

# EdGems Math ~ Course 1

## Content Standards Alignment

### Cluster Overview

Key: ■ Major Clusters; ■ Supporting Clusters; ■ Additional Clusters

#### Ratios and Proportional Reasoning

■ 6.RP.A Understand ratio concepts and use ratio reasoning to solve problems.

#### The Number System

■ 6.NS.A Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

■ 6.NS.B Compute fluently with multi-digit numbers and find common factors and multiples.

■ 6.NS.C Apply and extend previous understandings of numbers to the system of rational numbers.

#### Expressions and Equations

■ 6.EE.A Apply and extend previous understandings of arithmetic to algebraic expressions.

■ 6.EE.B Reason about and solve one-variable equations and inequalities.

■ 6.EE.C Represent and analyze quantitative relationships between dependent and independent variables.

#### Geometry

■ 6.G.A Solve real-world and mathematical problems involving area, surface area and volume.

#### Statistics and Probability

■ 6.SP.A Develop understanding of statistical variability.

■ 6.SP.B Summarize and describe distributions.

## 6.RP ~ Ratios and Proportional Relationships

### 6.RP.A Understand ratio concepts and use ratio reasoning to solve problems.

Lesson  
2.1

**6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”*

Lessons  
2.3, 2.4

**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. *For example, “This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is  $\frac{3}{4}$  cup of flour for each cup of sugar.” “We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger.”*

**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.

Lessons  
2.1, 2.2, 2.5

**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.

Lessons  
2.3, 2.4

Lessons  
3.1, 3.2, 3.3, 3.4,  
6.4

Lessons  
2.5

- 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?*
- c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means  $\frac{30}{100}$  times the quantity); solve problems involving finding the whole, given a part and the percent.
- d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

## 6.NS ~ The Number System

### 6.NS.A Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

Lessons  
4.2, 4.3, 4.4

- 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. *For example, create a story context for  $(\frac{2}{3}) \div (\frac{3}{4})$  and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that  $(\frac{2}{3}) \div (\frac{3}{4}) = \frac{8}{9}$  because  $\frac{3}{4}$  of  $\frac{8}{9}$  is  $\frac{2}{3}$ . (In general,  $(\frac{a}{b}) \div (\frac{c}{d}) = \frac{ad}{bc}$ ). How much chocolate will each person get if 3 people share  $\frac{1}{2}$  lb of chocolate equally? How many  $\frac{3}{4}$ -cup servings are in  $\frac{2}{3}$  of a cup of yogurt? How wide is a rectangular strip of land with length  $\frac{3}{4}$  mi and area  $\frac{1}{2}$  square mi?*

### 6.NS.B Compute fluently with multi-digit numbers and find common factors and multiples.

Lessons  
1.3, 1.4

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

Lessons  
1.1, 1.2, 1.5

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

Lessons  
1.6, 5.6

- 6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express  $36 + 8$  as  $4(9 + 2)$ .*

### 6.NS.C Apply and extend previous understandings of numbers to the system of rational numbers.

Lesson  
7.1

- 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, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

Lesson  
7.1

- 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
- 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.

Lessons  
7.4, 7.5

Lessons  
7.4, 7.5

Lesson  
7.2

Lessons  
7.2

Lesson  
7.1

Lessons  
7.1, 7.2

Lessons  
7.5, 8.1, 8.2, 8.3

- 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
- 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

- a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret  $-3 > -7$  as a statement that  $-3$  is located to the right of  $-7$  on a number line oriented from left to right.*
- b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write  $-3^{\circ}\text{C} > -7^{\circ}\text{C}$  to express the fact that  $-3^{\circ}\text{C}$  is warmer than  $-7^{\circ}\text{C}$ .*
- c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of  $-30$  dollars, write  $|-30| = 30$  to describe the size of the debt in dollars.*
- d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than  $-30$  dollars represents a debt greater than 30 dollars.*

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.

## 6.EE ~ Expressions and Equations

### 6.EE.A Apply and extend previous understandings of arithmetic to algebraic expressions.

Lessons  
5.1, 5.2

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

Lessons  
5.3, 5.4

6.EE.A.2 Write, read and evaluate expressions in which letters stand for numbers.

