6th GRADE LEARNING MAP I 2016-2017

Instructional Window: August 29, 2016 – November 4, 2016 ***Assessment Window:*** November 7-10, 2016

Suggested Timeline for 48 Days*: 3 Days (6.NS.2); 3 Days (6.NS.3); 4 Days (6.NS.4); 5 Days (6.NS.1); 5 Days (6.NS.5); 5 Days (6.NS.6); 5 Days (6.NS.7); 5 Days (6.NS.8); 3 Days (6.RP.1); 4 Days (6.RP.2); 6 Days (6.RP.3)

*The Suggested Timeline is only a *RECOMMENDATION* to assist with planning. Teachers and grade level teams should use their professional judgement to determine what is best for their students.

STANDARD	***FOCUS***
6.NS.2 Fluently divide multi-digit numbers using the standard algorithm.	**Student will know…(facts, vocabulary, concepts)** • fractional remainder • dividend • quotient • divisor • place value • remainder
	Student will be able to… • Determine when it is appropriate to use the standard algorithm. • Apply the standard algorithm to compute multi-digit division problems with procedural fluency. • Fluently execute the standard algorithm for dividing multi-digit numbers using the standard algorithm.
	Standard Essential Question *How do we divide multi-digit numbers using the standard algorithm and what is the standard algorithm for dividing multi-digit numbers?*

6.NS.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	**Student will know…(facts, vocabulary, concepts)** • Decimal • decimal point • sum • difference • quotient • addend • product • estimation • algorithm • round • tenths**,** hundredths, thousandths
	Student will be able to… • Identify place value to the right of the decimal point up at least the ten-thousandths place. • Determine the number value when rounded to at least the thousandths place. • Apply estimation strategies to determine the reasonableness of a solution. • Solve real-world problems using the standard algorithm for all four operations. • Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation to solve real-world and mathematical problems.
	Standard Essential Question *How do we apply all decimal operations to solve real-world scenarios?*

6.NS.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).

Student will know…(facts, vocabulary, concepts)

- Factor
- Multiple
- Prime
- Composite
- prime factorization
- greatest common factor
- least common multiple
- distributive property

Student will be able to…

- Identify prime and composite numbers.
- Construct the prime factorization of a number.
- Determine the GCF of two numbers less than or equal to 100.
- Represent the distributive property using sums and its use in adding numbers 1-100 with common factors. (e.g. 20+24 = 4(5+6)).
- Demonstrate fluency when applying the distributive property of multiplication over addition.
- Identify the largest prime factors of a set of numbers.
- Find the LCM between two numbers less than or equal to 12.
- Deduce the appropriate situation to use either GCF or LCM to solve problems in real-world contexts.
- Explain a solution to a word problem using GCF or LCM.
- Locate 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).

Standard Essential Question

Can I find the GCF (greatest common factor) between two numbers, apply the GCF to the distributive property, and apply GCF and LCM to solve real world problems?

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

Student will know…(facts, vocabulary, concepts)

- Numerator
- Denominator
- Improper fraction
- Mixed number
- Explicit
- Inverse operation
- Reciprocal
- Fair share
- Rational numbers
- Introductory
- Positive and negative rational numbers

Student will be able to…

- Represent the division of fractions by using models.
- Apply the properties of multiplication of fractions to explain the division of fractions.
- Interpret the meaning of the quotient in the context of the problem.
- Solve word problems using division of fractions.
- Construct equations represented in real world problems.
- 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

Standard Essential Question

How can we compare two quantities and express them as a ratio (e.g. part-to-part, part-to-whole)?

6.NS.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.	**Student will know…(facts, vocabulary, concepts)** • Zero • Above • Below • Credit • Debit • Charge • Temperature • sea level
	Student will be able to… • Recognize that positive and negative numbers have opposite values • Understand that a negative number is less than zero. • Understand that the meaning of zero is determined by the real world context(e.g. freezing point in Celsius system—anything below zero is negative; anything above zero is positive) • Represent integers using real world tools such as a thermometer, a checkbook, a balance sheet, environmental situations—sea level, temperature. • 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
	Standard Essential Question *How do we use positive and negative numbers to represent quantities in real world contexts?*

6.NS.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
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.

