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| **ESTABLISHED GOALS:** |
| **Major (m) Idaho Core cluster for the Unit:****Apply and extend previous understandings of arithmetic to algebraic expressions.*** **6.EE.1. Write and evaluate numerical expressions involving whole-number exponents.**
* 6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers.
* 6.EE.2a Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation “subtract y from 5” as 5 – y.*
* 6.EE.2b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, **coefficient**); **view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.**
* 6.EE.2c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, **including those involving whole-number exponents**, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2.

**Not previously in Idaho State Standards for 6th grade** | **Supporting and Additional (s/a) Idaho Core Standards for the Unit:****Compute fluently with multi-digit numbers and find common factors and multiples.*** 6.NS.2. Fluently divide multi-digit numbers using the standard algorithm.
 | **Bridging Idaho Core Standards from Previous Grade(s):*** 5.NF.5. Interpret multiplication as scaling (resizing), by:
* 5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation “add 8 and 7, then multiply by 2” as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*
* 5.NBT.5. Fluently multiply multi-digit whole numbers using the standard algorithm
* 4.NBT.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.
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| **TRANSFER*****Students will be able to independently use their learning to…***Apply and explain algebraic expressions that represent real world scenarios. |
| **MEANING** |
|  **Structure of Math / Overarching Understanding(s):*** Apply and extend previous understanding of arithmetic to algebraic expressions.
* Apply and extend previous understanding of numbers to compose and decompose expression
* Students can add, subtract, multiply, and divide fluently with decimals, fractions and whole numbers.
 | **Understandings:****Students will understand that:*** The relationship between properties of operations and algebraic expressions.
* Variables represent an unknown and the role of the variable in an algebraic expression.
* Algorithms provide structure and fluency in math computation
 | **Essential Questions:****Students will keep considering:*** Why is composing and decomposing numbers useful in mathematical reasoning?
* How would math change if there were not rules?
* When is it appropriate to use a variable?
* What role do algebraic expressions play in problem solving?
* Why is the language of math important when communicating mathematical reasoning?
* How do mathematical procedures and rules create the structure needed for success?
* How can I use the distributive property to simplify multiplication?
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| **ACQUISITION OF KNOWLEDGE AND SKILL****STUDENT-FRIENDLY LEARNING TARGET STATEMENTS** |
| 6.NS.2. Fluently divide multi-digit numbers using the standard algorithm. | 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.6 Attend to precision.MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.* Divide multi-digit numbers using the standard algorithm.
	+ I can justify and explain the standard algorithm for dividing multi-digit numbers
	+ I can apply the standard algorithm to divide multi-digit numbers
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| 6.EE.1. Write and evaluate numerical expressions involving whole-number exponents. | 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.* Define the parts of the exponents using mathematical vocabulary
	+ I can identify and define the base.
	+ I can identify and define the root.
	+ I can identify and define an exponent.
* Express whole-number exponents as repeated multiplication
	+ I can identify whole number exponents.
	+ I can represent whole-number exponents as repeated multiplication.
* Evaluate numerical expressions involving whole-number exponents.
	+ I can define and identify numerical expressions.
	+ I can solve whole-number exponents.
	+ I can evaluate numerical expressions involving whole number exponents
* Translate real-world situations into numerical expressions with whole-number exponents.
