, with no equal sign, that may contain a number(s), a unknown(s), and/or an operator(s) • Parentheses and brackets – symbols to show 	<p>6.7A</p> <p>Generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization.</p> <p>Readiness Standard</p> <p>Generate</p> <p>EQUIVALENT NUMERICAL EXPRESSIONS USING ORDER OF OPERATIONS, INCLUDING WHOLE NUMBER EXPONENTS AND PRIME FACTORIZATION</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Rational numbers – the set of numbers that

Grade 4**Grade 5****Grade 6**

a group of terms and/or expressions within a mathematical expression

- Up to two levels of grouping
 - Parentheses and brackets
 - Double parentheses
 - Division bar
- Generalization about grouping symbols within a numerical expression
 - When both parentheses and brackets or a double set of parentheses is used within a numerical expression, the inner most grouping should be evaluated first.
- Parentheses without an operation symbol may be used to represent multiplication.
 - Various symbols to represent multiplication include \times , \cdot , parentheses, or brackets.
- Relationship between numbers and operators separated by parentheses and/or brackets

Note(s):

- Grade Level(s):
 - Grade 5 introduces describing the meaning of parentheses and brackets in a numeric expression.
 - Grade 6 will generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization.
 - Various mathematical process standards

can be expressed as a fraction $\frac{a}{b}$,

where a and b are integers and $b \neq 0$, which includes the subsets of integers, whole numbers, and counting (natural) numbers (e.g., -3 , 0 , 2 , $-\frac{1}{2}$, $\frac{11}{7}$, $0.\overline{23}$, etc.). The set of

rational numbers is denoted by the symbol \mathbb{Q} .

- Various forms of positive and negative rational numbers
 - Whole numbers
 - Integers
 - Products of integers limited to an integer by an integer
 - Quotients of integers limited to an integer by an integer
 - Decimals (less than or greater than one)
 - Products of decimals limited to positive decimal values
 - Quotients of decimals limited to positive decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Products of fractions limited to positive fractional values
 - Quotients of fractions limited to positive fractional values
- Expression – a mathematical phrase, with no equal sign, that may contain a number(s), a variable(s), and/or an operator(s)

Grade 4	Grade 5	Grade 6
	<p>will be applied to this student expectation as appropriate.</p> <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding and generating expressions and equations to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation 	
	<p>5.4F</p> <p>Simplify numerical expressions that do not involve exponents, including up to two levels of grouping.</p> <p><i>Readiness Standard</i></p> <p>Simplify</p> <p>NUMERICAL EXPRESSIONS THAT DO NOT INVOLVE EXPONENTS, INCLUDING UP TO TWO LEVELS OF GROUPING</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time {1, 2, 3, ..., n} ◦ Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n} • Decimals (less than and greater than one to the tenths, hundredths, and thousandths) <ul style="list-style-type: none"> ◦ Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole 	<ul style="list-style-type: none"> • Exponent – in the expression x^y, x is called the base and y is called the exponent. The exponent determines the number of times the base is multiplied by itself. • Equivalent numerical expressions <ul style="list-style-type: none"> ◦ Order of operations – the rules of which calculations are performed first when simplifying an expression • Parentheses/brackets: simplify expressions inside parentheses or brackets in order from left to right • Exponents: rewrite in standard numerical form and simplify from left to right <ul style="list-style-type: none"> ◦ Limited to whole number positive exponents • Multiplication/division: simplify expressions involving multiplication and/or division in order from left to right • Addition/subtraction: simplify expressions involving addition and/or subtraction in order from left to right ◦ Prime factorization – the process of decomposing a composite number as a unique product of prime factors <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 5 described the meaning of parentheses and brackets in a numeric expression. ◦ Grade 5 simplified numerical expressions that do not involve exponents, including up to two levels of grouping. ◦ Algebra I will add and subtract polynomials of degree one and degree two.

Grade 4

Grade 5

Grade 6

- and is recorded with a decimal point separating the whole from the part
- Fractions (proper, improper, or mixed numbers with equal or unequal denominators)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division.
 - Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
 - Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
 - Mixed number – a number that is composed of a whole number and a fraction
 - Unit fraction – a fraction in the form $\frac{1}{b}$ representing the quantity formed by one part of a whole that has been partitioned into b equal parts where b is a non-zero whole number
 - Addition
 - Sums of whole numbers
 - Sums of decimals up to the thousandths
 - Sums of fractions with equal and unequal denominators
 - Subtraction
 - Differences of whole numbers
 - Differences of decimals with values limited to the thousandths
 - Differences of fractions with equal and

- Algebra I will multiply polynomials of degree one and degree two.
- Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using expressions and equations to represent relationships in a variety of contexts
- TxCCRS:
 - I. Numeric Reasoning
 - II. Algebraic Reasoning
 - IX. Communication and Representation

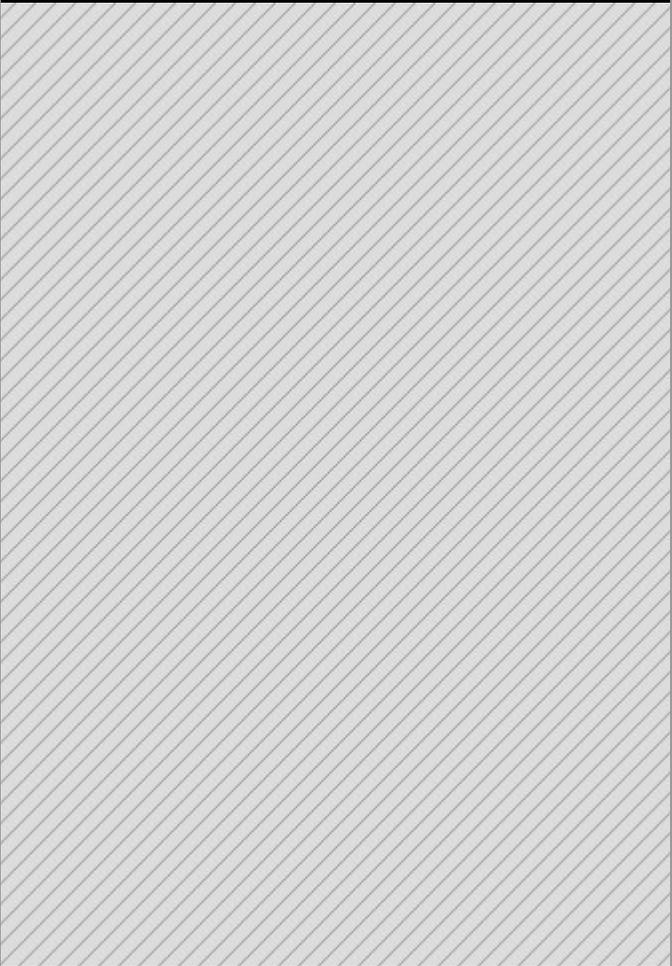
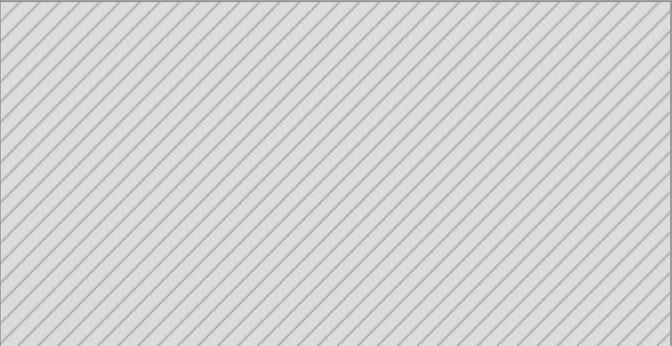
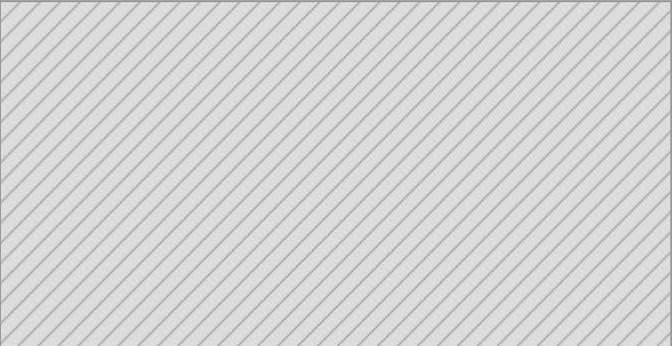
Grade 4**Grade 5****Grade 6**

unequal denominators

- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to three-digit factors by two-digit factors
 - Products of decimals limited to three-digit factors by two-digit factors with products to the hundredths
 - Multiply tenths by tenths (e.g., $0.3 \times 0.7 = 0.21$, $1.2 \times 1.2 = 1.44$, $14.3 \times 1.3 = 18.59$, etc.)
 - Multiply tenths by hundredths or vice versa (e.g., $0.5 \times 0.12 = 0.06$, $1.4 \times 0.15 = 0.21$, $21.4 \times 0.45 = 9.63$, etc.)
 - Multiply tenths by thousandths or vice versa (e.g., $0.4 \times 0.125 = 0.05$, $0.125 \times 8.4 = 1.05$, etc.)
 - Multiply whole numbers by tenths, hundredths, and thousandths or vice versa (e.g., $3 \times 1.3 = 3.9$, $42 \times 7.45 = 312.9$, $7.02 \times 78 = 547.56$, $6 \times 0.125 = 0.75$, etc.)
 - Products of fractions where factors are limited to a fraction and a whole number
- Division
 - Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor
 - Dividend – the number that is being divided
 - Divisor – the number the dividend is being divided by
 - Whole numbers with quotients up to four-digit dividends and two-digit divisors

Grade 4**Grade 5****Grade 6**

- Quotients of decimals limited to four-digit dividends and two-digit whole number divisors, with quotients to the hundredths
- Dividend to the tenths and whole number divisor (e.g., $1.2 \div 24 = 0.05$, $358.8 \div 23 = 15.6$, $721.7 \div 14 = 51.55$, etc.)
- Dividend to the hundredths and whole number divisor (e.g., $8.68 \div 4 = 2.17$, $8.25 \div 15 = 0.55$, $62.76 \div 12 = 5.23$, etc.)
- Whole number dividends and whole number divisors (e.g., $3 \div 4 = 0.75$, $10 \div 8 = 1.25$, $1000 \div 16 = 62.5$, etc.)
- Quotients of fractions where dividend and divisors are limited to whole numbers by unit fractions and unit fractions by whole numbers
- Expression – a mathematical phrase, with no equal sign, that may contain a number(s), a unknown(s), and/or an operator(s)
- Numerical expressions without exponents
- Parentheses and brackets – symbols to show a group of terms and/or expressions within a mathematical expression
 - Up to two levels of grouping
 - Parentheses and brackets
 - Double parentheses
 - Division bar
- Order of operations – the rules of which calculations are performed first when simplifying an expression
 - Parentheses/brackets: simplify expressions inside parentheses or brackets in order from left to right
 - Multiplication/division: simplify expressions involving multiplication and/or division in order from left to right

Grade 4	Grade 5	Grade 6
	<ul style="list-style-type: none"> • Various symbols to represent multiplication include \times, \cdot, parentheses, or brackets. ◦ Addition/subtraction: simplify expressions involving addition and/or subtraction in order from left to right <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 5 introduces simplifying numerical expressions that do not involve exponents, including up to two levels of grouping. ◦ Grade 6 will generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding and generating expressions and equations to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation 	
		

IF TWO EXPRESSIONS ARE EQUIVALENT USING CONCRETE MODELS, PICTORIAL MODELS, AND ALGEBRAIC REPRESENTATIONS

Including, but not limited to:

- Rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are integers and $b \neq 0$, which includes the subsets of integers, whole numbers, and counting (natural) numbers (e.g., -3 , 0 , 2 , $-\frac{1}{2}$, $\frac{11}{7}$, $0.\overline{23}$, etc.). The set of rational numbers is denoted by the symbol Q .
- Various forms of positive and negative rational numbers
 - Whole numbers
 - Integers
 - Products of integers limited to an integer by an integer
 - Quotients of integers limited to an integer by an integer
 - Decimals (less than or greater than one)
 - Products of decimals limited to positive decimal values
 - Quotients of decimals limited to positive decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Products of fractions limited to positive fractional values
 - Quotients of fractions limited to positive fractional values
- Expression – a mathematical phrase, with no equal sign, that may contain a number(s), a

Grade 4**Grade 5****Grade 6**

variable(s), and/or an operator(s)

- Expressions with and without variables
- Order of operations – the rules of which calculations are performed first when simplifying an expression
 - Parentheses/brackets: simplify expressions inside parentheses or brackets in order from left to right
 - Exponents: rewrite in standard numerical form and simplify from left to right
 - Limited to whole number positive exponents
 - Multiplication/division: simplify expressions involving multiplication and/or division in order from left to right
 - Addition/subtraction: simplify expressions involving addition and/or subtraction in order from left to right
- Equivalence of various representations of numerical expressions (concrete, pictorial, algebraic)
- Equivalence of various representations of algebraic expressions (concrete, pictorial, algebraic)

Note(s):

- Grade Level(s):
 - Grade 6 introduces determining if two expressions are equivalent using concrete models, pictorial models, and algebraic representations.
 - Algebra I will rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property.
 - Various mathematical process standards

Grade 4	Grade 5	Grade 6
		<p>will be applied to this student expectation as appropriate.</p> <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Using expressions and equations to represent relationships in a variety of contexts • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ II. Algebraic Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation
		<p>6.7D</p> <p>Generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties.</p> <p><i>Readiness Standard</i></p> <p>Generate</p> <p>EQUIVALENT EXPRESSIONS USING THE PROPERTIES OF OPERATIONS: INVERSE, IDENTITY, COMMUTATIVE, ASSOCIATIVE, AND DISTRIBUTIVE PROPERTIES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are integers and $b \neq 0$, which includes the subsets of integers, whole numbers, and counting (natural) numbers

Grade 4

Grade 5

Grade 6

(e.g., -3, 0, 2, $-\frac{1}{2}$, $\frac{11}{7}$, $0.\overline{23}$, etc.). The set of

rational numbers is denoted by the symbol \mathbb{Q} .

- Various forms of positive and negative rational numbers
 - Whole numbers
 - Integers
 - Products of integers limited to an integer by an integer
 - Quotients of integers limited to and integer by an integer
 - Decimals (less than or greater than one)
 - Products of decimals limited to positive decimal values
 - Quotients of decimals limited to positive decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Products of fractions limited to positive fractional values
 - Quotients of fractions limited to positive fractional values
- Expression – a mathematical phrase, with no equal sign, that may contain a number(s), a variable(s), and/or an operator(s)
 - Expressions with and without variables
- Properties of operations
 - Identity (Additive)
 - Rule $a + 0 = a = 0 + a$
 - Identity (Multiplicative)
 - Rule $a \times 1 = a = 1 \times a$
 - Commutative (Additive)
 - Rule $a + b = b + a$
 - Commutative (Multiplicative)
 - Rule $a \times b = b \times a$
 - Associative (Addition)

Grade 4

Grade 5

Grade 6

- Rule $(a + b) + c = a + (b + c)$
- Associative (Multiplication)
- Rule $(a \cdot b) \cdot c = a \cdot (b \cdot c)$
- Distributive
- Rule $a(b + c) = ab + ac$
- Inverse (Addition)
- Rule $a + (-a) = 0$
- Inverse (Multiplicative)
- Rule $a \cdot \frac{1}{a} = 1$

Note(s):

- Grade Level(s):
 - Grade 6 introduces generating equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties.
 - Algebra I will rewrite polynomial expressions of degree one and degree two in equivalent forms using the distributive property.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using expressions and equations to represent relationships in a variety of contexts
- TxCCRS:
 - I. Numeric Reasoning
 - II. Algebraic Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 4	Grade 5	Grade 6
<p>4.5 <i>Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>	<p>5.4 <i>Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>	<p>6.4 <i>Proportionality. The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations. The student is expected to:</i></p>
<p>4.5B</p> <p>Represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence.</p> <p>Readiness Standard</p> <p>Represent</p> <p>PROBLEMS USING AN INPUT-OUTPUT TABLE AND NUMERICAL EXPRESSIONS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of positive numbers that begins at one and 	<p>5.4C</p> <p>Generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph.</p> <p>Readiness Standard</p> <p>Generate</p> <p>A NUMERICAL PATTERN WHEN GIVEN A RULE IN THE FORM $y = ax$ OR $y = x + a$ AND GRAPH</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers <ul style="list-style-type: none"> ◦ Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$ ◦ Whole numbers – the set of counting 	<p>6.4A</p> <p>Compare two rules verbally, numerically, graphically, and symbolically in the form of $y = ax$ or $y = x + a$ in order to differentiate between additive and multiplicative relationships.</p> <p>Supporting Standard</p> <p>Compare</p> <p>TWO RULES VERBALLY, NUMERICALLY, GRAPHICALLY, AND SYMBOLICALLY IN THE FORM OF $y = ax$ OR $y = x + a$ IN ORDER TO DIFFERENTIATE BETWEEN ADDITIVE AND MULTIPLICATIVE RELATIONSHIPS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Rational numbers – the set of numbers that

Grade 4	Grade 5	Grade 6
<p>increases by increments of one each time {1, 2, 3, ..., n}</p> <ul style="list-style-type: none"> ◦ Whole numbers – the set of counting (natural) numbers and zero {0, 1, 2, 3, ..., n} • Addition 	<p>(natural) numbers and zero {0, 1, 2, 3, ..., n}</p> <ul style="list-style-type: none"> • Decimals (less than and greater than one to the tenths, hundredths, and thousandths) ◦ Decimal number – a number in the base-10 place value system used to represent a 	<p>can be expressed as a fraction $\frac{a}{b}$, where a and b are integers and $b \neq 0$, which includes the subsets of integers, whole numbers, and counting (natural) numbers (e.g., -3, 0, 2, $-\frac{1}{2}$, $\frac{11}{7}$, $0.\overline{23}$, etc.). The set of</p>

Grade 4

- Sums of whole numbers
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
- Data sets of whole numbers
 - Sets may or may not begin with 1
 - Sets may or may not be listed in sequential order
- Various representations of problem situations
 - Expression – a mathematical phrase, with no equal sign, that may contain a number(s), an unknown(s), and/or an operator(s)
 - Input-output table – a table which represents how the application of a rule on a value, input, results in a different value, output
 - Relationship between values in a number pattern
 - Additive numerical pattern – a pattern that occurs when a constant non-zero value is added to an input value to determine the output value
 - Multiplicative numerical pattern – a pattern that occurs when a constant non-zero value is multiplied by an input value to determine the output value

Grade 5

- quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Fractions (proper, improper, or mixed numbers with equal or unequal denominators)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division.
 - Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
 - Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a > b$ where b is not equal to zero
 - Mixed number – a number that is composed of a whole number and a fraction
 - Addition
 - Sums of whole numbers
 - Sums of decimals up to the thousandths
 - Sums of fractions with equal and unequal denominators
 - Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to three-digit

Grade 6

- rational numbers is denoted by the symbol \mathbb{Q} .
- Various forms of positive and negative rational numbers
 - Whole numbers
 - Integers
 - Decimals (less than or greater than one)
 - Limited to positive decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Limited to positive fractional values
 - Additive relationship – when a constant non-zero value is added to an input value to determine the output value ($y = x + a$)
 - Multiplicative relationship – when a constant non-zero value is multiplied by an input value to determine the output value ($y = ax$)
 - Independent variable – the variable in an equation or rule which represents the input value
 - Dependent variable – the variable in an equation or rule which represents the output value
 - Various representations of relationships
 - Verbally
 - Numerically
 - Graphically
 - Symbolically
 - Relationships between multiple representations of additive and multiplicative relationships

Note(s):

Grade 4

To Generate

A NUMBER PATTERN THAT FOLLOWS A GIVEN RULE REPRESENTING THE RELATIONSHIP OF THE VALUES IN THE RESULTING SEQUENCE AND THEIR POSITION IN THE SEQUENCE

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Data sets of whole numbers
 - Sets may or may not begin at 1
 - Sets may or may not be listed in sequential order
 - Relationship between values represented by only one operation
 - Addition or subtraction
 - Multiplication or division
 - Products of two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
 - Quotients up to four-digit dividends by one-digit divisors
- Sequence – an ordered list of numbers, usually set apart by commas, such as $\{2, 4, 6, 8, 10, 12, \dots\}$
- Relationship between input-output tables and sequences
 - Input – position in the sequence

Grade 5

factors by two-digit factors

- Products of decimals limited to three-digit factors by two-digit factors with products to the hundredths
 - Multiply tenths by tenths (e.g., $0.3 \times 0.7 = 0.21$, $1.2 \times 1.2 = 1.44$, $14.3 \times 1.3 = 18.59$, etc.)
 - Multiply tenths by hundredths or vice versa (e.g., $0.5 \times 0.12 = 0.06$, $1.4 \times 0.15 = 0.21$, $21.4 \times 0.45 = 9.63$, etc.)
 - Multiply tenths by thousandths or vice versa (e.g., $0.4 \times 0.125 = 0.05$, $0.125 \times 8.4 = 1.05$, etc.)
 - Multiply whole numbers by tenths, hundredths, and thousandths or vice versa (e.g., $3 \times 1.3 = 3.9$, $42 \times 7.45 = 312.9$, $7.02 \times 78 = 547.56$, $6 \times 0.125 = 0.75$, etc.)
- Products of fractions where factors are limited to a fraction and a whole number
- Input-output table – a table which represents how the application of a rule on a value, input, results in a different value, output
- Relationship between input-output tables and numerical patterns
 - Input represented as x
 - Output represented as y
- Numerical patterns from rules
 - Replace the input (x) with a set of numbers to generate an related output (y).
 - Input values must be sequential.
 - List of output values creates numerical pattern
 - Multiplicative rule in the form $y = ax$
 - Additive rule $y = x + a$

Grade 6

- Grade Level(s):
 - Grade 5 generated a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph.
 - Grade 5 recognized the difference between additive and multiplicative numerical patterns given in a table or graph.
 - Grade 7 will represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$.
 - Grade 7 will determine the constant of proportionality ($k = \frac{y}{x}$) within mathematical and real-world problems.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships
- TxCCRS:
 - II. Algebraic Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 4

- Output – value in the sequence
- Relationship between numerical expressions and rules to create a sequences

Note(s):

- Grade Level(s):
 - Grade 3 represented real-world relationships using number pairs in a table and verbal descriptions.
 - Grade 5 will generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph.
 - Grade 5 will recognize the difference between additive and multiplicative numerical patterns given in a table or graph.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - II.D. Algebraic Reasoning – Representations
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 5

Graph

A NUMERICAL PATTERN WHEN GIVEN A RULE IN THE FORM $y = ax$ OR $y = x + a$

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Fractions (proper, improper, or mixed numbers with equal or unequal denominators)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division.
 - Proper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a < b$ where b is not equal to zero
 - Improper fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and $a >$

Grade 6

Grade 4

Grade 5

Grade 6

- b where b is not equal to zero
- Mixed number – a number that is composed of a whole number and a fraction
 - Addition
 - Sums of whole numbers
 - Sums of decimals up to the thousandths
 - Sums of fractions with equal and unequal denominators
 - Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to three-digit factors by two-digit factors
 - Products of decimals limited to three-digit factors by two-digit factors with products to the hundredths
 - Multiply tenths by tenths (e.g., $0.3 \times 0.7 = 0.21$, $1.2 \times 1.2 = 1.44$, $14.3 \times 1.3 = 18.59$, etc.)
 - Multiply tenths by hundredths or vice versa (e.g., $0.5 \times 0.12 = 0.06$, $1.4 \times 0.15 = 0.21$, $21.4 \times 0.45 = 9.63$; etc.)
 - Multiply tenths by thousandths or vice versa (e.g., $0.4 \times 0.125 = 0.05$, $0.125 \times 8.4 = 1.05$, etc.)
 - Multiply whole numbers by tenths, hundredths, and thousandths or vice versa (e.g., $3 \times 1.3 = 3.9$, $42 \times 7.45 = 312.9$, $7.02 \times 78 = 547.56$, $6 \times 0.125 = 0.75$, etc.)
 - Products of fractions where factors are limited to a fraction and a whole number
 - Graphs of numerical patterns
 - Limited to Quadrant I of the coordinate

Grade 4

Grade 5

Grade 6

- plane
- Horizontal axis represents an input (x)
- Vertical axis represents the related output (y)
- Ordered pairs written in the form (x, y) where x represents the input (x -coordinate) and y represents the output (y -coordinate)
- Numerical patterns from the rule $y = ax$ create a graph of points that lie in a straight line and pass through the origin $(0,0)$.
- Numerical patterns from the rule $y = x + a$ create a graph of points that lie in a straight line and do not pass through the origin $(0,0)$.
- Generating a set of ordered pairs from a rule using an input-output table
 - Substitute values of x in the rule as the input to produce a related value of y as the output to create an ordered pair (x,y) , including when $x = 0$.
 - Multiplicative rule in the form $y = ax$
 - Additive rule in the form $y = x + a$
- Process for graphing ordered pairs of numbers in the first quadrant
 - To locate the x -coordinate, begin at the origin and move to the right along the x -axis the appropriate number of units according to the x -coordinate in the ordered pair.
 - To locate the y -coordinate, begin at the origin and move up along the y -axis the appropriate number of units according to the y -coordinate in the ordered pair.
 - The point of intersection of both the parallel movements on the x -axis and the y -axis is the location of the ordered pair.
- Graphing ordered pairs from a numerical rule

Grade 4**Grade 5****Grade 6**

on a coordinate plane

- Multiplicative rule in the form $y = ax$
- Additive rule in the form $y = x + a$

Note(s):

- Grade Level(s):
 - Grade 4 represented problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence.
 - Grade 6 will compare the two rules verbally, numerically, graphically, symbolically in the form $y = ax$ or $y = a + x$ in order to differentiate between additive and multiplicative relationships.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and generating expressions and equations to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - II.D. Algebraic Reasoning – Representations
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

5.4D

Recognize the difference between additive and multiplicative numerical patterns given in a table or

graph.

Supporting Standard

Recognize

THE DIFFERENCE BETWEEN ADDITIVE AND MULTIPLICATIVE NUMERICAL PATTERNS GIVEN IN A TABLE OR GRAPH

Including, but not limited to:

- Whole numbers
 - Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$
 - Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$
- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part
- Fractions (proper, improper, or mixed numbers with equal or unequal denominators)
 - Fraction – a number in the form $\frac{a}{b}$ where a and b are whole numbers and b is not equal to zero. A fraction can be used to name part of an object, part of a set of objects, to compare two quantities, or to represent division.

Grade 4

Grade 5

Grade 6

- Proper fraction – a number in the form $\frac{a}{b}$
where a and b are whole numbers and $a < b$ where b is not equal to zero
- Improper fraction – a number in the form $\frac{a}{b}$
where a and b are whole numbers and $a > b$ where b is not equal to zero
- Mixed number – a number that is composed of a whole number and a fraction
- Addition
 - Sums of whole numbers
 - Sums of decimals up to the thousandths
 - Sums of fractions with equal and unequal denominators
- Multiplication
 - Product – the total when two or more factors are multiplied
 - Factor – a number multiplied by another number to find a product
 - Products of whole numbers up to three-digit factors by two-digit factors
 - Products of decimals limited to three-digit factors by two-digit factors with products to the hundredths
 - Multiply tenths by tenths (e.g., $0.3 \times 0.7 = 0.21$, $1.2 \times 1.2 = 1.44$, $14.3 \times 1.3 = 18.59$, etc.)
 - Multiply tenths by hundredths or vice versa (e.g., $0.5 \times 0.12 = 0.06$, $1.4 \times 0.15 = 0.21$, $21.4 \times 0.45 = 9.63$, etc.)
 - Multiply tenths by thousandths or vice versa (e.g., $0.4 \times 0.125 = 0.05$, $0.125 \times 8.4 = 1.05$, etc.)
 - Multiply whole numbers by tenths, hundredths, and thousandths or vice

Grade 4**Grade 5****Grade 6**

versa (e.g., $3 \times 1.3 = 3.9$, $42 \times 7.45 = 312.9$, $7.02 \times 78 = 547.56$, $6 \times 0.125 = 0.75$, etc.)

- Products of fractions where factors are limited to a fraction and a whole number
- Additive numerical pattern – a pattern that occurs when a constant non-zero value is added to an input value to determine the output value ($y = x + a$)
- Multiplicative numerical pattern – a pattern that occurs when a constant non-zero value is multiplied by an input value to determine the output value ($y = ax$)
- Input-output table – a table which represents how the application of a rule on a value, input, results in a different value, output
- Relationship between input-output tables and tables of numerical patterns
 - x is the input.
 - y is the output.
 - Additive numerical patterns exist in a table when a constant non-zero value is added to each input value to result in a respective output value.
 - Multiplicative numerical patterns exist in a table when a constant non-zero value is multiplied by each input value to result in a respective output value.
- Graphs of numerical patterns
 - Limited to Quadrant I of the coordinate plane
 - Horizontal axis represents an input (x)
 - Vertical axis represents the related output (y)
 - Ordered pairs written in the form (x, y) where x represents the input (x -coordinate)

Grade 4**Grade 5****Grade 6**

and y represents the output (y -coordinate)

- Additive numerical patterns exist in a graph when the points lie in a straight line that does not pass through the origin $(0,0)$.
- Multiplicative numerical patterns exist in a graph when the points lie in a straight line that passes through the origin $(0,0)$.
- Relationship between numerical patterns in tables and graphs
 - An additive numerical pattern exists when each value of x is added to a constant non-zero value of a to result in a set of respective values of y and will result in a set of ordered pairs which, when graphed, lie on a straight line that does not pass through the origin $(0,0)$.
 - A multiplicative numerical pattern exists when each value of x is multiplied by a constant non-zero value of a to result in a set of respective values of y and will result in a set of ordered pairs which, when graphed, lie on a straight line that passes through the origin $(0,0)$.

Note(s):

- Grade Level(s):
 - Grade 4 represented problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence.
 - Grade 6 will compare two rules verbally, numerically, graphically, and symbolically in the form of $y = ax$ or $y = x + a$ in order to

Grade 4	Grade 5	Grade 6
	<p>differentiate between additive and multiplicative relationships.</p> <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding and generating expressions and equations to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ II.D. Algebraic Reasoning – Representations ◦ IX. Communication and Representation 	
		<p>6.6 <i>Expressions, equations, and relationships. The student applies mathematical process standards to use multiple representations to describe algebraic relationships. The student is expected to:</i></p>
		<p>6.6A Identify independent and dependent quantities from tables and graphs.</p> <p><i>Supporting Standard</i></p> <p>Identify</p> <p>INDEPENDENT AND DEPENDENT QUANTITIES FROM TABLES AND GRAPHS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Independent quantities are represented by the x-coordinates or the input.

