Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

FOA Unit One – Real Numbers
Unit Title: Real Numbers Course: Foundations of Algebra Brief Summary: Students will be able to approximate the value of real numbers both in expressions and on a number line. In addition, students will use the properties of rational numbers to add, subtract, multiply and divide numerical expressions. In addition, students will use technology to solve real world problems involving real numbers. Textbook Correlation: Pearson Algebra 1 Chapter 1 (Sections: 3,5, and 6)[Sections 5 and 6 - Emphasize real world problems and technology.] Time Frame: 3 weeks Note: Portions of this assessment will not allow calculators.

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
• How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions? • Why are patterns important to discover, use, and generalize in math?	• Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. • Clear and precise notation and mathematical

• How do I create a mathematical model? • How do I decide which is the best mathematical tool to use to solve a problem? • How do I effectively represent quantities and relationships through mathematical notation? • How accurate do I need to be? • When is estimating the best solution to a problem?	vocabulary enables effective communication and comprehension. • Level of accuracy is determined based on the context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • determine when it is more effective to use mental math versus technology • estimate values that are not easily calculated.

Meaning	
Essential Questions	Understandings
Students will consider... • Why are numbers classified the way they are? • What are various ways that numbers could be classified? • What is the best classification for a number? • When is it more appropriate to give the exact square root versus the approximated? • How can numbers be represented on a number line? • How do you graph any real number on the number line? • When computing, how is the sign of the number affected?	*Students will understand that...* • Numbers can be classified by their characteristics. • The square root of a non-negative integer can be approximated or exact. • All real numbers can be represented on a number line. • There is a relationship between ordering numbers and how they are represented on a number line. • Operations create relationships between real numbers. • Due to varying contexts, real numbers can be presented in different, but equivalent ways.

	• Operations on real numbers allow for modeling real world processes.

Acquisition	
Key Knowledge	Key Skills
Students will know... • Know how to order numbers from least to greatest • The equivalent forms of a number (Fractions/Decimals/Percents) • The meaning of a perfect square	*Students will be able to....* • Identify and differentiate types of real numbers (Emphasize rational vs. irrational) • Graph rational and irrational numbers on a number line • Use rational approximations to estimate irrational numbers • Compare real numbers • Compute rational numbers (adding, subtracting, multiplying and dividing) • Convert interchangeably between fractions, decimals and percents. • Simplify square root expressions • Find factors of a given number • Determine perfect square factors • Use technology to compute with rational numbers

Standards Alignment

MISSOURI LEARNING STANDARDS

8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). *For example, by truncating the decimal expansion of $\sqrt{2}$is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*

8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect

cubes. Know that $\sqrt{2}$is irrational.

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

SHOW-ME STANDARDS

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6
Mathematics: 1, 4, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

FOA Unit Two – Variables and Expressions
Unit Title: Variables and Expressions Course: Foundations of Algebra Brief Summary: In this unit students will analyze and evaluate algebraic expressions. In addition, students will use numerical and algebraic expressions and equations to model real world situations. Textbook Correlation: Pearson Algebra 1 Chapter One (Sections: 1,2,4,7, 8) Time Frame: 2 weeks Note - calculators will be used throughout this unit.

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
• How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions? • Why are patterns important to discover, use, and generalize in math? • How do I create a mathematical model?	• Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. • Clear and precise notation and mathematical vocabulary enables effective communication

• How do I decide which is the best mathematical tool to use to solve a problem? • How do I effectively represent quantities and relationships through mathematical notation? • How accurate do I need to be? • When is estimating the best solution to a problem?	and comprehension. • Level of accuracy is determined based on the context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • Understand that expressions, equations, and formulas are tools that are used to model real-world contexts.

Meaning	
Essential Questions	Understandings
Students will consider... • Where is algebra used? • Why is using algebra to solve problems helpful? • How can you represent an unknown quantity? • How are properties related to algebra? • How does algebra help you solve real world problems? • What makes an expression simplified? • What is the meaning of an equation?	*Students will understand that...* • Relationships that are always true for real numbers are called properties, which are rules used to rewrite and compare expressions. • Mathematical phrases and real-world relationships can be represented using symbols and operations. • When simplifying an expression, order of operations must be applied. • Equations can be used to model real world situations. • An algebraic expression can be simplified by combining the parts of the expression that are alike and using properties of mathematics. • Equations are used to represent the relationship between two quantities that have the same

	value.

