

BLOOMINGDALE PUBLIC SCHOOLS

MATHEMATICS GRADE 6

Adapted from:

New Jersey Student Learning Standards
New Jersey Department of Education Instructional Units for Mathematics

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I. OVERVIEW

This full-year course has been designed to further student understanding of mathematical concepts in each of five areas identified by the New Jersey Student Learning Standards for Mathematics (NJSLS-M) as critical in Grade 6: Numerical Operations, Expressions & Equations, Ratio & Proportion, Statistics & Probability, and Geometry. Real-life problems and concrete representations of concepts will form the center of lessons that will implement this integration. The New Jersey Student Learning Standards for - Career Readiness, Life Literacies, Key Skills are infused throughout the course with specific attention to Critical Thinking and Problem Solving, Technology Literacy, and Financial Literacy. These standards endorse the use of manipulatives, cooperative learning, financial applications and technology as a means to effectively communicate mathematical ideas. This course is designed to prepare students for higher-level mathematics instruction and includes opportunities for self-motivated students to challenge themselves with differentiated instructional and independent learning opportunities that introduce further concepts in mathematics.

This course is aligned with the 2020 New Jersey Student Learning Standards (NJSLS) for 6th grade Mathematics and is enriched with some extensions into 7th grade mathematics. The enriched 7th grade content standards are intended for differentiation opportunities that prepare students for placement into the advanced mathematics course in 7th grade. This course is also aligned with the 2020 New Jersey Student Learning Standards (NJSLS) for Career Readiness, Life Literacies, and Key Skills and is designed to prepare the students for success in their future mathematical courses

II. RATIONALE

The purpose of this course, the first in the three-year middle school sequence, is to prepare students for higher-level mathematics. It is aligned with the 2020 New Jersey Student Learning Standards (NJSLS) for Mathematics and the 2020 New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills.

III. AFFIRMATIVE ACTION COMPLIANCE STATEMENT

Bloomingtondale Public Schools are committed to the achievement of increased cultural awareness, respect, and equity amongst our students, teachers, and community. We are pleased to present all pupils with information pertaining to possible career, professional, or vocational opportunities which in no way restricts or limits options on the basis of race, color, creed, religion, sex, ancestry, national origin, or socioeconomic status.

IV. STUDENT OUTCOMES (Link to New Jersey Student Learning Standards)

In accordance with district policy as mandated by the New Jersey Administrative Code and the New Jersey Student Learning Standards, the following are proficiencies required for the successful completion of the above named course.

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As a result of a Bloomingdale Mathematics education, students will be able to...

- Synthesize mathematical skills across disciplines
- Develop into confident mathematicians
- Learn at their own pace and advance their understanding in a variety of ways
- Collaborate with others and contribute productively and articulately
- Act responsibly and be accountable for actions, in person and online
- Effectively approach, analyze, plan, and apply appropriate strategies for problem solving in ambitious contexts with accommodations for those who need it.
- Persevere through difficult situations and tasks and maintain a growth mindset despite adversity.
- Draw on knowledge from a wide variety of mathematical topics with flexibility to approach the same problem from different mathematical perspectives or represent the mathematics in different ways.
- Evaluate situations, draw logical conclusions, and develop, describe and apply solutions.
- Construct and support arguments.
- Evaluate their own reasoning and critique the reasoning of others.
- Assess the reasonableness of a solution with respect to the given construct or problem context.
- Use effective communication to engage in peer collaboration, reflecting on whether or not a solution is viable.
- Create appropriate representations of mathematical situations across a variety of mediums. These models will support the student's ability to demonstrate and explain their mathematical understanding.
- Use mathematical tools to explore and deepen their understanding of mathematical concepts.
- Make effective choices regarding the use of any available tools.
- Make appropriate use of technology as a tool that is constantly changing and evolving.
- Attend to precision in their mathematical calculations and in their communication.
- Calculate accurately and efficiently and express numerical answers with a degree of precision that is appropriate to the given context.
- Develop precision in their use of mathematical language.
- Look closely to determine patterns and structures within mathematics.
- Make meaningful connections between their knowledge from previous experiences and the content they are currently exploring.
- Develop deep understandings of mathematical concepts such that these understandings become applicable building blocks for future learning.
- Use their mathematical understandings to make generalizations that apply to various mathematical circumstances.
- Identify patterns in mathematics that can be used to solve problems that are challenging relative to their learning comfort zone.
- Use generalizations to increase the efficiency and manageability of their work.

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- Demonstrate growth mindset and grit in effectively approaching ever-rigorous problem solving.
- Apply appropriate strategies with differentiated levels of support.
- Be confident in participating in higher level discussions that will assess and advance the understanding of concepts.
- Learn mathematics through exploring and solving contextual and mathematical problems

V. Links to NEW JERSEY STUDENT LEARNING STANDARDS

- Visual and Performing Arts
- English Language Arts
- Mathematics
- Science
- Social Studies
- Technology
- 21st Century Life and Careers

VI. INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Students with IEPs, 504s, and/or Students at Risk of Failure Students read authentic texts and write authentic pieces at their independent and instructional reading levels. Individualized feedback is provided through conferences and small groups. The teacher utilizes visual and multi-sensory methods of instruction in addition to assistive technology when needed. Students are provided with graphic organizers and other scaffolded material. Modification of content and product may be deemed necessary based on student needs. Students are provided with testing accommodations and authentic assessments.

Gifted & Talented Students Students read authentic texts and write authentic pieces at their independent and instructional reading levels. Individualized feedback is provided to the student through conferences and small groups. Students are engaged through inquiry-based instruction to develop higher-order thinking skills. Activities are developed based on student interests and student goals. Students engage in real-world projects and scenarios.

