Chariho Regional School District
MATH CURRICULUM
ALGEBRA I

Unit 1: *Expressions*

OVERVIEW		

Total Number of 90-minute Days for this Unit: 7

LESSON #	LESSON TITLE	# of Days
Lesson 1-1	Numerical Expressions	1
Lesson 1-2	Algebraic Expressions	0.5
Lesson 1-3	Properties of Real Numbers	1
Lesson 1-4	Distributive Property	1
Lesson 1-5	Expressions Involving Absolute Value	0.5
Lesson 1-6	Descriptive Modeling and Accuracy	0.5

ESSENTIAL CONTENT & SKILLS

The major themes of this unit are:
- Students write and evaluate numerical and algebraic expressions.
- Students simplify expressions using the Distributive Property.
- Students evaluate absolute value expressions.

Content to be learned:
- Write numerical expressions.
- Evaluate numerical expressions.
- Use the order of operations.
- Write algebraic expressions.
- Evaluate algebraic expressions.
- Identify properties of equality.
- Apply the Identity and Inverse Properties to evaluate expressions.
- Apply the Commutative, Associative, and Distributive Properties to evaluate expressions.
- Write and evaluate absolute value expressions.
- Use descriptive modeling to describe real-world situations.
- Choose a level of accuracy appropriate to limitations on measurements.

Essential Question:
- How can mathematical expressions be represented and evaluated?

<table>
<tr><td colspan="3" align="center">WRITTEN CURRICULUM</td></tr>
<tr>
<td>Lesson 1.1</td>
<td align="right">FOCUS STANDARDS:

Click on the standard to view the progression of standards.</td>
<td>CCSS.MATH.CONTENT.A.SSE.1b
A. Interpret the structure of linear, quadratic, exponential, polynomial, and rational expressions.
1. Interpret expressions that represent a quantity in terms of its context.
b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1 + r)n as the product of P and a factor not depending on P.

CCSS.MATH.CONTENT.A.SSE.2
A. Interpret the structure of linear, quadratic, exponential, polynomial, and rational expressions.
2. Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.</td>
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<tr>
<td></td>
<td align="right">STANDARDS FOR MATHEMATICAL PRACTICES:</td>
<td>1 - Make sense of problems and persevere in solving them.
4 - Model with mathematics.
7 - Look for and make use of structure.</td>
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<tr>
<td>Lesson 1.2</td>
<td align="right">FOCUS STANDARDS:

Click on the standard to view the progression of standards.</td>
<td>CCSS.MATH.CONTENT.A.SSE.1

A. Interpret the structure of linear, quadratic, exponential, polynomial, and rational expressions.
1. Interpret expressions that represent a quantity in terms of its context.
a. Interpret parts of an expression, such as terms, factors, and coefficients.
b. Interpret complicated expressions by viewing one or more of their parts as a single entity.
For example, interpret P(1 + r)n as the product of P and a factor not depending on P.

CCSS.MATH.CONTENT.A.SSE.2
A. Interpret the structure of linear, quadratic, exponential, polynomial, and rational expressions.
2. Use the structure of an expression to identify ways to rewrite it.
For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.</td>
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	STANDARDS FOR MATHEMATICAL PRACTICES:	2 - Reason abstractly and quantitatively. 4 - Model with mathematics. 7 - Look for and make use of structure.
Lesson 1.3	**FOCUS STANDARDS:**	CCSS.MATH.CONTENT.A.SSE.2 A. Interpret the structure of linear, quadratic, exponential, polynomial, and rational expressions. 2. Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*
	STANDARDS FOR MATHEMATICAL PRACTICES:	3 - Construct viable arguments and critique the reasoning of others. 4 - Model with mathematics. 7 - Look for and make use of structure.
Lesson 1.4	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.A.SSE.1a A. Interpret the structure of linear, quadratic, exponential, polynomial, and rational expressions. 1. Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. CCSS.MATH.CONTENT.A.SSE.2 A. Interpret the structure of linear, quadratic, exponential, polynomial, and rational expressions. 2. Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*
	STANDARDS FOR MATHEMATICAL PRACTICES:	1 - Make sense of problems and persevere in solving them. 5 - Use appropriate tools strategically. 7 - Look for and make use of structure.
Lesson 1.5	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.A.SSE.2 A. Interpret the structure of linear, quadratic, exponential, polynomial, and rational expressions. 2. Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*
	STANDARDS FOR MATHEMATICAL PRACTICES:	4 - Model with mathematics. 7 - Look for and make use of structure. 8 - Look for and express regularity in repeated reasoning.
Lesson	**FOCUS**	CCSS.MATH.CONTENT.N-Q.2

