Bedminster Township School
Subject Area: Mathematics (Pre-Algebra)
Grade Level: 8 and
Grade 7 - only for qualifying students
TB 24-25
HC 24-25

Unit 1:
Equations

Student Paced Time Frame: 14 days

Overview

In this unit, students will understand equations.

Enduring Understandings

- Identify key words and phrases to solve equations.
- Write word sentences as equations.
- Explain how to solve equations.
- Model different types of equations to solve real-life problems.

Skill and Knowledge Objectives

- Write and solve one-step equations.
- Write and solve multi-step equations.
- Write and solve equations with variables on both sides.
- Solve literal equations for given variables and convert temperatures.

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments, as needed.

Pre-Assessment:

- Preview Performance Task - Heart Rates
- Unit Exploration - Solving One-Step Equations with Integers

Formative Assessment:

- Mid-Unit Assessment 1A, Mid-Unit Assessment 1B
- Chapter Tests A and B
- Alternative Assessment
- STEAM Performance Task (interdisciplinary)
- Online Quiz (Big Ideas)- Teacher selected (based on students needs and abilities)
- Web based (Big Ideas) lesson presentation followed by web based Self Assessment Concepts and Skills and Self Assessment for Problems Solving
- Online (Big Ideas) - classwork and homework problems - providing automatic results on accuracy to

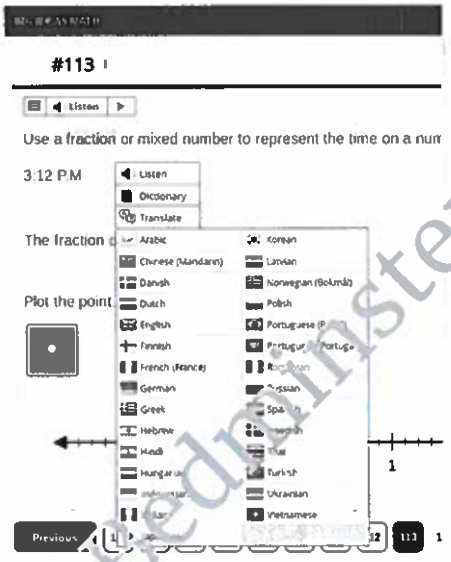
students and teacher

Self-Reflection/Self-Assessment:

- Student Journal Responses
- Mini-Assessments
- Complete Performance Task after completing this unit of instruction.

Summative Assessment:

- Paper tests - Version A, Version B, or Alternative Assessment (based on students needs and abilities)
- MLL assessments in Spanish
- Online Test (Big Ideas Website)- Teacher selected problems (based on students needs and abilities)
    - Chapter test for Grade Level
    - Modified Test for IEP
    - Modified test for 504
    - MLL - Web based translator tool for assessments in other languages



Accommodations:

Paper based and pdf worksheets (Big Ideas)

- Cumulative practice
- Vocabulary practice
- Prerequisite skills practice
- Extra practice
- Reteach
- Enrichment and Extension
- Puzzle time

Web based practice and assessments

- Practice problems
    - Adjustable time
    - Calculator - 4 function, scientific, or graphing

- Stepped out video examples
- Answer check - 0,1,2,3,4,5, or Unlimited

- Tests and quizzes
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  - Prevent or Allow late submission
  - Release for review by teacher or upon submission
  - Randomize - recalculates the values for each question so students are not given the same assessment
  - Scramble- rearranges questions so students are not given the same assessment

Accommodations/Modifications for special populations including 504, MLL, At Risk, IEP, enrichment:

MLL: Student journal in Spanish

Student Edition in Spanish

English language learners strategies infused in Big Ideas Teacher Edition

Dynamic Student eBook and Dynamic Student Edition includes English and Spanish audio

English version: Puzzle time, Reteach, Extra Practice
At Risk: Reteach
504: Reteach and Extra Practice

Enrichment (G&T): Enrichment and Extension, Alternative Assessment

Dictionary and Translation tool for all learners:
In Big Ideas assignments students may highlight words - then select a **dictionary** or **translate** to multiple languages using Big Ideas translator.

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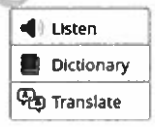

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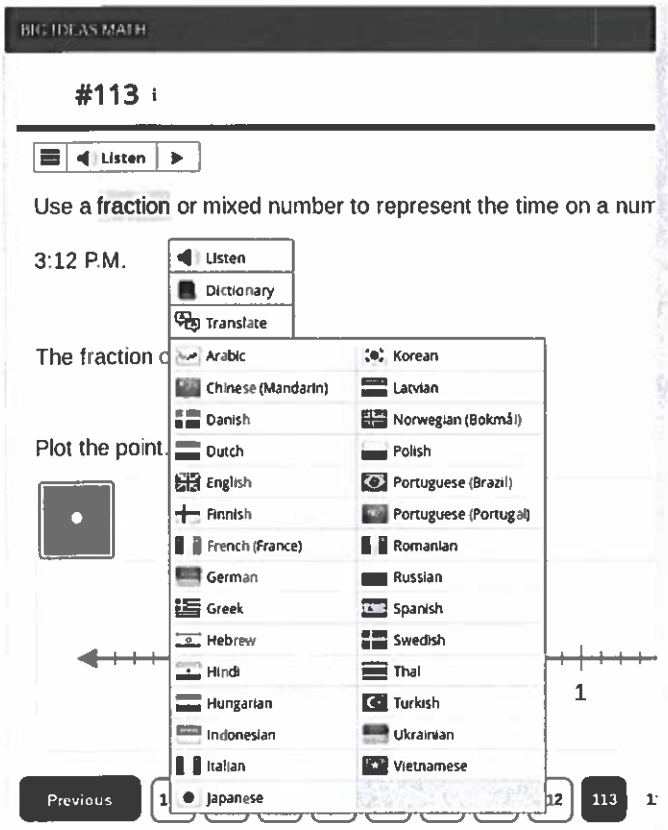

- Example

Big Ideas Video Tutorials in English and Spanish

Big Ideas Tutor - live audio support with Big Ideas live tutor during select practice problems

Virtual Manipulatives

Digital Examples (Resources)

Skills Trainer - online (Big Ideas) interactive tool for skills practice - used for remediation or enrichment

New Jersey Social and Emotional Learning Competencies:

Self-Awareness, Self-Management, Social Awareness, Responsible Decision-Making, Relationship Skills

Activities:

- **SEL Resources in Big Ideas**
- **Thumbs Up:** Infused in every online lesson presentation tool through Big Ideas website Dynamic Classroom. This technique asks students to indicate the extent to which they understand a concept, procedure, or even the direction of activity. This allows students to communicate their feelings with respect to

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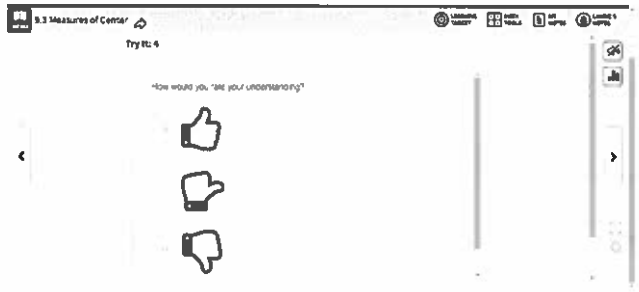

- **MLL Support:** Multi language learners strategies infused in every lesson of Big Ideas Teaching Edition

ELL Support

Have students work in groups to complete the exercises. Remind them to use the process described in Example 1 as they collaborate.
Beginner: Write out the equation. For example, $2 \times 2 \times 2 = 2^3$.
Intermediate: Describe the equation. For example, "Two times two times two equals two to the third power."
Advanced: Explain the functions of bases, exponents, and powers.

- Sample

- **Test Taking Strategies page T37 - Big Ideas -**
  Teacher led discussions prior to each chapter test.
  Designed to reduce student stress and improve test taking abilities.

Test-Taking Strategies

Remind students to quickly look over the entire test before they start so that they can budget their time. They should not spend too much time on any single problem. Urge students to try to work on every part of each problem, because partial credit is better than no credit. When they receive their tests, students should jot down simple examples of finding the greatest common factor and least common multiple on the back of the test. By doing this, they will not become confused when they are under pressure. Teach students to use the **Stop** and **Think** strategy before answering. **Stop** and carefully read the problem, and **Think** about what the answer should look like.

- Sample

Social Emotional Well Being Activities - All Units

Resources

- *STEAM Video from BigIdeasMath.com*
- *Tutorial Videos*
- *Algebra Tiles*
- *Formula Sheet*
- *Graphic Organizers*

- *Differentiation Lessons*

Standards

NJ Student Learning Standards for Mathematics: 8.EE.C.7, 8.EE.C.7a, 8.EE.C.7b

- Expressions & Equations:
  - Analyze and solve linear equations and pairs of simultaneous linear equations.
    - Solve linear equations in one variable.
      - Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
      - Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

- **8.1 Computer Science & Design Thinking, 9.1 21st-Century Life & Career Skills and/or Financial Literacy; AND Activities/Lesson(s):**

- 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
- 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.
- 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices
- 8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
- 8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
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9.1 21st-Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- A. Critical Thinking and Problem Solving

- 9.1.8.A.1 Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
  9.1.8.A.2 Implement problem-solving strategies to solve a problem in school or the community.
  9.1.8.A.3 Summarize strategies used by various organizations and agencies to solve problems that impact communities, and compare them with strategies used by similar organizations in another state or country.
  9.1.8.A.4 Design and implement a project management plan using one or more problem-solving strategies.

- B. Creativity and Innovation

- 9.1.8.B.1 Use multiple points of view to create alternative solutions.
  9.1.8.B.2 Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.

- C. Collaboration, Teamwork, and Leadership

- 9.1.8.C.1 Determine an individual's responsibility for personal actions and contributions to group activities.
  9.1.8.C.2 Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
  9.1.8.C.3 Model leadership skills during classroom and extra-curricular activities.

Additional Social and Emotional Competencies - Embed within Classroom Instruction

- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals
- Develop, implement, and model effective problem-solving and critical thinking skills
- Connect mathematical problems to student experiences
- Students explain their answers to each other
- Students self assess and/or self reflect on their understanding and level of engagement within the classroom setting and the instruction being provided.

Unit: Equations				
Lesson: Chapter Exploration/Solving Simple Equations - 2 - 3 Days **Materials:** *STEAM video, algebra tiles balance scale, card stock, whiteboards* **Activities:** • Watch a video about training for a half marathon and answer questions about average numbers of miles run while training. • Preview the Performance Task on heart rates. • Warm Up - Cumulative	**Lesson:** Solving Multi-Step Equations - 2 - 3 Days **Materials:** *index cards, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Match and explain the concept of like terms. • Explore/Discuss - Find angle measures of triangles using equations. • Apply	**Lesson:** Solving Equations with Variables on Both Sides - 3 - 5 Days **Materials:** *algebra tiles, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Use a balancing problem to model solving an equation. • Explore/Discuss - Use equations to find missing measures of	**Lesson:** Rewriting Equations and Formulas - 2 - 3 Days **Materials:** *formula cards/sheet* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Match formulas for area and perimeter to a labeled diagram. • Explore/Discuss - Write formulas for the heights and lengths of figures and use	**Lesson:** Connecting Concepts/Unit Review - 2 - 3 Days **Materials:** *graphic organizers* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Skill Practice • Motivate - Use problem solving to solve exercises that combine the concepts from the current unit and prior learning. • Explore/Discuss/Review - Review vocabulary

Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Explore the idea of an inverse through a game. • Explore/Discuss - Properties of Equality • Apply properties of equality to produce equivalent equations. • Solve equations using addition, subtraction, multiplication, or division. • Use equations to model and solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	properties to produce equivalent equations. • Solve multi-step equations. • Use multi-step equations to model and solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	figures and solids. • Explain how to solve an equation with variables on both sides. • Determine whether an equation has one solution, no solution, or infinitely many solutions. • Use equations with variables on both sides to model and solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	them to find missing dimensions. Introduce and discuss literal equations. • Use properties of equality to rewrite literal equations. • Use a formula to convert temperature. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	terms, complete graphic organizers for the concepts and complete review exercises. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Practice Assessment - Study Guide

Differentiate Instruction, depending on individual student needs (students with an IEP, MLL Students; Students At Risk; Gifted Students) **by:**

Presentation Accommodations

- Present information via the visual modality(written material to supplement oral explanation, models, illustrations, assignments written on board)
- Directions repeated, clarified or reworded
- Use alternate texts at lower readability level
- Rephrase word problems
- Reduce readability level of materials
- Work with fewer items per page or line and/or materials in a larger print size
- Provide multi-sensory presentation of data
- Use magnification device, screen reader, or Braille / Nemeth Code
- Use audio amplification device (e.g., hearing aid(s), auditory trainer, sound-field system (which may require teacher use of microphone)
- Be given a written list of instructions
- Record a lesson, instead of taking notes
- Provide tutorial video(s)
- Have another student share class notes with him
- Be given an outline of a lesson
- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments

- Use manipulatives to teach or demonstrate concepts

Response Accommodations

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use of calculator
- Use of a math grid
- Use a word processor to type notes or give responses in class

Setting Accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where student learns best (for example, near the teacher & away from distractions)
- Take an assessment and/or assignment in small group setting
- Use noise buffers such as headphones, earphones, or earplugs

Timing Accommodations

- Take more time to complete a task or an assessment
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

Scheduling Accommodations

- Take more time to complete a project
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization Skills Accommodations

- Use an alarm to help with time management
- Mark texts with a highlighter
- Break down tasks into manageable units
- Use of checklists
- Provide organizers/study guides

Assignment Modifications

- Provide larger white work space
- Allow for oral rather than written responses
- Answer fewer or different questions
- Assign questions aligned to different levels such as emerging, proficient, and/or advanced.
- Create alternate projects or assignments

Curriculum Modifications

- Learn different material related to the same mathematical concept (such as continuing to work on one or two step equations while classmates move on to solving multi-step equations, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)
- Get assessed using a leveled standard/concept (emerging, proficient, and/or advanced) than the one for classmate

Differentiated Lesson(s)for this Equation Unit

Subject Area:	Bedminster Township School

Unit 2:
Graphing & Writing Linear Equations

Student Paced Time Frame: 20 days

Overview

In this unit, students understand graphing linear equations.

Enduring Understandings

- Identify key features of a graph.
- Explain the meaning of different forms of linear equations.
- Interpret the slope and the intercepts of a line.
- Create graphs of linear equations.

Skill and Knowledge Objectives

- Graph linear equations.
- Find and interpret the slope of a line.
- Graph proportional relationships.
- Graph linear equations in slope intercept form.
- Graph linear equations in standard form.
- Write equations of lines in slope intercept form.
- Write equations of lines in point slope form.

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments, as needed.

Pre-Assessment:

- Preview Performance Task - Cost vs. Fuel Economy
- Unit Exploration - Scatter Plots & Relationships in Data

Formative Assessment:

- Mid-Unit Assessment 4A, Mid-Unit Assessment 4B
- Chapter Tests A and B
- Alternative Assessment
- STEAM Performance Task
- Online Quiz (Big Ideas Website)- Teacher selected (based on students needs and abilities)
- Web based (Big Ideas) lesson presentation followed by web based Self Assessment Concepts and Skills and Self Assessment for Problems Solving

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Self-Reflection/Self-Assessment:

- Student Journal Responses
- Mini-Assessments
- Complete Performance Task after completing this unit of instruction.

Summative Assessment:

- Paper tests - Version A, Version B, or Alternative Assessment (based on students needs and abilities)
- MLL assessments in Spanish
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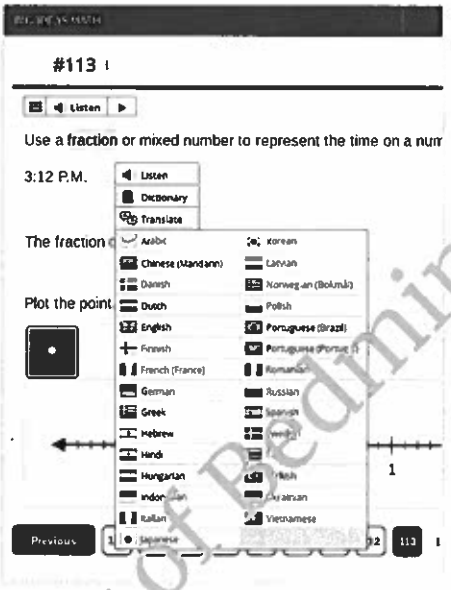

Accommodations:

Paper based and pdf worksheets (Big Ideas)

- Cumulative practice
- Prerequisite skills practice
- Extra practice
- Reteach
- Enrichment and Extension
- Puzzle time

Web based practice and assessments

- Practice problems
    - Adjustable time
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English language learners strategies infused in Big Ideas Teacher Edition

Dynamic Student eBook and Dynamic Student Edition includes English and Spanish audio

English version: Puzzle time, Reteach, Extra Practice

At Risk: Reteach

504: Reteach and Extra Practice

Enrichment: Enrichment and Extension, **Alternative Assessment**

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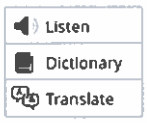
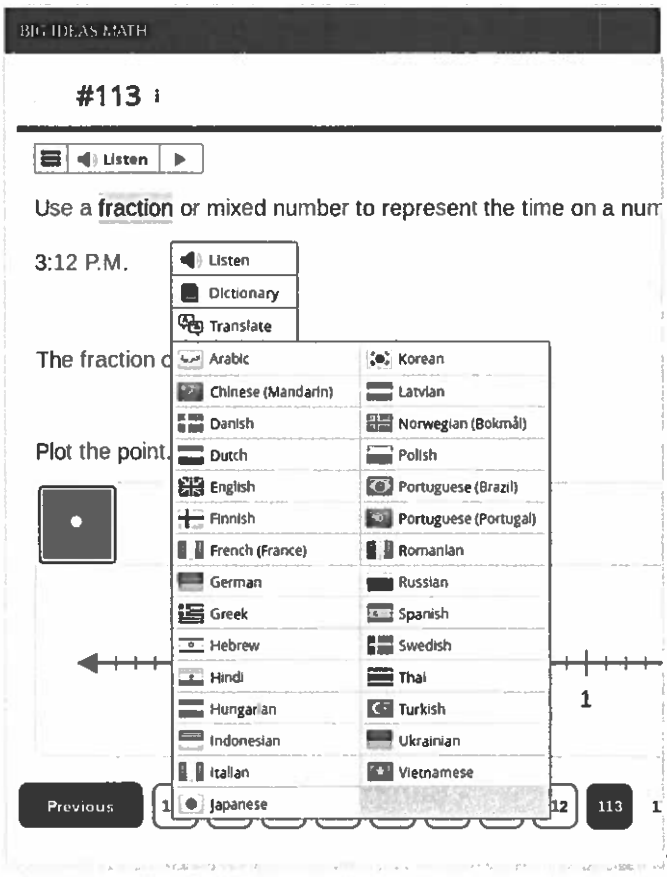


- Example



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Big Ideas Tutor - live audio support with Big Ideas tutor during select practice problems

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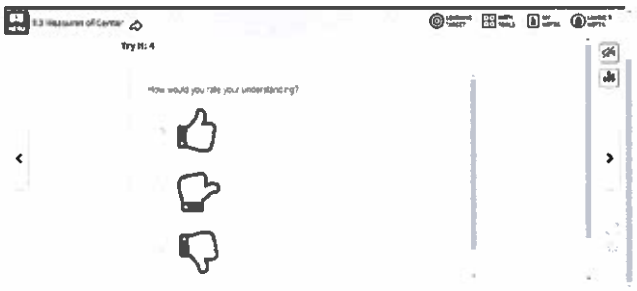

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ELL Support

Have students work in groups to complete the exercises. Remind them to use the process described in Example 1 as they collaborate.
Beginner: Write out the equation. For example, $2 \times 2 \times 2 = 2^3$.
Intermediate: Describe the equation. For example, "Two times two times two equals two to the third power."
Advanced: Explain the functions of bases, exponents, and powers.