Acquisition	
Key Knowledge	Key Skills
Students will know... • Key words that translate to a mathematical operations • Difference between like and unlike terms • Properties: additive inverse, associative, commutative, distributive, identity, multiplicative property of zero, substitution, symmetric	*Students will be able to....* • Translate a verbal phrase into a mathematical expression • Translate a mathematical expression into a verbal phrase • Apply order of operations to evaluate numerical and algebraic expressions • Identify the solution of an open sentence • Apply mathematical properties of operations to rational numbers (associative, commutative, distributive, identity, multiplicative property of zero, substitute, and symmetric) • Apply mathematical properties to simplify algebraic expressions by combining like terms

Standards Alignment
MISSOURI LEARNING STANDARDS 8.EE.7b. Solve linear equations with rational number coefficients, including equations, whose solutions require expanding expressions using the distributive property and collecting like terms. MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.

SHOW-ME STANDARDS

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6
Mathematics: 1, 4, 5

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Stage 1 – Desired Results

FOA Unit Three – Solving Linear Equations
Unit Title: Solving Linear Equations Course: Foundations of Algebra Brief Summary: In this unit students will solve multi-step equations and algebraic proportions. In addition, they will solve real world problems which can be represented as algebraic equations. Textbook Correlation: Pearson Algebra I Chapter Two (Sections: 2, 3, 4, 5, 6,7) Time Frame: 4 weeks

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
Students will consider... • How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions? • Why are patterns important to discover, use, and generalize in math? • How do I create a mathematical model?	*Students will understand that...* • Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. • Clear and precise notation and mathematical vocabulary enables effective communication

• How do I decide which is the best mathematical tool to use to solve a problem? • How do I effectively represent quantities and relationships through mathematical notation? • How accurate do I need to be? • When is estimating the best solution to a problem?	and comprehension. • Level of accuracy is determined based on the context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • choose from a variety of mathematical problem solving methods/tools to solve everyday situations (keeping in mind ease of use or most efficient method). • analyze, solve and represent real-world problems using mathematical representations (numbers, operations, expressions, equations).

Meaning	
Essential Questions	Understandings
Students will consider... • How can an equation be used to represent a real world problem? • Why can some equations that appear different be equivalent? • There is often more than one way to solve an equation; how can you decide which method to use? • What kinds of relationships can proportions represent? • What is the significance between equations with a solution of x=6, 6=6, and 6=7?	*Students will understand that...* • Solving an equation is the process of rewriting the equation to make what it says about its variable(s) as simple as possible • Properties of numbers and equality can be used to transform an equation into equivalent, simpler equations in order to find solutions • The numbers and types of solutions vary predictably, based on the type of equation • Proportionality involves a relationship in which the ratio of two quantities remains

	constant as the corresponding values of the quantities change • Equations can describe, explain, and predict various aspects of the real world

Acquisition	
Key Knowledge	Key Skills
Students will know... • An equation can have one solution, no solutions, or infinitely many solutions • The process involved in solving equations • How to translate between word phrases and algebraic relationships • How to write an equation from a proportion • The cross-products of a proportion are equal	*Students will be able to....* • Solve multi-step equations using rational number coefficients and constants • Solve multi-step equations applying the distributive property and combining like terms • Solve multi-step equations involving variables on both sides of the equation • Solve a real-world problem using linear equations • Solve proportions involving algebraic expressions

Standards Alignment

MISSOURI LEARNING STANDARDS

8.EE.7. Solve linear equations in one variable.

a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).