- a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract  $y$  from 5" as  $5 - y$ .*
- b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression  $2(8 + 7)$  as a product of two factors; view  $(8 + 7)$  as both a single entity and a sum of two terms..*
- c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas  $V = s^3$  and  $A = 6s^2$  to find the volume and surface area of a cube with sides of length  $s = \frac{3}{2}$ .*

Lessons  
5.3, 5.4, 5.5

Lesson  
5.4

Lessons  
5.5, 5.6

**6.EE.A.3** Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression  $3(2 + x)$  to produce the equivalent expression  $6 + 3x$ ; apply the distributive property to the expression  $24x + 18y$  to produce the equivalent expression  $6(4x + 3y)$ ; apply properties of operations to  $y + y + y$  to produce the equivalent expression  $3y$ .*

Lesson  
5.5, 5.6

**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). *For example, the expressions  $y + y + y$  and  $3y$  are equivalent because they name the same number regardless of which number  $y$  stands for.*

### 6.EE.B Reason about and solve one-variable equations and inequalities.

Lessons  
6.1, 7.3

**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.

Lessons  
5.3, 5.4, 5.5

**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.

Lessons  
6.1, 6.2, 6.3

**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.

Lesson  
7.3

**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 Represent and analyze quantitative relationships between dependent and independent variables.

Lessons  
8.1, 8.2, 8.3

**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. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation  $d = 65t$  to represent the relationship between distance and time.*

## 6.G ~ Geometry

### 6. G.A Solve real-world and mathematical problems involving area, surface area, and volume.

Lessons  
9.1, 9.2

**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.”

Lesson  
9.4

**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

Lesson  
7.5

**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.

Lesson  
9.3

**6.G.A.4** Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

## 6.SP ~ Statistics and Probability

### 6.SP.A Develop understanding of statistical variability.

Lesson  
10.1

**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. *For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.*

Lessons  
10.1, 10.2, 10.6

**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, spread, and overall shape.

Lessons  
10.2, 10.6

**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 Summarize and describe distributions.

Lessons  
10.3, 10.4, 10.5

**6.SP.B.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

Lessons  
10.1, 10.2, 10.3,  
10.4, 10.5, 10.6,  
10.7

**6.SP.B.5** Summarize numerical data sets in relation to their context, such as by:

- Reporting the number of observations.
- Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
- Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.
- Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

# Focus and Connecting Standards Alignment

EdGems Math supports students' proficiency in the Common Core State Standards through a program-design which supports the interconnectivity of mathematical ideas while providing clear learning objectives. This is achieved by designating Focus Standards in each lesson and Connecting Standards in each unit. The qualifiers of Focus and Connecting Standards were developed by the EdGems Math authoring team to develop a scope and sequence in which mathematical ideas build upon each other and are revisited throughout the course. Each EdGems Math lesson identifies one or more standards as a Focus Standard to provide a focal point for the lesson objectives. The unit then provides opportunities for further connections to other standards across clusters and domains. These Connecting Standards offer opportunities for students to draw up and apply many mathematical ideas throughout the unit. The following chart shows when each standard is aligned as a Focus Standard or Connecting Standard throughout the course. Further explanations of the Focus and Connecting Standards are available within each Unit Overview.

	Focus Standard Lesson(s)	Connecting Standard Unit(s)
<b>6.RP.A.1</b>	Lesson 2.1	Unit 3
<b>6.RP.A.2</b>	Lessons 2.3-2.4	Units 1, 3, 6, 8
<b>6.RP.A.3</b>	Lessons 2.1-2.5, 3.1-3.4, 6.4	Units 1, 4, 7, 10
<b>6.NS.A.1</b>	Lessons 4.2-4.4	Units 5, 6, 9, 10
<b>6.NS.B.2</b>	Lessons 1.3-1.4	Units 2, 3, 5, 6, 9, 10
<b>6.NS.B.3</b>	Lessons 1.1-1.2, 1.5	Units 2, 3, 5, 6, 9, 10
<b>6.NS.B.4</b>	Lessons 1.6, 5.6	Units 4, 5, 7
<b>6.NS.C.5</b>	Lesson 7.1	Unit 8
<b>6.NS.C.6</b>	Lessons 7.1, 7.4-7.5	Units 2, 10
<b>6.NS.C.7</b>	Lessons 7.1-7.2	Unit 10
<b>6.NS.C.8</b>	Lesson 7.5	Units 2, 8, 9
<b>6.EE.A.1</b>	Lessons 5.1-5.2	Units 6, 9
<b>6.EE.A.2</b>	Lessons 5.3-5.5	Units 6, 8, 9
<b>6.EE.A.3</b>	Lessons 5.5-5.6	Unit 4
<b>6.EE.A.4</b>	Lessons 5.5-5.6	Unit 4