Grade 4	Grade 5	Grade 6
		<ul style="list-style-type: none"> • Dependent quantities are represented by the y-coordinates or the output. • Identification of independent and dependent quantities <ul style="list-style-type: none"> ◦ Tables (horizontal/vertical) ◦ Graphs <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 6 introduces identifying independent and dependent quantities from tables and graphs. ◦ Grade 7 will represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Using expressions and equations to represent relationships in a variety of context ◦ Understanding data representation • TxCCRS: <ul style="list-style-type: none"> ◦ II. Algebraic Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation
		<p>6.6B</p> <p>Write an equation that represents the relationship between independent and dependent quantities from a table.</p>

Supporting Standard

Write

AN EQUATION THAT REPRESENTS THE RELATIONSHIP BETWEEN INDEPENDENT AND DEPENDENT QUANTITIES FROM A TABLE

Including, but not limited to:

- Rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are integers and $b \neq 0$, which includes the subsets of integers, whole numbers, and counting (natural) numbers (e.g., -3, 0, 2, $-\frac{1}{2}$, $\frac{11}{7}$, $0.\overline{23}$, etc.). The set of rational numbers is denoted by the symbol Q .
- Independent quantities are represented by the x-coordinates or the input.
- Dependent quantities are represented by the y-coordinates or the output.
- Equations from a table of data
 - In the form $y = kx$
 - Coefficient – a number that is multiplied by a variable(s)
 - Whole numbers
 - Integers
 - Products of integers limited to an integer by an integer
 - Decimals (less than or greater than one)
 - Limited to positive decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Limited to positive fractional values

Grade 4**Grade 5****Grade 6**

- In the form $y = x + b$
 - Constant – a fixed value that does not appear with a variable(s)
 - Whole numbers
 - Integers
 - Decimals (less than or greater than one)
 - Positive or negative decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Positive or negative fractional values
 - Equations from a table of related data pairs, where the y value (output) is dependent upon the x value (input)

Note(s)

- Grade Level(s):
 - Grade 6 introduces writing an equation that represents the relationship between independent and dependent quantities from a table.
 - Grade 7 will represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using expressions and equations to represent relationships in a variety of contexts
- TxCCRS:
 - I. Numeric Reasoning
 - II. Algebraic Reasoning
 - VIII. Problem Solving and Reasoning

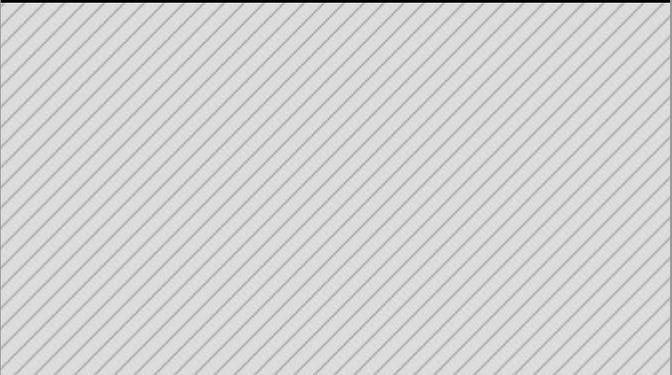
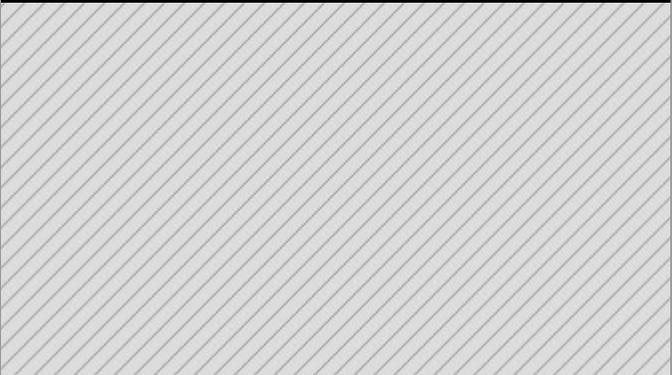
Grade 4	Grade 5	Grade 6
		<ul style="list-style-type: none"> ◦ IX. Communication and Representation
		<p>6.6C</p> <p>Represent a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$.</p> <p><i>Readiness Standard</i></p> <p>Represent</p> <p>A GIVEN SITUATION USING VERBAL DESCRIPTIONS, TABLES, GRAPHS, AND EQUATIONS IN THE FORM $y = kx$ OR $y = x + b$</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Independent quantities are represented by the x-coordinates or the input. • Dependent quantities are represented by the y-coordinates or the output. • Various representations to describe algebraic relationships <ul style="list-style-type: none"> ◦ Verbal descriptions ◦ Tables ◦ Graphs ◦ Equations <ul style="list-style-type: none"> • In the form $y = kx$, where k is the non-zero scale factor (constant of proportionality), from multiplicative problem situations <ul style="list-style-type: none"> ◦ Coefficient – a number that is multiplied by a variable(s) <ul style="list-style-type: none"> • Whole numbers • Integers

Grade 4**Grade 5****Grade 6**

- Products of integers limited to an integer by an integer
- Decimals (less than or greater than one)
 - Limited to positive decimal values
- Fractions (proper, improper, and mixed numbers)
 - Limited to positive fractional values
- In the form $y = x + b$, where b is the constant non-zero addend, from additive problem situations
 - Constant – a fixed value that does not appear with a variable(s)
 - Whole numbers
 - Integers
 - Decimals (less than or greater than one)
 - Positive or negative decimal values
 - Fractions (proper, improper, and mixed numbers)
 - Positive or negative fractional values

Note(s):

- Grade Level(s):
 - Grade 6 introduces representing a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$.
 - Grade 7 will represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$.
 - Various mathematical process standards will be applied to this student expectation as appropriate.

Grade 4	Grade 5	Grade 6		
		<ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Using expressions and equations to represent relationships in a variety of contexts • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ II. Algebraic Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation 		
				
				
				
				
				
				
				
				
				
Connecting Algebra and Geometry				
<p>4.5 <i>Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>	<p>5.4 <i>Algebraic reasoning. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:</i></p>	<p>6.8 <i>Expressions, equations, and relationships. The student applies mathematical process standards to use geometry to represent relationships and solve problems. The student is expected to:</i></p>		
<p>4.5C Use models to determine the formulas for the perimeter</p>	<p>5.4G Use concrete objects and pictorial models to develop</p>	<p>6.8B Model area formulas for parallelograms, trapezoids,</p>		

Grade 4	Grade 5	Grade 6
<p>of a rectangle ($l + w + l + w$ or $2l + 2w$), including the special form for perimeter of a square ($4s$) and the area of a rectangle ($l \times w$).</p> <p>Use</p> <p>MODELS TO DETERMINE THE FORMULAS FOR THE PERIMETER OF A RECTANGLE ($l + w + l + w$ OR $2l + 2w$), INCLUDING THE SPECIAL FORM FOR PERIMETER OF A SQUARE ($4s$) AND THE AREA OF A RECTANGLE ($l \times w$)</p> <p>Including, but not limited to:</p>	<p>the formulas for the volume of a rectangular prism, including the special form for a cube ($V = l \times w \times h$, $V = s \times s \times s$, and $V = Bh$).</p> <p>Use</p> <p>CONCRETE OBJECTS AND PICTORIAL MODELS TO DEVELOP THE FORMULAS FOR THE VOLUME OF A RECTANGULAR PRISM, INCLUDING THE SPECIAL FORM FOR A CUBE ($V = l \times w \times h$, $V = s \times s \times s$, AND $V = Bh$)</p> <p>Including, but not limited to:</p>	<p>and triangles by decomposing and rearranging parts of these shapes.</p> <p><i>Supporting Standard</i></p> <p>Model</p> <p>AREA FORMULAS FOR PARALLELOGRAMS, TRAPEZOIDS, AND TRIANGLES BY DECOMPOSING AND REARRANGING PARTS OF THESE SHAPES</p> <p>Including, but not limited to:</p>

Grade 4

- Perimeter – a linear measurement of the distance around the outer edge of a figure
 - Perimeter is an additive one-dimensional linear measure.
 - Attributes of rectangles and squares to model perimeter
 - Rectangle
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
 - Square (a special type of rectangle)
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
 - Models to determine formulas for perimeter
 - Rectangle ($P = l + w + l + w$ or $P = 2l + 2w$)
 - Square ($P = 4s$)
 - Area – the measurement attribute that describes the number of square units a figure or region covers
 - Area is a multiplicative two-dimensional square unit measure.
 - Attributes of rectangles and squares to model area
 - Rectangle
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides

Grade 5

- Volume – the measurement attribute of the amount of space occupied by matter
 - One way to measure volume is a three-dimensional cubic measure.
 - Attributes of rectangular prisms and cubes to model volume
 - Rectangular prism
 - 6 rectangular faces (2 parallel rectangular faces [bases], 4 rectangular faces)
 - 12 edges
 - 8 vertices
 - Cube (special form of a rectangular prism)
 - 6 square faces (2 parallel square faces [bases], 4 square faces)
 - 12 edges
 - 8 vertices
 - Concrete objects and pictorial models to develop formulas for volume
 - Rectangular prism
 - $V = l \times w \times h$ or $V = Bh$, where B represents the area of the base and h represents the height of the prism
 - Cube
 - $V = s \times s \times s$ or $V = Bh$, where B represents the area of the base and h represents the height of the prism

Note(s):

- Grade Level(s):
 - Grade 4 used models to determine the formulas for the perimeter of a rectangle ($l + w + l + w$ or $2l + 2w$), including the special form for perimeter of a square ($4s$) and the area of a rectangle ($l \times w$).

Grade 6

- Two-dimensional figure – a figure with two basic units of measure, usually length and width
 - Polygon – a closed figure with at least 3 sides, where all sides are straight (no curves)
 - Types of polygons
 - Triangle
 - 3 sides
 - 3 vertices
 - No parallel sides
 - Quadrilateral
 - 4 sides
 - 4 vertices
 - Types of quadrilaterals
 - Trapezoid
 - 4 sides
 - 4 vertices
 - Exactly one pair of parallel sides
 - Up to two possible pairs of perpendicular sides
 - Parallelogram
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - Opposite angles congruent
 - Types of parallelograms
 - Rectangle
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides

Grade 4

- 4 right angles
- Square (a special type of rectangle)
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
- Models to determine formulas for area
 - Rectangle ($A = l \times w$)
 - Square ($A = s \times s$)

Note(s):

- Grade Level(s):
 - Grade 4 introduces use models to determine the formulas for the perimeter of a rectangle ($l + w + l + w$ or $2l + 2w$), including the special form for perimeter of a square ($4s$) and the area of a rectangle ($l \times w$).
 - Grade 5 will use concrete objects and pictorial models to develop the formulas for the volume of a rectangular prism, including the special form for a cube ($V = l \times w \times h$, $V = s \times s \times s$, and $V = Bh$).
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - III.A. Geometric Reasoning – Figures and their properties

Grade 5

- Grade 6 will model area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes.
- Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and generating expressions and equations to solve problems
 - Representing and solving problems with perimeter, area, and volume
- TxCCRS:
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 6

- Square
 - 4 right angles
 - Rhombus
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - Opposite angles congruent
 - Square (a special type of rectangle and a special type of rhombus)
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
- Area – the measurement attribute that describes the number of square units a figure or region covers
 - Area is a two-dimensional square unit measure
 - Formulas for area from STAAR Grade 6 Mathematics Reference Materials
 - Rectangle or parallelogram
 - $A = bh$, where b represents the length of the base of the rectangle or parallelogram and h represents the height of the rectangle or parallelogram
 - A parallelogram can be decomposed and rearranged to form a rectangle.
 - Trapezoid
 - $A = \frac{1}{2}(b_1 + b_2)h$, where b_1 represents the length of one of the parallel bases, b_2 represents the length of the other

Grade 4

- IV.C. Measurement Reasoning – Measurement involving geometry and algebra
- VIII. Problem Solving and Reasoning
- IX. Communication and Representation

Grade 5**Grade 6**

parallel base, and h represents the height

- A parallelogram is always formed from two congruent trapezoids.
- Triangle
 - $A = \frac{1}{2}bh$, where b represents the length of the base of the triangle and h represents the height of the triangle
 - A parallelogram is always formed from two congruent triangles.

Note(s):

- Grade Level(s):
 - Grade 5 used concrete objects and pictorial models to develop the formulas for the volume of a rectangular prism including the special forms for a cube ($V = l \times w \times h$, $V = s \times s \times s$, and $V = Bh$).
 - Grade 7 will model the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights and connect that relationship to the formulas.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using expressions and equations to represent relationships in a variety of contexts
- TxCCRS:
 - III.C. Geometric Reasoning – Connections between geometry and other mathematical content strands
 - IV. Measurement Reasoning

| Grade 4 | Grade 5 | Grade 6 |
|---|---|--|
| | | <ul style="list-style-type: none"> ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation ◦ X. Connections |
| | | |
| <p>4.5D</p> <p>Solve problems related to perimeter and area of rectangles where dimensions are whole numbers.</p> <p><i>Readiness Standard</i></p> <p>Solve</p> <p>PROBLEMS RELATED TO PERIMETER AND AREA OF RECTANGLES WHERE DIMENSIONS ARE WHOLE NUMBERS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Perimeter – a linear measurement of the distance around the outer edge of a figure <ul style="list-style-type: none"> ◦ Perimeter is a one-dimensional linear measure. ◦ Attributes of rectangles and squares to determine perimeter <ul style="list-style-type: none"> • Rectangle | <p>5.4H</p> <p>Represent and solve problems related to perimeter and/or area and related to volume.</p> <p><i>Readiness Standard</i></p> <p>Represent, Solve</p> <p>PROBLEMS RELATED TO PERIMETER AND/OR AREA</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Perimeter – a linear measurement of the distance around the outer edge of a figure <ul style="list-style-type: none"> ◦ Perimeter is a one-dimensional linear measure. ◦ Whole number, decimal, or fractional side lengths • Recognition of perimeter embedded in mathematical and real-world problem | <p>6.8C</p> <p>Write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.</p> <p><i>Supporting Standard</i></p> <p>Write</p> <p>EQUATIONS THAT REPRESENT PROBLEMS RELATED TO THE AREA OF RECTANGLES, PARALLELOGRAMS, TRAPEZOIDS, AND TRIANGLES AND VOLUME OF RIGHT RECTANGULAR PRISMS WHERE DIMENSIONS ARE POSITIVE RATIONAL NUMBERS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction |

Grade 4

- 4 sides
- 4 vertices
- Opposite sides congruent
- 2 pairs of parallel sides
- 2 pairs of perpendicular sides
- 4 right angles
- Square (a special type of rectangle)
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
- Whole number side lengths
- Recognition of perimeter embedded in mathematical and real-world problem situations
- Formulas for perimeter from STAAR Grade 4 Mathematics Reference Materials
 - Square
 - $P = 4s$, where s represents the side length of the square
 - Rectangle
 - $P = l + w + l + w$ or $P = 2l + 2w$, where l represents the length of the rectangle and w represents the width of the rectangle
- Determine perimeter when given side lengths with or without models
- Determine perimeter by measuring to determine side lengths
 - Ruler, STAAR Grade 4 Mathematics Reference Materials ruler, yardstick, meter stick, measuring tape, etc.
- Determine missing side length when given perimeter and remaining side length
- Perimeter of composite figures

Grade 5

- situations
- Formulas for perimeter from STAAR Grade 5 Mathematics Reference Materials
 - Square
 - $P = 4s$, where s represents the side length of the square
 - Rectangle
 - $P = 2l + 2w$, where l represents the length of the rectangle and w represents the width of the rectangle
 - Determine perimeter when given side lengths with and without models
 - Determine perimeter by measuring to determine side lengths
 - Ruler, STAAR Grade 5 Mathematics Reference Materials ruler, yardstick, meter stick, measuring tape, etc.
 - Perimeter of composite figures
 - Area – the measurement attribute that describes the number of square units a figure or region covers
 - Area is a two-dimensional square unit measure.
 - Whole number, decimal, or fractional side lengths
 - Recognition of area embedded in mathematical and real-world problem situations
 - Formulas for area from STAAR Grade 5 Mathematics Reference Materials
 - Square
 - $A = s \times s$, where s represents the side length of the square
 - Rectangle
 - $A = l \times w$, where l represents the length of the rectangle and w represents the width

Grade 6

- $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Equation – a mathematical statement composed of algebraic and/or numeric expressions set equal to each other
 - Two-dimensional figure – a figure with two basic units of measure, usually length and width
 - Polygon – a closed figure with at least 3 sides, where all sides are straight (no curves)
 - Types of polygons
 - Triangle
 - 3 sides
 - 3 vertices
 - No parallel sides
 - Quadrilateral
 - 4 sides
 - 4 vertices
 - Types of quadrilaterals
 - Trapezoid
 - 4 sides
 - 4 vertices
 - Exactly one pair of parallel sides
 - Up to two possible pairs of perpendicular sides
 - Parallelogram
 - 4 sides

Grade 4

- Area – the measurement attribute that describes the number of square units a figure or region covers
 - Area is a two-dimensional square unit measure.
 - Attributes of rectangles and squares to determine area
 - Rectangle
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
 - Square (a special type of rectangle)
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
 - Whole number side lengths
- Recognition of area embedded in mathematical and real-world problem situations
- Formulas for area from STAAR Grade 4 Mathematics Reference Materials
 - Square
 - $A = s \times s$, where s represents the side length of the square
 - Rectangle
 - $A = l \times w$, where l represents the length of the rectangle and w represents the width of the rectangle
- Determine area when given side lengths with and without models
- Determine area by measuring to determine

Grade 5

- of the rectangle
 - $A = bh$, where b represents the base of the rectangle and h represents the height of the rectangle
 - Determine area when given side lengths with and without models
 - Determine area by measuring to determine side lengths
 - Ruler, STAAR Grade 5 Mathematics Reference Materials ruler, yardstick, meter stick, measuring tape, etc.
 - Determine missing side length when given area and remaining side length
 - Area of composite figures
- Represent, Solve
- PROBLEMS RELATED TO VOLUME
- Including, but not limited to:
- Volume – the measurement attribute of the amount of space occupied by matter
 - One way to measure volume is a three-dimensional cubic measure.
 - Whole number, decimal, or fractional side lengths
 - Recognition of volume embedded in mathematical and real-world problem situations
 - Formulas for volume for Grade 5 STAAR Mathematics Reference Materials
 - Rectangular prism
 - $V = l \times w \times h$, where l represents the length of the rectangular prism, w represents the width of the rectangular prism, and h represents the height of the rectangular prism

Grade 6

- 4 vertices
- Opposite sides congruent
- 2 pairs of parallel sides
- Opposite angles congruent
- Types of parallelograms
 - Rectangle
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
 - Rhombus
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - Opposite angles congruent
 - Square (a special type of rectangle and a special type of rhombus)
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
- Area – the measurement attribute that describes the number of square units a figure or region covers
 - Area is a two-dimensional square unit measure
 - Positive rational number side lengths
- Formulas for area from STAAR Grade 6 Mathematics Reference Materials
 - Rectangle or parallelogram

Grade 4

- Determine area by measuring to determine side lengths
 - Ruler, STAAR Grade 4 Mathematics Reference Materials ruler, yardstick, meter stick, measuring tape, etc.
- Determine missing side length when given area and remaining side length
- Area of composite figures
- Multiple ways to decompose a composite figure to determine perimeter and/or area

Note(s):

- Grade Level(s):
 - Grade 4 introduces solving problems related to perimeter and area of rectangles where dimensions are whole numbers.
 - Grade 5 will represent and solve problems related to perimeter and/or area and related to volume.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - III.A. Geometric Reasoning – Figures and their properties
 - IV.A. Measurement Reasoning – Measurement involving physical and natural attributes
 - IV.C. Measurement Reasoning – Measurement involving geometry and algebra

Grade 5

- $V = Bh$, where B represents the area of the base and h represents the height of the rectangular prism, which is the number of times the base area is repeated or layered
 - The base of a rectangular prism is a rectangle whose area may be found with the formula, $A = bh$ or $A = l \times w$, meaning the area of the base, B , may be found with the formula $B = bh$ or $B = l \times w$; therefore, the volume of a rectangular prism may be found using $V = Bh$ or $V = (bh)h$ or $V = l \times w \times h$.
- Cube
 - $V = s \times s \times s$, where s represents the length of one side of the cube
- Determine volume when given side lengths with and without models
- Determine volume by measuring to determine side lengths
 - Ruler, STAAR Grade 5 Mathematics Reference Materials ruler, yardstick, meter stick, measuring tape, etc.
- Determine missing side length when given volume and remaining side lengths
- Volume of composite figures

Note(s):

- Grade Level(s):
 - Grade 4 solved problems related to perimeter and area of rectangles where dimensions are whole numbers,
 - Grade 6 will write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms

Grade 6

- $A = bh$, where b represents the length of the base of the rectangle or parallelogram and h represents the height of the rectangle or parallelogram
- Trapezoid
 - $A = \frac{1}{2}(b_1 + b_2)h$, where b_1 represents the length of one of the parallel bases, b_2 represents the length of the other parallel base, and h represents the height
- Triangle
 - $A = \frac{1}{2}bh$, where b represents the length of the base of the triangle and h represents the height of the triangle
- Three-dimensional figure – a figure that has measurements including length, width (depth), and height
 - Attributes of rectangular prisms and cubes
 - Rectangular prism
 - 6 rectangular faces (2 parallel rectangular faces [bases], 4 rectangular faces)
 - 12 edges
 - 8 vertices
 - Face – a flat surface of a three-dimensional figure
 - Base of a rectangular prism – any two congruent, opposite and parallel faces shaped like rectangles; possibly more than one set
 - Height of a rectangular prism – the length of a side that is perpendicular to both bases
- Volume – the measurement attribute of the amount of space occupied by matter
 - One way to measure volume is a three-

Grade 4

- VIII. Problem Solving and Reasoning
- IX. Communication and Representation

Grade 5

- **Grade 5 will determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.**
- **Grade 6 will determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.**
- **Various mathematical process standards will be applied to this student expectation as appropriate.**
- TxRCFP:
 - Understanding and generating expressions and equations to solve problems
 - Representing and solving problems with perimeter, area, and volume
- TxCCRS:
 - I. Numeric Reasoning
 - III.A. Geometric Reasoning – Figures and their properties
 - III.C. Geometric Reasoning – Connections between geometry and other mathematical content strands
 - IV.C. Measurement Reasoning – Measurement involving geometry and algebra
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 6

- **Grade 6 will determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.**
- **Grade 6 will determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.**
- **Various mathematical process standards will be applied to this student expectation as appropriate.**
- **dimensional cubic measure**
- **Positive rational number side lengths**
- **Formulas for volume from STAAR Grade 6 Mathematics Reference Materials**
- **Rectangular prism**
 - **$V = Bh$, where B represents the base area and h represents the height of the prism which is the number of times the base area is repeated or layered**
 - **The base of a rectangular prism is a rectangle whose area may be found with the formula, $A = bh$ or $A = lw$, meaning the base area, B , may be found with the formula $B = bh$ or $B = lw$; therefore, the volume of a rectangular prism may be found using $V = Bh$ or $V = (bh)h$ or $V = (lw)h$.**

Note(s):

- **Grade Level(s):**
 - **Grade 5 represented and solved problems related perimeter and/or area and related to volume.**
 - **Various mathematical process standards will be applied to this student expectation as appropriate.**
- **TxRCFP:**
 - **Using expressions and equations to represent relationships in a variety of contexts**
- **TxCCRS:**
 - **III.C. Geometric Reasoning – Connections between geometry and other mathematical content strands**
 - **IV. Measurement Reasoning**

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|---|
| | | <ul style="list-style-type: none"> ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation ◦ X. Connections |
| | | <p>6.8D</p> <p>Determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.</p> <p><i>Readiness Standard</i></p> <p>Determine</p> <p>SOLUTIONS FOR PROBLEMS INVOLVING THE AREA OF RECTANGLES, PARALLELOGRAMS, TRAPEZOIDS, AND TRIANGLES AND VOLUME OF RIGHT RECTANGULAR PRISMS WHERE DIMENSIONS ARE POSITIVE RATIONAL NUMBERS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.). • Various forms of positive rational numbers <ul style="list-style-type: none"> ◦ Whole numbers ◦ Decimals (less than or greater than one) |

Grade 4**Grade 5****Grade 6**

- Fractions (proper, improper, and mixed numbers)
- Two-dimensional figure – a figure with two basic units of measure, usually length and width
- Polygon – a closed figure with at least 3 sides, where all sides are straight (no curves)
- Types of polygons
 - Triangle
 - 3 sides
 - 3 vertices
 - No parallel sides
 - Quadrilateral
 - 4 sides
 - 4 vertices
 - Types of quadrilaterals
 - Trapezoid
 - 4 sides
 - 4 vertices
 - Exactly one pair of parallel sides
 - Up to two possible pairs of perpendicular sides
 - Parallelogram
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - Opposite angles congruent
 - Types of parallelograms
 - Rectangle
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides

Grade 4

Grade 5

Grade 6

- 4 right angles
- Rhombus
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - Opposite angles congruent
- Square (a special type of rectangle and a special type of rhombus)
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
- Area – the measurement attribute that describes the number of square units a figure or region covers
 - Area is a two-dimensional square unit measure
 - Positive rational number side lengths
- Formulas for area from STAAR Grade 6 Mathematics Reference Materials
 - Rectangle or parallelogram
 - $A = bh$, where b represents the length of the base of the rectangle or parallelogram and h represents the height of the rectangle or parallelogram
 - Trapezoid
 - $A = \frac{1}{2}(b_1 + b_2)h$, where b_1 represents the length of one of the parallel bases, b_2 represents the length of the other parallel base, and h represents the height of the trapezoid

Grade 4

Grade 5

Grade 6

- Triangle
 - $A = \frac{1}{2}bh$, where b represents the length of the base of the triangle and h represents the height of the triangle
- Three-dimensional figure – a figure that has measurements including length, width (depth), and height
 - Attributes of rectangular prisms and cubes
 - Rectangular prism
 - 6 rectangular faces (2 parallel rectangular faces [bases], 4 rectangular faces)
 - 12 edges
 - 8 vertices
 - Face – a flat surface of a three-dimensional figure
 - Base of a rectangular prism –any two congruent, opposite and parallel faces shaped like rectangles; possibly more than one set
 - Height of a rectangular prism – the length of a side that is perpendicular to both bases
- Volume – the measurement attribute of the amount of space occupied by matter
 - One way to measure volume is a three-dimensional cubic measure
 - Positive rational number side lengths
- Formulas for volume from STAAR Grade 6 Mathematics Reference Materials
 - Rectangular prism
 - $V = Bh$, where B represents the base area and h represents the height of the prism which is the number of times the base area is repeated or layered

Grade 4**Grade 5****Grade 6**

- The base of a rectangular prism is a rectangle whose area may be found with the formula, $A = bh$ or $A = lw$, meaning the base area, B , may be found with the formula $B = bh$ or $B = lw$; therefore, the volume of a rectangular prism may be found using $V = Bh$ or $V = (bh)h$ or $V = (lw)h$.

Note(s):

- Grade Level(s):
 - Grade 5 represented and solved problems related to perimeter and/or area and related to volume.
 - Grade 7 will solve problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids.
 - Grade 7 will determine the circumference and area of circles.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Using expressions and equations to represent relationships in a variety of contexts
- TxCCRS:
 - I. Numeric Reasoning
 - III.C. Geometric Reasoning – Connections between geometry and other mathematical content strands
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation
 - X. Connections

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|--|
| | | |
| | | <p>6.8
 <i>Expressions, equations, and relationships. The student applies mathematical process standards to use geometry to represent relationships and solve problems. The student is expected to:</i></p> |
| | | <p>6.8A
 Extend previous knowledge of triangles and their properties to include the sum of angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle.</p> <p><i>Supporting Standard</i></p> <p>Extend</p> <p>PREVIOUS KNOWLEDGE OF TRIANGLES AND THEIR PROPERTIES TO INCLUDE THE SUM OF ANGLES OF A TRIANGLE, THE RELATIONSHIP BETWEEN THE LENGTHS OF SIDES AND MEASURES OF ANGLES IN A TRIANGLE, AND DETERMINING WHEN THREE LENGTHS FORM A TRIANGLE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Angle – two rays with a common endpoint (the vertex) <ul style="list-style-type: none"> ◦ Various angle types/names <ul style="list-style-type: none"> • Acute – an angle that measures less than 90° |

Grade 4**Grade 5****Grade 6**

- Right – an angle (formed by perpendicular lines) that measures exactly 90°
 - Notation is given as a box in the angle corner to represent a 90° angle.
- Obtuse – an angle that measures greater than 90° but less than 180°
- Congruent – of equal measure, having exactly the same size and same shape
 - Angle congruency marks – angle marks indicating angles of the same measure
 - Side congruency marks – side marks indicating side lengths of the same measure
- Triangle – a polygon with three sides and three vertices
 - 3 sides
 - 3 vertices
 - Classification by angles
 - Acute triangle
 - 3 sides
 - 3 vertices
 - 3 acute angles (less than 90°)
 - Right triangle
 - 3 sides
 - 3 vertices
 - 2 acute angles (less than 90°)
 - 1 right angle (exactly 90°)
 - Obtuse triangle
 - 3 sides
 - 3 vertices
 - 2 acute angles (less than 90°)
 - 1 obtuse angle (greater than 90° but less than 180°)
 - Classification by length of sides
 - Scalene triangle
 - 3 sides

Grade 4**Grade 5****Grade 6**

- 3 vertices
- No congruent sides
- No parallel sides
- Up to one possible pair of perpendicular sides
 - Right triangle with two sides that are perpendicular to form a right angle and three different side lengths
- No congruent angles
 - Right triangle with one 90° angle and two other angles each of different measures
- Isosceles triangle
 - 3 sides
 - 3 vertices
 - At least 2 congruent sides
 - No parallel sides
 - Up to one possible pair of perpendicular sides
 - Right triangle with two sides that are perpendicular to form a right angle and are each of the same length
 - At least 2 congruent angles
 - Right triangle with one 90° angle and two other angles each of the same measure
 - Obtuse triangle with two angles of the same measure and one angle greater than 90°
 - Acute triangle with all angles measuring less than 90° and at least two of the angles of the same measure
- Equilateral triangle
 - 3 sides
 - 3 vertices

Grade 4**Grade 5****Grade 6**

- All sides congruent
- No parallel or perpendicular sides
- All angles congruent
 - Acute triangle with all angles measuring 60°
- Sum of the interior angles of a triangle is 180 degrees
- Relationship between lengths of sides and measure of angles in a triangle
 - The shortest side length in a triangle is always opposite the smallest angle measure in a triangle.
 - The longest side length in a triangle is always opposite the largest angle measure in a triangle.
 - The sides opposite from angles of equal measure in a triangle are always congruent.
- Triangle Inequality Theorem
 - The sum of the lengths of any two sides in a triangle must be greater than the length of the third side.

Note(s):

- Grade Level(s):
 - Grade 6 introduces extending previous knowledge of triangles and their properties to include the sum of angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle.
 - Grade 7 will write and solve equations using geometry concepts, including the sum of the angles in a triangle, and angle relationships.
 - Various mathematical process standards

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|---|
| | | <p>will be applied to this student expectation as appropriate.</p> <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Grade Level Connections (reinforces previous learning and/or provides development for future learning) • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ III.C. Geometric Reasoning – Connections between geometry and other mathematical content strands ◦ IV. Measurement Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation ◦ X. Connections |
| | | <p>Developing Concepts Related to Proportionality</p> |
| | | <p>6.4
 <i>Proportionality. The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations. The student is expected to:</i></p> |
| | | <p>6.4B
 Apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates.</p> <p>Readiness Standard</p> <p>Apply</p> <p>QUALITATIVE AND QUANTITATIVE REASONING</p> |

TO SOLVE PREDICTION AND COMPARISON OF REAL-WORLD PROBLEMS INVOLVING RATIOS AND RATES

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents (less than or greater than 100%)
 - Percent – a part of a whole expressed in hundredths
- Qualitative – a broad subjective description (e.g., The speed of car A is slower than the speed of car B.)
 - Qualitative reasoning to compare and predict
 - Ratio – a multiplicative comparison of two quantities
 - Comparing ratios (e.g., color is brighter, taste is sweeter, pace is slower, etc.)
 - Predictions from ratios
 - Qualitative reasoning to compare and predict in real-world problem situations involving rates
 - Rate – a multiplicative comparison of two different quantities where the measuring

Grade 4**Grade 5****Grade 6**

unit is different for each quantity

- Comparing rates (e.g., decreases faster, more per pound, etc.)
- Predictions from rates
- Quantitative – a narrowed objective description associated with a quantity (e.g., The ratio of blue cars to red cars is 6:3; therefore, there are twice as many blue cars as red cars.)
 - Quantitative reasoning to compare and predict in real-world problem situations involving ratios
 - Comparing ratios (e.g., twice as much, half as sweet)
 - Predictions from ratios
 - Comparing rates (e.g., decreases half as fast, three times more per pound, etc.)
 - Predictions from rates

Note(s):

- Grade Level(s):
 - Grade 6 introduces applying qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

- X. Connections

6.4C

Give examples of ratios as multiplicative comparisons of two quantities describing the same attribute.