b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

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

SHOW-ME STANDARDS

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6
Mathematics: 1, 4, 5

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FOA Unit Four – Geometry
Unit Title: Geometry Course: Foundations of Algebra Brief Summary of Unit: In this unit students will apply geometric concepts to the coordinate plane and real world situations. They will create and analyze the properties of compositions of transformations. In addition, they will solve problems related to angles with polygons, parallel lines and transversals. Also, students will apply volume formulas for curved surfaces. Finally, the students will use the Pythagorean Theorem and and its converse to find distances for triangle side lengths both in real world problems and on the coordinate plane. Textbook Correlation: Pearson Algebra 1 chapter 10 section 1 (This unit will require supplementing for topics other than Pythagorean Theorem) (Use 7th Grade Pre-Algebra Book Chapters 11 and 12 include 8th grade standards) Timeframe: 4 weeks

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
Students will consider... • How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions?	*Students will understand that...* • Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a

• Why are patterns important to discover, use, and generalize in math? • How do I create a mathematical model? • How do I decide which is the best mathematical tool to use to solve a problem? • How do I effectively represent quantities and relationships through mathematical notation? • How accurate do I need to be? • When is estimating the best solution to a problem?	solution. • Clear and precise notation and mathematical vocabulary enables effective communication and comprehension. • Level of accuracy is determined based on the context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • Describe and analyze the relationships that exist between objects in the real world. • Apply the Pythagorean Theorem and its converse in a real world situation (e.g. to make sure you have square corners, etc.)

Meaning	
Essential Questions	Understandings
Students will consider... • Where are the geometric properties and measurement evident in the world around us? • How do we recognize and apply transformations of shapes to solve problems? • How are angle relationships used to find missing angle measurements? • What are some examples in real life when we can apply the Pythagorean Theorem? • How do I recognize transformations in the real world and use them to help me understand shape	*Students will understand that...* • There are various relationships among angles formed by parallel lines and transversals • There is a relationship between the number of sides a polygon has and the sum of the interior angles. • The sum of the angle measures in any polygon can be derived from the Triangle Sum Theorem • The resulting image from a sequence of transformations (rotations, reflections, translations) is congruent to the original figure

properties? • How do I apply problem solving strategies to analyze real world situations involving volume?	• The resulting image from a sequence of transformations (which includes at least one dilation) is not congruent, but similar, to the original figure • The Pythagorean Theorem and its converse can be used in various real world contexts to find the measure of missing lengths • Formulas are functional tools used to solve complex real world situations/problems

Acquisition	
Key Knowledge	Key Skills
Students will know... • The characteristics of vertical angles, supplementary and complementary angles, and reflex angles • The characteristics of angles formed by parallel lines and transversals. • The Triangle Sum Theorem • The formulas to find the measures of interior and exterior angles of polygons • How to identify the four transformations and a composition of the transformation • Dilations cause similar figures (Use AA Similarity Theorem for Triangles) • Reflections, Rotations, and Translations result in congruent figures. • How to use the prime symbol to represent the image of the figure. • The Pythagorean Theorem and its converse • The Pythagorean Theorem can be used on the coordinate grid to find distance. • The volume formulas for cones, cylinders, and spheres	*Students will be able to....* • Find missing angle measures given intersecting lines • Use informal arguments to determine the values of angles when parallel lines are cut by a transversal • Create an informal argument about the sum of the interior and exterior angles of triangles • Find missing angle measures in polygons • Identify and perform multiple transformations to the same point, line segment, or shape on the coordinate plane • Describe the effect of transformations on points, line segments, and two-dimensional figures • Apply the Pythagorean Theorem to two and three-dimensional figures • Apply the Pythagorean Theorem to find the distance between two points on a coordinate plane • Apply volume formulas to curved surfaces (cones, cylinders, spheres) • Apply Pythagorean Theorem and volume formulas to real-world problems

Standards Alignment

MISSOURI LEARNING STANDARDS

8.G.1 Verify experimentally the properties of rotations, reflections, and translations:
a. Lines are taken to lines, and line segments to line segments of the same length.
b. Angles are taken to angles of the same measure.
c. Parallel lines are taken to parallel lines.

8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.G.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*

8.G.6 Explain a proof of the Pythagorean Theorem and its converse.