1.6	STANDARDS: **Click on the standard to view the progression of standards.**	A. Extend the properties of exponents to rational exponents. 2. Define appropriate quantities for the purpose of descriptive modeling. CCSS.MATH.CONTENT.N-Q.3 A. Reason quantitatively and use units to solve problems. 3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. a. Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements. Identify significant figures in recorded measures and computed values based on the context given and the precision of the tools used to measure.
	STANDARDS FOR MATHEMATICAL PRACTICES:	2 - Reason abstractly and quantitatively. 4 - Model with mathematics. 6 - Attend to precision.

Unit 2: *Equations in One Variable*

OVERVIEW

Number of 90-minute Instructional Days: 7

LESSON #	LESSON TITLE	# of Days
Lesson 2.1	Writing and Interpreting Equations	0.5
Lesson 2.2	Solving One-Step Equations	1
Lesson 2.3	Solving Multi-Step Equations	0.5
Lesson 2.4	Solving Equations with Variables on Each Side	1
Lesson 2.5	Solving Equations Involving Absolute Value	0.5
Lesson 2.6	Solving Proportions	0.5
Lesson 2.7	Using Formulas	1

ESSENTIAL CONTENT & SKILLS

The major themes of this unit are:
- Students solve linear equations in one variable.
- Students solve proportions.
- Students use formulas to solve real-world problems.

Content to be learned:
- Write equations to represent relationships.
- Interpret equations that represent relationships.
- Solve one-step equations by using addition and subtraction.
- Solve one-step equations by multiplication and division.
- Solve multi-step equations.
- Solve equations with variables on each side.
- Solve equations by applying the Distributive Property.
- Solve equations that involve absolute value.
- Solve proportions.
- Solve an equation with more than one variable for a specific variable.
- Convert units of measure by using dimensional analysis.

Essential Questions:
- How can writing and solving equations help you solve problems in the real world?

WRITTEN CURRICULUM		
Lesson 2.1	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.A-CED.1 A. Create equations that describe numbers or relationships. 1. Create equations and inequalities in one variable and use them to solve problems. (Include equations arising from linear and quadratic functions, and simple rational and exponential functions.) CCSS.MATH.CONTENT.A-CED.3 A. Create equations that describe numbers or relationships. 3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non- viable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*
	STANDARDS FOR MATHEMATICAL PRACTICES:	2 - Reason abstractly and quantitatively. 4 - Model with mathematics.
Lesson 2.2	**FOCUS STANDARDS:**	CCSS.MATH.CONTENT.A-CED.1 A. Create equations that describe numbers or relationships.

		1. Create equations and inequalities in one variable and use them to solve problems. (Include equations arising from linear and quadratic functions, and simple rational and exponential functions.) CCSS.MATH.CONTENT.A-REI.1 A. Understand solving equations as a process of reasoning and explain the reasoning. 1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. CCSS.MATH.CONTENT.A-REI.3 B. Solve equations and inequalities in one variable. 3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. a. Solve linear equations and inequalities in one variable involving absolute value.
	STANDARDS FOR MATHEMATICAL PRACTICES:	2 - Reason abstractly and quantitatively. 5 - Use appropriate tools strategically. 7 - Look for and make use of structure.
Lesson 2.3	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.A-CED.1 A. Create equations that describe numbers or relationships. 1. Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.* CCSS.MATH.CONTENT.A-REI.3 B. Solve equations and inequalities in one variable. 3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
	STANDARDS FOR MATHEMATICAL PRACTICES:	2 - Reason abstractly and quantitatively. 5 - Use appropriate tools strategically. 7 - Look for and make use of structure.

