01 Integers and Rational Numbers

Content Area: **Mathematics**
Course(s):
Time Period: **Week1**
Length: **1 Week**
Status: **Published**

Stage 1: Desired Results

Unit Overview/ Rationale

Integers and Rational Numbers

Standards & Indicators

Common Core: Mathematics, Common Core: Grade 8, 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.

MA.7.7.NS	The Number System
MA.7.7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
MA.7.7.NS.A	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
MA.7.7.NS.A.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.

MA.7.7.NS.A.1a	Describe situations in which opposite quantities combine to make 0.
MA.7.7.NS.A.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.
MA.7.7.NS.A.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.
MA.7.7.NS.A.1d	Apply properties of operations as strategies to add and subtract rational numbers.
MA.7.7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
MA.7.7.NS.A.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.
MA.7.7.NS.A.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.
MA.7.7.EE.B.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.
MA.7.7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
MA.7.7.NS.A.2d	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.

Big Ideas - Students will understand that...

-Any integer and rational number can be added or subtracted using a number line model or using rules involving absolute value.
-The rules for multiplying integers and rational numbers are related to the properties of integers and rational numbers and the definitions of operations.
-The Distributive Property can be used to simplify the product of a number and a sum or difference.

Essential Questions - What provocative questions will foster inquiry and transfer of learning

-How do operations affect numbers?

-What makes a computational strategy both effective and efficient?

-How do we order integers and rational numbers?

-How do we apply the properties of addition and multiplication so that we can compute with integers and mixed numbers?

-How do we convert rational numbers into decimals?

Content - Students will know…

Key vocabulary:

additive inverse, integers, opposites, rational number, repeating decimal, terminating decimal

Skills - Students will be able to…

-Compare and order integers and rational numbers.

-Use the properties of addition and multiplication to add, subtract, multiply, and divide integers and rational numbers.

-Use the order of operations and Distributive Property to simplify expressions with integers and rational numbers.

Stage 2: Assessment Evidence

Assessment

Stage 3: Learning Plan

Learning Activities

Activities: Formative Assessment: Closure: Example: Sample Solution:	Students will compare and order integers and find and add opposites. Teacher observation of student work in small-group and independent practice. Students will be asked to order numbers from least to greatest. Order the numbers from least to greatest. -4, 8, 2, -6, 3 -6, -4, 2, 3, 8
Activities: Formative Assessment: Closure: Example: Sample Solution:	Students will add and subtract integers and solve problems involving integers. Students will multiply and divide integers and to solve problems involving integers. Teacher observation of student work in small-group and independent practice. Students will be asked to simplify expressions involving integers. Simplify -18 – (-6) + 27. -18 – (-6) + 27 -18 + 6 + 27 -12 + 27 15
Activities: Formative Assessment: Closure: Example: Sample Solution:	Students will convert between fractions and decimals. Students will compare and order rational numbers. Teacher observation of student work in small-group and independent practice. Students will be asked to write a decimal as a fraction and a fraction as a decimal. Students will be asked to order fractions and decimals. Order from least to greatest. 2.7, -0.3, -4/11

	(-4/11 ≈ -0.37) -4/11, -0.3, 2.7
Activities: Formative Assessment: Closure: Example: Sample Solution:	Students will add and subtract rational numbers. Students will use number lines and properties to understand multiplication or rational numbers and to multiply rational numbers. Students will use the rules for dividing integers to divide rational numbers and to solve problems by dividing rational numbers. Teacher observation of student work in small-group and independent practice. Students will be asked to simplify expressions involving rational numbers. Simplify -10/2.5. -10 ÷ 2.5 -100 ÷ 25 -4

Resources

Prentice Hall Course 2 Mathematics Common Core c2013	Unit 1