

GRADE 7 UNIT 1 – THE NUMBER SYSTEM

<p>Established Goals: Standards</p> <p>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.</p> <p>a. Describe situations in which opposite quantities combine to make 0. <i>For example, a hydrogen atom has 0 changes because its two constituents are oppositely charged.</i></p> <p>b. 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.</p> <p>c. 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.</p> <p>d. Apply properties of operations as strategies to add and subtract rational numbers</p> <p>7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations,</p>	Transfer	
	<p><i>Students will be able to:</i></p> <ul style="list-style-type: none"> Describe and model, on a horizontal and vertical number line, real-world situations in which rational numbers are combined. Apply the additive inverse property to subtraction problems and develop the argument that the distance between two points is the absolute value of the difference between their coordinates. Explain why a divisor cannot be zero and why division of integers results in a rational number. Model the multiplication and division of signed numbers using real-world contexts, such as taking multiple steps backwards. Convert a rational number to a decimal using long division and explain in oral or written language why the decimal is either a terminating or repeating decimal. Apply properties of operations as strategies to add, subtract, multiply, and divide rational numbers. Solve mathematical and real-world problems involving addition, subtraction, multiplication, and division of rational numbers. 	
	Meaning	
	ENDURING UNDERSTANDING	ESSENTIAL QUESTIONS
<ul style="list-style-type: none"> Negative numbers are used to represent quantities that are less than zero such as temperatures, scores in games or sports, and loss of income in business. Absolute value is useful in ordering and graphing positive and negative numbers. Computation with positive and negative numbers is often necessary to determine relationships between quantities. Models, diagrams, manipulatives and patterns are useful in developing and remembering algorithms for computing with positive and negative numbers. Properties of real numbers hold for all rational numbers. Positive and negative numbers are often used to solve problems in everyday life. 	<ul style="list-style-type: none"> When are negative numbers used and why are they important? What strategies are most useful in helping me develop algorithms (steps) for computing with rational numbers? What properties will help me simplify and evaluate rational numbers? How can rational numbers be applied to solve real-world situations? 	
Acquisition		

<p>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.</p> <p>b. 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.</p> <p>c. Apply properties of operations as strategies to multiply and divide rational numbers.</p> <p>d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p> <p>7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.</p>	KNOWLEDGE	SKILLS
	<i>Students will know how to...</i>	<i>Students will be skilled at...</i>
	Add, subtract, multiply and divide rational numbers.	Applying their knowledge to solve real world situations involving adding, subtracting, multiplying, and dividing rational numbers.

Vocabulary	Instruction and Pacing	
Rational Number Irrational number Absolute Value Terminating decimal Repeating Decimal Integer Improper Fraction Mixed Number Divisor Opposite Additive Inverse	Pretest	1 day
	Adding and subtracting decimals	1 week
	Multiplying decimals	1 week
	Dividing decimals	1 week
	Understanding integers	1 week
	Adding and subtracting integers	1 week
	Multiplying and dividing integers	1 week
	Adding and subtracting fractions and mixed numbers	1 week
	Multiplying and dividing fractions and mixed numbers	1 week
Resources		

Prentice Hall Course 2 Mathematics Common Core Textbook, Study Island, Teacher created materials.

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 Township 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

ELA, Science and Technology

Common Misconceptions

Multiplying 2 negatives make a negative.
 Multiplying proper fractions create larger numbers.
 When multiplying decimals, they must line up the decimal.

Proper Conceptions

Multiplying 2 negatives make a positive.
 Multiplying proper fractions create smaller numbers.
 When multiplying decimals, they needn't must line up the decimal.

Performance Task

The following 5 candidates ran for class president; the table shows what fraction of the votes each candidate received;

Name	Fraction of votes	Number of votes
mike	$\frac{1}{5}$	
Lamont	$\frac{2}{15}$	
Natalia	$\frac{1}{3}$	
Dina	$\frac{1}{4}$	
Tanya	?	

- Of the students who voted, what fraction did NOT vote for Lamont?
- What is the sum of the 4 fractions shown in the table?
- What will the five fractions for the five candidates add up to? Why?
- What fraction of the voters voted for Tanya?
- Suppose 600 students voted. Fill in the last column of the table to show how many votes each candidate received.

Rubric

When used as a quiz grade (based on 100%) each bullet would be worth 20 points for a correct answer, with the last bullet being worth 4 points for each correct number of votes.

ASSESSMENTS

Suggested Formative Assessment

Problem of the Day

Exit Ticket

Suggested Summative Assessment

topic quizzes

homework

Grade level developed Unit Tests