Lesson 2.4	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.A-CED.1 A. Create equations that describe numbers or relationships. 1. Create equations and inequalities in one variable and use them to solve problems. (Include equations arising from linear and quadratic functions, and simple rational and exponential functions.) CCSS.MATH.CONTENT.A-REI.3 B. Solve equations and inequalities in one variable. 3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. a. Solve linear equations and inequalities in one variable involving absolute value.
	STANDARDS FOR MATHEMATICAL PRACTICES:	2 - Reason abstractly and quantitatively. 3 - Construct viable arguments and critique the reasoning of others. 7 - Look for and make use of structure.
Lesson 2.5	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.A-CED.1 A. Create equations that describe numbers or relationships. 1. Create equations and inequalities in one variable and use them to solve problems. (Include equations arising from linear and quadratic functions, and simple rational and exponential functions.) CCSS.MATH.CONTENT.A-REI.3 B. Solve equations and inequalities in one variable. 3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
	STANDARDS FOR MATHEMATICAL PRACTICES:	1 - Make sense of problems and persevere in solving them. 4 - Model with mathematics. 7 - Look for and make use of structure.
Lesson 2.6	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.A-CED.1 A. Create equations that describe numbers or relationships. 1. Create equations and inequalities in one variable and use them to solve problems. (Include equations arising from linear and quadratic functions, and simple rational and exponential functions.) CCSS.MATH.CONTENT.A-REI.3 B. Solve equations and inequalities in one variable. 3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. a. Solve linear equations and inequalities in one variable involving absolute value.

	STANDARDS FOR MATHEMATICAL PRACTICES:	2 - Reason abstractly and quantitatively. 4 - Model with mathematics.
Lesson 2.7	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.A.REI.3 B. Solve equations and inequalities in one variable. 3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. a. Solve linear equations and inequalities in one variable involving absolute value. CCSS.MATH.CONTENT.A.CED.4 A. Create equations that describe numbers or relationships. 4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V = IR to highlight resistance R.*
	STANDARDS FOR MATHEMATICAL PRACTICES:	2 - Reason abstractly and quantitatively. 6 - Attend to precision. 8 - Look for and express regularity in repeated reasoning.

Unit 3: *Relations and Functions*

OVERVIEW
Number of 90-minute Instructional Days: 7

LESSON #	LESSON TITLE	# of Days
Lesson 3.1	Representing Relations	1
Lesson 3.2	Functions	0.5
Lesson 3.3	Linearity and Continuity of Graphs	0.5
Lesson 3.4	Intercepts of Graphs	1
Lesson 3.5	Shapes of Graphs	1
Lesson 3.6	Sketching Graphs and Comparing Functions	1

	ESSENTIAL CONTENT & SKILLS

The major themes of this unit are:
- Students represent relations, and determine whether a relation is a function.
- Students use function notation, and find function values.
- Students graph linear and nonlinear functions, and identify their attributes.

Content to be learned:
- Represent relations using ordered pairs, tables, graphs, and mappings.
- Analyze graphs of relations.
- Choose and interpret the scale on a coordinate graph.
- Determine whether relations are functions.
- Use function notation.
- Determine whether a graph is discrete, continuous, or neither.
- Determine whether a function is linear or nonlinear.
- Write linear functions in standard form.
- Find x- and y-intercepts of graphs.
- Interpret intercepts of graphs of functions.
- Determine whether a graph has line symmetry.
- Identify where a graph is increasing and where it is decreasing.
- Find extrema of a function.
- Describe the end behavior of a function.
- Sketch graphs of functions.
- Solve equations by graphing.

Essential Questions:
- Why are representations of relations and functions useful?

	WRITTEN CURRICULUM	

| Lesson 3.1 | **FOCUS STANDARDS:**

Click on the standard to view the progression of standards. | CCSS.MATH.CONTENT.N-Q.1
A. Reason quantitatively and use units to solve problems.
1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

