Unit 4 - Integers

Content Area: **Mathematics**
Course(s): **Mathematics**
Time Period: **Week 14**
Length: **3 Weeks**
Status: **Published**

Unit Overview

Students will be introduced to integers in this unit and the uses of negative numbers. They will relate integers to real life situations and make sense of integers through the use of a number line. Students will use their knowledge of a number line to compare and order integers. They will also use absolute values to determine the distance between positive and negative numbers. Then, students will delve deeper and apply their knowledge of integers to all rational numbers. They will compare and order all types of rational numbers. Lastly, students will learn all four quadrants of the coordinate plane and graph ordered pairs beyond the first quadrant.

Standards

MA.6.NS.C	Apply and extend previous understandings of numbers to the system of rational numbers.
MA.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.
MA.6.NS.C.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.
MA.6.NS.C.6a	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.
MA.6.NS.C.6c	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.
MA.6.NS.C.7	Understand ordering and absolute value of rational numbers.
MA.6.NS.C.7a	Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram.
MA.6.NS.C.7b	Write, interpret, and explain statements of order for rational numbers in real-world contexts.
MA.6.NS.C.7c	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.
MA.6.NS.C.7d	Distinguish comparisons of absolute value from statements about order.
MA.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.

Essential Questions

- How can we compare and contrast numbers?
- How are negatives numbers ordered differently than positive numbers?
- How are positive and negative numbers related to everyday life?
- How are absolute values used in real-world situations?
- How are rational numbers used in coordinate planes?
- How do we use coordinate planes in the real world?

Application of Knowledge: Students will know that...

- integers are positive whole numbers, their opposites, and zero.
- negative integers are used to represent data that are less than 0.
- negative numbers with a larger absolute value are smaller when comparing.
- opposites are numbers that are the same distance from zero in opposite directions.
- points in the coordinate plane are represented by ordered pairs where the first number is the x-coordinate and the second number is the y-coordinate.
- rational numbers are numbers that can be written as fractions.
- the absolute value of a number is the distance between that number and 0 on a number line.
- the coordinate plane is a two-dimensional graph with an x-axis and y-axis.
- the x-axis and y-axis meet at a point called the origin and divide the coordinate plane into four quadrants.
- zero is neither positive nor negative.

Application of Skills: Students will be able to...

- compare and order integers.
- compare and order rational numbers.
- find the absolute value of a number.
- find the distance between two ordered pairs.
- graph ordered pairs in all four quadrants.
- identify rational numbers on a number line.
- identify what quadrant an ordered pair is in.
- use integers to represent real-life situations.

Assessments

- Do Now: These daily assessments will include a few questions to check for prior knowledge and to determine mastery of particular topics. Remediation can also be done through this activity on an as needed basis.
- Exit Tickets and Quick Checks: These will be used to measure student understanding of the lesson and

assist in determining whether remediation is needed for the topic or if there were any common misconceptions amongst the students.
- Communicator Practice: During guided practice, this will be used as a quick whole-class assessment tool to check for complete comprehension.
- IXL Practice: This online tool will be used to formatively assess students during independent practice. This will provide students with practice and immediate self-check.
- Homework and Classwork: These will be used to formatively assess students. Some examples of activities that can be used in class as assessments are listed in suggested activities (Create a Number Line, Real World Integer Sort, Compare and Order Rational Numbers, Graphing Battleship, Coordinate Plane Picture, Make a Dream Team)
- Marzano learning goals self-assessment: Students will complete tiered questions to determine their own proficiency in the topic on a scale of 0 to 4
- Informal Observations: Walking around the room, listening to productive conversations, and checking in on students will help to formatively assess their learning.
- Mid-Chapter Quiz: This will be used to formatively assess students halfway through the chapter.
- Chapter Test: This will be used to summatively assess students at the end of the chapter.
- Information from this unit will be included on a locally developed, mid-year or end of year benchmark assessment that may take the form of a test, performance based project, or other summative assessment.

