

## Logan County Schools Deconstructed Standards 6th Grade Math

<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.EE.1 Write and evaluate numerical expressions involving whole number exponents.
<b>SMP</b>	MP.2, MP.6

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Write and evaluate  
Vocabulary: expressions, exponents, base  
Order of operations

### 2. Key Implementation Questions and Answers:

Interpret an exponent of size  $n$  as a repetitive multiplication expression of the base multiplied by itself  $n$  times; use the standard order of operations using exponents to evaluate numerical expressions.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I am learning to simplify numerical expressions by using exponents.  
I am learning to evaluate exponents.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I will know that I learned it when I can model a real world situation with exponents. Example: Finding the area of a square can be shown by squaring the length of one side and correctly evaluating the expression (possibly use an object in class or measure the floor of the classroom).

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Another example would be showing the volume of a cube as the side length raised to the third power and then evaluating correctly (use the volume of the classroom or a cube around the room).

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

Area-home, fencing, yardage, flooring, painting, sporting events  
volume-laying concrete, capacity (container) pool, capacity of places

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<b>Grade Level:</b>	6
<b>Standard</b>	<p>KY.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.</p> <p>b. Identify parts of an expression using mathematical terms (sums, term, product, factor, quotient, coefficient); view one or more parts of an expression in a single entity.</p> <p>c. Evaluate expressions for specific values of their variables, including values that are non-negative rational numbers. Include expressions that arise from formulas used in real-world problems.</p> <p>Perform arithmetic operations, including whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).</p>
<b>SMP</b>	MP.1, MP.3, MP.4

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Vocabulary: expression, sum, term, product, factor, quotient, coefficient, constant, difference, variable, rational number, negative, exponents, parenthesis, formula, surface area, volume,

### 2. Key Implementation Questions and Answers:

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For example,

- Express the calculation “y less than 5” as  $5 - y$ .
- 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.
- Use the formulas  $V = s^3$  and  $SA = 6s^2$  to find the volume and surface area of a cube with sides of length  $s = \frac{1}{2}$  meter.

Include expressions that arise from formulas used in real-world problems.

### **3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”**

I am learning to read expressions with variables.

I am learning to write expressions with operations, numbers and variables.

I am learning to identify each part of an expression using mathematical terms.

I am learning to evaluate expressions with variables.

I am learning to use order of operations when solving expressions.

### **4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”**

I know that I learned it when I model a real life situation as an expression, substitute the value of the unknown variable, and evaluate the value of the expression. An example could be to create an expression using the amount of money saved each week, determine the number of weeks you did this, and then decide how much money you had after that amount of time (write the expression, substitute a value for the number of weeks, evaluate the answer).

Common misconceptions with expressions are combining terms that are not alike, interpreting the key words incorrectly, incorrectly modeling the expressions from written expressions.

### **5. Ideas for Relevance (Authentic Work with a Connection to Real-World) “I am learning this because”**

I am learning this because I will be faced with real world situations where expressions will be able to help me evaluate the current situation as well as helping me make predictions about future situations. Expressions also help model the relationship between the independent and dependent variables that we encounter throughout our lives.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.EE.3 Apply the properties of operations to generate equivalent expressions.
<b>SMP</b>	MP.7, MP.8

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Vocabulary: Associative property, commutative property, distributive property  
equivalent

### 2. Key Implementation Questions and Answers:

Using Associative, Commutative and Distributive properties to generate equivalent expressions.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I am learning to apply the associative property to generate equivalent expressions.  
I am learning to apply the commutative property to generate equivalent expressions.  
I am learning to apply the distributive property to generate equivalent expressions.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I will know that I learned it when I can explain how I can utilize the associative, commutative, and distributive properties in my life, and how it makes my life easier and more efficient.

Students look for structure in expressions by deconstructing them into a sequence of operations.

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They make use of structure to interpret an expression's meaning in terms of the quantities represented by the variables. In addition, students make use of structure by creating equivalent expressions using properties. For example, students write  $6xx$  as  $xx + xx + xx + xx + xx + xx$ ,  $4xx + 2xx$ ,  $3(2xx)$ , or other equivalent expressions. Students look for regularity in a repeated calculation and express it with a general formula.

