

Mathematics Accelerated 6 (9065) Course Overview Curriculum Document

Course Description

Mathematics Accelerated 6 is the first course of the two-course curriculum designed to provide an effective accelerated pathway to Algebra 1. Mathematics Accelerated 6 is a compressed curriculum of the Mathematics 6 and Mathematics 7 curriculum. Mathematics Accelerated 6 begins with a study of area and surface area concepts. This work sets the tone for later units that use area models for arithmetic using rational numbers. Next, students begin study of ratios, rates, and percentages with an introduction using representations such as number line diagrams, tape diagrams, and tables. Student understanding of these concepts expands by exploring fraction and decimal representations of rational numbers. They explore sums, differences, products, and quotients using intuitive methods and efficient algorithms. Next, students are introduced to equations and expressions including finding solutions for linear equations in one variable and basic equations involving exponents. Student understanding of ratios and rates combined with a basic understanding of equations leads students to study proportional relationships with special emphasis on circumference and area of a circle as an example and nonexample of proportional relationships. This is followed by looking at percentage concepts and applications such as sales tax, tipping, and markup. They learn about rational numbers less than zero expanding their understanding of arithmetic to negative numbers. A brief study of data and statistics concludes the new concepts in the course. The last unit offers students an optional opportunity to synthesize their learning from the year using a number of different applications.

Credits

N.A.

Prerequisites

Fifth Grade Math

Board Approved

June 2023

Revised

June 2024

Required Assessments

District-wide, standards-based common summative assessments

Textbooks/Resources

Illustrative Mathematics. (2020). *Middle School Math: Accelerated Grade 6*. Kendall Hunt.

Course Essential Understandings

As a result of successfully completing this course, students will understand that:

- polyhedra nets can be used to determine the surface area
- forming a ratio as a measure of a real-world attribute involves isolating that attribute from other attributes and understanding the effect of changing each quantity on the attribute of interest
- proportional relationships express how quantities change in relationship to each other
- some percentages can be approximated by simple fractions and used to estimate the percent of a number
- rational numbers can be represented in multiple ways and are useful when examining situations involving numbers that are not whole
- numbers in a variety of forms, percentage, fractions, and decimals can be used to solve different problems
- Algebraic expressions and equations can help solve real-world application problems
- inequalities are used in real world problems and can be modeled using number lines and solved using different operations
- graphical representations and statistical representations can be used to make interpretations and predictions about real world situations
- prediction and comparison is a purpose of probability and statistics by evaluating samples, averages, and probability ratios.

Course Relevance Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

- How can I use mathematical reasoning to apply math concepts with real-world context?
- How can the relationship between quantities, how one number compares to another, be used to solve problems?
- When are variables used to stand for numbers that can change or used to stand for a single unknown number?