8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

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

SHOW-ME STANDARDS

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6

Mathematics: 1, 2, 4, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

FOA Unit Five – Functions and Patterns
Unit Title: Functions and Patterns Course: Foundations of Algebra Brief Summary: In this unit students will use linear functions to solve real world problems graphically. They will represent patterns and sequences with tables, equations, and graphs. Finally, they will determine the difference between linear and nonlinear functions and patterns. Textbook Correlation: Pearson Algebra 1 Chapter Four (Sections: 1,2,3,4,5,6, and 7) Timeframe: 3 weeks

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
Students will consider... • How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions? • Why are patterns important to discover, use, and generalize in math?	*Students will understand that...* • Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. • Clear and precise notation and mathematical

• How do I create a mathematical model? • How do I decide which is the best mathematical tool to use to solve a problem? • How do I effectively represent quantities and relationships through mathematical notation? • How accurate do I need to be? • When is estimating the best solution to a problem?	vocabulary enables effective communication and comprehension. • Level of accuracy is determined based on the context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • know that a linear equation/function can be written to model a real world situation. • notice patterns in the real world and describe them using mathematical representations such as equations, tables, graphs, and functions.

Meaning	
Essential Questions	Understandings
Students will consider... • How would you make a table that represents a relation that is not a function? • Why would different representations of functions be needed? • How can you find any particular term in a sequence? • When would it be best to use a graph to represent a function? • Why is it important to consider domain and range? • How can you represent a pattern found in real world as a function?	*Students will understand that...* • Functions (linear and nonlinear) are a special type of relation where each value in the domain is paired with exactly one value in the range • Functions can be represented in a variety of ways, such as graphs, tables, or equations • Sequences can be described using a rule (function) that can find a particular term. • Graphs can be used to visually represent the relationship between two variable quantities as they change. • Domain and range may be limited in certain situations.

	• Functions are used to quantitatively represent real-world relationships.

Acquisition	
Key Knowledge	Key Skills
Students will know... • Explicit notation/symbolic • The vertical line test • The definitions of function, input, output, domain, range, independent variable, dependent variable, initial value, and function notation • that real world problems can be represented by function rules.	*Students will be able to....* • Determine if a pattern or function is linear or nonlinear • Identify constant and variable rates of change. • Create an x-y table of values for an equation • Plot points on the coordinate plane • Find a constant rate of change • Represent patterns or functions in various forms, such as tables, graphs, and equations • Represent linear patterns as symbolic rules using explicit notation. • Determine whether or not a relation is a function • Identify the domain and range of a function • Find the value of a given function • interpret a graph to describe the relationship between two quantities • Sketch a graph that exhibits the qualitative features of a function that has been describe verbally. • Solve real world problems related to functions.

Standards Alignment
MISSOURI LEARNING STANDARDS
8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

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

SHOW-ME STANDARDS

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6
Mathematics: 1, 4, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

FOA Unit Six – Analyzing Linear Equations
Unit Title: Analyzing Linear Equations Course: Foundations of Algebra Brief Summary: In this unit students will learn to graph and write the equation of the line in slope-intercept form and point-slope form. Textbook Correlation: Pearson Algebra I Chapter Five (Sections: 1, 3, and 4) Time frame: 3 weeks

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
Students will consider... • How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions? • Why are patterns important to discover, use, and generalize in math? • How do I create a mathematical model? • How do I decide which is the best mathematical tool to use to solve a problem? • How do I effectively represent quantities and relationships through mathematical notation?	*Students will understand that...* • Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. • Clear and precise notation and mathematical vocabulary enables effective communication and comprehension.

• How accurate do I need to be? • When is estimating the best solution to a problem?	• Level of accuracy is determined based on the context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • know that a linear equation can be used to model a real world situation.

Meaning	
Essential Questions	Understandings
Students will consider... • How does finding a line's slope by counting units of vertical and horizontal change on a graph, compare with finding it using a slope formula? • Given various equations, how would you determine which method you would prefer to use to graph the lines in the coordinate grid? • How would you write the equation of a line graphed on a coordinate plane?	*Students will understand that...* • Slope shows a constant rate of change for a linear function. • Writing the equation of a line in slope-intercept form is best when you know the slope and y-intercept of the graph of the line. • Writing the equation of a line in point-slope form is best when you know a point on the line and the slope of the line. • A line on a graph can be represented by a linear equation in various forms, each form allows different features of the graph to be analyzed. • The rise and the run of a line create similar triangles when drawn through different points on the same line. • The relationship between the slope of a line, the y-intercept of that line, and other points

	on that line allow the slope-intercept form of a linear equation to be derived.