### **5. Ideas for Relevance (Authentic Work with a Connection to Real-World) *"I am learning this because"***

I am learning this because values in real life can be represented in many different ways. Simplifying expressions can make the situations easier to work with and easier to understand. I could add up the amount of money I make from my job in  $x$  month by repeated addition, or I could make it much easier by just using multiplication.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.EE.4 Identify when two expressions are equivalent when the two expressions name the same number regardless of which value is substituted into them.
<b>SMP</b>	MP.2, MP.3, MP.7

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Vocabulary: equivalent expressions, variables

### 2. Key Implementation Questions and Answers:

Students commonly think of variables as a missing number. The focus of this standard is recognizing the variable represents any number. In other words, they do not seek to find a single number to replace the letter, but they substitute any number and the expressions will be equivalent. When each expression (not just the variable) is altered by the same value, the expressions remain equivalent, no matter the value

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I am learning to identify equivalent expressions.  
I am learning to substitute values to determine equivalence.  
I am learning to explain how expressions remain equivalent with different/based on substitutions.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I will know that I learned it when I can model a real world situation using multiple expressions (each being equivalent).

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### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***"I am learning this because"***

There are multiple ways to model real world situations as expressions. I am learning this because I need to know that I may model a situation differently than someone else, but by applying various processes they can see that the resulting values are the same.



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<b>Grade Level:</b>	6
<b>Standard</b>	KY.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.
<b>SMP</b>	MP.1, MP.2, MP.7

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Vocabulary: equation, inequality, substitution, less than or equal to, greater than or equal to

### 2. Key Implementation Questions and Answers:

From a set of numbers, substitute values to choose which satisfy a given equation or inequality. An equation or inequality with no solutions from the list may be described as having no solutions or an empty set of solutions, given the set of possible values.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I am learning to solve equations or inequalities.  
 I am learning to substitute values to make equations or inequalities true.  
 I am learning to determine equivalence.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I will know I learned it when I can demonstrate being able to check the accuracy of the solution to a

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real world problem. I will be able to use this information to help make real world decisions.

Common misconceptions would be not being able to determine if the substitution needs to be larger or smaller to make the equation/inequality true. Another common misconception would be not correctly using order of operations when testing a value in the equation/inequality.

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because I need to know whether or not I have the correct answer to real world problems. I can test whether the value I have works with the current situation. If a person only has a set amount of money and needs to buy a set of items at the store, that person can determine how many of those items they can purchase based on the price. There shouldn't be any guessing about whether the situation is going to work out in your favor or not.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.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.
<b>SMP</b>	MP.2, MP.6

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Variable, expression

### 2. Key Implementation Questions and Answers:

Represent an unknown quantity in real-world context appropriately with a variable and write an expression to show this.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can represent an unknown number using a variable.  
I can write expressions using variables.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I will know that I learned it when I use variables to represent unknown values in a real world context. I will understand that information is not always available and to solve a mathematical problem, I will need to use variables.

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I will know that I learned it when I am given a situation with unknown value and I can write expressions to solve and understand.

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because I am not always given the full information in a situation. To solve a mathematical problem, I need to understand and apply the use of variables and expressions to make sense of those real world problems.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.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
<b>SMP</b>	MP.1, Mp.2, MP.3, MP.4

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Equations, inverse or opposite operations, balanced equation

### 2. Key Implementation Questions and Answers:

Emphasis is on understanding equations can be solved by using subtraction as an opposite operation of addition and division as an opposite operation of multiplication. Additionally, emphasis is on the importance of keeping the equations balanced when solving.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can solve addition and subtraction equations by using inverse operations.  
I can solve multiplication and division equations by using inverse operations.  
I can keep an equation balanced when solving.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I will know that I learned it when I can solve equations using inverse operations. While solving, I know that I must maintain a balanced equation by keeping each side equivalent.

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### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because using inverse operations in real world situations are a necessary skill when only partial information is given. This understanding will later be used to mentally figure solutions to problems and formulas.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.EE.8 Write an inequality of the form $xx > cc$ , $xx < cc$ , $xx \geq cc$ , or $xx \leq cc$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of these forms have infinitely many solutions; represent solutions of such inequalities on vertical and horizontal number lines.
<b>SMP</b>	MP.3, MP.7

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Inequality, less than, greater than, less than or equal to, greater than or equal to, infinite solutions, range of values

### 2. Key Implementation Questions and Answers:

Emphasis is on students understanding the phrases “more than”, “less than”, “at least” and “at most” represent constraints and conditions and are therefore associated with the operators listed in real-world problems. Students also understand an inequality does not yield a specific value, but rather an infinite range of values. Students also appropriately represent solutions to inequalities using both open and closed circles, along with direction, on vertical and horizontal number lines.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. *“I am learning”*

I can write an inequality.  
 I can create an inequality from a real world problem.  
 I can explain that the solution to an inequality is a range of values.  
 I can graph the solution to an inequality on a number line.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics

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*of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”*

I know that I learned it when I can represent a specific amount of an inequality on a number line using open and closed circles. I will be able to write an inequality from a real world scenario and explain the inequality's range.