- Sample

- **Test Taking Strategies page T193 - Big Ideas -**
  Teacher led discussions prior to each chapter test.
  Designed to reduce student stress and improve test taking abilities.

Test-Taking Strategies

Remind students to quickly look over the entire test before they start so that they can budget their time. They should not spend too much time on any single problem. Urge students to try to work on a part of each problem, because partial credit is better than no credit. When they receive their tests, students should jot down simple examples of finding the greatest common factor and least common multiple on the back of the test. By doing this, they will not become confused when they are under pressure. Teach students to use the **Stop** and **Think** strategy before answering. **Stop** and carefully read the problem, and **Think** about what the answer should look like.

- Sample

Social Emotional Well Being Activities - All Units

Resources

- *STEAM Video from BigIdeasMath.com*
- *Tutorial Videos*
- *Graphic Organizers*
- *Differentiation Lessons*
- *Grid Paper*
- *Whiteboards*
- *Coordinate Paper/Coordinate Planes*

Standards

NJ Student Learning Standards for Mathematics: 8.EE.B.5, 8.EE.B.6, 8.F.B.4

- Expressions & Equations:
  - Understand the connections between proportional relationships, lines, and linear equations.
    - Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
    - Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.
  - Define, evaluate, and compare functions.
    - Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
    - Compare properties (e.g. rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
    - Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
  - Use functions to model relationships between quantities.
    - Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
    - Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

- **8.1 Computer Science Technology, 9.1 21st-Century Life & Career Skills and/or Financial Literacy; AND Activities/Lesson(s):**

- 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
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- Students explain their answers to each other
- Students self assess and/or self reflect on their understanding and level of engagement within the classroom setting and the instruction being provided.

Lesson: Chapter/Graphing Linear Equations - 3 - 4 Days **Materials:** *STEAM Video, grid paper* **Activities:** • Watch a video about hurricanes and answer questions about the wind speed of a hurricane at different distances. • Preview the Performance Task on characteristics of a hurricane. • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Review/Plot ordered pairs and identify points. • Explore/Discuss - Draw & Compare Graphs/Linear Functions & Their Solutions • Create a table of values and write ordered pairs given a linear equation. • Plot ordered pairs to create a graph of a linear equation. • Use a graph of a linear equation to solve a real-life problem. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	**Lesson:** Slope of a Line - 2 - 3 Days **Materials:** *white boards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Discuss the steepness of roller coasters to prepare to understand slope. • Explore/Discuss - Measure & Compare Steepness - Slope as Rise/Run • Explain the meaning of slope. • Find the slope of a line. • Interpret the slope of a line in a real-life problem. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	**Lesson:** Graphing Proportional Relationships - 2 - 3 Days **Materials:** *coordinate planes, white boards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Complete a ratio table and justify their procedures. • Explore/Discuss - Represent Proportional Relationships as Equations and Graphs of those Equations • Graph an equation that represents a proportional relationship. • Write an equation that represents a proportional relationship. • Use graphs to compare proportional relationships. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	**Lesson:** Graphing Linear Equations in Slope Intercept Form - 2 - 3 Days **Materials:** *coordinate planes, coordinate paper, white boards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Describe what the slopes of three graphs represent and compare the graphs. • Explore/Discuss - Derive an equation for a linear relationship by applying a translation to the graph of a proportional relationship. Introduce and discuss slope and x and y intercepts. • Identify the slope and *y*-intercept of a line given an equation. • Rewrite a linear equation in slope-intercept form. • Use the slope and *y*-intercept to graph linear equations. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment
Lesson: Graphing Linear Equations in Standard Form - 2 - 3 Days **Materials:** *coordinate planes, coordinate paper, white boards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill	**Lesson:** Writing Equations in Slope-Intercept Form - 2 - 3 Days **Materials:** *coordinate planes, coordinate paper, white boards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill	**Lesson:** Writing Equations in Point-Slope Form - 2 - 3 Days **Materials:** *coordinate planes, coordinate paper, white boards, ribbon, scissors* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill	**Lesson:** Connecting Concepts/Unit Review - 3 - 4 Days **Materials:** *graphic organizers* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Skill Practice

Practice • Motivate - Determine if ordered pairs are solutions of different equations and observe that equations can be written in different but equivalent forms. • Explore/Discuss - Use an equation and graph to determine different combinations of fruit and vegetable trays that can be purchased for a given dollar amount. Relate to Standard Form. • Rewrite the standard form of a linear equation in slope-intercept form. • Find intercepts of linear equations written in standard form. • Use intercepts to graph linear equations. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	Practice • Motivate - Model lines in a large coordinate plane and observe the effects of changing the properties of those lines. • Explore/Discuss - Identify the slopes, y-intercepts, and equations of two sets of lines and identify what each set has in common. Interpret a graph and write an equation for the graph. • Find the slope and the *y*-intercept of a line. • Use the slope and the *y*-intercept to write an equation of a line. • Write equations in slope-intercept form to solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	Practice • Motivate - Model a linear relationship in terms of equal lengths being cut from a ribbon. • Explore/Discuss - Write an equation representing the slope of a line and reason about the result of multiplying both sides of the equation by the denominator of one side. Draw a graph and write an equation representing the balance in a savings account. Discuss and relate point slope form. • Use a point on a line and the slope to write an equation of the line. • Use any two points to write an equation of a line. • Write equations in point-slope form to solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	• Motivate - Use problem solving to solve exercises that combine the concepts from the current unit and prior learning. • Explore/Discuss/Review - Review vocabulary terms, complete graphic organizers for the concepts and complete review exercises. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Practice Assessment - Study Guide

Differentiate Instruction, depending on individual student needs (students with an IEP, MLL Students; Students At Risk; Gifted Students) **by:**

Presentation Accommodations

- Use alternate texts at lower readability level
- Work with fewer items per page or line and/or materials in a larger print size
- Use magnification device, screen reader, or Braille / Nemeth Code
- Use audio amplification device (e.g., hearing aid(s), auditory trainer, sound-field system (which may require teacher use of microphone)
- Be given a written list of instructions
- Record a lesson, instead of taking notes
- Have another student share class notes with him
- Be given an outline of a lesson
- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments
- Use visual presentations of verbal material, such as word webs and visual organizers
- Use manipulatives to teach or demonstrate concepts

Response Accommodations

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use a spelling dictionary or electronic spell-checker
- Use a word processor to type notes or give responses in class

Setting Accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where he learns best (for example, near the teacher & away from distractions)
- Use special lighting or acoustics
- Take a test in small group setting
- Use sensory tools such as an exercise band that can be looped around a chair's legs (so fidgety kids can kick it and quietly get their energy out)
- Use noise buffers such as headphones, earphones, or earplugs

Timing Accommodations

- Take more time to complete a task or a test
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

Scheduling Accommodations

- Take more time to complete a project
- Take a test in several timed sessions or over several days
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization Skills Accommodations

- Use an alarm to help with time management
- Mark texts with a highlighter

Assignment Modifications

- Answer fewer or different test questions
- Create alternate projects or assignments

Curriculum Modifications

- Learn different material (such as continuing to work on multiplication while classmates move on to fractions, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)
- Get graded or assessed using a different standard than the one for classmate

Differentiated Lesson(s)for this Graphing & Writing Linear Equations Unit

Bedminster Township School
Subject Area: Mathematics

Unit 3:
Systems of Linear Equations

Student Paced Time Frame: 12 days

Overview

In this unit, students will understand systems of linear equations.

Enduring Understandings

- Identify a linear equation.
- Describe a system of linear equations.
- Solve a system of linear equations.
- Model solving systems with different numbers of solutions.

Skill and Knowledge Objectives

- Understand how to solve systems of linear equations.
- Understand how to solve systems of linear equations by substitution.
- Understand how to solve systems of linear equations by elimination.
- Solve systems with different numbers of solutions

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments, as needed.

Pre-Assessment:

- Preview Performance Task - Heat Index
- Unit Exploration - Finding the output of a function given the input. Understanding mapping diagrams.

Formative Assessment:

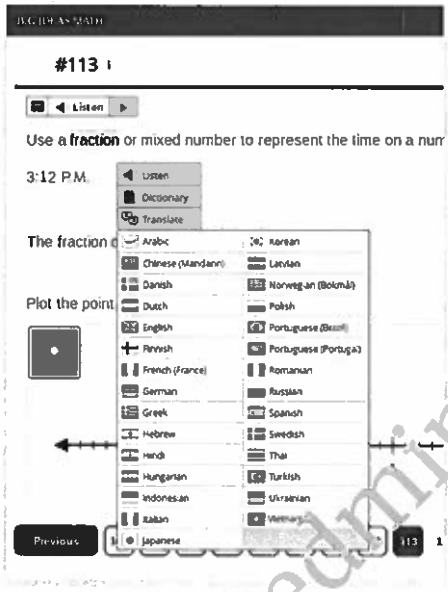
- Mid-Unit Assessment 5A, Mid-Unit Assessment 5B
- Chapter Tests A and B
- Alternative Assessment
- STEAM Performance Task
- Online Quiz (Big Ideas Website)- Teacher selected (based on students needs and abilities)
- Web based (Big Ideas) lesson presentation followed by web based Self Assessment Concepts and Skills and Self Assessment for Problems Solving
- Online (Big Ideas Website) - classwork and homework problems - providing automatic results on accuracy to students and teacher

Self-Reflection/Self-Assessment:

- Student Journal Responses
- Mini-Assessments
- Complete Performance Task after completing this unit of instruction.

Summative Assessment:

- Paper tests - Version A, Version B, or Alternative Assessment (based on students needs and abilities)
- MLL assessments in Spanish
- Online Test (Big Ideas Website)- Teacher selected problems (based on students needs and abilities)
    - Chapter test for Grade Level
    - Modified Test for IEP
    - Modified test for 504
    - MLL - Web based translator tool for assessments in other languages



Accommodations:

Paper based and pdf worksheets (Big Ideas)

- Cumulative practice
- Vocabulary practice
- Prerequisite skills practice
- Retea
- Enrichment and Extension
- Puzzle time

Web based practice and assessments

- Practice problems
    - Adjustable time
    - Calculator - 4 function, scientific, or graphing
    - Stepped out video examples
    - Answer check - 0,1,2,3,4,5, or Unlimited
- Tests and quizzes
    - Adjustable time
    - Prevent or Allow late submission

- Release for review by teacher or upon submission
- Randomize - recalculates the values for each question so students are not given the same assessment
- Scramble- rearranges questions so students are not given the same assessment

Accommodations/Modifications for special populations including 504, MLL, At Risk, IEP, enrichment:

MLL: Student journal in Spanish

Student Edition in Spanish

English language learners strategies infused in Big Ideas Teacher Edition

Dynamic Student eBook and Dynamic Student Edition includes English and Spanish audio

English version: Puzzle time, Reteach, Extra Practice

At Risk: Reteach

504: Reteach and Extra Practice

Enrichment: Enrichment and Extension, Alternative Assessment

Dictionary and Translation tool for all learners:

In Big Ideas assignments students may highlight words - then select a **dictionary** or **translate** to multiple languages using Big Ideas translator.

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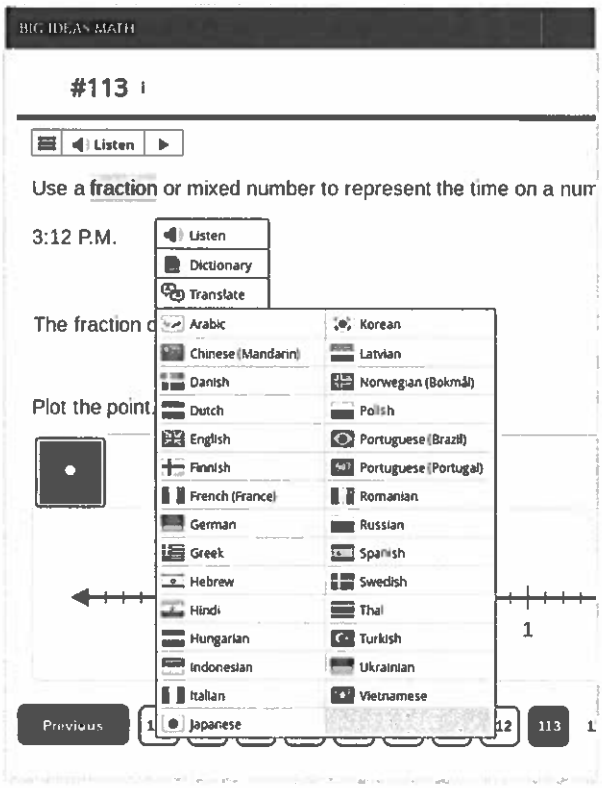
- Example



Big Ideas Video Tutorials in English and Spanish

Big Ideas Tutor - live audio support with Big Ideas tutor during select practice problems

Virtual Manipulatives

Digital Examples (Resources)

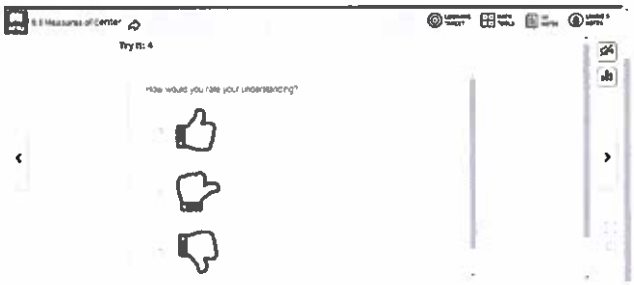
Skills Trainer - online (Big Ideas) interactive tool for skills practice - used for remediation or enrichment

New Jersey Social and Emotional Learning Competencies:

Self-Awareness, Self-Management, Social Awareness, Responsible Decision-Making, Relationship Skills

Activities:

- **SEL Resources in Big Ideas**
- **Thumbs Up:** Infused in every online lesson presentation tool through Big Ideas website Dynamic Classroom. This technique asks students to indicate the extent to which they understand a concept, procedure, or even the direction of activity. This allows students to communicate their feelings with respect to a specific success criterion.



- **MLL Support:** Multi language learners strategies infused in every lesson of Big Ideas Teaching Edition

ELL Support

Have students work in groups to complete the exercises. Remind them to use the process described in Example 1 as they collaborate.
Beginner: Write out the equation. For example, $2 \times 2 \times 2 = 2^3$.
Intermediate: Describe the equation. For example, "Two times two times two equals two to the third power."
Advanced: Explain the functions of bases, exponents, and powers.

- Sample

- **Test Taking Strategies page T231 - Big Ideas -**
  Teacher led discussions prior to each chapter test.
  Designed to reduce student stress and improve test taking abilities.

Test-Taking Strategies

Remind students to quickly look over the entire test before they start so that they can budget their time. They should not spend too much time on any single problem. Urge students to try to work on a part of each problem, because partial credit is better than no credit. When they receive their tests, students should jot down simple examples of finding the greatest common factor and least common multiple on the back of the test. By doing this, they will not become confused when they are under pressure. Teach students to use the **Stop** and **Think** strategy before answering. **Stop** and carefully read the problem, and **Think** about what the answer should look like.

- Sample

Social Emotional Well Being Activities - All Units

Resources

- *STEAM Video from BigIdeasMath.com*
- *Tutorial Videos*
- *Formula Sheet*
- *Graphic Organizers*
- *Differentiation Lessons*

Standards

NJ Student Learning Standards for Mathematics: 8.EE.C.8a, 8.EE.C.8b, 8.EE.C.8c,

- Expressions & Equations:
  - Analyze and solve linear equations and pairs of simultaneous linear equations.
    - Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
    - Solve systems of two linear equations in two variables using the substitution method and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, by inspection, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6. Solve $3x+y=30$ and $y=4x$ using the substitution method; Solve $y=3x+1$ and $y=-2x+7$ using the substitution method.
    - Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

- **8.1, 9.1 21st-Century Life & Career Skills and/or Financial Literacy; AND Activities/Lesson(s):**

- 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
- 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.
- 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices
- and
- 8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
- 8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
-
- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
- https://www.state.nj.us/education/aps/cccs/career/
-

9.1 21st-Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- A. Critical Thinking and Problem Solving

- 9.1.8.A.1 Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
9.1.8.A.2 Implement problem-solving strategies to solve a problem in school or the community.
9.1.8.A.3 Summarize strategies used by various organizations and agencies to solve problems that impact communities, and compare them with strategies used by similar organizations in another state or country.
9.1.8.A.4 Design and implement a project management plan using one or more problem-solving strategies.

- B. Creativity and Innovation

- 9.1.8.B.1 Use multiple points of view to create alternative solutions.

9.1.8.B.2 Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.

- C. Collaboration, Teamwork, and Leadership

- 9.1.8.C.1 Determine an individual's responsibility for personal actions and contributions to group activities.
  9.1.8.C.2 Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
  9.1.8.C.3 Model leadership skills during classroom and extra-curricular activities.