Acquisition	
Key Knowledge	Key Skills
Students will know... • The slope formula given two points • Slope is "rise over run" • Slope-intercept form • Point-slope form • x - and y – intercepts	*Students will be able to....* • Find the slope given two points • Find the slope given a line on a graph • Write and graph a linear equation in slope-intercept form • Derive the equations y = mx and y = mx + b • Write and graph a linear equation in point-slope form • Given a graphed line, write a linear equation • Explain why the slope of a line is the same through any two given points on that line.

Standards Alignment

MISSOURI LEARNING STANDARDS

8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*

8.EE.6 Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at *b*.

8.F.2 Compare properties of two functions each represented in a different way (algebraically , graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

8.F.3 Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1, 1), (2, 4), and (3, 9), which are not on a straight line.*

8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

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

SHOW-ME STANDARDS

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6
Mathematics: 1, 4, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

FOA Unit Seven – Bivariate Data
Unit Title: Bivariate Data Course: Foundations of Algebra: The students will construct and interpret a two way table. Students will also construct a scatter plot, determine a trend line for the scatter plot, and use a trend line and its equation to make predictions for the given data set. Textbook Correlation: Pearson Algebra 1 Chapter 5: Section: 7 Chapter 12: Section 5 Vocab and Concept Byte Activity Time Frame: 3 weeks

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
Students will consider... • How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions? • Why are patterns important to discover, use, and generalize in math? • How do I create a mathematical model? • How do I decide which is the best mathematical tool to use to solve a problem?	*Students will understand that...* • Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. • Clear and precise notation and mathematical vocabulary enables effective communication and comprehension. • Level of accuracy is determined based on the

• How do I effectively represent quantities and relationships through mathematical notation? • How accurate do I need to be? • When is estimating the best solution to a problem?	context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • Make informed decisions from analyzing information in the real world involving two related sets of data

Meaning	
Essential Questions	Understandings
Students will consider... • What are examples of real world data sets that could be represented on a scatter plot? • What are real-world situations (at least one with a positive correlation, at least one with a negative correlation, and at least one with no correlation) that could be represented on a scatter plot? • How can you make predictions given bivariate data?	*Students will understand that...* • Two sets of numerical data can be graphed as ordered pairs. If the two sets of data are related, a line on the graph can be used to estimate or predict values in a real world situation. • A two way table can be used to determine if there is an association between two variables that are categorical.

Acquisition	
Key Knowledge	Key Skills
Students will know... • Types of correlations (Positive, Negative, and No Correlation) • How to draw a line of best fit. • How to write an equation for a line of best fit. • Two way table • categorical data • association	*Students will be able to....* • Construct a scatter plot and describe its correlation • Given a verbal description of two sets of data, determine if the data sets will have a positive correlation, negative correlation, or no correlation • Given a scatter plot, be able to draw a trend line on the scatter plot. • Write an equation for a trend line from a scatter plot that shows a linear correlation. • Make a prediction based on a trend line • Display frequencies and relative frequencies in a two way table for bivariate categorical data. • Construct and interpret a two way table summarizing data on two categorical variables • Use a two way table to describe possible associations between two categorical variables • Solve real-world problems involving linear sets of data.

Standards Alignment
MISSOURI LEARNING STANDARDS
8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
8.SP.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*

8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two way table. Construct and interpret a two way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those that have a curfew also tend to have chores?*

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

SHOW-ME STANDARDS

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6
Mathematics: 1, 3, 4, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

Unit Eight – Solving Systems of Linear Equations
Unit Title: Solving Systems of Linear Equations Course: Foundations of Algebra Brief Summary: Students will be able to solve a system of linear equations using graphing, substitution, elimination and with technology. Students will also be able to identify if a system of equations has one solution, no solution or infinitely many solutions. Finally, students will be able to solve real-world problems that can be modeled using a system of equations. Textbook Correlation: Pearson Algebra I Chapter 6 (Sections: 1,2,3, and 4) Time Frame: 3 weeks