**5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) *“I am learning this because”*

I am learning this because using inequalities in real world situations is a necessary skill when given “at most” or “at least” situations. This understanding will later be used in high school algebra classes to find common ranges between two equations.



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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.EE.9 Use variables to represent two quantities in a real-world problem that changes in relationship to one another; a. Appropriately recognize one quantity as the dependent variable and the other as the independent variable. b. 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. c. Analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the question
<b>SMP</b>	MP.3, MP.4, MP.7

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Independent variables, dependent variables

### 2. Key Implementation Questions and Answers:

Students understand in real-world problems, one quantity dependently changes relative to another independent quantity at a constant rate; understand, at times, the quantities given may not have a clear independent/dependent relationship.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can identify independent variables.  
I can identify dependent variables.  
I can write an equation and understand the relationship between independent and dependent variables.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics

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*of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”*

I know that I learned it when I use variables to represent an equation with two quantities in a real world problem. More specifically when one quantity is dependent upon the other.  
I can use graphs and tables to show the relationships between the dependent and independent variables.

**5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) *“I am learning this because”*

I am learning this because it is important to recognize when one variable effects another in a constant pattern. When using proportional reasoning, the relationship between independent and dependent variables is critical for creating visual displays of data, such as tables and graphs.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.G.1 Find the area of right triangles, other triangles, special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and quadrilaterals; apply these techniques in the context of solving real-world and mathematical problems
<b>SMP</b>	MP.1, MP.6, MP.8

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Area, right triangles, quadrilaterals, polygons, composing and decomposing, surface area

### 2. Key Implementation Questions and Answers:

Area of the listed shapes may be thought of as a rectangle with larger area, subtracting the areas exterior to the actual shape to obtain the true area, or as a composite area of smaller triangles and rectangles which sum to the true area of the given shape. Students recognize given shapes can be combined to find area or decomposed to find area, such as surface area, and one method may be more efficient than the other.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can calculate the area of a triangle.  
I can calculate the area of a quadrilateral.  
I can calculate the area of an irregular shapes by decomposing the shape.  
I can calculate the surface area of a 3-D shape.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common

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*misconceptions. "I will know that I learned it when"*

I will know that I learned it when I can correctly calculate the area of polygons decomposing as needed. This will include calculating the surface area of three dimensional shapes.

**5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) *"I am learning this because"*

I am learning this because there are many real life situations that require me to know the area of a shape. Some examples include construction, carpeting a room, painting, landscaping, etc. Also, many real life shapes are not regular polygons. Most are irregular and require them to be decomposed in order to find the area.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.G.2 Find the volume of a right rectangular prism with rational number edge lengths. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with rational number edge lengths in the context of solving real-world and mathematical problems.
<b>SMP</b>	MP.2, MP.5, MP.6

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Volume, right rectangular prism, Volume formulas ( $V=lwh$  and  $V=Bh$ )

### 2. Key Implementation Questions and Answers:

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. **“I am learning”**

I can calculate the volume of a right rectangular prism.  
 I can calculate the area of the base (B) of a right rectangular prism.  
 I can apply the  $V=Bh$  formula.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. **“I will know that I learned it when”**

I know that I learned it when I calculate the volume of a right rectangular prism, specifically finding the area of the base and using it to determine the volume.

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### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because there are many real life situations that require me to know the volume of a shape. Some examples include aquariums, pools, food containers, pouring concrete, etc.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.G.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
<b>SMP</b>	MP.4, MP.5, MP.6

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Coordinate plane, coordinates, vertices, area

### 2. Key Implementation Questions and Answers:

For example, a gardener draws a map of his garden on a coordinate plane with vertices  $(-2, 7)$ ,  $(-2, -1)$ ,  $(4, 7)$ . What is the base and height of this triangle? What is the area of his garden, assuming each unit on the coordinate plane is 1 meter?

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can draw polygons on a coordinate plane.  
I can use coordinates to find the missing side of a polygon on a coordinate plane.  
I can calculate area and perimeter of shapes on a coordinate plane.  
I can use coordinates to help solve real world problems.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I know that I learned it when I’m given coordinates/vertices on a coordinate grid, I complete a

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polygon. This includes finding the length of a side and calculating the area of the polygon.

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because it is essential for future learning to know the key components of a coordinate plane. I also need to know how to use a drawing or map to find critical information, such as a land grid, theme park maps, video games, house plans, graphic design, globe, etc.



