UNIT 2 – RATIONAL NUMBERS

Established Goals:
Standards
6.NS.6 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.
a. 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.Understand ordering and absolute value of rational numbers. a. 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.
b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write – 3 o C > –7 o C to express the fact that –3 o C is warmer than –7 o C.
c. 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. d. 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.7 Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of

Transfer

Students will be able to:

- order and compare rational numbers and integers.
- Employ various strategies to solve operations using integers.
- Students will locate and plot points on the coordinate plane.
- Students will solve real-world problems involving integers.
- Students will write ratios to represent real-world situations.
- Students will identify equivalent ratios using proportions.
- Students will use proportions to find the unit rate.
- Students will use ratios to convert between units of measure.
- Students will use ratios, unit rates, and proportions to solve real-world problems.

Meaning

ENDURING UNDERSTANDING	ESSENTIAL QUESTIONS
• Understand how to graph ordered pairs on a coordinate plane. • Use symbols, tables of numbers, and graphs to help us understand mathematics. • Rational numbers can be represented in multiple ways. • Integers are numbers that can be represented in positive or negative terms. • Integers are useful for noting relative changes or values. • The absolute value of a rational number is its distance from zero. • Compare and contrast integers and rational numbers in real world applications. • Every numerical operation has	• How do we write, locate, and interpret corresponding terms in an expression? • What are rational numbers and how can they be compared? • What is an integer and how can they be compared? • How do you find the absolute value of a number? • Can everything that has been done mathematically be undone? • What is the difference between a rate, ratio and a proportion? • How can proportions be used to solve problems? • How can you connect unit rates with the equation describing a situation?

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. b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write – 3 o C > –7 o C to express the fact that –3 o C is warmer than –7 o C. c. 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. d. 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** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include the use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. **6.RP.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes." **6.RP.2** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A	an inverse. ● Ratios, rates, and proportions are used to solve problems encountered in everyday life. ● Ratios use division to represent the relationship between two quantities. ● Apply proportional reasoning to solve for the unknown part when one part of two equal ratios is unknown (part-to-whole, part-to-part). ● Solve rate problems using the per-unit-rate method and the proportion method.	
	Acquisition	
	KNOWLEDGE	SKILLS
	Students will know how to… ● *Understand that positive and negative numbers are used together to describe quantities having oppositedirections 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.* ● *Understand a rational number as a point 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.*	*Students will be skilled at…* ● *Using vocabulary terms to identify, locate, and represent positive and negative integers on a number line and as quantities in real-world context.* ● *Understanding a rational number as a point on a number line.* ● *Understanding ordering and absolute value of rational numbers* ● *Making tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.* ● *Solving unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* ● *Finding a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.* ● *Using ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.*

received, candidate C received nearly three votes." **6.RP.3** Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	• *Find and position integers and other rational numbers on a horizontal or vertical number line* • *Understand ordering and absolute value of rational numbers.* • *Interpret statements of inequality as statements about the relative position of two numbers on a number line. For example, interpret -3 > -7 as a statement that -3 is located to the right of -7.* • *Write, interpret, and explain statements of order for rational numbers in real-world contexts.* • *Understand the absolute value of a rational number as its distance from 0 on the number line*	
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Vocabulary	Instruction and Pacing

Integer cross multiplication ratio rate unit rate	**order and compare rational numbers and integers.**	**1 1/2 week**
	Create and simplify ratios by gathering data and given count	**1 week**
	Create equivalent ratios and tables	**1 week**
	Determine if ratios are equivalent/find missing parts of proportions using cross multiplication	**2 weeks**
	Find rate and unit rate	**1 week**

Resources

Envisions Textbook

- **Topic 10: lessons 1, 2, 3, 4, 5, 6, 7, 9**
- **Topic 12: lessons 1, 2, 3, 4, 5;**
- **Topic 13: lesson 1, 2, 3, 4, 5; Topic 16: lessons 1, 2**

Manipulatives

- **number lines**

www.pearsonsuccessnet.com

Games / Centers

SmartBoard

Study Island

Websites: Math-Aids.com, mathworksheetsland.com, www.k5learning.com, worksheetworks.com, commoncoresheets.com

Differentiation and Accommodations

Provide graphic organizers
Provide additional examples and opportunities for additional problems for repetition
Provide tutoring opportunities
Provide retesting opportunities after remediation (up to teacher and district discretion)
Teach for mastery not test
Teaching concepts in different modalities
Adjust pace and homework assignments

ELL Modifications

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21st Century Skills	Critical Thinking, Creative Thinking, Collaborating, Communicating, and Technology Literacy
Instructional Strategies	Fairfield School recognizes the importance of the varying methodologies that may be successfully employed by teachers within the classroom and, as a result, identifies a wide variety of possible instructional strategies that may be used effectively to support student achievement. These may include, but not be limited to, strategies that fall into categories identified by the Framework for Teaching by Charlotte Danielson: ● Communicating with students ● Using questioning and discussion techniques ● Engaging students in learning ● Using assessment in instruction ● Demonstrating Flexibility and Responsiveness
Interdisciplinary Connections	

Common Misconceptions	Proper Conceptions
Students may not understand that larger negative numbers are smaller in value.	Smaller negative numbers are further from zero.
Students may confuse the absolute value symbol with the number one.	Absolute value symbol is two bars bigger than the number.
Often there is a misunderstanding that a percent is always a natural number less than or equal to 100. Provide examples of percent amounts that are greater than 100%, and percent amounts that are less 1%.	Percents can be greater than 100.
Students may confuse mathematical terms such as ratio, rate, unit rate and percent.	All terms represent comparisons.

Performance Task

It took Tony 7 hours to mow 4 lawns.

a.) At that rate, how many lawns could be mowed in 35 hours?

b.) How long did it take Tony to mow each individual lawn?

c.) If he gets paid $25 per lawn, how much money would he make if he mowed for 35 hours?

Rubric

1 point for each correct answer

ASSESSMENTS

Suggested Formative Assessment

Problem of the Day

Lesson Quizzes

Exit Ticket

Anecdotal Records (Topic Observation Checklist)

Suggested Summative Assessment

Grade level developed Unit/Envisions Topic Tests

Ed-Connect Express Tests /State Unit Benchmark Assessment/Performance Task