Additional Social and Emotional Competencies - Embed within Classroom Instruction

- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals
- Develop, implement, and model effective problem-solving and critical thinking skills
- Connect mathematical problems to student experiences
- Students explain their answers to each other
- Students self assess and/or self reflect on their understanding and level of engagement within the classroom setting and the instruction being provided.

Unit 3: Systems of Linear Equations

Lesson: Chapter Exploration/Solving a System of Equations by Graphing - 3 - 4 Days

Materials:
STEAM video, whiteboards

Activities:
- Watch a video about gold alloys and answer questions about the amounts of gold in different alloys.
- Preview the Performance Task on mixing alloys.
- Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice
- Motivate - Solve systems of equations using geometric symbols instead of variables.
- Explore/Discuss - Complete a table representing the battery power of headphones and a phone, graph and discuss the results.
- Graph a linear equation.
- Find the point where two lines intersect.
- Solve a system of linear equations by graphing.
- Self Assessment for Concepts & Skills

Lesson: Solving Systems of Linear Equations by Substitution - 2 - 3 Days

Materials:
number cubes, whiteboards

Activities:
- Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice
- Motivate - "Zip, Zap, Zoop" Substitution Game.
- Explore/Discuss - Solve a system using geometric symbols and apply this method to solving a system of linear equations. Generate an ordered pair and create a system of linear equations that have that ordered pair as their solution.
- Solve a linear equation in two variables for either variable.
- Solve a system of linear equations by substitution.
- Self Assessment for Concepts & Skills
- Self Assessment for Problem Solving
- Closure Activity/Mini Assessment

Lesson: Solving Systems of Linear Equations by Elimination - 2 - 3 Days

Materials:
whiteboards

Activities:
- Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice
- Motivate - Use a balance scale to model elimination..
- Explore/Discuss - Use operations of algebraic expressions to eliminate a variable to solve a system
- Add or subtract equations in a system.
- Use the Multiplication Property of Equality to produce equivalent equations.
- Solve a system of linear equations by elimination.
- Self Assessment for Concepts & Skills
- Self Assessment for Problem Solving
- Closure Activity/Mini Assessment

Lesson: Solving Special Systems of Linear Equations - 2 - 3 Days

Materials:
coordinate grid, whiteboards, uncooked spaghetti

Activities:
- Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice
- Motivate - Discuss the ways lines do and do not intersect..
- Explore/Discuss - Represent the cost of making backpacks for dogs on a coordinate plane and discuss the prices you can sell the backpacks for you to break even. Discuss the number of solutions a system of linear equations can have and when.
- Determine the number of solutions of a system.
- Solve a system of linear equations with any number of solutions.
- Self Assessment for Concepts & Skills
- Self Assessment for Problem Solving
- Closure

Lesson: Connecting Concepts/Unit Review - 3 - 4 Days

Materials:
graphic organizers

Activities:
- Warm Up - Cumulative Practice, Vocabulary Practice, Skill Practice
- Motivate - Use problem solving to solve exercises that combine the concepts from the current unit and prior learning.
- Explore/Discuss/Review - Review vocabulary terms, complete graphic organizers for the concepts and complete review exercises.
- Self Assessment for Concepts & Skills
- Self Assessment for Problem Solving
- Closure Activity/Practice Assessment - Study Guide

• Self Assessment for Problem Solving • Closure Activity/Mini Assessment			Activity/Mini Assessment	

Differentiate Instruction, depending on individual student needs (students with an IEP, MLL Students; Students At Risk; Gifted Students) **by:**

Presentation Accommodations

- Present information via the visual modality(written material to supplement oral explanation, models, illustrations, assignments written on board)
- Directions repeated, clarified or reworded
- Use alternate texts at lower readability level
- Rephrase word problems
- Reduce readability level of materials
- Work with fewer items per page or line and/or materials in a larger print size
- Provide multi-sensory presentation of data
- Use magnification device, screen reader, or Braille / Nemeth Code
- Use audio amplification device (e.g., hearing aid(s), auditory trainer, sound-field system (which may require teacher use of microphone)
- Be given a written list of instructions
- Record a lesson, instead of taking notes
- Provide tutorial video(s)
- Have another student share class notes with him
- Be given an outline of a lesson
- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments
- Use manipulatives to teach or demonstrate concepts

Response Accommodations

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use of calculator
- Use of a math grid
- Use a word processor to type notes or give responses in class

Setting Accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where student learns best (for example, near the teacher & away from distractions)
- Take an assessment and/or assignment in small group setting
- Use noise buffers such as headphones, earphones, or earplugs

Timing Accommodations

- Take more time to complete a task or an assessment
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

Scheduling Accommodations

- Take more time to complete a project
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization Skills Accommodations

- Use an alarm to help with time management
- Mark texts with a highlighter
- Break down tasks into manageable units
- Use of checklists
- Provide organizers/study guides

Assignment Modifications

- Provide larger white work space
- Allow for oral rather than written responses
- Answer fewer or different questions
- Assign questions aligned to different levels such as emerging, proficient, and/or advanced.
- Create alternate projects or assignments

Curriculum Modifications

- Learn different material related to the same mathematical concept (such as continuing to work on one or two step equations while classmates move on to solving multi-step equations, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)
- Get assessed using a leveled standard/concept (emerging, proficient, and/or advanced) than the one for classmate

Differentiated Lesson(s)for this Systems of Equations Unit

Bedminster Township School
Subject Area: Mathematics

Unit 4:
Data Analysis & Displays

Student Paced Time Frame: 18 Days

Overview

In this unit, students will understand data displays.

Enduring Understandings

- Identify a data set.
- Use appropriate data displays to represent a situation.
- Interpret a data set.
- Compare different data sets.

Skill and Knowledge Objectives

- Use scatter plots to describe patterns and relationships between quantities.
- Use lines of fit to model data.
- Use two-way tables to represent data.
- Use appropriate data displays to represent situations.

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments, as needed.

Pre-Assessment:

- Preview Performance Task - Elements in the Universe
- Unit Exploration - Writing powers as words. Writing numbers as powers.

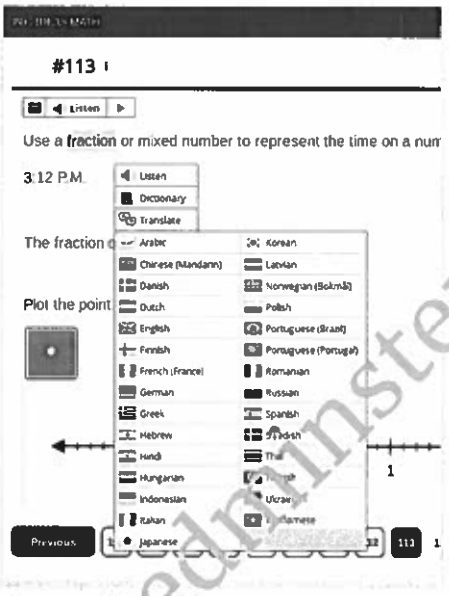
Formative Assessment:

- Mid-Unit Assessment 6A, Mid-Unit Assessment 6B
- Chapter Tests A and B
- Alternative Assessment
- STEAM Performance Task
- Online Quiz (Big Ideas Website)- Teacher selected (based on students needs and abilities)
- Web based (Big Ideas) lesson presentation followed by web based Self Assessment Concepts and Skills and Self Assessment for Problems Solving
- Online (Big Ideas Website) - classwork and homework problems - providing automatic results on accuracy to students and teacher

Self-Reflection/Self-Assessment:

- Student Journal Responses
- Mini-Assessments
- Complete Performance Task after completing this unit of instruction.

Summative Assessment:

- Paper tests - Version A, Version B, or Alternative Assessment (based on students needs and abilities)
- MLL assessments in Spanish
- Online Test (Big Ideas Website)- Teacher selected problems (based on students needs and abilities)
    - Chapter test for Grade Level
    - Modified Test for IEP
    - Modified test for 504
    - MLL - Web based translator tool for assessments in other languages
    - 

Accommodations:

Paper based and pdf worksheets (Big Ideas)

- Cumulative practice
- Vocabulary practice
- Prerequisite skills practice
- Extra practice
- Reteach
- Enrichment and Extension
- Puzzle time

Web based practice and assessments

- Practice problems
    - Adjustable time
    - Calculator - 4 function, scientific, or graphing
    - Stepped out video examples
    - Answer check - 0,1,2,3,4,5, or Unlimited
- Tests and quizzes

- Adjustable time
- Prevent or Allow late submission
- Release for review by teacher or upon submission
- Randomize - recalculates the values for each question so students are not given the same assessment
- Scramble- rearranges questions so students are not given the same assessment

Accommodations/Modifications for special populations including 504, MLL, At Risk, IEP, enrichment:

MLL: Student journal in Spanish

Student Edition in Spanish

English language learners strategies infused in Big Ideas Teacher Edition.

Dynamic Student eBook and Dynamic Student Edition includes English and Spanish audio

English version: Puzzle time, Reteach, Extra Practice

At Risk: Reteach

504: Reteach and Extra Practice

Enrichment: Enrichment and Extension, Alternative Assessment

Dictionary and Translation tool for all learners:

In Big Ideas assignments students may highlight words - then select a **dictionary** or **translate** to multiple languages using Big Ideas Translator.

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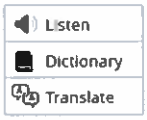
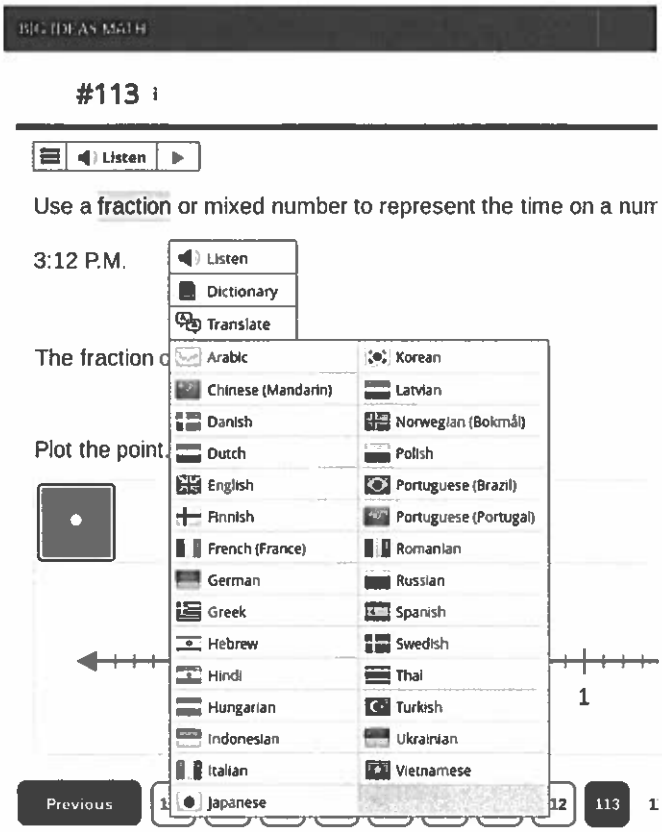


- Example



- Example

Big Ideas Video Tutorials in English and Spanish

Big Ideas Tutor - live audio support with Big Ideas tutor during select practice problems

Virtual Manipulatives

Digital Examples (Resources)

Skills Trainer - online (Big Ideas) interactive tool for skills practice - used for remediation or enrichment

New Jersey Social and Emotional Learning Competencies:

Self-Awareness, Self-Management, Social Awareness, Responsible Decision-Making, Relationship Skills

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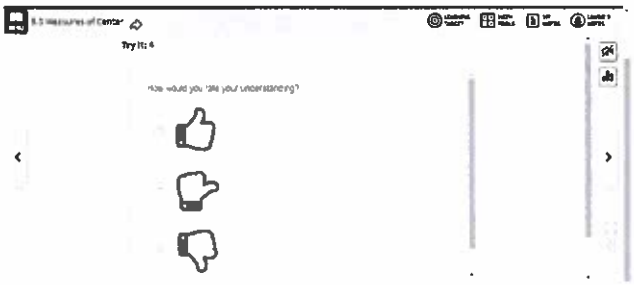
SEL Resources in Big Ideas

- **Thumbs Up:** Infused in every online lesson presentation tool through Big Ideas website Dynamic Classroom. This technique asks students to indicate the extent to which they understand a concept, procedure, or even the direction of activity. This allows students to communicate their feelings with respect to a specific success criterion.



- **MLL Support:** English language learners strategies infused in every lesson of Big Ideas Teaching Edition

ELL Support

Have students work in groups to complete the exercises. Remind them to use the process described in Example 1 as they collaborate.
Beginner: Write out the equation. For example, $2 \times 2 \times 2 = 2^3$.
Intermediate: Describe the equation. For example, "Two times two times two equals two to the third power."
Advanced: Explain the functions of bases, exponents, and powers.

- Sample

- **Test Taking Strategies page T269 - Big Ideas -**
  Teacher led discussions prior to each chapter test.
  Designed to reduce student stress and improve test taking abilities.

Test-Taking Strategies

Remind students to quickly look over the entire test before they start so that they can budget their time. They should not spend too much time on any single problem. Urge students to try to work on a part of each problem, because partial credit is better than no credit. When they receive their tests, students should jot down simple examples of finding the greatest common factor and least common multiple on the back of the test. By doing this, they will not become confused when they are under pressure. Teach students to use the **Stop** and **Think** strategy before answering. **Stop** and carefully read the problem, and **Think** about what the answer should look like.

- Sample

Social Emotional Well Being Activities - All Units

Resources

- *STEAM Video from BigIdeasMath.com*
- *Tutorial Videos*
- *Graphic Organizers*
- *Differentiation Lessons*

Standards

NJ Student Learning Standards for Mathematics: 8.SP.A.1, 8.SP.A.2, 8.SP.A.3, 8.SP.A.4

- Statistics & Probability:
  - Investigate patterns of association in bivariate data.
    - Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
    - Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.
    - Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
    - Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables

  - **8.1, 9.1 21st-Century Life & Career Skills and/or Financial Literacy; AND Activities/Lesson(s):**
  -
  - 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
  - 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.
  - 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices
  - and
  - 8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
  - 8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
  -
  - 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
  - https://www.state.nj.us/education/aps/cccs/career/
  -

    9.1 21st-Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

  - A. Critical Thinking and Problem Solving

  - 9.1.8.A.1 Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
    9.1.8.A.2 Implement problem-solving strategies to solve a problem in school or the community.
    9.1.8.A.3 Summarize strategies used by various organizations and agencies to solve problems that impact communities, and compare them with strategies used by similar organizations in another state or country.
    9.1.8.A.4 Design and implement a project management plan using one or more problem-solving strategies.

  - B. Creativity and Innovation

- 9.1.8.B.1 Use multiple points of view to create alternative solutions.
  9.1.8.B.2 Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.

- C. Collaboration, Teamwork, and Leadership

- 9.1.8.C.1 Determine an individual's responsibility for personal actions and contributions to group activities.
  9.1.8.C.2 Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
  9.1.8.C.3 Model leadership skills during classroom and extra-curricular activities.

Additional Social and Emotional Competencies - Embed within Classroom Instruction

- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals
- Develop, implement, and model effective problem-solving and critical thinking skills
- Connect mathematical problems to student experiences
- Students explain their answers to each other
- Students self assess and/or self reflect on their understanding and level of engagement within the classroom setting and the instruction being provided.

Lesson: Chapter Exploration/Scatter Plots - 3 - 4 Days **Materials:** *STEAM video, graph paper, whiteboards* **Activities:** • Watch a video about car fuel economy and answer questions about car footprint and its relationship with fuel economy. training. • Preview the Performance Task on fuel economy. • Warm Up - Cumulative Practice,	**Lesson:** Lines of Fit - 2 - 3 Days **Materials:** *whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Match and explain the concept of like terms. • Explore/Discuss - Find angle measures of triangles using equations. • Apply properties to produce	**Lesson:** Two-Way Tables - 2 - 3 Days **Materials:** *whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Discuss what columns and rows in a two-way table represent.. • Explore/Discuss - Complete and analyze tables representing shirts in a store.	**Lesson:** Choosing a Data Display - 2 - 3 Days **Materials:** *none* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Discuss roadkill and vehicle accidents. Explore how to best display this data. • Explore/Discuss - different types of data display and	**Lesson:** Connecting Concepts/Unit Review - 3 - 4 Days **Materials:** *graphic organizers* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Skill Practice • Motivate - Use problem solving to solve exercises that combine the concepts from the current unit and prior learning. • Explore/Discuss/Review - Review vocabulary

Vocabulary Practice, Prerequisite Skill Practice • Motivate - Discuss how bowling balls compare to other sport balls. • Explore/Discuss - Graph the weights/circumferences of sports balls in a coordinate plane and determine if there is a relationship between them. • Make a scatter plot. • Identify outliers, gaps, and clusters in a scatter plot. • Use scatter plots to describe relationships between data. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	equivalent equations. • Solve multi-step equations. • Use multi-step equations to model and solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	• Read a two-way table. • Make a two-way table. • Use a two-way table to describe relationships between data. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	what their purpose is. • Choose appropriate data displays for situations. • Identify misleading data displays. • Analyze a variety of data displays. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Min. Assessment	terms, complete graphic organizers for the concepts and complete review exercises. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Practice Assessment - Study Guide

Differentiate Instruction, depending on individual student needs (students with an IEP, MLL Students; Students At Risk; Gifted Students) **by:**

Presentation Accommodations

- Present information via the visual modality(written material to supplement oral explanation, models, illustrations, assignments written on board)
- Directions repeated, clarified or reworded
- Use alternate texts at lower readability level
- Rephrase word problems
- Reduce readability level of materials
- Work with fewer items per page or line and/or materials in a larger print size
- Provide multi-sensory presentation of data
- Use magnification device, screen reader, or Braille / Nemeth Code
- Use audio amplification device (e.g., hearing aid(s), auditory trainer, sound-field system (which may require teacher use of microphone)
- Be given a written list of instructions
- Record a lesson, instead of taking notes
- Provide tutorial video(s)
- Have another student share class notes with him

- Be given an outline of a lesson
- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments
- Use manipulatives to teach or demonstrate concepts

Response Accommodations

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use of calculator
- Use of a math grid
- Use a word processor to type notes or give responses in class

Setting Accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where student learns best (for example, near the teacher & away from distractions)
- Take an assessment and/or assignment in small group setting
- Use noise buffers such as headphones, earphones, or earplugs

Timing Accommodations

- Take more time to complete a task or an assessment
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

Scheduling Accommodations

- Take more time to complete a project
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization Skills Accommodations

- Use an alarm to help with time management
- Mark texts with a highlighter
- Break down tasks into manageable units
- Use of checklists
- Provide organizers/study guides

Assignment Modifications

- Provide larger white work space
- Allow for oral rather than written responses
- Answer fewer or different questions
- Assign questions aligned to different levels such as emerging, proficient, and/or advanced.
- Create alternate projects or assignments

Curriculum Modifications

- Learn different material related to the same mathematical concept (such as continuing to work on one or two step equations while classmates move on to solving multi-step equations, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)
- Get assessed using a leveled standard/concept (emerging, proficient, and/or advanced) than the one for classmate

Differentiated Lesson(s) for this Data Analysis & Displays Unit

Bedminster Township School
Subject Area: Mathematics

Unit 5:
Functions

Student Paced Time Frame: 15 days

Overview

In this unit, students will understand functions.