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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.G.4 Classify three-dimensional figures including cubes, prisms, pyramids, cones and spheres
<b>SMP</b>	MP.2, MP.3

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Classify, cube, prism, pyramid, cone, sphere, three-dimensional, faces, edges, vertices, base

### 2. Key Implementation Questions and Answers:

Emphasis is on classifying three-dimensional shapes and specifically the attributes of each shape that make it unique to its classification.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can classify three-dimensional shapes.  
I can identify key attributes of three-dimensional shapes in order to classify them correctly.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I know that I learned it when I can classify three dimensional shapes by their properties. These properties include edges, angles, faces, as well as kinds of lines (parallel, perpendicular), types of angles (acute, right, obtuse, straight), number of and shape of face, base number and shape.

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### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because it is important to understand the attributes of 3D shapes in order to make necessary calculations, such as volume and surface area. Also, we live in a 3D world. Therefore, we need a firm understanding of the world around us and how it functions!

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.NS.1 Interpret and compute quotients of fractions and solve word problems involving division of fractions by fractions. MP.1, MP.2, MP.3 For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient: How much chocolate will each
<b>SMP</b>	MP.1, MP.2, MP.3

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Quotient

### 2. Key Implementation Questions and Answers:

For example, create a story context for  $(2/3) \div (3/4)$  and use a visual fraction model to show the quotient: How much chocolate will each person get if 3 people share  $1/2$  lb. of chocolate equally? How many  $1/4$ -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 mile?

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can create visual models to show the quotient of a fraction division problem.  
 I can divide a fraction by a fraction.  
 I can understand the quotient of a fraction divided by a fraction.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

## Logan County Schools Deconstructed Standards 6th Grade Math

I know that I learned it when I can draw a fraction model to show the quotient of a fraction divided by a fraction or whole number.

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because it is important to create visual models that represent situations. It is also important to understand dividing a part by a part and which one is the divisor/dividend and make sense of the quotient.

## Logan County Schools Deconstructed Standards 6th Grade Math

<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.NS.2 Fluently divide multi-digit numbers using an algorithm. a. Convert a rational number to a decimal using long division. b. Know that the decimal form of a rational number terminates in 0s or eventually repeats.
<b>SMP</b>	MP.7, MP.8

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Long division, terminating decimal, repeating decimal, quotient, algorithm, rational number, remainder

### 2. Key Implementation Questions and Answers:

Divide a rational number  $a/b$  using long division, making sure to include rational numbers equivalent to terminating decimals and rational numbers equivalent to repeating decimals. Students understand and explain when they have a 0 remainder in a long division problem, the quotient (answer) is a terminating decimal; students understand when they notice a pattern in the process of dividing, they conclude they will never reach a 0 remainder and they then identify the part of the quotient that is repeating by marking a bar over those values.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can convert a fraction to a decimal using long division.  
I can understand a decimal as repeating or terminating.  
I can explain what a remainder means in a division problem.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics

## Logan County Schools Deconstructed Standards 6th Grade Math

*of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”*

I will know that I learned it when I understand the fraction bar represents division so I therefore can convert a fraction into a decimal by division. Then I am able to explain whether the number terminates or repeats.

**5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) *“I am learning this because”*

I am learning this because converting between fractions and decimals is important in cases dealing with things like money or measurement. It is also important because it reinforces place value and encourages students to be more precise in their calculations.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.NS.3 Fluently add, subtract, multiply and divide multi-digit decimals using an algorithm for each operation
<b>SMP</b>	MP.2, MP.6

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Algorithm, quotient, product, sum, difference

### 2. Key Implementation Questions and Answers:

Emphasis is on the role of the decimal point in operations and how place value is critical to the overall fluency of the performed operations involving decimals.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can add and subtract decimals using the algorithm.  
I can multiply decimals using the algorithm.  
I can divide decimals using the algorithm.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I know I have learned it when I use place value to determine the reasonableness of an answer and understand where the decimal point is located in a sum, difference, product, or quotient and why.

### 5. Ideas for Relevance (Authentic Work with a Connection to Real-World) “I am learning this

## Logan County Schools Deconstructed Standards 6th Grade Math

***because***”

I am learning this because when performing the four operations on decimals, it is important to determine the reasonableness of their answer which places emphasis on the decimal location and place value.



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<b>Grade Level:</b>	KY.6.NS.4
<b>Standard</b>	KY.6.NS.4 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.
<b>SMP</b>	MP.8

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Distributive property, sum, factor, multiple,

### 2. Key Implementation Questions and Answers:

Express numerical expressions using the distributive property; understand there may be multiple equivalent expressions, but only one will have been completely factored (the greatest common factor removed using the distributive property) such as  $6 + 21 = 3(2 + 7)$ .

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can factor a whole number addition expression.  
I can use distributive property to represent a factored addition expression.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I will know that I learned it when I can use greatest common factor to create an equivalent expression for addition.

