

Reading Public Schools

Instilling a joy of learning and inspiring the innovative leaders of tomorrow



Mathematics Curriculum Guide

Grade 7

Course Description

In grade 7, students will extend their understanding of ratios and rates and apply this to develop an understanding of proportionality. With this, students will graph proportional relationships and understand unit rate as a measure of steepness of the line, solve a wide variety of proportional relationships problems, with a focus on percent problems, and solve problems involving scale drawings. Students will develop a better understanding of numbers, recognizing fractions, decimals (as repeating or terminating), and percents as different representations of rational numbers. They will study performing addition, subtraction, multiplication, and division operations using all rational numbers. This study will include viewing negative numbers in terms of everyday context. Students will continue to study area and build upon their knowledge solving problems involving area and circumference of a circle and surface area of three-dimensional objects. Also, students will solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. They will begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences. During all these critical areas, students are encouraged to apply their critical thinking through word problems.

Content Standards

Ratios and Proportional Relationships

- Analyze proportional relationships and use them to solve real-world and mathematical problems.

The Number System

- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Statistics and Probability

- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.
- Investigate chance processes and develop, use, and evaluate probability models.

Expressions and Equations

- Use properties of operations to generate equivalent expressions.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Geometry

- Draw, construct and describe geometrical figures and describe the relationships between them.
- Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

Mathematical Practice Standards

- Making sense of problems and persevering in solving them
- Reasoning abstractly and quantitatively
- Constructing viable arguments and critiquing the reasoning of others
- Modeling with mathematics
- Using appropriate tools strategically
- Attending to precision
- Looking for and making use of structure
- Looking for and expressing regularity in repeated reasoning

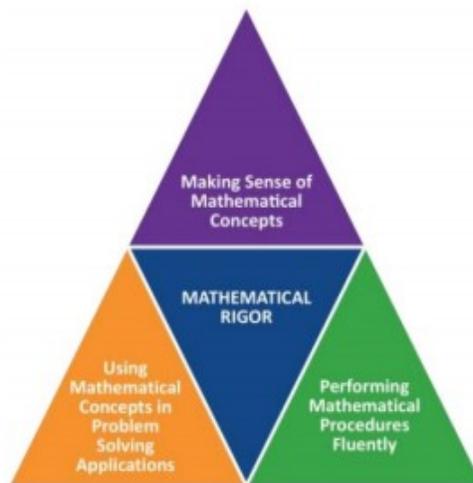


Units	Essential Questions
Integers and Rational Numbers	<ul style="list-style-type: none"> • How do operations with integers relate to the same operations with rational numbers? • How can you determine the correct operation to use to solve problems? • What would happen if reverse the order of rational numbers when performing any operation?
Expressions	<ul style="list-style-type: none"> • How can properties of operations help to generate equivalent expressions that can be used in solving problems?
Equations	<ul style="list-style-type: none"> • How can you solve real-world and mathematical problems with numerical and algebraic equations? • Why are inverse operations important in the equation solving process?
Inequalities	<ul style="list-style-type: none"> • How can you solve real-world and mathematical problems with numerical and algebraic inequalities? • How can you represent solution sets of inequalities on a number line?
Ratios and Rates	<ul style="list-style-type: none"> • How can you represent a relationship between two quantities using ratios and rates? • How do you simplify complex fractions when finding unit rates?
Proportional Relationships	<ul style="list-style-type: none"> • What is the constant of proportionality? • How do you use the constant of proportionality in an equation to solve problems?
Percents	<ul style="list-style-type: none"> • How can percents show proportional relationships between quantities and be used to solve problems? • What are the different ways we can use to find percents? • What types of percents are we finding?
Circles	<ul style="list-style-type: none"> • How are radius and diameter used in finding circumference and what is the relationship?
Angles	<ul style="list-style-type: none"> • What are the major classifications of angles?
Surface Area & Volume	<ul style="list-style-type: none"> • How can you find and compare the areas and volumes of similar solids?
Probability	<ul style="list-style-type: none"> • How can you investigate chance processes, and develop, use, and evaluate probability models? • How are tables, lists, tree diagrams, or simulations used to find the probability of an event? • How is probability used to find the frequency of an event? • How can sampling be used to draw inferences about one or more populations? • What are the different types of sampling and how are what would they represent?

Structures for Learning

During instructional time, students and teachers may be engaged in...

- Whole class instruction
- Small group instruction
- Formative assessments
- Summative assessments
- Performance tasks
- Group projects
- Explorations with technology
- Real-world application problems



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Curriculum Guide Overview

Curriculum Guide

Curriculum guides are public documents aligned with the Massachusetts Department of Education Curriculum Frameworks. They focus on the set of standards that students will learn within certain disciplines at appropriate grade levels. Each area of the curriculum is divided into general strands (broad categories) under which the standards fall. When we discuss “standards-based education” we mean that students are measured against their proficiency and growth towards meeting these standards. Curriculum Guides are intended for teachers, parents, and the wider school community as an overview document of the course of study for the year.

Curriculum Map

Curriculum maps are internal documents utilized as planning tools for teachers. Curriculum maps keep a focus on the end-of-year standards and chart a course for the teaching and learning over the year. They are typically organized in a grade-level overview organized by month or marking period. Curriculum maps typically include; standards and expectations for the grade/content, essential skills/concepts, methods of assessment, and major content resources. Maps are never “done” as ongoing work of educators include revisions, additions, and revisits to the maps. They provide an overview for the year while also allowing educators to see a vertical picture of how the content develops as students progress through each grade.

Standards

The standards used as the foundation of our curriculum come directly from the Massachusetts Department of Education Curriculum Frameworks. State standards may be viewed here: <http://www.doe.mass.edu/frameworks/>

Priority Areas

Priority areas are defined by the state of Massachusetts as the most critical areas in each grade level on which instructional time should focus.

Mathematical Practice Standards

Mathematical Practice Standards are a set of skills/behaviors that are replicated in grades preK-12. These standards describe ways in which students engage with the mathematical content and the level of application grows increasingly complex as students progress vertically throughout their education.

Content Standards

The Content Standards describe what students should know and be able to do once within the area of mathematics.

Essential Questions

Essential questions are questions that are not answerable with an easy answer or a simple instruction. The purpose of essential questions is to provide opportunities for inquiry into the learning and act as an umbrella to anchor the unit/lesson.