Supporting Standard

Give

EXAMPLES OF RATIOS AS MULTIPLICATIVE
COMPARISONS OF TWO QUANTITIES
DESCRIBING THE SAME ATTRIBUTE

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents (less than or greater than 100%)
 - Percent – a part of a whole expressed in hundredths
- Multiplicative comparison of two quantities – a proportional comparison in which one quantity can be described as a multiple of the other

Grade 4**Grade 5****Grade 6**

- Ratio – a multiplicative comparison of two quantities
 - Symbolic representations of ratios
 - a to b , $a:b$, or $\frac{a}{b}$
 - Verbal representations of ratios
 - 12 to 3, 12 per 3, 12 parts to 3 parts, 12 for every 3, 12 out of every 3
 - Units may or may not be included (e.g., 12 boys to 3 girls, 12 to 3, etc.).
- Quantities describing the same attribute
- Proportional representations of multiplicative comparisons
 - Strip diagram – a linear model used to illustrate number relationships
 - Ratio table
 - Double number lines

Note(s):

- Grade Level(s):
 - Grade 6 introduces giving examples of ratios as multiplicative comparisons of two quantities describing the same attribute.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

6.4D

Give examples of rates as the comparison by division of two quantities having different attributes, including rates as quotients.

Supporting Standard

Give

EXAMPLES OF RATES AS THE COMPARISON BY DIVISION OF TWO QUANTITIES HAVING DIFFERENT ATTRIBUTES, INCLUDING RATES AS QUOTIENTS

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents (less than or greater than 100%)
 - Percent – a part of a whole expressed in hundredths
- Comparison by division of two quantities – a proportional comparison in which one quantity can be described as a ratio of the other
- Ratio – a multiplicative comparison of two

Grade 4

Grade 5

Grade 6

quantities

- Symbolic representations of ratios
 - a to b , $a:b$, or $\frac{a}{b}$
- Verbal representations of ratios
 - 12 to 3, 12 per 3, 12 parts to 3 parts, 12 for every 3, 12 out of every 3
 - Units may or may not be included (e.g., 12 boys to 3 girls, 12 to 3, etc.).
- Rate – a multiplicative comparison of two different quantities where the measuring unit is different for each quantity
- Relationship between ratios and rates
 - All ratios have associated rates
- Quantities describing different attributes
- Proportional representations of comparisons by division
 - Ratio table
 - Double number lines
- Rates as quotients

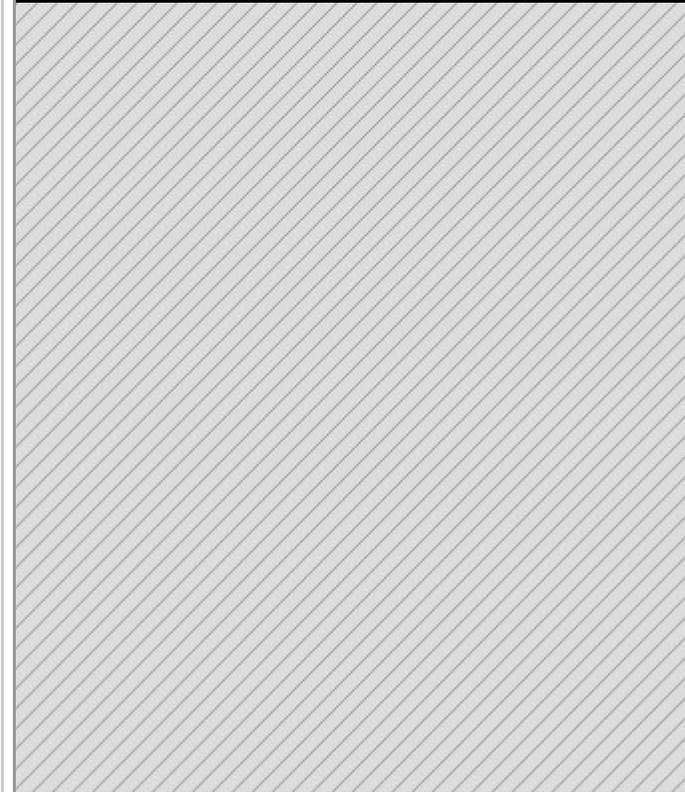
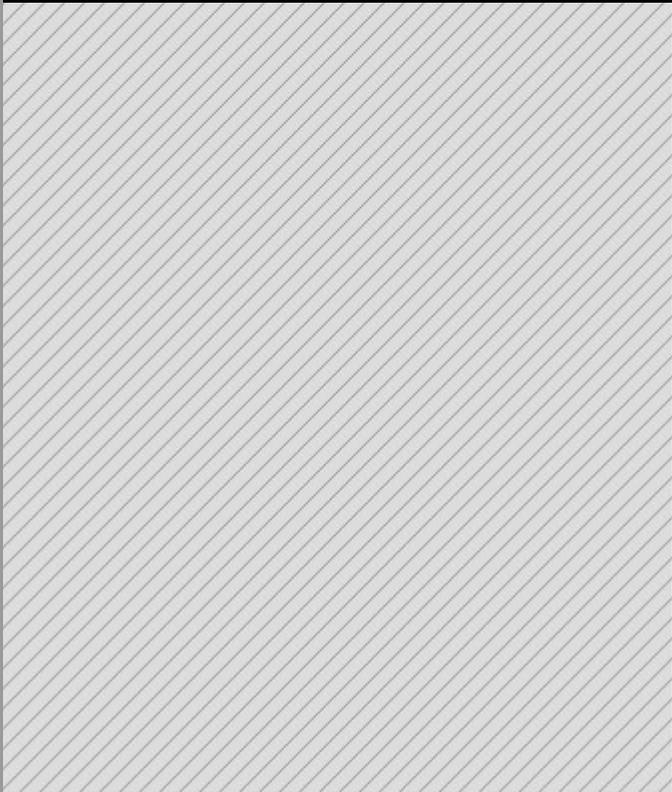
Note(s):

- Grade Level(s):
 - Grade 6 introduces giving examples of rates as the comparison by division of two quantities having different attributes, including rates as quotients.
 - Grade 7 will represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|---|
| | | <ul style="list-style-type: none"> ◦ Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation |
| | | <p>6.4E</p> <p>Represent ratios and percents with concrete models, fractions, and decimals.</p> <p><i>Supporting Standard</i></p> <p>Represent</p> <p>RATIOS AND PERCENTS WITH CONCRETE MODELS, FRACTIONS, AND DECIMALS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.). • Various forms of positive rational numbers <ul style="list-style-type: none"> ◦ Whole numbers ◦ Decimals (less than or greater than one) ◦ Fractions (proper, improper, and mixed numbers) |

Grade 4**Grade 5****Grade 6**

- Percents (less than or greater than 100%)
 - Percent – a part of a whole expressed in hundredths
- Ratio – a multiplicative comparison of two quantities
 - Symbolic representations of ratios
 - a to b , $a:b$, or $\frac{a}{b}$
 - Verbal representations of ratios
 - 12 to 3, 12 per 3, 12 parts to 3 parts, 12 for every 3, 12 out of every 3
 - Units may or may not be included (e.g., 12 boys to 3 girls, 12 to 3, etc.)
 - Concrete and pictorial models of ratios
 - Objects
 - Fraction circle
 - Strip diagram – a linear model used to illustrate number relationships
 - 10 by 10 grid
 - Number line
 - Numeric representation of ratios
 - Fraction notation
 - Decimal notation
- Percent
 - Numeric forms
 - Concrete and pictorial models of percents
 - Objects
 - Fraction circle
 - Strip diagram – a linear model used to illustrate number relationships
 - 10 by 10 grid
 - Number line
 - Numeric representation of percents
 - Fraction notation
 - Decimal notation

| Grade 4 | Grade 5 | Grade 6 |
|--|--|--|
|  |  | <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 6 introduces representing ratios and percents with concrete models, fractions, and decimals. ◦ Grade 7 will solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections |
| | | <p>6.4F</p> <p>Represent benchmark fractions and percents such as 1%, 10%, 25%, 33 1/3%, and multiples of these values using 10 by 10 grids, strip diagrams, number lines, and numbers.</p> <p><i>Supporting Standard</i></p> <p>Represent</p> <p>BENCHMARK FRACTIONS AND PERCENTS SUCH AS 1%, 10%, 25%, 33$\frac{1}{3}$%, AND MULTIPLES</p> |

Grade 4

Grade 5

Grade 6

OF THESE VALUES USING 10 BY 10 GRIDS, STRIP DIAGRAMS, NUMBER LINES, AND NUMBERS

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents (less than or greater than 100%)
 - Percent – a part of a whole expressed in hundredths
- Benchmark fractions ($\frac{1}{100}$, $\frac{1}{10}$, $\frac{1}{4}$, and $\frac{1}{3}$)
 - Multiples of benchmark fractions
 - $\frac{1}{100}$, $\frac{1}{100}$, $\frac{1}{50}$, $\frac{3}{100}$, $\frac{1}{25}$, $\frac{1}{20}$, ..., etc.
 - $\frac{1}{10}$, $\frac{1}{10}$, $\frac{1}{5}$, $\frac{3}{10}$, $\frac{2}{5}$, $\frac{1}{2}$, ..., etc.
 - $\frac{1}{4}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 , $\frac{5}{4}$, ..., etc.
 - $\frac{1}{3}$, $\frac{1}{3}$, $\frac{2}{3}$, 1 , $\frac{4}{3}$, $\frac{5}{3}$, ..., etc.
- Benchmark percents (1%, 10%, 25%, $33\frac{1}{3}\%$)
 - Multiples of benchmark percents
 - 1%: 1%, 2%, 3%, 4%, 5%, ..., etc.
 - 10%: 10%, 20%, 30%, 40%, 50%, ..., etc.

Grade 4

Grade 5

Grade 6

etc.

- 25%: 25%, 50%, 75%, 100%, 125%, ..., etc.

- $33\frac{1}{3}\%$: $33\frac{1}{3}\%$, $66\frac{2}{3}\%$, 100%, $133\frac{1}{3}\%$, $166\frac{2}{3}\%$, ..., etc.

- Various representations of benchmark fractions and percents and their multiples
 - 10 by 10 grid
 - Strip diagram – a linear model used to illustrate number relationships
 - Number line
 - Numerically

Note(s):

- Grade Level(s):
 - Grade 6 introduces representing benchmark fractions and percents such as 1%, 10%, 25%, $33\frac{1}{3}\%$, and multiples of these values using 10 by 10 grids, strip diagrams, number lines, and numbers.
 - Grade 7 will solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships
- TxCCRS:

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|--|
| | | <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation |
| | | <p>6.4G</p> <p>Generate equivalent forms of fractions, decimals, and percents using real-world problems, including problems that involve money.</p> <p><i>Readiness Standard</i></p> <p>Generate</p> <p>EQUIVALENT FORMS OF FRACTIONS, DECIMALS, AND PERCENTS USING REAL-WORLD PROBLEMS, INCLUDING PROBLEMS THAT INVOLVE MONEY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.). • Various forms of positive rational numbers <ul style="list-style-type: none"> ◦ Whole numbers ◦ Decimals (less than or greater than one) ◦ Fractions (proper, improper, and mixed numbers) ◦ Percents (less than or greater than 100%) <ul style="list-style-type: none"> • Percent – a part of a whole expressed in hundredths • Equivalent forms of positive rational numbers |

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|--|
| | | <p>in real-world problem situations</p> <ul style="list-style-type: none"> ◦ Given a fraction, generate a decimal and percent ◦ Given a decimal, generate a fraction and percent ◦ Given a percent, generate a fraction and decimal <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 6 introduces generating equivalent forms of fractions, decimals, and percents using real-world problems, including problems that involve money. ◦ Grade 7 will solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation ◦ X. Connections |
| | | <p>6.4H</p> <p>Convert units within a measurement system, including the use of proportions and unit rates.</p> |

Readiness Standard

Convert

UNITS WITHIN A MEASUREMENT SYSTEM,
INCLUDING THE USE OF PROPORTIONS AND
UNIT RATES

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
- Unit conversions within systems
 - Customary
 - Metric
- Unit rate – a ratio between two different units where one of the terms is 1
- Multiple solution strategies
 - Dimensional analysis using unit rates
 - Scale factor between ratios
 - Proportion method
 - Conversion graph

Note(s):

- Grade Level(s):

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|---|
| | | <ul style="list-style-type: none"> ◦ Grade 6 introduces converting units within a measurement system, including the use of proportions and unit rates. ◦ Grade 7 will convert between measurement systems, including the use of proportions and the use of unit rates. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IV. Measurement Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation |
| | | <p>6.5
 <i>Proportionality. The student applies mathematical process standards to solve problems involving proportional relationships. The student is expected to:</i></p> |
| | | <p>6.5A
 Represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions.</p> <p><i>Supporting Standard</i></p> <p>Represent</p> |

MATHEMATICAL AND REAL-WORLD PROBLEMS INVOLVING RATIOS AND RATES USING SCALE FACTORS, TABLES, GRAPHS, AND PROPORTIONS

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
- Ratio – a multiplicative comparison of two quantities
 - Symbolic representations of ratios
 - a to b , $a:b$, or $\frac{a}{b}$
 - Verbal representations of ratios
 - 12 to 3, 12 per 3, 12 parts to 3 parts, 12 for every 3, 12 out of every 3
 - Units may or may not be included (e.g., 12 boys to 3 girls, 12 to 3, etc.)
- Scale factor – the common multiplicative ratio between pairs of related data which may be represented as a unit rate
- Various representations of scale factor involving ratios in mathematical and real-world problem situations
 - Tables

Grade 4**Grade 5****Grade 6**

- Graphs
- Proportions
- Rate – a multiplicative comparison of two different quantities where the measuring unit is different for each quantity
- Various representations of scale factor involving rates in mathematical and real-world problem situations
 - Tables
 - Graphs
 - Proportions

Note(s):

- Grade Level(s)
 - Grade 6 introduces representing mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions.
 - Grade 7 will represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d = rt$.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships
- TxCCRS:
 - I. Numeric Reasoning
 - II. Algebraic Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation
 - X. Connections

6.5B

Solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models.

Readiness Standard

Solve

REAL-WORLD PROBLEMS TO FIND THE WHOLE GIVEN A PART AND THE PERCENT, TO FIND THE PART GIVEN THE WHOLE AND THE PERCENT, AND TO FIND THE PERCENT GIVEN THE PART AND THE WHOLE, INCLUDING THE USE OF CONCRETE AND PICTORIAL MODELS

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents (less than or greater than 100%)

Grade 4**Grade 5****Grade 6**

- Percent – a part of a whole expressed in hundredths
- Relationship between part, whole, and percent
- $\frac{\text{part}}{\text{whole}} = \frac{\text{percent}}{100}$
- Multiple methods for solving real-world problem situations involving percent
 - Concrete and pictorial models (e.g., objects, area model, strip diagram, 10 by 10 grid, number line, etc.)
 - Proportion method
 - Scale factor between ratios
- Various types of real-world problem situations involving percent
 - Finding the whole given a part and a percent
 - Finding the part given the whole and a percent
 - Finding the percent given the part and the whole

Note(s):

- Grade Level(s):
 - Grade 6 introduces solving real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models.
 - Grade 7 will solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems.
 - Various mathematical process standards

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|--|
| | | <p>will be applied to this student expectation as appropriate.</p> <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation ◦ X. Connections |
| | | <p>6.5C</p> <p>Use equivalent fractions, decimals, and percents to show equal parts of the same whole.</p> <p><i>Supporting Standard</i></p> <p>Use</p> <p>EQUIVALENT FRACTIONS, DECIMALS, AND PERCENTS TO SHOW EQUAL PARTS OF THE SAME WHOLE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.). • Various forms of positive rational numbers <ul style="list-style-type: none"> ◦ Whole numbers |

Grade 4**Grade 5****Grade 6**

- Decimals (less than or greater than one)
- Fractions (proper, improper, and mixed numbers)
- Percents (less than or greater than 100%)
 - Percent – a part of a whole expressed in hundredths
- Various representations to show equal parts of the same whole
 - 10 by 10 grid
 - Strip diagram – a linear model used to illustrate number relationships
 - Number line

Note(s):

- Grade Level(s):
 - Grade 6 introduces using equivalent fractions, decimals, and percents to show equal parts of the same whole.
 - Grade 7 will solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and applying ratios and rates and using equivalent ratios to represent proportional relationships
- TxCCRS:
 - I. Numeric Reasoning
 - IX. Communication and Representation

| Grade 4 | Grade 5 | Grade 6 |
|--|---------|---------|
| | | |
| Defining Attributes of One-Dimensional, Two-Dimensional, and Three-Dimensional Figures | | |
| <p>4.6
 <i>Geometry and measurement. The student applies mathematical process standards to analyze geometric attributes in order to develop generalizations about their properties. The student is expected to:</i></p> | | |
| <p>4.6A
 Identify points, lines, line segments, rays, angles, and perpendicular and parallel lines.</p> <p><i>Supporting Standard</i></p> <p>Identify</p> | | |

Grade 4**POINTS, LINES, LINE SEGMENTS, RAYS,
ANGLES, AND PERPENDICULAR AND PARALLEL
LINES**

Including, but not limited to:

- Point – a specific location in space
 - Has no dimension and is usually represented by a small dot
- Line – a set of points that form a straight path that goes in opposite directions without ending
 - Line labels
 - Lines named according to two points on a line
 - Lines named by one lower case cursive or print letter
 - Parallel lines – lines that lie in the same plane, never intersect, and are always the same distance apart
 - Various orientations including vertical, horizontal, diagonal, and parallel lines of even, uneven, or off-set lengths
 - Intersecting lines – lines that meet or cross at a point
 - Various orientations including vertical, horizontal, diagonal, and intersecting lines of even, uneven, or off-set lengths
 - Perpendicular lines – lines that intersect at right angles to each other to form square corners
 - Various orientations including vertical, horizontal, diagonal, and perpendicular lines of even, uneven, or off-set lengths
 - Notation is given as a box in the angle corner to represent a 90° angle.

Grade 5**Grade 6**

Grade 4

- Lines in pictorial models and polygons
- Extending lines beyond pictorial models
- Line segment – part of a line between two points on the line, called endpoints of the segment
- Ray – part of a line that has one endpoint and continues without end in one direction
 - Relationships between line segments, rays, and lines
- Degree – the measure of an angle where each degree represents $\frac{1}{360}$ of a circle
 - Unit measure labels as “degrees” or with symbol for degrees ($^{\circ}$)
- Angle – two rays with a common endpoint (the vertex)
 - Angle labels
 - Angle with one letter
 - Angle with three letters, where the middle letter is the vertex of the angle
 - Angle with a number
 - Angle symbol with one letter
 - Angle symbol with three letters, where the middle letter is the vertex of the angle
 - Angle symbol with a number
 - Various angle types/names
 - Acute – an angle that measures less than 90°
 - Right – an angle (formed by perpendicular lines) that measures exactly 90°
 - Notation is given as a box in the angle corner to represent a 90° angle.
 - Obtuse – an angle that measures greater than 90° but less than 180°
 - Straight – an angle that measures 180° (a straight line)

Grade 5**Grade 6**

| Grade 4 | Grade 5 | Grade 6 |
|---|---------|---------|
| <ul style="list-style-type: none"> ◦ Angles in pictorial models and polygons <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 3 used attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and drew examples of quadrilaterals that do not belong to any of these subcategories. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Measuring angles ◦ Grade Level Connections (reinforces previous learning and/or provides development for future learning) • TxCCRS: <ul style="list-style-type: none"> ◦ III.A. Geometric Reasoning – Figures and their properties ◦ IX. Communication and Representation | | |
| <p>4.6B</p> <p>Identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure.</p> <p><i>Supporting Standard</i></p> <p>Identify, Draw</p> <p>ONE OR MORE LINES OF SYMMETRY, IF THEY EXIST, FOR A TWO-DIMENSIONAL FIGURE</p> | | |

Grade 4

Including, but not limited to:

- Line of symmetry – line dividing an image into two congruent parts that are mirror images of each other
- Two-dimensional figure – a figure with two basic units of measure, usually length and width
- Two-dimensional figures and real-world figures
- Shapes with more than one line of symmetry
- Shapes with no lines of symmetry
- Shapes on which lines of symmetry have not been drawn
- Across a vertical line, across a horizontal line, or across a diagonal line of symmetry
- A line of reflection exists for a figure if for every point on one side of the line of reflection, there is a corresponding point the same distance from the line.

Note(s):

- Grade Level(s):
 - Grade 3 used attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and drew examples of quadrilaterals that do not belong to any of these subcategories.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Grade Level Connections (reinforces previous learning and/or provides development for future learning)
- TxCCRS:

Grade 5**Grade 6**

| Grade 4 | Grade 5 | Grade 6 |
|--|---------|---------|
| <ul style="list-style-type: none"> IX. Communication and Representation | | |
| <p>4.6C</p> <p>Apply knowledge of right angles to identify acute, right, and obtuse triangles.</p> <p><i>Supporting Standard</i></p> <p>Apply</p> <p>KNOWLEDGE OF RIGHT ANGLES TO IDENTIFY ACUTE, RIGHT, AND OBTUSE TRIANGLES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> Angle – two rays with a common endpoint (the vertex) <ul style="list-style-type: none"> Various angle types/names <ul style="list-style-type: none"> Acute – an angle that measures less than 90° Right – an angle (formed by perpendicular lines) that measures exactly 90° <ul style="list-style-type: none"> Notation is given as a box in the angle corner to represent a 90° angle. Obtuse – an angle that measures greater than 90° but less than 180° Triangle – a polygon with three sides and three vertices <ul style="list-style-type: none"> Acute triangle – a triangle in which each of the three angles is acute (less than 90 degrees) Right triangle – a triangle with one right angle (exactly 90 degrees) and two acute angles Obtuse triangle – a triangle that has one | | |

| Grade 4 | Grade 5 | Grade 6 |
|--|---------|---------|
| <p>obtuse angle (greater than 90 degrees) and two acute angles</p> <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 3 used attributes to recognize rhombuses, parallelograms, trapezoids, rectangles, and squares as examples of quadrilaterals and drew examples of quadrilaterals that do not belong to any of these subcategories. ◦ Grade 4 introduces formal and symbolic geometric language for lines, line segments, rays, and angles. ◦ Grade 5 will classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Measuring angles • TxCCRS: <ul style="list-style-type: none"> ◦ III.A. Geometric Reasoning – Figures and their properties ◦ IX. Communication and Representation | | |
| | | |
| Classifying and Sorting Two-Dimensional and Three-Dimensional Figures | | |
| 4.6 | 5.5 | |

| Grade 4 | Grade 5 | Grade 6 |
|--|---|---------|
| <p><i>Geometry and measurement. The student applies mathematical process standards to analyze geometric attributes in order to develop generalizations about their properties. The student is expected to:</i></p> | <p><i>Geometry and measurement. The student applies mathematical process standards to classify two-dimensional figures by attributes and properties. The student is expected to</i></p> | |
| <p>4.6D</p> <p>Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size.</p> <p>Readiness Standard</p> <p>Classify</p> <p>TWO-DIMENSIONAL FIGURES BASED ON THE PRESENCE OR ABSENCE OF PARALLEL OR PERPENDICULAR LINES OR THE PRESENCE OR ABSENCE OF ANGLES OF A SPECIFIED SIZE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Two-dimensional figure – a figure with two basic units of measure, usually length and width • Classify – applying an attribute to categorize a sorted group • Angle – two rays with a common endpoint (the vertex) <ul style="list-style-type: none"> ◦ Various angle types/names <ul style="list-style-type: none"> • Acute – an angle that measures less than 90° • Right – an angle (formed by perpendicular lines) that measures exactly 90° <ul style="list-style-type: none"> ◦ Notation is given as a box in the angle | <p>5.5A</p> <p>Classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.</p> <p>Readiness Standard</p> <p>Classify</p> <p>TWO-DIMENSIONAL FIGURES IN A HIERARCHY OF SETS AND SUBSETS USING GRAPHIC ORGANIZERS BASED ON THEIR ATTRIBUTES AND PROPERTIES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Two-dimensional figure – a figure with two basic units of measure, usually length and width • Classify – applying an attribute to categorize a sorted group • Attributes of two-dimensional figures – characteristics that define a geometric figure (e.g., sides, vertices, etc.) • Properties of two-dimensional figures – relationship of attributes within a geometric figure (e.g., a square has 4 congruent sides and 4 right angles, etc.) and between a group of geometric figures (e.g., a square and a rectangle both have 4 sides and 4 right | |

Grade 4

corner to represent a 90° angle.

- Obtuse – an angle that measures greater than 90° but less than 180°
- Line – a set of points that form a straight path that goes in opposite directions without ending
 - Parallel lines – lines that lie in the same plane, never intersect, and are always the same distance apart
 - Perpendicular lines – lines that intersect at right angles to each other to form square corners
- Sides of two-dimensional figures are composed of line segments, the part of a line between two points on the line
- Congruent – of equal measure, having exactly the same size and same shape
 - Angle congruency marks – angle marks indicating angles of the same measure
 - Side congruency marks – side marks indicating side lengths of the same measure
- Types of two-dimensional figures
 - Circle
 - A figure formed by a closed curve with all points equal distance from the center
 - No straight sides
 - No vertices
 - No parallel or perpendicular sides
 - Polygon – a closed figure with at least 3 sides, where all sides are straight (no curves)
 - Types of polygons
 - Triangle
 - 3 sides
 - 3 vertices

Grade 5

angles; however, a square has 4 congruent sides but a rectangle has only opposite sides congruent; etc.)

- Regular figure – a polygon with all side lengths and angles congruent
- Irregular figure – a polygon with side lengths and/or angles that are not all congruent
- Attributes of two-dimensional figures
 - Side – a line segment that forms the boundary of a two-dimensional figure
 - Number of sides
 - Length of sides
 - Vertex (vertices) in a two-dimensional figure – the point (corner) where two sides of a two-dimensional figure meet
 - Number of vertices
 - Angle – two rays with a common endpoint (the vertex)
 - Types of angles
 - Acute – an angle that measures less than 90°
 - Right – an angle (formed by perpendicular lines) that measures exactly 90°
 - Notation is given as a box in the angle corner to represent a 90° angle.
 - Obtuse – an angle that measures greater than 90° but less than 180°
- Congruent – of equal measure, having exactly the same size and same shape
 - Angle congruency marks – angle marks indicating angles of the same measure
 - Side congruency marks – side marks indicating side lengths of the same measure
- Types of two-dimensional figures

Grade 6

Grade 4

- No parallel sides
- Types of triangles
 - Scalene triangle
 - 3 sides
 - 3 vertices
 - No congruent sides
 - No parallel sides
 - Up to one possible pair of perpendicular sides
 - Right triangle with two sides that are perpendicular to form a right angle and three different side lengths
 - No congruent angles
 - Right triangle with one 90° angle and two other angles each of different measures
 - Isosceles triangle
 - 3 sides
 - 3 vertices
 - At least 2 congruent sides
 - No parallel sides
 - Up to one possible pair of perpendicular sides
 - Right triangle with two sides that are perpendicular to form a right angle and are each of the same length
 - At least 2 congruent angles
 - Right triangle with one 90° angle and two other angles each of the same measure
 - Obtuse triangle with two angles of the same measure and one angle greater than 90°
 - Acute triangle with all angles

Grade 5

- Circle
 - A figure formed by a closed curve with all points equal distance from the center
 - No straight sides
 - No vertices
 - No parallel or perpendicular sides
- Polygon – a closed figure with at least 3 sides, where all sides are straight (no curves)
 - Types of polygons
 - Triangle
 - 3 sides
 - 3 vertices
 - No parallel sides
 - Types of triangles
 - Scalene triangle
 - 3 sides
 - 3 vertices
 - No congruent sides
 - No parallel sides
 - Up to one possible pair of perpendicular sides
 - Right triangle with two sides that are perpendicular to form a right angle and three different side lengths
 - No congruent angles
 - Right triangle with one 90° angle and two other angles each of different measures
 - Isosceles triangle
 - 3 sides
 - 3 vertices
 - At least 2 congruent sides
 - No parallel sides
 - Up to one possible pair of

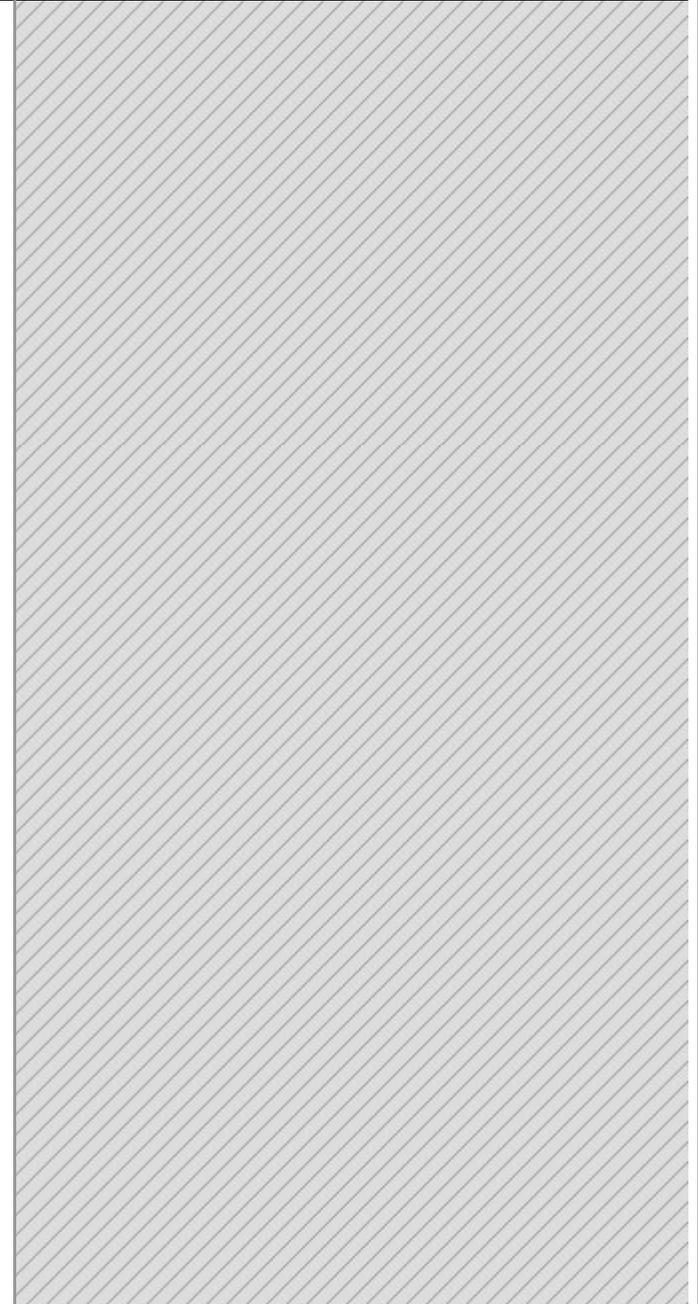
Grade 6

Grade 4

- measuring less than 90° and at least two of the angles of the same measure
- Equilateral triangle
 - 3 sides
 - 3 vertices
 - All sides congruent
 - No parallel or perpendicular sides
 - All angles congruent
 - Acute triangle with all angles measuring 60°
- Quadrilateral
 - 4 sides
 - 4 vertices
 - Types of quadrilaterals
 - Trapezoid
 - 4 sides
 - 4 vertices
 - Exactly one pair of parallel sides
 - Up to two possible pairs of perpendicular sides
 - Parallelogram
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - Opposite angles congruent
 - Types of parallelograms
 - Rectangle
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
 - Rhombus

Grade 5

- perpendicular sides
 - Right triangle with two sides that are perpendicular to form a right angle and are each of the same length
 - At least 2 congruent angles
 - Right triangle with one 90° angle and two other angles each of the same measure
 - Obtuse triangle with two angles of the same measure and one angle greater than 90°
 - Acute triangle with all angles measuring less than 90° and at least two of the angles of the same measure
- Equilateral triangle
 - 3 sides
 - 3 vertices
 - All sides congruent
 - No parallel or perpendicular sides
 - All angles congruent
 - Acute triangle with all angles measuring 60°
- Quadrilateral
 - 4 sides
 - 4 vertices
 - Types of quadrilaterals
 - Trapezoid
 - 4 sides
 - 4 vertices
 - Exactly one pair of parallel sides
 - Up to two possible pairs of perpendicular sides
 - Parallelogram
 - 4 sides