English Language Learners Students read authentic texts and write authentic pieces at their independent and instructional reading levels. Individualized feedback is provided to students through conferences and small groups. Students are pre-taught vocabulary terms and concepts. Teachers engage students through visual learning, including the use of graphic organizers. Teachers use cognates to increase comprehension. The teacher models tasks and concepts, and pairs students learning English with students who have more advanced English language skills. Scaffolding is provided including word walls, sentence frames, think-pair-share, cooperative learning groups, and teacher think-alouds.

VII. 21ST CENTURY THEMES & SKILLS

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Embedded in many of our units of study and problem based learning projects are the 21st Century Themes as prescribed by the New Jersey Department of Education. These themes are as follows:

- Global Awareness
- Financial, Economic, Business, and Entrepreneurial Literacy
- Civic Literacy
- Health Literacy

VIII. CURRICULUM ADDENDA FOR SPECIAL EDUCATION

This curriculum can be both grade and age appropriate for special education students and serves as a guide for the special education teacher in line with the district's written philosophy of special education, as stated within Policy #6700 concerning Programs for Educationally Disabled Students. Based on the Child Study Team evaluation and consultation with the parent and classroom teacher, an individualized education plan may include modifications to content, instructional procedures, student expectations, and targeted achievement outcomes of this curriculum document in accordance with the identified needs of an eligible student. This educational plan will then become a supplement guide that the classroom teacher, parent, and Child Study Team will use to measure the individual student's performance and achievement.

IV. CURRICULUM ADDENDA FOR ENGLISH LANGUAGE LEARNERS

This curriculum guide is appropriate and is implemented for all students according to age and grade, and is in line with the district's written philosophy of English language acquisition concerning Bilingual Instruction and English as a Second Language Programs. In accordance with the New Jersey Administrative Code 6A:15, the contents herein provide equitable instructional opportunities for English Language Learners to meet the New Jersey Student Learning Standards and to participate in all academic and non-academic courses. Students enrolled in a Bilingual and/or an ESL program may, in consultation with the classroom teacher and Bilingual and/or ESL teacher, receive modification to content, instructional procedures, student expectations and targeted achievement outcomes of this curriculum document in accordance with the students developmental and linguistic needs.

SCOPE AND SEQUENCE

(Pacing Guide)

Unit of Study	Estimated Time
Unit 1 <i>Quotients of Fractions Ratio and Rate Reasoning</i>	12 weeks
Unit 2 <i>Introductory Statistics</i>	4 weeks

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Unit 3 <i>Expressions, Equations, and Geometry</i>	12 weeks
Unit 4 <i>Integers in the Number System</i>	8 weeks

UNIT 1

Unit 1: *Quotients of Fractions, Ratio and Rate Reasoning*

UNIT SUMMARY

In this unit, students will...

Module A:

- fluently divide using the standard algorithm.
- fluently add multi-digit decimals using the standard algorithm.
- fluently subtract multi-digit decimals using the standard algorithm.
- fluently multiply multi-digit decimals using the standard algorithm.
- fluently divide multi-digit decimals using the standard algorithm.
- compute quotients of fractions.
- interpret quotients of fractions.
- create a story context for division.
- solve word problems involving division of fractions.

Module B:

- use ratio language to describe a ratio relationship between two quantities.
- use rate language in the context of a ratio relationship.
- use ratio and rate reasoning to solve real-world and mathematical problems.
- make a table of equivalent ratios relating quantities with whole-number measurements.

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- solve unit rate problems including those involving unit pricing and constant rate.
- find a percent of a quantity as a rate per 100 and solve problems involving finding the whole, given a part or the percent.
- use ratio reasoning to convert measurement units.
- manipulate and transform units appropriately when multiplying or dividing quantities.

NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS

- 6.NS.B.2.** Fluently divide multi-digit numbers using the standard algorithm.
- 6.NS.B.3** Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- 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. *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?*
- 6.RP.A.1.** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *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."*
- 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. *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 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.
- a. 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.
 - b. 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?*
 - c. 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.
 - d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

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INTERDISCIPLINARY CONNECTIONS

New Jersey Student Learning Standards- English Language Arts:

RI.6.1. Cite textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.

RI.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments. **RI.6.3.** Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).

New Jersey Student Learning Standards NJSLS- Science 2020:

MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills (2020)

9.4.8.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

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option

9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal

9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data

9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.

21st CENTURY LIFE AND CAREER STANDARDS

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Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success.

1. Act as a responsible and contributing community member and employee.
2. Attend to financial well-being.
3. Consider the environmental, social and economic impacts of decisions.
4. Demonstrate creativity and innovation.
5. Utilize critical thinking to make sense of problems and persevere in solving them.
6. Model integrity, ethical leadership and effective management.
7. Plan education and career paths aligned to personal goals.
8. Use technology to enhance productivity, increase collaboration and communicate effectively.
9. Work productively in teams while using cultural global competence.

9.1: Personal Financial Literacy

- A. Civic Responsibility
- B. Financial Institutions
- C. Financial Psychology
- D. Planning and Budgeting
- E. Risk Management and Insurance
- F. Civic Financial Responsibility
- G. Credit Profile
- H. Economic and Government Influences
- I. Credit and Debt Management

9.2: Career Awareness, Exploration & Preparation, and Training

- A. Career Awareness (K-2)
- B. Career Awareness and Planning (3-5)
- C. Career Awareness and Planning (6-8)
- D. Career Awareness and Planning (9-12)

9.4 Life Literacies and Key Skills

- A. Creativity and Innovation
- B. Critical Thinking and Problem-solving
- C. Digital Citizenship
- D. Global and Cultural Awareness
- E. Information and Media Literacy
- F. Technology Literacy

