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| **ESTABLISHED GOALS:** | | | | | |
| **Major (m) Idaho Core cluster for the Unit:**  **Reason about and solve one-variable equations and inequalities.**   * **6.EE.3. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.** * **6.EE.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for. Reason about and solve one-variable equations and inequalities.** * 6.EE.5. Understand solving an equation or **inequality** as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? **Use substitution to determine whether a given number in a specified set makes an equation or inequality true.** * 6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, **or, depending on the purpose at hand, any number in a specified set.** * **6.EE.7. Solve real-world and mathematical problems by writing and solving equations of the form *x* + *p* = *q* and *px* = *q* for cases in which *p*, *q* and *x* are all nonnegative rational numbers.** * **6.EE.8. Write an inequality of the form *x* > *c* or *x* < *c* to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form *x* > *c* or *x* < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.**   **Not previously in Idaho State Standards for 6th grade** | | | **Supporting and Additional (s/a) Idaho Core Standards 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. * 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. * 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. * 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. | | **Bridging Idaho Core Standards from Previous Grade(s):**   * 5.OA.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. * 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.OA.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. * 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. * 4.OA.1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations. * 4.OA.2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.1 * 4.OA.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. |
| **TRANSFER**  ***Students will be able to independently use their learning to…***  Apply problem solving strategies to solve a variety of complex equations, inequalities, and expressions. | | | | | |
| **MEANING** | | | | | |
| **Structure of Math/ Overarching Understanding(s):**   * Apply previous understanding of algebraic expression to solve one variable equations and inequalities * Explore and develop conceptual understanding of dependent and independent variables | | **Understandings:**  **Students will understand that:**   * All equations and inequalities can be solved with a set of values. * Variables can represent a number or a set of numbers * Real-world and mathematical problems can be solved using equations. * Conditions and constraints can be shown using inequalities. * The relationship between independent and dependent variables can be shown using graphs and tables. | | **Essential Questions:**  **Students will keep considering:**   * How does understanding what the unknown is help in solving problems? * How does understanding the relationship between unknowns help in solving problems? * How does an understanding of constraints and conditions help in solving problems and making conditions? | |
| **ACQUISITION OF KNOWLEDGE AND SKILL**  **STUDENT-FRIENDLY LEARNING TARGET STATEMENTS** | | | | | |
| 6.EE.3. Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y. | 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.   * Generate equivalent expressions by decomposing numbers.   + I can decompose numbers using a variety of operations   + I can create equivalent expressions by decomposing numerical expressions.   + I can create equivalent expressions by decomposing algebraic expressions. * .Develop a deeper understanding of equivalence and number properties using multiple representations.   + I can demonstrate understanding of the commutative property of addition and multiplication   + I can demonstrate understanding of the associative property of addition and multiplication   + I can demonstrate understanding of the identity property of addition and multiplication   + I can demonstrate understanding of the zero-product property of multiplication   + I can demonstrate understanding of the distributive property   + I can model equivalent expressions using the operational properties   + I can justify and critique a variety of models that show equivalent expressions   + I can generate equivalent expressions using operational properties | | | | |
