| Trimester: | Unit Title: | Recommended Instructional Days: |
|---|---|---|
| **3** | **Integers, Number Lines and the Coordinate Plane** | **20 - 24** |

**Domain: The Number System, Expressions and Equations & Geometry**

***Strand:***

**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.

**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.
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 zero is its own opposite.
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.
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.

**6.NS.C.7** Understand ordering and absolute value of rational numbers
a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.*
b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write -3°C > -7°C to express the fact that -3°C is warmer than -7°C.*
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. *For example, for an account balance of -30 dollars, write /-30/ = 30 to describe the size of the debt in dollars.*
d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance of less than -30 dollars represents a debt greater than 30 dollars.*

**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.

**6.EE.A.2** Write, read and evaluate expressions in which letters stand for numbers.
a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as 5 – y.*
c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V=s^3$ and $A=6s^2$ to find the volume and surface area of a cube with sides of length s=1/2.*

**6.EE.B.5** Understand solving an equation or inequality as a process of answering a question: which values from a specific 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.

**6.EE.B.6** Uses 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.

**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.

**6.G.A.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

**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.

**Major Cluster** **Supporting Cluster** **Additional Cluster** **Climate Change Opportunity**

***Progress Indicator:*** ◊ Tests ◊ Homework / Classwork ◊ Projects ◊ Formative assessments ◊ Summative assessments

**Mathematical Practices:**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.

3. Construct viable arguments and critique the reason 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.

**Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-CLKS within Unit**

**Essential Questions:**
**Lesson 8.1:** How can you apply integers to model real-life problems?
**Lesson 8.2:** How can you explain how to determine which of two integers is greater?
**Lesson 8.3:** How can you graph rational numbers on a number line.?
**Lesson 8.4:** What is absolute value?
**Lesson 8.5:** How can you plot ordered pairs in a coordinate plane and describe their locations?
**Lesson 8.6:** How can you find distances between points in the coordinate plane with the same x-coordinates or the same y-coordinates.
**Lesson 8.7:** What is an inequality?
**Lesson 8.8:** How can you write inequalities that represent real-life problems?

**Essential Understandings:**
**Lesson 8.1:** Understand the concept of negative numbers and that they are used along with positive numbers to describe quantities
**Lesson 8.2:** Compare and order integers.
**Lesson 8.3:** Compare and order rational numbers.
**Lesson 8.4:** Understand the concept of absolute value.
**Lesson 8.5:** Plot and refl ect ordered pairs in all four quadrants of a coordinate plane.
**Lesson 8.6:** Draw polygons in the coordinate plane and fi nd distances between points in the coordinate plane.
**Lesson 8.7:** Write inequalities and represent solutions of inequalities on number lines.
**Lesson 8.8:** Write and solve inequalities.

**Vocabulary:**
- positive numbers
- negative numbers
- opposites
- integers
- rational numbers
- absolute value
- coordinate plane

- origin
- quadrants
- inequality
- solution of an inequality
- solution set
- graph of an inequality

**Encourage students to practice using the unit vocabulary as they talk and write about mathematics. Understanding vocabulary will aid their understanding of the concepts. When students encounter a new definition, encourage them to write in their Big Ideas Student Journals. They will revisit these definitions during the Chapter Review.*

**Suggested Activity Descriptions**:

- Performance Task TB pg. 343, Launching a CubeSat
- Exploration Activities at the beginning of each section.
- Students analyze sample student answers to compare strategies and approaches for problem solving.
- Students engage in fluency practice resources.
- Using beans, number cubes, and a positive/negative chip, students play a game in which they create random integers between −12 and 12. Then they mark their numbers on a number line, determine the greatest integer, and record an appropriate inequality statement for each round until ten rounds have been completed. See differentiated resources, Lesson 8.2B for more details.

**Interdisciplinary Connections:**

**Science:**
1. Big Ideas STEAM Video and corresponding questions on TB page 343.
2. Rich Math Tasks: Science Notes, pgs. 9 - 14, digital Big Ideas resource.
3. Exploration 1 TB pg. 345.

**Social Studies:**
1. Modeling Real Life TB pg. 349, problem #22 & 23
2. Rich Math Tasks: History Notes, pgs. 3 - 8, digital Big Ideas resource.

