

Unit 1: The Number System

Content Area: **Template**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

UNIT RATIONALE

The purpose of teaching The Number System Unit is to extend upon the previous knowledge of operations with rational numbers. Students will then be able apply mathematical properties to add, subtract, multiply, and divide a greater variety of numbers including integers and all positive and negative rational numbers in order to solve real-world problems.

ESSENTIAL QUESTIONS

- How are positive, negative, and absolute values found in real-world situations?
- How can you determine the sign and value of a sum, difference, product, or quotient?
- How are adding and subtracting rational numbers related?
- How are multiplying and dividing rational numbers related?
- What strategies can you use to order positive and negative rational numbers?

STANDARDS

NEW JERSEY STUDENT LEARNING STANDARDS: CONTENT AREA

New Jersey (NJSL) - Grade 7 - Mathematics (2020)

MA.7.NS	The Number System
MA.7.NS.A	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
MA.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.NS.A.1a	Describe situations in which opposite quantities combine to make 0.

MA.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.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.NS.A.1d	Apply properties of operations as strategies to add and subtract rational numbers.
MA.7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
MA.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.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.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
MA.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.
MA.7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.

New Jersey (NJSL) - K-12 - Math Practice Standards (2020)

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.

NEW JERSEY STUDENT LEARNING STANDARDS: CAREER READINESS, LIFE LITERACIES AND KEY SKILLS

TECH.9.4.8.TL.1	Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.
TECH.9.4.8.TL.2	Gather data and digitally represent information to communicate a real-world problem (e.g., MS-ESS3-4, 6.1.8.EconET.1, 6.1.8.CivicsPR.4).
TECH.9.4.8.TL.3	Select appropriate tools to organize and present information digitally.
TECH.9.4.8.TL.5	Compare the process and effectiveness of synchronous collaboration and asynchronous collaboration.

NEW JERSEY STUDENT LEARNING STANDARDS: COMPUTER SCIENCE AND DESIGN THINKING

CS.6-8.8.2.8.ED.2

Identify the steps in the design process that could be used to solve a problem.

PRE-ASSESSMENTS

Good pre-test would be on operations with whole numbers, decimals, and fractions.

INSTRUCTIONAL PLAN

MODULE 1

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning about integers so that we can represent quantities in real-world situations that are both positive and negative.
Student Learning Strategies	-Peardeck Lesson on Introduction to Integers. -IXL Lesson B.1
Success Criteria	I can define what an integer is. I can write an integer for a real-world quantity.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

MODULE 2

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to compare and order integers so that we can grasp the magnitude of both positive and negative numbers and to find absolute value.
Student Learning Strategies	-Peardeck Lesson on Comparing & Ordering Integers. -IXL Lessons B.2 through B.8
Success Criteria	I can order integers from least to greatest and greatest to least. I can compare two integers using $<$, $>$, or $=$. I can define absolute value. I can find the absolute value of an integer.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks. Line Up Activity.
Suggested Modifications	Students can work in groups.

MODULE 3

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to add integers so that we can solve real-world problems that involve positive and negative numbers.
Student Learning Strategies	-Peardeck Lesson on Adding Integers. -IXL Lessons C.1 through C.5
Success Criteria	I can add two integers using counters and a number line. I can add two integers using the rules for addition. I can explain the two rules for adding integers. I can add three or more integers by grouping and using the integer addition rules.
Formative Assessment (drives instructional	-Peardeck lesson interaction & feedback.

decisions)	-Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks. Integer Bingo.
Suggested Modifications	Students can work in groups.

[Adding Integers](#)

MODULE 4

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to subtract integers so that we can solve real-world problems that involve subtracting positive and negative numbers.
Student Learning Strategies	-Peardeck Lesson on Subtracting Integers. -IXL Lessons C.6 through C.14
Success Criteria	I can subtract two integers using counters and number lines. I can subtract two integers by rewriting the problem as addition of the opposite.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks. Integer Bingo.
Suggested Modifications	Students can work in groups.

[Subtracting Integers](#)

MOUDLE 5

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to multiply integers so that we can solve real-world problems that involve multiplying positive and negative numbers.
Student Learning Strategies	-Peardeck Lesson on Multiplying Integers. -IXL Lessons C.15 through C.17
Success Criteria	I can multiply two or more integers by using the rule for multiplication. I can explain how the rules of multiplication were derived.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks. Integer Bingo.
Suggested Modifications	Students can work in groups.

