



01

Maths - USA

COMMON CORE - GRADE 7



Experience Level: **MIDDLE SCHOOL**



Number of Classes: **VARIABLE**



Age Range: **11 - 12 YEARS**

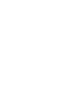
01

Ratios and Proportional Relationships

- Analyze proportional relationships and use them to solve real-world and mathematical problems.
- Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
- Recognize and represent proportional relationships between quantities.
 - Decide whether two quantities are in a proportional relationship
- Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.



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02

01

Ratios and Proportional Relationships (Contd).

- Represent proportional relationships by equations.
- 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.

- Use proportional relationships to solve multistep ratio and percent problems.

02

The Number System

- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
- Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
 - Describe situations in which opposite quantities combine to make 0.
 - Understand $p + q$ as the number located a distance $|q|$ from p , in the positive or negative direction depending on whether q is positive or negative.
 - Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$.
 - Apply properties of operations as strategies to add and subtract rational numbers.
- Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.



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The Number System (Contd).

- Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers.
- Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number.
- Apply properties of operations as strategies to multiply and divide rational numbers.
- Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
- Solve real-world and mathematical problems involving the four operations with rational numbers.

03

Expressions and Equations

- Use properties of operations to generate equivalent expressions.
- Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
 - Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form



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03

Expressions and Equations (Contd.)

- Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
 - Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$
 - Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$

04

Geometry

- Draw, construct, and describe geometrical figures and describe the relationships between them.
- Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
- Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions.
- Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
- Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
 - Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.



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04

Geometry (Contd.)

- Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
- 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.

05

Statistics and Probability

- Use random sampling to draw inferences about a population.
 - Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
- Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions.
- Draw informal comparative inferences about two populations.
 - Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability.



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05

Statistics and Probability (Contd.)

- Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.
- Investigate chance processes and develop, use, and evaluate probability models.
 - Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.
 - Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
 - Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
 - Develop a uniform probability model by assigning equal probability to all outcomes.
 - Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.
 - Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
 - Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
 - Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams.



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