	Focus Standard Lesson(s)	Connecting Standard Unit(s)
<b>6.EE.B.5</b>	Lessons 6.1, 7.3	
<b>6.EE.B.6</b>	Lessons 5.3-5.5	Units 1, 8, 9
<b>6.EE.B.7</b>	Lessons 6.1-6.3	Units 1, 8, 9, 10
<b>6.EE.B.8</b>	Lesson 7.3	
<b>6.EE.C.9</b>	Lessons 8.1-8.3	Unit 2
<b>6.G.A.1</b>	Lessons 9.1-2	Units 1, 2, 7
<b>6.G.A.2</b>	Lesson 9.4	Units 2, 5
<b>6.G.A.3</b>	Lesson 7.5	Unit 9
<b>6.G.A.4</b>	Lesson 9.3	Units 5, 7
<b>6.SP.A.1</b>	Lesson 10.1	
<b>6.SP.A.2</b>	Lessons 10.1-10.2, 10.6	Unit 7
<b>6.SP.A.3</b>	Lessons 10.2, 10.6	
<b>6.SP.B.4</b>	Lessons 10.3-10.5	Unit 7
<b>6.SP.B.5</b>	Lessons 10.1-10.7	Unit 7

# Standards Alignment by Lesson

Unit	Lesson	Focus Content Standard(s)	Focus SMP	Unit	Lesson	Focus Content Standard(s)	Focus SMP
Multi-Digit Operations	1.1	6.NS.B.3	SMP4	Equations	6.1	6.EE.B.5/6.EE.B.7	SMP1
	1.2	6.NS.B.3	SMP8		6.2	6.EE.B.7	SMP4
	1.3	6.NS.B.2	SMP5		6.3	6.EE.B.7	SMP2
	1.4	6.NS.B.2	SMP6		6.4	6.RP.A.3c	SMP2
	1.5	6.NS.B.3	SMP8	Rational Numbers and the Coordinate Plane	7.1	6.NS.C.5/6.NS.C.6a/ 6.NS.C.7c,d	SMP2
	1.6	6.NS.B.4	SMP1		7.2	6.NS.C.7a,b,d	SMP1
Ratio and Rates	2.1	6.RP.A.1/6.RP.A.3a	SMP5		7.3	6.EE.B.5/6.EE.B.8	SMP2
	2.2	6.RP.A.3a	SMP8		7.4	6.NS.C.6b,c	SMP7
	2.3	6.RP.A.2/6.RP.A.3b	SMP2		7.5	6.NS.C.6b,c/ 6.NS.C.8/6.G.A.3	SMP3
	2.4	6.RP.A.2/6.RP.A.3b	SMP3	Tables, Equations and Graphs	8.1	6.EE.C.9	SMP4
	2.5	6.RP.A.3a/6.RP.A.3d	SMP7		8.2	6.EE.C.9	SMP8
Percents	3.1	6.RP.A.3c	SMP7		8.3	6.EE.C.9	SMP6
	3.2	6.RP.A.3c	SMP8	Area and Volume	9.1	6.G.A.1	SMP7
	3.3	6.RP.A.3c	SMP4		9.2	6.G.A.1	SMP5
	3.4	6.RP.A.3c	SMP1		9.3	6.G.A.4	SMP5
Fraction Operations	4.1	5.NF.B.4/5.NF.B.6	SMP6		9.4	6.G.A.2	SMP8
	4.2	6.NS.A.1	SMP4	Statistics	10.1	6.SP.A.1/6.SP.A.2/ 6.SP.B.5	SMP3
	4.3	6.NS.A.1	SMP2		10.2	6.SP.A.2/6.SP.A.3/ 6.SP.B.5	SMP6
	4.4	6.NS.A.1	SMP3		10.3	6.SP.B.4/6.SP.B.5	SMP6
Expressions	5.1	6.EE.A.1	SMP8		10.4	6.SP.B.4/6.SP.B.5	SMP5
	5.2	6.EE.A.1	SMP3		10.5	6.SP.B.4/6.SP.B.5	SMP2
	5.3	6.EE.A.2a,b/6.EE.B.6	SMP7		10.6	6.SP.A.2/6.SP.A.3/ 6.SP.B.5	SMP3
	5.4	6.EE.A.2a,b,c/6.EE.B.6	SMP2		10.7	6.SP.B.5	SMP1
	5.5	6.EE.A.2b/6.EE.A.3/ 6.EE.A.4/6.EE.B.6	SMP3				
	5.6	6.EE.A.3/6.EE.A.4 6.NS.B.4	SMP7				

