**Native American Community Academy UbD 2.0**

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| **Stage 1 Desired Results** *What are your unit objectives and outcomes?* |
| BIG IDEAS Using Patterns to make conjectures about relationships. | ***Transfer*** |
| *Students will be able to independently use their learning to…* * to extend the number system to include the rational numbers (positive and negative integers, fractions, and decimals);
* to locate and compare the values of rational numbers using a number line;
* to develop and use algorithms for adding, subtracting, multiplying, and dividing rational numbers;
* to identify which type of number (integer, rational, whole) is appropriate for each situation and use it to solve problems.
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| ***Meaning*** |
| UNDERSTANDINGS *Students will understand that…** Rational numbers consist of positive and negative numbers.
* That using a number line and or chip boards they can develop an algorithm for adding, subtracting, multiplying, and dividing rational numbers.
 | ESSENTIAL QUESTIONS * How can the number line be extended to include rational numbers?
* How can number lines or chip boards help make an algorithm (rule) for operations with integers?
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| ***Acquisition*** |
| *As a result of this unit, students will know…* that rational numbers consist of positive numbers, negative numbers, and zerooperations with rational numbers and their properties | *As a result of this unit, students will be able to…* * Explore relationships between positive and negative numbers by modeling them on a number line
* Use appropriate notation to indicate positive and negative numbers
* Compare and order positive and negative rational numbers (integers, fractions, decimals, and zero) and locate them on a number line
* Recognize and use the relationship between a number and its opposite (additive inverse) to solve problems
* Relate direction and distance to the number line
* Use models and rational numbers to represent and solve problems
* Develop and use different models (number line, chip model) for representing addition, subtraction, multiplication, and division
* Develop algorithms for adding, subtracting, multiplying, and dividing integers
* Recognize situations in which one or more operations of rational numbers are needed
* Interpret and write mathematical sentences to show relationships and solve problems
* Write and use related fact families for addition/subtraction and multiplication/division to solve simple equations
* Use parentheses and the Order of Operations in computations
* Understand and use the Commutative Property for addition and multiplication
* Apply the Distributive Property to simplify expressions and solve problems
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| COMMON CORE STATE STANDARDS **7.NS.A.1, NS.A.1a, 7.NS.A.1b, 7.NS.A.1c, 7.NS.A.1d, 7.NS.A.2, 7.NS.A.2a**, **7.NS.A.2b, 7.NS.A.2c, 7.NS.A.2d, 7.NS.A.3, 7.EE.B.3, 7.EE.B.4, 7.EE.B.4b** Practice 1: Make sense of problems and persevere in solving them. Practice 2: Reason abstractly and quantitatively. Practice 3: Construct viable arguments and critique the reasoning of others. Practice 4: Model with mathematics. Practice 5: Use appropriate tools strategically. Practice 6: Attend to precision. Practice 7: Look for and make use of structure. Practice 8: Look for and express regularity in repeated reasoning. |

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| **Stage 2 – Evidence** *How will you assess student learning?* |
| **Evaluative Criteria** | **Assessment Evidence** |
| Unit Project Rubric:**4+ Exemplary Response**Complete, with clear, coherent explanationsShows understanding of the mathematical concepts and proceduresSatisfies all essential conditions of the problem and goes beyond what is asked for in some unique way**4 Complete Response**Complete, with clear, coherent explanationsShows understanding of the mathematical concepts and proceduresSatisfies all essential conditions of the problem**3 Reasonably Complete Response**Reasonably complete; may lack detail in explanationsShows understanding of most of the mathematical concepts and proceduresSatisfies most of the essential conditions of the problem**2 Partial Response**Gives response; explanation may be unclear or lack detailShows some understanding of some of the mathematical concepts and proceduresSatisfies some essential conditions of the problem**1 Inadequate Response**Incomplete; explanation is insufficient or not understandableShows little understanding of the mathematical concepts and proceduresFails to address essential conditions of problem**0 No Attempt**Irrelevant responseDoes not attempt a solutionDoes not address conditions of the problem**Criteria and Procedures**Title—“Dealing Down Report” Typed report using size 12 or 14 fontIntroductory paragraph with a topic sentenceFour detailed supporting paragraphsOperations with positive and negative numbersOrder of Operations including the use of parentheses and exponentsCommutative Property of Addition and MultiplicationDistributive PropertyConcluding paragraphParagraphs include mathematical examplesUse correct mathematical vocabularyUse correct conventionsName on paperIn writing your report, focus on creative thinking behaviors such as fluency, originality, elaboration, curiosity, and imagination | SUMMATIVE PERFORMANCE TASK(S) Checkup 1 after investigation 1Quiz on adding and subtracting integersCheckup 2 after Investigation 3Unit TestUnit Project, *Dealing Down*, allows students to apply what they have learned about operating with integers, using the Distributive and Commutative properties, and applying the Order of Operations to make computational sequences clear. The project has two parts. First, students play a game in which they find the least quantity using four number cards drawn from a set. After playing a few rounds of the game, students write a report explaining their strategies for the game and their use of the mathematics of the Unit to write an expression for the least possible quantity. |
| <type here>Answer keys | FORMATIVE ASSESSMENTExit card after 1.4 using integer chips. Give 2 examples of red and black chips that equal zero, solve 4+ -5.Checkup 1 After Investigation 1Reflection after investigation 1 Exit card after investigation 2.3 (write an equivalent expression for -3 - -3 and +5/6 + - 2/3)Quiz on adding and subtracting integersCheckup 2 after Investigation 3Exit card after Investigation 4.2 ( 10-50/(-2 x 25) – 7) x 2 ^2  |