9.3: Career and Technical Education

- A. Agriculture
- B. Architecture
- C. Arts,A/V, Technology
- D. Business Management
- E. Education
- F. Finance
- G. Government
- H. Health Science
- I. Hospital & Tourism
- J. Human Services
- K. Information Tech.
- L. Law and Public Safety
- M. Manufacturing
- N. Marketing
- O. Science, Technology, Engineering & Math
- P. Trans./Logistics

TECHNOLOGY STANDARDS

8.1: Computer Science

8.2 Design Thinking

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<p>A. Computing systems B. Networks and the Internet C. Impacts of Computing D. Data & Analysis E. Algorithms & Programming</p>	<p>A. Engineering Design B. Interaction of Technology and Humans C. Nature of Technology D. Effects of Technology on the Natural World E. Ethics & Culture</p>
<p>ENDURING UNDERSTANDINGS</p>	<p>ESSENTIAL QUESTIONS</p>
<ul style="list-style-type: none"> • the proper operations and procedures must be determined in order to solve problems. • the standard algorithm for division of multi-digit numbers • the standard algorithms for addition, subtraction, multiplication, and division of multi-digit decimals • ratios compare two values. • unit rates are a/b given that the ratio is $a:b$, such that $b \neq 0$. • ratio language (the ratio of $a:b$ means that there is a of something for every b of a corresponding item). • a/b is the same as $a:b$ or a to b. • how to relate a percent of a quantity to a rate per 100. • the size of a factor impacts the size of the answer with respect to the other factor. • division by a rational number may result in a quotient whose value is bigger than, equal to, or smaller than the value of the dividend. • multiplication with fractions represents part of a part. 	<ul style="list-style-type: none"> • What type(s) of problems require using multi-digit decimal operations? • Why does one need to compare numbers? • When does one need to use ratios to compare numbers? • How can one compare and contrast numbers? • What is represented by division of a fraction by a fraction? • What type of visual models can be used to represent division of fractions? • How are division and multiplication of a fraction by a fraction related?

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- division of a fraction by a proper fraction creates a larger answer.
- multiplication of a fraction by a proper fraction creates a smaller answer.

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that...

- divide multi-digit numbers using the standard algorithm working towards accuracy and efficiency
- add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation, working towards accuracy and efficiency
- compute quotients of fractions
- interpret quotients of fractions
- solve word problems involving division of fractions by fractions using visual models and equations
- explain the concept of a ratio through definition
- use ratio language to describe a relationship between two quantities
- construct a unit rate (a/b) from a given ratio ($a:b$)
- explain a unit rate (a/b) associated with a ratio ($a:b$)
- express a ratio relationship using rate language
- represent and solve rate and ratio real-world and mathematical problems by using tables, tape diagrams, double number line diagrams, and equations
- create tables of equivalent ratios and find missing values with whole number measurements
- plot pairs of values, in the coordinate plane, from a ratio table to compare ratios
- solve unit rate problems, including unit pricing and constant speed
- find the part, whole, and percent of a quantity in real-world problems
- unit ratios can be used to manipulate and transform units accurately
- convert measurement units utilizing ratio reasoning

SUGGESTED ACTIVITIES

- presentations
- project and problem based learning
- exploration with manipulatives
- tiered lessons
- real world connections
- cooperative learning

EVIDENCE OF LEARNING

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<p>Formative Assessments: Classroom Discussion Exit Slip Checklists Peer Assessment Vocabulary Quizzes Rubrics Participation and teacher observation Mini Whiteboard Responses Think-Pair-Share Concept Map Classroom Poll Nearpod Interactive activities</p>	<p>Summative Assessment: Unit Tests End-of-Book Test NJSLA Test</p>
<p>Benchmark Assessment: iReady Benchmark Unit Benchmarks</p>	<p>Alternative Assessments: Project Portfolio</p>

INSTRUCTIONAL RESOURCES

<p>Core Instructional Resource:</p> <ul style="list-style-type: none"> ● HMH Into Math ● Achieve the Core 	<p>Teacher Created Materials:</p> <p>Nearpod presentations</p>	<p>Supplemental Resources:</p> <ul style="list-style-type: none"> ● Teacher created materials ● Khan Academy ● ● Achieve the Core (coherence map tasks) ● Math Playground ● Fact Monster ● Greg Tang Math ● Grade 6 NJ Digital Item Library
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INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

<p>Special Education: Provide modified notes and access to extra copies online Provide oral reminders and check student work during independent work time Model skills/techniques to be mastered Check and sign assignment planner Preferential seating Pair visual prompts with verbal presentations</p>
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Modified or scaffolded homework and classwork

Extended time as needed

Provide graphic organizers and study guides

English Learners:

Provide scaffolded assignments and assessments

Pair visual prompts with visual presentations

Check and sign assignment planner

Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)

Extended time for assignment and assessment as needed

Highlight key vocabulary

Use graphic organizers

Provide verbal and written directions

Preferential seating with a English-speaking peer

At Risk of Failure:

Check and sign assignment planner

Encourage class participation and reinforce skills

Model skills and assignments

Extended to time to complete class work

Preferential seating

Provide extra help outside of class and 1:1 instruction when needed

Communicate regularly with students' other teachers

Provide positive feedback for tasks well done

Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:

Pose higher-level thinking questions

Provide higher level reading and writing materials for literacy based activities

Probe student to extend thinking beyond the text or connect two or more texts

Provide alternate or project-based assessments and assignments

Students with 504 Plans

Provide extended time as needed

Modify length of writing assignment

Provide short breaks within the lesson

Provide scaffolding for students

Utilize graphic organizers

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UNIT 2

Unit 2: *Introductory Statistics*

UNIT SUMMARY

In this unit, students will...