**Language Arts:**
1. Student Journal opportunities throughout the chapter.

**Art:**
1. Rich Math Tasks: Art Notes, pgs. 15 - 20, digital Big Ideas resource.

**Spot Light On:** Rachel Carson

| **Social and Emotional Learning:**<br>***Competencies*** | **Social and Emotional Learning:**<br>***Sub-Competencies*** |
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| SEL Competencies:<br>• Self-Awareness<br>• Social Awareness<br>• Self-Management<br>• Relationship Skills<br>• Responsible Decision-Making | • Recognizing the importance of self-confidence in handling daily tasks and challenges.<br>• Demonstrate an awareness of the expectations for social interactions in a variety of ways.<br>• Demonstrate an understanding of the need for mutual respect when viewpoints differ.<br>• Identify and apply ways to persevere through alternative methods to achieve goals.<br>• Utilize positive communication and social skills to interact effectively with others.<br>•Develop, implement, and model effective problem solving and critical thinking skills. |
| **Assessments (Formative)**<br>***To show evidence of meeting the standard/s, students will successfully engage within:*** | **Assessments (Summative)**<br>***To show evidence of meeting the standard/s, students will successfully complete:*** |
| **<u>Formative Assessments:</u>**<br>• Teacher Observations • Exit Tickets • Quizzes • Self Assessments • Big Ideas Student Journals • Homework/Classwork • Teacher Created Assessments • Progress Monitoring Items • Formative Assessment Tips in Big Ideas Teacher Edition | **<u>Benchmarks & Summative Assessments:</u>**<br>• Chapter/Unit Assessments • Standardized Tests • Project-based Assessments |

| **Differentiated Student Access to Content:**<br>**Teaching and Learning *<u>Resources/Materials</u>*** | | | |
|---|---|---|---|
| **Core Resources** | **Alternate Core Resources**<br>***IEP/504/At-Risk/ESL*** | **ELL Core Resources** | **Gifted & Talented Core Resources** |
| Big Ideas Student Journal, Dynamic Assessment System, iReady, Khan Academy, Illustrative Mathematics, Learn360, TeacherTube, BrainPOP, Freckle, LearnZillion, MobyMax, 60 minutes of weekly ST Math, | Reteach worksheets, Extra Practice worksheets, Math manipulatives, Scaffolding Instructions in each section of textbook, Tutorial Videos, Skills Review Handbook, Skills Trainer | Dictionary for native language, Video tutorial in native language, ELL Support in each section of Big Ideas Teacher's Edition | ST Math Challenge Objectives, G&T tasks, Enrichment and Extension worksheets, Art of Problem Solving, Leveled assessments |

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| Edulastic, Achieve the Core, Desmos | | | |

**Supplemental Resources**

**Technology:**
• Chromebooks • Scientific/Graphing Calculators (upper grades only) • Online math manipulatives
**Other:**
• Google Classroom, Google Meets, Schoology, Interactive Workbooks • Illustrative Mathematics • insidemathematics.org • National Library of Virtual Manipulatives

**Differentiated Student Access to Content:**
**Recommended *Strategies & Techniques***

| **Core Resources** | **Alternate Core Resources** ***IEP/504/At-Risk/ESL*** | **ELL Core Resources** | **Gifted & Talented Core** |
|---|---|---|---|
| Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics. | Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake test for additional credit, provide additional times and preferential seating as needed, review, restate and repeat directions, provide study guides, and/or break assignments into segments of shorter tasks. | Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric. | Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect student to related content. |

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| | **Disciplinary Concept(s):** Critical Thinking and Problem Solving |

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| **NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS** | ***Core Ideas:*** | An essential aspect of problem solving is being able to self reflect on why possible solutions for solving problems were or were not successful. |
| | ***Performance Expectation/s:*** | 9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option. |
| | **Career Readiness, Life Literacies, & Key Skills Practices** | |
| | **Act as a responsible and contributing community member and employee.**<br>**Attend to financial well-being.**<br>**Consider the environmental, social and economic impacts of decisions.**<br>**Demonstrate creativity and innovation.**<br>**Utilize critical thinking to make sense of problems and persevere in solving them.**<br>**Model integrity, ethical leadership and effective management.**<br>**Plan education and career paths aligned to personal goals.**<br>**Use technology to enhance productivity, increase collaboration and communicate effectively.**<br>**Work productively in teams while using cultural/global competence.** | |

| New Jersey Legislative Statutes and Administrative Code<br>(place an "X" before each law/statute if/when present within the curriculum map) | | | | | | | | | |
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| | Amistad Law:<br>*N.J.S.A. 18A 52:16A-88* | | Holocaust Law:<br>*N.J.S.A. 18A:35-28* | **X** | LGBT and Disabilities Law:<br>*N.J.S.A. 18A:35-4.35* | **X** | Diversity & Inclusion:<br>*N.J.S.A. 18A:35-4.36a* | | Standards in Action:<br>*Climate Change* |