Westborough Public Schools Grade 6 Math (2025-2026)

Grade 6 mathematics is about:

(1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems;

(2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers;

(3) writing, interpreting, and using expressions and equations; and

(4) developing understanding of statistical thinking.

Key Areas of Focus for Grade 6: Ratios and proportional reasoning; early expressions and equations

Required Fluency: All facts should be mastered with automaticity and used to solve problems.

Our core curriculum in Grade 6 mathematics is **Eureka Math**. In addition to the core program, we use a variety of other complementary resources including both published materials and district created materials to provide more practice, to differentiate instruction, and to embed more problem solving.

Module 1: Ratios and Unit Rates (Fall)

Purpose of Module: In module 1, students are introduced to ratio reasoning. They use tape diagrams, double number lines, tables, and graphs to model and compare ratio relationships, determine equivalent ratios, and solve real-world problems. Then, students develop an understanding of rates associated with ratio relationships. They calculate unit rates and use them to solve problems involving speed, unit pricing, measurement conversions, and other real-world applications. At the end of the module, students understand a percent as a fraction with a denominator of 100, and they apply their ratio and rate reasoning to solve for the unknown percent, part, or whole in real-world problems.

Family Module Resources by Topic:

- **Topic A:** Reasoning about Ratios *(Topic A Spanish)*
- **Topic B:** Collections of Equivalent Ratios *(Topic B Spanish)*
- **Topic C:** Unit Rates *(Topic C Spanish)*
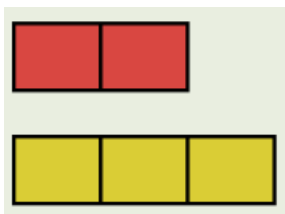- **Topic D:** Percent *(Topic D Spanish)*
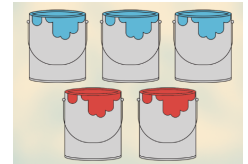
Massachusetts State Standards Addressed in Module 1

6.RP.A.1: Understand the concept of a ratio including the distinctions between part:part and part:whole and the value of a ratio; part/part and part/whole. Use ratio language to describe a ratio relationship between two quantities.

6.RP.A.2: Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship, including the use of units.
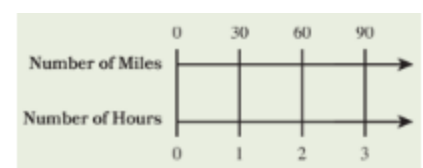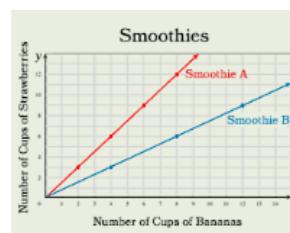
6.RP.A.3: Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

- **6.RP.A.3.a:** Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

- **6.RP.A.3.b:** Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?

- **6.RP.A.3.c:** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

- **6.RP.A.3.d:** Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

Number of Kilograms of Sand	Number of Kilograms of Cement
3	4
6	8
9	12
60	80

×20 ... ×20

Smoothies

Smoothie A

Smoothie B

Number of Cups of Strawberries

Number of Cups of Bananas

|	0	30	60	90
Number of Miles				
Number of Hours	0	1	2	3

Module 2: Arithmetic Operations Including Division of Fractions (Fall)

Purpose of Module: Students begin module 2 by using visual models and an understanding of divisibility to find the greatest common factor and least common multiple of pairs of numbers. Then, students apply their previous understanding of multiplication and division to divide fractions by fractions. They model fraction division expressions with tape diagrams and double number lines, use common denominators to divide fractions by fractions, and then develop and apply the invert and multiply strategy. Students use standard algorithms to fluently add, subtract, and multiply decimals, and apply those skills in real-world applications. They extend their understanding of division from prior grades to use the standard division algorithm to divide multi-digit numbers and decimals.

