Dover Area School District Curriculum K-U-D
7th Grade Math

Standards	Eligible Content	Know	Understand	Do
CC.2.1.7.E.1 Apply and extend previous understandings of operations with fractions to operations with rational numbers.	M07.A-N.1.1.1 Apply properties of operations to add and subtract rational numbers, including real-world contexts. M07.A-N.1.1.2 Represent addition and subtraction on a horizontal or vertical number line. M07.A-N.1.1.3 Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats.	negtive sign rational numbers addition subtraction number lines terminating decimal repeating decimal multiplication division	Rational numbers can be estimated, analyzed, and computed using appropriate strategies.	-Determine the operation represented by a real world example. -Solve addition and subtraction problems with rational numbers -Using arrows, model a subtraction or addition problem on a horizontal or vertical number line "-Determine the operation represented by a real world example. -Solve multiplication and division problems with rational numbers -Identify decimals as terminating or repeating based on their characteristics" -When given a ratio of fractions, students can calculate an equivalent unit rate.
CC.2.1.7.D.1 Analyze proportional relationships and use them to model and solve real‐world and mathematical problems.	M07.A-R.1.1.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. Example: If a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2 / 1/4 miles per hour, equivalently 2 miles per hour. M07.A-R.1.1.2 Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, graphing on a coordinate plane and observing whether the graph is a straight line through the origin). M07.A-R.1.1.3 Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. M07.A-R.1.1.4 Represent proportional relationships by equations. Example: If total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn. M07.A-R.1.1.5 Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r), where r is the unit rate. M07.A-R.1.1.6 Use proportional relationships to solve multi-step ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease.	unit rate complex fractions proportional relationships equivalent ratios Reciprocal constant of proportionality origin unit rate proportional relationships origin simple interest tax markups and markdowns gratuities/tip commisions fees percent increase percent decrease	Mathematical relationships and patterns between numbers can be computed, represented, compared, and analyzed.	-When given a ratio of fractions, students can calculate an equivalent unit rate. -Using division, students can test a table to determine if a proportinal relationship exist. -Using the characteristics of a graph (straight line through the origin), students can visually identify if a proportional relationship exists. -Given different representations of data, students will find the constant of proportionality. -Write an equation to represent a proportional relationship using the model formula y=kx. -Given any point on a proportional graph, explain its context -Create and solve a proportion for a specific consumer situation
CC.2.2.7.B.1 Apply properties of operations to generate equivalent expressions.	M07.B-E.1.1.1 Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients. Example 1: The expression 1/2 • (x + 6) is equivalent to 1/2 • x + 3. Example 2: The expression 5.3 – y + 4.2 is equivalent to 9.5 – y (or – y + 9.5). Example 3: The expression 4w – 10 is equivalent to 2(2w – 5).	linear expression coefficents distributive property factor combining like terms	Properties of algebraic expressions are needed to generate equivalent expressions.	Use factoring, distribution, and combining of like terms to write equivalent expressions

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CC.2.2.7.B.3 Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.	M07.B-E.2.1.1 Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. Example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50 an hour (or 1.1 × $25 = $27.50). M07.B-E.2.2.1 Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Example: The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width? M07.B-E.2.2.2 Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers, and graph the solution set of the inequality. Example: A salesperson is paid $50 per week plus $3 per sale. This week she wants her pay to be at least $100. Write an inequality for the number of sales the salesperson needs to make and describe the solutions. M07.B-E.2.3.1 Determine the reasonableness of answer (s) or interpret the solution(s) in the context of the problem. Example: If you want to place a towel bar that is 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	percent decimal fraction convert linear equation inequality reasonableness	Properties of algebraic expressions are needed to analyze, interpret and evaluate equations and inequalities.	-Convert fractions, decimals, and percents to the same form to write an equivalent quantity. -Write and solve equations given a word problem. -Identify opposite operations -Write and solve inequalities given a word problem -Identify the opposite operation -Graph the solution of the inequality -Use estimation to determine if your answer is reasonable. -Identify key details in the problem to interpret the context of the solution
CC.2.3.7.A.2 Visualize and represent geometric figures and describe the relationships between them.	M07.C-G.1.1.1 Solve problems involving scale drawings of geometric figures, including finding length and area. M07.C-G.1.1.2 Identify or describe the properties of all types of triangles based on angle and side measures. M07.C-G.1.1.3 Use and apply the triangle inequality theorem. M07.C-G.1.1.4 Describe the two-dimensional figures that result from slicing three-dimensional figures. Example: Describe plane sections of right rectangular prisms and right rectangular pyramids.	scaled Drawing scaled Copy scale Factor corresponding area perimeter isoceles equilateral scalene acute triangle obtuse triangle right triangle triangle inequality theorem cross section plane section	Geometric relationships can be described, analyzed, evaluated, and classified based on spacial reasoning and/or visualization.	-When given a scale drawing or scale factor, students can find side length and area. -Determine the type of triangle based on its angle and side measures -Given 3 side lengths, determine if they can create a triangle. -Given 2 side lengths, write an inequality to represent the remaining possible side length. -When a 3D figure is sliced at any angle, name the resulting 2D cross section