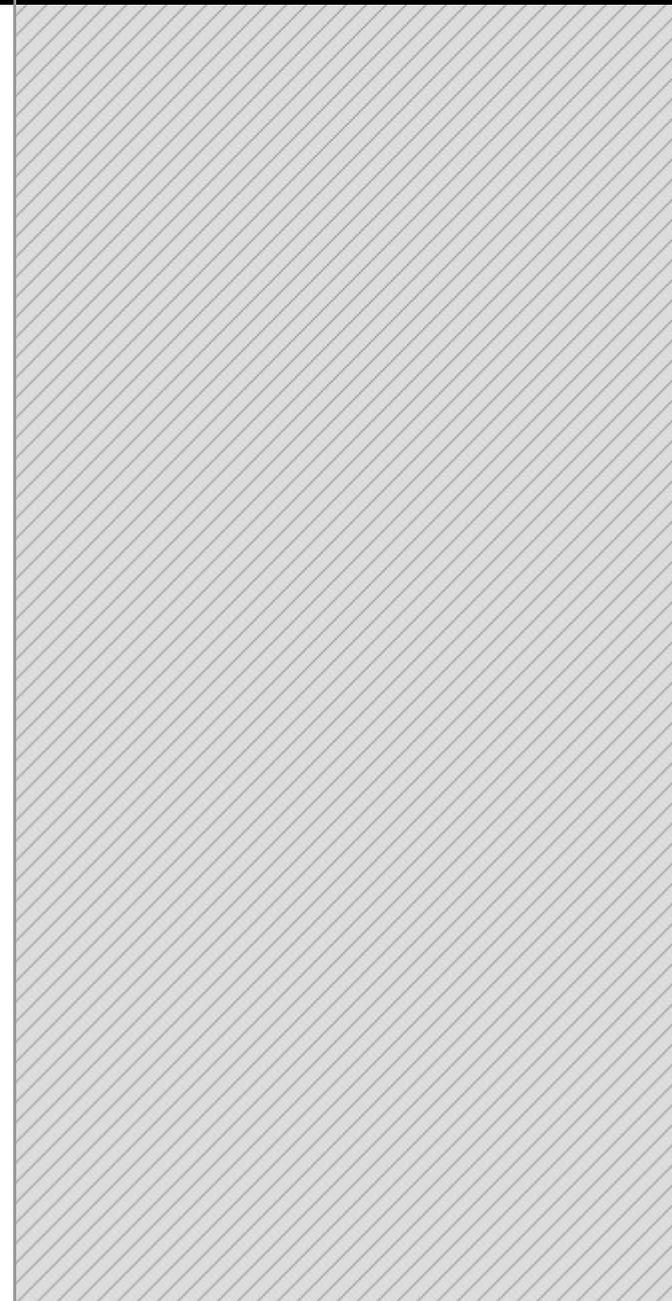
Grade 6

Grade 4

- 4 sides
- 4 vertices
- All sides congruent
- 2 pairs of parallel sides
- Opposite angles congruent
- Square (a special type of rectangle and a special type of rhombus)
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
- Pentagon
 - 5 sides
 - 5 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Hexagon
 - 6 sides
 - 6 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Heptagon or septagon
 - 7 sides
 - 7 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Octagon

Grade 5

- 4 vertices
- Opposite sides congruent
- 2 pairs of parallel sides
- Opposite angles congruent
- Types of parallelograms
 - Rectangle
 - 4 sides
 - 4 vertices
 - Opposite sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
 - Rhombus
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - Opposite angles congruent
 - Square (a special type of rectangle and a special type of rhombus)
 - 4 sides
 - 4 vertices
 - All sides congruent
 - 2 pairs of parallel sides
 - 2 pairs of perpendicular sides
 - 4 right angles
- Pentagon
 - 5 sides
 - 5 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles

Grade 6

Grade 4

- 8 sides
- 8 vertices
- Possible parallel and/or perpendicular sides
- Possible acute, obtuse, and/or right angles
- Nonagon or enneagon
 - 9 sides
 - 9 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Decagon
 - 10 sides
 - 10 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Undecagon or hendecagon
 - 11 sides
 - 11 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Dodecagon
 - 12 sides
 - 12 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles

Note(s):

Grade 5

- Hexagon
 - 6 sides
 - 6 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Heptagon or septagon
 - 7 sides
 - 7 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Octagon
 - 8 sides
 - 8 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Nonagon or enneagon
 - 9 sides
 - 9 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Decagon
 - 10 sides
 - 10 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Undecagon or hendecagon

Grade 6

Grade 4

- Grade Level(s):
 - Grade 3 classified and sorted two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prisms, and cubes, based on attributes using formal geometric language.
 - Grade 5 will classify two-dimensional figures in a hierarchy of sets and subsets using graphic organizers based on their attributes and properties.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Measuring angles
- TxCCRS:
 - III.A. Geometric Reasoning – Figures and their properties
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 5

- 11 sides
- 11 vertices
- Possible parallel and/or perpendicular sides
- Possible acute, obtuse, and/or right angles
- Dodecagon
 - 12 sides
 - 12 vertices
 - Possible parallel and/or perpendicular sides
 - Possible acute, obtuse, and/or right angles
- Graphic organizer to represent hierarchy of sets and subsets of two-dimensional figures
- Sample generalizations about sets and subsets of two-dimensional figures
 - All two-dimensional figures have attributes and properties and can be classified.
 - Some two-dimensional figures can be classified into more than one set or subset.
 - All polygons can be classified by their angles and/or sides.
 - All two-dimensional figures are polygons or circles.
 - All triangles are acute, obtuse, or right triangles.
 - All triangles are isosceles, equilateral, or scalene triangles.
 - All acute triangles are isosceles, equilateral, or scalene triangles.
 - All obtuse triangles are isosceles or scalene triangles.
 - All right triangles are isosceles or scalene triangles.
 - All isosceles and scalene triangles are

Grade 6

Grade 4**Grade 5****Grade 6**

acute, obtuse, or right triangles.

- All equilateral triangles are acute triangles.
- All equilateral triangles are isosceles triangles.
- All squares are rectangles and rhombuses.
- Some rectangles are rhombuses.
- Some rhombuses are rectangles.
- Some rectangles are squares.
- Some rhombuses are squares.
- All squares, rectangles, and rhombuses are parallelograms.
- All squares, rectangles, rhombuses, parallelograms, and trapezoids are quadrilaterals.

Note(s):

- Grade Level(s):
 - Grade 4 classified two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Grade Level Connections (reinforces previous learning and/or provides development for future learning)
- TxCCRS:
 - III.A. Geometric Reasoning – Figures and their properties
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

| Grade 4 | Grade 5 | Grade 6 |
|--|---------|---------|
| | | |
| Measuring Attributes of Two-Dimensional and Three-Dimensional Objects | | |
| <p>4.8
 <i>Geometry and measurement. The student applies mathematical process standards to select appropriate customary and metric units, strategies, and tools to solve problems involving measurement. The student is expected to:</i></p> | | |
| <p>4.8C
 Solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.</p> <p>Readiness Standard</p> <p>Solve</p> <p>PROBLEMS THAT DEAL WITH MEASUREMENTS OF LENGTH, INTERVALS OF TIME, LIQUID VOLUMES, MASS, AND MONEY USING ADDITION, SUBTRACTION, MULTIPLICATION, OR DIVISION AS APPROPRIATE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers (0 – 1,000,000,000) <ul style="list-style-type: none"> ◦ Products of two-digit factors by two-digit factors and up to four-digit factors by one- | | |

Grade 4

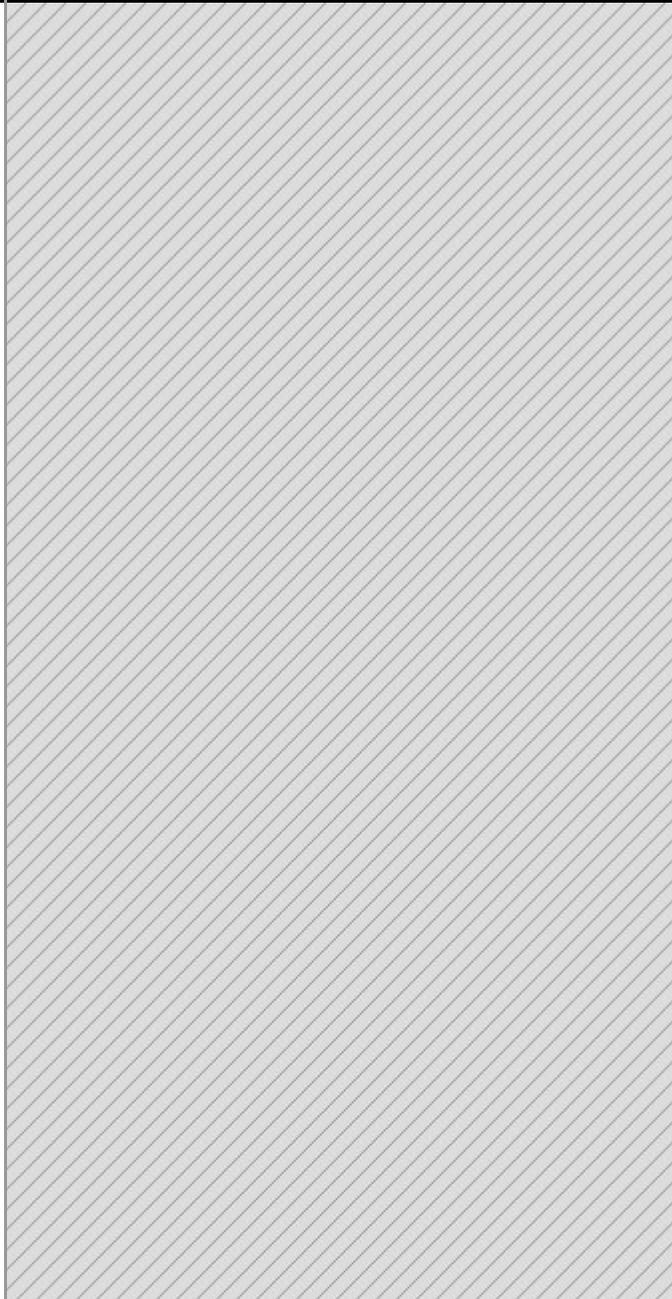
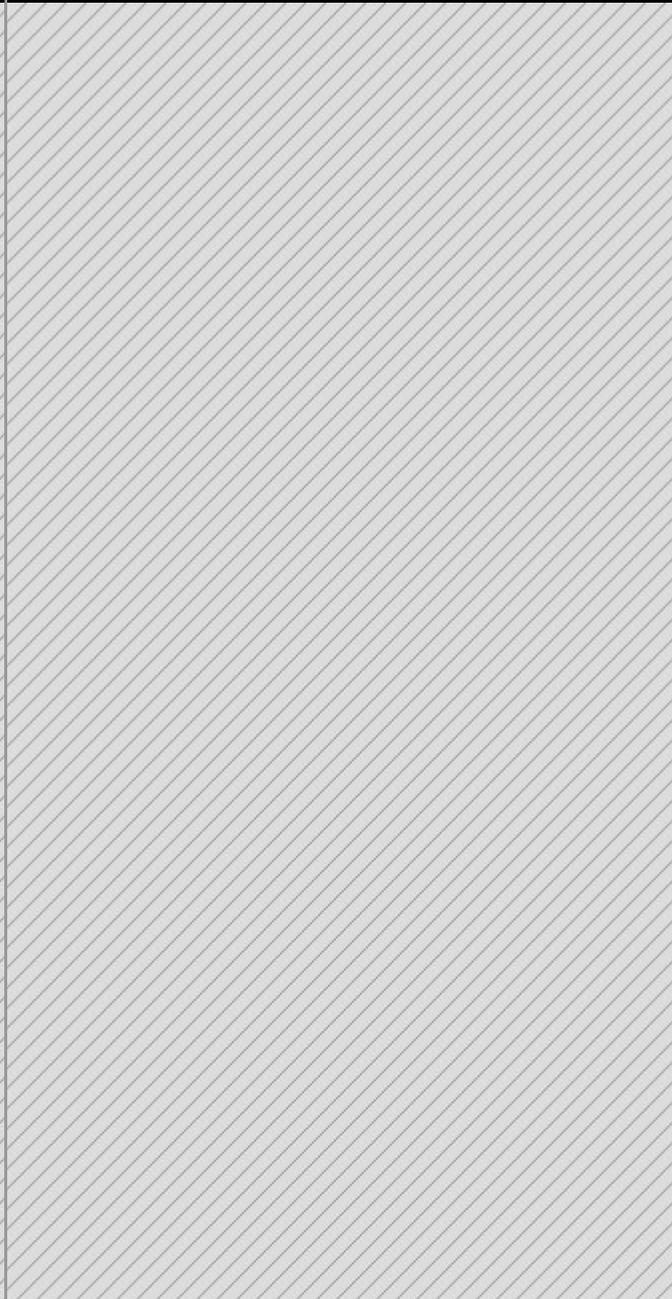
digit factors

- Quotients up to four-digit dividends by one-digit divisors
- Decimals (values greater than and less than one, limited to multiples of halves, e.g., 1.5; 0.5; 4.5 etc.)
 - Addition and subtraction of money amounts up to hundredths
- Fractions (proper, improper, and mixed numbers, limited to multiples of halves, e.g., $1\frac{1}{2}$; $\frac{1}{2}$; $4\frac{1}{2}$; etc.)
- Typically used customary and metric units
 - Customary
 - Length: miles, yards, feet, inches
 - Volume (liquid volume) and capacity: gallons, quarts, pints, cups, fluid ounces
 - Weight: tons, pounds, ounces
 - Metric
 - Length: kilometer, meter, centimeters, millimeters
 - Volume (liquid volume) and capacity: kiloliter, liter, milliliter
 - Mass: kilogram, gram, milligram
 - Based on prefixes attached to base unit
 - Base units include meter for length, liter for volume and capacity, and gram for weight and mass.
 - Kilo: one thousand base units
 - Deci: one-tenth of a base unit
 - Centi: one-hundredth of a base unit
 - Milli: one-thousandth of a base unit
 - Typically used measurement tools
 - Customary
 - Length: rulers, yardsticks, measuring tapes

Grade 5**Grade 6**

Grade 4

- Volume (liquid volume) and capacity: measuring cups, measuring containers or jars
- Metric
 - Length: rulers, meter sticks, measuring tapes
 - Volume (liquid volume) and capacity: beakers, graduated cylinders, eye droppers, measuring containers or jars
 - Mass: pan balances, triple beam balances
- Problem situations that deal with measurements of length
- Problem situations that deal with intervals of time (clocks: hours, minutes, seconds)
 - Addition and subtraction of time intervals in minutes
 - Such as a 1 hour and 45-minute event minus a 20-minute event equals 1 hour 25 minutes
 - Time intervals given
 - Pictorial models and tools
 - Measurement conversion tables
 - Analog clock with gears, digital clock, number line, etc.
 - Time conversions
 - 1 hour = 60 minutes; 1 minute = 60 seconds
 - Fractional values of time
 - Elapsed time
 - Finding the end time
 - Finding the start time
 - Finding the duration
- Problem situations that deal with intervals of time (calendar: years, months, weeks, days)
 - Time conversions

Grade 5**Grade 6**

Grade 4

- 1 year = 12 months; 1 year = 52 weeks; 1 week = 7 days; 1 day = 24 hours
- Fractional values of time
- Problem situations that deal with measurements of volume (liquid volume) and capacity
- Problem situations that deal with measurements of mass
- Problem situations that deal with money
 - Comparison of money amounts
 - Making change
 - Range of dollar amounts

Note(s):

- Grade Level(s):
 - Grade 4 introduces solving problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.
 - Grade 5 will solve problems by calculating conversions within a measurement system, customary or metric.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation
 - X. Connections

Grade 5**Grade 6**

| Grade 4 | Grade 5 | Grade 6 |
|--|---------|---------|
| | | |
| Measuring Length of Two-Dimensional and Three-Dimensional Objects | | |
| 4.8C | | |
| <p>Solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.</p> | | |
| <p>Readiness Standard</p> | | |
| <p>Solve</p> | | |
| <p>PROBLEMS THAT DEAL WITH MEASUREMENTS OF LENGTH, INTERVALS OF TIME, LIQUID VOLUMES, MASS, AND MONEY USING ADDITION, SUBTRACTION, MULTIPLICATION, OR DIVISION AS APPROPRIATE</p> | | |
| <p>Including, but not limited to:</p> | | |
| <ul style="list-style-type: none"> • Whole numbers (0 – 1,000,000,000) <ul style="list-style-type: none"> ◦ Products of two-digit factors by two-digit factors and up to four-digit factors by one-digit factors ◦ Quotients up to four-digit dividends by one-digit divisors • Decimals (values greater than and less than one, limited to multiples of halves, e.g., 1.5; 0.5; 4.5 etc.) <ul style="list-style-type: none"> ◦ Addition and subtraction of money amounts up to hundredths • Fractions (proper, improper, and mixed numbers, limited to multiples of halves, e.g., | | |

Grade 4

$1\frac{1}{2}$; $\frac{1}{2}$; $4\frac{1}{2}$; etc.)

- Typically used customary and metric units
 - Customary
 - Length: miles, yards, feet, inches
 - Volume (liquid volume) and capacity: gallons, quarts, pints, cups, fluid ounces
 - Weight: tons, pounds, ounces
 - Metric
 - Length: kilometer, meter, centimeters, millimeters
 - Volume (liquid volume) and capacity: kiloliter, liter, milliliter
 - Mass: kilogram, gram, milligram
 - Based on prefixes attached to base unit
 - Base units include meter for length, liter for volume and capacity, and gram for weight and mass.
 - Kilo: one thousand base units
 - Deci: one-tenth of a base unit
 - Centi: one-hundredth of a base unit
 - Milli: one-thousandth of a base unit
- Typically used measurement tools
 - Customary
 - Length: rulers, yardsticks, measuring tapes
 - Volume (liquid volume) and capacity: measuring cups, measuring containers or jars
 - Metric
 - Length: rulers, meter sticks, measuring tapes
 - Volume (liquid volume) and capacity: beakers, graduated cylinders, eye droppers, measuring containers or jars
 - Mass: pan balances, triple beam

Grade 5**Grade 6**

Grade 4

balances

- Problem situations that deal with measurements of length
- Problem situations that deal with intervals of time (clocks: hours, minutes, seconds)
 - Addition and subtraction of time intervals in minutes
 - Such as a 1 hour and 45-minute event minus a 20-minute event equals 1 hour 25 minutes
 - Time intervals given
 - Pictorial models and tools
 - Measurement conversion tables
 - Analog clock with gears, digital clock, number line, etc.
 - Time conversions
 - 1 hour = 60 minutes; 1 minute = 60 seconds
 - Fractional values of time
 - Elapsed time
 - Finding the end time
 - Finding the start time
 - Finding the duration
- Problem situations that deal with intervals of time (calendar: years, months, weeks, days)
 - Time conversions
 - 1 year = 12 months; 1 year = 52 weeks; 1 week = 7 days; 1 day = 24 hours
 - Fractional values of time
- Problem situations that deal with measurements of volume (liquid volume) and capacity
- Problem situations that deal with measurements of mass
- Problem situations that deal with money
 - Comparison of money amounts

Grade 5**Grade 6**

| Grade 4 | Grade 5 | Grade 6 |
|--|--|---|
| <ul style="list-style-type: none"> ◦ Making change ◦ Range of dollar amounts <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 introduces solving problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate. ◦ Grade 5 will solve problems by calculating conversions within a measurement system, customary or metric. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation ◦ X. Connections | | |
| Solving Problems Using Measurement Systems | | |
| <p>4.8
<i>Geometry and measurement. The student applies mathematical process standards to select appropriate customary and metric units, strategies, and tools to solve problems involving</i></p> | <p>5.7
<i>Geometry and measurement. The student applies mathematical process standards to select appropriate units, strategies, and tools to solve problems involving measurement. The student is</i></p> | <p>6.4
<i>Proportionality. The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations. The student is expected to:</i></p> |

| Grade 4 | Grade 5 | Grade 6 |
|---|---|--|
| <i>measurement. The student is expected to:</i> | <i>expected to</i> | |
| <p>4.8A</p> <p>Identify relative sizes of measurement units within the customary and metric systems.</p> <p>Supporting Standard</p> <p>Identify</p> <p>RELATIVE SIZES OF MEASUREMENT UNITS
WITHIN THE CUSTOMARY AND METRIC SYSTEMS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Relative size – size in relation to a measure • Sizes within a single system of measurement (e.g., sizes within customary or sizes within | <p>5.7A</p> <p>Solve problems by calculating conversions within a measurement system, customary or metric.</p> <p>Supporting Standard</p> <p>Solve</p> <p>PROBLEMS BY CALCULATING CONVERSIONS
WITHIN A MEASUREMENT SYSTEM, CUSTOMARY
OR METRIC</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers • Decimals (less than and greater than one to | <p>6.4H</p> <p>Convert units within a measurement system, including the use of proportions and unit rates.</p> <p>Readiness Standard</p> <p>Convert</p> <p>UNITS WITHIN A MEASUREMENT SYSTEM,
INCLUDING THE USE OF PROPORTIONS AND
UNIT RATES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction |

Grade 4

metric systems)

- Typically used units of measure and their relative sizes in words and abbreviations
 - Length – the measurement attribute that describes a continuous distance from end to end
 - Customary units typically used for length
 - Inch (in.)
 - 12 inches (in.) = 1 foot (ft)
 - Foot (ft)
 - 1 foot (ft) = 12 inches (in.)
 - 3 feet (ft) = 1 yard (yd)
 - Yard (yd)
 - 1 yard (yd) = 3 feet (ft)
 - 1,760 yards (yd) = 1 mile (mi)
 - Mile (mi)
 - 1 mile (mi) = 1,760 yards (yd)
 - Measurement tools typically used for customary length
 - Rulers, yardsticks, measuring tapes
 - Metric units typically used for length
 - Millimeter (mm)
 - 10 millimeters (mm) = 1 centimeter (cm)
 - Centimeter (cm)
 - 1 centimeter (cm) = 10 millimeters (mm)
 - 100 centimeters (cm) = 1 meter (m)
 - Decimeter (dm)
 - 1 decimeter (dm) = 100 millimeters (mm)
 - 1 decimeter (dm) = 10 centimeters (cm)
 - Meter (m)
 - 1 meter (m) = 100 centimeters (cm)
 - 1,000 meters (m) = 1 kilometer (km)

Grade 5

the tenths, hundredths, and thousandths)

- Fractions (proper, improper, or mixed numbers with equal or unequal denominators)
- Multiplication
 - Products of whole numbers up to three-digit factors by two-digit factors
 - Products of decimals limited to three-digit factors by two-digit factors with products to the hundredths
 - Multiply tenths by tenths (e.g., $0.3 \times 0.7 = 0.21$, $1.2 \times 1.2 = 1.44$, $14.3 \times 1.3 = 18.59$, etc.)
 - Multiply tenths by hundredths or vice versa (e.g., $0.5 \times 0.12 = 0.06$, $1.4 \times 0.15 = 0.21$, $21.4 \times 0.45 = 9.63$, etc.)
 - Multiply tenths by thousandths or vice versa (e.g., $0.4 \times 0.125 = 0.05$, $0.125 \times 8.4 = 1.05$, etc.)
 - Multiply whole numbers by tenths, hundredths, and thousandths or vice versa (e.g., $3 \times 1.3 = 3.9$, $42 \times 7.45 = 312.9$, $7.02 \times 78 = 547.56$, $6 \times 0.125 = 0.75$, etc.)
 - Products of fractions where factors are limited to a fraction and a whole number
- Division
 - Whole numbers with quotients up to four-digit dividends and two-digit divisors
 - Quotients of decimals limited to four-digit dividends and two-digit whole number divisors, with quotients to the hundredths
 - Dividend to the tenths and whole number divisor (e.g., $1.2 \div 24 = 0.05$, $358.8 \div 23 = 15.6$, $721.7 \div 14 = 51.55$, etc.)
 - Dividend to the hundredths and whole number divisor (e.g., $8.68 \div 4 = 2.17$,

Grade 6

$\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).

- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
- Unit conversions within systems
 - Customary
 - Metric
- Unit rate – a ratio between two different units where one of the terms is 1
- Multiple solution strategies
 - Dimensional analysis using unit rates
 - Scale factor between ratios
 - Proportion method
 - Conversion graph

Note(s):

- Grade Level(s):
 - Grade 6 introduces converting units within a measurement system, including the use of proportions and unit rates.
 - Grade 7 will convert between measurement systems, including the use of proportions and the use of unit rates.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding and applying ratios and rates and using equivalent ratios to

Grade 4

- Kilometer (km)
 - 1 kilometer (km) = 1,000 meters (m)
- Measurement tools typically used for metric length
 - Rulers, meter sticks, measuring tapes
- Liquid volume – the measurement attribute that describes the amount of space that a liquid or dry, pourable material takes up, typically measured using standard units of capacity
- Customary units typically used for liquid volume (capacity)
 - Fluid ounce (fl oz)
 - 8 fluid ounces (fl oz) = 1 cup (c)
 - Cup (c)
 - 1 cup (c) = 8 fluid ounces (fl oz)
 - 2 cups (c) = 1 pint (pt)
 - Pint (pt)
 - 1 pint (pt) = 2 cups (c)
 - 2 pints (pt) = 1 quart (qt)
 - Quart (qt)
 - 1 quart (qt) = 2 pints (pt)
 - 4 quarts (qt) = 1 gallon (gal)
 - Gallon (gal)
 - 1 gallon (gal) = 4 quarts (qt)
- Measurement tools typically used for customary liquid volume
 - Measuring cups, measuring containers or jars
- Metric units typically used for liquid volume (capacity)
 - Milliliter (mL)
 - 1,000 milliliters (mL) = 1 liter (L)
 - Liter (L)
 - 1 liter (L) = 1,000 milliliters (mL)
 - 1,000 liters (L) = 1 kiloliter (kL)

Grade 5

- 8.25 ÷ 15 = 0.55, 62.76 ÷ 12 = 5.23, etc.)
- Whole number dividends and whole number divisors (e.g., 3 ÷ 4 = 0.75, 10 ÷ 8 = 1.25, 1000 ÷ 16 = 62.5, etc.)
- Quotients of fractions where dividend and divisors are limited to whole numbers by unit fractions and unit fractions by whole numbers
- Conversion – change from one unit to another unit
- Typically used customary and metric units
 - Customary
 - Length: miles, yards, feet, inches
 - Volume (liquid volume) and capacity: gallons, quarts, pints, cups, fluid ounces
 - Weight: tons, pounds, ounces
 - Metric system units
 - Length: kilometers, meters, centimeters, millimeters
 - Volume (liquid volume) and capacity: kiloliters, liters, milliliters
 - Mass: kilograms, grams, milligrams
 - Based on prefixes attached to base unit
 - Base units include meter for length, liter for volume and capacity, and gram for weight and mass.
 - Kilo: one thousand base units
 - Deci: one-tenth of a base unit
 - Centi: one-hundredth of a base unit
 - Milli: one-thousandth of a base unit
- Relationship between converting units
 - Converting within the same measurement system, customary or metric
 - Multiplication converts larger units to smaller units.
 - Division converts smaller units to larger

Grade 6

- represent proportional relationships
- TxCCRS:
 - I. Numeric Reasoning
 - IV. Measurement Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 4

- Kiloliter (kL)
 - 1 kiloliter (kL) = 1,000 liters (L)
- Measurement tools typically used for metric liquid volume
 - Beakers, graduated cylinders, eye droppers, measuring containers or jars
- Weight – a measurement attribute that describes how heavy an object is, determined by the pull of gravity on the

Grade 5

- units.
- Appropriate units based on the information considered in the mathematical and real-world problem situations
 - Length
 - Volume (liquid volume) and capacity
 - Weight and mass

Note(s):

Grade 6

Grade 4

- object (weight depends upon location)
- Customary units typically used for weight
 - Ounce (oz)
 - 16 ounces (oz) = 1 pound (lb)
 - Pound (lb)
 - 1 pound (lb) = 16 ounces (oz)
 - 2,000 pounds (lb) = 1 ton (T)
 - Ton (T)
 - 1 ton (T) = 2,000 pounds (lb)
- Measurement tools typically used for weight
 - Spring scales, kitchen scales, bathroom scales
- Mass – the measurement attribute that describes the amount of matter in an object (mass remains constant, regardless of location)
- Metric units typically used for mass
 - Milligram (mg)
 - 1,000 milligrams (mg) = 1 gram (g)
 - Gram (g)
 - 1 gram (g) = 1,000 milligrams (mg)
 - 1,000 grams (g) = 1 kilogram (kg)
 - Kilogram (kg)
 - 1 kilogram (kg) = 1,000 grams (g)
- Measurement tools typically used for mass
 - Pan balances, triple beam balances
- Metric units
 - Based on prefixes attached to base unit
 - Base units include meter for length, liter for volume and capacity, and gram for mass.
 - Kilo: one thousand base units
 - Deci: one-tenth of a base unit
 - Centi: one-hundredth of a base unit

Grade 5

- Grade Level(s):
 - Grade 4 identified relative sizes of measurement units within the customary and metric systems.
 - Grade 4 converted measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table.
 - Grade 4 solved problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.
 - Grade 6 will convert units within a measurement system, including the use of proportions and unit rates.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing an understanding of and fluency with addition, subtraction, multiplication, and division of fractions and decimals
 - Understanding and generating expressions and equations to solve problems
 - Representing and solving problems with perimeter, area, and volume
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 6

Grade 4

- Milli: one-thousandth of a base unit

Note(s):

- Grade Level(s):
 - Grade 4 introduces identifying relative sizes of measurement units within the customary and metric systems.
 - Grade 5 will solve problems by calculating conversions within a measurement system, customary or metric.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - IX. Communication and Representation

Grade 5**Grade 6****4.8B**

Convert measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table.

Supporting Standard

Convert

MEASUREMENTS WITHIN THE SAME
MEASUREMENT SYSTEM, CUSTOMARY OR
METRIC, FROM A SMALLER UNIT INTO A LARGER

Grade 4

UNIT OR A LARGER UNIT INTO A SMALLER UNIT
WHEN GIVEN OTHER EQUIVALENT MEASURES
REPRESENTED IN A TABLE

Including, but not limited to:

- Whole numbers (0 – 1,000,000,000)
 - Products of two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
 - Quotients up to four-digit dividends by one-digit divisors
- Decimals (less than or greater than one, limited to multiples of halves, e.g., 1.5; 0.5; 4.5 etc.)
- Fractions (proper, improper, and mixed numbers, limited to multiples of halves, e.g., $1\frac{1}{2}$, $\frac{1}{2}$, $4\frac{1}{2}$; etc.
- One-step conversions from a smaller unit to a larger unit or from a larger unit to a smaller unit
- Conversion – change from one unit to another unit
- Typically used units of measure
 - Customary
 - Length: miles, yards, feet, inches
 - Volume (liquid volume) and capacity: gallons, quarts, pints, cups, fluid ounces
 - Weight: tons, pounds, ounces
 - Metric
 - Length: kilometer, meter, centimeters, millimeters
 - Volume (liquid volume) and capacity: kiloliter, liter, milliliter
 - Mass: kilogram, gram, milligram
 - Based on prefixes attached to base unit

Grade 5**Grade 6**

Grade 4

- Base units include meter for length, liter for volume and capacity, and gram for weight and mass.
- Kilo: one thousand base units
- Deci: one-tenth of a base unit
- Centi: one-hundredth of a base unit
- Milli: one-thousandth of a base unit
- Relationship between converting units
 - Converting within the same measurement system, customary or metric
 - Multiplication converts larger units to smaller units.
 - Division converts smaller units to larger units.
- Convert measurements within the customary measurement system from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table.
 - Length
 - Rule/process column given in a table
 - Rule/process column not given in a table
 - Volume (liquid volume) and capacity
 - Rule/process column given in a table
 - Rule/process column not given in a table
 - Weight
 - Rule/process column given in a table
 - Rule/process column not given in a table
- Convert measurements within the metric measurement system from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table.
 - Length
 - Rule/process column given in a table
 - Rule/process column not given in a table

Grade 5**Grade 6**

Grade 4

- Volume (liquid volume) and capacity
 - Rule/process column given in a table
 - Rule/process column not given in a table
- Mass
 - Rule/process column given in a table
 - Rule/process column not given in a table
- Equivalent measures in tables may have missing information in one or both columns.