Enduring Understandings

- Identify functions.
- Represent functions in a variety of ways.
- Evaluate functions.
- Solve problems using functions.

Skill and Knowledge Objectives

- Understand the concept of a function.
- Represent functions in a variety of ways.
- Use functions to model linear relationships.
- Understand differences between linear and nonlinear functions.
- Use graphs of functions to describe relationships between quantities.

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments, as needed.

Pre-Assessment:

- Preview Performance Task - Identifying and Correcting Errors in the Calculations of Periods of Pendulums
- Unit Exploration - Finding square roots. Finding the radius of a circle.

Formative Assessment:

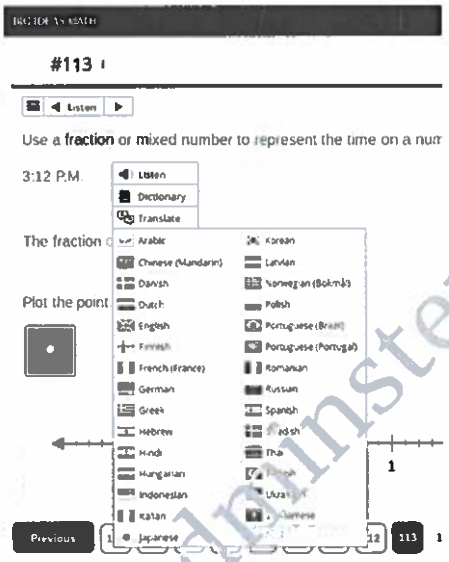
- Mid-Unit Assessment 7A , Mid-Unit Assessment 7B
- Chapter Tests A and B
- Alternative Assessment
- STEAM Performance Task
- Online Quiz (Big Ideas Website)- Teacher selected (based on students needs and abilities)
- Web based (Big Ideas) lesson presentation followed by web based Self Assessment Concepts and Skills and Self Assessment for Problems Solving
- Online (Big Ideas Website) - classwork and homework problems - providing automatic results on accuracy to students and teacher

Self-Reflection/Self-Assessment:

- Student Journal Responses
- Mini-Assessments
- Complete Performance Task after completing this unit of instruction.

Summative Assessment:

- Paper tests - Version A, Version B, or Alternative Assessment (based on students needs and abilities)
- MLL assessments in Spanish
- Online Test (Big Ideas Website)- Teacher selected problems (based on students needs and abilities)
    - Chapter test for Grade Level
    - Modified Test for IEP
    - Modified test for 504
    - MLL - Web based translator tool for assessments in other languages



Accommodations:

Paper based and pdf worksheets (Big Ideas)

- Cumulative practice
- Prerequisite skills practice
- Extra practice
- Retea
- Puzzle time

Web based practice and assessments

- Practice problems
    - Adjustable time
    - Calculator - 4 function, scientific, or graphing
    - Stepped out video examples
    - Answer check - 0,1,2,3,4,5, or Unlimited
- Tests and quizzes
    - Adjustable time
    - Prevent or Allow late submission
    - Release for review by teacher or upon submission

- Randomize - recalculates the values for each question so students are not given the same assessment
- Scramble- rearranges questions so students are not given the same assessment

Accommodations/Modifications for special populations including 504, MLL, At Risk, IEP, enrichment:

MLL: Student journal in Spanish

Student Edition in Spanish

English language learners strategies infused in Big Ideas Teacher Edition

Dynamic Student eBook and Dynamic Student Edition includes English and Spanish audio

English version: Puzzle time, Reteach, Extra Practice

At Risk: Reteach

504: Reteach and Extra Practice

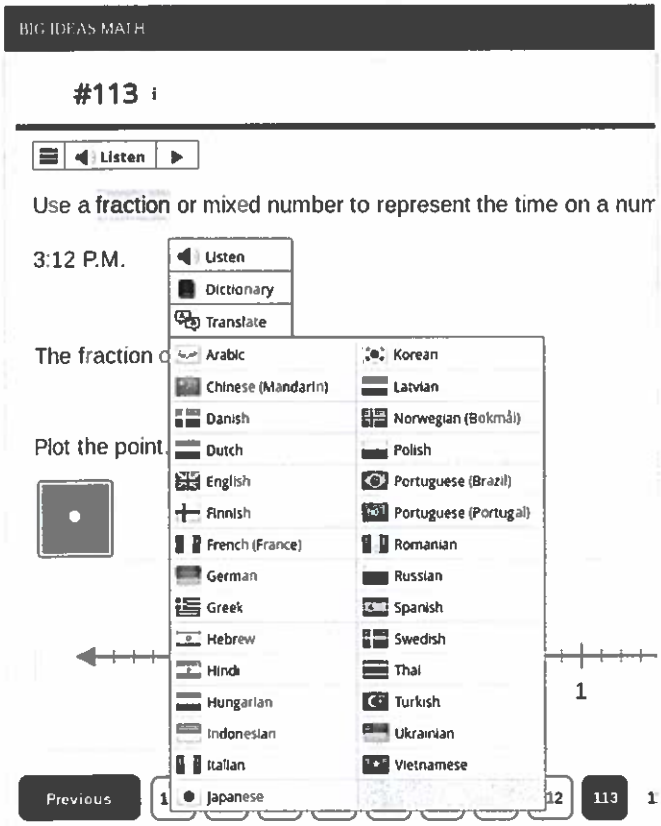
Enrichment: Enrichment and Extension, Alternative Assessment

Dictionary and Translation tool for all learners:

In Big Ideas assignments students may highlight words - then select a **dictionary** or **translate** to multiple languages using Big Ideas translator.

e. Let 0 represent noon.

- Example



- Example

Big Ideas Video Tutorials **in English and Spanish**

Big Ideas Tutor - live audio support with Big Ideas tutor during select practice problems

Virtual Manipulatives

Digital Examples (Resources)

Skills Trainer **- online (Big Ideas) interactive tool for skills practice - used for remediation or enrichment**

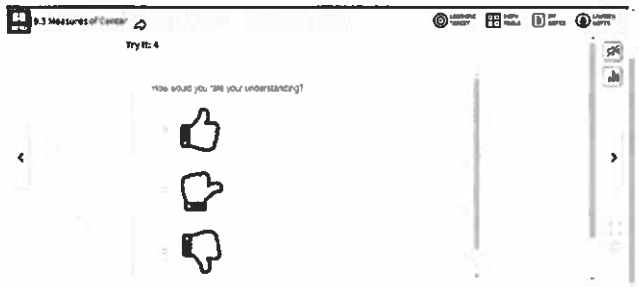
New Jersey Social and Emotional Learning Competencies:

Self-Awareness, Self-Management, Social Awareness, Responsible Decision-Making, Relationship Skills

Activities:

- **SEL Resources in Big Ideas**

- **Thumbs Up:** Infused in every online lesson presentation tool through Big Ideas website Dynamic Classroom. This technique asks students to indicate the extent to which they understand a concept, procedure, or even the direction of activity. This allows students to communicate their feelings with respect to a specific success criterion.



- **MLL Support:** Multi language learners strategies infused in every lesson of Big Ideas Teaching Edition

ELL Support

Have students work in groups to complete the exercises. Remind them to use the process described in Example 1 as they collaborate.
Beginner: Write out the equation. For example, $2 \times 2 \times 2 = 2^3$.
Intermediate: Describe the equation. For example, "Two times two times two equals two to the third power."
Advanced: Explain the functions of bases, exponents, and powers.

- Sample

- **Test Taking Strategies page T313 - Big Ideas -**
  Teacher led discussions prior to each chapter test.
  Designed to reduce student stress and improve test taking abilities.

Test-Taking Strategies

Remind students to quickly look over the entire test before they start so that they can budget their time. They should not spend too much time on any single problem. Urge students to try to work on a part of each problem, because partial credit is better than no credit. When they receive their tests, students should jot down simple examples of finding the greatest common factor and least common multiple on the back of the test. By doing this, they will not become confused when they are under pressure. Teach students to use the **Stop** and **Think** strategy before answering. **Stop** and carefully read the problem, and **Think** about what the answer should look like.

- Sample

Social Emotional Well Being Activities - All Units

Resources

- *STEAM Video from BigIdeasMath.com*
- *Tutorial Videos*
- *Graphic Organizers*
- *Differentiation Lessons*

Standards

NJ Student Learning Standards for Mathematics: 8.F.A.1, 8.F.A.2, 8.F.A.3, 8.F.B.4, F.B.5

- Functions:
  - Define, evaluate, and compare functions.
    - Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
    - Compare properties (e.g. rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
    - Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.
  - Use functions to model relationships between quantities.
    - Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
    - Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.Analyze and solve linear equations and pairs of simultaneous linear equations.

- **8.1, 9.1 21st-Century Life & Career Skills and/or Financial Literacy; AND Activities/Lesson(s):**

- 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
- 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.
- 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices
- and
- 8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
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- https://www.state.nj.us/education/aps/cccs/career/
-

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- A. Critical Thinking and Problem Solving

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  9.1.8.A.2 Implement problem-solving strategies to solve a problem in school or the community.
  9.1.8.A.3 Summarize strategies used by various organizations and agencies to solve problems that impact communities, and compare them with strategies used by similar organizations in another state or country.
  9.1.8.A.4 Design and implement a project management plan using one or more problem-solving strategies.

- B. Creativity and Innovation

- 9.1.8.B.1 Use multiple points of view to create alternative solutions.
  9.1.8.B.2 Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.

- C. Collaboration, Teamwork, and Leadership

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  9.1.8.C.2 Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
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Additional Social and Emotional Competencies - Embed within Classroom Instruction

- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals
- Develop, implement, and model effective problem-solving and critical thinking skills
- Connect mathematical problems to student experiences
- Students explain their answers to each other
- Students self assess and/or self reflect on their understanding and level of engagement within the classroom setting and the instruction being provided.

Lesson: Chapter Exploration/Relations & Functions - 3 - 4 Days **Materials:** *STEAM video, whiteboards* **Activities:** • Watch a video about finding the apparent temperature and	**Lesson:** Representations of Functions - 2 - 3 Days **Materials:** *whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice	**Lesson:** Linear Functions - 2 - 3 Days **Materials:** *whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate -	**Lesson:** Comparing Linear & Nonlinear Functions - 2 - 3 Days **Materials:** *whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill	**Lesson:** Analyzing & Sketching Graphs - 2 - 3 Days **Materials:** *whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate -	**Lesson:** Connecting Concepts/Unit Review - 3 - 4 Days **Materials:** *graphic organizers* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice

answer questions about the Wet Bulb Globe Temperature formula. • Preview the Performance Task on heat index. • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Explore mapping diagrams and function machines. • Explore/Discuss - Vending Machines and relationships to input and output tables. • Represent a relation as a set of ordered pairs. • Determine whether a relation is a function. • Use functions to solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	• Motivate - Amusement Park Activity - determine the total cost of multiple tickets and discover an equation to determine the total cost for any number of tickets. • Explore/Discuss - Create a table showing the relationship between figure and area. Match relationships to equations. • Write a function rule that describes a relationship. • Evaluate functions for given inputs. • Represent functions using tables and graphs. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	Match equations to respective graphs • Explore/Discuss - Write function rules for each table and reason whether each function is linear. • Write linear functions to model relationships. • Interpret linear functions in real-life situations. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	Practice • Motivate - Skydiving - Consider whether the function that describes the height of a skydiver is linear. • Explore/Discuss - Graph equations representing the height of a falling skydiver and bowling ball. Decide whether the graphs represent linear or nonlinear functions and compare the falling objects. • Recognize linear functions represented as tables, equations, and graphs. • Compare linear and nonlinear functions. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	Graph the distance from a wall of a student walking quickly across the room, slowly across the room, and standing still. • Explore/Discuss - Match different scenarios with a graph. Create a scenario given a graph. • Describe relationships between quantities in graphs. • Sketch graphs given verbal descriptions of relationships. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	• Motivate - Use problem solving to solve exercises that combine the concepts from the current unit and prior learning. • Explore/Discuss/Review - Review vocabulary terms, complete graphic organizers for the concepts and complete review exercises. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Practice Assessment - Study Guide

Differentiate Instruction, depending on individual student needs (students with an IEP, MLL Students; Students At Risk; Gifted Students) **by:**

Presentation Accommodations

- Present information via the visual modality(written material to supplement oral explanation, models, illustrations, assignments written on board)
- Directions repeated, clarified or reworded
- Use alternate texts at lower readability level
- Rephrase word problems
- Reduce readability level of materials
- Work with fewer items per page or line and/or materials in a larger print size
- Provide multi-sensory presentation of data
- Use magnification device, screen reader, or Braille / Nemeth Code
- Use audio amplification device (e.g., hearing aid(s), auditory trainer, sound-field system (which may require teacher use of microphone)
- Be given a written list of instructions
- Record a lesson, instead of taking notes
- Provide tutorial video(s)
- Have another student share class notes with him
- Be given an outline of a lesson
- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments
- Use manipulatives to teach or demonstrate concepts

Response Accommodations

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use of calculator
- Use of a math grid
- Use a word processor to type notes or give responses in class

Setting Accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where student learns best (for example, near the teacher & away from distractions)
- Take an assessment and/or assignment in small group setting
- Use noise buffers such as headphones, earphones, or earplugs

Timing Accommodations

- Take more time to complete a task or an assessment
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

Scheduling Accommodations

- Take more time to complete a project
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization Skills Accommodations

- Use an alarm to help with time management
- Mark texts with a highlighter
- Break down tasks into manageable units
- Use of checklists
- Provide organizers/study guides

Assignment Modifications

- Provide larger white work space
- Allow for oral rather than written responses
- Answer fewer or different questions
- Assign questions aligned to different levels such as emerging, proficient, and/or advanced.
- Create alternate projects or assignments

Curriculum Modifications

- Learn different material related to the same mathematical concept (such as continuing to work on one or two step equations while classmates move on to solving multi-step equations, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)
- Get assessed using a leveled standard/concept (emerging, proficient, and/or advanced) than the one for classmate

Differentiated Lesson(s)for this Functions Unit

Bedminster Township School
Subject Area: Mathematics

Unit 6:

Exponents & Scientific Notation

Student Paced Time Frame: 20 days

Overview

In this unit, students will understand exponents and scientific notation.

Enduring Understandings

- Write products using exponents.
- Describe the value of powers.
- Evaluate expressions.
- Compare quantities using scientific notation.

Skill and Knowledge Objectives

- Use exponents to write and evaluate expressions.
- Generate equivalent expressions involving products of powers.
- Generate equivalent expressions involving quotients of powers.
- Understand the concepts of zero and negative exponents.
- Round numbers and write the results as the product of a single digit and a power of ten.
- Understand the concept of scientific notation.
- Perform operations with numbers written in scientific notation.

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments, as needed.

Pre-Assessment:

- Preview Performance Task - Master Puppeteer - Application of Transformations
- Unit Exploration - Identify Congruent Figures

Formative Assessment:

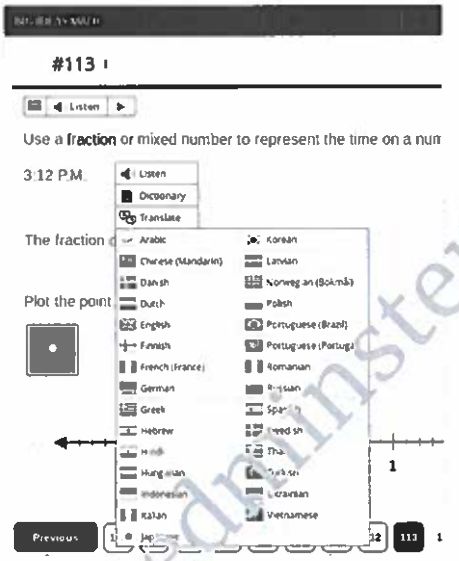
- Mid-Unit Assessment 8A , Mid-Unit Assessment 8B
- Chapter Tests A and B
- Alternative Assessment
- STEAM Performance Task
- Online Quiz (Big Ideas Website)- Teacher selected (based on students needs and abilities)
- Web based (Big Ideas) lesson presentation followed by web based Self Assessment Concepts and Skills and Self Assessment for Problems Solving
- Online (Big Ideas Website) - classwork and homework problems - providing automatic results on accuracy to students and teacher

Self-Reflection/Self-Assessment:

- Student Journal Responses
- Mini-Assessments
- Complete Performance Task after completing this unit of instruction.

