

6th Grade Math Curriculum



Egg Harbor Township School District

State Board Adoption Date of Standards: 5/2016

Unit Overview (Standards Coverage)

Unit	Standards	Unit Focus	Standards for Mathematical Practice	Open Educational Resources
Unit 1 Operations and Reasoning about Ratios (8 weeks)	<ul style="list-style-type: none"> ● 6.NS.A.1 ● 6.NS.B.2 ● 6.RP.A.1 ● 6.RP.A.2 ● 6.RP.A.3* ● 6.NS.B.3 ● 6.NS.B.4 	<ul style="list-style-type: none"> • Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • Compute fluently with multi-digit numbers and find common factors and multiples. • Understand ratio concepts and use ratio reasoning to solve problems. 	<p>MP.1 Make sense of problems and persevere in solving them.</p> <p>MP.2 Reason abstractly and quantitatively.</p> <p>MP.3 Construct viable arguments & critique the reasoning of others.</p> <p>MP.4 Model with mathematics.</p> <p>MP.5 Use appropriate tools strategically.</p> <p>MP.6 Attend to precision.</p>	<p>6.NS.A.1 Traffic Jam</p> <p>6.RP.A.1 Games at Recess</p> <p>6.RP.A.2 Price per pound and pounds per dollar</p> <p>6.RP.A.3 Voting for Three, Variation 1</p> <p>6.RP.A.3c Shirt Sale</p> <p>6.NS.B.3 Reasoning about Multiplication and Division and Place Value, Part 1</p> <p>6.NS.B.4 Factors and Common Factors</p> <p>6.NS.B.4 Multiples and Common Multiples</p>
Unit 2 Expressions and 3-D Geometry (8 weeks)	<ul style="list-style-type: none"> ● 6.EE.A.1 ● 6.EE.A.2 ● 6.EE.A.3 ● 6.EE.A.4 ● 6.EE.B.6 ● 6.G.A.2 ● 6.G.A.4 	<ul style="list-style-type: none"> • Apply and extend previous understandings of arithmetic to algebraic expressions. • Reason about and solve one-variable equations and inequalities. • Solve real-world and mathematical problems involving area, surface area, and volume. 	<p>MP.7 Look for and make use of structure.</p> <p>MP.8 Look for and express regularity in repeated reasoning</p>	<p>6.EE.A.1 The Djinni's Offer</p> <p>6.EE.A.2 Rectangle Perimeter 1</p> <p>6.EE.A.4 Rectangle Perimeter 2</p> <p>6.EE.A.4 Equivalent Expressions</p> <p>6.G.A.2 Volumes with Fractional Edge Lengths</p> <p>6.G.A.4 Nets for Pyramids and Prisms</p>

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<p>Unit 3 Equations, The Rational Number System, and 2-D Geometry (8 weeks)</p>	<ul style="list-style-type: none"> ● 6.EE.B.5 ● 6.EE.B.7 ● 6.NS.C.5 ● 6.NS.C.6 ● 6.NS.C.7 ● 6.EE.B.8 ● 6.NS.C.8* ● 6.G.A.3 ● 6.G.A.1 	<ul style="list-style-type: none"> ● Reason about and solve one-variable equations and inequalities. ● Apply and extend previous understandings of numbers to the system of rational numbers. ● Solve real-world and mathematical problems involving area, surface area, and volume. 		<p>6.EE.B.5 Make Use of Structure</p> <p>6.EE.B.7 Morning Walk</p> <p>6.NS.C.5 Warmer in Miami</p> <p>6.NS.C.6 Mile High</p> <p>6.NS.C.7 Jumping Flea</p> <p>6.NS.C.7a Fractions on the Number Line</p> <p>6.NS.C.7b Comparing Temperatures</p> <p>6.EE.B.8 Fishing Adventures 1</p> <p>6.NS.C.8 Nome, Alaska</p> <p>6.G.A.1, 6.G.A.3 Polygons in the Coordinate Plane</p>
<p>Unit 4 Variability, Distributions, and Relationships between Quantities (8 weeks)</p>	<ul style="list-style-type: none"> ● 6.EE.C.9 ● 6.SP.A.1 ● 6.SP.A.2 ● 6.SP.A.3 ● 6.SP.B.4 ● 6.SP.B.5 ● 6.RP.A.3* ● 6.NS.C.8* 	<ul style="list-style-type: none"> ● Represent and analyze quantitative relationships between dependent and independent variables. ● Develop understanding of statistical variability. ● Summarize and describe distributions. ● Understand ratio concepts & use ratio reasoning to solve problems. ● Apply and extend previous understandings of numbers to the system of rational numbers. 		<p>6.EE.C.9 Families of Triangles</p> <p>6.SP.A.1 Identifying Statistical Questions</p> <p>6.SP.A.2, 6.SP.B.4 Puppy Weights</p> <p>6.SP.A.3 Is It Center or Is It Variability?</p> <p>6.SP.B.5c Number of Siblings</p> <p>6.SP.B.5d Mean or Median?</p>

This document outlines in detail the answers to the following four questions:

- 1. What do we want our students to know?**
- 2. How do we know if they learned it?**
- 3. What do we do if they did not learn it?**
- 4. What do we do when they did learn it?**

Unit 1 MATH 6 TH GRADE		
Content & Practice Standards	Interdisciplinary Standards	Critical Knowledge & Skills
<p>6.NS.A.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. <i>For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lb of chocolate equally? How many $3/4$-cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi and area $1/2$ square mi?</i></p> <p>6.NS.B.2. Fluently divide multi-digit numbers using the standard algorithm.</p> <p>6.RP.A.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. <i>For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."</i></p> <p>6.RP.A.2. Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. <i>For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is $3/4$ cup of flour</i></p>	<p>Infused within the unit are connections to the NJSLs for Mathematics, Language Arts Literacy</p> <ul style="list-style-type: none"> - RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. - SL.11-12.4 Present information, findings and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience. - W.6.10 Write routinely over extended time frames (time for research, reflection, metacognition/self correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences. <p>Technology Standards:</p> <ul style="list-style-type: none"> - 8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. - A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations - B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology. 	<p>Concept(s): No new concept(s) introduced</p> <p>Students are able to:</p> <ul style="list-style-type: none"> ● divide a fraction by a fraction. ● represent division of fractions using visual models. ● interpret quotients of fractions in the context of the problem. ● compute quotients of fractions in order to solve word problems. ● write equations to solve word problems involving division of fraction by a fraction. ● use the relationship between multiplication and division to explain division of fractions.

for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a rate of \$5 per hamburger."