Note(s):

- Grade Level(s):
 - Grade 4 introduces converting measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table.
 - Grade 5 will solve problems by calculating conversions within a measurement system, customary or metric.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 5**Grade 6**

4.8C

Grade 4

Solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.

Readiness Standard

Solve

PROBLEMS THAT DEAL WITH MEASUREMENTS OF LENGTH, INTERVALS OF TIME, LIQUID VOLUMES, MASS, AND MONEY USING ADDITION, SUBTRACTION, MULTIPLICATION, OR DIVISION AS APPROPRIATE

Including, but not limited to:

- Whole numbers (0 – 1,000,000,000)
 - Products of two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
 - Quotients up to four-digit dividends by one-digit divisors
- Decimals (values greater than and less than one, limited to multiples of halves, e.g., 1.5; 0.5; 4.5 etc.)
 - Addition and subtraction of money amounts up to hundredths
- Fractions (proper, improper, and mixed numbers, limited to multiples of halves, e.g., $1\frac{1}{2}$; $\frac{1}{2}$; $4\frac{1}{2}$; etc.)
- Typically used customary and metric units
 - Customary
 - Length: miles, yards, feet, inches
 - Volume (liquid volume) and capacity:

Grade 5**Grade 6**

Grade 4

gallons, quarts, pints, cups, fluid ounces

- Weight: tons, pounds, ounces
- Metric
 - Length: kilometer, meter, centimeters, millimeters
 - Volume (liquid volume) and capacity: kiloliter, liter, milliliter
 - Mass: kilogram, gram, milligram
 - Based on prefixes attached to base unit
 - Base units include meter for length, liter for volume and capacity, and gram for weight and mass.
 - Kilo: one thousand base units
 - Deci: one-tenth of a base unit
 - Centi: one-hundredth of a base unit
 - Milli: one-thousandth of a base unit
- Typically used measurement tools
 - Customary
 - Length: rulers, yardsticks, measuring tapes
 - Volume (liquid volume) and capacity: measuring cups, measuring containers or jars
 - Metric
 - Length: rulers, meter sticks, measuring tapes
 - Volume (liquid volume) and capacity: beakers, graduated cylinders, eye droppers, measuring containers or jars
 - Mass: pan balances, triple beam balances
- Problem situations that deal with measurements of length
- Problem situations that deal with intervals of time (clocks: hours, minutes, seconds)
 - Addition and subtraction of time intervals in

Grade 5**Grade 6**

Grade 4

minutes

- Such as a 1 hour and 45-minute event minus a 20-minute event equals 1 hour 25 minutes
- Time intervals given
- Pictorial models and tools
 - Measurement conversion tables
 - Analog clock with gears, digital clock, number line, etc.
- Time conversions
 - 1 hour = 60 minutes; 1 minute = 60 seconds
 - Fractional values of time
- Elapsed time
 - Finding the end time
 - Finding the start time
 - Finding the duration
- Problem situations that deal with intervals of time (calendar: years, months, weeks, days)
- Time conversions
 - 1 year = 12 months; 1 year = 52 weeks; 1 week = 7 days; 1 day = 24 hours
 - Fractional values of time
- Problem situations that deal with measurements of volume (liquid volume) and capacity
- Problem situations that deal with measurements of mass
- Problem situations that deal with money
 - Comparison of money amounts
 - Making change
 - Range of dollar amounts

Note(s):

- Grade Level(s):
 - Grade 4 introduces solving problems that

Grade 5**Grade 6**

| Grade 4 | Grade 5 | Grade 6 |
|--|---------|---------|
| <p>deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.</p> <ul style="list-style-type: none"> ◦ Grade 5 will solve problems by calculating conversions within a measurement system, customary or metric. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation ◦ X. Connections | | |
| Measuring Time | | |
| <p>4.8
<i>Geometry and measurement. The student applies mathematical process standards to select appropriate customary and metric units, strategies, and tools to solve problems involving measurement. The student is expected to:</i></p> | | |
| <p>4.8C
Solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as</p> | | |

Grade 4**Grade 5****Grade 6**

appropriate.

Readiness Standard

Solve

PROBLEMS THAT DEAL WITH MEASUREMENTS OF LENGTH, INTERVALS OF TIME, LIQUID VOLUMES, MASS, AND MONEY USING ADDITION, SUBTRACTION, MULTIPLICATION, OR DIVISION AS APPROPRIATE

Including, but not limited to:

- Whole numbers (0 – 1,000,000,000)
 - Products of two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
 - Quotients up to four-digit dividends by one-digit divisors
- Decimals (values greater than and less than one, limited to multiples of halves, e.g., 1.5; 0.5; 4.5 etc.)
 - Addition and subtraction of money amounts up to hundredths
- Fractions (proper, improper, and mixed numbers, limited to multiples of halves, e.g., $1\frac{1}{2}$; $\frac{1}{2}$; $4\frac{1}{2}$; etc.)
- Typically used customary and metric units
 - Customary
 - Length: miles, yards, feet, inches
 - Volume (liquid volume) and capacity: gallons, quarts, pints, cups, fluid ounces
 - Weight: tons, pounds, ounces
 - Metric
 - Length: kilometer, meter, centimeters,

Grade 4

millimeters

- Volume (liquid volume) and capacity:
kiloliter, liter, milliliter
- Mass: kilogram, gram, milligram
- Based on prefixes attached to base unit
 - Base units include meter for length, liter for volume and capacity, and gram for weight and mass.
 - Kilo: one thousand base units
 - Deci: one-tenth of a base unit
 - Centi: one-hundredth of a base unit
 - Milli: one-thousandth of a base unit
- Typically used measurement tools
 - Customary
 - Length: rulers, yardsticks, measuring tapes
 - Volume (liquid volume) and capacity: measuring cups, measuring containers or jars
 - Metric
 - Length: rulers, meter sticks, measuring tapes
 - Volume (liquid volume) and capacity: beakers, graduated cylinders, eye droppers, measuring containers or jars
 - Mass: pan balances, triple beam balances
- Problem situations that deal with measurements of length
- Problem situations that deal with intervals of time (clocks: hours, minutes, seconds)
 - Addition and subtraction of time intervals in minutes
 - Such as a 1 hour and 45-minute event minus a 20-minute event equals 1 hour 25 minutes

Grade 5**Grade 6**

Grade 4

- Time intervals given
- Pictorial models and tools
 - Measurement conversion tables
 - Analog clock with gears, digital clock, number line, etc.
- Time conversions
 - 1 hour = 60 minutes; 1 minute = 60 seconds
 - Fractional values of time
- Elapsed time
 - Finding the end time
 - Finding the start time
 - Finding the duration
- Problem situations that deal with intervals of time (calendar: years, months, weeks, days)
- Time conversions
 - 1 year = 12 months; 1 year = 52 weeks; 1 week = 7 days; 1 day = 24 hours
 - Fractional values of time
- Problem situations that deal with measurements of volume (liquid volume) and capacity
- Problem situations that deal with measurements of mass
- Problem situations that deal with money
 - Comparison of money amounts
 - Making change
 - Range of dollar amounts

Note(s):

- Grade Level(s):
 - Grade 4 introduces solving problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.

Grade 5**Grade 6**

| Grade 4 | Grade 5 | Grade 6 |
|--|--|---------|
| <ul style="list-style-type: none"> ◦ Grade 5 will solve problems by calculating conversions within a measurement system, customary or metric. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation ◦ X. Connections | | |
| | Measuring Area and Volume | |
| | <p>5.6
 <i>Geometry and measurement. The student applies mathematical process standards to understand, recognize, and quantify volume. The student is expected to:</i></p> | |
| | <p>5.6A</p> <p>Recognize a cube with side length of one unit as a unit cube having one cubic unit of volume and the volume of a three-dimensional figure as the number of unit cubes (n cubic units) needed to fill it with no gaps or overlaps if possible.</p> <p><i>Supporting Standard</i></p> | |

Grade 4**Grade 5****Grade 6**

Recognize

A CUBE WITH SIDE LENGTH OF ONE UNIT AS A UNIT CUBE HAVING ONE CUBIC UNIT OF VOLUME AND THE VOLUME OF A THREE-DIMENSIONAL FIGURE AS THE NUMBER OF UNIT CUBES (n CUBIC UNITS) NEEDED TO FILL IT WITH NO GAPS OR OVERLAPS IF POSSIBLE

Including, but not limited to:

- Three-dimensional figure – a figure that has measurements including length, width (depth), and height
 - Attributes of cubes
 - Cube (special form of a rectangular prism)
 - 6 square faces (2 parallel square faces [bases], 4 square faces)
 - 12 edges
 - 8 vertices
 - Relationships between units used to measure one-, two-, and three-dimensional figures
 - One-dimensional figures are measured using linear units.
 - Two-dimensional figures are measured using square units.
 - Three-dimensional figures are measured using cubic units.
 - Volume – the measurement attribute of the amount of space occupied by matter
 - One way to measure volume is a three-dimensional cubic measure.
 - Volume is measured by counting the number of unit cubes that fill the space with no gaps or overlaps.

Note(s):

| Grade 4 | Grade 5 | Grade 6 |
|---------|--|---------|
| | <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 2 used concrete models of square units to find the area of a rectangle by covering it with no gaps or overlaps, counting to find the total number of square units, and describing the measurement using a number and the unit. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Representing and solving problems with perimeter, area, and volume • TxCCRS: <ul style="list-style-type: none"> ◦ III.A. Geometric Reasoning – Figures and their properties ◦ IX. Communication and Representation | |
| | <p>5.6B</p> <p>Determine the volume of a rectangular prism with whole number side lengths in problems related to the number of layers times the number of unit cubes in the area of the base.</p> <p>Supporting Standard</p> <p>Determine</p> <p>THE VOLUME OF A RECTANGULAR PRISM WITH WHOLE NUMBER SIDE LENGTHS IN PROBLEMS RELATED TO THE NUMBER OF LAYERS TIMES THE NUMBER OF UNIT CUBES IN THE AREA OF THE BASE</p> <p>Including, but not limited to:</p> | |

Grade 4**Grade 5****Grade 6**

- Three-dimensional figure – a figure that has measurements including length, width (depth), and height
 - Attributes of rectangular prisms and cubes
 - Rectangular prism
 - 6 rectangular faces (2 parallel rectangular faces [bases], 4 rectangular faces)
 - 12 edges
 - 8 vertices
 - Cube (special form of a rectangular prism)
 - 6 square faces (2 parallel square faces [bases], 4 square faces)
 - 12 edges
 - 8 vertices
- Volume – the measurement attribute of the amount of space occupied by matter
 - One way to measure volume is a three-dimensional cubic measure.
 - Whole number side lengths
 - Products of whole numbers up to three-digit factors by two-digit factors
 - Whole numbers with quotients up to four-digit dividends and two-digit divisors
- Volume is measured by counting the number of unit cubes that fill the space with no gaps or overlaps.
- Formulas for volume for Grade 5 STAAR Mathematics Reference Materials
 - Rectangular prism
 - $V = l \times w \times h$, where l represents the length of the rectangular prism, w represents the width of the rectangular prism, and h represents the height of the rectangular prism

Grade 4

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- $V = Bh$, where B represents the area of the base and h represents the height of the rectangular prism, which is the number of times the base area is repeated or layered
 - The base of a rectangular prism is a rectangle whose area may be found with the formula, $A = bh$ or $A = l \times w$, meaning the area of the base, B , may be found with the formula $B = bh$ or $B = l \times w$; therefore, the volume of a rectangular prism may be found using $V = Bh$ or $V = (bh)h$ or $V = l \times w \times h$.
- Relationship between volume of a rectangular prism, its base area, and height (the number of layers)
 - The volume of a rectangular prism is the product of its base area and its height. ($V = Bh$)
 - The base area of a rectangular prism is the quotient of its volume and its height. ($B = V \div h$)
 - The height of a rectangular prism is the quotient of its volume and its base area. ($h = V \div B$)
- Problem situations related to the number of layers times the number of unit cubes in the area of the base

Note(s):

- Grade Level(s):
 - Grade 3 determined the area of rectangles with whole number side lengths in problems using multiplication related to the number of rows times the number of unit squares in each row.

| Grade 4 | Grade 5 | Grade 6 |
|--|--|---------|
| | <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Representing and solving problems with perimeter, area, and volume • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ III.A. Geometric Reasoning – Figures and their properties ◦ III.C. Geometric Reasoning – Connections between geometry and other mathematical content strands ◦ IV.C. Measurement Reasoning – Measurement involving geometry and algebra ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation | |
| | | |
| | | |
| | | |
| Measuring Angles | | |
| <p>4.7
 <i>Geometry and measurement. The student applies mathematical process standards to solve problems involving angles less than or equal to 180 degrees. The student is expected to:</i></p> | | |
| <p>4.7A
 Illustrate the measure of an angle as the part of a circle whose center is at the vertex of the angle that is "cut</p> | | |

Grade 4**Grade 5****Grade 6**

out" by the rays of the angle. Angle measures are limited to whole numbers.

Illustrate

THE MEASURE OF AN ANGLE AS THE PART OF A CIRCLE WHOSE CENTER IS AT THE VERTEX OF THE ANGLE THAT IS "CUT OUT" BY THE RAYS OF THE ANGLE. ANGLE MEASURES ARE LIMITED TO WHOLE NUMBERS.

Including, but not limited to:

- Ray – part of a line that has one endpoint and continues without end in one direction
- Degree – the measure of an angle where each degree represents $\frac{1}{360}$ of a circle
 - Unit measure labels as “degrees” or with symbol for degrees (°)
- Angle – two rays with a common endpoint (the vertex)
 - Various angle types/names
 - Acute – an angle that measures less than 90°
 - Right – an angle (formed by perpendicular lines) that measures exactly 90°
 - Notation is given as a box in the angle corner to represent a 90° angle.
 - Obtuse – an angle that measures greater than 90° but less than 180°
 - Straight – an angle that measures 180° (a straight line)
 - Angle measures limited to whole numbers, 0° to 180°
- Center of the circle – the point equidistant from all points on the circle
- Circle

| Grade 4 | Grade 5 | Grade 6 |
|--|---------|---------|
| <ul style="list-style-type: none"> ◦ A figure formed by a closed curve with all points equal distance from the center ◦ No straight sides ◦ No vertices ◦ No parallel or perpendicular sides ◦ A circle measures 360° for one full rotation around the center of the circle. • Representation of an angle measure as a “turn” around the center point of a circle “cut out” by the rays of the angle where the vertex of the angle is aligned to the center of the circle. <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 introduces illustrating the measure of an angle as the part of a circle whose center is at the vertex of the angle that is "cut out" by the rays of the angle. Angle measures are limited to whole numbers. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Measuring angles • TxCCRS: <ul style="list-style-type: none"> ◦ III.A. Geometric Reasoning – Figures and their properties ◦ IX. Communication and Representation | | |
| <p>4.7B</p> <p>Illustrate degrees as the units used to measure an angle, where 1/360 of any circle is one degree and an angle that "cuts" n/360 out of any circle whose center</p> | | |

Grade 4

is at the angle's vertex has a measure of n degrees.
Angle measures are limited to whole numbers.

Illustrate

DEGREES AS THE UNITS USED TO MEASURE AN ANGLE, WHERE $\frac{1}{360}$ OF ANY CIRCLE IS ONE DEGREE AND AN ANGLE THAT "CUTS" $\frac{n}{360}$ OUT OF ANY CIRCLE WHOSE CENTER IS AT THE ANGLE'S VERTEX HAS A MEASURE OF n DEGREES. ANGLE MEASURES ARE LIMITED TO WHOLE NUMBERS

Including, but not limited to:

- Degree – the measure of an angle where each degree represents $\frac{1}{360}$ of a circle
 - Unit measure labels as “degrees” or with symbol for degrees ($^{\circ}$)
 - Angle measures limited to whole numbers, 0° to 360°
- Angle – two rays with a common endpoint (the vertex)
- Center of the circle – the point equidistant from all points on the circle
- Circle
 - A figure formed by a closed curve with all points equal distance from the center
 - No straight sides
 - No vertices
 - No parallel or perpendicular sides
 - A circle measures 360° for one full rotation around the center of the circle.
- Representations of the “cuts” $\frac{n}{360}$ out of a

Grade 5**Grade 6**

| Grade 4 | Grade 5 | Grade 6 |
|---|---------|---------|
| <p>circle as degrees of angle measures</p> <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 introduces illustrating degrees as the units used to measure an angle, where $\frac{1}{360}$ of any circle is one degree and an angle that "cuts" $\frac{n}{360}$ out of any circle whose center is at the angle's vertex has a measure of n degrees. Angle measures are limited to whole numbers. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Measuring angles • TxCCRS: <ul style="list-style-type: none"> ◦ III.A. Geometric Reasoning – Figures and their properties ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation | | |
| <p>4.7C</p> <p>Determine the approximate measures of angles in degrees to the nearest whole number using a protractor.</p> <p><i>Readiness Standard</i></p> <p>Determine</p> <p>THE APPROXIMATE MEASURES OF ANGLES IN</p> | | |

Grade 4**DEGREES TO THE NEAREST WHOLE NUMBER
USING A PROTRACTOR**

Including, but not limited to:

- Degree – the measure of an angle where each degree represents $\frac{1}{360}$ of a circle
 - Unit measure labels as “degrees” or with symbol for degrees ($^{\circ}$)
 - Angle measures limited to whole numbers, 0° to 180°
- Various angle types/names
 - Acute – an angle that measures less than 90°
 - Right – an angle (formed by perpendicular lines) that measures exactly 90°
 - Notation is given as a box in the angle corner to represent a 90° angle.
 - Obtuse – an angle that measures greater than 90° but less than 180°
 - Straight – an angle that measures 180° (a straight line)
- Protractor – a tool used to determine the measure of an angle
 - Two sets of measures from 0° to 180° going in opposite directions
 - Relationships between a protractor and a circle
 - One protractor is a semi-circle, 180°
 - Two protractors make a complete circle, 360°
- Measurement or “ m ” notation indicates the measure of the angle in degrees (e.g., $m\angle 1 = 50^{\circ}$)
- Measure angles with a ray aligned at zero degrees (right and/or left).

Grade 5**Grade 6**

| Grade 4 | Grade 5 | Grade 6 |
|--|---------|---------|
| <ul style="list-style-type: none"> • Measure angles where a ray of the angle does not lie on zero degrees. • Measure angles whose rays may lie between numerically marked intervals. • Use angle classifications (acute, obtuse, and right) to determine reasonableness of angle measures. • Measure angles within two-dimensional figures. <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 introduces determining the approximate measures of angles in degrees to the nearest whole number using a protractor. • TxRCFP: <ul style="list-style-type: none"> ◦ Measuring angles • TxCCRS: <ul style="list-style-type: none"> ◦ III.A. Geometric Reasoning – Figures and their properties ◦ IV.A. Measurement Reasoning – Measurement involving physical and natural attributes ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation | | |
| <p>4.7D</p> <p>Draw an angle with a given measure.</p> <p><i>Supporting Standard</i></p> <p>Draw</p> | | |

Grade 4**AN ANGLE WITH A GIVEN MEASURE**

Including, but not limited to:

- Degree – the measure of an angle where each degree represents $\frac{1}{360}$ of a circle
- Unit measure labels as “degrees” or with symbol for degrees ($^{\circ}$)
- Angle measures limited to whole numbers, 0° to 180°
- Angle – two lines or rays with a common endpoint (the vertex)
- Various angle types/names
 - Acute – an angle that measures less than 90°
 - Right – an angle (formed by perpendicular lines) that measures exactly 90°
 - Notation is given as a box in the angle corner to represent a 90° angle.
 - Obtuse – an angle that measures greater than 90° but less than 180°
 - Straight – an angle that measures 180° (a straight line)
- Protractor – a tool used to determine the measure of an angle

Note(s):

- Grade Level(s):
 - Grade 4 introduces drawing an angle with a given measure
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Measuring angles

Grade 5**Grade 6**

| Grade 4 | Grade 5 | Grade 6 |
|--|---------|---------|
| <ul style="list-style-type: none"> • TxCCRS: <ul style="list-style-type: none"> ◦ III.A. Geometric Reasoning – Figures and their properties ◦ IV.A. Measurement Reasoning – Measurement involving physical and natural attributes ◦ X. Communication and Representation | | |
| <p>4.7E</p> <p>Determine the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures.</p> <p><i>Supporting Standard</i></p> <p>Determine</p> <p>THE MEASURE OF AN UNKNOWN ANGLE FORMED BY TWO NON-OVERLAPPING ADJACENT ANGLES GIVEN ONE OR BOTH ANGLE MEASURES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Degree – the measure of an angle where each degree represents $\frac{1}{360}$ of a circle <ul style="list-style-type: none"> ◦ Unit measure labels as “degrees” or with symbol for degrees (°) ◦ Angle measures limited to whole numbers, 0° to 180° • Angle – two rays with a common endpoint (the vertex) • Adjacent Angles – angles that share a common vertex and side | | |

Grade 4

- Complementary angles – two angles whose sum of angle measures equals 90 degrees
- Supplementary angles – two angles whose sum of angle measures equals 180 degrees
- Congruent angles – angles whose angle measurements are equal
- Angle congruency marks – angle marks indicating angles of the same measure
- Decompose and compose angle measures
 - Angle measures up to 360 degrees
 - The angle measure of the whole is the sum of the angle measure of the parts
 - Given the measure of one angle, and the whole, find the measure of the other angle.
 - Given the measure of two angles, find the measure of the whole angle.
 - Given the measure of the whole angle divided equally, find the measure of the equal sized angles
 - Given multiple angle measures, find the missing measure
 - Adjacent angles within two-dimensional figures
 - Angles in context without graphics

Note(s):

- Grade Level(s):
 - Grade 4 introduces determining the measure of an unknown angle formed by two non-overlapping adjacent angles given one or both angle measures.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:

Grade 5**Grade 6**

| Grade 4 | Grade 5 | Grade 6 |
|---|---|--|
| <ul style="list-style-type: none"> ◦ Measuring angles • TxCCRS: <ul style="list-style-type: none"> ◦ III.A. Geometric Reasoning – Figures and their properties ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation | | |
| | Graphing on the Coordinate Plane | |
| | <p>5.8
<i>Geometry and measurement. The student applies mathematical process standards to identify locations on a coordinate plane. The student is expected to:</i></p> | <p>6.11
<i>Measurement and data. The student applies mathematical process standards to use coordinate geometry to identify locations on a plane. The student is expected to:</i>
Readiness Standard</p> |
| | <p>5.8A</p> <p>Describe the key attributes of the coordinate plane, including perpendicular number lines (axes) where the intersection (origin) of the two lines coincides with zero on each number line and the given point (0, 0); the <i>x</i>-coordinate, the first number in an ordered pair, indicates movement parallel to the <i>x</i>-axis starting at the origin; and the <i>y</i>-coordinate, the second number, indicates movement parallel to the <i>y</i>-axis starting at the origin.</p> <p>Supporting Standard</p> <p>Describe</p> <p>THE KEY ATTRIBUTES OF THE COORDINATE PLANE, INCLUDING PERPENDICULAR NUMBER LINES (AXES) WHERE THE INTERSECTION</p> | <p>6.11A</p> <p>Graph points in all four quadrants using ordered pairs of rational numbers.</p> <p>Graph</p> <p>POINTS IN ALL FOUR QUADRANTS USING ORDERED PAIRS OF RATIONAL NUMBERS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where <i>a</i> and <i>b</i> are integers and <i>b</i> ≠ 0, which includes the subsets of integers, whole numbers, and counting (natural) numbers (e.g., -3, 0, 2, $-\frac{1}{2}$, $\frac{11}{7}$, $0.\overline{23}$, etc.). The set of rational numbers is denoted by the symbol Q. |

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(ORIGIN) OF THE TWO LINES COINCIDES WITH ZERO ON EACH NUMBER LINE AND THE GIVEN POINT (0, 0); THE X-COORDINATE, THE FIRST NUMBER IN AN ORDERED PAIR, INDICATES MOVEMENT PARALLEL TO THE X-AXIS STARTING AT THE ORIGIN; AND THE Y-COORDINATE, THE SECOND NUMBER, INDICATES MOVEMENT PARALLEL TO THE Y-AXIS STARTING AT THE ORIGIN

Including, but not limited to:

- Coordinate plane – a two-dimensional plane on which to plot points, lines, and curves
- Perpendicular lines – lines that intersect at right angles to each other to form square corners
- Axes – the vertical and horizontal lines that act as a reference when plotting points on a coordinate plane
- Intersecting lines – lines that meet or cross at a point
- Origin – the starting point in locating points on a coordinate plane
- Quadrants – any of the four areas created by dividing a plane with an x-axis and y-axis
- Attributes of the coordinate plane
 - Two number lines intersect perpendicularly to form the axes, which are used to locate points on the plane.
 - The horizontal number line is called the x-axis.
 - The vertical number line is called the y-axis.
 - The x-axis and the y-axis cross at 0 on both number lines and that intersection is called the origin.

- Various forms of positive and negative rational numbers as ordered pairs
 - Whole numbers
 - Integers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
- Coordinate plane – a two-dimensional plane on which to plot points, lines, and curves
- Axes – the vertical and horizontal lines that act as a reference when plotting points on a coordinate plane
- Intersecting lines – lines that meet or cross at a point
- Origin – the starting point in locating points on a coordinate plane
- Quadrants – any of the four areas created by dividing a plane with an x-axis and y-axis
- Attributes of the coordinate plane
 - Two number lines intersect perpendicularly to form the axes which are used to locate points on the plane
 - The horizontal number line is called the x-axis.
 - The vertical number line is called the y-axis.
 - The x-axis and the y-axis cross at 0 on both number lines and that intersection is called the origin.
 - The ordered pair of numbers corresponding to the origin is (0,0).
 - Four quadrants are formed by the intersection of the x- and y-axes and are labeled counterclockwise with Roman numerals.
 - Iterated units are labeled and shown on

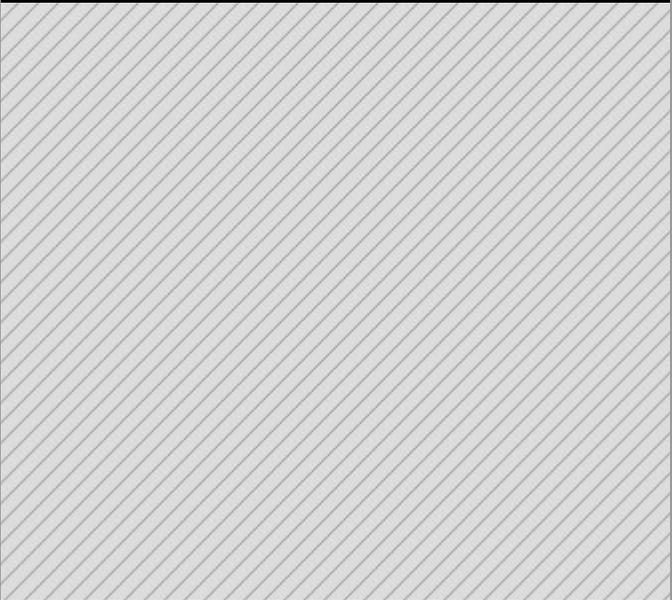
Grade 4**Grade 5****Grade 6**

- The ordered pair of numbers corresponding to the origin is (0, 0).
- Four quadrants are formed by the intersection of the x- and y-axes and are labeled counterclockwise with Roman numerals.
- The first quadrant plots positive rational numbers.
 - Positive numbers on the x-axis are located to the right of the origin.
 - Positive numbers on the y-axis are located above the origin.
- Iterated units are labeled and shown on both axes to show scale.
 - Intervals may or may not be increments of one.
 - Intervals may or may not include decimal or fractional amounts.
- Relationship between ordered pairs and attributes of the coordinate plane
 - A pair of ordered numbers names the location of a point on a coordinate plane.
 - Ordered pairs of numbers are indicated within parentheses and separated by a comma (x, y).
 - When graphing in Quadrant I, the first number in the ordered pair represents the parallel movement on the x-axis, starting at the origin and moving right.
 - When graphing in Quadrant I, the second number in the ordered pair represents the parallel movement on the y-axis, starting at the origin and moving up.

Note(s):

- both axes to show scale.
- Intervals may or may not be increments of one.
- Intervals may or may not include decimal or fractional amounts.
- Relationship between ordered pairs and attributes of the coordinate plane
 - A pair of ordered numbers names the location of a point on a coordinate plane.
 - Ordered pairs of numbers are indicated within parentheses and separated by a comma. (x,y)
 - The first number in the ordered pair represents the parallel movement on the x-axis, left or right starting at the origin.
 - The second number in the ordered pair represents the parallel movement on the y-axis, up or down starting at the origin.
- Process for graphing ordered pairs of numbers on the coordinate plane
 - To locate the x-coordinate, begin at the origin and move to the right or left along the x-axis the appropriate number of units according to the x-coordinate in the ordered pair.
 - To locate the y-coordinate, begin at the origin and move up or down along the y-axis the appropriate number of units according to the y-coordinate in the ordered pair.
 - The point of intersection of both the parallel movements on the x-axis and the y-axis is the location of the ordered pair.

Note(s):

| Grade 4 | Grade 5 | Grade 6 |
|--|--|---|
|  | <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 3 represented fractions of halves, fourths, and eighths as distances from zero on a number line. ◦ Grade 6 will graph points in all four quadrants using ordered pairs of rational numbers. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Organizing, representing, and interpreting sets of data • TxCCRS: <ul style="list-style-type: none"> • IX. Communication and Representation | <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 5 described the key attributes of the coordinate plane, including perpendicular number lines (axes) where the intersection (origin) of the two lines coincides with zero on each number line and the given point (0,0), the x-coordinate, the first number in the ordered pair, indicates movement parallel to the x-axis starting at the origin, the y-coordinate, the second number, indicates movement parallel to the y-axis starting at the origin. ◦ Grade 5 described the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane. ◦ Grade 5 graphed in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, including those generated by number patterns or found in an input-output table. ◦ Grade 8 will use an algebraic representation to explain the effect of a given positive rational scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation. ◦ Grade 8 will explain the effect of translations, reflections over the x- or y-axis, and rotations limited to 90°, 180°, 270°, and 360° as applied to two-dimensional shapes on a coordinate plane using an algebraic representation. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: |
| | <p>5.8B</p> <p>Describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane.</p> <p><i>Supporting Standard</i></p> <p>Describe</p> <p>THE PROCESS FOR GRAPHING ORDERED PAIRS OF NUMBERS IN THE FIRST QUADRANT OF THE COORDINATE PLANE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Coordinate plane – a two-dimensional plane on which to plot points, lines, and curves • Axes – the vertical and horizontal lines that act as a reference when plotting points on a coordinate plane | <ul style="list-style-type: none"> • TxRCFP: |

Grade 4**Grade 5****Grade 6**

- Intersecting lines – lines that meet or cross at a point
- Origin – the starting point in locating points on a coordinate plane
- Quadrants – any of the four areas created by dividing a plane with an x -axis and y -axis
- Attributes of the coordinate plane
 - Two number lines intersect perpendicularly to form the axes, which are used to locate points on the plane.
 - The horizontal number line is called the x -axis.
 - The vertical number line is called the y -axis.
 - The x -axis and the y -axis cross at 0 on both number lines and that intersection is called the origin.
 - The ordered pair of numbers corresponding to the origin is $(0, 0)$.
 - Relationship between ordered pairs and attributes of the coordinate plane
 - A pair of ordered numbers names the location of a point on a coordinate plane.
 - Ordered pairs of numbers are indicated within parentheses and separated by a comma (x, y) .
 - When graphing in Quadrant I, the first number in the ordered pair represents the parallel movement on the x -axis, starting at the origin and moving right.
 - When graphing in Quadrant I, the second number in the ordered pair represents the parallel movement on the y -axis, starting at the origin and moving up.
- Limited to the first quadrant for graphing

- Grade Level Connections (reinforces previous learning and/or provides development for future learning)
- TxCCRS:
 - IX. Communication and Representation
 - X. Connections

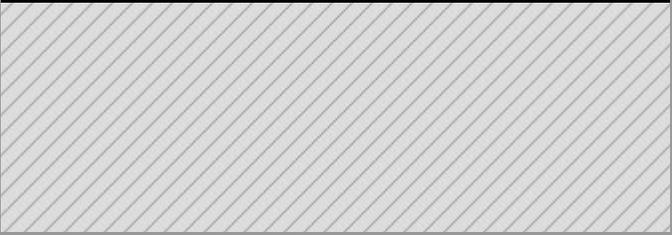
Grade 4**Grade 5****Grade 6**

ordered pairs of positive rational numbers

- Various forms of positive rational numbers as ordered pairs
 - Whole numbers
 - Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Fractions (proper, improper, or mixed numbers with equal or unequal denominators)
- Process for graphing ordered pairs of numbers in the first quadrant
 - To locate the x -coordinate, begin at the origin and move to the right along the x -axis the appropriate number of units according to the x -coordinate in the ordered pair.
 - To locate the y -coordinate, begin at the origin and move up along the y -axis the appropriate number of units according to the y -coordinate in the ordered pair.
 - The point of intersection of both the parallel movements on the x -axis and the y -axis is the location of the ordered pair.
- Multiple ordered pairs may be graphed on the same coordinate plane.