Module A:

- Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. 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.
- 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.
- 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.
- Construct dot plots, histograms, and box plots

Module B:

- Summarize numerical data by:
 - reporting the number of observations
 - describing the nature of the attribute under investigation, including how it was measured and its units of measurement
 - giving quantitative measures of center (median and/or mean)
 - giving quantitative measures of variability (interquartile range and/or mean absolute deviation)
 - describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered
 - 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

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6.SPA.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *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.*

6.SPA.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.

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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:

- a. Reporting the number of observations.
- b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.
- c. Giving quantitative measures of center (median and/or mean) and variability (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.
- d. 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.

INTERDISCIPLINARY CONNECTIONS

New Jersey Student Learning Standards- English Language Arts:

RI.6.1. Cite textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.

RI.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments. **RI.6.3.** Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).

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MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

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New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills (2020)

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9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option

9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal

9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data

9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.

21st CENTURY LIFE AND CAREER STANDARDS

Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success.

1. Act as a responsible and contributing community member and employee.
2. Attend to financial well-being.
3. Consider the environmental, social and economic impacts of decisions.
4. Demonstrate creativity and innovation.
5. Utilize critical thinking to make sense of problems and persevere in solving them.
6. Model integrity, ethical leadership and effective management.
7. Plan education and career paths aligned to personal goals.
8. Use technology to enhance productivity, increase collaboration and communicate effectively.
9. Work productively in teams while using cultural global competence.

9.1: Personal Financial Literacy	9.2: Career Awareness, Exploration & Preparation, and Training	9.3: Career and Technical Education
J. Civic Responsibility	G. Career Awareness (K-2)	Q. Agriculture
K. Financial Institutions	H. Career Awareness and Planning (3-5)	R. Architecture
L. Financial Psychology	I. Career Awareness and Planning (6-8)	S. Arts,A/V, Technology
M. Planning and Budgeting	J. Career Awareness and Planning (9-12)	T. Business Management
N. Risk Management and Insurance		U. Education
O. Civic Financial Responsibility		V. Finance
P. Credit Profile		W. Government
		X. Health Science
		Y. Hospital & Tourism

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<p>Q. Economic and Government Influences</p> <p>R. Credit and Debt Management</p>	<p>9.4 Life Literacies and Key Skills</p> <p>A. Creativity and Innovation</p> <p>B. Critical Thinking and Problem-solving</p> <p>C. Digital Citizenship</p> <p>D. Global and Cultural Awareness</p> <p>K. Information and Media Literacy</p> <p>L. Technology Literacy</p>	<p>Z. Human Services</p> <p>AA. Information Tech.</p> <p>BB. Law and Public Safety</p> <p>CC. Manufacturing</p> <p>DD. Marketing</p> <p>EE. Science, Technology, Engineering & Math</p> <p>FF. Trans./Logistics</p>
TECHNOLOGY STANDARDS		
<p>8.1: Computer Science</p> <p>A. Computing systems</p> <p>B. Networks and the Internet</p> <p>C. Impacts of Computing</p> <p>D. Data & Analysis</p> <p>E. Algorithms & Programming</p>	<p>8.2 Design Thinking</p> <p>A. Engineering Design</p> <p>B. Interaction of Technology and Humans</p> <p>C. Nature of Technology</p> <p>D. Effects of Technology on the Natural World</p> <p>E. Ethics & Culture</p>	
ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS	
<ul style="list-style-type: none"> • statistical questions anticipate variability • a set of data has a distribution • center and spread are two related but different ways of describing a set of data • that a set of data can be described by its center, spread, and overall shape • how to find the center of a numerical data set • the center summarizes a data set with a single number • the spread is a measure of variation of all values in a data set about the center 	<ul style="list-style-type: none"> • What is a statistical question? • What is a distribution? • What is the difference between the center and the spread of a numerical set? • How are data sets described? • How do measures of center and variability help us make sense of the world around us? • In what contexts are the measures of center and variability preferred descriptions of the data? • Why do we need multiple ways of describing numerical data? 	

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- numerical data can be displayed in multiple ways.
- summaries of numerical data vary based on their contexts.
- overall patterns of numerical data can vary.
- some patterns in numerical data can have striking deviations.
- how to display numerical data using dot plots, histograms, and box plots.
- how to summarize numerical data in multiple ways.
- that the choice of measures of center and variability depends on the context.
- how to identify a striking deviation from the overall pattern.
- real life examples of patterns with, and without, striking deviations.

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that...

- a statistical question is one that anticipates variability in the data related to the question and accounts for it in the answers
- recognize statistical questions
- a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape
- a measure of center (mean and median) for a numerical data set summarizes all of its values with a single number
- a measure of variation (interquartile range and mean absolute deviation) describes how its values vary with a single number
- display numerical data in plots on a number line, including dot plots, histograms, and box plots
- summarize numerical data sets in relation to their context, such as by reporting the number of observations and describing how it was measured and the units for the measurement

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- describe overall patterns and any striking deviations from a data set by giving the measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation) with reference to the context with which the data was collected
- the shape of the data distribution and the context in which the data were gathered can be related to the choice of measures of center and variability

SUGGESTED ACTIVITIES

- presentations
- project and problem based learning
- exploration with manipulatives
- tiered lessons
- real world connections
- cooperative learning

EVIDENCE OF LEARNING

Formative Assessments:

Classroom Discussion
 Exit Slip
 Checklists
 Peer Assessment
 Vocabulary Quizzes
 Rubrics
 Participation and teacher observation
 Mini Whiteboard Responses
 Think-Pair-Share
 Concept Map
 Classroom Poll
 Nearpod Interactive activities

Summative Assessment:

Unit Tests
 End-of-Book Test

 NJSLA Test

Benchmark Assessment:

iReady Benchmark
 Unit Benchmarks

Alternative Assessments:

Project
 Portfolio

INSTRUCTIONAL RESOURCES

Core Instructional Resource:

- HMH Into Math

Leveled Texts:

Supplemental Resources:

- Teacher created materials

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<ul style="list-style-type: none"> ● Achieve the Core 	<p>N/A</p>	<ul style="list-style-type: none"> ● Khan Academy ● ● Achieve the Core (coherence map tasks) ● Math Playground ● Fact Monster ● Greg Tang Math ● Grade 6 NJ Digital Item Library
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INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Special Education:

- Provide modified notes and access to extra copies online
- Provide oral reminders and check student work during independent work time
- Model skills/techniques to be mastered
- Check and sign assignment planner
- Preferential seating
- Pair visual prompts with verbal presentations
- Modified or scaffolded homework and classwork
- Extended time as needed
- Provide graphic organizers and study guides

English Learners:

- Provide scaffolded assignments and assessments
- Pair visual prompts with visual presentations
- Check and sign assignment planner
- Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment and assessment as needed
- Highlight key vocabulary
- Use graphic organizers
- Provide verbal and written directions
- Preferential seating with a English-speaking peer

At Risk of Failure:

- Check and sign assignment planner
- Encourage class participation and reinforce skills
- Model skills and assignments
- Extended to time to complete class work
- Preferential seating
- Provide extra help outside of class and 1:1 instruction when needed
- Communicate regularly with students' other teachers
- Provide positive feedback for tasks well done

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Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:

Pose higher-level thinking questions

Provide higher level reading and writing materials for literacy based activities

Probe student to extend thinking beyond the text or connect two or more texts

Provide alternate or project-based assessments and assignments

Students with 504 Plans

Provide extended time as needed

Modify length of writing assignment

Provide short breaks within the lesson

Provide scaffolding for students

Utilize graphic organizers

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UNIT 3

Unit 3: Expressions, Equations, and Geometry

UNIT SUMMARY

In this unit, students will...

Module A:

- find the greatest common factor of two whole numbers less than or equal to 100
- find the least common multiple of two whole numbers less than or equal to 12.
- use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of the sum of two whole numbers with no common factor. For example, express $36 + 8$ as $4(9 + 2)$.
- write numerical expressions involving whole-number exponents.
- evaluate numerical expressions involving whole-number exponents.
- write expressions in which letters stand for numbers.
- read expressions in which letters stand for numbers.
- evaluate expressions in which letters stand for numbers.
- write expressions that record operations with numbers and with letters standing for numbers.
- identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.
- evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).
- apply the properties of operations to generate equivalent expressions. identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).
- use substitution to determine whether a given number in a specified set makes an equation or inequality true.

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- use variables to represent numbers

Module B:

- solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ for cases in which p , q and x are all nonnegative rational numbers.
- solve real-world and mathematical problems by writing and solving equations of the form $px = q$ for cases in which p , q and x are all nonnegative rational numbers.
- 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.
- use the equation of a relationship between two dependent and independent variables to predict ordered pairs that are not displaced in a given graph or table

Module C:

- find the area of right triangles.
- find the area of triangles.
- find the area of special quadrilaterals.
- find the areas of polygons by composing them into rectangles or decomposing them into triangles
- represent three-dimensional figures using nets
- to find the surface area of a 3-D figure by finding the total area of its 2-D net

NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS

6.EE.A.1. Write and evaluate numerical expressions involving whole-number exponents.

6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.
a. Write expressions that record operations with numbers and with letters standing

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for numbers. *For example, express the calculation "Subtract y from 5" as $5 - y$.*

6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.

b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression $2(8 + 7)$ as a product of two factors; view $(8 + 7)$ as both a single entity and a sum of two terms.*

6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers.

c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = \frac{1}{2}$.*

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. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express $36 + 8$ as $4(9 + 2)$.*

6.EE.A.3 Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.*

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). *For example, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for.*

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.

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.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. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times,*

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and write the equation $d = 65t$ to represent the relationship between distance and time.

- 6.G.A.1** Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.
- 6.G.A.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.
- 6.G.A.2** Find the volume of a right rectangular prism with fractional edge lengths by packing it 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 $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

INTERDISCIPLINARY CONNECTIONS

New Jersey Student Learning Standards- English Language Arts:

RI.6.1. Cite textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.

RI.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments. **RI.6.3.** Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).

New Jersey Student Learning Standards NJSL- Science 2020:

MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills

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(2020)

9.4.8.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

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option

9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal

9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data

9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.

21st CENTURY LIFE AND CAREER STANDARDS

Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success.

1. Act as a responsible and contributing community member and employee.
2. Attend to financial well-being.
3. Consider the environmental, social and economic impacts of decisions.
4. Demonstrate creativity and innovation.
5. Utilize critical thinking to make sense of problems and persevere in solving them.
6. Model integrity, ethical leadership and effective management.
7. Plan education and career paths aligned to personal goals.
8. Use technology to enhance productivity, increase collaboration and communicate effectively.
9. Work productively in teams while using cultural global competence.