6.RP.A.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

6.RP.A.3a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

6.RP.A.3b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?*

6.RP.A.3c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

6.RP.A.3d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

6.NS.B.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

6.NS.B.4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12.

Unit 1 MATH 6TH GRADE

Stage 1 – Desired Results

UNIT SUMMARY

CORE AND SUPPLEMENTAL MATERIALS/RESOURCES

• Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

Big Ideas Math Text and Online Resources

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<ul style="list-style-type: none"> • Compute fluently with multi-digit numbers and find common factors and multiples. • Understand ratio concepts and use ratio reasoning to solve problems. 	<p>Moby Max</p> <p>Link It</p> <p>Edulastic</p> <p>Supplemental Materials</p>
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UNDERSTANDINGS

<p>Learning Goal 1: Compute quotients of fractions.</p> <p>Learning Goal 2: Construct visual fraction models to represent quotients of fractions and use the relationship between multiplication and division to explain division of fractions.</p> <p>Learning Goal 3: Solve real-world problems involving quotients of fractions and interpret the solutions in the context given.</p> <p>Learning Goal 4: Fluently divide multi-digit numbers using the standard algorithms.</p> <p>Learning Goal 5: Explain the relationship of two quantities in given ratio using ratio language.</p> <p>Learning Goal 6: Use rate language, in the context of the ratio relationship, to describe a unit rate.</p> <p>Learning Goal 7: Create and complete tables of equivalent ratios to solve real world and mathematical problems using ratio and rate reasoning that include making tables of equivalent ratios, solving unit rate problems, finding percent of a quantity as a rate per 100.</p> <p>Learning Goal 8: Use ratio and rate reasoning to convert measurement units and to transform units appropriately when multiplying or dividing quantities.</p> <p>Learning Goal 9: Fluently add, subtract, multiply and divide multi-digit decimals.</p> <p>Learning Goal 10: Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two numbers less than or equal to 12.</p>

Students will know...	Students will be able to...
<ul style="list-style-type: none"> • multiplication and division to divide fractions by fractions. • multi-digit numbers and find common factors and multiples. • ratio concepts and use ratio reasoning to solve problems. 	<ul style="list-style-type: none"> • Apply and extend previous understandings of multiplication and division to divide fractions by fractions. • Compute fluently with multi-digit numbers and find common factors and multiples. • Understand ratio concepts and use ratio reasoning to solve problems.

Stage 2 – Assessment Evidence

<p>Performance Tasks:</p>	<p>Other Evidence:</p> <p><i>What other means of assessment will be used throughout this unit?</i></p> <p><u>Formative</u></p>
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Curricular Framework MATH-6th Grade

What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?

Performance Tasks/Use of Technology

[6.NS.A.1 Traffic Jam](#)

[6.RP.A.1 Games at Recess](#)

[6.RP.A.2 Price per pound and pounds per dollar](#)

[6.RP.A.3 Voting for Three, Variation 1](#)

[6.RP.A.3c Shirt Sale](#)

[6.NS.B.3 Reasoning about Multiplication and Division and Place Value, Part 1](#)

[6.NS.B.4 Factors and Common Factors](#)

[6.NS.B.4 Multiples and Common Multiples](#)

- [Teacher observation](#)
- [Exit tickets/check for understandings](#)
- [Games](#)
- [Oral Assessments/conferencing](#)
- [Portfolio/math journal](#)
- [Daily Classwork](#)
- [Pre-Assessment](#)
- [Fluency Check](#)
- [Quick Quiz](#)
- [Student Activity Pages](#)

Summative

- [Quick Quiz](#)
- [Performance Task](#)
- [Test](#)

Stage 3 – Learning Plan

Lessons Covered:

- GCF, LCM
- Ratios and ratio tables
- Rates
- Percents
- Dividing Fractions
- Decimals Operations (add, subtract, multiply, divide)

Points of Focus:

- Factor trees and lists
- Simplifying fractions; equivalent ratios
- Decimal placement across various operations
- Vocabulary (product, quotient, factors, multiples, etc.)

Planned Differentiation & Interventions for Tiers I, II, III, ELL, SPED, and Gift & Talented Students

• Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.

• *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*

• *Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:

- “Differentiating the Lesson” in Big Ideas online resources for all sections
- “Additional Topics” in Big Ideas online resources to extend and enhance instruction
- Big Ideas Game Closet
- Big Ideas Differentiated Instruction options
- Big Ideas Mini-Assessments
- Design Challenges
- Student Choice/Driven Activities
- Group Projects
- MobyMax
- LinkIt!
- Rocket Math
- [Intervention Central](#)
- [Do to Learn](#)
- [Differentiation Strategies for Math](#)
- [Discovery Education Math](#)
- [Everyday Mathematics](#)
- [Homework Spot](#)
- [Math Fact Fluency](#)

Tier I:

- “Differentiating the Lesson” in Big Ideas online resources for all sections
- Big Ideas MATH Pyramid of Tiered Interventions for additional resources
- Record and Practice Journal
- Differentiated Instruction options
- Fair Game Review
- Vocabulary Support Glossary resources
- Mini-Assessments
- Game Closet
- Lesson Tutorials

- Flash Cards
- Extended Time
- Flexible Grouping
- Small Group Instruction
- Peer Buddies
- Math Tutoring Center (HS only)
- Math Lab/Tutorial
- MobyMax
- LinkIt!
- Rocket Math
- [Intervention Central](#)
- [Do to Learn](#)
- [Learning Ally](#)
- [Differentiation Strategies for Math](#)
- [Discovery Education Math](#)
- [Everyday Mathematics](#)
- [Homework Spot](#)
- [Flash Card Math](#)
- [Math Fact Fluency](#)

Tier II:

- Lesson Tutorials
- Basic Skills Handbook
- Skills Review Handbook
- Differentiated Instruction Big Ideas resources
- Game Closet
- Centers/Small Group Instruction
- Math Tutoring Center (HS only)
- Math Lab/Tutorial
- MobyMax
- LinkIt!
- Math Fact Fluency/Rocket Math

Tier III:

- Customized Learning Intervention Activities resources
- Intensive Intervention resource
- Systematic Assessments to focus on specific deficits

ELL:

- Big Ideas Math Student Editions are available online in Spanish
- Letters to Parents are available in the Resources by Chapter book to assist in guiding parents through each chapter and offer helpful suggestions they can use to demonstrate mathematical concepts for their child in daily activities. These letters are editable so teachers can customize them.
- Student Dynamic eBook Audio has the option to be read in English or Spanish
- Multi-Language Glossary for new Math vocabulary is available in 14 different languages.
- Audio version is available in English or Spanish.
- Game Closet can be accessed in English or Spanish, while also allowing for all students to play and understand these educational games.
- ELL Notes included in Teacher Edition to help teachers overcome obstacles.
- Record & Practice Journal available in Spanish.
- Student Journal available in Spanish.
- Chapter Reviews available in English and Spanish.
- Vocabulary Flash Cards
- Chunking Information
- Math Word Wall/Word Bank
- Multi-Sensory Instruction
- Use of Translation software
- Gradual Release Model
- [TODOS: Mathematics for ALL](#) - Excellence and Equity in Mathematics
- [FABRIC - A Learning Paradigm for ELLs](#) (NJDOE resource)

SPED:

- Menu Math (mostly for very low functioning students)
- Math Labs/Tutorial
- MobyMax
- LinkIt!
- IXL
- Learning Ally (audio version for textbooks and other published materials) – Also available for 504 students
- Apex Online Learning – Bridge students only
- Use of specialized equipment such as beeping balls, text to speech and speech to text software, special seats or desks
- Use of hands-on materials for problem solving
- Visual supports and Use of Manipulatives
- Extended time to complete tests and assignments
- Graphic Organizers/Study Guides
- Mnemonic tricks to improve memory
- Reducing workload
- Centers/Small Group Instruction

- Adjusting accountability for standards by focusing only on essential standards
- Use of iPads or laptops for students with motor issues that make writing difficult
- Use of tangible rewards (certificates, small toys, etc. per behavior plan)
- Use prompts and model directions
- Use task analysis to break down activities and lessons into each individual step needed to complete the task
- Use concrete examples to teach concepts
- Have student repeat/rephrase written directions
- Provide multi-sensory, hands-on materials for instruction
- Chunking Information
- Modify all fine motor tasks for example: (fat crayons, pencil grip, adaptive scissors)
- Functional or practical emphasis

504:

- Learning Ally (audio version for textbooks and other published materials)
- Extra help opportunities
- Reduce workload
- Partial credit
- Allow use of calculator, when appropriate
- Modified length and time frame of assignments
- Alternate assessments with extended time
- Provide guided notes and study guides as needed (use interactive notebook)
- Preferential Seating
- Extra Practice
- Directions repeated, clarified and reworded
- Breakdown task into manageable units
- Differentiated instruction
- Use of manipulatives

Unit 2 MATH 6 TH GRADE		
Content & Practice Standards	Interdisciplinary Standards	Critical Knowledge & Skills
<ul style="list-style-type: none"> 6.EE.A.1. Write and evaluate numerical expressions involving whole-number exponents <hr/> <ul style="list-style-type: none"> 6.EE.A.2. Write, read, and evaluate expressions in which letters stand for numbers <hr/> <ul style="list-style-type: none"> 6.EE.A.3. Apply the properties of operations to generate equivalent expressions 6.EE.A.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them) <hr/> <ul style="list-style-type: none"> 6.EE.B.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set <hr/> <ul style="list-style-type: none"> 6.G.A.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it 	<p>Infused within the unit are connections to the NJSLs for Mathematics, Language Arts Literacy</p> <ul style="list-style-type: none"> RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. SL.11-12.4 Present information, findings and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience. W.6.10 Write routinely over extended time frames (time for research, reflection, metacognition/self correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. <p>Technology Standards:</p> <ul style="list-style-type: none"> 8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology. 	<p>6.EE.A.1 Concept(s): No new concept(s) introduced</p> <p>Students are able to:</p> <ul style="list-style-type: none"> write numerical expressions (involving whole number exponents) from verbal descriptions. evaluate numerical expressions involving whole number exponents. <hr/> <p>6.EE.A.2 Concept(s): No new concept(s) introduced</p> <p>Students are able to:</p> <ul style="list-style-type: none"> write algebraic expressions from verbal descriptions. use mathematical terms (sum, term, product, factor, quotient, coefficient) to identify the parts of an expression. evaluate algebraic expressions and formulas, including those involving exponents. <hr/> <p>6.EE.A.3/6.EE.A.4 Concept(s):</p> <ul style="list-style-type: none"> Properties of operations: distributive property, combining like terms <p>Students are able to:</p> <ul style="list-style-type: none"> combine like terms to generate an equivalent expression. factor to generate an equivalent expression. multiply (apply the distributive property) to generate an equivalent expression. <hr/> <p>6.EE.B.6 Concept(s):</p> <ul style="list-style-type: none"> A variable can represent an unknown number or any number in a set of numbers. <p>Students are able to:</p> <ul style="list-style-type: none"> write expressions for solving real-world problems. <hr/> <p>6.G.A.2 Concept(s): No new concept(s) introduced</p> <p>Students are able to:</p>

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<p>with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l w h$ and $V = B h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems</p> <hr/> <ul style="list-style-type: none"> 6.G.A.4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems 		<ul style="list-style-type: none"> pack a right rectangular prism with fractional edge lengths with unit fraction cubes. show that the volume found by packing is the same as would be found by multiplying the edge lengths of the prism. apply volume formulas, $V = l w h$ and $V = b h$, to right rectangular prisms with fractional edge lengths. <hr/> <p>6.G.A.4 Concept(s): No new concept(s) introduced</p> <p>Students are able to:</p> <ul style="list-style-type: none"> represent three dimensional objects with nets made up of rectangles and triangles. find surface area of three-dimensional objects using nets. solve real world and mathematical problems involving surface area using nets.
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Unit 2 MATH 6TH GRADE

Stage 1 – Desired Results

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES
<p>The purpose of this unit is to apply and extend students' previous understandings of arithmetic to algebraic expressions, area, surface area, and volume. It will cover the formulas for area and volume, and their application to problem solving, as well as how to use substitution to solve expressions and to write expressions to represent a given situation. At the conclusion of this unit, students will understand how to employ these skills to solve real-world and mathematical problems.</p>	<p>Big Ideas Math Text and Online Resources</p> <p>Moby Max</p> <p>Link It</p> <p>Edulastic</p> <p>Supplemental Material</p>

UNDERSTANDINGS

<p>Students will understand that...</p> <ul style="list-style-type: none"> Write and evaluate numerical expressions involving whole number exponents. Use mathematical language to identify parts of an expression. Write and evaluate algebraic expressions involving exponents (include evaluating formulas). Apply properties of operations (factor, distribute, and combine like terms) to generate equivalent expressions and to identify when two expressions are equivalent.

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- Use variables to represent numbers and write expressions when solving real world or mathematical problems.
- Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes and show that the volume is the same as it would be if found by multiplying the edge lengths; apply volume formulas to right rectangular prisms with fractional edge lengths.
- Represent three dimensional figures objects with nets made of rectangles and triangles, and use the nets to find the surface area of the figures in order to solve real world and mathematical problems.