Summative Assessment:

- Paper tests - Version A, Version B, or Alternative Assessment (based on students needs and abilities)
- MLL assessments in Spanish
- Online Test (Big Ideas Website)- Teacher selected problems (based on students needs and abilities)
    - Chapter test for Grade Level
    - Modified Test for IEP
    - Modified test for 504
    - MLL - Web based translator tool for assessments in other languages



Accommodations:

Paper based and pdf worksheets (Big Ideas)

- Cumulative practice
- Vocabulary practice
- Prerequisite skills practice
- Extra practice
- Reteach
- Enrichment and Extension
- Puzzle time

Web based practice and assessments

- Practice problems
    - Adjustable time
    - Calculator - 4 function, scientific, or graphing
    - Stepped out video examples
    - Answer check - 0,1,2,3,4,5, or Unlimited

- Tests and quizzes
  - Adjustable time
  - Prevent or Allow late submission
  - Release for review by teacher or upon submission
  - Randomize - recalculates the values for each question so students are not given the same assessment
  - Scramble- rearranges questions so students are not given the same assessment

Accommodations/Modifications for special populations including 504, MLL, At Risk, IEP, enrichment:

MLL: Student journal in Spanish

Student Edition in Spanish

English language learners strategies infused in Big Ideas Teacher Edition

Dynamic Student eBook and Dynamic Student Edition include English and Spanish audio

English version: Puzzle time, Reteach, Extra Practice

At Risk: Reteach

504: Reteach and Extra Practice

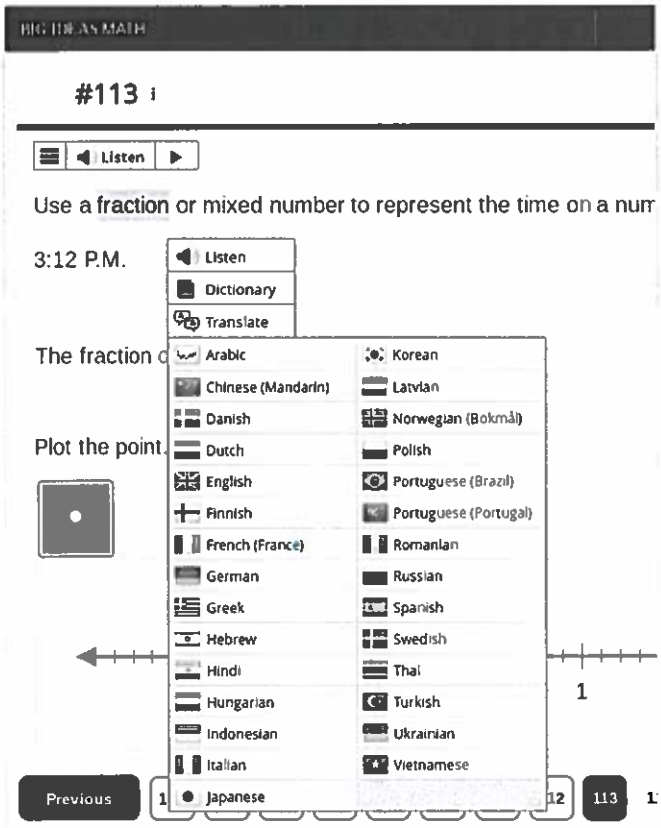
Enrichment: Enrichment and Extension, Alternative Assessment

Dictionary and Translation tool for all learners:

In Big Ideas assignments students may highlight words - then select a **dictionary** or **translate** to multiple languages using Big Ideas translator.

e. Let 0 represent noon.

- Example



- Example

Big Ideas Video Tutorials **in English and Spanish**

Big Ideas Tutor - live audio support with Big Ideas tutor during select practice problems

Virtual Manipulatives

Digital Examples (Resources)

Skills Trainer **- online (Big Ideas) interactive tool for skills practice - used for remediation or enrichment**

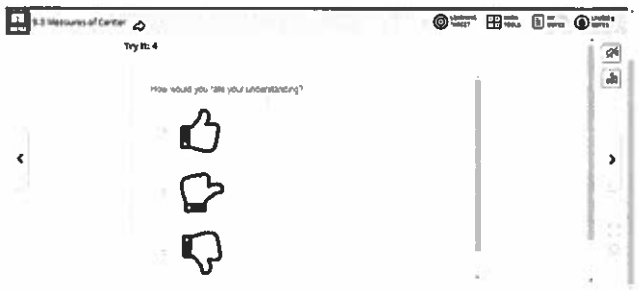
New Jersey Social and Emotional Learning Competencies:

Self-Awareness, Self-Management, Social Awareness, Responsible Decision-Making, Relationship Skills

Activities:

- **SEL Resources in Big Ideas**

- **Thumbs Up:** Infused in every online lesson presentation tool through Big Ideas website Dynamic Classroom. This technique asks students to indicate the extent to which they understand a concept, procedure, or even the direction of activity. This allows students to communicate their feelings with respect to a specific success criterion.



- **MLL Support:** Multi language learners strategies infused in every lesson of Big Ideas Teaching Edition

ELL Support

Have students work in groups to complete the exercises. Remind them to use the process described in Example 1 as they collaborate.
Beginner: Write out the equation. For example, $2 \times 2 \times 2 = 2^3$.
Intermediate: Describe the equation. For example, "Two times two times two equals two to the third power."
Advanced: Explain the functions of bases, exponents, and powers.

- Sample

- **Test Taking Strategies page T367 - Big Ideas -**
  Teacher led discussions prior to each chapter test.
  Designed to reduce student stress and improve test taking abilities.

Test-Taking Strategies

Remind students to quickly look over the entire test before they start so that they can budget their time. They should not spend too much time on any single problem. Urge students to try to work on a part of each problem, because partial credit is better than no credit. When they receive their tests, students should jot down simple examples of finding the greatest common factor and least common multiple on the back of the test. By doing this, they will not become confused when they are under pressure. Teach students to use the **Stop** and **Think** strategy before answering. **Stop** and carefully read the problem, and **Think** about what the answer should look like.

- Sample

Social Emotional Well Being Activities - All Units

Resources

- *STEAM Video from BigIdeasMath.com*
- *Tutorial Videos*
- *Graphic Organizers*
- *Differentiation Lessons*

Standards

NJ Student Learning Standards for Mathematics: 8.EE.A1, 8.EE.A3, 8.EE.A4

- Expressions & Equations:
  - Work with radicals and integer exponents.
    - Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 32 × 3–5 = 3–3 = 1/33 = 1/27.
    - Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
    - Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

- **8.1, 9.1 21st-Century Life & Career Skills and/or Financial Literacy; AND Activities/Lesson(s):**
-
- 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
- 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.
- 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices
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- 8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
- 8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
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- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
- https://www.state.nj.us/education/aps/cccs/career/
-

  9.1 21st-Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- A. Critical Thinking and Problem Solving

- 9.1.8.A.1 Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
  9.1.8.A.2 Implement problem-solving strategies to solve a problem in school or the community.
  9.1.8.A.3 Summarize strategies used by various organizations and agencies to solve problems that impact communities, and compare them with strategies used by similar organizations in another state or country.
  9.1.8.A.4 Design and implement a project management plan using one or more problem-solving strategies.

- B. Creativity and Innovation

- 9.1.8.B.1 Use multiple points of view to create alternative solutions.
  9.1.8.B.2 Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.

- C. Collaboration, Teamwork, and Leadership

- 9.1.8.C.1 Determine an individual's responsibility for personal actions and contributions to group activities.
  9.1.8.C.2 Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
  9.1.8.C.3 Model leadership skills during classroom and extra-curricular activities.

Additional Social and Emotional Competencies - Embed within Classroom Instruction

- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals
- Develop, implement, and model effective problem-solving and critical thinking skills
- Connect mathematical problems to student experiences
- Students explain their answers to each other
- Students self assess and/or self reflect on their understanding and level of engagement within the classroom setting and the instruction being provided.

Lesson: Chapter Exploration/Exponents - 3 - 4 Days **Materials:** *STEAM video, whiteboards* **Activities:** • Watch a video about carbon atoms and answer questions about different amounts of carbon • Preview the Performance Task on atomic mass and the amount of carbon dioxide in the atmosphere. • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Discuss	**Lesson:** Product of Powers Property - 2 - 3 Days **Materials:** *index cards, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Determine whether $2000 or starting with a penny and receiving twice as much each day for 23 days results in more money. • Explore/Discuss - Use repeated multiplication to rewrite products of powers, powers of powers, and powers	**Lesson:** Quotient of Powers Property - 2 - 3 Days **Materials:** *index cards, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Solve a long product of fractions by reasoning about denominators being able to divide out numerators. • Explore/Discuss - Use repeated multiplication to rewrite quotients of powers and write a general rule for	**Lesson:** Zero & Negative Exponents - 2 - 3 Days **Materials:** *index cards, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Reason about how numbers in expanded form can be written using powers of 10. • Explore/Discuss - Use quotients of powers to reason about the definition of a power with an exponent of a 0. Use products of powers and their

the number of cubic millimeters in a cubic meter and express the value as an exponent. • Explore/Discuss - Complete a table of powers of -3 and reason about the meaning of the expression $(-3)^n$. Use powers to find the total value of the large cube • Write products using exponents. • Evaluate expressions involving powers. • Use exponents to solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	of products. Write a general rule for rewriting each. • Find products of powers that have the same base. • Find powers of powers. • Find powers of products. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	rewriting quotients of powers. • Find quotients of powers that have the same base. • Simplify expressions using the Quotient of Powers Property. • Solve real-life problems involving quotients of powers. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	multiplicative inverses to reason about the definition of a power with a negative exponent. Discuss zero and negative exponents. • Explain the meanings of zero and negative exponents. • Evaluate numerical expressions involving zero and negative exponents. • Simplify algebraic expressions involving zero and negative exponents. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment
Lesson: Estimating Quantities - 2 - 3 Days **Materials:** *whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Determine if you have had their millionth and billionth heartbeats. • Explore/Discuss - Match pictures with the most appropriate distance. Determine which number in list 1 is closest to a number written as a product of a power of 10 in list 2. Discuss approximating a very large or very small number by rounding the number and writing it as a product of a single digit and a power of 10. • Write products using exponents. • Round very large and	**Lesson:** Scientific Notation - 2 - 3 Days **Materials:** *whiteboards, graphing calculators, scientific calculators* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Discuss the area of the Florida Keys. • Explore/Discuss - Use a graphing calculator to display numbers that are not in standard form and reason about what they represent. • Find products of powers that have the same base. • Convert between scientific notation and standard form. • Choose appropriate units to represent quantities. • Use scientific notation to solve real-life problems. • Self Assessment for	**Lesson:** Operations in Scientific Notation - 2 - 3 Days **Materials:** *Whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Discuss how to evaluate an expression using the distributive property. • Explore/Discuss - Find sums and differences of numbers in scientific notation with the same power of a ten and explain how to perform these operations in the general case. Find products and quotients of numbers in scientific notation and explain how to perform these operations in the general case. • Explain how to add and subtract numbers in scientific notation. • Explain how to	**Lesson:** Connecting Concepts/Unit Review - 3 - 4 Days **Materials:** *graphic organizers* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Use problem solving to solve exercises that combine the concepts from the current unit and prior learning. • Explore/Discuss/Review - Review vocabulary terms, complete graphic organizers for the concepts and complete review exercises. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Practice Assessment - Study Guide

very small numbers. • Write a multiple of 10 as a power. • Compare very large or very small quantities. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	multiply and divide numbers in scientific notation. • Use operations in scientific notation to solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	

Differentiate Instruction, depending on individual student needs (students with an IEP, MLL Students; Students At Risk; Gifted Students) **by:**

Presentation Accommodations

- Present information via the visual modality(written material to supplement oral explanation, models, illustrations, assignments written on board)
- Directions repeated, clarified or reworded
- Use alternate texts at lower readability level
- Rephrase word problems
- Reduce readability level of materials
- Work with fewer items per page or line and/or materials in a larger print size
- Provide multi-sensory presentation of data
- Use magnification device, screen reader, or Braille / Nemeth Code
- Use audio amplification device (e.g., hearing aid(s), auditory trainer, sound-field system (which may require teacher use of microphone)
- Be given a written list of instructions
- Record a lesson, instead of taking notes
- Provide tutorial video(s)
- Have another student share class notes with him
- Be given an outline of a lesson
- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments
- Use manipulatives to teach or demonstrate concepts

Response Accommodations

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use of calculator
- Use of a math grid
- Use a word processor to type notes or give responses in class

Setting Accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where student learns best (for example, near the teacher & away from distractions)
- Take an assessment and/or assignment in small group setting
- Use noise buffers such as headphones, earphones, or earplugs

Timing Accommodations

- Take more time to complete a task or an assessment
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

Scheduling Accommodations

- Take more time to complete a project
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization Skills Accommodations

- Use an alarm to help with time management
- Mark texts with a highlighter
- Break down tasks into manageable units
- Use of checklists
- Provide organizers/study guides

Assignment Modifications

- Provide larger white work space
- Allow for oral rather than written responses
- Answer fewer or different questions
- Assign questions aligned to different levels such as emerging, proficient, and/or advanced.
- Create alternate projects or assignments

Curriculum Modifications

- Learn different material related to the same mathematical concept (such as continuing to work on one or two step equations while classmates move on to solving multi-step equations, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)
- Get assessed using a leveled standard/concept (emerging, proficient, and/or advanced) than the one for classmate

Differentiated Lesson(s)for this Exponents & Scientific Notation Unit

Bedminster Township School
Subject Area: Mathematics

Unit 7:

Real Numbers and the Pythagorean Theorem

Student Paced Time Frame: 18 days

Overview

In this unit, students will understand square roots.

Enduring Understandings

- Describe a square root.
- Find the square root(s) of a number.
- Approximate the value of the square root of a number.
- Explain the Pythagorean Theorem.

Skill and Knowledge Objectives

- Understand the concept of a square root of a number.
- Understand the Pythagorean Theorem.
- Understand the concept of a cube root of a number.
- Convert between different forms of rational numbers.
- Understand the concept of irrational numbers.
- Understand the converse of the Pythagorean Theorem.

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments, as needed.

Pre-Assessment:

- Preview Performance Task - Turtle Shells - Angle Measures
- Unit Exploration - Honey Combs - Volume

Formative Assessment:

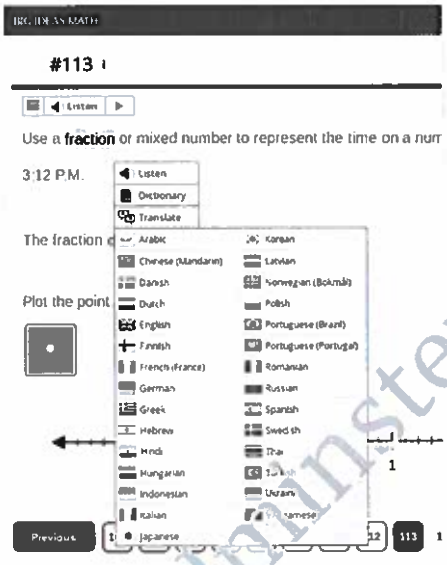
- Mid-Unit Assessment 9A, Mid-Unit Assessment 9B
- Chapter Tests A and B
- Alternative Assessment
- STEAM Performance Task
- Online Quiz (Big Ideas Website)- Teacher selected (based on students needs and abilities)
- Web based (Big Ideas) lesson presentation followed by web based Self Assessment Concepts and Skills and Self Assessment for Problems Solving
- Online (Big Ideas Website) - classwork and homework problems - providing automatic results on accuracy to students and teacher

Self-Reflection/Self-Assessment:

- Student Journal Responses
- Mini-Assessments
- Complete Performance Task after completing this unit of instruction.

Summative Assessment:

- Paper tests - Version A, Version B, or Alternative Assessment (based on students needs and abilities)
- MLL assessments in Spanish
- Online Test (Big Ideas Website)- Teacher selected problems (based on students needs and abilities)
    - Chapter test for Grade Level
    - Modified Test for IEP
    - Modified test for 504
    - MLL - Web based translator tool for assessments in other languages



Accommodations:

Paper based and pdf worksheets (Big Ideas)

- Vocabulary practice
- Prerequisite skills practice
- Extra practice
- Enrichment and Extension
- Puzzle time

Web based practice and assessments

- Practice problems
    - Adjustable time
    - Calculator - 4 function, scientific, or graphing
    - Stepped out video examples
    - Answer check - 0,1,2,3,4,5, or Unlimited
- Tests and quizzes
    - Adjustable time
    - Prevent or Allow late submission

- Release for review by teacher or upon submission
- Randomize - recalculates the values for each question so students are not given the same assessment
- Scramble- rearranges questions so students are not given the same assessment

Accommodations/Modifications for special populations including 504, MLL, At Risk, IEP, enrichment:

MLL: Student journal in Spanish

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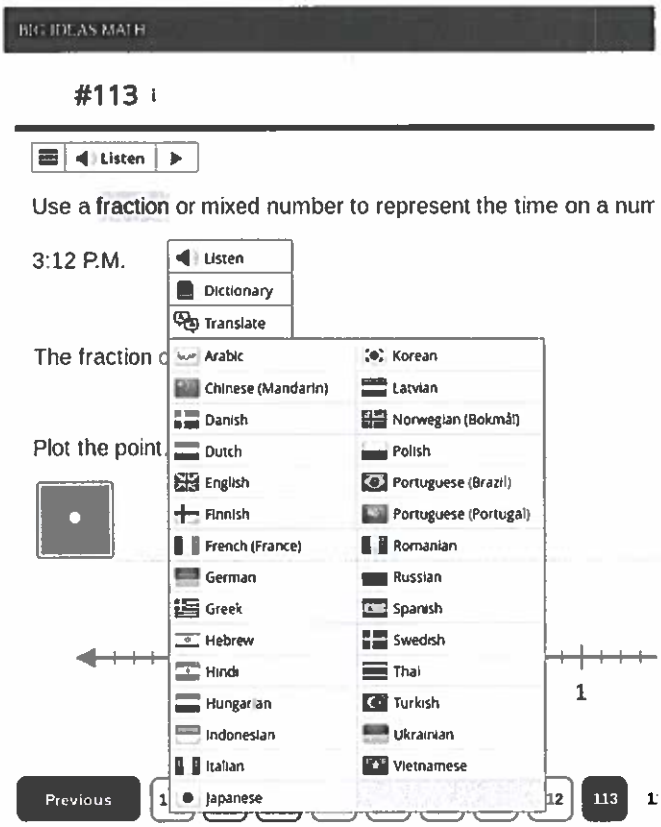
3. Let 0 represent noon.

- Example



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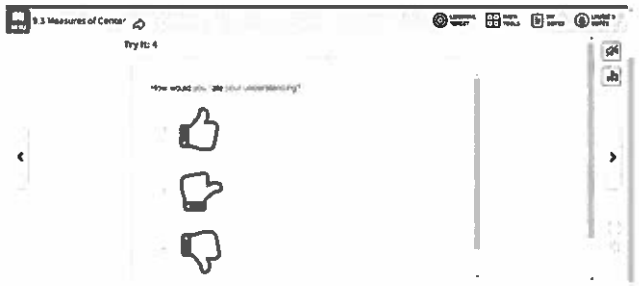

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ELL Support

Have students work in groups to complete the exercises. Remind them to use the process described in Example 1 as they collaborate.
Beginner: Write out the equation. For example, $2 \times 2 \times 2 = 2^3$.
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Advanced: Explain the functions of bases, exponents, and powers.

- Sample

- **Test Taking Strategies page T421 - Big Ideas -**
  Teacher led discussions prior to each chapter test.
  Designed to reduce student stress and improve test taking abilities.