<p>9.1: Personal Financial Literacy</p> <p>S. Civic Responsibility</p> <p>T. Financial Institutions</p> <p>U. Financial Psychology</p> <p>V. Planning and Budgeting</p> <p>W. Risk Management and Insurance</p> <p>X. Civic Financial Responsibility</p> <p>Y. Credit Profile</p> <p>Z. Economic and Government</p>	<p>9.2: Career Awareness, Exploration & Preparation, and Training</p> <p>M. Career Awareness (K-2)</p> <p>N. Career Awareness and Planning (3-5)</p> <p>O. Career Awareness and Planning (6-8)</p> <p>P. Career Awareness and Planning (9-12)</p> <p>9.4 Life Literacies and Key Skills</p>	<p>9.3: Career and Technical Education</p> <p>GG. Agriculture</p> <p>HH. Architecture</p> <p>II. Arts,A/V, Technology</p> <p>JJ. Business Management</p> <p>KK. Education</p> <p>LL. Finance</p> <p>MM. Government</p> <p>NN. Health Science</p> <p>OO. Hospital & Tourism</p> <p>PP. Human Services</p> <p>QQ. Information Tech.</p>
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AA. Influences Credit and Debt Management	A. Creativity and Innovation B. Critical Thinking and Problem-solving C. Digital Citizenship D. Global and Cultural Awareness Q. Information and Media Literacy R. Technology Literacy	RR. Law and Public Safety SS. Manufacturing TT. Marketing UU. Science, Technology, Engineering & Math VV. Trans./Logistics
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TECHNOLOGY STANDARDS

8.1: Computer Science

- A. Computing systems
- B. Networks and the Internet
- C. Impacts of Computing
- D. Data & Analysis
- E. Algorithms & Programming

8.2 Design Thinking

- A. Engineering Design
- B. Interaction of Technology and Humans
- C. Nature of Technology
- D. Effects of Technology on the Natural World
- E. Ethics & Culture

ENDURING UNDERSTANDINGS

- the proper operations and procedures must be determined in order to solve problems.
- factors of a (whole) number are always less than or equal to the number itself.
- multiples of a (whole) number are always greater than or equal to the number itself.
- the definition of a factor.
- the process of finding a factor.
- the definition of a multiple.
- the process of finding a multiple.
- how to factor out a number from the sum of two whole numbers
- algebraic expressions have letters that stand for numbers and arithmetic

ESSENTIAL QUESTIONS

- Why would one need to find common factors and multiples?
- In what situation would one want to use the distributive property to add two whole numbers?
- How are mathematical expressions in which letters stand for numbers useful in real life?
- What is the purpose of identifying equivalent expressions?
- What is the difference between an algebraic expression and an arithmetic expression?
- What is the difference between an equation and an inequality?

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<p>expressions have only numbers and no letters.</p> <ul style="list-style-type: none">• numbers can be substituted in place of letters in algebraic expressions• algebraic expressions can be equivalent to each other• area, perimeter, or volume formulas are algebraic expressions• that verbal sentences or expressions can be written as algebraic expressions• the definition of sum, term, product, factor, quotient, coefficient.• how to identify two algebraic expressions that are equivalent .• to apply the conventional order of operations when no parentheses are given.• how to apply the distributive property.• solving an equation or inequality will find the value(s) that will make the statement true.• a variable can represent an unknown number.• a variable can represent any number in a specified set.• that a random number may not make an equation or inequality true.• that a variable in an equation or inequality represents an unknown number.• quantities can change in relation to one another and the relationship can be expressed as an equation relating the two.	<ul style="list-style-type: none">• What does it mean when a number does not satisfy an equation or inequality?• How is a relationship represented in tables?• How is a relationship represented in graphs?• How is a relationship represented in an equation?• How can one tell that there is a relationship between two quantities?• Why is it useful to write an equation to express one quantity in terms of another quantity?• Why would one want to calculate areas of polygons?• How are areas of polygons found?• How are the volume and surface area of a right rectangular prism found?• Why are volumes represented in cubic units?• What is the connection between the net and surface area of 3-D figures?
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- the value of one quantity determines the value of the second quantity.
- two quantities may or may not be related.
- the meaning of a dependent variable.
- the meaning of an independent variable.
- when two quantities are related to each other.
- triangles and rectangles can be used to find areas of other polygons
- a 2-D net of a 3-D figure can be used to find the surface area of the figure
- surface area is related to “wrapping” or “covering” of a surface with square units, i.e. squares with side length of one unit
- volume is related to “filling” of space with cubic units, i.e. cubes with edges of one-unit length
- that areas of triangles, including right triangles, and rectangles can be used to find areas of other polygons, when the other polygons are decomposed into triangles or composed into rectangles
- that the volume of a right rectangular prism is the number of unit cubes it contains (of the appropriate unit fraction edge length)
- the total area of a net of a 3-D figure is the surface area of the figure

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that...

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- write a numerical expression using whole-number exponents
- evaluate numerical expressions involving whole number exponents
- write an algebraic expression from a verbal description that includes operations, numbers, and variables
- identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient)
- view one or more parts of an expression as a single entity
- evaluate expressions, including formulas, for specific values of the variables
- perform arithmetic operations, utilizing the Order of Operations, that include whole number exponents and no parentheses
- find the greatest common factor of two whole numbers that are less than or equal to 100
- find the least common multiple of two whole numbers that are less than or equal to 12
- use the distributive property to factor the greatest common factor from a sum of two whole numbers in the range 1 to 100
- generate equivalent expressions using the properties of operations
- two expressions are equivalent when they name the same number regardless of which value is substituted into them
- identify when two expressions are equivalent
- variables are used to represent unknown numbers, including any number in a specified set
- write expressions using variables to represent real-world or mathematical situations
- determine if a given number from a specified set is a solution to an equation or an inequality using substitution
- write and solve equations of the form $x + p = q$ and $px = q$, where p , q , and x are all nonnegative rational numbers, for real-world and mathematical problems
- two quantities which change in relationship to one another are expressed as independent and dependent variables
- write an equation using two quantities, an independent and a dependent variable, to represent a real-world problem
- analyze the relationship between the dependent and independent variables using graphs and tables and relate them to the equation
- find the area of right triangles and other triangles by composing into rectangles
- find the area of special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and other shapes
- apply the techniques of finding area of polygons by composition or decomposition to solve real-world and mathematical problems
- represent three-dimensional figures made up of rectangles and triangles by using nets