Unit Overviews

Unit Name	Unit Description	Unit Relevance Question	Instructional Standards	Assessed Standards
Unit 1: Areas	In this unit, students learn to find areas of polygons by decomposing, rearranging, and composing shapes. They learn to understand and use the terms “base” and “height,” and find areas of parallelograms and triangles. Students approximate areas of non-polygonal regions by polygonal regions. They represent polyhedra with nets and find their surface areas. Lessons included: reasoning to find area, parallelograms, triangles, and surface area.	What are area and surface area? How can I use surface area to reason about real-world objects?	M.6.G.A.1 M.6.G.A.2 M.6.G.A.4 M.6.EE.A.2.a M.6.EE.A.2.c	M.6.G.A.1 M.6.G.A M.6.G.A.4
Unit 2: Ratios, Rates, Percentages	In this unit, students learn to understand and use the terms “ratio,” “rate,” “equivalent ratios,” “per,” “at this rate,” “constant speed,” “constant rate,” “unit rate,” “speed,” “pace,” “percent,” and “percentage.” They recognize when two ratios are or are not equivalent and that equivalent ratios have equal unit rates. They represent ratios as expressions, and represent equivalent ratios with double number line diagrams, tape diagrams, and tables. They represent percentages with tables, tape diagrams, and double number line diagrams, and as expressions. They use these terms and representations in reasoning about situations involving unit price, constant speed, measurement conversion, color mixtures, and recipes. Lessons included: what are ratios, representing equivalent ratios, rates, and percentages.	What are ratios? How can I solve real-world problems about ratios and rates?	M.6.RP.A M.6.RP.A.1 M.6.RP.A.2 M.6.RP.A.3 M.6.RP.A.3.a M.6.RP.A.3.b M.6.RP.A.3.c M.6.RP.A.3.d M.6.G.A	M.6.RP.A.1 (mid) M.6.RP.A.2 (mid, end) M.6.RP.A.3 (mid, end) M.6.RP.A.3.b (mid, end) M.6.RP.A.3.c (end) M.6.RP.A.3.d (end)
Unit 3: Unit Rates and Percentages	In the first half of this unit, students examine how the relative sizes of numerator and denominator affect the size of their quotient when numerator or denominator (or both) is a fraction. They acquire the understanding that dividing by $\frac{a}{b}$ has the same outcome as multiplying by b , then by $\frac{1}{a}$. They compute quotients of fractions. In the second half of this unit, students compute sums, differences, products, and quotients of multi-digit whole numbers and decimals, using efficient algorithms. They use calculations with whole numbers and decimals to	What are unit rates and percentages? How can I apply what I have learned about unit rates and percentages to solve problems about percentages?	M.6.NS.A.1 M.6.NS.B M.6.NS.B.2 M.6.NS.B.3 M.6.G.A.1 M.6.G.A.2 M.6.EE.A M.7.RP.A.1	M.6.NS.A.1 (mid) M.6.G.A.2 (mid) M.7.RP.A.1 (mid) M.6.NS.B (end) M.6.NS.B.2 (end) M.6.NS.B.3 (end) M.6.RP.A.3.b (end)

