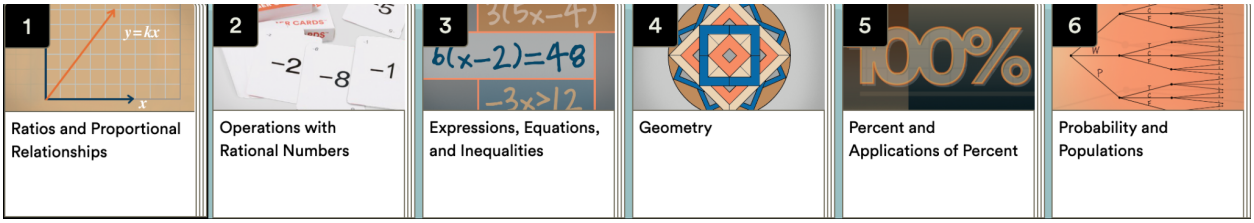
Module Overviews



Module 1: Ratios and Proportional Relationships

In module 1, students apply multiplicative relationships and ratio reasoning to understand proportional relationships and identify them in tables, graphs, equations, and written descriptions. They compare proportional relationships and determine when constant rates indicate proportional relationships. Students connect the constant of proportionality to scale factor, and they use proportionality to identify when figures are truly enlargements or reductions of original figures.

Module 2: Operations with Rational Numbers

In module 2, students extend their knowledge of rational numbers and use patterns and properties of operations to make sense of rational and negative number addition, subtraction, multiplication, and division. Students also use the properties of operations, as well as decomposition and order of operations, to evaluate numerical expressions containing rational numbers.

Module 3: Expressions, Equations, and Inequalities

In module 3, students move from doing familiar work with numerical expressions to determining when algebraic expressions are equivalent. They apply properties of operations—namely the distributive property—as well as the use of tabular models to multiply and factor expressions with rational and negative numbers. Students explore unknown angle measurement contexts to solve equations and move to a new strategy for solving equations: if-then moves. Students use if-then moves or the structure of the equation to solve equations in the forms px+q=r and p⊠(x+q)=r, where p, q, and r are specific rational numbers and in the form a/b=c/d to foreshadow work with proportional reasoning in module 5. Students apply and extend the if-then moves to solving inequalities.

Module 4: Geometry

In module 4, students construct geometric figures by sketching or by using tools and technology. They construct triangles given certain conditions and determine whether triangles

are identical. They discover that at least three conditions are needed to guarantee a unique triangle, but that three angle measures alone do not guarantee a unique triangle. Students explore the proportional relationship between the circumference of a circle and its diameter and formally use pi to determine the circumference of a circle. They use circumference to aid in generalizing the formula for the area of a circle, and determine the area of circles, semicircles and quarter-circles. Students use strategies to find the area of composite figures and determine an efficient strategy to calculate the surface area of three-dimensional solids. They explore the cross sections of three-dimensional solids and use the information to understand how to compose or decompose a three-dimensional solid to calculate its volume more efficiently.

Module 5: Percent and Applications of Percent

In module 5, connection to the learning from previous modules drives the need for students to use percents. Students realize the equation a/b=c/d represents proportional relationships and use proportions and rate language to examine percent as a rate per 100. They identify part, whole, and percent and use proportional reasoning to solve percent problems in real-world contexts, understanding that the unknown could either be part of 100 or more or less than 100%.

Module 6: Probability and Populations

In module 6, students bridge their understanding of proportional relationships to calculating and interpreting probabilities. They find empirical probabilities and compute theoretical probabilities. Students estimate probabilities and observe that the more trials they conduct, the closer an empirical probability should be to the theoretical probability. They further estimate when they learn the importance of random sampling and when they estimate a population proportion by using categorical data from a random sample. Students end the module by comparing populations with similar variability.