Major Standard
  Supporting Standard
  Additional Standard
  Pre-Requirement

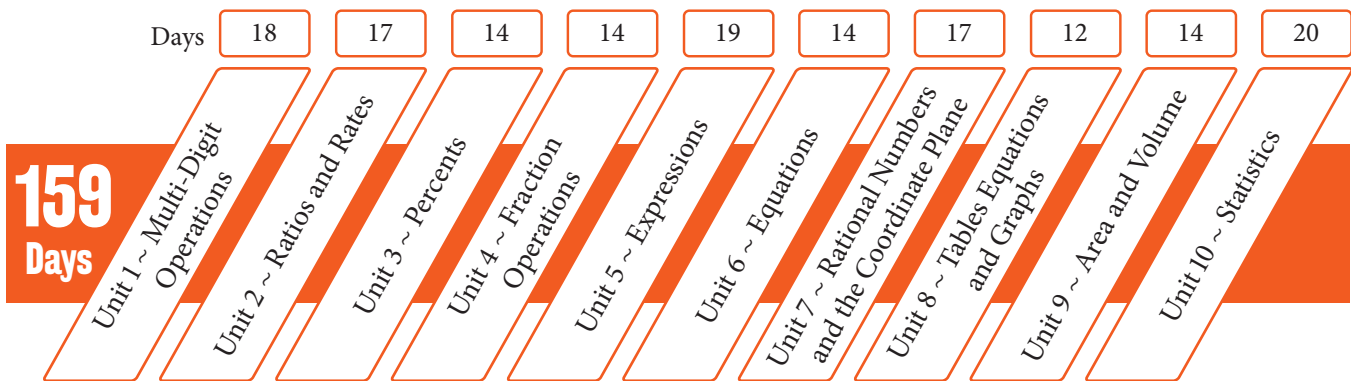
# Standards for Mathematical Practice Alignment

The Standards for Mathematical Practice (SMPs) are integrated throughout the entirety of the EdGems Math curriculum. While every lesson provides specific implementation guidance for the SMPs in the Teacher Guide, each lesson also has a Focus Math Practice Standard. The correlation between these Focus Math Practices and student lessons is shown in the table below. There are also opportunities for each SMP to be formatively assessed during the listed unit's Storyboards and Performance Task. Additionally, there are opportunities for each SMP to be summatively assessed during the Performance Assessment in the listed unit or units.