Students will know...	Students will be able to...
<ul style="list-style-type: none"> ● Properties of operations: distributive property, combining like terms ● A variable can represent an unknown number or any number in a set of numbers 	<ul style="list-style-type: none"> ● write numerical expressions (involving whole number exponents) from verbal descriptions. ● evaluate numerical expressions involving whole number exponents ● write algebraic expressions from verbal descriptions. ● use mathematical terms (sum, term, product, factor, quotient, coefficient) to identify the parts of an expression. ● evaluate algebraic expressions and formulas, including those involving exponents ● combine like terms to generate an equivalent expression. ● factor to generate an equivalent expression. ● multiply (apply the distributive property) to generate an equivalent expression ● write expressions for solving real-world problems ● pack a right rectangular prism with fractional edge lengths with unit fraction cubes. ● show that the volume found by packing is the same as would be found by multiplying the edge lengths of the prism. ● apply volume formulas, $V = l w h$ and $V = b h$, to right rectangular prisms with fractional edge lengths ● represent three dimensional objects with nets made up of rectangles and triangles. ● find surface area of three-dimensional objects using nets. ● solve real world and mathematical problems involving surface area using nets

Stage 2 – Assessment Evidence

<p>Performance Tasks: <i>What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?</i></p> <p><u>Performance Tasks/Use of Technology</u></p>	<p>Other Evidence: <i>What other means of assessment will be used throughout this unit?</i></p> <p><u>Formative</u></p> <ul style="list-style-type: none"> ● <u>Teacher observation</u> ● <u>Exit tickets/check for understandings</u>
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<p>6.EE.A.1 The Djinni's Offer</p> <p>6.EE.A.2 Rectangle Perimeter 1</p> <p>6.EE.A.4 Rectangle Perimeter 2</p> <p>6.EE.A.4 Equivalent Expressions</p> <p>6.G.A.2 Volumes with Fractional Edge Lengths</p> <p>6.G.A.4 Nets for Pyramids and Prisms</p>	<ul style="list-style-type: none"> ● Mini-quizzes ● Games ● Oral Assessments/conferencing ● Portfolio/math journal ● Daily Classwork ● Pre-Assessment ● Fluency Check ● Quick Quiz ● Student Activity Pages <p><u>Summative</u></p> <ul style="list-style-type: none"> ● Performance Task ● Test
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Stage 3 – Learning Plan

Lessons Covered

- Algebraic Expressions (identify parts and finding equivalent expressions)
- Writing Expressions
- Commutative Property of Addition and Multiplication
- Associative Property of Addition and Multiplication
- Distributive Property
- Factoring Expressions
- 3D Figures and Nets
- Surface Area of Prisms
- Surface Area of Pyramids
- Volume of Rectangular Prisms

Points of Focus

- Understanding the concept of a variable and substituting for a variable
- Properties of Addition and Multiplication
- Distributive Property with and without variables
- Naming and identifying prisms and pyramids
- Using nets to represent prisms and pyramids
- Finding surface of prisms and pyramids area with and without nets
- Finding volume of rectangular prisms

- *The properties of addition and multiplication (commutative and associative) can be confusing to students. Use lots of visual examples to demonstrate them.*
- *With the distributive property, students often forget to distribute to the second term inside the parentheses. This must be reinforced every time a problem with the distributive property is completed.*

- *For 3-D figures, we must use physical figures to demonstrate the various parts of a prism or pyramid (face, edge, vertex, etc.) because many students struggle to visualize the figures. Cereal boxes, shoes boxes, oatmeal containers, etc. can all help to demonstrate the properties of 3-D figures. Deconstructing boxes can also help to understand surface area.*

Planned Differentiation & Interventions for Tiers I, II, III, ELL, SPED, and Gift & Talented Students

- *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*
- *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*
- *Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:

- “Differentiating the Lesson” in Big Ideas online resources for all sections
- “Additional Topics” in Big Ideas online resources to extend and enhance instruction
- Big Ideas Game Closet
- Big Ideas Differentiated Instruction options
- Big Ideas Mini-Assessments
- Design Challenges
- Student Choice/Driven Activities
- Group Projects
- MobyMax
- LinkIt!
- Rocket Math
- [Intervention Central](#)
- [Do to Learn](#)
- [Differentiation Strategies for Math](#)
- [Discovery Education Math](#)
- [Everyday Mathematics](#)
- [Homework Spot](#)
- [Math Fact Fluency](#)

Tier I:

- “Differentiating the Lesson” in Big Ideas online resources for all sections
- Big Ideas MATH Pyramid of Tiered Interventions for additional resources

- Record and Practice Journal
- Differentiated Instruction options
- Fair Game Review
- Vocabulary Support Glossary resources
- Mini-Assessments
- Game Closet
- Lesson Tutorials
- Flash Cards
- Extended Time
- Flexible Grouping
- Small Group Instruction
- Peer Buddies
- Math Tutoring Center (HS only)
- Math Lab/Tutorial
- MobyMax
- LinkIt!
- Rocket Math
- [Intervention Central](#)
- [Do to Learn](#)
- [Learning Ally](#)
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- [Discovery Education Math](#)
- [Everyday Mathematics](#)
- [Homework Spot](#)
- [Flash Card Math](#)
- [Math Fact Fluency](#)

Tier II:

- Lesson Tutorials
- Basic Skills Handbook
- Skills Review Handbook
- Differentiated Instruction Big Ideas resources
- Game Closet
- Centers/Small Group Instruction
- Math Tutoring Center (HS only)
- Math Lab/Tutorial
- MobyMax

- LinkIt!
- Math Fact Fluency/Rocket Math

Tier III:

- Customized Learning Intervention Activities resources
- Intensive Intervention resource
- Systematic Assessments to focus on specific deficits

ELL:

- Big Ideas Math Student Editions are available online in Spanish
- Letters to Parents are available in the Resources by Chapter book to assist in guiding parents through each chapter and offer helpful suggestions they can use to demonstrate mathematical concepts for their child in daily activities. These letters are editable so teachers can customize them.
- Student Dynamic eBook Audio has the option to be read in English or Spanish
- Multi-Language Glossary for new Math vocabulary is available in 14 different languages.
- Audio version is available in English or Spanish.
- Game Closet can be accessed in English or Spanish, while also allowing for all students to play and understand these educational games.
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- Math Word Wall/Word Bank
- Multi-Sensory Instruction
- Use of Translation software
- Gradual Release Model
- [TODOS: Mathematics for ALL](#) - Excellence and Equity in Mathematics
- [FABRIC - A Learning Paradigm for ELLs](#) (NJDOE resource)

