COURSE: Mathematics **LEVEL**: Grade 5 **UNIT/FOCUS**: Decimal Concepts

Desired Results

Related standard(s):

5.NBT.1
5.NBT.3
5.NBT.4

Transfer

Students will be able to independently use their learning to…

- Apply an understanding of the place value system in solving mathematical problems.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Meaning

Enduring Understandings (EUs)	Essential Questions (EQs)
Students will understand that…	*Students will keep considering…*
• A quantity can be represented numerically in various ways. • Place value is important when identifying quantity.	• Why is place value important when communicating quantities? • When is it appropriate to round decimals? • How does rounding influence the estimation process?

Acquisition

Knowledge	Skills
Students will know…	*Students will be able to…*
• In a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left (place value). • A decimal number contains a decimal point. • Place value applies to decimal numbers. • The place value of a digit is given a name (ones, tens, tenths, etc.). • A number line can be used to represent decimals. • Equidistant locations on a number line represent equal values. • "And" is used to separate a whole number and its decimal. • "<" and ">" are used to compare numbers. • "Zeros" can be added to any decimal as place holders. • Rounded numbers are an approximation and make quantities easier to work with.	• Read, write, and compare decimals to thousandths. • Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). • Identify the place value of a digit in a given number. • Determine relative values on a number line. • Determine the value of each division on a number line, given two known endpoint values. • Read and write decimals. • Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. • Order three or more decimals from least to greatest or vice versa. • Use place value understanding to round decimals to any place. • Use rounding to estimate quantities.

TASKS from CCSS for Decimal Concepts

- Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.

COURSE: Mathematics **LEVEL**: Grade 5 **UNIT/FOCUS**: Decimal Computation

Desired Results

Related standard(s):

5.NBT.5
5.NBT.7

Transfer

Students will be able to independently use their learning to…

- Apply an understanding of the place value system in solving mathematical problems.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Meaning

Enduring Understandings (EUs)	Essential Questions (EQs)
Students will understand that…	*Students will keep considering…*
• Computation of quantities containing decimals is dependent on the value of the decimal places.	• How does the number of decimal places in a quantity impact computation of that quantity?

Acquisition

Knowledge	Skills
Students will know…	*Students will be able to…*
• Place value impacts computation with decimals. • The relationship between decimals and money in terms of being part of a whole. • Multiplying by a two digit number is equivalent to multiplying by the number of tens "plus" the number of ones. • When multiplying decimals, the decimal point is "assigned" a place in the product based on how many decimal places are in the numbers being multiplied. • Rules for computation of decimals apply to computation involving money.	• Fluently multiply multi-digit whole numbers using the standard algorithm. • Add, subtract, and multiply decimals to hundredths. • Use concrete models or drawings during decimal computations. • Use strategies based on place value, properties of operations, and/or the relationship between addition and subtraction during decimal computations. • Relate the strategies used during decimal computations to a written method and explain the reasoning used.

TASKS from CCSS for Decimal Computation
N/A

COURSE: Mathematics **LEVEL**: Grade 5 **UNIT/FOCUS**: Division

Desired Results

Related standard(s):

5.NBT.2
5.NBT.6
5.NBT.7
5.NF.3

Transfer

Students will be able to independently use their learning to…

- Perform operations with multi-digit whole numbers and with decimals to hundredths.
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Meaning

Enduring Understandings (EUs)	Essential Questions (EQs)
Students will understand that…	*Students will keep considering…*
• A quantity can be divided in various ways, into a varying number of parts.	• In what ways can I divide a quantity?

Acquisition

Knowledge	Skills
Students will know…	*Students will be able to…*
• When an exponent such as x =2, a^x= a • a, and so on. • The relationship between scientific and standard notation. • Simple divisibility rules. • "Crossing out" is a technique used to divide powers of ten. • The relationship between the dividend, divisor, remainder, and quotient. • Estimating is useful in approaching division problems. • The relationship between the numerator, denominator, and the part of the whole a fraction represents. • A mixed number represents more than "one". • The steps of "long division". • A quotient can be written as a mixed number. • Place value impacts computation with decimals. • When dividing decimals, "rules"(the standard algorithm) prescribe the placement of the decimal in the quotient. • "Zero" acts as a place holder when dividing decimals. • Numerical remainders have "real-life" representations.	• Explain patterns in the number of zeros of the product when multiplying a number by powers of 10. • Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. • Use whole-number exponents to denote powers of 10. • Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors • Find quotients using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. • Illustrate and explain the calculation of quotients by using equations, rectangular arrays, and/or area models. • Divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction • Relate the strategy for dividing decimals to a written method and explain the reasoning used. • Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b).

		• Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

TASKS from CCSS for Division

- Interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4.
- If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?

COURSE: Mathematics **LEVEL**: Grade 5 **UNIT/FOCUS**: Algebraic Concepts

Desired Results

Related standard(s):

5.OA.1
5.OA.2
5.OA.3

Transfer

Students will be able to independently use their learning to…

- Write and interpret numerical expressions.
- Analyze patterns and relationships.
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Meaning

Enduring Understandings (EUs)	Essential Questions (EQs)
Students will understand that…	*Students will keep considering…*
• Symbols are used to communicate quantities or unknowns. • Patterns can be used to solve problems.	• In what ways can I communicate a quantity? • What types of clues are used to detect mathematical patterns?

Acquisition

Knowledge	Skills
Students will know…	*Students will be able to…*
• An expression is like a phrase and names a number. • An equation is a number sentence that describes the relationship between two expressions. • A letter that stands for a number is called a variable. • Length, width, and height, are common variables. • X and Y are common variables. • Order of mathematical operations. • Parenthesis, braces, and brackets can all be used to group expressions. • The relationship between the x and y coordinates within the coordinate plane, and when written as: (x , y). • Number patterns, function tables, and equations can be shown in graphs on a coordinate plane.	• Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. • Write simple expressions that record calculations with numbers. • Interpret numerical expressions without evaluating them. • Generate two numerical patterns using two given rules. • Identify apparent relationships between corresponding terms. • Form ordered pairs consisting of corresponding terms from two patterns, and graph the ordered pairs on a coordinate plane.

	• Standard form for a line: $y = mx + b$.	

TASKS from CCSS for Algebraic Concepts

- Express the calculation "add 8 and 7, then multiply by 2" as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product.
- Given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

COURSE: Mathematics **LEVEL**: Grade 5 **UNIT/FOCUS**: Measurement & Data

Desired Results

Related standard(s):

5.MD.1
5.MD.2
5.MD.3
5.MD.4
5.MD.5

Transfer

Students will be able to independently use their learning to…

- Convert like measurement units within a given measurement system.
- Represent and interpret data.
- Relate volume to multiplication and to addition.
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Meaning

Enduring Understandings (EUs)	Essential Questions (EQs)
Students will understand that…	*Students will keep considering…*
• Line plots can be used to interpret data. • Measurements can be compared and converted.	• In what ways can line plots represent data? • What is the most appropriate unit to use?

Acquisition

Knowledge	Skills
Students will know…	*Students will be able to…*
• A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. • A solid figure which can be packed without gaps or overlaps using "n" unit cubes is said to have a volume of n cubic units. • The names of common items which are right rectangular prisms. • Height, width, and length represent edge measures for a rectangular prism. • The formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms. • Volume is the amount of space an object takes up.	• Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m) • Use conversions in solving multi-step, real world problems. • Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). • Use operations on fractions to solve problems involving information presented in line plots. • Recognize volume as an attribute of solid figures.

	• Volume is additive. • Parallel faces of a rectangular prism can be labeled as a base. • Drawing a picture of rectangular prisms is useful in finding the volume.	• Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units. • Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. • Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. • Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. • Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems. • Recognize volumes as additive. • Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

TASKS from CCSS for Measurement and Data

- Given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

COURSE: Mathematics **LEVEL**: Grade 5 **UNIT/FOCUS**: Fraction Operations

Desired Results

Related standard(s):

5.NF.1
5.NF.2
5.NF.3
5.NF.4
5.NF.5
5.NF.6
5.NF.7

Transfer

Students will be able to independently use their learning to…

- Use equivalent fractions as a strategy to add and subtract fractions.
- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Meaning

Enduring Understandings (EUs)	Essential Questions (EQs)
Students will understand that… • Fractions are used to represent parts of a whole.	*Students will keep considering…* • What are ways in which I can represent parts of a whole?