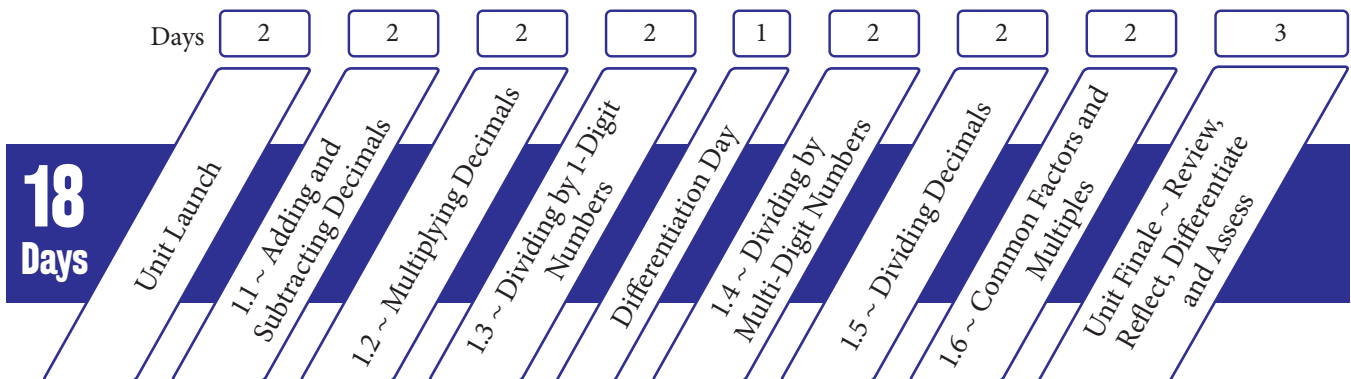
SMP	Student Lesson	Storyboards	Performance Task	Performance Assessment
<b>SMP1</b> <i>Make sense of problems and persevere in solving them.</i>	1.6, 3.4, 6.1, 7.2, 10.7	Units 1, 9	Unit 6	Unit 4
<b>SMP2</b> <i>Reason abstractly and quantitatively.</i>	2.3, 4.3, 5.4, 6.3, 6.4, 7.1, 7.3, 10.5	Unit 2	Units 7, 9	Unit 1
<b>SMP3</b> <i>Construct viable arguments and critique the reasoning of others.</i>	2.4, 4.4, 5.2, 5.5, 7.5, 10.1, 10.6	Unit 10	Unit 3	Units 2, 6
<b>SMP4</b> <i>Model with mathematics.</i>	1.1, 3.3, 4.2, 6.2, 8.1	Units 5, 6	Unit 4	Units 3, 8
<b>SMP5</b> <i>Use appropriate tools strategically.</i>	1.3, 2.1, 9.2, 9.3, 10.4	Unit 7	Unit 10	Unit 9
<b>SMP6</b> <i>Attend to precision.</i>	1.4, 4.1, 8.3, 10.2, 10.3	Unit 8	Units 1, 2	Unit 7
<b>SMP7</b> <i>Look for and make use of structure.</i>	2.5, 3.1, 5.3, 5.6, 7.4, 9.1	Unit 3	Unit 8	Unit 5
<b>SMP8</b> <i>Look for and express regularity in repeated reasoning.</i>	1.2, 1.5, 2.2, 3.2, 5.1, 8.2, 9.4	Unit 4	Unit 5	Unit 10

This Course 1 Pacing Guide is based on daily 45-60 minute math class periods. Each unit includes days for the Unit Launch, lessons, Differentiation Days and Unit Finale (which includes assessment). Any additional days beyond the 159 days allow for flexibility in the pacing calendar to include such things as (1) beginning of the year activities, (2) state assessment preparation and (3) benchmark/state assessments.