## Logan County Schools Deconstructed Standards 6th Grade Math

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because in future mathematical processes, it is important to express multiple representations of an equivalent expression.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.NS.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in realworld contexts, explaining the meaning of 0 in each situation.
<b>SMP</b>	MP.1, MP.2, MP.4

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Positive numbers, negative numbers

### 2. Key Implementation Questions and Answers:

For example, positive and negative temperatures or elevations, with the understanding that zero means the freezing point Celsius of water or sea level.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can identify the opposite of a number on a number line.  
I can combine positive and negative numbers to understand the meaning of zero.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I know that I learned it when I can describe quantities as positive or negative based on their place above or below zero. When I combine two numbers that are in the same distance from zero but in opposite directions, the sum will always be zero.

## Logan County Schools Deconstructed Standards 6th Grade Math

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because the sum of opposite values are used when learning operations with integers and solving real life problems, such as sea level, freezing point in Celcius, temperatures, etc.

## Logan County Schools Deconstructed Standards 6th Grade Math

<b>Grade Level:</b>	6
<b>Standard</b>	<p>KY.6.NS.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes, using appropriate range and intervals, to represent points on the line and in the plane, that include negative numbers and coordinates.</p> <p>a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize 0 is its own opposite and the opposite of a positive number is a negative, and the opposite of a negative number is a positive, such as <math>-(-3) = 3</math>.</p> <p>b. 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.</p> <p>c. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize the similarity between whole numbers, their negative opposites and their positions on a number line, ordered pairs differ only by signs and their locations on one or both axes.</p>
<b>SMP</b>	MP.2, MP.4

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Rational number, coordinate plane, coordinates/ordered pairs, axes, opposite, positive, negative, integer, quadrants

### 2. Key Implementation Questions and Answers:

For example, positive and negative temperatures or elevations, with the understanding that zero means the freezing point Celsius of water or sea level.

a. Emphasis is on student understanding that every positive location on a number line has an opposite the same distance from zero in the negative direction and vice versa. Logically following from this is the fact that zero, as it has no positive or negative sign, is its own opposite.

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- b. Emphasis is on generalizing patterns about where coordinates are located on a coordinate plane.
- c. The intent is for students to see a coordinate axis is the combination of a vertical number line and a horizontal number line. KY.6.EE.6

### **3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”**

- I can find the opposite of a number.
- I can understand that zero has no opposite.
- I can use coordinates to find locations on a coordinate plane.
- I can visualize that a coordinate plane is created by a vertical and horizontal number line.

### **4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”**

- I know that I learned it when I can justify a number’s opposite based on its relationship to zero and why zero has no opposite.
- I know that I learned it when I successfully locate ordered pairs on a coordinate plane.
- I know that I learned it when I correctly label vertical and horizontal number lines of a coordinate plane.

### **5. Ideas for Relevance (Authentic Work with a Connection to Real-World) “I am learning this because”**

- I am learning this because it is important to future math work, such as slope and proportional relationships. It is also important for real world applications, such as reading maps/GPS, altitude, sea level, temperatures, personal finances, etc.

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<b>Grade Level:</b>	6
<b>Standard</b>	<p>KY.6.NS.7 Understand ordering and absolute value of rational numbers.</p> <p>a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.</p> <p>b. Write, interpret and explain statements of order for rational numbers in real-world contexts.</p> <p>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.</p> <p>d. Distinguish comparisons of absolute value from statements about order.</p>
<b>SMP</b>	MP.1, MP.2, MP.4

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Rational numbers, absolute value, inequality, magnitude

### 2. Key Implementation Questions and Answers:

- a. Interpret two numbers, including two negatives, as one is to the left or right (or above or below) the other on a number line diagram.
- b. Understand, as with 6.NS.7a, positive and negative rational numbers represent real-life situations and can be compared.
- c. Interpret a positive or negative direction from zero as an absolute value, or magnitude, to describe a real-life situation.
- d. Recognize a number's distance from zero can be compared to another number's distance from zero with a "less than" or "greater than" distinction.

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**3. Develop “Learning Intention” statements.** *Describe the standard and/or element(s) as statements of intended learning. “I am learning”*

I can order positive and negative numbers on number lines and justify the placement.  
I can explain that absolute value is the distance from zero on a number line.  
I can compare and order absolute values.

**4. Establish success criteria by identifying strong and weak work.** *Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”*

I will know that I learned it when I compare and order positive numbers, negative numbers, and absolute value, utilizing their position on the number line and justifying my reasoning.  
I can describe/explain the relationship of positive and negative numbers in real life situations.

**5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) *“I am learning this because”*

I am learning this because absolute value is important when understanding debt, distance on maps, elevations, etc. Also, I will use absolute value when operating with integers.