| 6.EE.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for. Reason about and solve one-variable equations and inequalities. | 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.   * Develop an understanding of properties of equality.   + I can show that values are equal using the equal sign (=).   + I can show that values are not equal using the inequivalent sign (≠).   + I can create models that represent the reflexive property   + I can create models that represent the symmetric property.   + I can create models that represent the transitive property.   + I can model the addition property of equality   + I can model the subtraction property of equality   + I can model the multiplication property of equality   + I can model the division property of equality * Develop an understanding of inequalities   + I can apply prior knowledge of comparison symbols to model inequalities that show less than and greater than   + I can apply knowledge of comparison symbols to write inequalities that show less than and greater than   + I can extend knowledge of comparisons to write inequalities including ≤ ≥   + I can create a variety of visual representations of inequalities.   + I can justify and critique a variety of visual representations of inequalities.   + I can compare and contrast inequalities and equations. * Examine numerical sentences, substituting variables for known values (e.g., rewrite as 4 + 6 = 10 as *x* + 6 = 10).   + I can use a variable to represent a known value in a numerical sentence.   + I can write a variety of numerical sentences substituting variables for known values using all four operations. * Explain how to find the value of the variable using reasoning and prior knowledge (fact families, inverse operations, balanced scale model, bar model).   + I can use a variety of models to show the value of an unknown variable in context.   + I can justify and critique a variety of models that show the value of an unknown variable in context * Explain what it means if a number is a solution of an equation or inequality.   + I can create models to represent the solution of an equation or inequality.   + I can justify and critique a variety of models that show the solution of an equation or inequality.   + I can explain why a number is a solution to an equation or an inequality. * Write equations and inequalities and evaluate and justify if a given number is a solution.   + I can write equations and inequalities.   + I can evaluate and justify if a given number is a solution to an equation or inequality. | | | | |
| 6.EE.5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. | 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.   * Use substitution to determine which number makes an equation true.   + I can substitute a number for a variable   + I can determine if a substitution makes an equation true * Understand how to solve an equation   + I can use inverse operations to determine the value of a variable in an equation * Use substitution to determine which number makes an inequality true.   + I can substitute a set of numbers for a variable   + I can determine if a set of numbers makes an inequality true * Understand how to solve an inequality   + I can use inverse operations to determine the value of a variable in an inequality | | | | |
| 6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. | 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.   * Write an expression that represents a given scenario using numbers and a variable.   + I can describe the role of a variable in an algebraic expression   + I can compose a real-world problem from an algebraic expression.   + I can construct an algebraic expression representing a real world situation. * Write an equation that represents a given scenario using numbers and a variable.   + I can describe the role of a variable in an algebraic equation   + I can compose a real-world problem from an algebraic equation.   + I can construct an algebraic equation representing a real world situation. | | | | |
| 6.EE.7. Solve real-world and mathematical problems by writing and solving equations of the form *x* + *p* = *q* and *px* = *q* for cases in which *p*, *q* and *x* are all nonnegative rational numbers. | 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.   * Explore strategies for solving one-step equations.   + I can draw a model of one-step equations   + I can use a chart or a table to model solutions to one-step equations   + I can create a bar model to represent the solution to a one-step equation * Use algebraic equations to solve real-world and mathematical problems.   + I can solve for a variable in an algebraic equation * Solve one step equations   + I can use the addition property of equality to solve a one-step equation.   + I can use the subtraction property of equality to solve a one-step equation.   + I can use the multiplication property of equality to solve a one-step equation   + I can use the division property of equality to solve a one-step equation. | | | | |