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- use the net to find the surface area of three-dimensional figures made up of rectangles and triangles
- solve real-world and mathematical problems by using nets to find surface area applying net surface area techniques
- we can find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes
- show that volume of a right rectangular prism is the same when multiplying edge lengths or packing it with unit cubes
- find volumes of right rectangular prisms with fractional edge lengths applying the volume formulas $V = lwh$ and $V = Bh$ in real-world or mathematical problems

SUGGESTED ACTIVITIES

- presentations
- project and problem based learning
- exploration with manipulatives
- tiered lessons
- real world connections
- cooperative learning

EVIDENCE OF LEARNING

Formative Assessments:

Classroom Discussion
Exit Slip
Checklists
Peer Assessment
Vocabulary Quizzes
Rubrics
Participation and teacher observation
Mini Whiteboard Responses
Think-Pair-Share
Concept Map
Classroom Poll
Nearpod Interactive activities

Summative Assessment:

Unit Tests
End-of-Book Test

NJSLA Test

Benchmark Assessment:

iReady Benchmark
Unit Benchmarks

Alternative Assessments:

Project
Portfolio

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INSTRUCTIONAL RESOURCES		
<p>Core Instructional Resource:</p> <ul style="list-style-type: none"> ● HMH Into Math ● Achieve the Core 	<p>Leveled Texts:</p> <p>N/A</p>	<p>Supplemental Resources:</p> <ul style="list-style-type: none"> ● Teacher created materials ● Khan Academy ● ● Achieve the Core (coherence map tasks) ● Math Playground ● Fact Monster ● Greg Tang Math ● Grade 6 NJ Digital Item Library
INTEGRATED ACCOMMODATIONS AND MODIFICATIONS		
<p>Special Education: Provide modified notes and access to extra copies online Provide oral reminders and check student work during independent work time Model skills/techniques to be mastered Check and sign assignment planner Preferential seating Pair visual prompts with verbal presentations Modified or scaffolded homework and classwork Extended time as needed Provide graphic organizers and study guides</p> <p>English Learners: Provide scaffolded assignments and assessments Pair visual prompts with visual presentations Check and sign assignment planner Native Language translation (peer, online assistive technology, translation device, bilingual dictionary) Extended time for assignment and assessment as needed Highlight key vocabulary Use graphic organizers Provide verbal and written directions Preferential seating with a English-speaking peer</p> <p>At Risk of Failure: Check and sign assignment planner Encourage class participation and reinforce skills Model skills and assignments Extended to time to complete class work</p>		

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Preferential seating

Provide extra help outside of class and 1:1 instruction when needed

Communicate regularly with students' other teachers

Provide positive feedback for tasks well done

Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:

Pose higher-level thinking questions

Provide higher level reading and writing materials for literacy based activities

Probe student to extend thinking beyond the text or connect two or more texts

Provide alternate or project-based assessments and assignments

Students with 504 Plans

Provide extended time as needed

Modify length of writing assignment

Provide short breaks within the lesson

Provide scaffolding for students

Utilize graphic organizers

UNIT 4

Unit 4: Integers in the Number System

UNIT SUMMARY

In this unit, students will...

Module A

- use positive and negative numbers to represent quantities in real-world contexts.
- explain the meaning of 0 in situations using positive and negative numbers.
- extend number-line diagrams and coordinate axes to represent points on the line and in the plane with negative number coordinates.
- 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.

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- 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.
- 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 .
- 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.
- 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.

Module B:

- solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane.
- find distances between points with the same first coordinate or the same second coordinate, using coordinates and absolute value.

NEW JERSEY STUDENT LEARNING STANDARDS MATHEMATICS

- 6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.
- 6.NS.C.6** Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
- a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite.
- 6.NS.C.7** Understand ordering and absolute value of rational numbers.
- a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.*
 - b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ to express the fact that -3°C is warmer than -7°C .*

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- c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of -30 dollars, write $|-30| = 30$ to describe the size of the debt in dollars.*
- d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance 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.

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.

- c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

6.NS.C.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.

- b. 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.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

INTERDISCIPLINARY CONNECTIONS

New Jersey Student Learning Standards- English Language Arts:

RI.6.1. Cite textual evidence and make relevant connections to support analysis of what the text says explicitly as well as inferences drawn from the text.

RI.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments. **RI.6.3.** Analyze in detail how a key individual, event, or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).

New Jersey Student Learning Standards NJSLS- Science 2020:

MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.

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MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.

MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

New Jersey Student Learning Standards: Career Readiness, Life Literacies and Key Skills (2020)

9.4.8.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

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option

9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal

9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data

9.4.8.TL.1: Construct a spreadsheet in order to analyze multiple data sets, identify relationships, and facilitate data-based decision-making.

21st CENTURY LIFE AND CAREER STANDARDS

Career Readiness, Life Literacies, and Key Skills Practices describe the habits of the mind that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success.

1. Act as a responsible and contributing community member and employee.
2. Attend to financial well-being.
3. Consider the environmental, social and economic impacts of decisions.
4. Demonstrate creativity and innovation.
5. Utilize critical thinking to make sense of problems and persevere in solving them.
6. Model integrity, ethical leadership and effective management.
7. Plan education and career paths aligned to personal goals.
8. Use technology to enhance productivity, increase collaboration and communicate effectively.