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<b>Grade Level:</b>	6
<b>Standard</b>	KY.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.
<b>SMP</b>	MP.5, MP.7

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Quadrants, coordinate plane, coordinates, absolute value

### 2. Key Implementation Questions and Answers:

For example, represent the vertices of a rectangle in the coordinate plane and find distances between horizontal and vertical vertices accurately. Given a vertex of  $(-2, 3)$ , a length of 5 and a width of 11, locate the other three vertices of the rectangle

### 3. Develop “Learning Intention” statements. *Describe the standard and/or element(s) as statements of intended learning. “I am learning”*

I can graph points in all four quadrants on a coordinate plane.  
I can find the distance between two points with the same first or second coordinate.

### 4. Establish success criteria by identifying strong and weak work. *Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”*

I will know that I learned it when I successfully graph positive and negative coordinates on a

## Logan County Schools Deconstructed Standards 6th Grade Math

coordinate plane in all 4 quadrants. I am able to identify distances between points to successfully complete a shape given 3 of 4 ordered pairs.

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because it is important to complete geometrical shapes on a coordinate plane, finding the distance on maps/GPS, future math content (slope), etc.

## Logan County Schools Deconstructed Standards 6th Grade Math

<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities
<b>SMP</b>	MP.2, MP.6
<b>Also See</b>	

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Ratio, equivalent

### 2. Key Implementation Questions and Answers:

Students use the concept of ratios as a comparison between related quantities; students also express these relationships in equivalent ratios in lowest terms, where appropriate.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can compare quantities using ratios.  
I can express ratios in a variety of ways.  
I can describe the relationship between two ratios.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I will know that I have it when I can express ratios in various forms (as a fractions, with a colon, with the word “to”). I will also know that I am successful given two quantities and describing the

## Logan County Schools Deconstructed Standards 6th Grade Math

relationship between them.

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***"I am learning this because"***

I am learning this because comparing two quantities and expressing in simplest form is demonstrated in recipes, home improvement projects (paint/fertilize), and multiple careers (farming/construction/chef).

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.RP.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.
<b>SMP</b>	MP.2, MP.6

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Unit rate, rate

### 2. Key Implementation Questions and Answers:

Expectations for unit rates in grade 6 are limited to non-complex fractions; additionally, students reduce ratios of two whole numbers to a unit rate involving a fraction and a denominator of 1. Students describe real-life contexts using ratio language.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. **“I am learning”**

I can identify and describe unit rate.  
I can express unit rate in a variety of forms.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. **“I will know that I learned it when”**

I will know that I have it when I can express unit rate in various forms (as a fractions, with a colon, with the word inequality). I will also know that I am successful when I can explain that a unit rate is a ratio where the second term of the ratio is ONE of something.

## Logan County Schools Deconstructed Standards 6th Grade Math

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because future math content will focus heavily on linear relationships and proportionality. Unit rate is practiced in real life with price comparison, mileage, cooking, etc.

## Logan County Schools Deconstructed Standards 6th Grade Math

<b>Grade Level:</b>	6
<b>Standard</b>	<p>KY.6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems.</p> <p>a. Make tables of equivalent ratios relating quantities with wholenumber measurements, find missing values in the tables and plot the pairs of values on the coordinate plane. Use tables to compare ratios.</p> <p>b. Solve rate problems including those involving unit pricing and constant speed.</p> <p>c. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.</p>
<b>SMP</b>	MP.1, MP.4, MP.7

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Ratios, equivalent ratios, coordinate plane, unit rate

### 2. Key Implementation Questions and Answers:

- a. Students find the missing values in a table, assuming the values in the table represent a proportional relationship; students plot the values from a table on a coordinate plane, with appropriate labels and scales; Students compare the ratios of tables, answering, which has a greater/less rate.
- b. Students find a unit rate from a given situation and reason to apply it to a future scenario.
- c. For example, convert miles per hour to feet per hour or meters per minute to meters per hour using appropriate conversion ratios.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can create a ratio table to determine equivalent ratios.  
 I can identify missing values in a ratio table.

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I can use a ratio table to plot points on a coordinate plane.  
I can solve problems using unit rate and constant speed.  
I can use ratios to convert measurements.

**4. Establish success criteria by identifying strong and weak work.** *Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”*

I will know that I learned it when I can complete a ratio table to equivalency and plot points on a coordinate plane. I will also be able to solve real word problems including speed and unit rate where the unit is per one. I will be able to utilize ratios to convert metric and standard units of measurement.

**5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) *“I am learning this because”*

I am learning this because creating ratio tables is important for linear relationships and proportionality. It is also important to use ratios for unit pricing to find the best buy, converting measurements (cooking/recipes, construction, best gas mileage, etc), and determine speed/distance. Learning this will help transition from ratio tables to creating graphs.



