

6th GRADE LEARNING MAP II 2016-2017

Instructional Window: November 14, 2016 – February 3, 2017

Assessment Window: February 6-10, 2017

Suggested Timeline for 46 Days*: 5 Days (6.EE.2), 6 Days (6.EE.1), 6 Days (6.EE.3), 6 Days (6.EE.4), 5 Days (6.EE.5), 4 Days(6.EE.6), 4 Days (6.EE.7), 5 Days (6.EE.8), 5 days (6.EE.9)

*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
<p>6.EE.2 Write, read, and evaluate expressions in which letters stand for numbers.</p> <p>a. Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$.</p> <p>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. <i>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.</i></p> <p>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). <i>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 $s = \frac{1}{2}$.</i></p>	<p>Student will know...(facts, vocabulary, concepts)</p> <ul style="list-style-type: none"> • Expressions • Expressions • Variables • Coefficients • Constants • Term • Expressions • Variables • Coefficients • Constants • Term • Constant • Term • Constant • Formula • Simplify • Evaluate
	<p>Student will be able to...</p> <ul style="list-style-type: none"> • <u>Recognize</u> operational vocabulary (sum, difference, product, quotient) • <u>Translate</u> expressions from verbal descriptions using letters and numbers. • <u>Understand</u> that order is important in writing subtraction and division problems. • <u>Understand</u> that if a value is not given, you can't evaluate an expression. • <u>Understand</u> that expressions do not include equal signs (e.g. $5 + x$ is an expression not $5 + x = 20$) • <u>Construct</u> expressions that include operations with numbers and variables standing for numbers. For example, express the calculation “Subtract y from 5” as $5 - y$
	<p>Standard Essential Question <i>How do we apply a value and use the parts of an expression to simplify an expression?</i></p>

<p>6.EE.1 Write and evaluate numerical expressions involving whole-number exponents.</p>	<p>Student will know...(facts, vocabulary, concepts) Order of operations, Parentheses, Brackets, Simplify, Evaluate, Numerical, expression, Explicit, Variable, Exponent, Power, Base, Algebraic expression, Like terms, Evaluate, Coefficient, Equivalent expression, Introductory, Factor, Distributive property, Rational coefficients, Linear expressions</p> <p>Student will be able to...</p> <ul style="list-style-type: none"> • <u>Recognize</u> that the base can be a whole number, positive fraction, or a positive decimal. • <u>Recognize</u> that a base with an exponent is repeated multiplication (including variable expressions). • <u>Write</u> an algebraic expression from a verbal expression • <u>Simplify</u> an expression using order of operations (now including exponents) • <u>Write and evaluate</u> numerical expressions involving whole-number exponents. <p>Standard Essential Question <i>How do we simplify expressions with exponents in real-world mathematical contexts?</i></p>
<p>6.EE.3 Apply the properties of operations to generate equivalent expressions. <i>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 $3y$.</i></p>	<p>Student will know...(facts, vocabulary, concepts)</p> <ul style="list-style-type: none"> • Associative property • Identity property • Commutative property • Factor • Distributive property • Area model • Factorization <p>Student will be able to...</p> <ul style="list-style-type: none"> • <u>Recognize</u> and <u>name</u> each property. • <u>Understand</u> the properties (identity, multiplication and addition, associative, distributive, and commutative). • <u>Recognize</u> that repeated addition of variables can be expressed through multiplication ($y + y + y = 3y$). • <u>Understand</u> area models to illustrate the distributive property with variables. • Use factoring to <u>rewrite</u> an expression so that the distributive property is represented (e.g. $24x + 18y = 6(4x + 3y)$). • <u>Apply</u> the properties of operations to generate equivalent expressions. <p>Standard Essential Question <i>How can I use properties of operations to rewrite expressions?</i></p>

6.EE.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.

Student will know...(facts, vocabulary, concepts)

- Substitution
- Equivalent
- Variable
- Equation

Student will be able to...

- Substitute values into an expression to solve an equation.
- Substitute values into expressions to prove equivalency.
- Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).

Standard Essential Question

How can I use properties of operations to rewrite expressions?

6.EE.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.

Student will know...(facts, vocabulary, concepts)

- Equation
- Number line
- Variable
- Inequality
- Less than
- Equal to
- Greater than or equal to
- Less than or equal to
- Solution set
- Inequality symbols
- Substitution Inverse operation
- Addition property of equality
- Multiplication property of equality
- Subtraction property of equality
- Division property of equality

Student will be able to...

- Understand the difference between equations and inequalities.
- Demonstrate that inequalities represent a range of possible values rather than a single solution.
- Represent a solution of an equation and an inequality on a number line.
- Use substitution to determine whether a given number in a specified set makes an equation or inequality true
- Model solving equations or inequalities using manipulatives.
- 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.

Standard Essential Question

How do we use substitution to determine if an equation or inequality is true?

6.EE.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.

Student will know...(facts, vocabulary, concepts)

- Expression
- Inequality
- Substitute
- Operations
- Explicit
- Unknown number
- Variable

Student will be able to...

- Substitute for a variable
- Determine if the equation or inequality is true.
- Solve real world mathematical problems using equations and expressions with numbers.
- Explain the strategies used to determine the answer to an expression or inequality.
- 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

Standard Essential Question

How can we use variables and expressions to solve real-world and mathematical problems?

6.EE.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.

Student will know...(facts, vocabulary, concepts)

- Expression
- Equation
- Solution
- Operations
- Variable
- Inverse operation
- One-step equation
- Justify
- Unknown
- Two-step and three-step equations

Student will be able to...

- Solve equations involving fractions and decimals.
- Understand the meaning of the equation and the solution in the context of a given problem.
- Write equations from real-world problems.
- Use inverse operations to solve one-step equations based on real world situations.
- Check answer for reasonableness and accuracy.
- Justify solutions
- 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 non-negative rational numbers.

Standard Essential Question

How do we construct, solve, and explain one-step equations using all four inverse operations?

6.EE.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.

Student will know...(facts, vocabulary, concepts)

- Equation
- Expression
- Variable
- Statement
- Inequality
- Inequality symbols
- Number line
- Infinite
- Line diagram
- Constraint
- Condition
- Slope

Student will be able to...

- Define infinite.
- Define constraint.
- Recognize a constraint.
- Represent the constraint on a number line using an open circle or a closed circle.
- Plot a given inequality on a number line and represent the constraint (shading in the designated direction).
- Construct an inequality that represents a real-world condition.
- Given a solution on a number line, write the corresponding inequality.
- Plot an inequality that represents a real-world condition.
- 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.

Standard Essential Question

How are representing and translating two quantities that relate to each other help me to solve real-world and mathematical problems?

6.EE.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.*

Student will know...(facts, vocabulary, concepts)

- Variable
- Coefficient
- Table
- X-axis
- Y-axis
- Dependent variable
- Independent variable
- Function
- Function table
- Linear functions
- Non-linear functions

Student will be able to...

- Define and distinguish between dependent and independent variables.
- Construct an equation form a word problem. Understand how the coefficient of the dependent variable is related to the graph and/or table of values.
- Use many forms to represent relationships between two quantities.
- Recognize that the independent variable is graphed on the x-axis; the dependent variable is graphed on the y-axis.
- 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.

Standard Essential Question

How are representing and translating two quantities that relate to each other help me to solve real-world and mathematical problems?