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
Students will consider... • How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions? • Why are patterns important to discover, use, and generalize in math?	*Students will understand that...* • Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. • Clear and precise notation and mathematical

• How do I create a mathematical model? • How do I decide which is the best mathematical tool to use to solve a problem? • How do I effectively represent quantities and relationships through mathematical notation? • How accurate do I need to be? • When is estimating the best solution to a problem?	vocabulary enables effective communication and comprehension. • Level of accuracy is determined based on the context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • When encountering at least two options for which a decision needs to be made, use problem solving strategies to choose a "best" decision for the individual's situation.

Meaning	
Essential Questions	Understandings
Students will consider... • When do you use a system of equations, rather than a single linear equation to solve a problem? • How can you determine what the most efficient way is to solve a system of linear equations? • A classmate said that their system of equations had exactly two solutions, what would you say to this student about their answer? • What do the substitution method and the elimination method have in common?	*Students will understand that...* • Systems of linear equations can be used to model problems in which there are two or more unknown quantities • Systems of equations can be solved in more than one way • One method is to graph each equation and find the intersection point, if one exists • When a system has at least one equation that can be solved quickly for a variable, the system can be solved efficiently using substitution. • Some equations are written in a way that makes eliminating a variable a good method to use

	• The most efficient way to solve a system of linear equations depends on the forms of the given equations, how precise the solution should be, and the preference of the person solving the system

Acquisition	
Key Knowledge	Key Skills
Students will know... • The intersection of graphed linear equations is the solution to the system of equations • That parallel lines have no solution • Equivalent equations will have infinitely many solutions • That they can multiply or divide an entire equation to develop an equivalent equation • That equations can be added or subtracted to solve for a single variable in a system of equations	*Students will be able to....* • Solve a system of equations by graphing • Solve a system of equations by substitution • Solve a system of equations by elimination • Determine the number of solutions for a system of equations • Translate a real world situation into a system of equations • Use technology to determine the solution of a system of equations

Standards Alignment

MISSOURI LEARNING STANDARDS

8.EE.8 Analyze and solve pairs of simultaneous linear equations.

a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.*

c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*

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MP.8 Look for and express regularity in repeated reasoning.

SHOW-ME STANDARDS

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6
Mathematics: 1, 4, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

Foundations of Algebra Unit Nine – Exponents and Scientific Notation
Unit Title: Exponents and Scientific Notation Course: Foundations of Algebra Brief Summary: In this unit, students will simplify numerical and algebraic expressions using the properties of exponents, including working with zero and negative exponents. In addition, students will work with numbers written in scientific notation and solve real-world problems involving scientific notation. Textbook Correlation: Pearson Algebra I Chapter 7 (Sections: 1,2,3, and 4) & pg. 807 in the skills handbook Time Frame: 3 weeks

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
Students will consider... • How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions? • Why are patterns important to discover, use, and generalize in math? • How do I create a mathematical model?	*Students will understand that...* • Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. • Clear and precise notation and mathematical vocabulary enables effective communication

• How do I decide which is the best mathematical tool to use to solve a problem? • How do I effectively represent quantities and relationships through mathematical notation? • How accurate do I need to be? • When is estimating the best solution to a problem?	and comprehension. • Level of accuracy is determined based on the context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • Understand and interpret the meaning of very large and very small numbers in exponential form written in literature.

Meaning	
Essential Questions	Understandings
Students will consider... • What do negative exponents represent? • Why does a zero exponent always result in one? • How can you simplify an expression with exponents? • What are at least four equivalent expressions for x^3y^5? • Why do we write numbers in scientific notation? • How is computing with numbers written in scientific notation similar to working with the exponent rules when simplifying expressions?	*Students will understand that...* • The idea of exponents can be extended to include zero and negative exponents • The properties of exponents can be used to simplify a complex algebraic expression to make the expression more meaningful. • Computing numbers when written in scientific notation allows one to more efficiently work with very large and very small numbers