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<b>Grade Level:</b>	6
<b>Standard</b>	<p>KY.6.SP.0 Apply the four-step investigative process for statistical reasoning.</p> <p>a. Formulate Questions: Formulate a statistical question as one that anticipates variability and can be answered with data.</p> <p>b. Collect Data: Design and use a plan to collect appropriate data to answer a statistical question.</p> <p>c. Analyze Data: Select appropriate graphical methods and numerical measures to analyze data by displaying variability within a group, comparing individual to individual and comparing individual to group.</p> <p>d. Interpret Results: Draw logical conclusions and make generalizations from the data based on the original question.</p>
<b>SMP</b>	MP.1, MP.4

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Statistical questions, variability, data,

### 2. Key Implementation Questions and Answers:

Emphasis is on understanding answering a statistical question is completed by an investigative process that encompasses questioning, collection, analysis and interpretation of the data gathered.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can determine if a question is statistical.  
 I can create a statistical question.  
 I can collect, analyze, and interpret data.

## Logan County Schools Deconstructed Standards 6th Grade Math

**4. Establish success criteria by identifying strong and weak work.** *Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”*

I will know that I learned it when I can select a statistical question from a list of questions. I will also be able to create a valid statistical question and use it to collect, analyze and interpret data.

**5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) *“I am learning this because”*

I am learning this because surveys give a sample of the population and guides decision making for the entire population. Using a true statistical question, provides the most useful and accurate information regarding the population.

## Logan County Schools Deconstructed Standards 6th Grade Math

<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.SP.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.
<b>SMP</b>	MP.1, MP.3, MP.6

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Statistical question, variability

### 2. Key Implementation Questions and 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 a variety of values with associated variability in students’ ages.

### 3. Develop “Learning Intention” statements. *Describe the standard and/or element(s) as statements of intended learning. “I am learning”*

I can identify a statistical question.  
I can decide if the answers to a statistical question will show variability.

### 4. Establish success criteria by identifying strong and weak work. *Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”*

I will know that I learned it when I can select a statistical question from a list of questions and explain how the answers show variability. I will also be able to create or correct a statistical question so that the answers anticipate variability.

## Logan County Schools Deconstructed Standards 6th Grade Math

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because surveys give a sample of the population and guides decision making for the entire population. If the statistical question does not insure variability appropriate and effective decisions cannot be made.

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<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.SP.2 Understand that a set of numerical data collected to answer a statistical question has a distribution which can be described by its center, spread and overall shape.
<b>SMP</b>	MP.2, MP.6, MP.7

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Data, statistical question, distribution, center, spread

### 2. Key Implementation Questions and Answers:

Students distinguish between graphical representations which are skewed or approximately symmetric; use a measure of center to describe a set of data.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can identify the mean, median, and mode.  
I can identify the range and interquartile range.  
I can use the measure of center and variability to describe the data set.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I will know that I learned it when I can find the measures of center and variability when given a data set. I can also use those measures to data to make describe the overall data set.

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### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***"I am learning this because"***

I am learning this because it helps give an idea of what the "most" common, normal, or representative answers might be. Many times, a single value is used to describe the entire data set to provide an general overview.

## Logan County Schools Deconstructed Standards 6th Grade Math

<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.SP.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number to describe a typical value, while a measure of variation describes how the values in the distribution vary
<b>SMP</b>	MP.2, MP.5, MP.6

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Measure of center, data set, measure of variation, mean, median, mode, range, interquartile range, spread

### 2. Key Implementation Questions and Answers:

Emphasis is on the sensitivity of measures of center to changes in the data, such as mean is generally much more likely to be pulled towards an extreme value than the median. Additionally, measures of variation (range, interquartile range) describe the data by giving a sense of the spread of data points.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can utilize a measure of center to describe a typical value.  
I can utilize a measure of variation to describe the spread of data.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common

## Logan County Schools Deconstructed Standards 6th Grade Math

*misconceptions. "I will know that I learned it when"*

I will know that I learned it when I can calculate measures of center and variation. Additionally, I will use those measures to either describe a typical value in the data set or describe the spread or range of data.

**5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) *"I am learning this because"*

I am learning this because it is important to know which measure is appropriate to use with given situations. Many times, only one representative value is needed to describe a data set, but other times the spread is necessary to describe it.



## Logan County Schools Deconstructed Standards 6th Grade Math

<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.SP.4 Display the distribution of numerical data in plots on a number line, including dot plots, histograms and box plots.
<b>SMP</b>	MP.6, MP.7
<b>Also See</b>	

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Distribution, data, dot plots, histogram, box plots, graphical representation, range, interquartile range, mean, median, mode

### 2. Key Implementation Questions and Answers:

Students create the listed graphical representations in the appropriate context and describe the attributes of each.