Student will know…(facts, vocabulary, concepts)

- Number line
- rational numbers
- negative
- positive
- integer

Student will be able to…

- Recognize that there are values to the left of zero.
- Discuss that zero is its own opposite.
- Plot rational numbers on the vertical or horizontal number line. (e.g. Thermometer)
- Determine the distance of any rational number to zero.
- Distinguish that the opposite of a number is the number itself through discussion (e.g. –(−3) is 3)

Standard Essential Question

How do we identify the location of both positive and negative numbers on a number line?

6.NS.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. *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°C>-7°C to express the fact that -3°C is warmer than -7°C.*
c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute 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.*

Student will know…(facts, vocabulary, concepts)

- Point
- positive number
- number line
- opposite
- rational number
- negative number
- absolute value

Student will be able to…

- Illustrate and identify the five inequality symbols
- Utilize the appropriate symbol to make an inequality statement true
- Correctly order rational numbers by displaying them correctly on a number line (least to greatest, greatest to least) a set of numbers
- Construct inequality statements (in both words and symbols) about the relationship between two rational number.
- Interpret statements of inequality as statements about the relative position of two numbers on a number line

Standard Essential Question

How do we determine the absolute value of rational numbers and recognize statements of inequality as a comparison of the relative position of two numbers on a number line?

6.NS.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	**Student will know…(facts, vocabulary, concepts)** • x-axis • y-axis • x-coordinate • y-coordinate • quadrant (I, II, III, IV) • reflection • ordered pair • origin • scale
	Student will be able to… • Determine the distance between two points on the coordinate plane using absolute value. • Graph the line segment or figure on the coordinate plane. • Determine horizontal distances using the absolute value of the x coordinate of the ordered pair. • Determine vertical distances using the absolute value of the y coordinate of the ordered pair. • Use horizontal and vertical distances to solve real world problems (e.g., distance from home to grocery store, etc). • Evaluate real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to locate distances between points with the same first coordinate or the same second coordinate.
	Standard Essential Question *How do we determine the distance between points on a coordinate grid (using absolute value)?*

6.RP.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."*

Student will know…(facts, vocabulary, concepts)

- Fraction
- Quantity
- Compare
- Measure
- Ratio
- Part-to-part
- Part-to-whole
- Colon
- Relationship
- Rate
- Unit Rate
- Proportion

Student will be able to…

- Compare two quantities or measures.
- Display a ratio or a comparison as a part-to-part and a part-to-whole relationship using the correct mathematical symbols (e.g. words, fraction bar, and colon).
- Define a ratio.
- Identify and describe any ratio using "For every___,there are____"
- Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

Standard Essential Question

How can a comparison of numbers be expressed as a ratio (e.g. part-to-part, part-to-whole)?

6.RP.2
Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 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 ¾ cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*[1]

[1] Expectations for unit rates in this grade are limited to non-complex fractions.

Student will know…(facts, vocabulary, concepts)

- Reciprocal
- Ratio
- Per
- Reciprocal
- Rate
- Unit rate
- Part-to-one
- Relationship
- Simplify
- Simplest form
- Proportion

Student will be able to…

- Name the amount of either quantity in terms of the other quantity (150 miles: 2hrs OR 2hrs:150 miles).
- Identify appropriate symbols for expressing unit rate (non-equal ≠, fraction bar, colon)
- Define a part to one relationship (unit rate).
- Calculate (re-write) a ratio as a unit rate.
- Explain how related unit rates are reciprocals.
- Explain why b ≠ 0.
- Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship.

Standard Essential Question

How do we represent two quantities as a ratio, part-to-one (unit rate)?

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<td rowspan="3">6.RP.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.
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.
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 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.</td>
<td>Student will know…(facts, vocabulary, concepts)
• Coordinate plane
• Ordered pairs
• x- and y-axis
• x- and y- coordinates
• Patterns
• Sequences
• Quadrant
• Equivalent ratios
• Equation
• Function table
• Rule
• Table
• Unit rate
• Proportional reasoning</td>
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<tr>
<td>Student will be able to…
• Analyze a table to find a ratio.
• Apply properties of multiplication and division to find missing values.
• Create a table with given information and fill in missing values.
• Write the rule for a table (equation)
• Plot ratios as ordered pairs on the coordinate plane.
• Apply the rule or equation to justify the solution.
• Find a pattern and calculate a new value when the ratio remains the same.**
• Students use ratios, unit rates and multiplicative reasoning to solve problems in various contexts, including measurement, prices, and geometry.</td>
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<td>Standard Essential Question
How do we use tape diagrams, double number lines, tables of equivalent ratios and equations as tools to solve real-world problems involving percentages, unit rates and measurement conversions</td>
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