| 6.EE.8. Write an inequality of the form *x* > *c* or *x* < *c* to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form *x* > *c* or *x* < c have infinitely many solutions; represent solutions of such inequalities on number line diagrams. | 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.   * Recognize that a variable in an inequality can represent more than one number.   + I can recognize that more than one number can make an inequality true * Represent solutions of inequalities on number line diagrams.   + I can use a number line to show the solutions of an inequality. * Write an inequality to represent a constraint or condition in a real-world or mathematical problem.   + I can write an inequality to represent a constraint in a real-world or mathematical problem.   + I can write an inequality to represent a condition in a real-world or mathematical problem. | | | | |
| **ASSESSMENT EVIDENCE:**  **Assessment Tasks that Provide Evidence for Claims including DOK** | * **Claim #1/DOK 1, 2, 3, 4 (circle one):**   Algebraic Expressions  Representing Inequalities  Solving Equations  Story Problems and Equations  Sugar Cookies | | | | |
| * **Claim #2/DOK 1, 2, 3, 4 (circle one):**   Ana’s Bicycle  Boxes | | | | |
| * **Claim #3/DOK 1, 2, 3, 4 (circle one):** | | | | |
| * **Claim #4/DOK 1, 2, 3, 4 (circle one):**   Elk Street  Glass Beads  Mileage Comparisons  Mileage Comparisons part 2 | | | | |
| |  |  | | --- | --- | | **Goal** |  | | **Role** |  | | **Audience** |  | | **Situation** |  | | **Product/Performance** |  | | **Standards** |  | | | | | | |
| **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)** |
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| **Focus Task (to begin unit)**:  Andrew is saving for an iPod Touch. He earns $24 a week mowing lawns. He saves $21 of his pay each week. So far he’s saved $63. The IPod touch he wants to buy is 16GB and costs $170.   1. How many more weeks will Andrew need to save before he has enough money. Justify your answer with a model.    1. Write an equation to show how you got your answer. 2. If Andrew decides to upgrade to 32GB with an MP3 player, he’ll need to save $204. How might this change his plan for an iPod touch? 3. Justify your answer with a model and equation. | **Sample learning tasks:**  **Teacher note: These tasks may need refinement based on the needs of your students. Not all tasks have been vetted. These documents can be found in Moodle.**  **Learning Tasks:**  Inequalities  Day at Lagoon  Feeding a Family  Katie’s Kennel  Stack it up  Wicked Rollercoaster  $100 Lottery  Summer Job  Water Money  Temperature  Spaghetti and Meatballs  **Material Resources:**  Prentice Hall chapter 12  Story Problem Workbook page 8, 97-99 | **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 the place of a digit inside a number determines its value. | Success Criteria: | Learning Targets  I can statements…  (completed by PLCs): | Activate Prior Knowledge:  Previous Grade Level:  Number Talks:  Number Strings: | Conceptual Understanding/  Application: | Procedural Fluency: |
| Learning Goal(s):  Understand that place value is essential in addition and subtraction. | Success Criteria: | Learning Targets  I can statements…  (completed by PLCs): | Activate Prior Knowledge:  Previous Grade Level:  Number Talks:  Number Strings: | Conceptual Understanding/  Application: | Procedural Fluency: |
| Learning Goal(s):  Understand that place value is essential in multiplication and division. | Success Criteria: | Learning Targets  I can statements…  (completed by PLCs): | Activate Prior Knowledge:  Previous Grade Level:  Number Talks:  Number Strings: | Conceptual Understanding/  Application: | Procedural Fluency: |
| Learning Goal(s):  Understand that multi-digit whole numbers can be read and written using base-ten numerals, number names, and expanded form. | Success Criteria: | Learning Targets  I can statements…  (completed by PLCs): | Activate Prior Knowledge:  Previous Grade Level:  Number Talks:  Number Strings: | Conceptual Understanding/  Application: | Procedural Fluency: |
| Learning Goal(s): | Success Criteria: | Learning Targets  I can statements…  (completed by PLCs): | Activate Prior Knowledge:  Previous Grade Level:  Number Talks:  Number Strings: | Conceptual Understanding/  Application: | Procedural Fluency: |
| Learning Goal(s): | Success Criteria: | Learning Targets  I can statements…  (completed by PLCs): | Activate Prior Knowledge:  Previous Grade Level:  Number Talks:  Number Strings: | Conceptual Understanding/  Application: | Procedural Fluency: |
| Learning Goal(s): | Success Criteria: | Learning Targets  I can statements…  (completed by PLCs): | Activate Prior Knowledge:  Previous Grade Level:  Number Talks:  Number Strings: | Conceptual Understanding/  Application: | Procedural Fluency: |
| Learning Goal(s): | Success Criteria: | Learning Targets  I can statements…  (completed by PLCs): | Activate Prior Knowledge:  Previous Grade Level:  Number Talks:  Number Strings: | Conceptual Understanding/  Application: | Procedural Fluency: |
| Learning Goal(s): | Success Criteria: | Learning Targets  I can statements…  (completed by PLCs): | Activate Prior Knowledge:  Previous Grade Level:  Number Talks:  Number Strings: | Conceptual Understanding/  Application: | Procedural Fluency: |