Unit 1b-Integers and rational Numbers

Content Area: **Math**
Course(s): **Math 6**
Time Period: **Marking Period 1**
Length: **Weeks 6-9 Envision Mathematics Topic 2**
Status: **Published**

Essential Questions

- What are integers and rational numbers?
- How are points graphed on a coordinate plane?

Big Ideas

- Apply and extend previous understandings of numbers to the system of rational numbers and their absolute values.
- Solve real-world and mathematical problems involving distances on the coordinate plane.

Cross-Curricular Integration

Integration Area: Science

MS-ESS3-3 Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

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.

MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

Activity:

Students choose a problem identified in the Topic 1 project and apply the engineering design process to

research, plan, test, propose, and present a solution.

CSDT Technology Integration

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

8.1.8.NI.3: Explain how network security depends on a combination of hardware, software, and practices that control access to data and systems.

Activity:

Tech-Desmos polygraph for coordinate points. It works like the game "Guess Who" where you can only use yes/no questions while using the proper math vocabulary. For example: "Is your point located on the y-axis?", "Is your x-coordinate negative?". Students are randomly paired each round and the goal is to get the correct ordered pair in the least amount of questions. Students then complete a review together about *the coordinate plane through a series of questions.

Enduring Understandings

The Number System

6.NS.5 [M] Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

6.NS.6 [M] Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

6.NS.6a [M] Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.

6.NS.6b [M] Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

6.NS.6c [M] Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

6.NS.7 Understand ordering and absolute value of rational numbers.

6.NS.7a [M] Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret –3 >–7 as a statement that –3 is located to the right of –7 on a

number line oriented from left to right.

6.NS.7b [M] Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write –3 oC > –7 oC to express the fact that –3 oC is warmer than –7 oC.

6.NS.7c [M] Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of –30 dollars, write |–30| = 30 to describe the size of the debt in dollars.

6.NS.7d [M] Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than –30 dollars represents a debt greater than 30 dollars.

6.NS.8 [M] Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Mathematial Practices Focus

1. Make sense of problems and persevere in solving them. Lesson 4, and page 95

2. Reason abstractly and quantitatively. Lessons 1,2,3,5,6, and page 95

3. Construct viable arguments and critique the reasoning of others. Lessons 1,2,3,6, and page 95

4. Model with mathematics. Lesson 4, and page 95

5. Use appropriate tools strategically. and page 95

6. Attend to precision. Lesson 4, and page 95

7. Look for and make use of structure. Lessons 1,2,3,4,5,6, and page 95

8. Look for and express regularity in repeated reasoning. Lessons 1,2,4,6, and page 95