Family Module Resources by Topic:

- **Topic A:** Dividing Fractions by Fractions *(Topic A Spanish)*
- **Topic B:** Multi-Digit Decimal Operations- Adding, Subtracting, and Multiplying *(Topic B Spanish)*
- **Topic C:** Dividing Whole Numbers and Decimals *(Topic C Spanish)*
- **Topic D:** Number Theory-Thinking Logically About Multiplicative Arithmetic *(Topic D Spanish)*
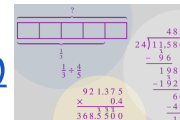
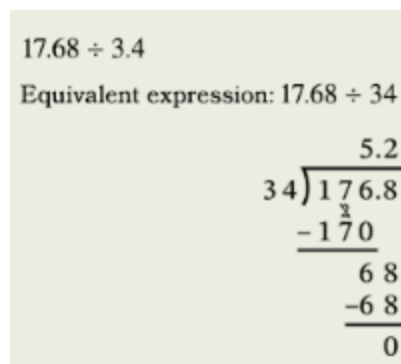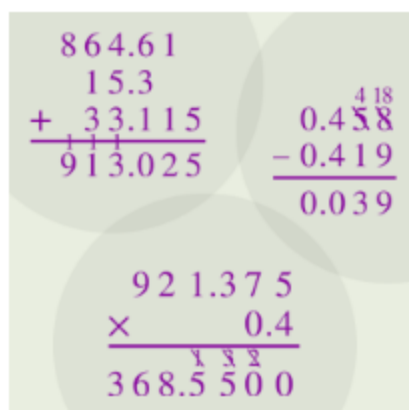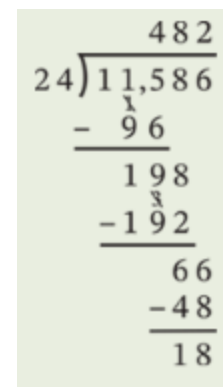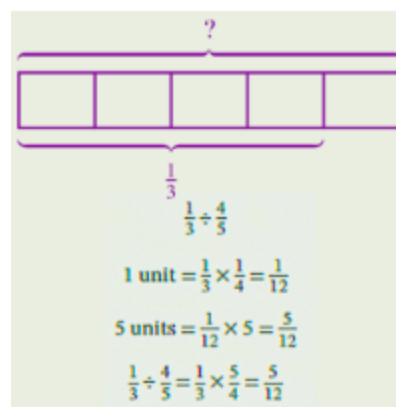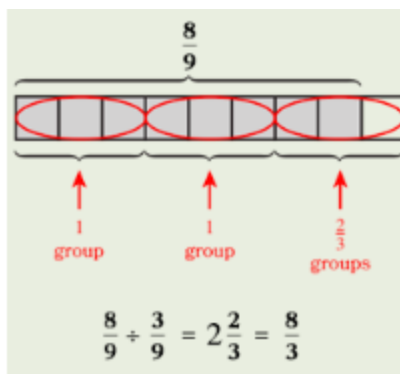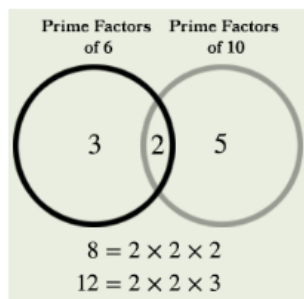## Massachusetts State Standards Addressed in Module 2

6.NS.A.1: Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

6.NS.B.2: Fluently divide multi-digit numbers using the standard algorithm.

6.NS.B.3: Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm.

6.NS.B.4: Use prime factorization to find the greatest common factor of 2 whole numbers less than or equal to 100 and the least common multiple of 2 whole numbers less than or equal to 12. Use the distributive property to express a sum of 2 whole numbers 1–100 with a common factor as a multiple of a sum of 2 relatively prime numbers.


Prime Factors of 6 — Prime Factors of 10

3   2   5

$8 = 2 \times 2 \times 2$
$12 = 2 \times 2 \times 3$

$\frac{8}{9}$

1 group   1 group $2\frac{2}{3}$ groups

$\frac{8}{9} \div \frac{3}{9} = 2\frac{2}{3} = \frac{8}{3}$

?

