Unit 8: Integers & Rational Numbers

Content Area: **Math**
Course(s): **Math**
Time Period: **April**
Length: **3 weeks**
Status: **Published**

Unit Overview

In this unit, students will learn about the following topics:

- Identifying positive and negative integers and rational numbers

- Plotting positive and negative integers and rational numbers on a number line

- Correctly labeling a number line

- Comparing/Ordering integers and rational numbers

- Finding the absolute value of a number

- Plotting points as ordered pairs in the coordinate plane

- Finding horizontal and vertical distances in the coordinate plane

- Drawing polygons in the coordinate plane

- Writing inequalities in one variable from written phrases

- Graphing inequalities in one variable

- Solving basic inequalities in one variable

Enduring Understandings

SWBAT:

- Label a real-world scenario as being represented by a positive or negative number

- Plot integers and rational numbers (as well as their opposites) on a number line

- Compare two integers or rational numbers using inequality symbols

- Order three or more integers or rational numbers from least to greatest

- Find absolute value of a number and describe how it relates to the number line

- Plot points in the coordinate plane and describe their location

- Identify ordered pairs in the coordinate plane

- Draw polygons in the coordinate plane and find their area/perimeter

- Write and graph inequalities in one variable

- Determine whether a value satisfies an inequality

Essential Questions

How can we:

- write integers to represent quantities in real life?
- graph integers on a number line?
- find/graph the opposite of a number?

How can we:

- determine which of two integers is greater?
- read inequalities from both directions (left to right and right to left)?
- order integers from least to greatest?
- interpret statements about order in real-world problems?

How can we:

- define rational numbers?
- graph rational numbers on a number line?
- determine which of two rational numbers is greater?
- order rational numbers from least to greatest?

How can we:

- find the absolute value of a number?
- define absolute value as the distance from zero on a number line?
- compare sets of numbers that include absolute value expressions?
- apply absolute value in real-world problems?

How can we:

- identify ordered pairs in the coordinate plane?
- plot ordered pairs in a coordinate plane and describe their locations?
- reflect points in the x-axis, y-axis, or both simultaneously?
- represent real-world problems in the coordinate plane?

How can we:

- draw polygons in the coordinate plane?
- find distances between points in the coordinate plane with either the same x-coordinates or y-coordinates?
- find horizontal and vertical side lengths of polygons in the coordinate plane?

- draw polygons in the coordinate plane that represent real-world scenarios?

How can we:

- write word sentences as inequalities?
- determine whether a value is in the solution set of an inequality?
- graph the solutions of inequalities?

How can we:

- apply the properties of inequality to generate equivalent inequalities?
- solving one-step inequalities using inverse operations?
- write and solve inequalities that represent real-world problems?

Instructional Strategies & Learning Activities

- Guided Practice
- Daily Do Now
- Extra Practice & Puzzle Time (Resources)
- Scavenger Hunts
- Coloring Activities
- Task Cards (Around the World)
- Maze Activities
- Quizizz Online Assignments
- Kahoot! Online Games
- GimKit Online Games
- Mystery Activity (like Clue)

Integration of 21st Century Themes and Skills

CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
PFL.9.1.8.A.7	Explain the purpose of the payroll deduction process, taxable income, and employee benefits.

PFL.9.1.8.C.8	Explain the purpose of a credit score and credit record, and summarize borrowers' credit report rights.
PFL.9.1.8.D.1	Determine how saving contributes to financial well-being.
PFL.9.1.8.E.3	Compare and contrast product facts versus advertising claims.
TECH.9.4.8.CT.3	Compare past problem-solving solutions to local, national, or global issues and analyze the factors that led to a positive or negative outcome.

Technology Design & Integration

CS.6-8.8.1.8.AP.4	Decompose problems and sub-problems into parts to facilitate the design, implementation, and review of programs.
TECH.8.1.8.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.8.B.CS2	Create original works as a means of personal or group expression.
TECH.8.1.8.E.CS1	Plan strategies to guide inquiry.

Interdisciplinary Connections

ELA.L.KL.6.2	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
ELA.L.KL.6.2.B	Gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.
ELA.L.VL.6.3.B	Determine the meaning of words and phrases as they are used, including figurative, connotative, and technical meanings.
ELA.L.VL.6.3.C	Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., audience, auditory, audible).
VPA.1.3.P.D.2	Create two and three-dimensional works of art while exploring color, line, shape, form, texture, and space.

Differentiation

Definitions of Differentiation Components:

- Content – the specific information that is to be taught in the lesson/unit/course of instruction.
- Process – how the student will acquire the content information.
- Product – how the student will demonstrate understanding of the content.
- Learning Environment – the environment where learning is taking place including physical location and/or student grouping

Differentiation occurring in this unit:

- High-achieving students will assist low-achieving students in mixed ability groupings for games and activities.

- High-achieving students can complete sudoku puzzles and logic puzzles as extension activities.
- Limit number/difficulty of problems for low-achieving students to demonstrate mastery.
- Narrow down problem choice to core concepts for low-achieving students.

- Leveled group-based activities, determined by formative assessment.

Modifications & Accommodations

- High-achieving students will assist low-achieving students in mixed ability groupings for games and activities.

- High-achieving students can complete sudoku puzzles and logic puzzles as extension activities.
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Benchmark Assessments

Schoolwide Benchmark assessments:

- Linkit Benchmarks (Form A in September, Form B in January, Form C in June): Linked to NJSLA standards

Additional Benchmarks used in this unit:

- IXL Diagnostic + continued practice during IXL periods

Formative Assessments

Formative Assessments used in this unit:

- Kahoot! Games

- Quizizz Games

- Homework

- Q & A

- Scavenger Hunts

- Coloring Activities

- Task Cards

- Partner Activities

- Mystery Activity

Summative Assessments

Summative assessments for this unit:

- Chapter Test
- Quizzes

Instructional Materials

1. Big Ideas Math: Math & You 6th Grade Textbook
2. Quizizz
3. Kahoot!
4. Scavenger Hunts
5. Task Cards
6. Coloring Activities
7. GimKit

Standards

MATH.6.NS.C.5	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.
MATH.6.NS.C.6.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.
MATH.6.NS.C.6.b	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.
MATH.6.NS.C.6.c	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.

MATH.6.NS.C.7.a	Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
MATH.6.NS.C.7.b	Write, interpret, and explain statements of order for rational numbers in real-world contexts.
MATH.6.NS.C.7.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.
MATH.6.NS.C.7.d	Distinguish comparisons of absolute value from statements about order.
MATH.6.NS.C.8	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.
MATH.6.EE.B.5	Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.
MATH.6.EE.B.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
MATH.6.EE.B.8	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.
MATH.6.G.A.3	Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.