SPED:

- Menu Math (mostly for very low functioning students)
- Math Labs/Tutorial
- MobyMax
- LinkIt!
- IXL
- Learning Ally (audio version for textbooks and other published materials) – Also available for 504 students
- Apex Online Learning – Bridge students only
- Use of specialized equipment such as beeping balls, text to speech and speech to text software, special seats or desks

- Use of hands-on materials for problem solving
- Visual supports and Use of Manipulatives
- Extended time to complete tests and assignments
- Graphic Organizers/Study Guides
- Mnemonic tricks to improve memory
- Reducing workload
- Centers/Small Group Instruction
- Adjusting accountability for standards by focusing only on essential standards
- Use of iPads or laptops for students with motor issues that make writing difficult
- Use of tangible rewards (certificates, small toys, etc. per behavior plan)
- Use prompts and model directions
- Use task analysis to break down activities and lessons into each individual step needed to complete the task
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- Have student repeat/rephrase written directions
- Provide multi-sensory, hands-on materials for instruction
- Chunking Information
- Modify all fine motor tasks for example: (fat crayons, pencil grip, adaptive scissors)
- Functional or practical emphasis

504:

- Learning Ally (audio version for textbooks and other published materials)
- Extra help opportunities
- Reduce workload
- Partial credit
- Allow use of calculator, when appropriate
- Modified length and time frame of assignments
- Alternate assessments with extended time
- Provide guided notes and study guides as needed (use interactive notebook)
- Preferential Seating
- Extra Practice
- Directions repeated, clarified and reworded
- Breakdown task into manageable units
- Differentiated instruction
- Use of manipulatives

Unit 3 MATH 6 TH GRADE		
Content & Practice Standards	Interdisciplinary Standards	Critical Knowledge & Skills
<ul style="list-style-type: none"> 6.EE.B.5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. 6.EE.B.7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers. 6.NS.C.5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. 	<p>Infused within the unit are connections to the NJSLs for Mathematics, Language Arts Literacy</p> <ul style="list-style-type: none"> RI.11-12.7 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. SL.11-12.4 Present information, findings and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience. W6.10 Write routinely over extended time frames (time for research, reflection, metacognition/self correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences. <p>Technology Standards:</p> <ul style="list-style-type: none"> 8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology. 	<p>6.EE.B.5 Concept(s):</p> <ul style="list-style-type: none"> Solving an equation or inequality is a process of answering the question: determine which values from a specified set, if any, make the equation or inequality true. <p>Students are able to:</p> <ul style="list-style-type: none"> substitute a number into an equation to determine whether it makes an equation true. substitute a number into an inequality to determine whether it makes the inequality true. <p>6.EE.B.7 Concept(s):</p> <ul style="list-style-type: none"> An equation is defined by two expressions that are equivalent to one another. <p>Students will be able to:</p> <ul style="list-style-type: none"> solve real world problems by writing and solving equations of the form $x + p = q$ (p, q, and x are non-negative and rational). solve real world problems by writing and solving equations of the form $px = q$ (p, q, and x are non-negative and rational). <p>6.NS.C5 Concept(s):</p> <ul style="list-style-type: none"> Positive and negative numbers, used together, describe quantities having opposite directions or opposite values. <p>Students are able to:</p> <ul style="list-style-type: none"> represent quantities with positive and negative numbers in real-world contexts.

- 6.NS.C.6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
 - 6.NS.C.6a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.
 - 6.NS.C.6b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
 - 6.NS.C.6c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
-
- 6.NS.C.7. Understand ordering and absolute value of rational numbers.

- interpret positive and negative numbers in real-world contexts.
- explain the meaning of zero, in context, in each real-world situation.

6.NS.C.6 Concept(s):

- Opposite signs of numbers indicate locations on opposite sides of 0 on the number line.
- The opposite of the opposite of a number is the number itself (e.g. the opposite of three is -3. The opposite of the opposite of three, $-(-3)$, is equal to the original number, 3).
- Signs of numbers in ordered pairs indicate their locations in quadrants of the coordinate plane.
- When two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

Students are able to:

- position rational numbers on horizontal and vertical number lines.
- position pairs of rational numbers on a coordinate plane.
- explain the conditions for which pairs of points are reflections across an axes in the coordinate plane.
- locate numbers and their opposites on the number line and explain their relation to 0.

6.NS.C.7 Concept(s):

- The absolute value of a rational number is its distance from 0 on the number line.

Students are able to:

- given an inequality, determine the position of one rational number relative to another.

- 6.NS.C.7a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.*
- 6.NS.C.7b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ to express the fact that -3°C is warmer than -7°C .*
- 6.NS.C.7c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of -30 dollars, write $|-30| = 30$ to describe the size of the debt in dollars.*
- 6.NS.C.7d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.*
- 6.EE.B.8. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams

- write a inequality and explain statements of order for rational numbers in real world situations.

6.EE.B.8 Concept(s):

- An inequality may represent a constraint (or a condition) in a real-world problem.
- Infinity ($x > c$ and $x < c$ have an infinite number of solutions).

Students are able to:

- represent real-world constraint or condition by writing an inequality of the form $x > c$ or $x < c$.
- graph inequalities of the form $x > c$ or $x < c$ on number lines.

6.NS.C.8/6.GA.3 Concept(s):

No new concept(s) introduced

<ul style="list-style-type: none"> 6.NS.C.8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. 6.G.A.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. 		<p>Students are able to:</p> <ul style="list-style-type: none"> graph points in all four quadrants of the coordinate plane in order to solve real-world and mathematical problems. draw polygons in the coordinate plane. use absolute value to find distances between points with the same first coordinate or the same second coordinate. use coordinates to solve real-world distance, perimeter, and area problems. <p>6.GA.1 Concept(s): No new concept(s) introduced</p> <p>Students are able to:</p> <ul style="list-style-type: none"> compose rectangles in order to find the area of triangles, special quadrilaterals and polygons. decompose triangles, special quadrilaterals, and polygons into triangles and other shapes in order to find their area compose rectangles and decompose into triangles in order to solve real-world problems.
Unit 3 MATH 6TH GRADE		
Stage 1 – Desired Results		
UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES	