Test-Taking Strategies

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- Sample

Social Emotional Well Being Activities - All Units

Resources

- *STEAM Video from BigIdeasMath.com*
- *Tutorial Videos*
- *Graphic Organizers*
- *Differentiation Lessons*

Standards

NJ Student Learning Standards for Mathematics: 8.NS.A1, 8NS.A2, 8.NS.A.3 , 8.EE.A2, 8.EE.A2a, 8.EE.A2b 8.G.B.6, 8.G.B.7, 8.G.B.8, N.RN.A.3

- The Number System:
  - Know that there are numbers that are not rational, and approximate them by rational numbers.
    - Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
    - Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).
    - Understand that the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational, and that the product of a nonzero rational number and an irrational number is irrational.
  - Work with radicals and integer exponents.
    - Know and apply the properties of integer exponents to generate equivalent numerical expressions.
    - Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number.
    - Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
    - Simplify numerical radicals, limiting to square roots (i.e. nonperfect squares). For example, $\sqrt{8}$ simplify to $2\sqrt{2}$.
    - Simplify radicals, including algebraic radicals (e.g. $\sqrt[3]{54} = 3\sqrt[3]{2}$, simplify $\sqrt{32x^2}$)
  - Understand and apply the Pythagorean Theorem.
  - Explain a proof of the Pythagorean Theorem and its converse.
  - Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and mathematical problems in two and three dimensions.
  - Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

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Lesson: Chapter Exploration/Finding Square Roots - 3 - 4 Days **Materials:** *STEAM video, grid paper, whiteboards* **Activities:** • Watch a video about metronome design and answer questions about the relationship between the period of a pendulum and its length. • Preview the Performance Task identifying and correcting errors in the calculations of periods of pendulums. • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Draw squares and find their areas and review other methods of finding the area of squares. • Explore/Discuss - Find the side lengths of squares given their areas. Solve equations involving exponents of 2 and reason about the number of solutions to each. • Find square roots of numbers. • Evaluate expressions involving square roots. • Use square roots to solve equations. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	**Lesson:** The Pythagorean Theorem - 2 - 3 Days **Materials:** *grid paper, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Discuss Pythagoras, the Father of Numbers. • Explore/Discuss - Model the relationship between the side lengths of a right triangle. Discuss the sides of a right triangle and the Pythagorean Theorem. • Explain the Pythagorean Theorem. • Use the Pythagorean Theorem to find unknown side lengths of triangles. • Use the Pythagorean Theorem to find distances between points in a coordinate plane. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	**Lesson:** Finding Cube Roots- 2 -3 Days **Materials:** *whiteboards, calculator, cubes* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Describe a cube, find its volume, and reason about how you can find the edge lengths of a cube given its volume. • Explore/Discuss - Use mental math and solve equations to find the edge length of each cube. • Find cube roots of numbers. • Evaluate expressions involving cube roots. • Use cube roots to solve equations. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	**Lesson:** Rational Numbers - 2 - 3 Days **Materials:** *whiteboards, calculators* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Use a calculator to write fractions as repeating decimals and describe the patterns in the digits. • Explore/Discuss - Use systems of equations to find a method of rewriting repeating decimals as a fraction. Discuss terminating versus repeating decimals. • Explain the meaning of rational numbers. • Write fractions and mixed numbers as decimals. • Write repeating decimals as fractions or mixed numbers. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment
Lesson: Irrational Numbers - 2 - 3 Days **Materials:** *whiteboards, calculators*	**Lesson:** The Converse of the Pythagorean Theorem - 2 - 3 Days **Materials:**	**Lesson:** Connecting Concepts/Unit Review - 2 - 3 Days **Materials:**	

Activities: • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Create a Venn Diagram based on student characteristics. Create a Venn Diagram of Rational and Irrational Numbers • Explore/Discuss - Find the exact length of a diagonal of a square, reason about if it's rational or irrational, and approximate the length of the diagonal. • Classify real numbers as rational or irrational. • Approximate irrational numbers. • Solve real-life problems involving irrational numbers. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	*whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Write true if then statements and determine if the converse of each is true. • Explore/Discuss - Determine if the converse of each statement is true or false and write statements with true and false converses. Write the converse of the Pythagorean Theorem and show that it is true. • Explain the converse of the Pythagorean Theorem. • Identify right triangles given three side lengths. • Identify right triangles in a coordinate plane. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	*graphic organizers* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Use problem solving to solve exercises that combine the concepts from the current unit and prior learning. • Explore/Discuss/Review - Review vocabulary terms, complete graphic organizers for the concepts and complete review exercises. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Practice Assessment - Study Guide	

Differentiate Instruction, depending on individual student needs (students with an IEP, MLL Students; Students At Risk; Gifted Students) **by:**

Presentation Accommodations

- Present information via the visual modality(written material to supplement oral explanation, models, illustrations, assignments written on board)
- Directions repeated, clarified or reworded
- Use alternate texts at lower readability level
- Rephrase word problems
- Reduce readability level of materials
- Work with fewer items per page or line and/or materials in a larger print size
- Provide multi-sensory presentation of data
- Use magnification device, screen reader, or Braille / Nemeth Code
- Use audio amplification device (e.g., hearing aid(s), auditory trainer, sound-field system (which may require teacher use of microphone)
- Be given a written list of instructions
- Record a lesson, instead of taking notes
- Provide tutorial video(s)
- Have another student share class notes with him
- Be given an outline of a lesson
- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments

- Use manipulatives to teach or demonstrate concepts

Response Accommodations

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use of calculator
- Use of a math grid
- Use a word processor to type notes or give responses in class

Setting Accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where student learns best (for example, near the teacher & away from distractions)
- Take an assessment and/or assignment in small group setting
- Use noise buffers such as headphones, earphones, or earplugs

Timing Accommodations

- Take more time to complete a task or an assessment
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

Scheduling Accommodations

- Take more time to complete a project
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization Skills Accommodations

- Use an alarm to help with time management
- Mark texts with a highlighter
- Break down tasks into manageable units
- Use of checklists
- Provide organizers/study guides

Assignment Modifications

- Provide larger white work space
- Allow for oral rather than written responses
- Answer fewer or different questions
- Assign questions aligned to different levels such as emerging, proficient, and/or advanced.
- Create alternate projects or assignments

Curriculum Modifications

- Learn different material related to the same mathematical concept (such as continuing to work on one or two step equations while classmates move on to solving multi-step equations, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)
- Get assessed using a leveled standard/concept (emerging, proficient, and/or advanced) than the one for classmate

Differentiated Lesson(s)for this Real Numbers & the Pythagorean Theorem Unit

Bedminster Township School
Subject Area: Mathematics

Unit 8:

Transformations

Student Paced Time Frame: 22 days

Overview

In this unit, students will understand transformations.

Enduring Understandings

- Identify a translation.
- Describe a transformation.
- Describe a sequence of rigid motions between two congruent figures.
- Solve real-life problems involving transformations.

Skill and Knowledge Objectives

- Translate figures in the coordinate plane.
- Reflect figures in the coordinate plane.
- Rotate figures in the coordinate plane.
- Dilate figures in the coordinate plane.
- Understand the concept of similar figures.
- Find perimeters and areas of similar figures.

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments, as needed.

Pre-Assessment:

- Preview Performance Task - Anatomy of a Hurricane
- Unit Exploration - Finding Solutions of Linear Equations and Graphing Linear Equations

Formative Assessment:

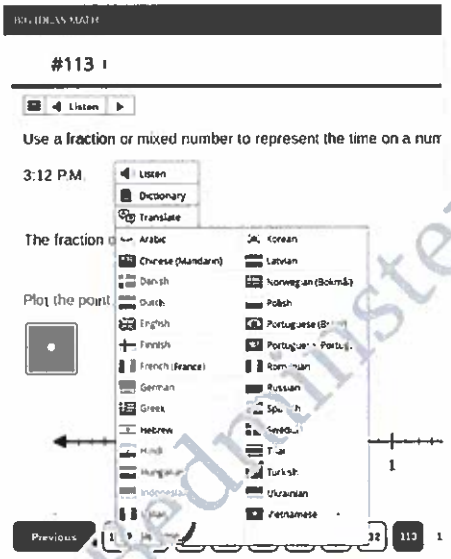
- Mid-Unit Assessment 2A, Mid-Unit Assessment 2B
- Chapter Tests A and B
- Alternative Assessment
- STEAM Performance Task
- Online Quiz (Big Ideas)- Teacher selected (based on students needs and abilities)
- Web based (Big Ideas) lesson presentation followed by web based Self Assessment Concepts and Skills and Self Assessment for Problems Solving
- Online (Big Ideas) - classwork and homework problems - providing automatic results on accuracy to students and teacher

Self-Reflection/Self-Assessment:

- Student Journal Responses
- Mini-Assessments
- Complete Performance Task after completing this unit of instruction.

Summative Assessment:

- Paper tests - Version A, Version B, or Alternative Assessment (based on students needs and abilities)
- MLL assessments in Spanish
- Online Test (Big Ideas Website)- Teacher selected problems (based on students needs and abilities)
    - Chapter test for Grade Level
    - Modified Test for IEP
    - Modified test for 504
    - MLL - Web based translator tool for assessments in other languages



Accommodations:

Paper based and pdf worksheets (Big Ideas)

- Cumulative practice
- Extra practice
- Reteach
- Enrichment and Extension
- Puzzle time

Web based practice and assessments

- Practice problems
    - Adjustable time
    - Calculator - 4 function, scientific, or graphing
    - Stepped out video examples
    - Answer check - 0,1,2,3,4,5, or Unlimited
- Tests and quizzes

- Adjustable time
- Prevent or Allow late submission
- Release for review by teacher or upon submission
- Randomize - recalculates the values for each question so students are not given the same assessment
- Scramble- rearranges questions so students are not given the same assessment

Accommodations/Modifications for special populations including 504, MLL, At Risk, IEP, enrichment:

MLL: Student journal in Spanish

Student Edition in Spanish

English language learners strategies infused in Big Ideas Teacher Edition

Dynamic Student eBook and Dynamic Student Edition includes English and Spanish audio

English version: Puzzle time, Reteach, Extra Practice

At Risk: Reteach

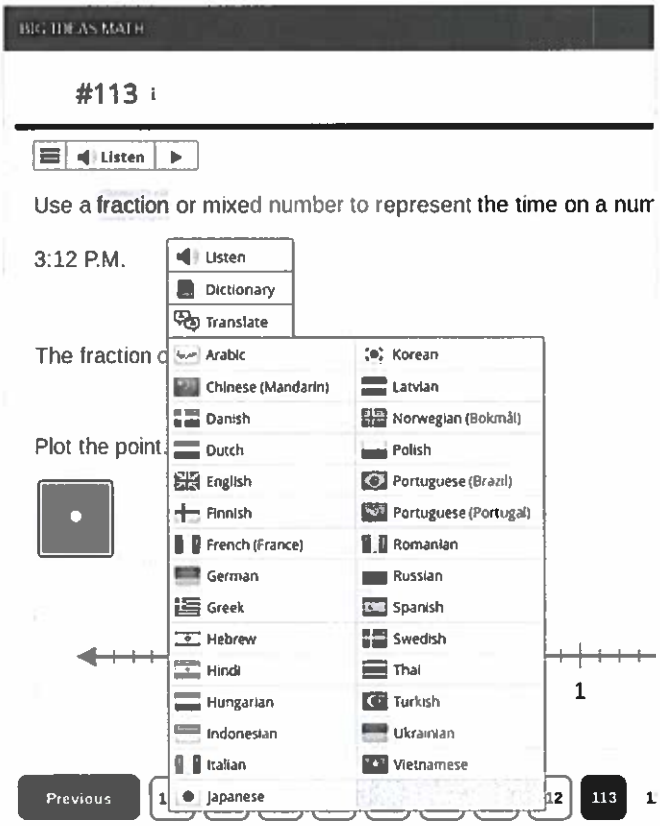
504: Reteach and Extra Practice

Enrichment: Enrichment and Extension Alternative Assessment

Dictionary and Translation tool for all learners:

In Big Ideas assignments students may highlight words - then select a **dictionary** or **translate** to multiple languages using Big Ideas Translator.

- Example



- Example

Big Ideas Video Tutorials in English and Spanish

Big Ideas Tutor - live audio support with Big Ideas tutor during select practice problems

Virtual Manipulatives

Digital Examples (Resources)

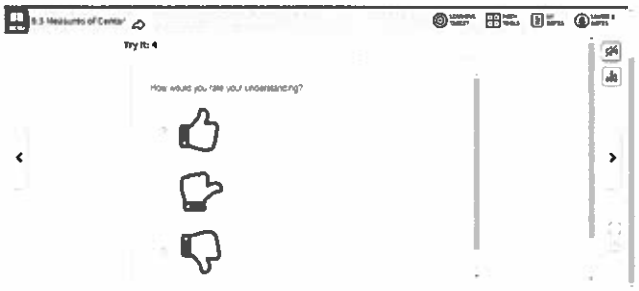
Skills Trainer - online (Big Ideas) interactive tool for skills practice - used for remediation or enrichment

New Jersey Social and Emotional Learning Competencies:

Self-Awareness, Self-Management, Social Awareness, Responsible Decision-Making, Relationship Skills

Activities:

- SEL Resources **in Big Ideas**
- **Thumbs Up:** Infused in every online lesson presentation tool through Big Ideas website Dynamic Classroom. This technique asks students to indicate the extent to which they understand a concept, procedure, or even the direction of activity. This allows students to communicate their feelings with respect to a specific success criterion.



- **MLL Support:** Multi language learners strategies infused in every lesson of Big Ideas Teaching Edition

ELL Support

Have students work in groups to complete the exercises. Remind them to use the process described in Example 1 as they collaborate.
Beginner: Write out the equation. For example, $2 \times 2 \times 2 = 2^3$.
Intermediate: Describe the equation. For example, "Two times two times two equals two to the third power."
Advanced: Explain the functions of bases, exponents, and powers.

- Sample

- **Test Taking Strategies page T97 - Big Ideas -**
  Teacher led discussions prior to each chapter test.
  Designed to reduce student stress and improve test taking abilities.

Test-Taking Strategies

Remind students to quickly look over the entire test before they start so that they can budget their time. They should not spend too much time on any single problem. Urge students to try to work on a part of each problem, because partial credit is better than no credit. When they receive their tests, students should jot down simple examples of finding the greatest common factor and least common multiple on the back of the test. By doing this, they will not become confused when they are under pressure. Teach students to use the **Stop** and **Think** strategy before answering. **Stop** and carefully read the problem, and **Think** about what the answer should look like.

- Sample

Social Emotional Well Being Activities - All Units

Resources

- *STEAM Video from BigIdeasMath.com*
- *Tutorial Videos*
- *Graphic Organizers*
- *Differentiation Lessons*

Standards

NJ Student Learning Standards for Mathematics: 8.G.A.1, 8.G.A.2, 8.G.A.3, 8.G.A.4

- Geometry:
  - Understand congruence and similarity using physical models, transparencies, or geometry

software.

- Verify experimentally the properties of rotations, reflections, and translations:
  - Lines are transformed to lines, and line segments to line segments of the same length.
  - Angles are transformed to angles of the same measure.
  - Parallel lines are transformed to parallel lines.
- Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
- Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
- Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

- **8.1, 9.1 21st-Century Life & Career Skills and/or Financial Literacy; AND Activities/Lesson(s):**
-
- 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
- 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.
- 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices
- and
- 8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
- 8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
-
- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
- https://www.state.nj.us/education/aps/cccs/career/
-

  9.1 21st-Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- A. Critical Thinking and Problem Solving

- 9.1.8.A.1 Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
  9.1.8.A.2 Implement problem-solving strategies to solve a problem in school or the community.
  9.1.8.A.3 Summarize strategies used by various organizations and agencies to solve problems that impact communities, and compare them with strategies used by similar organizations in another state or country.
  9.1.8.A.4 Design and implement a project management plan using one or more problem-solving strategies.

- B. Creativity and Innovation

- 9.1.8.B.1 Use multiple points of view to create alternative solutions.
  9.1.8.B.2 Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple

solutions.

- C. Collaboration, Teamwork, and Leadership

- 9.1.8.C.1 Determine an individual's responsibility for personal actions and contributions to group activities.
  9.1.8.C.2 Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
  9.1.8.C.3 Model leadership skills during classroom and extra-curricular activities.

Additional Social and Emotional Competencies - Embed within Classroom Instruction

- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals
- Develop, implement, and model effective problem-solving and critical thinking skills
- Connect mathematical problems to student experiences
- Students explain their answers to each other
- Students self assess and/or self reflect on their understanding and level of engagement within the classroom setting and the instruction being provided.