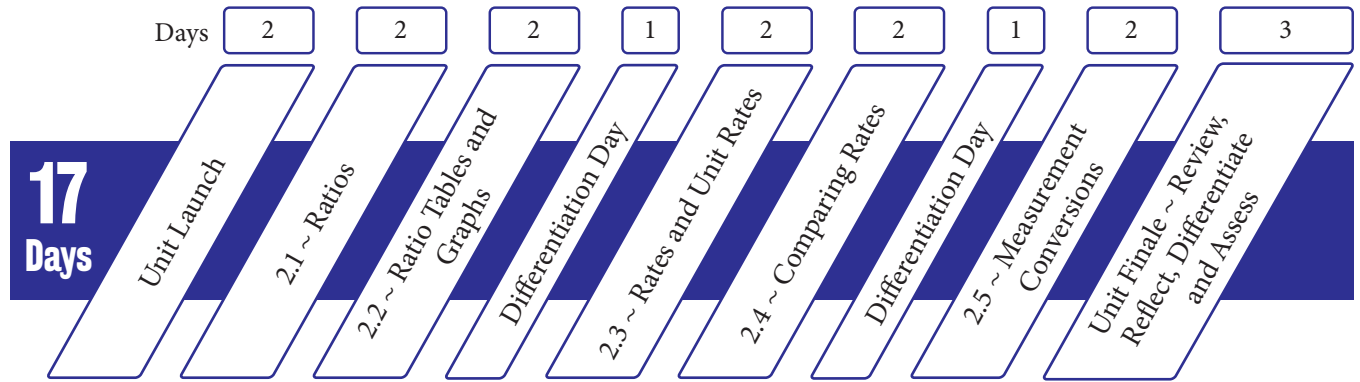
### Year at a Glance



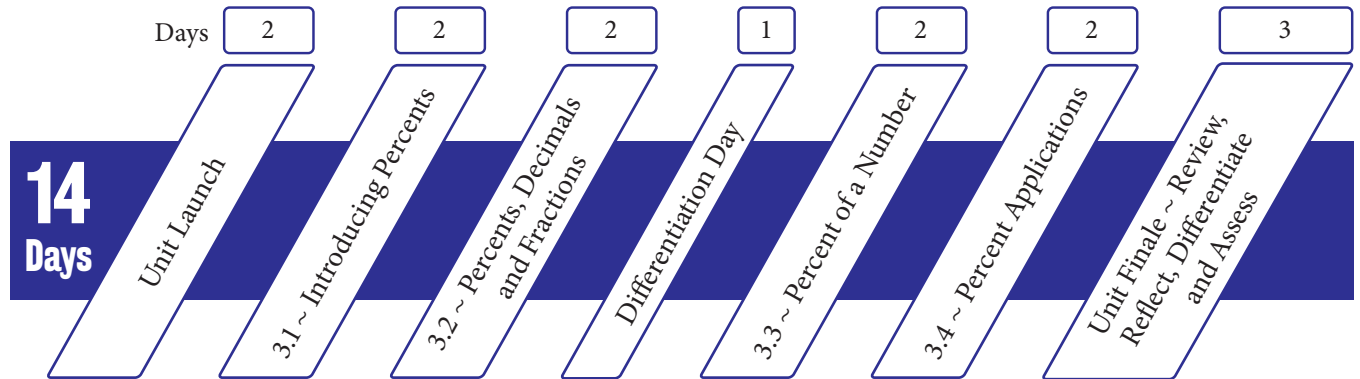
### Unit 1 ~ Multi-Digit Operations



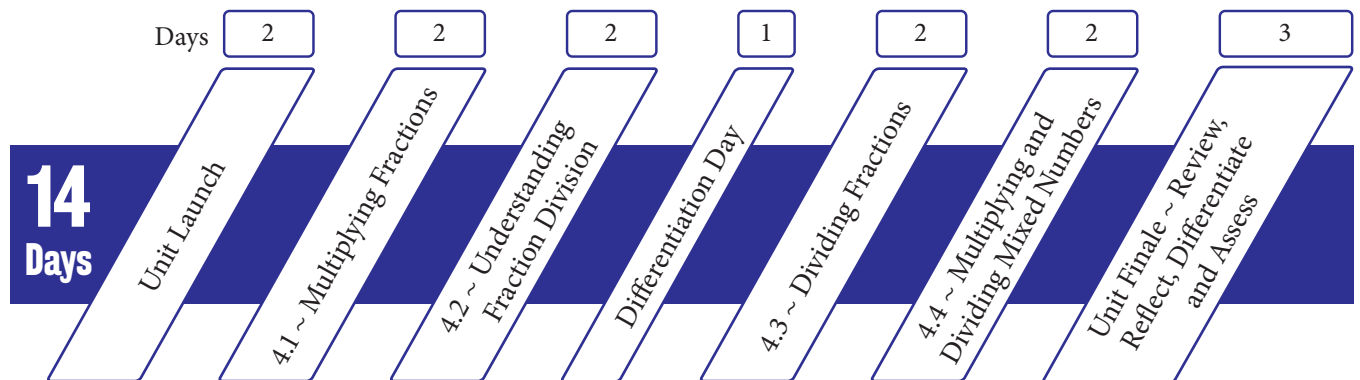
## Unit 2 ~ Ratios and Rates



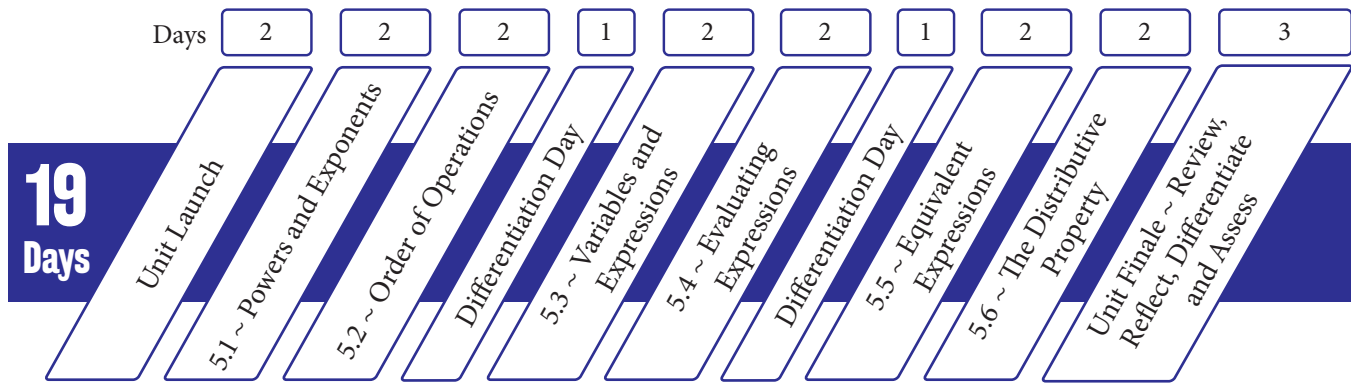