Suggested Activities

- Grade 6 Digits Topic 8 and 9 Launches
- Inquiry labs using number lines to show value of integers
- Student centered Smart Board lessons using number lines that students can interact with
- Review games using communicators
- Marzano learning goals self-assessment: Students will complete tiered questions to determine their own proficiency in the topic on a scale of 0 to 4
- Create a Number Line - Students will use different colors and shapes to create their own number line and make sense of zero, negatives, positives and opposites
- Human Number Line - Students will receive an index card with an integer on it and they will create a human number line from least to greatest
- Real World Integer Sort - Students will work in pairs to sort real life situations where integers are used in one of three categories: positive integer, zero, negative integer
- Compare and Order Rational Numbers - Students will receive a stack of mixed up rational numbers that they will order with their partners. They will be able to physically move the cards in place.
- Graphing Battleship - Students will attempt to sink their partner's ship by listing possible ordered pairs where their ships are placed. This will help them practice saying the coordinates correctly and graphing ordered pairs.
- Coordinate Plane Picture - Students will graph ordered pairs that will create a connect-the-dot picture
- Make a Dream Team Basketball Assignment - Students will use real basketball statistics on player accuracy to make their own Dream Team. They will compare rational numbers in order to determine who they would prefer to have on their team. Along with making their Dream Team, they must answer thinking questions that requires the students to order and compare the players based on their statistics, which are presented as rational numbers

Activities to Differentiate Instruction

Differentiation for special education:

- General modifications may include:
  - Modifications & accommodations as listed in the student's IEP
  - Assign a peer to help keep student on task
  - Modified or reduced assignments
  - Reduce length of assignment for different mode of delivery
  - Increase one-to-one time
  - Working contract between you and student at risk
  - Prioritize tasks
  - Think in concrete terms and provide hands-on-tasks
  - Position student near helping peer or have quick access to teacher
  - Anticipate where needs will be
  - Break tests down in smaller increments
- Content specific modifications may include:
  - Use a number line to visualize the position of integers and rational numbers better
  - Provide coordinate plane with numbered grid lines
  - Provide guided notes and step-by-step instructions
  - Provide completed worked out examples on classwork and homework that students may use as a guide

Differentiation for ELL's:

- General modifications may include:
  - Strategy groups
  - Teacher conferences
  - Graphic organizers
  - Modification plan
  - Collaboration with ELL Teacher
- Content specific vocabulary important for ELL students to understand include:
  - Absolute value, bar notation, coordinate plane, integer, negative integer, number line, opposite, positive integer, quadrants, rational number, repeating decimal, terminating decimal

Differentiation to extend learning for gifted students may include:

- Compare and order with more integers and rational numbers
- Mixing all types of rational numbers when comparing and ordering them
- Have students create their own number lines and coordinate planes when asked to graph
- Introduce operations (addition, subtraction, multiplication, division) with integers

Technology Integration

- iPads or Chromebooks as appropriate to the activity.
- Online learning components including use of the Digits digital textbook, Buzzmath, KhanAcademy,

and other resources.
- Teacher integration of the SMART board to facilitate active student engagement throughout the course of the lesson.
- Software or online programs that teachers may use to create students materials or generate problems such as Kuta software.
- Additional practice provided through the use of IXL

Integrated/Cross-Disciplinary Instruction

- **ELA:** Reading and understanding the meaning of real-life situations that the students have to sort into the correct type of integer they would use to represent that situation
- **Science:** Problems dealing with temperature, elevation, or atoms
- **Social Studies**: Integer relation with BC and AD years. Longitude and latitude relationship with coordinate planes
- **Physical Education:** Analyzing sports statistics. Scoring system for Golf.
- **Economics:** Use of economic situations that can be represented by integers

Resources

- Digits student access and support: www.MyMathUniverse.com
- Digits teacher materials and support: www.pearsonrealize.com
- IXL: www.ixl.com
- SMART Exchange: www.exchange.smartteach.com
- SMART Board Lessons
- Pizzazz worksheets (self-correcting)
- Kuta software generated worksheets
- Khanacademy: www.khanacademy.org
- Buzzmath: www.buzzmath.com
- NCTM Illuminations: www.illuminations.nctm.org
- New Jersey Center for Teaching and Learning: www.njctl.org

21st Century Skills

CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.