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CC.2.3.7.A.1 Solve real‑world and mathematical problems involving angle measure, area, surface area, circumference, and volume.	M07.C-G.2.1.1 Identify and use properties of supplementary, complementary, and adjacent angles in a multistep problem to write and solve simple equations for an unknown angle in a figure. M07.C-G.2.1.2 Identify and use properties of angles formed when two parallel lines are cut by a transversal (e.g., angles may include alternate interior, alternate exterior, vertical, corresponding). M07.C-G.2.2.1 Find the area and circumference of a circle. Solve problems involving area and circumference of a circle(s). Formulas will be provided. M07.C-G.2.2.2 Solve real-world and mathematical problems involving area, volume, and surface area of two and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. Formulas will be provided.	supplementary angles complementary angles adjacent angles parallel lines transversal alternate exterior angles alternate interior angles vertical angles corresponding angles circumference radius diameter area circle pi squared square Root area volume surface area triangles quadrilaterals polygons cubes right prisms	Geometric relationships can be described, analyzed, evaluated, and classified based on spacial reasoning and/or visualization.	-Set up equations based on the properties of supplementary, complementary, and adjacent angles -Solve the written equations to find the missing angles -Name given angles -Using angle property knowledge, identify the specific angle relationship created when parallel lines are cut by a tranversal. -Calculate area, circumference, radius, and/or diameter when one of the quantities is given. -Substitute given values into the correct formula to determine the area, volume, or surface area given a two or three dimensional object
CC.2.4.7.B.1 Draw inferences about populations based on random sampling concepts.	M07.D-S.1.1.1 Determine whether a sample is a random sample given a real-world situation. M07.D-S.1.1.2 Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Example 1: Estimate the mean word length in a book by randomly sampling words from the book. Example 2: Predict the winner of a school election based on randomly sampled survey data.	sample random non-random ratio inference population	Data can be modeled and used to make inferences.	-Decide if a sample is random or non-random based on the definition of a random sample. -Using given data, create a comparison (such as a proportion) to infer an unknown value about a population.
CC.2.4.7.B.2 Draw informal comparative inferences about two populations.	M07.D-S.2.1.1 Compare two numerical data distributions using measures of center and variability. Example 1: The mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team. This difference is equal to approximately twice the variability (mean absolute deviation) on either team. On a line plot, note the difference between the two distributions of heights. Example 2: Decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourthgrade science book.	mean median mode range mean absolute deviation measures of center measures of variability	Data can be modeled and used to make inferences.	-Calculate the measures of variability and the measures of center -Interpret the measures of variability and the measures of center in the context of the situation

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CC.2.4.7.B.3 Investigate chance processes and develop, use, and evaluate probability models.	M07.D-S.3.1.1 Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (i.e., a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event). M07.D-S.3.2.1 Determine the probability of a chance event given relative frequency. Predict the approximate relative frequency given the probability. Example: When rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times but probably not exactly 200 times. M07.D-S.3.2.2 Find the probability of a simple event, including the probability of a simple event not occurring. Example: What is the probability of not rolling a 1 on a number cube? M07.D-S.3.2.3 Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation.	certain more likely equally likely less likely impossible relative frequency "probability simple event complement" "independent event compound event tree diagrams"	Data can be analyzed and used to make predictions.	-Decide if an outcome is certain, more likely, equally likely, less likely, or impossible based on the definition of those terms. -Using the given relative frequncy, calculate/predict the approimate amount of times an event will occur. -Calculate the probability of a simple event occuring by comparing the favorable outcomes to the possible outcomes. -Use lists, tables, tree diagrams and simulation to organize the outcomes of independent compound events. -Use the visual representation to find the probability of the event.