## Unit 3 ~ Percents



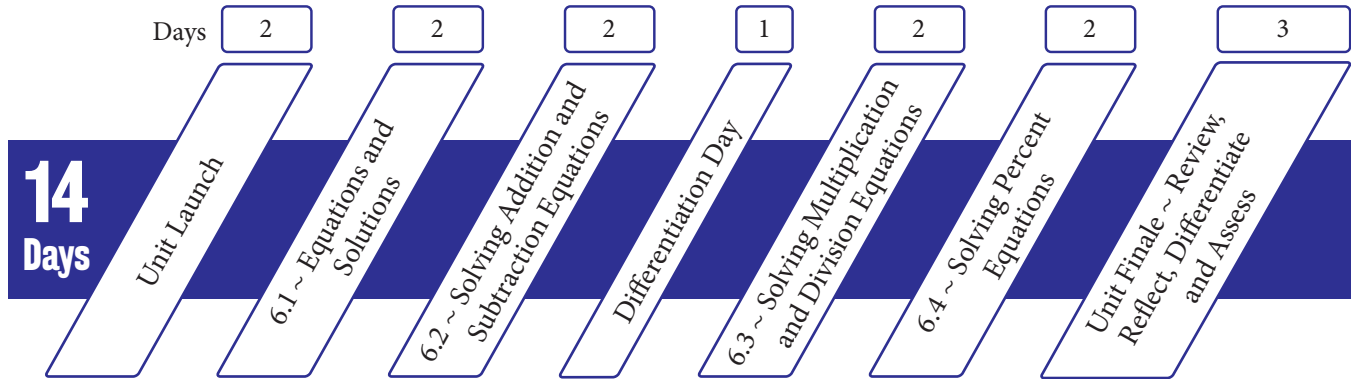
## Unit 4 ~ Fraction Operations



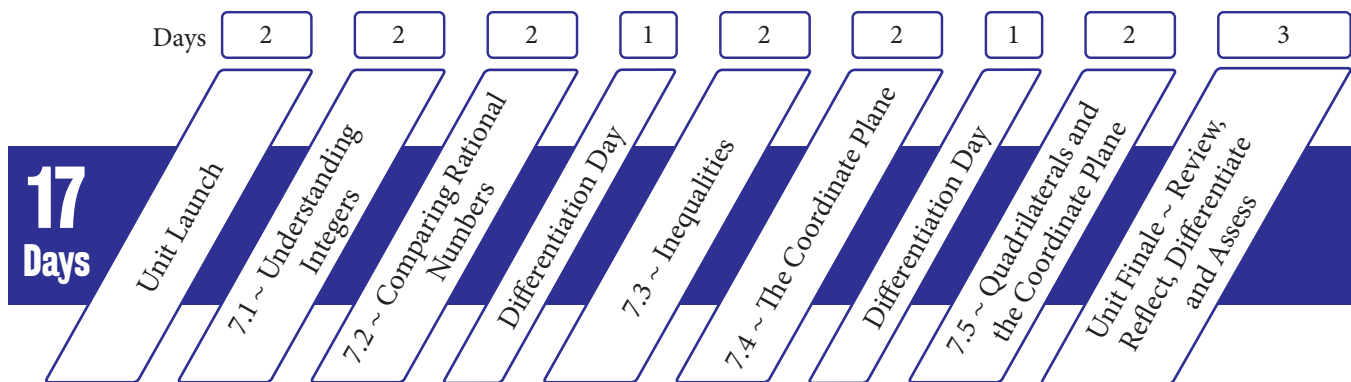
# Unit 5 ~ Expressions



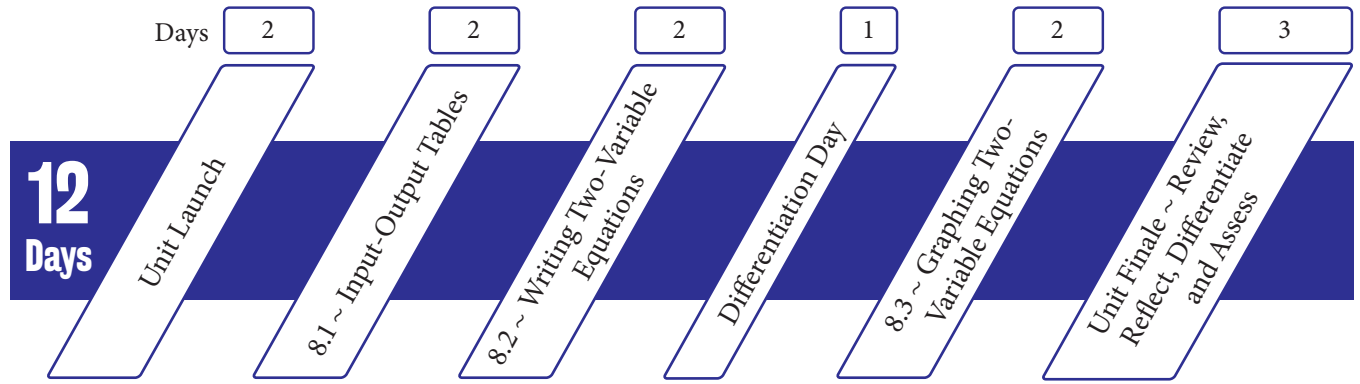