	<p>solve problems set in real-world contexts. Lessons included: making sense of division, dividing fractions, fractions in lengths, areas, and volumes; warming up to decimals, and dividing decimals.</p>			
<p>Unit 4: Equations and Expressions</p>	<p>In this unit, students learn to understand and use the terms “variable,” “coefficient,” “solution,” “equivalent expressions,” “exponent,” “independent variable,” and “dependent variable.” Students begin the unit by working with linear equations that have single occurrences of one variable. They represent relationships with tape diagrams and with linear equations, explaining correspondences between these representations. They examine values that make a given linear equation true or false, and what it means for a number to be a solution to an equation. Lessons included: equations in one variable, equal and equivalent, expressions with exponents, and relationships between quantities.</p>	<p>What are equations and expressions, and how are they used to reason about real-world situations?</p>	<p>M.6.EE.A M.6.EE.A.1 M.6.EE.A.2 M.6.EE.A.2.a, c M.6.EE.A.3 M.6.EE.A.4 M.6.EE.A.2.a M.6.EE.B M.6.EE.B.5 M.6.EE.B.6 M.6.EE.B.7 M.6.EE.C.9 M.6.NS.B.3 M.6.RP.A.1 M.6.RP.A.3.a, b, c M.6.G.A.4</p>	<p>M.6.EE.B.5 (mid) M.6.EE.B.6 (mid) M.6.EE.B.7 (mid) M.6.EE.A.3 (mid, end) M.6.EE.A.2.a (mid) M.6.EE.A.4 (mid, end) M.6.EE.C (mid) M.6.RP.A.3.c (mid) M.6.EE.A.1 (end) M.6.EE.A.2.b (end) M.6.EE.C.9 (end) M.6.RP.A.3.a (end)</p>
<p>Unit 5: Proportional Relationships</p>	<p>In this unit, students develop the idea of a proportional relationship based on the idea of equivalent ratios in an earlier unit. Proportional relationships prepare the way for the study of linear functions in later courses. This unit focuses on understanding what a proportional relationship is, how it is represented, and what types of contexts give rise to proportional relationships. Lessons included: representing proportional relationships with equations, comparing proportional and nonproportional relationships, representing proportional relationships with graphs, circumference of a circle, and area of a circle.</p>	<p>What is proportional relationship and how is it represented?</p>	<p>M.7.NS.A.2.d M.7.RP.A M.7.RP.A.1 M.7.RP.A.2 M.7.RP.A.2.a M.7.RP.A.2.b M.7.RP.A.2.c M.7.G.A M.7.G.A.1 M.7.G.A.2 M.7.G.B.4 M.7.G.B.6</p>	<p>M.7.RP.A.2 M.7.RP.A.2.c M.7.RP.A.2.b M.7.RP.A.2.d M.7.RP.A.3 M.7.G.B.4</p>
<p>Unit 6: Percentage Increase and Decrease</p>	<p>In this unit, students are introduced to signed numbers and plot points in all four quadrants of the coordinate plane for the first time. They extend the operations of addition, subtraction, multiplication, and division from fractions to all rational numbers, written as decimals or in the form $\frac{a}{b}$. Lessons included: negative numbers and absolute value, adding and subtracting rational numbers, the coordinate plane, multiplying and dividing rational numbers, and equations with rational numbers.</p>	<p>How does percent increase and decrease apply to everyday situations?</p>	<p>M.7.RP.A.2 M.7.NS.A.2.d M.7.RP.A.3</p>	<p>M.7.RP.A.1 M.7.RP.A.2 M.7.RP.A.3 M.7.EE.B.3</p>
<p>Unit 7: Rational Numbers</p>	<p>In this unit, students are introduced to signed numbers and plot points in all four quadrants of the coordinate plane for the first time. They extend the operations of addition, subtraction, multiplication, and division from fractions to all rational numbers, written as decimals or in the form $\frac{a}{b}$. Lessons included: negative numbers and absolute value, adding and subtracting rational numbers, the coordinate plane, multiplying and dividing rational numbers, and equations with rational numbers.</p>	<p>What are signed numbers and how are they used to denote changes in the environment (temperature, elevation, sea level, etc)?</p>	<p>M.6.NS.C M.6.NS.C.5 M.6.NS.C.6 M.6.NS.C.6.a, b, c M.6.NS.C.7.a, b M.6.NS.C.7 M.6.NS.C.7.c, d M.6.NS.C.8 M.6.G.A.3 M.7.EE.B.3 M.7.EE.B.4 M.7.EE.B.4.a M.7.NS.A.1 M.7.NS.A.1.a, b, c, d M.7.NS.A.2 M.7.NS.A.2.a, b, c M.7.NS.A.3 M.7.RP.A M.7.RP.A.2</p>	<p>M.6.NS.C.6.c M.6.NS.C.7 M.6.NS.C.8 M.6.G.A.3 M.7.NS.A M.7.NS.A.1 M.7.NS.A.2 M.7.NS.A.3 M.7.EE.B.4.a</p>
<p>Unit 8: Data Sets and Distributions</p>	<p>This unit is an overview of some key statistical concepts. Students are introduced to visual representations of data and their distributions, ways to quantify measures of center and measures of variability, and sampling from a population when access to all of the relevant data is not possible. Lessons included: dot plot and histograms, measures of center and variability, sampling, and probabilities of single step events.</p>	<p>What are data sets and how can I use data? How can the collection, organization, interpretation, and display of data be used to answer questions, solve problems, or make effective predictions?</p>	<p>M.6.SP.A.1 M.6.SP.A.2 M.6.SP.A.3 M.6.SP.B M.6.SP.B.4 M.6.SP.B.5.a, b, c, d M.7.RP.A M.7.SP.A M.7.SP.A.1 M.7.SP.A.2 M.7.SP.B M.7.SP.B.4 M.7.SP.C.5 M.7.SP.C.6 M.7.SP.C.7 M.7.SP.C.7.a M.7.SP.C.8.a, b, c</p>	<p>M.6.RP.A.3.c M.6.SP.A.3 M.6.SP.B.4 M.6.SP.B.5.a M.6.SP.B.5.c M.6.SP.B.5.d M.7.SP.A.1</p>