Curricular Framework MATH-6th Grade

<ul style="list-style-type: none"> ● Reason about and solve one-variable equations and inequalities. ● Apply and extend previous understandings of numbers to the system of rational numbers. ● Solve real-world and mathematical problems involving area, surface area, and volume. 		<ul style="list-style-type: none"> ● Big Ideas Math Text and Online Resources ● Moby Max ● Link It ● Edulastic ● IXL
UNDERSTANDINGS		
<p>Students will understand that...</p> <p>Learning Goal 1: Use substitution to determine whether a given number makes an equation or inequality true.</p> <p>Learning Goal 2: Solve real world problems by writing and solving equations of the form $x + p = q$ and $px = q$ (p, q, and x are non-negative rational numbers).</p> <p>Learning Goal 3: Use positive and negative numbers to represent quantities in real-world situations, explaining the meaning of zero in the context of the real-world situation.</p> <p>Learning Goal 4: Locate rational numbers and their opposites on horizontal and vertical number line; explain their relation of the opposites to zero.</p> <p>Learning Goal 5: Plot pairs of positive and negative rational numbers in the coordinate plane; describe two ordered pairs that differ only by signs as reflections across one or both axes.</p> <p>Learning Goal 6: Use statements of inequality to determine relative positions of two rational numbers on a number line; write and explain statements of order for rational numbers in real-world contexts.</p> <p>Learning Goal 7: Explain the meaning of absolute value of a rational number as distance from zero on the number line and as magnitude for a positive or negative quantity in a real-world situation.</p> <p>Learning Goal 8: Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real world or mathematical problem and represent them on a number line.</p> <p>Learning Goal 9: Solve real world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Use the absolute value of the differences of their coordinates to find distances between points with the same first coordinate or same second coordinate.</p> <p>Learning Goal 10: Find the area of right triangles, other triangles, special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and other shapes to solve real world or mathematical problems.</p>		
Students will know...	Students will be able to...	
<ul style="list-style-type: none"> ● Solving an equation or inequality is a process of answering the question: determine which values from a specified set, if any, make the equation or inequality true. ● An equation is defined by two expressions that are equivalent to one another. ● Positive and negative numbers, used together, describe quantities having opposite directions or opposite values. ● Opposite signs of numbers indicate locations on opposite sides of 0 on the number line. ● The opposite of the opposite of a number is the number itself (e.g. the opposite of three is -3. The opposite of the opposite of three, -(-3), is equal to the original number, 3). ● Signs of numbers in ordered pairs indicate their locations in quadrants of the coordinate plane. ● When two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. ● The absolute value of a rational number is its distance from 0 on the number line. 	<ul style="list-style-type: none"> ● substitute a number into an equation to determine whether it makes an equation true. ● substitute a number into an inequality to determine whether it makes the inequality true. ● solve real world problems by writing and solving equations of the form $x + p = q$ (p, q, and x are non-negative and rational). ● solve real world problems by writing and solving equations of the form $px = q$ (p, q, and x are non-negative and rational). ● represent quantities with positive and negative numbers in real-world contexts. 	

- An inequality may represent a constraint (or a condition) in a real-world problem.
- Infinity ($x > c$ and $x < c$ have an infinite number of solutions).

- interpret positive and negative numbers in real-world contexts.
- explain the meaning of zero, in context, in each real-world situation.
- represent real-world constraint or condition by writing an inequality of the form $x > c$ or $x < c$.
- graph inequalities of the form $x > c$ or $x < c$ on number lines.
- graph points in all four quadrants of the coordinate plane in order to solve real-world and mathematical problems.
- draw polygons in the coordinate plane.
- use absolute value to find distances between points with the same first coordinate or the same second coordinate.
- use coordinates to solve real-world distance, perimeter, and area problems.
- compose rectangles in order to find the area of triangles, special quadrilaterals and polygons.
- decompose triangles, special quadrilaterals, and polygons into triangles and other shapes in order to find their area
- compose rectangles and decompose into triangles in order to solve real-world problems.

Stage 2 – Assessment Evidence

Performance Tasks:

What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?

Performance Tasks/Use of Technology

[6.EE.B.5 Make Use of Structure](#)

[6.EE.B.7 Morning Walk](#)

[6.NS.C.5 Warmer in Miami](#)

[6.NS.C.6 Mile High](#)

[6.NS.C.7 Jumping Flea](#)

Other Evidence:

What other means of assessment will be used throughout this unit?

Formative

- Teacher observation
- Exit tickets/Checks for Understanding
- Games
- Oral Assessments/Conferencing
- Portfolio/Math Journal
- Daily Classwork/Homework
- Pre-Assessment
- Fluency Check
- Mini Quizzes/Mid-Chapter Quizzes
- Student Activity Pages

[6.NS.C.7a Fractions on the Number Line](#)

[6.NS.C.7b Comparing Temperatures](#)

[6.EE.B.8 Fishing Adventures 1](#)

[6.NS.C.8 Nome, Alaska](#)

[6.G.A.1, 6.G.A.3 Polygons in the Coordinate Plane](#)

Summative

- Chapter Tests
- Performance Tasks
- Benchmark Tests

Stage 3 – Learning Plan

Lessons Covered:

- Comparing and Ordering Integers
- Graphing Fractions and Decimals on the Number Line
- Finding Distance on the Coordinate Plane
- Writing Equations
- Solving One-Step Equations
- Writing and Graphing Equations in Two Variables
- Solving and Graphing Inequalities
- Area of Polygons
- Polygons on the Coordinate Plane

Points of Focus:

- Order of Operations
- Inverse Operations
- Properties (Commutative Property, Associative Property, Distributive Property, Addition Property of Equality/Inequality, Subtraction Property of Equality/Inequality, Multiplication Property of Equality/Inequality, Division Property of Equality/Inequality)
- Formulas for Area of Polygons (parallelograms, triangles, trapezoids)
- Distance Formula

Planned Differentiation & Interventions for Tiers I, II, III, ELL, SPED, and Gift & Talented Students

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Tier II:

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- Directions repeated, clarified and reworded
- Breakdown task into manageable units
- Differentiated instruction
- Use of manipulatives