$\frac{1}{3}$

$\frac{1}{3} \div \frac{4}{5}$

1 unit $= \frac{1}{3} \times \frac{1}{4} = \frac{1}{12}$

5 units $= \frac{1}{12} \times 5 = \frac{5}{12}$

$\frac{1}{3} \div \frac{4}{5} = \frac{1}{3} \times \frac{5}{4} = \frac{5}{12}$


```
        482
24)11,586
  - 96
    198
   -192
     66
    -48
     18
```



```
  864.61
   15.3
+  33.115
  913.025
```

```
     4 18
   0.458
  -0.419
   0.039
```

```
  921.375
×      0.4
  368.5500
```


$17.68 \div 3.4$

Equivalent expression: $17.68 \div 34$

```
      5.2
34)176.8
  -170
    68
   -68
     0
```

Module 3: Rational Numbers (Winter)

Purpose of Module: In module 3, students develop an understanding of rational numbers and use rational numbers to describe real-world quantities. Students plot rational numbers and their opposites on a number line, calculate absolute values, order and compare rational numbers, and apply the concept of magnitude to describe and compare real-world quantities. Students explore the structure of the four quadrants of the coordinate plane. They plot and locate points with rational number coordinates, reflect points across one or both axes, calculate the lengths of line segments, graph geometric figures, and use the coordinate plane to solve problems.

Family Module Resources by Topic:

- **Topic A:** Understanding Positive and Negative Numbers on the Number Line *(Topic A Spanish)*
- **Topic B:** Order and Absolute Value *(Topic B Spanish)*
- **Topic C:** Rational Numbers and the Coordinate Plane *(Topic C Spanish)*
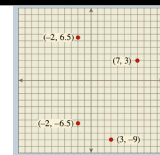
Massachusetts State Standards Addressed in Module 3

6.NS.C.5: Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, and positive/negative electric charge). Use positive and negative numbers (whole numbers, fractions, and decimals) to represent quantities in real-world contexts, explaining the meaning of zero in each situation.

6.NS.C.6: Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

- **6.NS.C.6.a:** Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.

- **6.NS.C.6.b:** Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

- **6.NS.C.6.c:** Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

- **6.NS.C.7:** Understand ordering and absolute value of rational numbers.

6.NS.C.8: Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.
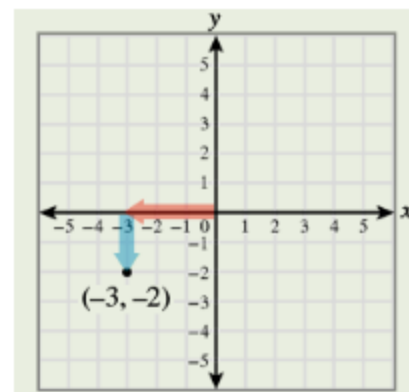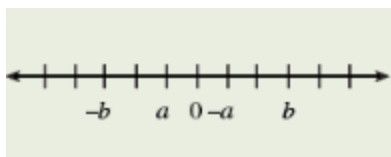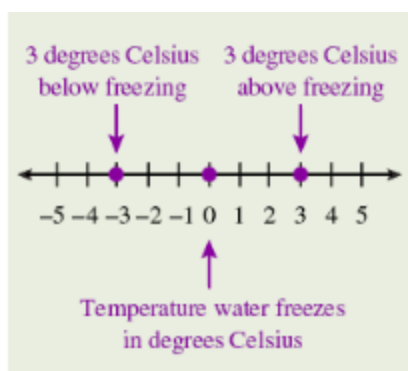
Module 4: Expressions and Equations (Winter)

Purpose of Module: In module 4, students work with numerical and algebraic expressions and equations. First, they learn that exponents represent repeated multiplication, evaluate powers with whole number, fraction, and decimal bases, and use the order of operations to evaluate numerical expressions. Then, students learn why and how to use variables to represent unknown numbers and quantities. They write and evaluate algebraic expressions and use properties of operations to generate equivalent expressions. Students reason about and solve single-variable, one-step equations, and they understand the meaning of a solution to an equation or inequality. At the end of the module, they revisit ratio relationships and write and graph equations in two variables, identifying independent and dependent variables in real-world situations.