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**Stage 3 – Learning Plan** *What lessons will you teach, and what skills will students master, as a result of this unit?* |
| **Topical EU/EQ****For Lesson** | **CCSS Alignment with Stage 1** | **Formative Assessment of Lesson** | **Unit Modifications** | **Activities to Support the Lesson** |
| 1. How can you find the total value of a combination of positive and negative integers?
 | 7.NS.A.1, 7.NS.A.2b, 7.NS.A3 7.NS.A.1c,  | Teacher observe students as they find teams total points in "math fever"  | Oral questioning to check for understandingStudent pairing adjustments Seating preferencesManipulatives (chip boards & number lines) Provide needed vocabulary prior to lesson (word wall) Extra timeShorten assignments or extension questions Visual aids Any other aids or help that may be required by and IEP of a studentCalculators and multiplication chartsIn support class 2 times weekly skill based warm-up.   | Playing Math fever |
| 1. How can you use a number line to compare two numbers?
 | 7.NS.A.1, 7.NS.A1a, 7.NS.A.2b 7.NS.A3 ,7.EE.B.4b,7.NS.A.1b, 7.EE.B.4 | Students number lines  | Extending the number line |
| 1. How can you write a number sentence to represent a change on a number line, and how can you use a number line to represent a number sentence?
 | 7.NS.A.1, , 7.NS.A.2b, 7.NS.A3 7.NS.A.1b, 7.NS.A.1c,  | Exit card. Find the new temperature. | From Sauna to Snow bank. |
| 1. How can you use a chip model to represent addition and subtraction?
 | 7.NS.A.1, 7.NS.A.2b, 7.NS.A3,  7.NS.A.1b, 7.NS.A.1c,  | Exit card give example of zero and solve 1 equation  | In the Chips |
| 1. How can you predict whether the result of addition of two number lines will be positive, negative, or zero?
 | 7.NS.A.1a, 7.NS.A.1b, 7.NS.A.1, 7.NS.A.1d, 7.NS.A.3, 7.EE.B.3 | Check up 1  | Extending Addition to Rational Numbers |
| 1. How is a chip model or number line useful in determining an algorithm for subtraction?
 | 7.NS.A.1b, 7.NS.A.1c, 7.NS.A.1, 7.NS.A.3, 7.EE.B.3 | student reflection | Extending Subtraction to Rational Numbers |
| 1. How are the algorithms for addition and subtraction of integers related?
 | 7.NS.A.1c, 7.NS.A.1, 7.NS.A.3, 7.EE.B.3 | supplement work sheets practicing adding and subtracting  | The “ + and –“ Connection |
| 1. What related sentences is equivalent to 4+ n = 43 and make it easier to find the value of n?
 |  7.NS.A.1c, 7.NS.A.1, 7.NS.A.3,  | quiz on adding and subtracting integers  | Fact Families |
| 1. How is multiplication of two integers represented on a number line and a chip board?
 | , 7.NS.A.2, 7.NS.A.2a, 7.NS.A.3, 7.EE.B.3 |  | Multiplication Patterns With Integers |
| 1. What algorithms can you use for multiplying integers?
 | 7.NS.A.2c, 7.NS.A.2, 7.NS.A.2a, 7.NS.A.3, 7.EE.B.3 | Students poster for algorithms  | Multiplication of Rational Numbers |
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| 1. What algorithms can you use for dividing integers? How are multiplication and division of integers related?
 | 7.NS.A.2b, 7.NS.A.2c, 7.NS.A.2d, 7.NS.A.2, 7.NS.A.2a, 7.NS.A.3, 7.EE.B.3 | Students poster for algorithms  |  | Division of Rational Numbers |
| 1. What pattern do you notice on the game board for the Integer Product Game that will help you win?
 | 7.NS.A.2c, 7.NS.A.2, 7.NS.A.2a, 7.NS.A.3,  |  Exit cardGive possible factors for given productssupplemental worksheets multiplying and dividingQuiz |  | Playing the Integer Product game |
| 1. Does the Order of Operations work for integers? Explain
 | 7.NSA.1d, 7.NS.A.2a, 7.NS.A.2c, 7.NS.A.3, 7.EE.B.3, 7.NS.A.1, 7.NS.A.2, 7.NS.A.2d |  exit cardsolving 1 problem |  | Order of Operations |
| 1. How can you use the Distributive Property to expand and expression of factor an expression that evolves integers?
 | 7.NSA.1d, 7.NS.A.2a, 7.NS.A.2c, 7.NS.A.3, 7.EE.B.3, 7.NS.A.1, 7.NS.A.2, 7.NS.A.2d |  |  | The Distributive Property |
| 1. What information in a problem is useful to help you decide which operation to use to solve the problem?
 | 7.NSA.1d, 7.NS.A.2a, 7.NS.A.2c, 7.NS.A.3, 7.EE.B.3, 7.NS.A.1, 7.NS.A.2, 7.NS.A.2d |  |  | What Operations are Needed? |