Acquisition

Knowledge	Skills
Students will know… • A fraction line represents division. • A quantity which is more than "1 whole" can be written as the number of "whole parts" and the fraction of a whole which is left, and is called a mixed number. • A quotient with a remainder can be written as a mixed number. • It is possible to find equivalent parts of "two wholes", even if the "wholes" are divided in different ways. • Using multiples is a tool to help find common denominators. • The relationship between multiples and the least common denominator.	*Students will be able to…* • Add and subtract fractions with unlike denominators, by finding equivalent fractions with like denominators. • Add and subtract mixed numbers with unlike denominators by finding equivalent fractions with like denominators. • Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. • Use visual fraction models or equations to represent word problems.

	• Finding a common denominator makes is easier to compare fractions. • Finding the least common denominator requires the least amount of simplification. • Factors are used to reduce fractions to lowest terms. • There is an algorithm for adding, subtracting, multiplying, and dividing the various fraction forms. • Sometimes "borrowing" is necessary when subtracting mixed numbers. • Sometimes you can simplify prior to multiplying fractions. • Area can be represented by whole units, as well as by fractional units. • Scaling does not have to be based on whole units.	• Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. • Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). • Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers. • Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. • Interpret the product $(a/b) \times q$ as "a" parts of a partition of "q" into "b" equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. • Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. • Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. • Interpret multiplication as scaling (resizing), by comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. • Interpret multiplication as scaling (resizing), by explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case). • Interpret multiplication as scaling (resizing), by explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. • Interpret multiplication as scaling (resizing), by relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1. • Solve real world problems involving multiplication of fractions and mixed numbers, by using visual fraction models or equations to represent the problem. • Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (Division of a fraction by a fraction is NOT a CCSS requirement at grade 5.) • Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. • Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$. • Interpret division of a whole number by a unit fraction, and compute such quotients. • Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, by using visual fraction models and equations to represent the problem.

TASKS from CCSS for Fraction Operations

- Solve: $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)
- Recognize an incorrect result $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.
- Interpret $3/4$ as the result of dividing 3 by 4, noting that $3/4$ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size $3/4$. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?
- Use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.)
- Create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient.
- Create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.
- How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?

COURSE: Mathematics **LEVEL**: Grade 5 **UNIT/FOCUS**: Geometry

Desired Results

Related standard(s):

5.G.1
5.G.2
5.G.3
5.G.4

Transfer

Students will be able to independently use their learning to…

- Graph points on the coordinate plane to solve real-world and mathematical problems.
- Classify two-dimensional figures into categories based on their properties.
- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

Meaning

Enduring Understandings (EUs)	Essential Questions (EQs)
Students will understand that…	*Students will keep considering…*
• Geometric figures have identifying characteristics. • The coordinate plane is a useful tool for representing mathematical problems.	• In what ways can I categorize geometric figures? • In what ways can I use the coordinate plane to represent and solve mathematical problems?

Acquisition

Knowledge	Skills
Students will know…	*Students will be able to…*
• Polygons have distinguishable properties. • Prefixes indicate the number of sides a polygon has. • Regular and irregular polygons are defined by comparing interior angles and side lengths. • Triangles can be classified as equilateral, scalene, and isosceles. • Angles can be classified as acute, obtuse, or right. • Triangles can be classified based on angles or sides. • Quadrilaterals are classified based on angles and sides.	• Distinguish between polygons and non-polygons based on properties. • Classify two-dimensional figures in a hierarchy based on properties. • Classify angles. • Classify polygons as regular or irregular. • Classify triangles based on sides and angles. • Classify quadrilaterals. • Graph points in the first quadrant of the coordinate plane. • Represent real world and mathematical problems by graphing points.

	• Quadrilaterals can be classified as a: parallelogram, trapezoid, rectangle, rhombus, and /or square. • The coordinate plane is a pair of perpendicular number lines, called axes, with the intersection of the lines (called the origin) arranged to coincide with the 0 on each line. • A given point in the plane is located by using an ordered pair of numbers, called its coordinates. • The first number in an ordered pair indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis. • The names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). • Attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. (For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.)	• Interpret coordinate values of points in the context of the situation.

TASKS from CCSS for Geometry
N/A