Family Module Resources by Topic:

- **Topic A:** Relationships of the Operations *(Topic A Spanish)*
- **Topic B:** Special Notations of Operations *(Topic B Spanish)*
- **Topic C:** Replacing Letters With Numbers *(Topic C Spanish)*
- **Topic D:** Expanding, Factoring, and Distributing Expressions *(Topic D Spanish)*
- **Topic E:** Expressing Operations in Algebraic Form *(Topic E Spanish)*
- **Topic F:** Writing and Evaluating Expressions and Formulas *(Topic F Spanish)*
- **Topic G:** Solving Equations *(Topic G Spanish)*
- **Topic H:** Applications of Equations *(Topic H Spanish)*
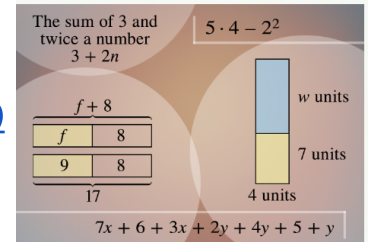
Massachusetts State Standards Addressed in Module 4

6.EE.A.1: Write and evaluate numerical expressions involving whole-number exponents.

6.EE.A.3: Apply the properties of operations to generate equivalent expressions.

6.EE.A.4: Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).

6.EE.B.5: Understand solving an equation or inequality as a process of answering a question: Which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

6.EE.B.6: Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

6.EE.B.7: Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.

6.EE.B.8: Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

6.EE.C.9: Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

$$2(50 - 4 \cdot 3^2) = 2(50 - 4 \cdot 9)$$
$$= 2(50 - 36)$$
$$= 2(14)$$
$$= 28$$

| Blake's Age (years)	Jada's Age (years)
9	4
13	8
16	11
b	$b - 5$

$3(6 + 2x) = 18 + 6x$
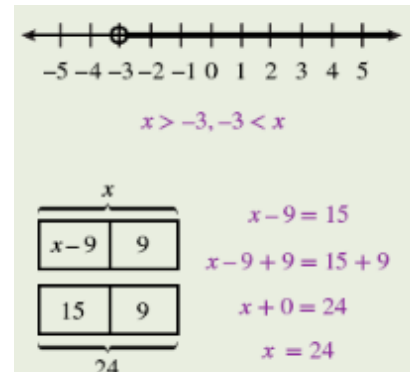
Module 5: Area, Surface Area, and Volume (Spring)

Purpose of Module: In module 5, students use their understanding of the areas of rectangles to develop formulas for the area of a parallelogram and the area of a triangle. Students apply their prior knowledge of area, equivalent numerical expressions, the properties of operations, and coordinate graphing as they find the areas of composite polygons and trapezoids. They identify attributes of the faces of right prisms and pyramids and use the net of a solid to determine its surface area. By packing right rectangular prisms with cubes of fractional edge lengths, students determine that the formulas $V=lwh$ and $V=Bh$ can be applied to find the volume of any right rectangular prism with positive, rational number edge lengths. Students apply these formulas to solve real-world and mathematical problems, and they write and solve single-variable equations to determine unknown measurements of a prism.

Family Module Resources by Topic:

- **Topic A:** Area of Triangles, Quadrilaterals, and Polygons *(Topic A Spanish)*
- **Topic B:** Polygons on the Coordinate Plane *(Topic B Spanish)*
- **Topic C:** Volume of Right Rectangular Prisms *(Topic C Spanish)*
- **Topic D:** Nets and Surface Area *(Topic D Spanish)*
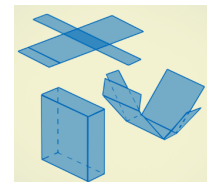
Massachusetts State Standards Addressed in Module 5

6.G.A.1: Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6.G.A.2: Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