[Multiplying Integers](#)

MODULE 6

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to divide integers so that we can solve real-world problems that involve division of positive and negative numbers and so that we can find the mean of a set of integers.
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Student Learning Strategies	-Peardeck Lesson on Dividing Integers -IXL Lessons C.18 through C.25
Success Criteria	I can divide two integers by using the division rules. I can explain how the rules of division are derived. I can find the mean of a set of integers.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks. Integer Bingo.
Suggested Modifications	Students can work in groups.

[Dividing Integers](#)

MODULE 7

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to convert fractions into decimals so that we can represent rational numbers in different forms and so that we can compare and order rational numbers in different forms.
Student Learning Strategies	-Peardeck Lesson on Converting Fractions to Decimals. -IXL Lesson H.1
Success Criteria	I can convert a fraction or mixed number to a decimal using division.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.

Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Converting Fractions to Decimals](#)

MODULE 8

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to convert decimals into fractions so that we can represent rational numbers in different forms and so that we can compare and order rational numbers in different forms.
Student Learning Strategies	-Peardeck Lesson on Converting Decimals to Fractions -IXL Lessons H.2 and H.3
Success Criteria	I can convert a decimal to a fraction or mixed number using place value.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Converting Decimals to Fractions](#)

MODULE 9

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to compare and order rational numbers so that we can solve real-world problems that involve rational numbers (for example, comparing elevations, weights, etc.).
Student Learning Strategies	IXL Lessons H.7 through H.9
Success Criteria	I can compare and order rational numbers by converting them to the same format.
Formative Assessment (drives instructional decisions)	<ul style="list-style-type: none">-Peardeck lesson interaction & feedback.-Quizizz, Kahoot!, or Blooket results.-Whiteboard practice problems.-Exit ticket.
Activities and Resources	<ul style="list-style-type: none">Interactive notebooks.Line Up Activity.
Suggested Modifications	Students can work in groups.

MODULE 10

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to add rational numbers so that we can solve real-world problems that involve addition of rational numbers in various forms.
Student Learning Strategies	<ul style="list-style-type: none">-Peardeck Lesson on Adding Rational Numbers-IXL Lessons H.10 through H.12
Success Criteria	I can add rational numbers together using the rules for integers and the rules for fractions and decimals.
Formative Assessment (drives instructional decisions)	<ul style="list-style-type: none">-Peardeck lesson interaction & feedback.-Quizizz, Kahoot!, or Blooket results.-Whiteboard practice problems.-Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

MODULE 11

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to subtract rational numbers so that we can solve real-world problems that involve subtraction of rational numbers in various forms.
Student Learning Strategies	-Peardeck Lesson on Subtracting Rational Numbers -IXL Lessons H.10 through H.12
Success Criteria	I can subtract two rational numbers by applying the rules for integers as well as the rules for fractions and decimals.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

[Subtracting Rational Numbers](#)

MODULE 12

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to multiply rational numbers so that we can solve real-world problems that involve multiplication of rational numbers in various forms.
Student Learning Strategies	-Peardeck Lesson on Multiplying Rational Numbers -IXL Lessons H.16 through H.19
Success Criteria	I can multiply rational numbers by applying the rules for integers as well as rules for decimals and

	fractions.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

MODULE 13

Student Learning Intentions (SLI) WALT: (We are learning to...)	We are learning how to divide rational numbers so that we can solve real-world problems that involve division of rational numbers in various forms.
Student Learning Strategies	-Peardeck Lesson on Dividing Rational Numbers -IXL Lessons H.16 through H.19
Success Criteria	I can divide rational numbers using the rules for integers and also the rules for decimals and fractions.
Formative Assessment (drives instructional decisions)	-Peardeck lesson interaction & feedback. -Quizizz, Kahoot!, or Blooket results. -Whiteboard practice problems. -Exit ticket.
Activities and Resources	Interactive notebooks.
Suggested Modifications	Students can work in groups.

REFLECTIONS

Students seemed to do very well with the integers portion. Before getting into operations with rational numbers, it would be a good idea to do a thorough fraction review.

INTERDISCIPLINARY CONNECTIONS: NEW JERSEY STUDENT LEARNING STANDARDS FOR ELA, SOCIAL STUDIES, SCIENCE AND/OR MATHEMATICS

LA.K-12.NJSLSA.W1	Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
LA.RI.7.4	Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of a specific word choice on meaning and tone.
LA.K-12.NJSLSA.W2	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
LA.W.7.1	Write arguments to support claims with clear reasons and relevant evidence.
LA.W.7.2.D	Use precise language and domain-specific vocabulary to inform about or explain the topic.