Note(s):

- Grade Level(s):
 - Grade 3 represented fractions of halves, fourths, and eighths as distances from zero on a number line.
 - Grade 6 will graph points in all four quadrants using ordered pairs of rational numbers.
 - Various mathematical process standards will be applied to this student expectation as appropriate.

| Grade 4 | Grade 5 | Grade 6 |
|--|---|---------|
|  | <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Organizing, representing, and interpreting sets of data • TxCCRS: <ul style="list-style-type: none"> • IX. Communication and Representation | |
| | <p>5.8C</p> <p>Graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical and real-world problems, including those generated by number patterns or found in an input-output table.</p> <p><i>Readiness Standard</i></p> <p>Graph</p> <p>IN THE FIRST QUADRANT OF THE COORDINATE PLANE ORDERED PAIRS OF NUMBERS ARISING FROM MATHEMATICAL AND REAL-WORLD PROBLEMS, INCLUDING THOSE GENERATED BY NUMBER PATTERNS OR FOUND IN AN INPUT-OUTPUT TABLE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Coordinate plane – a two-dimensional plane on which to plot points, lines, and curves • Axes – the vertical and horizontal lines that act as a reference when plotting points on a coordinate plane • Intersecting lines – lines that meet or cross at a point • Origin – the starting point in locating points on a coordinate plane • Quadrants – any of the four areas created by | |

Grade 4**Grade 5****Grade 6**

dividing a plane with an x -axis and y -axis

- Attributes of the coordinate plane
 - Two number lines intersect perpendicularly to form the axes, which are used to locate points on the plane.
 - The horizontal number line is called the x -axis.
 - The vertical number line is called the y -axis.
 - The x -axis and the y -axis cross at 0 on both number lines and that intersection is called the origin.
 - The coordinate pair of numbers corresponding to the origin is $(0, 0)$.
 - Relationship between ordered pairs and attributes of the coordinate plane
 - A pair of ordered numbers names the location of a point on a coordinate plane.
 - Ordered pairs of numbers are indicated within parentheses and separated by a comma (x, y) .
 - When graphing in Quadrant I, the first number in the ordered pair represents the parallel movement on the x -axis, starting at the origin and moving right.
 - When graphing in Quadrant I, the second number in the ordered pair represents the parallel movement on the y -axis, starting at the origin and moving up.
- Limited to the first quadrant for graphing ordered pairs of positive rational numbers
- Various forms of positive rational numbers as ordered pairs
 - Whole numbers
 - Decimals (less than and greater than one to

Grade 4**Grade 5****Grade 6**

the tenths, hundredths, and thousandths)

- Fractions (proper, improper, or mixed numbers with equal or unequal denominators)
- Process for graphing ordered pairs of numbers in the first quadrant
 - To locate the x -coordinate, begin at the origin and move to the right along the x -axis the appropriate number of units according to the x -coordinate in the ordered pair.
 - To locate the y -coordinate, begin at the origin and move up along the y -axis the appropriate number of units according to the y -coordinate in the ordered pair.
 - The point of intersection of both the parallel movements on the x -axis and the y -axis is the location of the ordered pair.
- Multiple ordered pairs may be graphed on the same coordinate plane.
- Ordered pairs in mathematical and real-world problem situations
- Ordered pairs generated from number patterns or those found in an input-output table

Note(s):

- Grade Level(s):
 - Grade 3 represented fractions of halves, fourths, and eighths as distances from zero on a number line.
 - Grade 6 will graph points in all four quadrants using ordered pairs of rational numbers.
 - Various mathematical process standards will be applied to this student expectation as appropriate.

| Grade 4 | Grade 5 | Grade 6 |
|---|--|---|
| | <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Organizing, representing, and interpreting sets of data • TxCCRS: <ul style="list-style-type: none"> • IX. Communication and Representation | |
| | | |
| Representing Data | | |
| <p>4.9
<i>Data analysis. The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to:</i></p> | <p>5.9
<i>Data analysis. The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to:</i></p> | <p>6.12
<i>Measurement and data. The student applies mathematical process standards to use numerical or graphical representations to analyze problems. The student is expected to:</i></p> |
| | | |
| | | |
| <p>4.9A</p> <p>Represent data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions.</p> <p>Readiness Standard</p> <p>Represent</p> <p>DATA ON A FREQUENCY TABLE, DOT PLOT, OR STEM-AND-LEAF PLOT MARKED WITH WHOLE NUMBERS AND FRACTIONS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers • Decimals (less than or greater than one to the | <p>5.9A</p> <p>Represent categorical data with bar graphs or frequency tables and numerical data, including data sets of measurements in fractions or decimals, with dot plots or stem-and-leaf plots.</p> <p>Supporting Standard</p> <p>Represent</p> <p>CATEGORICAL DATA WITH BAR GRAPHS OR FREQUENCY TABLES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers | <p>6.12A</p> <p>Represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots.</p> <p>Supporting Standard</p> <p>Represent</p> <p>NUMERIC DATA GRAPHICALLY, INCLUDING DOT PLOTS, STEM-AND-LEAF PLOTS, HISTOGRAMS AND BOX PLOTS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction |

| Grade 4 | Grade 5 | Grade 6 |
|--|--|--|
| <p>tenths and hundredths)</p> <ul style="list-style-type: none"> • Fractions (proper, improper, and mixed numbers) • Data – information that is collected about people, events, or objects | <ul style="list-style-type: none"> • Data – information that is collected about people, events, or objects <ul style="list-style-type: none"> ◦ Categorical data – data that represents the attributes of a group of people, events, or objects | $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.). |

Grade 4

- Categorical data – data that represents the attributes of a group of people, events, or objects
- Categorical data may represent numbers or ranges of numbers.
- Numerical data – data that represents values or observations that can be measured and placed in ascending or descending order
- Numerical data can be counted or measured.
- Data representations
- Frequency table – a table to organize data that lists categories and the frequency (number of times) that each category occurs
- Characteristics of a frequency table
 - Title clarifies the meaning of the data represented.
 - Categorical data is represented with labels.
 - Data represented may be objects, events, numbers, or a range of numbers.
 - Tally marks are used to record frequencies.
 - Numbers are used to represent the count of tally marks in each category.
 - Count of tally marks represents the frequency of how often a category occurs.
- Dot plot – a graphical representation to organize data that uses dots (or Xs) to show the frequency (number of times) that each category or number occurs
- Characteristics of a dot plot

Grade 5

- Categorical data may represent numbers or ranges of numbers.
- Data representations
- Bar graph – a graphical representation to organize data that uses solid bars that do not touch each other to show the frequency (number of times) that each category occurs
- Characteristics of a bar graph
 - Title clarifies the meaning of the data represented.
 - Subtitles clarify the meaning of the data represented on each axis.
 - Categorical data is represented with labels.
 - Horizontal or vertical linear arrangement
 - Bars are solid.
 - Bars do not touch.
 - Scale of the axis may be intervals of one or more, and scale intervals are proportionally displayed.
 - The scale of the axis is a number line.
 - Length of the bar represents the number of data points for a given category.
 - Length the bar represents the distance from zero on the scale of the axis.
 - Value of the data represented by the bar is determined by reading the number associated with its length (distance from zero) on the axis scale.
- Frequency table – a table to organize data that lists categories and the frequency (number of times) that each category

Grade 6

- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
- Data – information that is collected about people, events, or objects
 - Numerical data – data that represents values or observations that can be measured and placed in ascending or descending order
 - Data can be counted (discrete) or measured (continuous).
- Data representations
- Dot plot – a graphical representation to organize data that uses dots (or Xs) to show the frequency (number of times) that each number occurs
- Characteristics of a dot plot
 - Title clarifies the meaning of the data represented.
 - Numerical data is represented with labels and may be whole numbers, fractions, or decimals.
 - Data represented may be numbers.
 - Counts related to numbers represented by a number line.
 - Dots (or Xs) recorded vertically above the line to represent the frequency of each number.
 - Dots (or Xs) generally represent one count. (some plots may include a key)
 - Dots (or Xs) may represent multiple counts if indicated with a key.
 - Density of dots relates to the frequency of distribution of the data.

Grade 4

- Title clarifies the meaning of the data represented.
- Categorical data is represented with labels.
 - When categorical data is used it is orderly and not arbitrary.
- Numerical data is represented with labels and may be whole numbers, fractions, or decimals.
- Data represented may be objects, events, numbers, or a range of numbers.
 - Categories are represented by a line, or number line, labeled with categories.
 - Counts related to numbers represented by a number line.
- Dots (or Xs) recorded vertically above the line to represent the frequency of each category or number.
- Dots (or Xs) generally represent one count.
- Dots (or Xs) may represent multiple counts if indicated with a key.
- Value of the category is determined by the number of dots (or Xs) drawn.
- Density of dots relates to the frequency of distribution of the data.
- Stem-and-leaf plot – a graphical representation used to analyze and compare groups or clusters of numerical data by separating one place value from another place value of a data set. The larger of the two place values is called the stem and the smaller of the two place values is called the leaf.
 - Characteristics of a stem-and-leaf plot

Grade 5

- occurs
- Characteristics of a frequency table
 - Title clarifies the meaning of the data represented.
 - Categorical data is represented with labels.
 - Data represented may be objects, events, numbers, or a range of numbers.
 - Tally marks are used to record frequencies.
 - Numbers are used to represent the count of tally marks in each category.
 - Count of tally marks represents the frequency of how often a category occurs.

Represent**NUMERICAL DATA, INCLUDING DATA SETS OF MEASUREMENTS IN FRACTIONS OR DECIMALS, WITH DOT PLOTS OR STEM-AND-LEAF PLOTS**

Including, but not limited to:

- Whole numbers
- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
- Fractions (proper, improper, and mixed numbers)
- Data – information that is collected about people, events, or objects
 - Numerical data – data that represents values or observations that can be measured and placed in ascending or descending order
 - Data can be counted (discrete) or measured (continuous).

Grade 6

- Stem-and-leaf plot – a graphical representation used to analyze and compare groups or clusters of numerical data by separating one place value from another place value of a data set. The larger of the two place values is called the stem and the smaller of the two place values is called the leaf.
- Characteristics of a stem-and-leaf plot
 - Title clarifies the meaning of the data represented.
 - Numerical data is represented with labels and may be whole numbers, fractions, or decimals.
 - The place value of the stem and leaf is dependent upon the values of data in the set.
 - For decimals and fractions, usually the whole number is the stem and decimal or fractional values are the leaves.
 - For sets of data close in value, usually the stem is represented by the place value of a number before the last digit and the leaves are represented by the last digit in the number.
 - The stem represents one or more piece of data in the set.
 - The leaf represents one piece of data in the set.
 - Density of leaves relates to the frequency of distribution of the data.
- Histogram – a graphical representation of adjacent bars with different heights or lengths used to represent the frequency of

Grade 4

- Characteristics of a stem and leaf plot
 - Title clarifies the meaning of the data represented.
 - Numerical data is represented with labels and may be whole numbers, fractions, or decimals.
 - The place value of the stem and leaf is dependent upon the values of data in the set.
 - For decimals and fractions, usually the whole number is the stem and decimal or fractional values are the leaves.
 - For sets of data close in value, usually the stem is represented by the place value of a number before the last digit and the leaves are represented by the last digit in the number.
 - The stem represents one or more piece of data in the set.
 - The leaf represents one piece of data in the set.
 - Density of leaves relates to the frequency of distribution of the data.

Note(s):

- Grade Level(s):
 - Grade 3 summarized a data set with multiple categories using a frequency table, dot plot, pictograph, or bar graph with scaled intervals.
 - Grade 5 will represent categorical data with bar graphs or frequency tables and numerical data, including data sets of measurements in fractions or decimals, with dot plots or stem and leaf plots.

Grade 5

- Data representations
 - Dot plot – a graphical representation to organize data that uses dots (or Xs) to show the frequency (number of times) that each number occurs
 - Characteristics of a dot plot
 - Title clarifies the meaning of the data represented.
 - Numerical data is represented with labels and may be whole numbers, fractions, or decimals.
 - Data represented may be numbers.
 - Counts related to numbers represented by a number line.
 - Dots (or Xs) recorded vertically above the line to represent the frequency of each number.
 - Dots (or Xs) generally represent one count.
 - Dots (or Xs) may represent multiple counts if indicated with a key.
 - Density of dots relates to the frequency of distribution of the data.
 - Stem-and-leaf plot – a graphical representation used to analyze and compare groups or clusters of numerical data by separating one place value from another place value of a data set. The larger of the two place values is called the stem and the smaller of the two place values is called the leaf.
 - Characteristics of a stem-and-leaf plot
 - Title clarifies the meaning of the data represented.
 - Numerical data is represented with labels and may be whole numbers,

Grade 6

- data in certain ranges of continuous and equal intervals
- Characteristics of a histogram
 - Title clarifies the meaning of the data represented.
 - Numerical data is represented with labels and may be whole numbers, fractions, or decimals.
 - Bars represent certain ranges and equal intervals, and may be on a horizontal or vertical number line.
 - Different heights or lengths correspond to the frequency of the data in that range.
 - The bars of a histogram touch each other, unlike the bars of a bar graph, because the intervals of the numeric data are continuous.
- Box plot (box and whisker plot) – a graphical representation that displays the centers and range of the data distribution on a number line
- Characteristics of a box plot
 - Title clarifies the meaning of the data represented.
 - Numerical data is represented with labels and may be whole numbers, fractions, or decimals.
 - Aligned to a vertical or horizontal number line
 - Data is divided into quartiles using the five-number summary.
 - Minimum
 - Quartile 1 (Q1): median of lower 50% of the data
 - Median

Grade 4

with dot plots or stem-and-leaf plots.

- Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
 - Understanding decimals and addition and subtraction of decimals
 - Building foundations for addition and subtraction of fractions
- TxCCRS:
 - VI.B. Statistical Reasoning – Describe Data
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 5

fractions, or decimals.

- The place value of the stem and leaf is dependent upon the values of data in the set.
 - For decimals and fractions, usually the whole number is the stem and decimal or fractional values are the leaves.
 - For sets of data close in value, usually the stem is represented by the place value of a number before the last digit and the leaves are represented by the last digit in the number.
- The stem represents one or more piece of data in the set.
- The leaf represents one piece of data in the set.
- Density of leaves relates to the frequency of distribution of the data.

Note(s):

Grade 6

- Quartile 3 (Q3): median of the upper 50% of the data
- Maximum
- Interquartile range represented by the difference between Q3 and Q1 (IQR = $Q3 - Q1$)
- Outliers may or may not exist.
 - Outliers calculated as any data point that falls outside of range of 1.5 times the IQR (Outliers = $1.5IQR$) from Q1 and Q3
 - From the lower quartile: $Q1 - 1.5IQR$
 - From the upper quartile: $Q3 + 1.5IQR$
 - Density of quartiles represents the frequency of distribution of the data.

Note(s):

- Grade Level(s):
 - Grade 5 represented categorical data with bar graphs or frequency tables and

| Grade 4 | Grade 5 | Grade 6 |
|---------|--|---|
| | <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 represented data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions. ◦ Grade 6 will represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Organizing, representing, and interpreting sets of data • TxCCRS: <ul style="list-style-type: none"> ◦ VI.A. Statistical Reasoning – Describe Data ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation | <p>numerical data, including data sets of measurements in fractions or decimals, with dot plots or stem-and-leaf plots.</p> <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding data representation • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IV. Measurement Reasoning ◦ VII. Statistical Reasoning ◦ IX. Communication and Representation |
| | <p>5.9B</p> <p>Represent discrete paired data on a scatterplot.</p> <p><i>Supporting Standard</i></p> <p>Represent</p> <p>DISCRETE PAIRED DATA ON A SCATTERPLOT</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Data – information that is collected about people, events, or objects • Discrete data – data with finite and distinct values, not inclusive of in-between values • Scatterplot – a graphical representation used to display the relationship between discrete | |

Grade 4**Grade 5****Grade 6**

data pairs

- Characteristics of a scatterplot
 - Title clarifies the meaning of the data represented.
 - Subtitles clarify the meaning of data represented on each axis.
 - Numerical data represented with labels may be whole numbers, fractions, or decimals.
 - Points are not connected by a line.
 - Scales of the axes may be intervals of one or more, and scale intervals are proportionally displayed.
 - The scales of the axes are number lines.
- Data pairs are analyzed to find possible relationships between the two sets of data.
 - A pair of numbers is collected to determine if a relationship exists between the two sets of data.
- Various forms of positive rational numbers within related data pairs
 - Whole numbers
 - Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
 - Fractions (proper, improper, and mixed numbers)
- Relationship between related data pairs and ordered pairs graphed in the first quadrant of the coordinate plane
 - Scatterplots consist of an x - and y -axis and a series of points (ordered pairs) to represent data from an observation.
 - Pairs of data are used to form ordered pairs that can be graphed.
- Attributes of the coordinate plane

Grade 4**Grade 5****Grade 6**

- Two number lines intersect perpendicularly to form the axes, which are used to locate points on the plane.
 - The horizontal number line is called the *x*-axis.
 - The vertical number line is called the *y*-axis.
- The *x*-axis and the *y*-axis cross at 0 on both number lines and that intersection is called the origin.
 - The coordinate pair of numbers corresponding to the origin is (0, 0).
- Relationship between ordered pairs and attributes of the coordinate plane
 - A pair of ordered numbers names the location of a point on a coordinate plane.
 - Ordered pairs of numbers are indicated within parentheses and separated by a comma (*x*, *y*).
 - When graphing in Quadrant I, the first number in the ordered pair represents the parallel movement on the *x*-axis, starting at the origin and moving right.
 - When graphing in Quadrant I, the second number in the ordered pair represents the parallel movement on the *y*-axis, starting at the origin and moving up.

Note(s):

- Grade Level(s):
 - Grade 5 introduces representing discrete paired data on a scatterplot.
 - Grade 8 will construct a scatterplot and describe the observed data to address questions of association such as linear,

| Grade 4 | Grade 5 | Grade 6 |
|---------|---|---------|
| | <p>non-linear, and no association between bivariate data.</p> <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Organizing, representing, and interpreting sets of data • TxCCRS: <ul style="list-style-type: none"> ◦ VI.A. Statistical Reasoning – Describe Data ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation | |

Drawing Conclusions and Solving Problems Using Representations of Data

| | | |
|--|--|---|
| <p>4.9
<i>Data analysis. The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to:</i></p> | <p>5.9
<i>Data analysis. The student applies mathematical process standards to solve problems by collecting, organizing, displaying, and interpreting data. The student is expected to:</i></p> | <p>6.13
<i>Measurement and data. The student applies mathematical process standards to use numerical or graphical representations to solve problems. The student is expected to:</i></p> |
|--|--|---|

| | | |
|---|---|--|
| <p>4.9B</p> <p>Solve one- and two-step problems using data in whole number, decimal, and fraction form in a frequency table, dot plot, or stem-and-leaf plot.</p> <p>Supporting Standard</p> <p>Solve</p> <p>ONE- AND TWO-STEP PROBLEMS USING DATA IN WHOLE NUMBER, DECIMAL, AND FRACTION FORM IN A FREQUENCY TABLE, DOT PLOT, OR</p> | <p>5.9C</p> <p>Solve one- and two-step problems using data from a frequency table, dot plot, bar graph, stem-and-leaf plot, or scatterplot.</p> <p>Readiness Standard</p> <p>Solve</p> <p>ONE- AND TWO-STEP PROBLEMS USING DATA FROM A FREQUENCY TABLE, DOT PLOT, BAR GRAPH, STEM-AND-LEAF PLOT, OR</p> | <p>6.13A</p> <p>Interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots.</p> <p>Readiness Standard</p> <p>Interpret</p> <p>NUMERIC DATA SUMMARIZED IN DOT PLOTS, STEM-AND-LEAF PLOTS, HISTOGRAMS, AND BOX PLOTS</p> <p>Including, but not limited to:</p> |
|---|---|--|

Grade 4

STEM-AND-LEAF PLOT

Including, but not limited to:

- Whole numbers
- Decimals (less than or greater than one to the tenths and hundredths)
- Fractions (proper, improper, and mixed numbers)
- Addition
 - Sums of whole numbers
 - Sums of decimals up to the hundredths
 - Sums of fractions limited to equal denominators
- Subtraction
 - Differences of whole numbers
 - Differences of decimals with values limited to the hundredths
 - Differences of fractions limited to equal denominators
- Multiplication
 - Products of whole numbers up to two-digit factors by two-digit factors and up to four-digit factors by one-digit factors
- Division
 - Quotients of whole numbers up to four-digit dividends by one-digit divisors
- Data – information that is collected about people, events, or objects
 - Categorical data – data that represents the attributes of a group of people, events, or objects
 - Categorical data may represent numbers or ranges of numbers.
 - Numerical data – data that represents values or observations that can be measured and placed in ascending or

Grade 5

SCATTERPLOT

Including, but not limited to:

- Whole numbers
- Decimals (less than and greater than one to the tenths, hundredths, and thousandths)
- Fractions (proper, improper, or mixed numbers with equal or unequal denominators)
- Addition
 - Sums of whole numbers
 - Sums of decimals up to the thousandths
 - Sums of fractions with equal and unequal denominators
- Subtraction
 - Differences of whole numbers
 - Differences of decimals with values limited to the thousandths
 - Differences of fractions with equal and unequal denominators
- Multiplication
 - Products of whole numbers up to three-digit factors by two-digit factors
 - Products of decimals limited to three-digit factors by two-digit factors with products to the hundredths
 - Multiply tenths by tenths (e.g., $0.3 \times 0.7 = 0.21$, $1.2 \times 1.2 = 1.44$, $14.3 \times 1.3 = 18.59$, etc.)
 - Multiply tenths by hundredths or vice versa (e.g., $0.5 \times 0.12 = 0.06$, $1.4 \times 0.15 = 0.21$, $21.4 \times 0.45 = 9.63$, etc.)
 - Multiply tenths by thousandths or vice versa (e.g., $0.4 \times 0.125 = 0.05$, $0.125 \times 8.4 = 1.05$, etc.)
 - Multiply whole numbers by tenths, hundredths, and thousandths or vice

Grade 6

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
- Data – information that is collected about people, events, or objects
 - Numerical data – data that represents values or observations that can be measured and placed in ascending or descending order
 - Data can be counted (discrete) or measured (continuous).
- Numeric summaries
 - Mean – average of a set of data found by finding the sum of a set of data and dividing the sum by the number of pieces of data in the set
 - Median – the middle number of a set of data that has been arranged in order from greatest to least or least to greatest
 - Mode of numeric data – most frequent value in a set of data
 - Range – the difference between the greatest number and least number in a set of data
 - May be expressed as a single value or as a range of numbers
 - Interquartile range (IQR) represented by the

Grade 4

descending order

- Numerical data can be counted or measured.
- Data Representations
 - Frequency table – a table to organize data that lists categories and the frequency (number of times) that each category occurs
 - Dot plot – a graphical representation to organize data that uses dots (or Xs) to show the frequency (number of times) that each category or number occurs
 - Stem-and-leaf plot – a graphical representation used to analyze and compare groups or clusters of numerical data by separating one place value from another place value of a data set. The larger of the two place values is called the stem and the smaller of the two place values is called the leaf.
- One- and two-step problem situations using graphical representations

Note(s):

- Grade Level(s):
 - Grade 3 solved one- and two-step problems using categorical data represented with a frequency table, dot plot, pictograph, or bar graph with scaled intervals.
 - Grade 5 will solve one- and two-step problems using data from a frequency table, dot plot, bar graph, stem-and-leaf plot, or scatterplot.
 - Various mathematical process standards will be applied to this student expectation as appropriate.

Grade 5

versa (e.g., $3 \times 1.3 = 3.9$, $42 \times 7.45 = 312.9$, $7.02 \times 78 = 547.56$, $6 \times 0.125 = 0.75$, etc.)

- Products of fractions where factors are limited to a fraction and a whole number
- Division
 - Whole numbers with quotients up to four-digit dividends and two-digit divisors
 - Quotients of decimals limited to four-digit dividends and two-digit whole number divisors, with quotients to the hundredths
 - Dividend to the tenths and whole number divisor (e.g., $1.2 \div 24 = 0.05$, $358.8 \div 23 = 15.6$, $721.7 \div 14 = 51.55$, etc.)
 - Dividend to the hundredths and whole number divisor (e.g., $8.68 \div 4 = 2.17$, $8.25 \div 15 = 0.55$, $62.76 \div 12 = 5.23$, etc.)
 - Whole number dividends and whole number divisors (e.g., $3 \div 4 = 0.75$, $10 \div 8 = 1.25$, $1000 \div 16 = 62.5$, etc.)
 - Quotients of fractions where dividend and divisors are limited to whole numbers by unit fractions and unit fractions by whole numbers
- Data – information that is collected about people, events, or objects
 - Categorical data – data that represents the attributes of a group of people, events, or objects
 - Categorical data may represent numbers or ranges of numbers.
 - Numerical data – data that represents values or observations that can be measured and placed in ascending or descending order
 - Data can be counted (discrete) or

Grade 6

interquartile range (IQR), represented by the difference between Q3 and Q1 (IQR = Q3 – Q1)

- Usually used only for box plots
- Data representations
 - Dot plot – a graphical representation to organize data that uses dots (or Xs) to show the frequency (number of times) that each number occurs
 - Stem-and-leaf plot – a graphical representation used to analyze and compare groups or clusters of numerical data by separating one place value from another place value of a data set. The larger of the two place values is called the stem and the smaller of the two place values is called the leaf.
 - Histogram – a graphical representation of adjacent bars with different heights or lengths used to represent the frequency of data in certain ranges of continuous and equal intervals
 - Box plot (box and whisker plot) – a graphical representation that displays the centers and range of the data distribution on a number line

Note(s):

- Grade Level(s):
 - Grade 5 solved one- and two-step problems using data from a frequency table, dot plot, bar graph, stem-and-leaf plot, or scatterplot.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Understanding data representation

Grade 4

- TxRCFP:
 - Developing fluency with efficient use of the four arithmetic operations on whole numbers and using this knowledge to solve problems
 - Understanding decimals and addition and subtraction of decimals
 - Building foundations for addition and subtraction of fractions
- TxCCRS:
 - I. Numeric Reasoning
 - VI.B. Statistical Reasoning – Describe Data
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

Grade 5

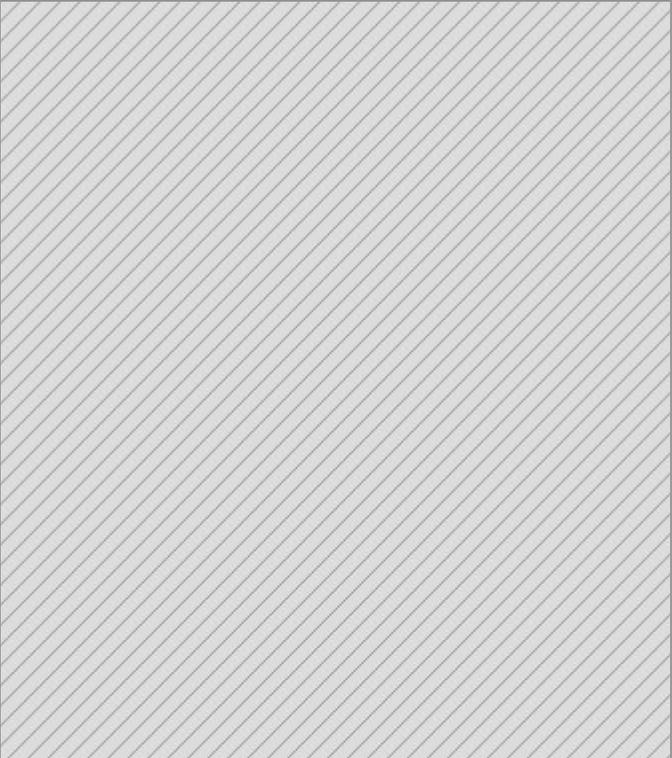
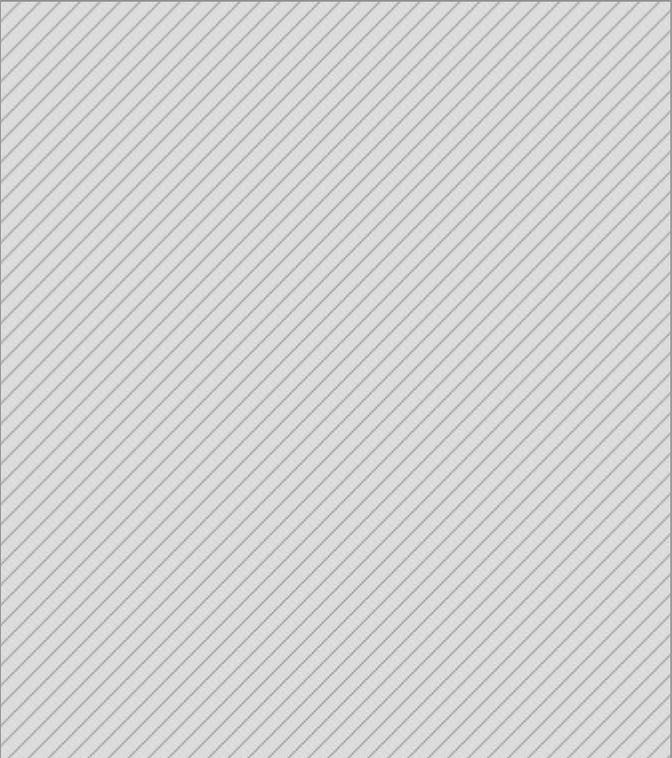
- measured (continuous)
- Discrete data – data with finite and distinct values, not inclusive of in-between values
- Data representations
 - Frequency table – a table to organize data that lists categories and the frequency (number of times) that each category occurs
 - Bar graph – a graphical representation to organize data that uses solid bars that do not touch each other to show the frequency (number of times) that each category occurs
 - Dot plot – a graphical representation to organize data that uses dots (or Xs) to show the frequency (number of times) that each number occurs
 - Stem-and-leaf plot – a graphical representation used to analyze and compare groups or clusters of numerical data by separating one place value from another place value of a data set. The larger of the two place values is called the stem and the smaller of the two place values is called the leaf.
 - Scatterplot – a graphical representation used to display the relationship between discrete data pairs
- One- and two-step problem situations using graphical representations