Lesson: Chapter Exploration/Translations - 3 - 4 Days **Materials:** *STEAM video, coordinate planes, transparencies, tracing paper, whiteboards* **Activities:** • Watch a video about shadow puppets and answer questions about transformations. • Preview the Performance Task on shadow puppets and transformations. • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Model translations by moving around the room or using transparencies or tracing paper. • Explore/Discuss -	**Lesson:** Reflections - 2 - 3 Days **Materials:** *transparent paper, transparencies, hand mirrors, rulers, protractors, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Use simple words with lines of symmetry to model reflections in the coordinate plane. Use transparent paper to model reflections and observe their properties. • Explore/Discuss - Use transparent paper to model reflections and observe/discuss their properties.	**Lesson:** Rotations - 2 - 3 Days **Materials:** *toy car, transparent paper, patty paper, paper clips, marker, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Identify objects that rotate in different ways. • Explore/Discuss - Model rotations and observe their properties. Discuss rotations, centers of rotation, and angles of rotation. • Identify a rotation. • Find the coordinates of a figure rotated about the origin. • Use coordinates to rotate a figure about the origin.	**Lesson:** Congruent Figures - 2 - 3 Days **Materials:** *templates, stencils, rubber stamps, cookie cutters, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Answer questions about congruent figures and objects. • Explore/Discuss - Use transformation to reason about whether two figures are identical. Discuss rigid motions, congruent figures, congruent angles, and congruent sides. • Identify congruent figures. • Describe a sequence of rigid motions

transformations, images, translations, and properties of translations. • Identify a translation. • Find the coordinates of a translated figure. • Use coordinates to translate a figure. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	• Identify a reflection. • Find the coordinates of a figure reflected in an axis. • Use coordinates to reflect a figure in the *x*- or *y*-axis • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	• Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	between two congruent figures. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment
Lesson: Dilations - 2 - 3 Days **Materials:** *flashlight, card stock, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Model dilations using shadows of figures. • Explore/Discuss - What does it mean for something to be dilated? • Identify a dilation. • Find the coordinates of a figure dilated with respect to the origin. • Use coordinates to dilate a figure with respect to the origin. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	**Lesson:** Similar Figures - 2 - 3 Days **Materials:** *rectangular item (e.g. index card, school ID), non-rectangular item, transparent paper* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate -Use projections to model similarity. • Explore/Discuss - Transform figures and observe the features of figures obtained by a combination of dilations and rigid motions. • Identify similar figures. • Describe a similarity transformation between two similar figures. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	**Lesson:** Perimeters and Areas of Similar Figures - 2 - 3 Days **Materials:** *pattern blocks, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Determine how long it takes to mow a lawn when they can mow a similar lawn in one-half hour. • Explore/Discuss - Compare the perimeters and areas of rectangles dilated with different scales. • Use corresponding side lengths to compare perimeters of similar figures. • Use corresponding side lengths to compare areas of similar figures. • Use similar figures to solve real-life problems involving perimeter and area. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	**Lesson:** Connecting Concepts/Unit Review - 2 - 3 Days **Materials:** *graphic organizers* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Use problem solving to solve exercises that combine the concepts from the current unit and prior learning. • Explore/Discuss/Review - Review vocabulary terms, complete graphic organizers for the concepts and complete review exercises. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Practice Assessment - Study Guide
Differentiate Instruction, depending on individual student needs (students with an IEP, MLL Students; Students At Risk; Gifted Students) **by:** **Presentation Accommodations**			

- Present information via the visual modality(written material to supplement oral explanation, models, illustrations, assignments written on board)
- Directions repeated, clarified or reworded
- Use alternate texts at lower readability level
- Rephrase word problems
- Reduce readability level of materials
- Work with fewer items per page or line and/or materials in a larger print size
- Provide multi-sensory presentation of data
- Use magnification device, screen reader, or Braille / Nemeth Code
- Use audio amplification device (e.g., hearing aid(s), auditory trainer, sound-field system (which may require teacher use of microphone)
- Be given a written list of instructions
- Record a lesson, instead of taking notes
- Provide tutorial video(s)
- Have another student share class notes with him
- Be given an outline of a lesson
- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments
- Use manipulatives to teach or demonstrate concepts

Response Accommodations

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use of calculator
- Use of a math grid
- Use a word processor to type notes or give responses in class

Setting Accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where student learns best (for example, near the teacher & away from distractions)
- Take an assessment and/or assignment in small group setting
- Use noise buffers such as headphones, earphones, or earplugs

Timing Accommodations

- Take more time to complete a task or an assessment
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

Scheduling Accommodations

- Take more time to complete a project
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization Skills Accommodations

- Use an alarm to help with time management
- Mark texts with a highlighter
- Break down tasks into manageable units
- Use of checklists
- Provide organizers/study guides

Assignment Modifications

- Provide larger white work space
- Allow for oral rather than written responses
- Answer fewer or different questions
- Assign questions aligned to different levels such as emerging, proficient, and/or advanced.
- Create alternate projects or assignments

Curriculum Modifications

- Learn different material related to the same mathematical concept (such as continuing to work on one or two step equations while classmates move on to solving multi-step equations, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)

- Get assessed using a leveled standard/concept (emerging, proficient, and/or advanced) than the one for classmate

Differentiated Lesson(s)for this Transformation Unit

Bedminster Township School
Subject Area: Mathematics

Unit 9:

Angles & Triangles

Student Paced Time Frame: 16 days

Overview

In this unit, students will understand angles.

Enduring Understandings

- Identify angle relationships.
- Find angle measurements.
- Compare angles.
- Apply angle relationships to solve real-life problems

Skill and Knowledge Objectives

- Find missing angle measures created by the intersections of lines.
- Understand properties of interior and exterior angles of triangles.
- Find interior angle measures of polygons.
- Use similar triangles to find missing measures.

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments, as needed.

Pre-Assessment:

- Preview Performance Task - Mixing Alloys
- Unit Exploration - Finding Solutions of a System of Linear Equations.

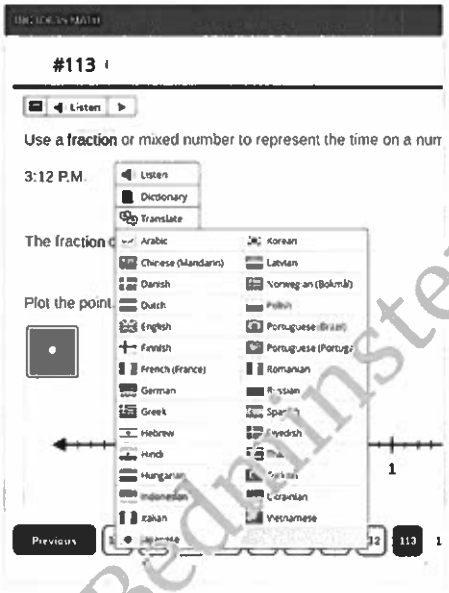
Formative Assessment:

- Mid-Unit Assessment 3A, Mid-Unit Assessment 3B
- Chapter Tests A and B
- Alternative Assessment
- STEAM Performance Task
- Online Quiz (Big Ideas)- Teacher selected (based on students needs and abilities)
- Web based (Big Ideas) lesson presentation followed by web based Self Assessment Concepts and Skills and Self Assessment for Problems Solving
- Online (Big Ideas) - classwork and homework problems - providing automatic results on accuracy to students and teacher

Self-Reflection/Self-Assessment:

- Student Journal Responses
- Mini-Assessments
- Complete Performance Task after completing this unit of instruction.

Summative Assessment:

- Paper tests - Version A, Version B, or Alternative Assessment (based on students needs and abilities)
- MLL assessments in Spanish
- Online Test (Big Ideas Website)- Teacher selected problems (based on students needs and abilities)
    - Chapter test for Grade Level
    - Modified Test for IEP
    - Modified test for 504
    - MLL - Web based translator tool for assessments in other languages
    - 

Accommodations:

Paper based and digital worksheets (Big Ideas)

- Vocabulary practice
- Prerequisite skills practice
- Extra practice
- Enrichment and Extension
- Puzzle time

Web based practice and assessments

- Practice problems
    - Adjustable time
    - Calculator - 4 function, scientific, or graphing
    - Stepped out video examples
    - Answer check - 0,1,2,3,4,5, or Unlimited
- Tests and quizzes

- Adjustable time
- Prevent or Allow late submission
- Release for review by teacher or upon submission
- Randomize - recalculates the values for each question so students are not given the same assessment
- Scramble- rearranges questions so students are not given the same assessment

Accommodations/Modifications for special populations including 504, MLL, At Risk, IEP, enrichment:

MLL: Student journal in Spanish

Student Edition in Spanish

English language learners strategies infused in Big Ideas Teacher Edition

Dynamic Student eBook and Dynamic Student Edition includes English and Spanish audio

English version: Puzzle time, Reteach, Extra Practice

At Risk: Reteach

504: Reteach and Extra Practice

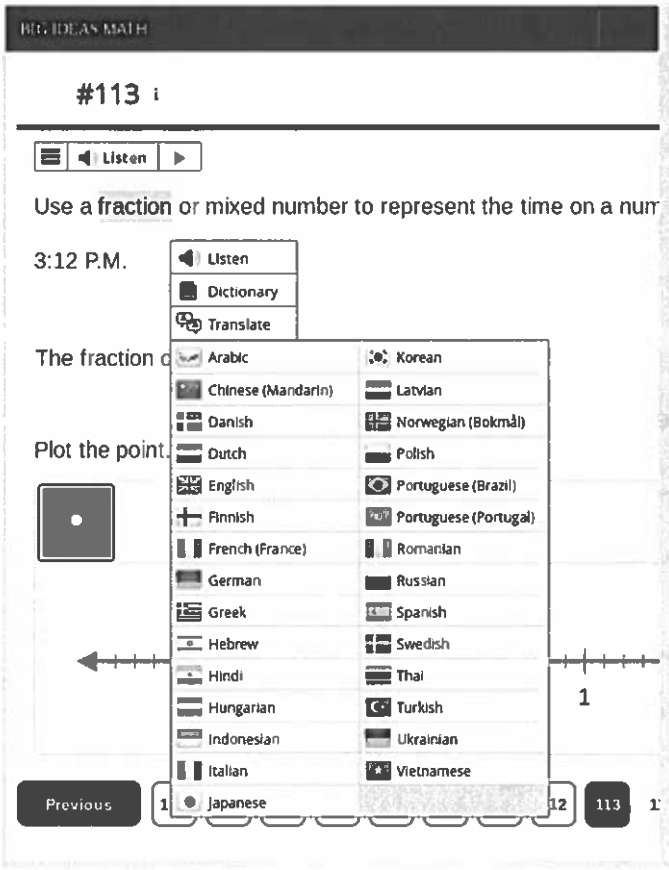
Enrichment: Enrichment and Extension, Alternative Assessment

Dictionary and Translation tool for all learners:

In Big Ideas assignments students may highlight words - then select a **dictionary** or **translate** to multiple languages using Big Ideas translator.

3. Let 0 represent noon

- Example



- Example

Big Ideas Video Tutorials in English and Spanish

Big Ideas Tutor - live audio support with Big Ideas tutor during select practice problems

Virtual Manipulatives

Digital Examples (Resources)

Skills Trainer - online (Big Ideas) interactive tool for skills practice - used for remediation or enrichment

New Jersey Social and Emotional Learning Competencies:

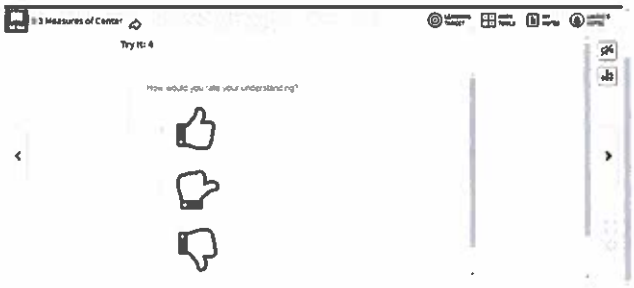
Self-Awareness, Self-Management, Social Awareness, Responsible Decision-Making, Relationship Skills

Activities:

- **SEL Resources in Big Ideas**

- **Thumbs Up:** Infused in every online lesson presentation tool through Big Ideas website Dynamic Classroom. This technique asks students to indicate the extent to which they understand a concept, procedure, or even the direction of activity. This allows students to communicate their feelings with respect to

a specific success criterion.



- **MLL Support:** Multi language learners strategies infused in every lesson of Big Ideas Teaching Edition

ELL Support

Have students work in groups to complete the exercises. Remind them to use the process described in Example 1 as they collaborate.
Beginner: Write out the equation. For example, $2 \times 2 \times 2 = 2^3$.
Intermediate: Describe the equation. For example, "Two times two times two equals two to the third power."
Advanced: Explain the functions of bases, exponents, and powers.

- **Sample**

- **Test Taking Strategies page T135 - Big Ideas -**
  Teacher led discussions prior to each chapter test.
  Designed to reduce student stress and improve test taking abilities.

Test-Taking Strategies

Remind students to quickly look over the entire test before they start so that they can budget their time. They should not spend too much time on any single problem. Urge students to try to work on a part of each problem, because partial credit is better than no credit. When they receive their tests, students should jot down simple examples of finding the greatest common factor and least common multiple on the back of the test. By doing this, they will not become confused when they are under pressure. Teach students to use the **Stop** and **Think** strategy before answering. **Stop** and carefully read the problem, and **Think** about what the answer should look like.

- Sample

Social Emotional Well Being Activities - All Units

Resources

- *STEAM Video from BigIdeasMath.com*
- *Tutorial Videos*
- *Graphic Organizers*
- *Differentiation Lessons*

Standards

NJ Student Learning Standards for Mathematics: 8.G.A.5

- Geometry:
  - Understand congruence and similarity using physical models, transparencies, or geometry

software.

- Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.

- **8.1 Computer Science & Design Thinking, 9.1 21st-Century Life & Career Skills and/or Financial Literacy; AND Activities/Lesson(s):**

- 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
- 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.
- 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices
- and
- 8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
- 8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
-
- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
- https://www.state.nj.us/education/aps/cccs/career/
-

9.1 21st-Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- A. Critical Thinking and Problem Solving

- 9.1.8.A.1 Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
  9.1.8.A.2 Implement problem-solving strategies to solve a problem in school or the community.
  9.1.8.A.3 Summarize strategies used by various organizations and agencies to solve problems that impact communities, and compare them with strategies used by similar organizations in another state or country.
  9.1.8.A.4 Design and implement a project management plan using one or more problem-solving strategies.

- B. Creativity and Innovation

- 9.1.8.B.1 Use multiple points of view to create alternative solutions.
  9.1.8.B.2 Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.

- C. Collaboration, Teamwork, and Leadership

- 9.1.8.C.1 Determine an individual's responsibility for personal actions and contributions to group activities.
  9.1.8.C.2 Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
  9.1.8.C.3 Model leadership skills during classroom and extra-curricular activities.

Additional Social and Emotional Competencies - Embed within Classroom Instruction

- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals
- Develop, implement, and model effective problem-solving and critical thinking skills
- Connect mathematical problems to student experiences
- Students explain their answers to each other
- Students self assess and/or self reflect on their understanding and level of engagement within the classroom setting and the instruction being provided.

Lesson: Chapter Exploration/Parallel Lines & Transversals - 3 - 4 Days **Materials:** *STEAM video, card stock, whiteboards* **Activities:** • Watch a video about honey comb and answer questions about the shape and volume of a tiling. • Preview the Performance Task on angles on turtle shells. • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Use a model transversal to observe when angles are congruent.. • Explore/Discuss - Reason about when angles formed by a transversal are congruent. • Identify congruent angles when a transversal intersects	**Lesson:** Angles of Triangles - 2 - 3 Days **Materials:** *paper triangles, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - List words that begin with the prefix tri-. • Explore/Discuss - Explore the properties of a triangle's interior and exterior angles. Justify their conclusions about interior and exterior angles using parallel lines and transversals. Discuss interior angles, exterior angles, and the sum of the interior angle measures of a triangle • Use equations to find missing angle measures of triangles. • Use interior and exterior	**Lesson:** Angles of Polygons - 2 - 3 Days **Materials:** *whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Identify highway signs from their shapes. • Explore/Discuss - Find the sum of the interior angle measure of figures and develop a formula relating the number of sides in a figure to the sum of the measures of its interior angles. Discuss how to calculate the interior angle measures of a polygon. • Explain how to find the sum of the interior angle measures of a polygon. • Use an equation to find an interior	**Lesson:** Using Similar Triangles - 2 - 3 Days **Materials:** *rulers, protractors measuring tapes, scrap paper* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Construct a triangle with sides of 4, 5, and 6 inches, measure the angles created, and compare their triangle with those made by other students. • Explore/Discuss - Draw pairs of triangles that share two angles measures and reason about their properties. find the height of a flagpole based on the length of its shadow. Discuss that triangles which share two angle measures also share their	**Lesson:** Connecting Concepts/Unit Review - 3 - 4 Days **Materials:** *graphic organizers* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Use problem solving to solve exercises that combine the concepts from the current unit and prior learning. • Explore/Discuss/Review - Review vocabulary terms, complete graphic organizers for the concepts and complete review exercises. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Practice Assessment

parallel lines. • Find angle measures when a transversal intersects parallel lines. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	angles of a triangle to solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	angle measure of a polygon. • Find the interior angle measures of a regular polygon. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	third angle measures and are similar. • Use angle measures to determine whether triangles are similar. • Use similar triangles to solve real-life problems. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	- Study Guide

Differentiate Instruction, depending on individual student needs (students with an IEP, MLL Students; Students At Risk; Gifted Students) **by:**

Presentation Accommodations

- Present information via the visual modality(written material to supplement oral explanation, models, illustrations, assignments written on board)
- Directions repeated, clarified or reworded
- Use alternate texts at lower readability level
- Rephrase word problems
- Reduce readability level of materials
- Work with fewer items per page or line and/or materials in a larger print size
- Provide multi-sensory presentation of data
- Use magnification device, screen reader, or Braille / Nemeth Code
- Use audio amplification device (e.g., hearing aid(s), auditory trainer, sound-field system (which may require teacher use of microphone)
- Be given a written list of instructions
- Record a lesson, instead of taking notes
- Provide tutorial video(s)
- Have another student share class notes with him
- Be given an outline of a lesson
- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments
- Use manipulatives to teach or demonstrate concepts

Response Accommodations

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use of calculator
- Use of a math grid
- Use a word processor to type notes or give responses in class

Setting Accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where student learns best (for example, near the teacher & away from distractions)
- Take an assessment and/or assignment in small group setting

- Use noise buffers such as headphones, earphones, or earplugs

Timing Accommodations

- Take more time to complete a task or an assessment
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

Scheduling Accommodations

- Take more time to complete a project
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization Skills Accommodations

- Use an alarm to help with time management
- Mark texts with a highlighter
- Break down tasks into manageable units
- Use of checklists
- Provide organizers/study guides

Assignment Modifications

- Provide larger white work space
- Allow for oral rather than written responses
- Answer fewer or different questions
- Assign questions aligned to different levels such as emerging, proficient, and/or advanced.
- Create alternate projects or assignments

Curriculum Modifications

- Learn different material related to the same mathematical concept (such as continuing to work on one or two step equations while classmates move on to solving multi-step equations, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)
- Get assessed using a leveled standard/concept (emerging, proficient, and/or advanced) than the one for classmate

Differentiated Lesson(s)for this Angles & Triangles Unit

Bedminster Township School
Subject Area: Mathematics

Unit 10:

Volume & Similar Solids

Student Paced Time Frame: 14 days

Overview

In this unit, students will understand volume.

Enduring Understandings

- Explain how to find the volumes of cylinders, cones, and spheres.
- Use formulas to find volumes of solids.
- Find missing dimensions of solids.
- Find surface areas and volumes of similar solids.

Skill and Knowledge Objectives

- Find the volume of a cylinder.
- Find the volume of a cone.
- Find the volume of a sphere.
- Find the surface areas and volumes of similar solids.

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments, as needed.