Unit 4 MATH 6 TH GRADE		
Content & Practice Standards	Interdisciplinary Standards	Critical Knowledge & Skills
<ul style="list-style-type: none"> 6.EE.C.9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. <i>For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time.</i> 6.SP.A.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. <i>For example, “How old am I?” is not a statistical question, but “How old are the students in my school?” is a statistical question because one anticipates variability in students’ ages.</i> 6.SP.A.2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. 6.SP.A.3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. 6.SP.B.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots. 6.SP.B.5. Summarize numerical data sets in relation to their context, such as by: 6.SP.B.5a. Reporting the number of observations. 6.SP.B.5b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. 6.SP.B.5c. Giving quantitative measures of center (median and/or mean) and variability 	<p>Infused within the unit are connections to the NJSLs for Mathematics, Language Arts Literacy</p> <ul style="list-style-type: none"> RI.11-12.7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem. SL.11-12.4 Present information, findings and supporting evidence clearly, concisely, and logically. The content, organization, development, and style are appropriate to task, purpose, and audience. W.6.10 Write routinely over extended time frames (time for research, reflection, metacognition/self correction, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline- specific tasks, purposes, and audiences. <p>Technology Standards:</p> <ul style="list-style-type: none"> 8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology. 	<p>Concept(s):</p> <ul style="list-style-type: none"> Two quantities that change in relationship to one another may be represented with an equation in two variables, with a graph, and with a table of values. <p>Students are able to:</p> <ul style="list-style-type: none"> represent two quantities that related to one another, with variables. write an equation in two variables. distinguish the dependent variable from the independent variable. analyze a given graph and table of values, and relate them to the equation. <p>Concept(s):</p> <ul style="list-style-type: none"> Variability/Variation A statistical question is one that anticipates variability in the data that is related to the question. <p>Students are able to:</p> <ul style="list-style-type: none"> distinguish questions that are statistical (anticipate variability in data) from those that are not. <p>Concept(s):</p> <ul style="list-style-type: none"> A data set has a distribution which can be described by its center, spread, and overall shape. A measure of center summarizes, with a single number, the values of an entire data set. A measure of variation describes, with a single number, how the values of a data set vary. <p>Students are able to:</p> <ul style="list-style-type: none"> distinguish center from variation.

<p>(interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.</p> <ul style="list-style-type: none"> ● 6.SP.B.5d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. ● 6.RP.A.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. ● 6.RP.A.3a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. ● 6.RP.A.3b. Solve unit rate problems including those involving unit pricing and constant speed. <i>For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?</i> ● 6.RP.A.3c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. ● 6.RP.A.3d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. ● 6.NS.C.8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. 		<ul style="list-style-type: none"> ● display numerical data in dot plots on a number line. ● display numerical data in histograms on a number line. ● display numerical data in box plots on a number line. <p>Students are able to:</p> <ul style="list-style-type: none"> ● determine the number of observations of a data set. ● describe the data in context, including how it was measured and the units of measurement. ● calculate measures of center, mean and median. ● calculate measures of spread, interquartile range and mean absolute deviation. ● describe the overall shape of a distribution (skewed left, skewed right, etc). ● identify striking deviations (outliers). ● choose measures of center and variability appropriate to the shape of the distribution and context. <p>Students are able to:</p> <ul style="list-style-type: none"> ● use ratio and rate reasoning to create tables of equivalent ratios relating quantities with <i>whole number</i> measurements, find missing values in tables and plot pairs of values. ● compare ratios using tables of equivalent ratios. ● solve real world and mathematical problems involving unit rate (including unit price and constant speed). ● calculate a percent of a quantity and solve problems by finding the whole when given the part and the percent. ● convert measurement units using ratio reasoning. ● transform units appropriately when multiplying and dividing quantities. <p>Students are able to:</p>
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		<ul style="list-style-type: none"> ● use ratio and rate reasoning to create tables of equivalent ratios relating quantities with <i>whole number</i> measurements, find missing values in tables and plot pairs of values. ● compare ratios using tables of equivalent ratios. ● solve real world and mathematical problems involving unit rate (including unit price and constant speed). ● calculate a percent of a quantity and solve problems by finding the whole when given the part and the percent. ● convert measurement units using ratio reasoning. ● transform units appropriately when multiplying and dividing quantities.
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Unit 4 MATH 6TH GRADE

Stage 1 – Desired Results

UNIT SUMMARY	CORE AND SUPPLEMENTAL MATERIALS/RESOURCES
<ul style="list-style-type: none"> ● Represent and analyze quantitative relationships between dependent and independent variables. ● Develop understanding of statistical variability. ● Summarize and describe distributions. ● Understand ratio concepts and use ratio reasoning to solve problems. ● Apply and extend previous understandings of numbers to the system of rational numbers. 	<p>Big Ideas Math Text and Online Resources</p> <p>Moby Max</p> <p>Link It</p> <p>EduLastic</p> <p>Supplemental Materials</p>

UNDERSTANDINGS

<p>Learning Goal 1: Write an equation using two variables (independent and dependent) to represent two quantities that change in relationship to one another in a real world problem.</p> <p>Learning Goal 2: Analyze the relationship between the dependent and independent variables and relate the equation to a given graph and to its table of values.</p> <p>Learning Goal 3: Distinguish questions that are statistical (anticipate variability in data) from those that are not.</p> <p>Learning Goal 4: Display numerical data in plots on the number line (including dot plots, histograms, and box plots) and summarize in relation to their context.</p> <p>Learning Goal 5: Summarize numerical data in relation to their context by identifying the number of observations and describing how the data was measured.</p>
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Learning Goal 6: Calculate, and interpret measures of center (mean and median) and variability (interquartile range and mean absolute deviation); report measures of center and variability appropriate to the shape of the distribution and context.

Learning Goal 7: Create and complete tables of equivalent ratios to solve real world and mathematical problems using ratio and rate reasoning that include making tables of equivalent ratios, solving unit rate problems, finding percent of a quantity as a rate per 100.

Learning Goal 8: Use ratio and rate reasoning to convert measurement units and to transform units appropriately when multiplying or dividing quantities.

Learning Goal 9: Solve real world and mathematical problems by graphing points in all four quadrants of the coordinate plane; use the absolute value of the differences of their coordinates to find distances between points with the same first coordinate or same second coordinate.

Students will know...	Students will be able to...
<ul style="list-style-type: none"> ● relationships between dependent and independent variables. ● statistical variability. ● distributions descriptions (skewed, centered, etc) ● ratio concepts and use ratio reasoning 	<ul style="list-style-type: none"> ● Represent and analyze quantitative relationships between dependent and independent variables. ● Develop understanding of statistical variability. ● Summarize and describe distributions. ● Understand ratio concepts and use ratio reasoning to solve problems. ● Apply and extend previous understandings of numbers to the system of rational numbers.