Acquisition	
Key Knowledge	Key Skills
Students will know... • Any number to the power of zero equals one • Negative exponents can become positive by moving them to the other side of the fraction bar • To have an expression that is fully simplified it must not contain any negative exponents • That the exponents are added when multiplying two powers with the same base • That exponents are subtracted when dividing two powers with the same base • That exponents are multiplied when a power is taken to another power • Large numbers are represented in scientific notation using positive exponents • Small numbers are represented in scientific notation using negative exponents	*Students will be able to....* • Simplify expressions involving zero and negative exponents • Multiply and divide powers with the same base • Take a power to another power • Apply multiple properties of exponents to simplify a more complex expression • Write any number in scientific notation • Write a number written in scientific notation in decimal notation • Add, subtract, multiply and divide numbers written in scientific notation • Solve real-world problems using exponents and scientific notation. • Use technology to compute with numbers written in scientific notation. o For example, know what it means when a calculator displays 3.2 E 5, etc.

Standards Alignment
MISSOURI LEARNING STANDARDS
8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.
8.EE.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 times 10^8 and the population of the world as 7 times 10^9, and determine that the world population is more than 20 times larger.*
8.EE.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and

scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology

MP.1 Make sense of problems and persevere in solving them.
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MP.6 Attend to precision.
MP.7 Look for and make use of structure.
MP.8 Look for and express regularity in repeated reasoning.

SHOW-ME STANDARDS

Goal 1: 1, 4, 5, 6, 7, 8
Goal 2: 2, 3, 7
Goal 3: 1, 2, 3, 4, 5, 6, 7, 8
Goal 4: 1, 4, 5, 6
Mathematics: 1, 4, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

FOA Unit 10 – Solving Linear Inequalities
Unit Title: Solving Linear Inequalities Course: Foundations of Algebra Brief Summary: In this unit, students will solve and graph one-step, two-step, multi-step, and compound inequalities. Students will also solve real-world problems involving inequalities. Textbook Correlation: Pearson Algebra I Chapter 3 (Sections: 1,2,3,4,and 6) Time Frame: 2 weeks

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
Students will consider... • How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions? • Why are patterns important to discover, use, and generalize in math? • How do I create a mathematical model? • How do I decide which is the best mathematical tool to use to solve a problem? • How do I effectively represent quantities and	*Students will understand that...* • Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. • Clear and precise notation and mathematical vocabulary enables effective communication

relationships through mathematical notation? • How accurate do I need to be? • When is estimating the best solution to a problem?	and comprehension. • Level of accuracy is determined based on the context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • Use problem solving strategies of inequalities that are modeled in the real world. (For example: chlorine levels in a swimming pool, safe temperatures for food in a refrigerator, appropriate ranges for temperatures for medicine, and acceptable ranges of measurements in manufacturing.)

Meaning	
Essential Questions	Understandings
Students will consider... • How do you represent relationships between quantities that are not equal? • How can inequalities that appear different be equivalent? • What is a real-world situation that could represent the following graph? (Place a number line on the board with a solution to an inequality graphed on it) • How are the properties of equality the same and different from the properties of inequality? • Why must the inequality symbol be flipped when you multiply or divide both sides of the	*Students will understand that...* • An inequality is a mathematical sentence that uses an inequality symbol to compare the values of two expressions • The solution of an inequality can be represented on a number line • In the same way equations are solved using properties of equality, inequalities are solved using properties of inequalities • When multiplying or dividing by a negative number, it is necessary to reverse the inequality sign. • The properties of inequalities are used to transform the original inequality into a series

inequality by a negative number? • What is the difference between using the words "and" and "or" in a mathematical sentence?	of simpler, equivalent inequalities • The solutions of a compound inequality are either the overlap or combination of the solution sets of distinct inequalities

Acquisition	
Key Knowledge	Key Skills
Students will know... • Properties of Inequalities • The solutions to any inequality can be graphed on a number line • When solving compound inequalities, the word "and" indicates that the solution is where both inequalities overlap on a number line (intersection). • When solving compound inequalities, the word "or" indicates that the solution works with either inequality (union).	*Students will be able to....* • Solve and graph one step inequalities • Solve and graph two step inequalities • Solve and graph multi-step inequalities, including variables on both sides • Solve and graph compound inequalities • Solve real-world problems involving inequalities