Pre-Assessment:

- Preview Performance Task - Packaging Salsa - Volume
- Unit Exploration - Volume & Proportional Relationships

Formative Assessment:

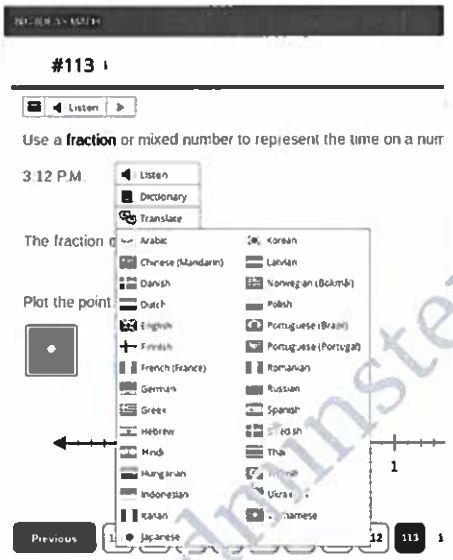
- Mid-Unit Assessment 10A, Mid-Unit Assessment 10B
- Chapter Tests A and B
- Alternative Assessment
- STEAM Performance Task
- Online Quiz (Big Ideas Website)- Teacher selected (based on students needs and abilities)
- Web based (Big Ideas) lesson presentation followed by web based Self Assessment Concepts and Skills and Self Assessment for Problems Solving
- Online (Big Ideas Website) - classwork and homework problems - providing automatic results on accuracy to students and teacher

Self-Reflection/Self-Assessment:

- Student Journal Responses
- Mini-Assessments
- Complete Performance Task after completing this unit of instruction.

Summative Assessment:

- Paper tests - Version A, Version B, or Alternative Assessment (based on students needs and abilities)
- MLL assessments in Spanish
- Online Test (Big Ideas Website)- Teacher selected problems (based on students needs and abilities)
    - Chapter test for Grade Level
    - Modified Test for IEP
    - Modified test for 504
    - MLL - Web based translator tool for assessments in other languages



Accommodations:

Paper based and pdf worksheets (Big Ideas)

- Cumulative practice
- Vocabulary practice
- Prerequisite skills practice
- Extra practice
- Enrichment and Extension
- Puzzle time

Web based practice and assessments

- Practice problems
    - Adjustable time
    - Calculator - 4 function, scientific, or graphing
    - Stepped out video examples
    - Answer check - 0,1,2,3,4,5, or Unlimited
- Tests and quizzes
    - Adjustable time

- Prevent or Allow late submission
- Release for review by teacher or upon submission
- Randomize - recalculates the values for each question so students are not given the same assessment
- Scramble- rearranges questions so students are not given the same assessment

Accommodations/Modifications for special populations including 504, MLL, At Risk, IEP, enrichment:

- **MLL:** Student journal in Spanish

  Student Edition in Spanish

  English language learners strategies infused in Big Ideas Teacher Edition

  Dynamic Student eBook and Dynamic Student Edition includes English and Spanish audio

English version: Puzzle time, Reteach, Extra Practice

At Risk: Reteach

504: Reteach and Extra Practice

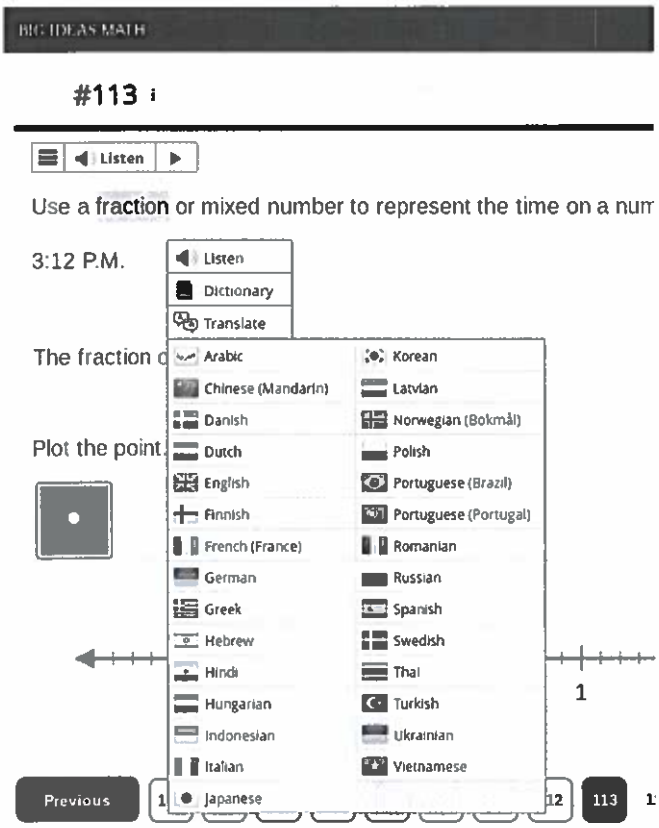
Enrichment: Enrichment and Extension Alternative Assessment

Dictionary and Translation tool for all learners:

In Big Ideas assignments students may highlight words - then select a **dictionary** or **translate** to multiple languages using Big Ideas translator.

e. Let 0 represent noon

- Example



- examp.e

Big Ideas Video Tutorials **in English and Spanish**

Big Ideas Tutor - live audio support with Big Ideas tutor during select practice problems

Virtual Manipulatives

Digital Examples (Resources)

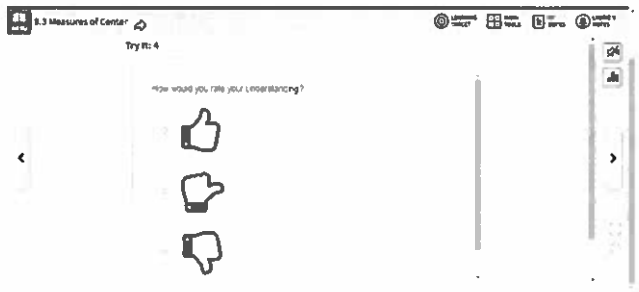
Skills Trainer **- online (Big Ideas) interactive tool for skills practice - used for remediation or enrichment**

New Jersey Social and Emotional Learning Competencies:

Self-Awareness, Self-Management, Social Awareness, Responsible Decision-Making, Relationship Skills

Activities:

- **SEL Resources in Big Ideas**
- **Thumbs Up:** Infused in every online lesson presentation tool through Big Ideas website Dynamic Classroom. This technique asks students to indicate the extent to which they understand a concept, procedure, or even the direction of activity. This allows students to communicate their feelings with respect to a specific success criterion.



- **MLL Support:** Multi language learners strategies infused in every lesson of Big Ideas Teaching Edition

ELL Support

Have students work in groups to complete the exercises. Remind them to use the process described in Example 1 as they collaborate.
Beginner: Write out the equation. For example, $2 \times 2 \times 2 = 2^3$.
Intermediate: Describe the equation. For example, "Two times two times two equals two to the third power."
Advanced: Explain the functions of bases, exponents, and powers.

- Sample

- **Test Taking Strategies page T459 - Big Ideas -**
  Teacher led discussions prior to each chapter test.
  Designed to reduce student stress and improve test taking abilities.

Test-Taking Strategies

Remind students to quickly look over the entire test before they start so that they can budget their time. They should not spend too much time on any single problem. Urge students to try to work on a part of each problem, because partial credit is better than no credit. When they receive their tests, students should jot down simple examples of finding the greatest common factor and least common multiple on the back of the test. By doing this, they will not become confused when they are under pressure. Teach students to use the **Stop** and **Think** strategy before answering. **Stop** and carefully read the problem, and **Think** about what the answer should look like.

- Sample

Social Emotional Well Being Activities - All Units

Resources

- *STEAM Video from BigIdeasMath.com*
- *Tutorial Videos*
- *Graphic Organizers*
- *Differentiation Lessons*

Standards

NJ Student Learning Standards for Mathematics: 8.G.C.9

- Geometry:
  - Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.
    - Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.Analyze and solve linear equations and pairs of simultaneous linear equations.

- **8.1, 9.1 21st-Century Life & Career Skills and/or Financial Literacy; AND Activities/Lesson(s):**
-
- 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
- 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.
- 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices
- and
- 8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
- 8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
-
- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
- https://www.state.nj.us/education/aps/cccs/career/
-

  9.1 21st-Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- A. Critical Thinking and Problem Solving

- 9.1.8.A.1 Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
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  9.1.8.A.3 Summarize strategies used by various organizations and agencies to solve problems that impact communities, and compare them with strategies used by similar organizations in another state or country.
  9.1.8.A.4 Design and implement a project management plan using one or more problem-solving strategies.

- B. Creativity and Innovation

- 9.1.8.B.1 Use multiple points of view to create alternative solutions.
  9.1.8.B.2 Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.

- C. Collaboration, Teamwork, and Leadership

- 9.1.8.C.1 Determine an individual's responsibility for personal actions and contributions to group activities.
  9.1.8.C.2 Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
  9.1.8.C.3 Model leadership skills during classroom and extra-curricular activities.

Additional Social and Emotional Competencies - Embed within Classroom Instruction

- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve one's goals
- Develop, implement, and model effective problem-solving and critical thinking skills
- Connect mathematical problems to student experiences
- Students explain their answers to each other
- Students self assess and/or self reflect on their understanding and level of engagement within the classroom setting and the instruction being provided.

Lesson: Chapter Exploration/Volumes of Cylinders- 3 - 4 Days **Materials:** *STEAM video, whiteboards* **Activities:** • Watch a video about canning salsa and answer questions about approximating volumes of foods and identify if there is a proportional relationship between quantities in a relationship. • Preview the Performance Task on packaging jars of salsa. • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Compare the volumes of two cans with	**Lesson:** Volumes of Cones - 2 - 3 Days **Materials:** *ice cream cone, ice cream scoop, paper cup, rice, scissors, tape, whiteboards, sand timer, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Consider the volume of a cone relative to its radius. • Explore/Discuss - Find the volume of a cone by using a model to compare its volume to the volume of a cylinder. Discuss the formula for a cone in comparison to a cylinder. • Use a formula to find the volume of a cone.	**Lesson:** Volume of Spheres - 2 - 3 Days **Materials:** *different sized spherical objects, plastic ball, rice, scissors, tape, index cards, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Discuss spheres and how they can be described. • Explore/Discuss - Find the volume of a sphere by using a model to compare its volume to the volume of a cylinder. Introduce and discuss the formula to find the volume of a sphere. • Use a formula to find the volume of a sphere.	**Lesson:** Surface Areas and Volumes of Similar Solids - 2 - 3 Days **Materials:** *Index cards, whiteboards* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Use *Goldilocks and the Three Bears* to discuss similar solids. • Explore/Discuss - Compare the surface areas and volumes of cylinders and square pyramids with different dimensions. • Use corresponding dimensions to determine whether solids are similar. • Use corresponding dimensions to	**Lesson:** Connecting Concepts/Unit Review - 3 - 4 Days **Materials:** *graphic organizers* **Activities:** • Warm Up - Cumulative Practice, Vocabulary Practice, Prerequisite Skill Practice • Motivate - Use problem solving to solve exercises that combine the concepts from the current unit and prior learning. • Explore/Discuss/Review - Review vocabulary terms, complete graphic organizers for the concepts and complete review exercises. • Self Assessment for Concepts & Skills

different dimensions.. • Explore/Discuss - Determine how to find the volume of a variety of prisms. Find the volume of a cylinder by using a model to compare its volume to the volume of a cube. Introduce and discuss the formula for volume of a cylinder and prism. • Use a formula to find the volume of a cylinder. • Use the formula for the volume of a cylinder to find a missing dimension. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	• Use the formula for the volume of a cone to find a missing dimension. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	• Use the formula for the volume of a sphere to find the radius. • Find volumes of composite solids. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	find missing measures in similar solids. • Use linear measures to find surface areas and volumes of similar solids. • Self Assessment for Concepts & Skills • Self Assessment for Problem Solving • Closure Activity/Mini Assessment	• Self Assessment for Problem Solving • Closure Activity/Practice Assessment - Study Guide

Differentiate Instruction, depending on individual student needs (students with an IEP, MLL Students; Students At Risk; Gifted Students) **by:**

Presentation Accommodations

- Present information via the visual modality(written material to supplement oral explanation, models, illustrations, assignments written on board)
- Directions repeated, clarified or reworded
- Use alternate texts at lower readability level
- Rephrase word problems
- Reduce readability level of materials
- Work with fewer items per page or line and/or materials in a larger print size
- Provide multi-sensory presentation of data
- Use magnification device, screen reader, or Braille / Nemeth Code
- Use audio amplification device (e.g., hearing aid(s), auditory trainer, sound-field system (which may require teacher use of microphone)
- Be given a written list of instructions
- Record a lesson, instead of taking notes
- Provide tutorial video(s)
- Have another student share class notes with him
- Be given an outline of a lesson

- Be given a copy of teacher's lecture notes
- Be given a study guide to assist in preparing for assessments
- Use manipulatives to teach or demonstrate concepts

Response Accommodations

- Use sign language, a communication device, Braille, other technology, or native language other than English
- Dictate answers to a scribe
- Capture responses on an audio recorder
- Use of calculator
- Use of a math grid
- Use a word processor to type notes or give responses in class

Setting Accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where student learns best (for example, near the teacher & away from distractions)
- Take an assessment and/or assignment in small group setting
- Use noise buffers such as headphones, earphones, or earplugs

Timing Accommodations

- Take more time to complete a task or an assessment
- Have extra time to process oral information and directions
- Take frequent breaks, such as after completing a task

Scheduling Accommodations

- Take more time to complete a project
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization Skills Accommodations

- Use an alarm to help with time management
- Mark texts with a highlighter
- Break down tasks into manageable units
- Use of checklists
- Provide organizers/study guides

Assignment Modifications

- Provide larger white work space
- Allow for oral rather than written responses
- Answer fewer or different questions
- Assign questions aligned to different levels such as emerging, proficient, and/or advanced.
- Create alternate projects or assignments

Curriculum Modifications

- Learn different material related to the same mathematical concept (such as continuing to work on one or two step equations while classmates move on to solving multi-step equations, or moving ahead to an extension concept/skill while classmates continue to work on a core skill)
- Get assessed using a leveled standard/concept (emerging, proficient, and/or advanced) than the one for classmate

Differentiated Lesson(s) for this Volumes & Similar Solids Unit

Bedminster Township School
Subject Area: Mathematics

Unit 11:
Climate Change

Student Paced Time Frame: 5 Days

Overview

This lesson is aimed at increasing students' general knowledge of climate change on local, national, and global scales, and how such changes in climate will affect humans. This lesson provides data detailing the average annual temperature over time recorded at a climate station in Greenland. Students will use this information to practice their math and analytical skills and relate to average temperature change over time.

Enduring Understandings

- Practice math and critical thinking skills using practical, real-life numbers
- Recognize trends in data and use them to predict future changes

Skill and Knowledge Objectives

- Find the Mean of a set of data
- Find the Median of a set of data
- Find the Mode of the set of data
- Create a scatter plot of the data
- Analyze a line of best fit do determine if a correlation exists in the set of data

Assessments*

Note: Questions may be revised, modified, and/or simplified based on students' needs. Special Education teachers, and English as Second Language teachers will be notified for suggestions to modify/revise/simplify assessments as needed.

Formative Assessment:

Calculations of mean, median, and mode of the temperatures.

Summative Assessment:

- Group presentation displaying the outcome of the data analysis

Acccomodations:

Adjustable time

Calculator - 4 function, scientific, or graphing

Video tutorial on measures of central tendency

Big Ideas Video Tutorials

Big Ideas Tutor - live audio support with Big Ideas tutor during select practice problems

Virtual Manipulatives

Digital Examples

Skills Trainer - (Big Ideas) interactive tool for skills practice - used for remediation or enrichment

New Jersey Social and Emotional Learning Competencies:

Self-Awareness, Self-Management, Social Awareness, Responsible Decision-Making, Relationship Skills

Activities:

- **SEL Resources in Big Ideas**

Social Emotional Well Being Activities - All Units

Lesson Links:

Climate Change

Climate Change _Pre-Algebra

Standards

NJ Student Learning Standards for Mathematics: 8.SP

A. Investigate patterns of association in bivariate data.

1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.

- **8.1 Computer Science & Design Thinking, 9.1 21st-Century Life & Career Skills and/or Financial Literacy; AND Activities/Lesson(s):**

- 8.1.5.NI.1: Develop models that successfully transmit and receive information using both wired and wireless methods.
- 8.1.5.NI.2: Describe physical and digital security measures for protecting sensitive personal information.
- 8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices
- and
- 8.1.8.CS.4: Systematically apply troubleshooting strategies to identify and resolve hardware and software problems in computing systems.
- 8.1.8.DA.4: Transform data to remove errors and improve the accuracy of the data for analysis.
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- https://www.state.nj.us/education/aps/cccs/career/
-

  9.1 21st-Century Life & Career Skills: All students will demonstrate the creative, critical thinking, collaboration, and problem-solving skills needed to function successfully as both global citizens and workers in diverse ethnic and organizational cultures.

- A. Critical Thinking and Problem Solving

- 9.1.8.A.1 Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills.
  9.1.8.A.2 Implement problem-solving strategies to solve a problem in school or the community.
  9.1.8.A.3 Summarize strategies used by various organizations and agencies to solve problems that impact communities, and compare them with strategies used by similar organizations in another state or country.
  9.1.8.A.4 Design and implement a project management plan using one or more problem-solving strategies.

- B. Creativity and Innovation

- 9.1.8.B.1 Use multiple points of view to create alternative solutions.
  9.1.8.B.2 Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.

- C. Collaboration, Teamwork, and Leadership

- 9.1.8.C.1 Determine an individual's responsibility for personal actions and contributions to group activities.
  9.1.8.C.2 Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.
  9.1.8.C.3 Model leadership skills during classroom and extra-curricular activities.

- 9.1.8.CI.1: Assess data gathered on varying perspectives on causes of climate change (e.g., crosscultural, gender-specific, generational), and determine how the data can best be used to design multiple potential solutions (e.g., RI.7.9, 6.SP.B.5, 7.1.NH.IPERS.6, 8.2.8.ETW.4).

Social and Emotional Competencies - Embed within Classroom Instruction

- Recognize the skills needed to establish and achieve personal and educational goals
- Identify and apply ways to persevere or overcome barriers through alternative methods to achieve

one's goals

- Develop, implement, and model effective problem-solving and critical thinking skills
- Connect mathematical problems to student experiences
- Students explain their answers to each other
- Students self assess and/or self reflect on their understanding and level of engagement within the classroom setting and the instruction being provided.

ESS3.D:
Global Climate Change

Human activities, such as the release of greenhouse gasses from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)