Unit 1a-Rational Numbers Operations

Content Area: **Math**
Course(s): **Math 7 PRE-ALGEBRA**
Time Period: **Marking Period 1**
Length: **Weeks 2-7 Envision Mathematics Topic 1**
Status: **Published**

Essential Questions

- How do operations with integers relate to the same operations with rational numbers?
- How can you determine the correct operation to use to solve problems?

Big Ideas

- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Cross Curricular Integration

Integration Area: Science

MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

Activity:

Students research the habitability of regions with cold temperatures and extreme conditions. They learn about the minimum and maximum temperatures that make a place inhabitable. Students will create a presentation that displays their findings and possible solutions.

CSDT Technology Connection

8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.

Enduring Understandings

The Number System

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.

7.NS.1a [M] Describe situations in which opposite quantities combine to make 0. For example, in the first round of a game, Maria scored 20 points. In the second round of the same game, she lost 20 points. What is her score at the end of the second round?

7.NS.1b 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.

7.NS.1c 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.

7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

7.NS.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(–1)(–1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

7.NS.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $–(p/q) = (–p)/q = p/(–q)$. Interpret quotients of rational numbers by describing real-world contexts.

7.NS.2c [M] Apply properties of operations as strategies to multiply and divide rational numbers.

7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

Mathematical Practices Focus

1. Make sense of problems and persevere in solving them. Lesson 1,2,4,6,9,10 and page 71

2. Reason abstractly and quantitatively. Lesson 1,2,3,4,5,6,8,9,10 and page 71

3. Construct viable arguments and critique the reasoning of others. Lesson 1,3,4,59,10 and page 71

4. Model with mathematics. Lesson 1,3,4,5,6,7,8,10 and page 71

5. Use appropriate tools strategically. Lesson 3, page 71

6. Attend to precision. Lesson 2,6,7

7. Look for and make use of structure. Lesson 2,3,4,5,6,8,9,10, page 71

8. Look for and express regularity in repeated reasoning. Lesson 5,6,7,8,9, page 81