	+ I can recognize whole-number exponents in real world situations.
	+ I can write a numerical expression from a real world situation involving exponents.
	+ I can interpret and explain a numerical expression with an exponent representing a real world situation.
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| 6.EE.2a Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation “Subtract y from 5” as 5 – y. | 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. * Identify and define a variable.
	+ I can describe a variable.
* Develop understanding that a variable represents a number.
	+ I can understand that a variable represents a number
* Read and write numeric and algebraic expressions
	+ I can identify an algebraic expression.
	+ I can define an algebraic expression.
	+ I can model an algebraic expression.
	+ I can create an algebraic expression given a model.
	+ I can accurately read an algebraic expression using mathematical language.
* Translate word phrases into numeric and algebraic expressions.
	+ I can differentiate between numeric and algebraic expressions.
	+ I can translate word phrases into numeric and algebraic expressions.
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| 6.EE.2b Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms. | 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.* Identify parts of numerical expressions using mathematical terms.
	+ I can use a variety of mathematical terms to represent a numerical expression
	+ I can identify and describe how the parts of a numerical expression relate using mathematical language.
* Identify parts of algebraic expressions using mathematical terms.
	+ I can use a variety of mathematical terms to represent an algebraic expression
	+ I can identify and describe how the parts of an algebraic expression relate using mathematical language.
* Define sums, differences, products and quotients inside parenthesis as one quantity.
	+ I can define and explain sums, differences, products and quotients inside parenthesis as one quantity.
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| 6.EE.2c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2. | 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.6 Attend to precision.MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.* Evaluate expressions by substituting a specific value for each variable.
	+ I can substitute a specific value for a variable to simplify an algebraic expression.
* Apply conventional order (order of operations) to solving multiple step expressions (including whole number exponents).
	+ I can explore how the sequence of operations impacts the value of an expression using real world scenarios.
	+ I can construct a model that demonstrates the correct order of operation given a real world scenario.
	+ I can defend or critique examples and non-examples representing order of operations.
	+ I can defend my understanding of order of operations.
	+ I can correctly apply the order of operations to numerical and algebraic expressions.
	+ I can simplify or solve an algebraic and numerical expression using the order of operations.
* Given a real-world problem, write and evaluate variable expressions.
	+ I can determine if a story problem involves addition, subtraction, multiplication or division.
	+ I can identify real-world situations that can be represented by variable expressions.
	+ I can model a story problem using a variable expression.
	+ I can write an algebraic expression that represents a story problem.
	+ I can justify and critique a variety of algebraic expressions used to represent story problems.
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| **ASSESSMENT EVIDENCE:****Assessment Tasks that Provide Evidence for Claims including DOK**  | * **Claim #1/DOK 1, 2, 3, 4 (circle one):**
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| * **Claim #2/DOK 1, 2, 3, 4 (circle one):**
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| * **Claim #3/DOK 1, 2, 3, 4 (circle one):**
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| * **Claim #4/DOK 1, 2, 3, 4 (circle one):**
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| **Goal** |  |
| **Role** |  |
| **Audience** |  |
| **Situation** |  |
| **Product/Performance** |  |
| **Standards** |  |