Standards Alignment
MISSOURI LEARNING STANDARDS MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.
SHOW-ME STANDARDS Goal 1: 1, 4, 5, 6, 7, 8 Goal 2: 2, 3, 7 Goal 3: 1, 2, 3, 4, 5, 6, 7, 8 Goal 4: 1, 4, 5, 6

Mathematics: 1, 4, 5

Wentzville School District
Curriculum Development Template
Stage 1 – Desired Results

FOA Unit Eleven - Polynomials
Unit Title: Polynomials Course: Foundations of Algebra Textbook Correlation: Pearson Algebra I Chapter 8 (Sections: 1,2,3, and 4) Brief summary: In this unit, students will learn to classify polynomials. In addition, students will learn to add, subtract and multiply polynomials. Finally, students will be able to factor a polynomial by factoring out a greatest common factor. Time Frame: 2 weeks

WSD Overarching Essential Question	WSD Overarching Enduring Understandings
Students will consider... • How do I use the language of math (i.e. symbols, words) to make sense of/solve a problem? • How does the math I am learning in the classroom relate to the real-world? • What does a good problem solver do? • What should I do if I get stuck solving a problem? • How do I effectively communicate about math with others in verbal form? In written form? • How do I explain my thinking to others, in written form? In verbal form? • How do I construct an effective (mathematical) argument? • How reliable are predictions? • Why are patterns important to discover, use, and generalize in math?	*Students will understand that...* • Mathematical skills and understandings are used to solve real-world problems. • Problem solvers examine and critique arguments of others to determine validity. • Mathematical models can be used to interpret and predict the behavior of real world phenomena. • Recognizing the predictable patterns in mathematics allows the creation of functional relationships. • Varieties of mathematical tools are used to analyze and solve problems and explore concepts. • Estimating the answer to a problem helps predict and evaluate the reasonableness of a solution. • Clear and precise notation and mathematical

• How do I create a mathematical model? • How do I decide which is the best mathematical tool to use to solve a problem? • How do I effectively represent quantities and relationships through mathematical notation? • How accurate do I need to be? • When is estimating the best solution to a problem?	vocabulary enables effective communication and comprehension. • Level of accuracy is determined based on the context/situation. • Using prior knowledge of mathematical ideas can help discover more efficient problem solving strategies. • Concrete understandings in math lead to more abstract understanding of math.

Transfer
Transfer Goal
Students will be able to independently use their learning to... • Apply algebraic processes to simplify and solve complex problems in the real world

Meaning	
Essential Questions	Understandings
Students will consider... • When is a variable expression not a monomial? • How are the processes of adding monomials and adding polynomials alike? How are the processes different? • How are the multiplication of polynomials and the factoring of polynomials related? • What are some different methods for multiplying two binomials? What do all of the methods have in common?	*Students will understand that...* • Monomials can be used to form larger expressions called polynomials • Polynomials can be added and subtracted by combining like terms • Polynomials can be multiplied together by applying the distributive property and properties of exponents • There are several ways to find the product of two binomials, including models, algebra, and table

Acquisition	
Key Knowledge	Key Skills
Students will know... • The definitions of degree of polynomials, monomial, binomial, trinomial, and polynomial • That like terms means that the variables have the same exponent • The definition of subtraction (to add the opposite) also applies to polynomials • How to find GCF for numbers and variable expressions	*Students will be able to....* • Classify polynomials • Determine the degree of a polynomial • Write polynomials in standard form • Add and subtract polynomials • Multiplying a monomial by a polynomial • Multiplying two binomials together • Factoring out the greatest common monomial factor

Standards Alignment
MISSOURI LEARNING STANDARDS MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.
SHOW-ME STANDARDS Goal 1: 1, 4, 5, 6, 7, 8 Goal 2: 2, 3, 7 Goal 3: 1, 2, 3, 4, 5, 6, 7, 8 Goal 4: 1, 4, 5, 6 Mathematics: 1, 4, 5