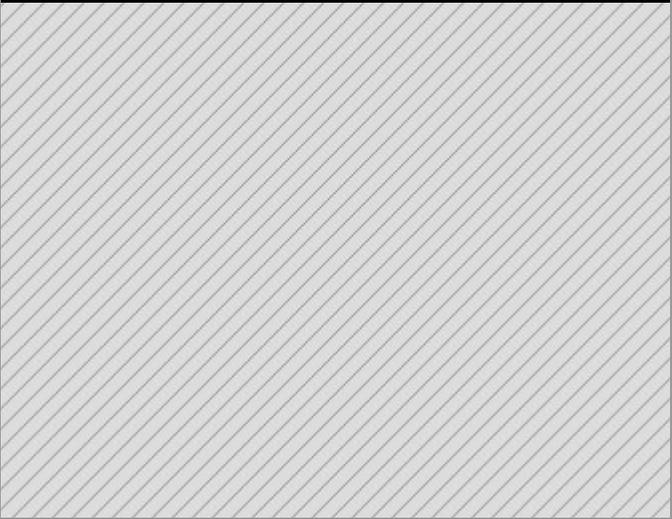
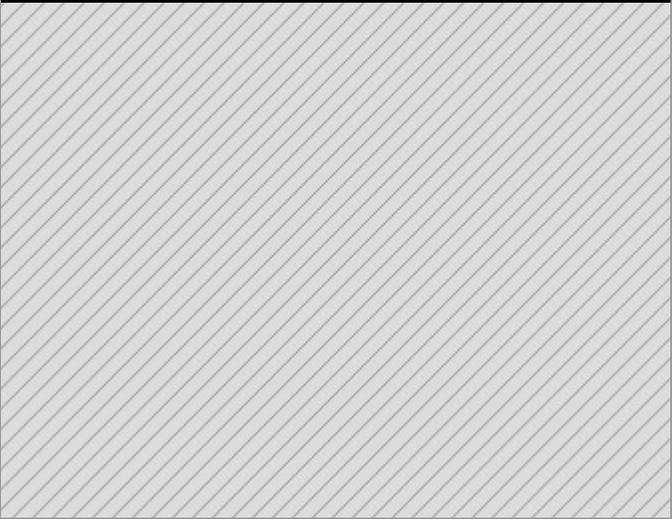
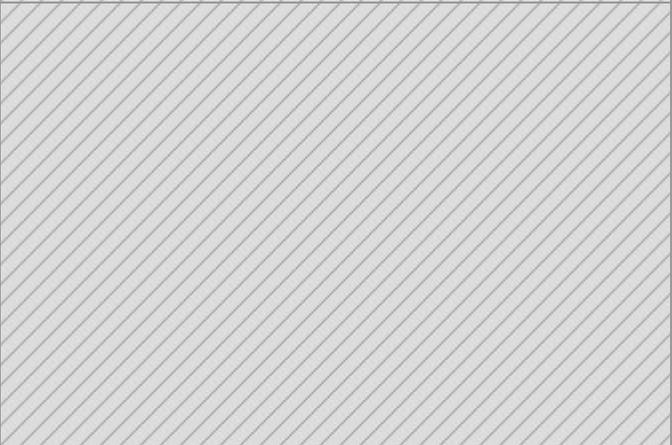
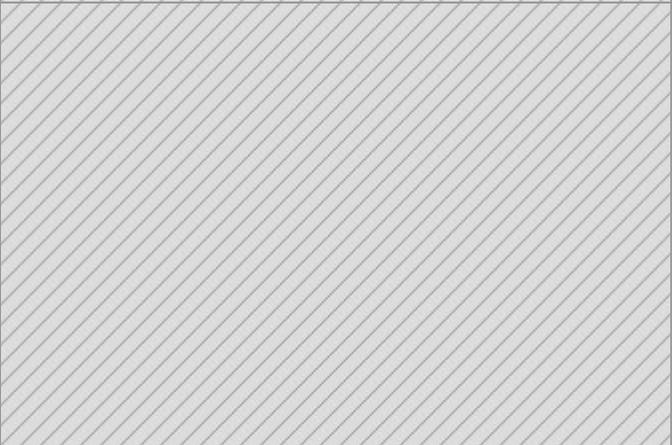
Note(s):

- Grade Level(s):
 - Grade 4 solved solve one- and two-step problems using data in whole number, decimal, and fraction form in a frequency

Grade 6

- Understanding data representation
- TxCCRS:
 - I. Numeric Reasoning
 - IV. Measurement Reasoning
 - VII. Statistical Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation

| Grade 4 | Grade 5 | Grade 6 |
|---|--|--|
| | <p>table, dot plot, or stem-and-leaf plot.</p> <ul style="list-style-type: none"> ◦ Grade 6 will interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Organizing, representing, and interpreting sets of data • TxCCRS: <ul style="list-style-type: none"> ◦ VI.A. Statistical Reasoning – Describe Data ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation | |
|  |  | <p>6.13B</p> <p>Distinguish between situations that yield data with and without variability.</p> <p><i>Supporting Standard</i></p> <p>Distinguish</p> <p>BETWEEN SITUATIONS THAT YIELD DATA WITH AND WITHOUT VARIABILITY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Variability – range, spread of the data • Data with variability can be summarized with a range. • Data without variability can be summarized with a single value. <p>Note(s):</p> |

| Grade 4 | Grade 5 | Grade 6 |
|---|---|---|
|  |  | <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 6 introduces distinguishing between situations that yield data with and without variability. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding data representation • TxCCRS: <ul style="list-style-type: none"> ◦ IV. Measurement Reasoning ◦ VII. Statistical Reasoning ◦ IX. Communication and Representation |
| | | <p>Describing Data Distribution and Drawing Inferences</p> |
| | | <p>6.12
 <i>Measurement and data. The student applies mathematical process standards to use numerical or graphical representations to analyze problems. The student is expected to:</i></p> |
|  |  | <p>6.12B</p> <p>Use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution.</p> <p><i>Supporting Standard</i></p> <p>Use</p> <p>THE GRAPHICAL REPRESENTATION OF NUMERIC DATA TO DESCRIBE THE CENTER,</p> |

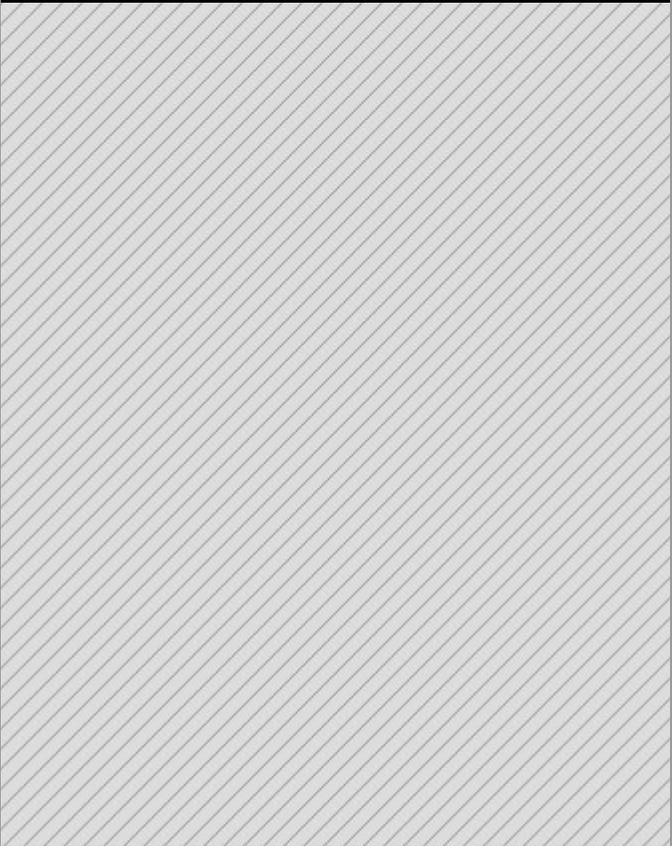
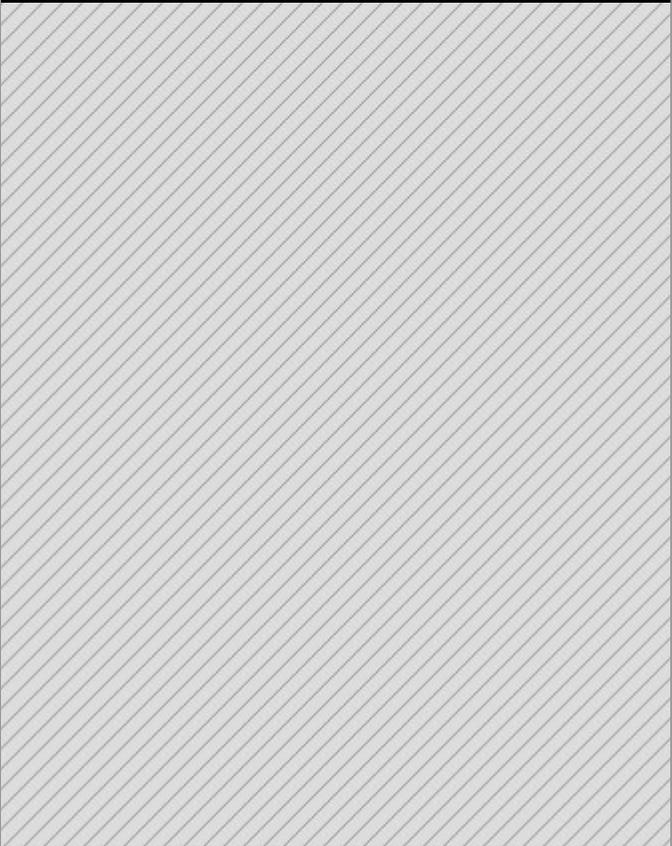
SPREAD, AND SHAPE OF THE DATA DISTRIBUTION

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
- Data – information that is collected about people, events, or objects
 - Numerical data – data that represents values or observations that can be measured and placed in ascending or descending order
 - Data can be counted (discrete) or measured (continuous).
- Center of the data distribution from a graphical representation
 - Mean – average of a set of data found by finding the sum of a set of data and dividing the sum by the number of pieces of data in the set
 - Median – the middle number of a set of data that has been arranged in order from greatest to least or least to greatest
 - Mode – most frequent piece of data in a set of data

Grade 4**Grade 5****Grade 6**

- The mean or median may be used to describe the data distribution if the shape of the data is symmetrical.
- The median may be used to describe the data distribution if the shape of the data is skewed (asymmetrical).
- Spread of the data distribution from a graphical representation
 - Range – the difference between the greatest number and least number in a set of data
 - May be expressed as a single value or as a range of numbers
 - Interquartile range (IQR) represented by the difference between Q3 and Q1 ($IQR = Q3 - Q1$)
 - Usually used only for box plots
- Shape of the data distribution from a graphical representation
 - Skewed right
 - Usually the mean is greater than the median, and the median is greater than the mode.
 - Shape of data when graphed has a tail to the right
 - Symmetric
 - Usually the mean, median, and mode are approximately the same.
 - Shape of data when graphed resembles a bell curve
 - Skewed left
 - Usually the mean is less than the median, and the median is less than the mode.
 - Shape of data when graphed has a tail to the left

| Grade 4 | Grade 5 | Grade 6 |
|--|--|--|
|  |  | <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 6 introduces using the graphical representation of numeric data to describe the center, spread, and shape of the data distribution. ◦ Grade 7 will compare two groups of numeric data using dot plots or box plots by comparing their shapes, centers, and spreads. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding data representation • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IV. Measurement Reasoning ◦ VII. Statistical Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation |
| | | <p>6.12C</p> <p>Summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution.</p> <p><i>Readiness Standard</i></p> <p>Summarize</p> |

Grade 4

Grade 5

Grade 6

NUMERIC DATA WITH NUMERICAL SUMMARIES, INCLUDING THE MEAN AND MEDIAN (MEASURES OF CENTER) AND THE RANGE AND INTERQUARTILE RANGE (IQR) (MEASURES OF SPREAD)

Including, but not limited to:

- Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).
- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
- Data – information that is collected about people, events, or objects
 - Numerical data – data that represents values or observations that can be measured and placed in ascending or descending order
 - Data can be counted (discrete) or measured (continuous).
- Measures of center
 - Mean – average of a set of data found by finding the sum of a set of data and dividing the sum by the number of pieces of data in the set
 - Median – the middle number of a set of data that has been arranged in order from greatest to least or least to greatest

Grade 4**Grade 5****Grade 6**

- Mode – most frequent piece of data in a set of data
- Measures of spread
 - Range – the difference between the greatest number and least number in a set of data
 - May be expressed as a single value or as a range of numbers
 - Interquartile range (IQR) represented by the difference between Q3 and Q1 ($IQR = Q3 - Q1$)
 - Usually used only for box plots

Use

NUMERICAL SUMMARIES TO DESCRIBE THE CENTER, SPREAD, AND SHAPE OF THE DATA DISTRIBUTION

Including, but not limited to:

- Center of the data distribution from numerical summaries
 - Mean
 - Median
 - Mode
 - The mean or median may be used to describe the data distribution if the shape of the data is symmetrical.
 - The median may be used to describe the data distribution if the shape of the data is skewed (asymmetrical).
 - The mean may be greater or less than the median if there are outliers.
- Spread of the data distribution from numerical summaries
 - Range

Grade 4**Grade 5****Grade 6**

- May be expressed as a single value or as a range of numbers
- Interquartile range (IQR)
- The smaller the spread, the closer the data values are to each other.
- The larger the spread, the further the data values are from each other.
- Shape of the data distribution from numerical summaries
 - Skewed right
 - Usually the mean is greater than the median, and the median is greater than the mode.
 - Symmetric
 - Usually the mean, median, and mode are approximately the same.
 - Skewed left
 - Usually the mean is less than the median, and the median is less than the mode.

Note(s):

- Grade Level(s):
 - Grade 6 introduces summarizing numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and using these summaries to describe the center, spread, and shape of the data distribution.
 - Grade 7 will compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads.
 - Various mathematical process standards will be applied to this student expectation

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|---|
| | | <p>as appropriate.</p> <ul style="list-style-type: none"> • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding data representation • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IV. Measurement Reasoning ◦ VII. Statistical Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation |
| | | <p>6.12D</p> <p>Summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution.</p> <p><i>Readiness Standard</i></p> <p>Summarize</p> <p>CATEGORICAL DATA WITH NUMERICAL AND GRAPHICAL SUMMARIES, INCLUDING THE MODE, THE PERCENT OF VALUES IN EACH CATEGORY (RELATIVE FREQUENCY TABLE), AND THE PERCENT BAR GRAPH</p> <p>Including, but not limited to</p> <ul style="list-style-type: none"> • Positive rational numbers – the set of numbers that can be expressed as a fraction $\frac{a}{b}$, where a and b are whole numbers and $b \neq 0$, which includes the subsets of whole numbers and counting (natural) |

Grade 4**Grade 5****Grade 6**

numbers (e.g., 0, 2, $\frac{11}{7}$, $0.\overline{23}$, etc.).

- Various forms of positive rational numbers
 - Whole numbers
 - Decimals (less than or greater than one)
 - Fractions (proper, improper, and mixed numbers)
 - Percents (less than or greater than 100%)
 - Percent – a part of a whole expressed in hundredths
- Data – information that is collected about people, events, or objects
 - Categorical data – data that represents the attributes of a group of people, events, or objects
 - Categorical data may represent numbers or ranges of numbers.
 - Mode of categorical data (modal category) – most frequent category in a set of data
- Data representations
 - Relative frequency table – a table to organize data that lists categories and the frequency (number of times) that each category occurs as a percentage
 - Characteristics of a relative frequency table
 - Title clarifies the meaning of the data represented.
 - Categorical data is represented with labels.
 - Data represented may be objects, events, numbers, or a range of numbers.
 - Data values are calculated by dividing the number of observations in a specific category by the total number of

Grade 4**Grade 5****Grade 6**

observations.

- Data values are represented as percents where all categories together total to 100%.
- Percent bar graph – a graphical representation to organize data that uses solid bars that do not touch each other to show the frequency (number of times) that each category occurs as a percentage as compared to the related part(s) or to the whole
- Characteristics of a percent bar graph
 - Title clarifies meaning of the data being represented.
 - Subtitles clarify the meaning of the data represented on each axis.
 - Categorical data is represented with labels.
 - Horizontal or vertical linear arrangement
 - Bars are solid.
 - Bars do not touch.
 - Bars of graph represent the relative frequency (as a percentage) for each category.
 - May represent part-to-part relationships or part-to-whole relationships
 - Scale of the axis may be intervals of one or more, and scale intervals are proportionally displayed.
 - The scale of the axis is a number line.
 - Length of the bar represents the percentage of data points for a given category.
 - Length the bar represents the distance from zero on the scale of

the axis.

- Value of the data represented by the bar is determined by reading its associated number (the intervals) on the axis scale.

Use

NUMERICAL AND GRAPHICAL SUMMARIES TO DESCRIBE THE DATA DISTRIBUTION

Including, but not limited to:

- Summaries of data distribution
 - Numerical summary
 - Mode appears as the greatest percent for each category in a relative frequency table.
 - Graphical summary
 - The comparative heights or lengths of the category bars can be used to draw conclusions about the data represented.
 - Mode appears as the tallest or longest bar in a percent bar graph.

Note(s):

- Grade Level(s):
 - Grade 6 introduces summarizing categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and using these summaries to describe the data distribution.
 - Grade 7 will compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers,

| Grade 4 | Grade 5 | Grade 6 |
|--|--|---|
| | | <p>and spreads.</p> <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Understanding data representation • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IV. Measurement Reasoning ◦ VII. Statistical Reasoning ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation |
| | | |
| Considering Income and Careers | | |
| <p>4.10
<i>Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:</i></p> | <p>5.10
<i>Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:</i></p> | <p>6.14
<i>Personal financial literacy. The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to:</i></p> |
| <p>4.10A</p> <p>Distinguish between fixed and variable expenses.</p> <p>Supporting Standard</p> <p>Distinguish</p> <p>BETWEEN FIXED AND VARIABLE EXPENSES</p> <p>Including, but not limited to:</p> | <p>5.10A</p> <p>Define income tax, payroll tax, sales tax, and property tax.</p> <p>Supporting Standard</p> <p>Define</p> <p>INCOME TAX, PAYROLL TAX, SALES TAX, AND PROPERTY TAX</p> | |

Grade 4

- Expense – payment for goods and services
 - Fixed expenses – expenses that occur regularly and do not vary month to month
 - Variable expenses – expenses that occur regularly but vary month to month and can usually be controlled by an individual
- Relationship between fixed and variable expenses
 - Some expenses do not change from month to month and some expenses do change each month
 - Some expenses that may be fixed for you may be variable for others

Note(s):

- Grade Level(s):
 - Grade 3 explained the connection between human capital/labor and income.
 - Grade 5 will define income tax, payroll tax, sales tax, and property tax.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Financial Literacy
- TxCCRS:
 - IX. Communication and Representation
 - X. Connections

Grade 5

Including, but not limited to:

- Income tax – money paid on the earned wages of an individual or business for the federal and/or state governments as required by law
 - Income – money earned or received
 - Income tax goes directly to federal government; the state of Texas does not collect income tax.
- Payroll tax – the amount of money that a company withholds from its employees for the federal government as required by law
 - A portion of the wages of each employee is given directly to the federal government.
- Sales tax – the amount of money collected by a store (retailer), in addition to a good or service that was purchased, for the local government as required by law
 - Sales tax is set by the local government (city, county, and state) and the money stays within those local systems.
- Property tax – the amount of money collected on the value of a property for the local government as required by law
 - A portion of the value of the property is given to different levels of local government (city and county).
- Taxes help pay for things the government provides to its citizens.

Note(s):

- Grade Level(s):
 - Grade 4 distinguished between fixed and variable incomes.

Grade 6

| Grade 4 | Grade 5 | Grade 6 |
|---------|---|---|
| | <ul style="list-style-type: none"> ◦ Grade 7 will calculate the sales tax for a given purchase and calculate income tax for earned wages. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Financial Literacy • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections | |
| | <p>5.10B</p> <p>Explain the difference between gross income and net income.</p> <p><i>Supporting Standard</i></p> <p>Explain</p> <p>THE DIFFERENCE BETWEEN GROSS INCOME AND NET INCOME</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Income – money earned or received • Gross income – the total amount of personal income prior to taxes and deductions <ul style="list-style-type: none"> ◦ Individuals pay income tax on their gross income. • Net income – the income that remains after taxes and other deductions are taken from an individual’s gross income <ul style="list-style-type: none"> ◦ Payroll deductions may include federal and state taxes, health insurance, retirement, | <p>6.14H</p> <p>Compare the annual salary of several occupations requiring various levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income.</p> <p><i>Supporting Standard</i></p> <p>Compare</p> <p>THE ANNUAL SALARY OF SEVERAL OCCUPATIONS REQUIRING VARIOUS LEVELS OF POST-SECONDARY EDUCATION OR VOCATIONAL TRAINING</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Salary – a fixed paycheck described as an annual sum that may or may not be dependent on the number of hours worked • Post-secondary education – education that occurs beyond high school, usually at a college or university |

Grade 4**Grade 5****Grade 6**

etc.

- Calculated by subtracting deductions from gross income
- Businesses and self-employed persons pay income tax on their net income.
- Refers to the ending amount a person should expect “take-home” to use for budgeting for other expenses and savings .

Note(s):

- Grade Level(s):
 - Grade 6 will compare the annual salary of several occupations requiring various levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Financial Literacy
- TxCCRS:
 - IX. Communication and Representation
 - X. Connections

- Associate’s degree – a degree usually earned at a community college that is for a specific occupation and can be used towards pursuing a bachelor’s degree
- Bachelor’s degree – a degree usually earned from a four-year college or university by completing undergraduate coursework in a specific field of study
- Master’s degree – an advanced or postgraduate degree that is obtained after receiving a bachelor’s degree and is highly specialized in a specific field or occupation
- Doctoral degree – the most advanced postgraduate degree that is obtained after receiving a bachelor’s and/or master’s degree and is extremely specialized in a specific field or occupation
- Vocational training – training that occurs beyond high school and specializes in a specific field of work (e.g., medical transcriber, mechanic, electrician, welder, etc.) may require state certification and/or a license
- Generalizations of annual salaries of occupations requiring post-secondary or vocational training
 - Annual salaries are usually directly related to the amount of post-secondary or vocational training accumulated.
 - Occupations requiring post-secondary education or vocational training usually offer salaries more than those occupations that do not require post-secondary education or vocational training.

Calculate

Grade 4

Grade 5

Grade 6

THE EFFECTS OF THE DIFFERENT ANNUAL SALARIES ON LIFETIME INCOME

Including, but not limited to:

- Lifetime income
 - Determined by the number of years spent working and the salary earned during those years.
- Generalizations of the effects of salary on lifetime income
 - The more money earned each year, the more money earned in a lifetime.
 - The less money earned each year, the less money earned in a lifetime.
 - Lower annual salaries will require more years of working to equal the lifetime income of those individuals who work fewer years at a higher annual salary.

Note(s):

- Grade Level(s):
 - Grade 5 explained the difference between gross income and net income.
 - Grade 8 will estimate the cost of a two-year and four-year college education, including family contribution, and devise a periodic savings plan for accumulating the money needed to contribute to the total cost of attendance for at least the first year of college.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Financial Literacy

| Grade 4 | Grade 5 | Grade 6 |
|--|---------|---|
| | | <ul style="list-style-type: none"> • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections |
| <p>4.10B</p> <p>Calculate profit in a given situation.</p> <p><i>Supporting Standard</i></p> <p>Calculate</p> <p>PROFIT IN A GIVEN SITUATION</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Whole numbers • Decimals (less than or greater than one to the tenths and hundredths) • Addition <ul style="list-style-type: none"> ◦ Sums of whole numbers ◦ Sums of decimals up to the hundredths • Subtraction <ul style="list-style-type: none"> ◦ Differences of whole numbers ◦ Differences of decimals with values limited to the hundredths • Multiplication <ul style="list-style-type: none"> ◦ Products of whole numbers up to two-digit factors by two-digit factors and up to four-digit factors by one-digit factors • Division <ul style="list-style-type: none"> ◦ Quotients of whole numbers up to four-digit dividends by one-digit divisors • Income – money earned or received • Expense – payment for goods and services • Profit – money that is made in a business | | |

| Grade 4 | Grade 5 | Grade 6 |
|---|---------|---------|
| <p>after all the costs and expenses are paid</p> <ul style="list-style-type: none"> ◦ Profit is calculated by subtracting expenses (or costs) from income: $\text{income} - \text{expenses (costs)} = \text{profit}$ • Determining profit from a single source for income and/or expenses • Determining profit from multiple sources for incomes and/or expenses • Relationship between income, expenses, and profit <ul style="list-style-type: none"> ◦ When income is greater than expenses there is a profit. ◦ When income is less than expenses, there is no profit or the costs exceed the income. <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 3 described the relationship between the availability or scarcity of resources and how that impacts cost. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Financial Literacy • TxCCRS: <ul style="list-style-type: none"> ◦ VIII. Problem Solving and Reasoning ◦ IX. Communication and Representation ◦ X. Connections | | |
| | | |
| Considering Saving and Investing | | |

| Grade 4 | Grade 5 | Grade 6 |
|--|---|--|
| <p>4.10
 <i>Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:</i></p> | <p>5.10
 <i>Personal financial literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:</i></p> | <p>6.14
 <i>Personal financial literacy. The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to:</i></p> |
| <p>4.10C
 Compare the advantages and disadvantages of various savings options.</p> <p>Compare</p> <p>THE ADVANTAGES AND DISADVANTAGES OF VARIOUS SAVINGS OPTIONS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Savings – money set aside for future use • Interest – money received for saving money in a bank account; money paid for borrowing money or making purchases on credit <ul style="list-style-type: none"> ◦ Interest earned from saving <ul style="list-style-type: none"> ◦ Used to encourage people to put money in a bank or credit union or to invest money ◦ Factors that affect the interest earned in a savings account <ul style="list-style-type: none"> • Amount of money deposited in the account • Interest rate • Length of time the money is in the account • Interest rate – price paid for using someone else's money; the price paid to you for someone else to use your money | | |

Grade 4

Grade 5

Grade 6

- Savings options (choices)
 - Savings account – a bank or credit union account in which the money deposited earns interest so there will be more money in the future than originally deposited
 - Advantages of savings accounts
 - Money is easy to access and withdrawal usually does not incur a penalty
 - Low to almost no risk
 - Earns interest
 - Disadvantages of savings accounts
 - Interest rate is usually low
 - Longer time to earn interest on deposits
 - Investing – purchasing something of value (e.g., stocks, bonds, real estate, etc.) with the goal of earning money over time if the value increases
 - Advantages of investing
 - Potential for profit is higher than a savings account
 - Disadvantages of investing
 - Money is sometimes hard to access and/or a penalty is charged for withdrawal
 - Low to high risk depending on the type of investment
 - Potential loss due to economic situations

Note(s):

- Grade Level(s):
 - Grade 3 listed reasons to save and explained the benefit of a savings plan, including for college.

| Grade 4 | Grade 5 | Grade 6 |
|---|---|---|
| <ul style="list-style-type: none"> ◦ Grade 7 will calculate and compare simple interest and compound interest earning. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Financial Literacy • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections | | |
| | | |
| Considering Credit and Debt | | |
| <p>4.10E</p> <p>Describe the basic purpose of financial institutions, including keeping money safe, borrowing money, and lending.</p> <p><i>Supporting Standard</i></p> <p>Describe</p> <p>THE BASIC PURPOSE OF FINANCIAL INSTITUTIONS, INCLUDING KEEPING MONEY SAFE, BORROWING MONEY, AND LENDING</p> | <p>5.10C</p> <p>Identify the advantages and disadvantages of different methods of payment, including check, credit card, debit card, and electronic payments.</p> <p>Identify</p> <p>THE ADVANTAGES AND DISADVANTAGES OF DIFFERENT METHODS OF PAYMENT, INCLUDING CHECK, CREDIT CARD, DEBIT CARD, AND ELECTRONIC PAYMENTS</p> <p>Including, but not limited to:</p> | <p>6.14B</p> <p>Distinguish between debit cards and credit cards.</p> <p><i>Supporting Standard</i></p> <p>Distinguish</p> <p>BETWEEN DEBIT CARDS AND CREDIT CARDS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Debit cards <ul style="list-style-type: none"> ◦ May be used to withdraw money from a |

Grade 4

Including, but not limited to:

- Financial institution – an establishment that focuses on dealing with financial transactions, such as investments, loans, and deposits
- Purposes of financial institutions
 - Take in funds (deposits), pool that money, and lend that money to those who need funds.
 - Keep deposits safe and regulate accounts and transactions according to federal and/or state laws.
 - Provide a place where individuals, businesses, and governments can deposit and borrow money.
 - Serve as agents for depositors (who lend money to the bank) and borrowers (to whom the bank lends money).
 - Depositors and borrowers can be individuals and households, financial and nonfinancial firms, or national and local governments.
 - Keep individual funds available on demand (e.g., checking accounts) or with some restrictions (e.g., savings or investments).
 - Process payments to and from account holders and other financial institutions.

Note(s):

- Grade Level(s):
 - Grade 3 explained that credit is used when wants or needs exceed the ability to pay and that it is the borrower's responsibility to pay it back to the lender, usually with interest.
 - Grade 5 will identify the advantages and

Grade 5

- Check – a written document telling the financial institution to pay a specific amount of money from your account to a specific person or organization
 - Must include date, name of payee (person or organization whom to pay), amount, and a signature from the account holder.
 - Advantages of checks
 - Financial institutions can trace a check to prove your payment was or was not paid.
 - Physical copy of transaction may be obtained if duplicate (carbon copy) checks are used or if electronic scanning from a financial institution is available.
 - Immediate tracking of payments may help to stay within a budget.
 - Payment form for those who do not accept other forms of payment such as credit cards, debit cards, or electronic payments
 - Funds may be received without having a bank account.
 - Funds may be mailed.
 - Disadvantages of checks
 - Checks usually must be purchased.
 - Timing of withdrawals from bank account depends on when the check is cashed by the payee, which may take days or weeks.
 - Fees may be assessed by a financial institution and payee if the value of the check exceeds the available funds in the account and there is not an overdraft protection.
 - Bounced check

Grade 6

- bank account as purchases are made
 - May be used to withdraw cash from a bank account
 - May be used like cash or checks
- Credit cards
 - May be used like personal short-term loans
 - May be used to finance purchases
 - Offer monthly payments that can be paid towards the balance due
 - Charge a fixed or variable interest rate on the monthly balance or type of purchase made
 - May charge other fees associated with the account (e.g., late fees, annual enrollment fees, payment by phone fees, etc.)

Note(s):

- Grade Level(s):
 - Grade 5 identified the advantages and disadvantages of different methods of payment including checks, credit card, debit card, and electronic payments.
 - Grade 8 will solve real-world problems comparing how interest rate and loan length affect the cost of credit.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Financial Literacy
- TxCCRS:
 - IX. Communication and Representation
 - X. Connections

Grade 4

disadvantages of different methods of payment, including check, credit card, debit card, and electronic payments.

- Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Financial Literacy
- TxCCRS:
 - IX. Communication and Representation
 - X. Connections

Grade 5

- Not all retailers accept checks as a form of payment.
- Postage may be required if mailing a check as a form of payment.
- Credit card – a card that can be used to borrow money from financial institutions, stores, or other businesses in order to buy products and services on credit
 - Lending company allows an individual to borrow money and pay it back over time
 - Advantages of credit cards
 - Convenience of not carrying cash, counting change, or writing in a check book
 - Quick form of payment by swiping the card and signing for the purchase
 - Repayment may occur in one payment or over time.
 - Accepted most places as a form of payment
 - Incentives may be offered by the lender (e.g., cash back, frequent flier miles, other reward programs, etc.).
 - Information from credit card use and payments is linked to an individual's credit score to determine future lending.
 - Theft protection may be available if the card is used without authorization from the cardholder.
 - Disadvantages of credit cards
 - Fees may be assessed for using a credit card (e.g., annual membership fees, interest rates on unpaid balances, overdraft, etc.).
 - Spending may be more difficult to track
 - Limits on the amount of money from the

Grade 6

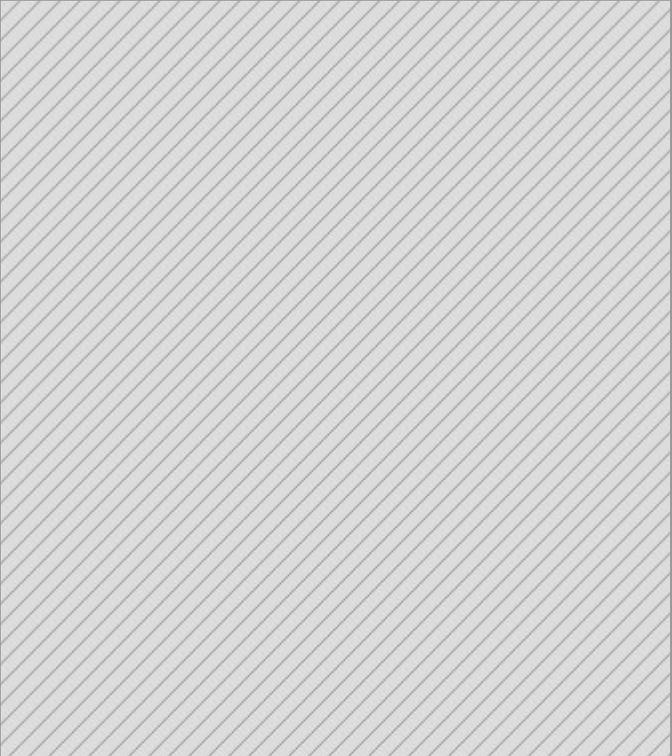
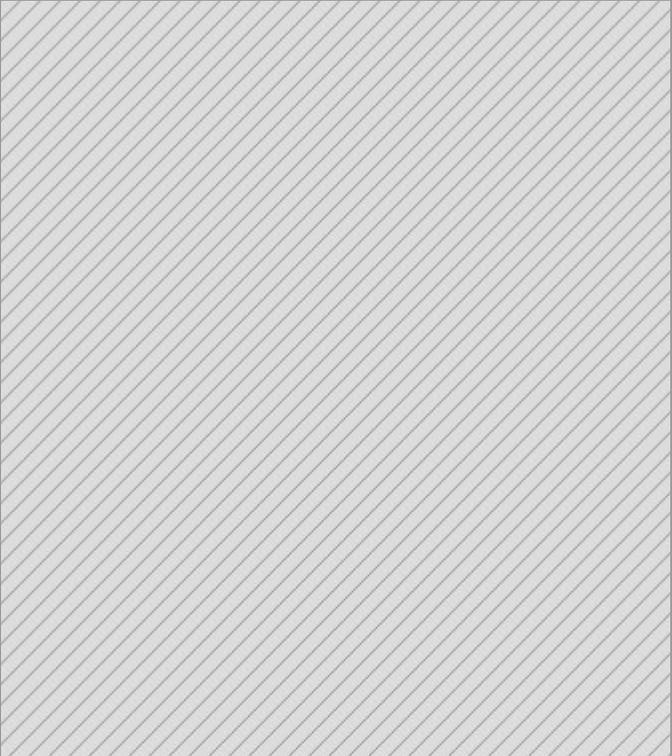
Grade 4**Grade 5****Grade 6**

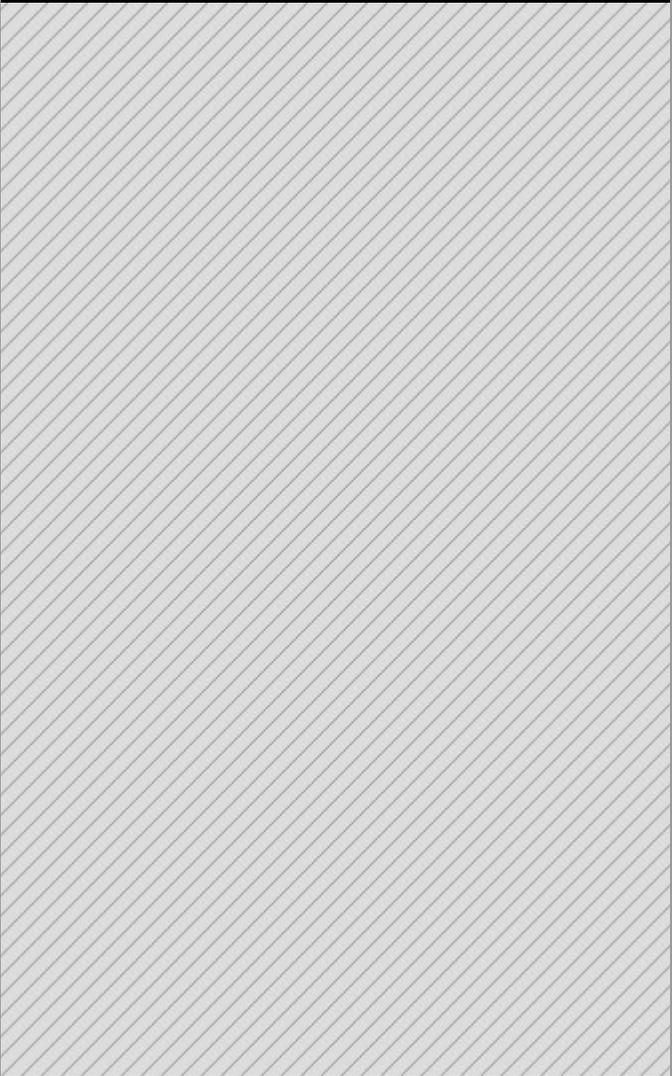
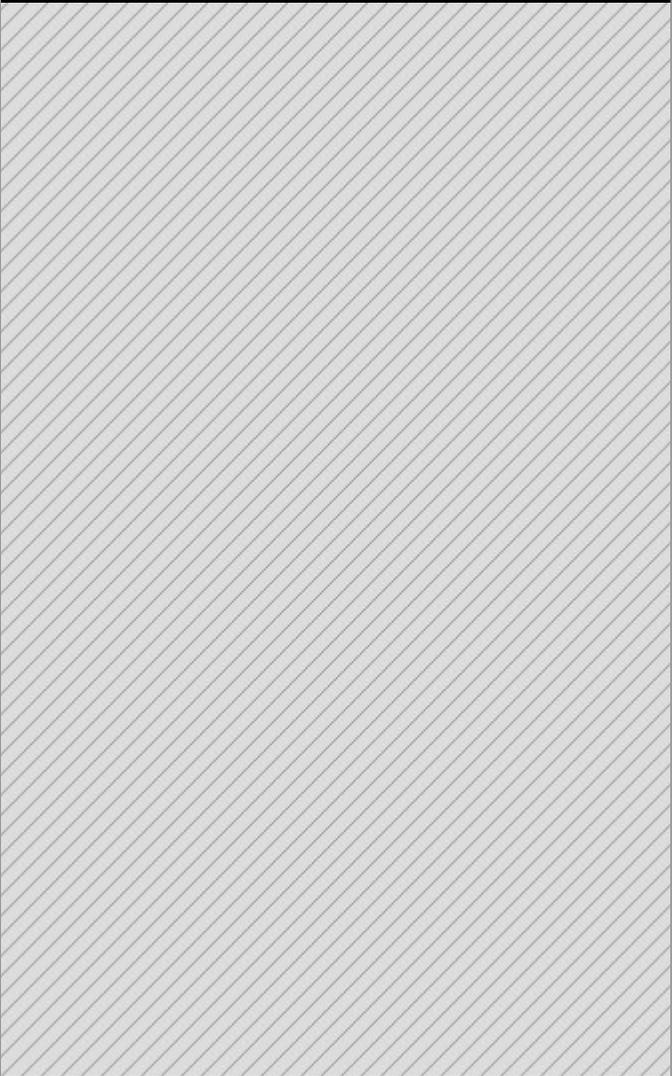
- lender as available credit may limit purchases
- Failure to repay the entire amount borrowed may result in a decrease an individual's credit score to determine future lending and/or legal actions from the lender.
 - Application required for each credit card obtained
 - Not all brands of credit cards are accepted at every location (e.g., American Express, Visa, a store specific credit card, etc.).
 - May not be accepted as a form of payment for certain purchases (e.g., school lunches, bus fair, etc.)
 - Banking information may be compromised if lost or stolen
 - Debit card – a card that is linked to your checking account so that a person can withdraw money, make deposits, or make purchases at a store
 - Advantages of debit cards
 - Convenience of not carrying cash, counting change, or writing in a checkbook
 - Quick form of payment by swiping the card and signing for the purchase or entering a personalized identification code (PIN)
 - Money is withdrawn from account within hours of the purchase
 - Accepted most places
 - No application required
 - Incentives may be offered by the financial institution (e.g., cash back, etc.).

Grade 4**Grade 5****Grade 6**

- Purchases are usually accepted only for amounts of the available balance in the account
- Disadvantages of debit cards
 - Fees may be assessed for withdrawing money from an automated teller machine (ATM).
 - Information is not linked to an individual's credit score.
 - Limits may be set by a financial institution regarding the amount of purchases that can be made within a specific time period (e.g., \$700 within a 24-hour period).
 - Banking information may be compromised if lost or stolen
- Electronic payment (e-payment) – payments using security features on the Internet
 - Various types of electronic payments
 - One-time customer to vendor payment
 - Recurring customer-to-vendor payments
 - Automatic bank-to-vendor payment
 - Advantages of electronic payments
 - Convenience of not carrying cash, counting change, or writing in a check book
 - Quick form of payment by entering banking information
 - No postage needed to mail payment
 - May be set up as reoccurring payment
 - Disadvantages of electronic payments
 - Bank information may be compromised if an unsecure website is used to make a purchase

Note(s):

| Grade 4 | Grade 5 | Grade 6 |
|---|---|--|
| | <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 4 described the basic purpose of financial institutions, including keeping money safe, borrowing money, and lending. ◦ Grade 6 will distinguish between debit cards and credit cards. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Financial Literacy • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections | |
|  |  | <p>6.14D</p> <p>Explain why it is important to establish a positive credit history.</p> <p>Explain</p> <p>WHY IT IS IMPORTANT TO ESTABLISH A POSITIVE CREDIT HISTORY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Credit history <ul style="list-style-type: none"> ◦ Established by the number of open credit accounts, the balances on credit accounts, the number of on-time payments, and the number of credit inquiries for an individual ◦ A positive credit history is established by paying bills and loan payments on time and in full according to the credit agreement. • Importance of a positive credit history <ul style="list-style-type: none"> ◦ Large and/or major purchases (e.g., |

| Grade 4 | Grade 5 | Grade 6 |
|---|---|--|
|  |  | <p>appliances, furniture, automobiles, property) may require approval from a lender.</p> <ul style="list-style-type: none"> ◦ Lenders examine an individual's credit history to determine if they should loan money to the individual. ◦ Positive credit histories may entitle an individual to a lower monthly interest rate than someone without a positive credit history. <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 2 identified examples of borrowing and distinguished between responsible and irresponsible borrowing. ◦ Grade 8 will calculate the total cost of repaying a loan, including credit cards and easy access loans, under various rates of interest and over different periods using an online calculator. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Financial Literacy • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections |
| | | <p>6.14E</p> <p>Describe the information in a credit report and how long it is retained.</p> |

Grade 4

Grade 5

Grade 6

Supporting Standard

Describe

THE INFORMATION IN A CREDIT REPORT AND HOW LONG IT IS RETAINED

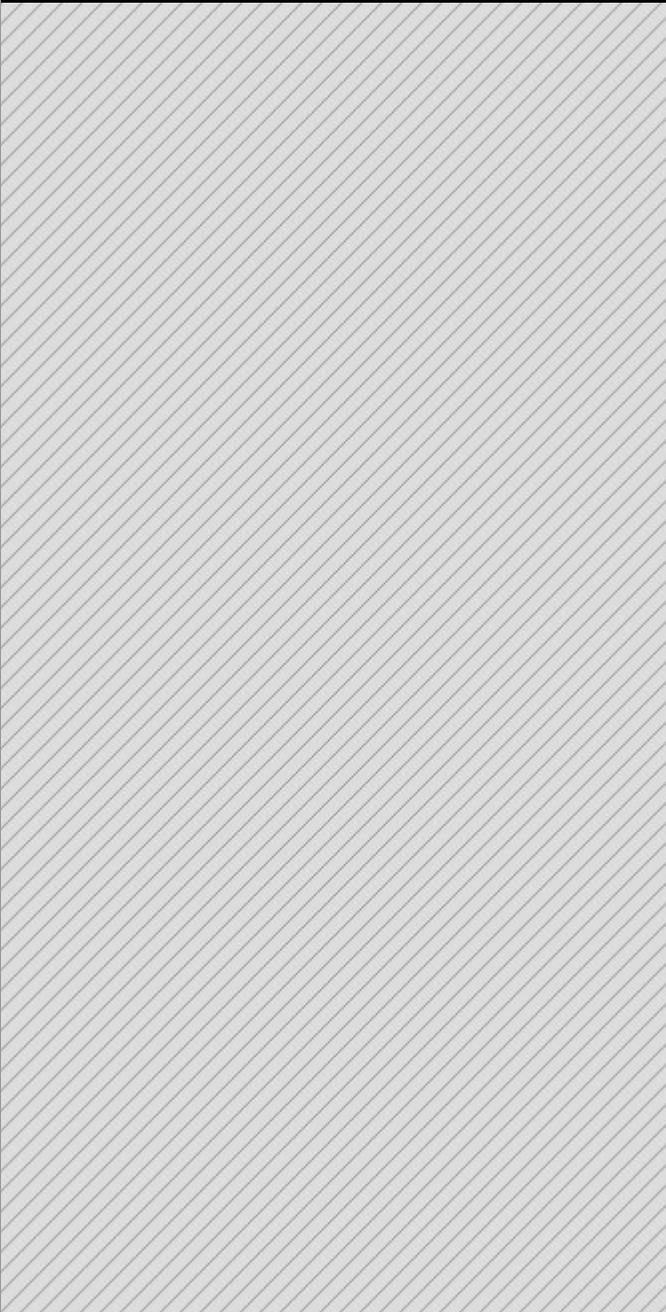
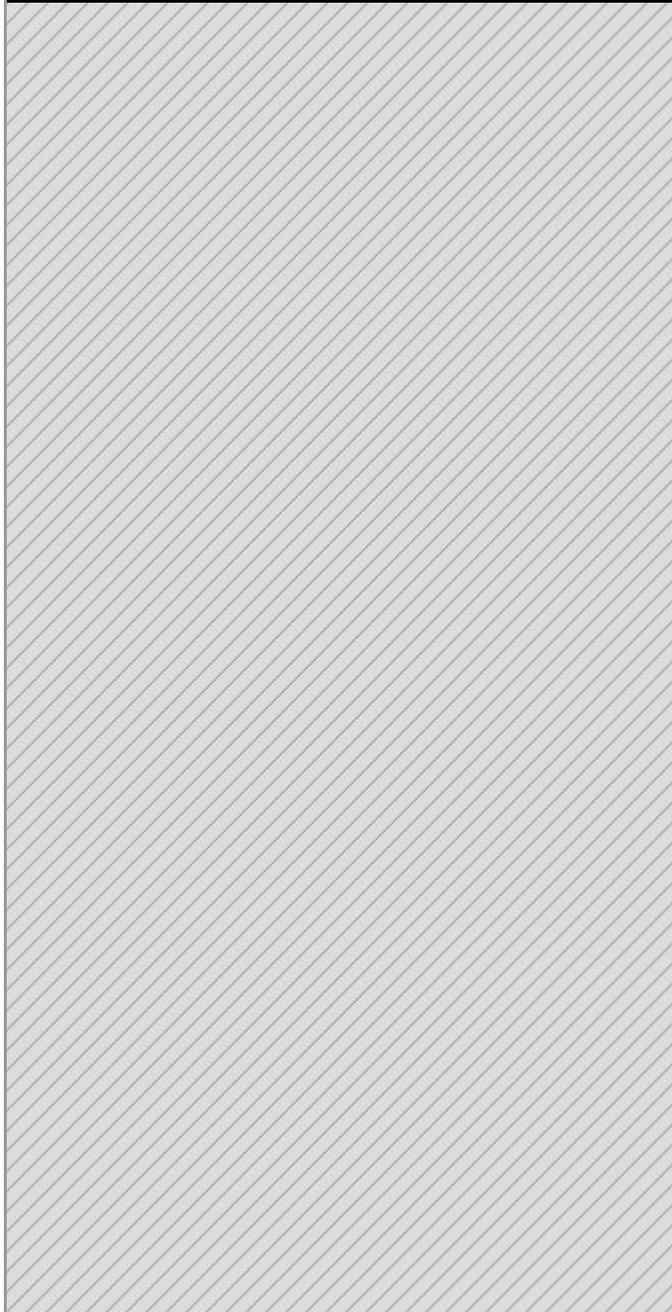
Including, but not limited to:

- Information on a credit report
 - Personal information
 - Full name, and maiden name if applicable
 - Current address and/or previous addresses
 - Social security number
 - Date of birth
 - Driver's license or state identification number
 - Current and/or previous employers
 - Current and previous applications for credit
 - Number of credit inquiries
 - Number of bankruptcies
 - Number of arrests
 - Number of law suits
 - Open accounts
 - All current accounts balances and monthly payments made (e.g., credit cards, personal loans, car loans, medical bills, home mortgages, and any other accounts that require regular payments, etc.)
 - Closed accounts
 - All past accounts that have been paid in full
 - All accounts that have been charged off as bad accounts due to failure of

Grade 4

Grade 5

Grade 6



- payment
- Payment history
 - Number of on time payments
 - Number of early payments
 - Number of late payments
 - Number of payments that have not been made and may have been turned over to collection agencies
- Credit score
 - A three-digit number between 300 and 850 associated with an individual’s credit history and risk calculated by a credit reporting agency (e.g., Equifax, Experian, TransUnion)
- Duration of information retained
 - Most information regarding accounts and payments is retained for 7 years.
 - Bankruptcy may be retained for 10 years.
 - Criminal history may be retained indefinitely.
 - Credit scores are usually updated monthly.

Note(s):

- Grade Level(s):
 - Grade 2 identified examples of borrowing and distinguished between responsible and irresponsible borrowing.
 - Grade 8 will identify and explain the advantages and disadvantages of different payment methods.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Financial Literacy
- TxCCRS:

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|---|
| | | <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections |
| | | <p>6.14G</p> <p>Explain various methods to pay for college, including through savings, grants, scholarships, student loans, and work-study.</p> <p><i>Supporting Standard</i></p> <p>Explain</p> <p>VARIOUS METHODS TO PAY FOR COLLEGE, INCLUDING THROUGH SAVINGS, GRANTS, SCHOLARSHIPS, STUDENT LOANS, AND WORK-STUDY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Savings account – a bank or credit union account in which the money deposited earns interest so there will be more money in the future than originally deposited <ul style="list-style-type: none"> ◦ Traditional savings account – money put into a savings account much like paying a monthly expense such as a light bill or phone bill ◦ Taxable investment account – many companies will create an investment portfolio with the specific purpose of saving and building a strong portfolio to be used to pay for college ◦ Annuity – deductible and non-deductible contributions may be made, taxes may be waived if used for higher education |

Grade 4**Grade 5****Grade 6**

- U.S. savings bond – money saved for a specific length of time and guaranteed by the federal government
- 529 account – educational savings account managed by the state, and is usually tax-deferred
- Grant – money that is awarded to students usually based on need with no obligation to repay this money
- Scholarship – money that is awarded to students based on educational achievement with no obligation to repay this money
- Student loan – borrowed money that must be paid back with interest
 - Direct subsidized federal student loan – a loan issued by the U.S. Government in an amount determined by the college available to undergraduate students who demonstrate a financial need where the U.S. Government pays the interest on the loans while the student is enrolled at least half-time, up to six months after leaving school, or during a requested deferment period
 - Direct unsubsidized federal student loan – a loan issued by the U.S. Government in an amount determined by the college available to undergraduate or graduate students where the interest is paid by the borrower from the time the loan is initiated, even during requested deferment or forbearance periods
 - Private student loan – a loan issued by a lender other than the U.S. Government
- Work study – programs that allow students to work in exchange for a portion of their tuition

| Grade 4 | Grade 5 | Grade 6 |
|---------|---------|--|
| | | <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 2 identified examples of borrowing and distinguished between responsible and irresponsible borrowing. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Financial Literacy • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections |
| | | <p>6.14F</p> <p>Describe the value of credit reports to borrowers and to lenders.</p> <p><i>Supporting Standard</i></p> <p>Describe</p> <p>THE VALUE OF CREDIT REPORTS TO BORROWERS AND TO LENDERS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Value of credit reports to borrowers <ul style="list-style-type: none"> ◦ Positive credit reports show borrower's payment history and ability to pay. ◦ Positive credit reports may lower interest rates for future lending. ◦ Allows borrowers to know their credit rating <ul style="list-style-type: none"> • Inaccurate credit reports may indicate |

| Grade 4 | Grade 5 | Grade 6 |
|---|---|---|
| <p>Grade 4</p> | <p>Grade 5</p> | <p>identity theft or fraud.</p> <ul style="list-style-type: none"> ◦ Poor credit reports help borrowers to determine the accounts and/or information that should be resolved to improve their credit report. • Value of credit report to lenders <ul style="list-style-type: none"> ◦ Allows lenders to determine financial stability and/or financial risk involved with a borrower ◦ Allows lenders to share information about an individual's credit ◦ Allows lenders to view all current and/or past accounts of the borrower along with their payment history <p>Note(s):</p> <ul style="list-style-type: none"> • Grade Level(s): <ul style="list-style-type: none"> ◦ Grade 2 identified examples of lending and used concepts of benefits and costs to evaluate lending decisions. ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Financial Literacy • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections |
| | | <p>Considering Planning and Money Management</p> |
| <p>4.10
<i>Personal financial literacy. The student applies mathematical process standards to manage one's</i></p> | <p>5.10
<i>Personal financial literacy. The student applies mathematical process standards to manage one's</i></p> | <p>6.14
<i>Personal financial literacy. The student applies mathematical process standards to develop an</i></p> |

| Grade 4 | Grade 5 | Grade 6 |
|---|---|--|
| <p><i>financial resources effectively for lifetime financial security. The student is expected to:</i></p> | <p><i>financial resources effectively for lifetime financial security. The student is expected to:</i></p> | <p><i>economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to:</i></p> |
| | | |
| <p>4.10D</p> <p>Describe how to allocate a weekly allowance among spending; saving, including for college; and sharing.</p> <p>Describe</p> <p>HOW TO ALLOCATE A WEEKLY ALLOWANCE AMONG SPENDING; SAVING, INCLUDING FOR COLLEGE; AND SHARING</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Process to allocate (assign or distribute) weekly allowance <ul style="list-style-type: none"> ◦ Set a goal every week for both spending | <p>5.10D</p> <p>Develop a system for keeping and using financial records.</p> <p>Develop</p> <p>A SYSTEM FOR KEEPING AND USING FINANCIAL RECORDS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Financial records – a formal record of the transactions made by a person, business, or other organization <ul style="list-style-type: none"> ◦ May includes deposits, receipts, bills, | <p>6.14A</p> <p>Compare the features and costs of a checking account and a debit card offered by different local financial institutions.</p> <p><i>Supporting Standard</i></p> <p>Compare</p> <p>THE FEATURES AND COSTS OF A CHECKING ACCOUNT AND A DEBIT CARD OFFERED BY DIFFERENT LOCAL FINANCIAL INSTITUTIONS</p> <p>Including, but not limited to:</p> |

Grade 4

and saving.

- Calculate fixed and variable expenses for each week.
- Calculate the desired amount for savings each week.
- The remaining money, after expenses and savings, is allocated for personal spending and/or sharing.
- Reasons to allocate (assign or distribute) weekly allowance
 - Pre-determined spending amounts
 - Ability to earn interest on savings
 - Saving to pay for college
 - Saving to purchase future wants and needs
 - Saving to cover unexpected future expenses

Note(s):

- Grade Level(s):
 - Grade 2 distinguished between a deposit and a withdrawal.
 - Grade 5 will develop a system for keeping and using financial records.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Financial Literacy
- TxCCRS:
 - IX. Communication and Representation
 - X. Connections

Grade 5

invoices, bank statements, etc.

- Retains all accurate and necessary information of a bank account
- Income – money earned or received
- Register – a small table to track deposits added to account, expenses withdrawn from account, and current available balance
 - Manual paper registers are available for maintaining a physical copy of an individual's financial records.
 - Electronic registers and software are available for maintaining an individual's financial records electronically.
- Available balance – the amount available in an account for a person, business, or organization to spend
- Transaction – a specific time or instance when money changes hands
- Record income and expenses in a register
 - Individuals have finite resources (money) and people have to pay for things using their finite amount of money.
 - Registers organize and track the income and expenses within a particular account.
 - Information in a financial record includes the date of purchase or deposit, description of purchase or deposit, amount of deposit or withdrawal, and a running record of available balance.
- Process of recording income and expenses in a register
 - Record an initial available balance and the date.
 - Log each transaction on a separate row of the register with the date, a description of the payee or deposit, and exact amount of

Grade 6

- Features of a checking account offered by financial institutions
 - May charge a monthly service fee
 - Monthly service fee may be waived if a certain balance is maintained.
 - May charge for the cost of the checks
 - Fees for insufficient funds may be assessed if a check is written for more money than is in the account.
 - Fees may vary from \$25 to \$35 dollars per check.
 - Interest may or may not be earned based on the account balance.
 - Interest is generated by multiplying a predetermined percent by the total
- Features of a debit card offered by financial institutions
 - May be used to make purchases, like a check, or can be used to withdraw cash from a bank account
 - Fees may be assessed for withdrawing funds using an automated teller machine (ATM) that is not owned by the bank that issued the debit card.
 - Attached to a checking account
 - May be offered at no charge to the account holder
 - May offer reward points associated for qualifying purchases that can be used for specific goods and/or services
 - May offer a cashback incentive for each qualifying purchase that is paid out annually

Note(s):

- Grade Level(s):

Grade 4**Grade 5**

- the transaction in either the “income” column or the “expense” column.
- Calculate the new available balance for each transaction.
 - For expense transactions, subtract the amount of the expense from the available balance, making a new available balance less each time.
 - For income transactions, add the amount of income to the available balance, making a new available balance more each time.
 - After all income and expense items have been logged and calculated, the last balance at the bottom of the register is the new available balance to be considered for future spending and saving.
 - Budgets based on financial records help people plan and make choices about how to spend and save their money.
 - Transactions can be tracked to determine which products and services are wants and which are needs.
 - Monthly bank statements allow individuals to reconcile their financial records by verifying their recorded transactions and balances with the bank’s record of transactions and balances.

Note(s):

- Grade Level(s):
 - Grade 4 described how to allocate a weekly allowance among spending; saving, including for college; and sharing.
 - Grade 6 will compare the features and costs of a checking account and a debit

Grade 6

- Grade 5 developed a system for keeping and using financial records.
- Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Financial literacy
- TxCCRS:
 - IX. Communication and Representation
 - X. Connections

| Grade 4 | Grade 5 | Grade 6 |
|---------|---|--|
| | <p>card offered by different local financial institutions.</p> <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Financial Literacy • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections | |
| | | <p>6.14C</p> <p>Balance a check register that includes deposits, withdrawals, and transfers.</p> <p><i>Supporting Standard</i></p> <p>Balance</p> <p>A CHECK REGISTER THAT INCLUDES DEPOSITS, WITHDRAWALS, AND TRANSFERS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Deposit – money put into an account • Withdrawal – money taken out of an account • Transfer – money moved from one account to another account <ul style="list-style-type: none"> ◦ A checking account receiving a transfer is considered a deposit. ◦ A checking account transferring money is considered a withdrawal. • Available balance – the amount available in an account for a person, business, or organization to spend |

Grade 4**Grade 5****Grade 6**

- Check register – a small table to keep track of deposits, withdrawals, transfers, and current available balance
- Balance – to reconcile your budget or account statement with your check register to make sure the records match and are accurate
- Process of balancing a check register
 - Record an initial available balance with the date.
 - Log each transaction on a separate row of the register with the date, a description of the payee or deposit, and the exact amount of the transaction in either the “deposit” column or the “withdrawal” column.
 - Calculate the new available balance for each transaction.
 - For withdrawals, subtract the amount of each expense from the available balance, making the new available balance less each time.
 - For deposits, add the amount of each income to the available balance, making the new available balance more each time.
 - After all deposit and withdrawal items have been logged and calculated, the last balance at the bottom of the register is the new available balance to be considered for future spending and saving.

Note(s):

- Grade Level(s):
 - Grade 6 introduces balancing a check register that includes deposits, withdrawals, and transfers.

| Grade 4 | Grade 5 | Grade 6 |
|---------|--|--|
| | | <ul style="list-style-type: none"> ◦ Various mathematical process standards will be applied to this student expectation as appropriate. • TxRCFP: <ul style="list-style-type: none"> ◦ Financial Literacy • TxCCRS: <ul style="list-style-type: none"> ◦ I. Numeric Reasoning ◦ IX. Communication and Representation ◦ X. Connections |
| | <p>5.10E</p> <p>Describe actions that might be taken to balance a budget when expenses exceed income.</p> <p><i>Supporting Standard</i></p> <p>Describe</p> <p>ACTIONS THAT MIGHT BE TAKEN TO BALANCE A BUDGET WHEN EXPENSES EXCEED INCOME</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Balance – to reconcile your budget or account statement with your check register to make sure the records match and are accurate • Available balance – the amount available in an account for a person, business, or organization to spend • Budget – a monthly or yearly spending and savings plan for an individual, family, business, or organization • Income – money earned or received • Expense – payment for goods and services | |

Grade 4**Grade 5****Grade 6**

- Transaction – a specific time or instance when money changes hands
- Register – a small table to track deposits added to account, expenses withdrawn from account, and current available balance
- Individuals have finite resources (money) and people have to pay for things using their finite amount of money.
- Budgets based on financial records help people plan and make choices about how to spend and save their money.
 - Transactions can be tracked to determine which products and services are wants and which are needs.
- Actions to balance a budget
 - Increase the available balance by depositing additional funds into the account.
 - Remove or reduce expenses from the budget that may not be necessary.
- Budget planning should be adhered to closely and include funds allotted for unexpected expenses to provide less opportunity for expenses to exceed income.
 - Unexpected expenses include car repairs, emergency healthcare, etc.

Note(s):

- Grade Level(s):
 - Grade 5 introduces describing actions that might be taken to balance a budget when expenses exceed income.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:

| Grade 4 | Grade 5 | Grade 6 |
|---------|--|---------|
| | <ul style="list-style-type: none"> ◦ Financial Literacy • TxCCRS: <ul style="list-style-type: none"> ◦ IX. Communication and Representation ◦ X. Connections | |
| | <p>5.10F</p> <p>Balance a simple budget.</p> <p><i>Supporting Standard</i></p> <p>Balance</p> <p>A SIMPLE BUDGET</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Balance – to reconcile your budget or account statement with your check register to make sure the records match and are accurate • Available balance – the amount available in an account for a person, business, or organization to spend • Budget – a monthly or yearly spending and savings plan for an individual, family, business, or organization. <ul style="list-style-type: none"> ◦ Various categories for a budget may include income, savings, emergencies, household expenses, automobile expenses, etc. ◦ A determined amount must be set for each expense category as a limit. ◦ Income amounts are expected for the budget and do not have a limit. • Transaction – a specific time or instance | |

Grade 4**Grade 5****Grade 6**

when money changes hands

- Transactions should be recorded with an assigned category to track spending within a budget.
 - The sum of the transactions for a category subtracted from the budgeted amount for the category should be greater than or equal to zero.
- Money remaining in a budget expense category may be rolled over into a savings account or used for other expenditures that are wanted and not necessarily needed.

Note(s):

- Grade Level(s):
 - Grade 5 introduces balancing a simple budget.
 - Grade 7 will identify the components of a personal budget, including income, planned savings for college, retirement, and emergencies, taxes, fixed and variable expenses, and calculate what percentage each category comprises of the total budget.
 - Various mathematical process standards will be applied to this student expectation as appropriate.
- TxRCFP:
 - Financial Literacy
- TxCCRS:
 - I. Numeric Reasoning
 - VIII. Problem Solving and Reasoning
 - IX. Communication and Representation
 - X. Connections

| Grade 4 | Grade 5 | Grade 6 |
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Black text in italics: Knowledge and Skills Statement (TEKS)

Black text: Student Expectation (TEKS)

Red text in italics: Student Expectation identified by TEA as a Readiness Standard for STAAR

Green text in italics: Student Expectation identified by TEA as a Supporting Standard for STAAR

Blue text: Supporting information / Clarifications from TCMPC (Specificity)

Black text: Texas Education Agency (TEA); Texas College and Career Readiness Standards (TxCCRS)