### 3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”

I can create and describe the attributes of a dot plot.  
I can create and describe the attributes of a histogram.  
I can create and describe the attributes of a box plot.

### 4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”

I will know that I learned it when I can create a dot plot, histogram, and box plot when given a set of data. I will also be able to describe various aspects of each. For example, they are all created on a number line that must have even intervals, but the mean can only be found using a dot plot. Also, a

## Logan County Schools Deconstructed Standards 6th Grade Math

histogram is the only representation that uses range groups to represent the data.

### **5. Ideas for Relevance** (Authentic Work with a Connection to Real-World) ***“I am learning this because”***

I am learning this because graphical representations are extremely common in the every day world. Often times, data is presented to individuals in a visual form rather than a list. The graphical representation allows me to “see” the data as a picture of the overall set.

## Logan County Schools Deconstructed Standards 6th Grade Math

<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.SP.4 Display the distribution of numerical data in plots on a number line, including dot plots, histograms and box plots.
<b>SMP</b>	MP.6, MP.7

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Distribution, data, dot plots, histogram, box plots, graphical representation, range, interquartile range, mean, median, mode

### 2. Key Implementation Questions and Answers:

Students create the listed graphical representations in the appropriate context and describe the attributes of each.

### 3. Develop “Learning Intention” statements. *Describe the standard and/or element(s) as statements of intended learning. “I am learning”*

I can create and describe the attributes of a dot plot.  
 I can create and describe the attributes of a histogram.  
 I can create and describe the attributes of a box plot.

### 4. Establish success criteria by identifying strong and weak work. *Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”*

I will know that I learned it when I can create a dot plot, histogram, and box plot when given a set of data. I will also be able to describe various aspects of each. For example, they are all created on a number line that must have even intervals, but the mean can only be found using a dot plot. Also, a

## Logan County Schools Deconstructed Standards 6th Grade Math

histogram is the only representation that uses range groups to represent the data.

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I am learning this because graphical representations are extremely common in the every day world. Often times, data is presented to individuals in a visual form rather than a list. The graphical representation allows me to “see” the data as a picture of the overall set.

## Logan County Schools Deconstructed Standards 6th Grade Math

<b>Grade Level:</b>	6
<b>Standard</b>	KY.6.SP.5 Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. c. Determining quantitative measures of center (median and/or mean) to describe distribution of numerical data. d. Describing distributions of numerical data qualitatively relating to shape (using terms such as cluster, mode(s), gap, symmetric, uniform, skewed-left, skewed-right and the presence of outliers) and quantitatively relating to spread/variability (using terms such as range and interquartile range). e. Relating the choice of measures of center and variability to the shape of the data distribution.
<b>SMP</b>	MP.3, MP.7

### Standard for Mathematical Practice (select and highlight)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of the structure
8. Look for and express regularity in repeated reasoning

### 1. Critical vocabulary and questions as it relates to the standard.

Observations, measures of center, mean, median, mode, distribution, cluster, gap, symmetric, uniform, skewed, outliers, spread, variability, range, interquartile range

### 2. Key Implementation Questions and Answers:

- a. Students understand larger numbers of observations create a more accurate statistical representation than smaller numbers of observations.
- b. Students describe how the data measured relates to answering a statistical question.
- c. Students know methods of finding measures of center, including finding median in non-ordered sets of data and a mean is a mathematical average.
- d. Students describe the shape of data by inspection using the terms listed and calculate the range and interquartile range of a set of data.

## Logan County Schools Deconstructed Standards 6th Grade Math

e. Students recognize mean and range are appropriate measures for symmetrical data while the median and interquartile range may be better measures for skewed data.

### **3. Develop “Learning Intention” statements. Describe the standard and/or element(s) as statements of intended learning. “I am learning”**

I can summarize a set of data into plots and histograms.  
I can describe the data as quantitative (mean, IQR, etc) or qualitative (skewed, clustered, etc.).  
I can draw conclusions from the summary of my data.  
I can compare data sets accurately.

### **4. Establish success criteria by identifying strong and weak work. Identify the characteristics of strong and weak work related to the standard and/or element(s). Identify common misconceptions. “I will know that I learned it when”**

I will know that I learned it when I can create a visual representation of a data set and use those representations to describe the data multiple ways. I will also be able to draw conclusions once I have summarized my data, and use those summaries to compare my data with other data sets.

### **5. Ideas for Relevance (Authentic Work with a Connection to Real-World) “I am learning this because”**

I am learning this because it is essential to understand the more data I have the more accurate the representations. Being able to summarize my data and use it to compare to other data sets will allow me to analyze and make decisions that are the most effective.