# Unit 6 ~ Equations



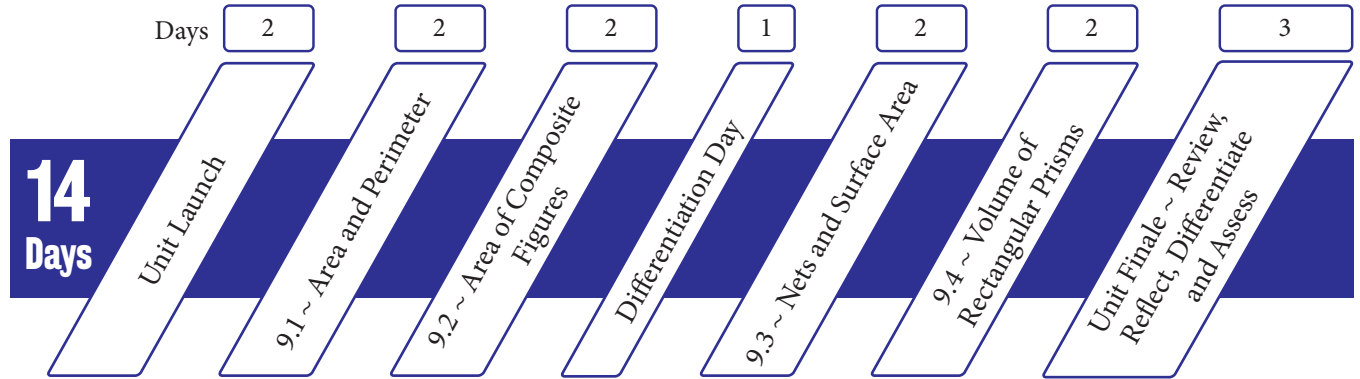
# Unit 7 ~ Rational Numbers and the Coordinate Plane



## Unit 8 ~ Tables, Equations and Graphs



## Unit 9 ~ Area and Volume



## Unit 10 ~ Statistics

