**Unit Abstract:**

Students will add and subtract positive and negative numbers. Students will calculate using number lines and other alternate forms to help solve problems. Students will apply absolute value. Students will solve problems in context.

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| **Overarching Question:**  Why do we need negative numbers? | | | | | | |
|  | | **This Unit:** Adding and Subtracting rational numbers | | | |  |
| **Questions to Focus Assessment and Instruction:**   * Why do we need negative numbers? * Can you reverse the order of rational numbers when performing addition and subtraction and still get the same answer? * How does the opposite of n differ from the absolute value of n? | | | | **Standards for Mathematical Practice**  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.  4.Model with mathematics.  5.Use appropriate tools strategically.  **6.Attend to precision.**  **7.Look for and make use of structure.**  8.Look for and express regularity in repeated reasoning. | | |
| **Academic Vocabulary**  *(5-8 most important content specific vocabulary words)* |  | | Additive inverse  Absolute value  Rational number  Integer | |  | |

| **Standards** | **Learning Targets** *(including relevant practice standards)* | **Explanations and Examples\*** | **Assured Experiences**  *(common assessments and learning activities)* |
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| **7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.**   * 1. **Describe situations in which opposite quantities combine to make 0.**   2. **Understand *p*+ *q*as the number located a distance |*q*| from *p*, in the positive or negative direction depending on whether *q*is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.**   3. **Understand subtraction of rational numbers as adding the additive inverse, *p*– *q*= *p*+ (–*q*). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.**   4. **Apply properties of operations as strategies to add and subtract rational numbers.**   MP 6 Attend to precision.  MP 7 Look for and make use of structure | Students will describe real life examples in which quantities combine to make 0.  Students will add and subtract rational numbers.  Students will explain answers using number lines.  Students will show that subtraction is the same as addition of the opposite. | Visual representations may be helpful as students begin this work; they become less necessary as students become more fluent with the operations.  Examples:  • Use a number line to illustrate:  o *p - q*  o *p + (- q)*  o Is this equation true *p – q = p + (-q)*  • -3 and 3 are shown to be opposites on the number line because they are equal distance from zero and therefore have the same absolute value and the sum of the number and its opposite is zero.    You have $4 and you need to pay a friend $3. What will you have after paying your friend?  4 + (-3) = 1 or (-3) + 4 = 1 | * common assessments * learning activity:   + Comparing Freezing Points <https://www.illustrativemathematics.org/content-standards/7/NS/A/1/tasks/314>   + Distance between Houses <https://www.illustrativemathematics.org/content-standards/7/NS/A/1/tasks/591> |

| **Standards** | **Learning Targets** *(including relevant practice standards)* | **Explanations and Examples\*** | **Assured Experiences**  *(common assessments and learning activities)* |
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| 7.NS.3 Solve real-world and mathematical problems involving the four operations (only addition and subtraction in unit 1) with rational numbers.  (Computations with rational numbers extend the rules for manipulating fractions to complex fractions.) | Students will solve word problems.  Students will write word problems. | Examples:  • Your cell phone bill is automatically deducting $32 from your bank account every month. How much will the deductions total for the year?  -32 + -32 + -32 + -32 + -32 + -32 + -32 + -32 + -32 + -32 + -32 + -32 = 12 (-32) | * common assessments * learning activity: |

**Instructional resources** (including manipulatives, literature connections, professional resources)

7.NS.1

* + Zip Zilch Zero NCTM Illuminations: [Zip, Zilch, Zero](http://illuminations.nctm.org/LessonDetail.aspx?id=L819)

7.NS.3