Stage 2 – Assessment Evidence

<p>Performance Tasks: <i>What projects, hands-on lessons, use of manipulatives, active participation in new situations, etc. will reveal evidence of meaning-making and transfer (true understanding)?</i></p> <p><u>Performance Tasks/Use of Technology</u></p> <p>www.bigideasmath.com BYOD (teacher directed use of wireless devices) www.Math.com www.math-drills.com www.helpingwithmath.com/resources/math_games.htm www.math-play.com www.quia.com/shared/math www.gamequarium.com/multiplication.html www.mrnussbaum.com/multiplication.htm www.xtramath.org</p>	<p>Other Evidence:</p> <p><u>Formative</u></p> <ul style="list-style-type: none"> ● <u>Teacher observation</u> ● <u>Exit tickets/check for understandings</u> ● <u>Games</u> ● <u>Oral Assessments/conferencing</u> ● <u>Portfolio/math journal</u> ● <u>Daily Classwork</u> ● <u>Pre-Assessment</u> ● <u>Fluency Check</u> ● <u>Quick Quiz</u> ● <u>Student Activity Pages</u> <p><u>Summative</u></p> <ul style="list-style-type: none"> ● <u>Quick Quiz</u> ● <u>Performance Task</u> ● <u>Test</u>
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Stage 3 – Learning Plan

Lessons Covered:

- Introduction to statistics (statistical questioning)
- Mean
- Measures of center (median, mode)
- Measures of variation (range, quartiles, interquartile range)
- Mean absolute deviation
- Data displays (dot plots, histograms, box plots)

Points of Focus:

- Vocabulary (difference between mean, median, mode, range, IQR)
- Accuracy of data displays (titles, labels, etc.)
- Processes for finding different data points, specially IQR and MAD

Planned Differentiation & Interventions for Tiers I, II, III, ELL, SPED, and Gift & Talented Students

- *Rethink and revise. Dig deeper into ideas at issue (through the faces of understanding). Revise, rehearse, and refine, as needed. Guide students in self-assessment and self-adjustment, based on feedback from inquiry, results, and discussion.*
- *Evaluate understandings. Reveal what has been understood through final performances and products. Involve students in a final self-assessment to identify remaining questions, set future goals, and point toward new units and lessons.*
- *Tailor (personalize) the work to ensure maximum interest and achievement. Differentiate the approaches used and provide sufficient options and variety (without compromising goals) to make it most likely that all students will be engaged and effective.*

Gifted & Talented:

- “Differentiating the Lesson” in Big Ideas online resources for all sections
- “Additional Topics” in Big Ideas online resources to extend and enhance instruction
- Big Ideas Game Closet
- Big Ideas Differentiated Instruction options
- Big Ideas Mini-Assessments
- Design Challenges
- Student Choice/Driven Activities
- Group Projects
- MobyMax
- LinkIt!
- Rocket Math
- [Intervention Central](#)
- [Do to Learn](#)

- [Differentiation Strategies for Math](#)
- [Discovery Education Math](#)
- [Everyday Mathematics](#)
- [Homework Spot](#)
- [Math Fact Fluency](#)

Tier I:

- “Differentiating the Lesson” in Big Ideas online resources for all sections
- Big Ideas MATH Pyramid of Tiered Interventions for additional resources
- Record and Practice Journal
- Differentiated Instruction options
- Fair Game Review
- Vocabulary Support Glossary resources
- Mini-Assessments
- Game Closet
- Lesson Tutorials
- Flash Cards
- Extended Time
- Flexible Grouping
- Small Group Instruction
- Peer Buddies
- Math Tutoring Center (HS only)
- Math Lab/Tutorial
- MobyMax
- LinkIt!
- Rocket Math
- [Intervention Central](#)
- [Do to Learn](#)
- [Learning Ally](#)
- [Differentiation Strategies for Math](#)
- [Discovery Education Math](#)
- [Everyday Mathematics](#)
- [Homework Spot](#)
- [Flash Card Math](#)
- [Math Fact Fluency](#)

Tier II:

- Lesson Tutorials
- Basic Skills Handbook
- Skills Review Handbook
- Differentiated Instruction Big Ideas resources
- Game Closet
- Centers/Small Group Instruction
- Math Tutoring Center (HS only)
- Math Lab/Tutorial
- MobyMax
- LinkIt!
- Math Fact Fluency/Rocket Math

Tier III:

- Customized Learning Intervention Activities resources
- Intensive Intervention resource
- Systematic Assessments to focus on specific deficits

ELL:

- Big Ideas Math Student Editions are available online in Spanish
- Letters to Parents are available in the Resources by Chapter book to assist in guiding parents through each chapter and offer helpful suggestions they can use to demonstrate mathematical concepts for their child in daily activities. These letters are editable so teachers can customize them.
- Student Dynamic eBook Audio has the option to be read in English or Spanish
- Multi-Language Glossary for new Math vocabulary is available in 14 different languages.
- Audio version is available in English or Spanish.
- Game Closet can be accessed in English or Spanish, while also allowing for all students to play and understand these educational games.
- ELL Notes included in Teacher Edition to help teachers overcome obstacles.
- Record & Practice Journal available in Spanish.
- Student Journal available in Spanish.
- Chapter Reviews available in English and Spanish.
- Vocabulary Flash Cards
- Chunking Information
- Math Word Wall/Word Bank
- Multi-Sensory Instruction
- Use of Translation software
- Gradual Release Model
- [TODOS: Mathematics for ALL](#) - Excellence and Equity in Mathematics
- [FABRIC - A Learning Paradigm for ELLs](#) (NJDOE resource)

SPED:

- Menu Math (mostly for very low functioning students)
- Math Labs/Tutorial
- MobyMax
- LinkIt!
- IXL
- Learning Ally (audio version for textbooks and other published materials) – Also available for 504 students
- Apex Online Learning – Bridge students only
- Use of specialized equipment such as beeping balls, text to speech and speech to text software, special seats or desks
- Use of hands-on materials for problem solving
- Visual supports and Use of Manipulatives
- Extended time to complete tests and assignments
- Graphic Organizers/Study Guides
- Mnemonic tricks to improve memory
- Reducing workload
- Centers/Small Group Instruction
- Adjusting accountability for standards by focusing only on essential standards
- Use of iPads or laptops for students with motor issues that make writing difficult
- Use of tangible rewards (certificates, small toys, etc. per behavior plan)
- Use prompts and model directions
- Use task analysis to break down activities and lessons into each individual step needed to complete the task
- Use concrete examples to teach concepts
- Have student repeat/rephrase written directions
- Provide multi-sensory, hands-on materials for instruction
- Chunking Information
- Modify all fine motor tasks for example: (fat crayons, pencil grip, adaptive scissors)
- Functional or practical emphasis

504:

- Learning Ally (audio version for textbooks and other published materials)
- Extra help opportunities
- Reduce workload
- Partial credit
- Allow use of calculator, when appropriate
- Modified length and time frame of assignments
- Alternate assessments with extended time
- Provide guided notes and study guides as needed (use interactive notebook)

- Preferential Seating
- Extra Practice
- Directions repeated, clarified and reworded
- Breakdown task into manageable units
- Differentiated instruction
- Use of manipulatives