6.G.A.3: Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

6.G.A.4: Represent 3-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface areas of these figures. Apply these techniques in the context of solving real-world mathematical problems.
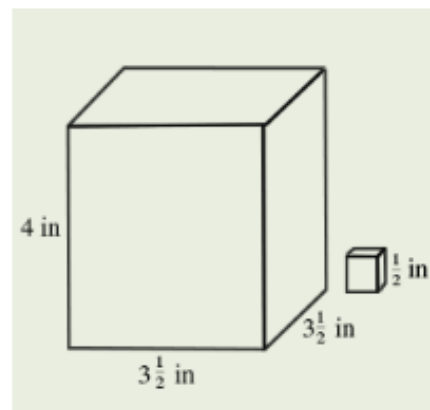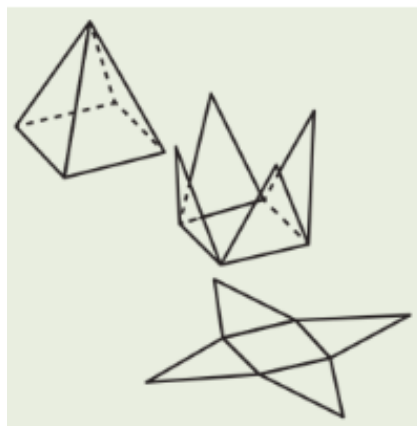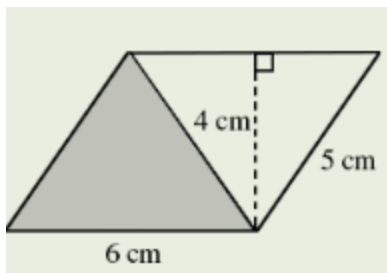
Module 6: Statistics (Spring)

Purpose of Module: In module 6, students begin to think and reason statistically. They identify statistical questions and represent data distributions by using dot plots, histograms, relative frequency histograms, and box plots. Students describe the center, spread, and shape of a data distribution. They calculate and interpret measures of center and spread including mean, median, and interquartile range, and they use these measures to describe the typical value and variability of a data distribution.

Family Module Resources by Topic:

- **Topic A:** Understanding Distributions *(Topic A Spanish)*
- **Topic B:** Summarizing a Distribution that is Approximately Symmetric Using Mean *(Topic B Spanish)*
- **Topic C:** Summarizing a Distribution That is Skewed Using the Median and the Interquartile Range *(Topic C Spanish)*
- **Topic D:** Summarizing and Describing Distributions *(Topic D Spanish)*
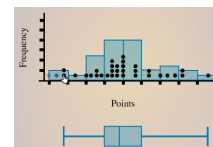
Massachusetts State Standards Addressed in Module 6

6.SP.A.1: Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.

6.SP.A.2: Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center (median, mean, and/or mode), spread (range, interquartile range), and overall shape.

6.SP.A.3: Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

6.SP.B.4: Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
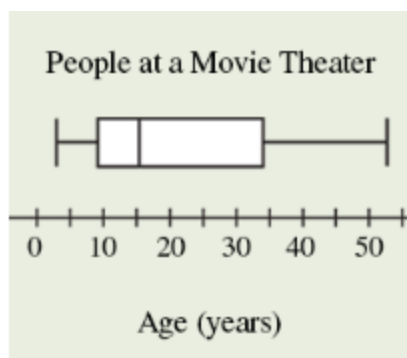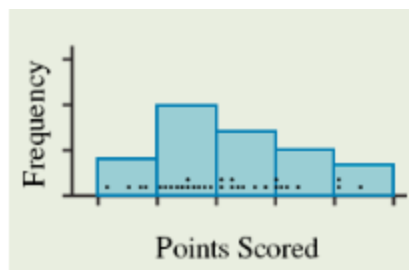
Lengths of Fish from Lake A (centimeters)				
16	17	19	22	22
22	23	24	24	25
25	26	27	27	28
29	29	29	31	34

Grade 6 Major Emphasis Clusters of Standards

Ratios and Proportional Relationships
- Understand ratio concepts and use ratio reasoning to solve problems.

The Number System
- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Apply and extend previous understandings of numbers to the system of rational numbers.

Expressions and Equations
- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.