CCSS.MATH.CONTENT.F-IF.1
A. Understand the concept of a function and use function notation.
1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the |

		equation $y = f(x)$.
	STANDARDS FOR MATHEMATICAL PRACTICES:	1 - Make sense of problems and persevere in solving them. 6 - Attend to precision. 8 - Look for and express regularity in repeated reasoning.
Lesson 3.2	**FOCUS STANDARDS:**	CCSS.MATH.CONTENT.F-IF.1 A. Understand the concept of a function and use function notation. 1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$. CCSS.MATH.CONTENT.F-IF.2 A. Understand the concept of a function and use function notation. 2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
	STANDARDS FOR MATHEMATICAL PRACTICES:	3 - Construct viable arguments and critique the reasoning of others. 4 - Model with mathematics.
Lesson 3.3	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.F-IF.4 B. Interpret functions that arise in applications in terms of the context (linear, quadratic,exponential, rational, polynomial, square root, cube root, trigonometric, logarithmic). 4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. CCSS.MATH.CONTENT.F-IF.5 B. Interpret functions that arise in applications in terms of the context (linear, quadratic,exponential, rational, polynomial, square root, cube root, trigonometric, logarithmic). 5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*

	STANDARDS FOR MATHEMATICAL PRACTICES:	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.
Lesson 3.4	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.A-REI.10 D. Represent and solve equations and inequalities graphically. 10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line). CCSS.MATH.CONTENT.F-IF.4 B. Interpret functions that arise in applications in terms of the context (linear, quadratic,exponential, rational, polynomial, square root, cube root, trigonometric, logarithmic). 4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
	STANDARDS FOR MATHEMATICAL PRACTICES:	1 - Make sense of problems and persevere in solving them. 2 - Reason abstractly and quantitatively. 5 - Use appropriate tools strategically.
Lesson 3.5	**FOCUS STANDARDS:** **Click on the standard to view the progression of standards.**	CCSS.MATH.CONTENT.F-IF.4 B. Interpret functions that arise in applications in terms of the context (linear, quadratic,exponential, rational, polynomial, square root, cube root, trigonometric, logarithmic). 4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
	STANDARDS FOR MATHEMATICAL PRACTICES:	1 - Make sense of problems and persevere in solving them. 2 - Reason abstractly and quantitatively. 4 - Model with mathematics.
Lesson 3.6	**FOCUS STANDARDS:** **Click on the standard to view**	CCSS.MATH.CONTENT.F-IF.4 B. Interpret functions that arise in applications in terms of the context (linear, quadratic,exponential, rational, polynomial, square root, cube root, trigonometric, logarithmic). 4. For a function that models a relationship between two quantities,

the progression of standards.	interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. CCSS.MATH.CONTENT.F-IF.9 C. Analyze functions using different representations. 9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.	
STANDARDS FOR MATHEMATICAL PRACTICES:	6 - Attend to precision. 7 - Look for and make use of structure.	

Unit 4: *Linear and Nonlinear Functions*

OVERVIEW		
Number of 90-minute Instructional Days: 7.5		

LESSON #	LESSON TITLE	# of Days
Lesson 4.1		
Lesson 4.2		
Lesson 4.3		
Lesson 4.4		
Lesson 4.5		
Lesson 4.6		
Lesson 4.7		

ESSENTIAL CONTENT & SKILLS
The major themes of this unit are: ●   Content to be learned: ●   Essential Questions: ●

WRITTEN CURRICULUM		
Lesson 4.1	**FOCUS STANDARDS:** Click on the standard to view the progression of standards.	
	STANDARDS FOR MATHEMATICAL PRACTICES:	
Lesson 4.2	**FOCUS STANDARDS:**	
	STANDARDS FOR MATHEMATICAL PRACTICES:	
Lesson 4.3	**FOCUS STANDARDS:** Click on the standard to view the progression of standards.	
	STANDARDS FOR MATHEMATICAL PRACTICES:	

Lesson 4.4	FOCUS STANDARDS: **Click on the standard to view the progression of standards.**	
	STANDARDS FOR MATHEMATICAL PRACTICES:	
Lesson 4.5	FOCUS STANDARDS: **Click on the standard to view the progression of standards.**	
	STANDARDS FOR MATHEMATICAL PRACTICES:	
Lesson 4.6	FOCUS STANDARDS: **Click on the standard to view the progression of standards.**	
	STANDARDS FOR MATHEMATICAL PRACTICES:	
Lesson 4.7	FOCUS STANDARDS: **Click on the standard to view the progression of standards.**	
	STANDARDS FOR	

	MATHEMATICAL PRACTICES:	

NEXT HERE