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| **Materials/Resources** |  |
| **Teacher Notes** |  |

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| **Sample Learning Plan****This is not intended to be a scope and sequence** |
| **Exploring and Making Connections****(Conceptual Understanding)** | **Practice****(Procedural Fluency)** | **Assessments****(Application)** |
| **6.EE.1** |
| **Focus Task (to begin unit)**: Jenny has a bacteria sample that she is going to grow for her science experiment. She starts with two bacteria. This particular bacterium doubles every day.1. How many bacteria will there be at the end of the third day? Explain and justify your answer with a visual model.
2. How many bacteria will there be after a week? Explain and justify your answer with a visual model.
3. Your petri dish is only able to hold 1500 bacteria before it overflows. On what day does the petri dish overflow and infect the classroom? What day should it be destroyed to avoid a contamination?
 | **Sample learning tasks:****Teacher note: These tasks may need refinement based on the needs of your students. Not all tasks have been vetted.**Exponential GrowthHometown TreesHomeworkI will Race YouNo Bones About itNo Bones About it (Student task)**Material Resources:**Prentice Hall chapter 2 sections 2 and 8Story Problem Workbook pg 3 | **Formative assessment by teacher using I Can statement checklist** |

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| **6.EE.2a-c** |
| **Focus Task (to begin unit)**Molly has two older brothers, Jessie and Sam. Jessie is five years older than Molly. Sam is two years younger than Jessie. Write as many expressions as you can to represent the age of each sibling. Use M to represent Molly, S for Sam and J for Jessie. | **Sample learning tasks:****Teacher note: These tasks may need refinement based on the needs of your students. Not all tasks have been vetted.**Algebraic equations (Siblings)Vocabulary Baseball**Material Resources:**Prentice Hall chapter 2 sections 2, 3, 6, and 7Story Problem Workbook pg 5  | **Formative assessment by teacher using I Can statement checklist** |
| **Focus Task (to begin unit)**: Your Scout troop has decided to collect aluminum pop cans to be recycled at Pacific Recycling to earn money for Scout Camp. There are 35 boys in your troop. At the end of the aluminum round up, your troop has collected 4008 pounds. Pacific Recycling is offering $.45 per pound for aluminum. If the total earnings are divided evenly amongst all of the boys, how much will each boy get? | **Sample learning tasks:****Teacher note: These tasks may need refinement based on the needs of your students. Not all tasks have been vetted.**Color my SchoolDivisionMoving the DecimalScaling the Pyramids of Giza**Material Resources:**Prentice Hall Chapter 1 sections 1Prentice Hall Skills Handbook pgs 660 and 661 | **Formative assessment by teacher using I Can statement checklist** |

**Stage 3 Learning Plan**

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| **Focus** | **Coherence/Rigor** |
| Learning Goal(s):Understand that there is an algorithm for division of multi-digit numbers that increases fluency. | Task/Activity/Resource**Illustrative Math Task**6.NS.B.2 Interpreting a Division Computation**Other Tasks**6.NS.2 Color My School6.NS.2 Division6.NS.2 Moving the Decimal6.NS.2 Scaling the Pyramids of Giza**Sample Assessment Items**Claim 1Claim 2Claim 3 | Evidence (Success Criteria):Students will demonstrate fluency using the standard algorithm for division |
| Learning Goal(s):Understand that a variable represents an unknown quantity in a real-world scenario | Task/Activity/Resource**Illustrative Math Task**6.EE.A.2 Rectangle Perimeter 16.EE.A.2 Distance to School**Other Tasks**6.EE.2b Algebriac equations (siblings)**Sample Assessment Items**Claim 1Claim 2Claim 3 | Evidence (Success Criteria):Student will identify what a variable represents when given a real world situation |
| Learning Goal(s):Understand that there is a relationship between words and algebraic expressionsFor example: subtract y from 5 is 5 – y  | Task/Activity/Resource**Illustrative Math Task****Other Tasks**6.EE.2B Vocabulary Baseball6.EE.2a-c Wumps**Sample Assessment Items**Claim 1Claim 2Claim 3 | Evidence (Success Criteria):Students will generate expressions from wordsStudents will write word phrases from expressions |
| Learning Goal(s):Understand that exponents are used to represent repeated factors including variables and whole numbers | Task/Activity/Resource**Illustrative Math Task**6.EE.A.1 The Djinni's Offer6.EE.A.1 Seven to the What**Other Tasks**6.EE.2 Growing Staircases6.EE.1 Hometown trees6.EE.1 Homework**Sample Assessment Items**Claim 16.EE.1 Exponents 26.EE.1, 6.EE.2 ExponentsClaim 26.EE.2 Growing StaircasesClaim 3 | Evidence (Success Criteria):Students will solve exponents |
| Learning Goal(s):Understand that adding a variable does not change the rules and properties of math including:* Order of operations
* Exponents
* Properties (distributive, associative, etc)
* Formulas
 | Task/Activity/Resource**Illustrative Math Task**6.EE.A.2 Distance to School6.EE.A.2 Rectangle Perimeter 16.EE.A Rectangle Perimeter 36.EE.A Watch out for Parentheses**Other Tasks****Sample Assessment Items**Claim 16.EE.2a-b Algebraic Expressions6.EE.2c Algebraic SubstitutionsClaim 26.EE.2 Once Upon a TimeClaim 3 | Evidence (Success Criteria):Students will solve complex expressions using the following:* Order of operations
* Exponents
* Properties (distributive, associative, etc)
* Formulas
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