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9. Work productively in teams while using cultural global competence.	
<p>9.1: Personal Financial Literacy</p> <p>BB. Civic Responsibility</p> <p>CC. Financial Institutions</p> <p>DD. Financial Psychology</p> <p>EE. Planning and Budgeting</p> <p>FF. Risk Management and Insurance</p> <p>GG. Civic Financial Responsibility</p> <p>HH. Credit Profile</p> <p>II. Economic and Government Influences</p> <p>JJ. Credit and Debt Management</p>	<p>9.2: Career Awareness, Exploration & Preparation, and Training</p> <p>S. Career Awareness (K-2)</p> <p>T. Career Awareness and Planning (3-5)</p> <p>U. Career Awareness and Planning (6-8)</p> <p>V. Career Awareness and Planning (9-12)</p> <p>9.4 Life Literacies and Key Skills</p> <p>A. Creativity and Innovation</p> <p>B. Critical Thinking and Problem-solving</p> <p>C. Digital Citizenship</p> <p>D. Global and Cultural Awareness</p> <p>W. Information and Media Literacy</p> <p>X. Technology Literacy</p>
<p>9.3: Career and Technical Education</p> <p>WW. Agriculture</p> <p>XX. Architecture</p> <p>YY. Arts,A/V, Technology</p> <p>ZZ. Business Management</p> <p>AAA. Education</p> <p>BBB. Finance</p> <p>CCC. Government</p> <p>DDD. Health Science</p> <p>EEE. Hospital & Tourism</p> <p>FFF. Human Services</p> <p>GGG. Information Tech.</p> <p>HHH. Law and Public Safety</p> <p>III. Manufacturing</p> <p>JJJ. Marketing</p> <p>KKK. Science, Technology, Engineering & Math</p> <p>LLL. Trans./Logistics</p>	
<p>TECHNOLOGY STANDARDS</p>	
<p>8.1: Computer Science</p> <p>A. Computing systems</p> <p>B. Networks and the Internet</p> <p>C. Impacts of Computing</p> <p>D. Data & Analysis</p> <p>E. Algorithms & Programming</p>	<p>8.2 Design Thinking</p> <p>A. Engineering Design</p> <p>B. Interaction of Technology and Humans</p> <p>C. Nature of Technology</p> <p>D. Effects of Technology on the Natural World</p> <p>E. Ethics & Culture</p>
<p>ENDURING UNDERSTANDINGS</p>	
<p>•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).</p>	<p>ESSENTIAL QUESTIONS</p> <p>• What are some rational numbers around us?</p> <p>• What are some non-rational numbers around us?</p>

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| <ul style="list-style-type: none">• a rational number is a point on the number line.• rational numbers on the number line are oriented from left to right• rational numbers have an order that exists related to their location on a number line.• the absolute value of a rational number is its distance from 0 on the number line.• the distance from a point on the coordinate system to the origin (0,0) is related to the absolute value of its x-and y-coordinates• 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., $-(-3) = 3$, and that 0 is its own opposite.• signs of numbers in ordered pairs indicate locations in quadrants of the coordinate plane.• that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.• how to find the absolute value of a rational number.• inequalities of the form $x > c$ or $x < c$ have infinitely many solutions.• that solutions of inequalities of form $x > c$ or $x < c$ can be represented as intervals on the number line. | <ul style="list-style-type: none">• How can ordering of rational numbers help to make sense of the world around us?• When is the absolute value of a rational number used in real life?• What is the difference between an equation and an inequality?• What does it mean when a number does not satisfy an equation or inequality? |
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- that while inequalities may have infinitely many solutions, equations have a finite number of solutions.

STUDENT LEARNING OBJECTIVES (Students are learning to / Students are learning that)

Students are learning to/that...

- the signs of an ordered pair indicate its quadrant location in the coordinate plane
- ordered pairs that differ only by signs are reflections across one or both axes
- locate numbers with opposite signs as points on opposite sides of zero on the number line
- the opposite of an opposite of a number is the number itself and that zero is its own opposite
- represent the relative position of two numbers on a number line diagram using inequality statements
- write and interpret statements of order using rational numbers to explain real-world problems
- absolute value of a rational number is its distance from zero on the number line
- express the magnitude of a positive or negative quantity in a real-world situation using absolute value
- statements about order are used to distinguish comparisons of absolute value
- represent a constraint or condition in a real-world or mathematical problem by writing an inequality in the form $x > c$ or $x < c$
- inequalities of the form $x > c$ or $x < c$ have infinitely many solutions
- represent the infinitely many solutions to the inequalities $x > c$ or $x < c$ on a number line diagram
- find and position integers and other rational numbers on a horizontal or vertical number line
- find and plot pairs of integers and other rational numbers on the coordinate plane
- the signs of an ordered pair indicate its quadrant location in the coordinate plane
- ordered pairs that differ only by signs are reflections across one or both axes
- use coordinates and absolute value to find distances between points, with the same first coordinates or same second coordinates, in the four quadrants to solve real-world and mathematical problems
- draw polygons in the coordinate plane given coordinates of the vertices

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- find the length of a side of a polygon using coordinates with the same first coordinate or the same second coordinate
- apply the technique of finding the length of a side of a polygon to solve real-world and mathematical problems in the coordinate plane

SUGGESTED ACTIVITIES

- presentations
- project and problem based learning
- exploration with manipulatives
- tiered lessons
- real world connections
- cooperative learning

EVIDENCE OF LEARNING

Formative Assessments:

Classroom Discussion
Exit Slip
Checklists
Peer Assessment
Vocabulary Quizzes
Rubrics
Participation and teacher observation
Mini Whiteboard Responses
Think-Pair-Share
Concept Map
Classroom Poll
Nearpod Interactive activities

Summative Assessment:

Unit Tests
End-of-Book Test
NJSLA Test

Benchmark Assessment:

iReady Benchmark
Unit Benchmarks

Alternative Assessments:

Project
Portfolio

INSTRUCTIONAL RESOURCES

Core Instructional Resource:

- HMH Into Math

Leveled Texts:

- N/A

Supplemental Resources:

- Teacher created materials

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<ul style="list-style-type: none"> ● Achieve the Core 		<ul style="list-style-type: none"> ● Khan Academy ● ● Achieve the Core (coherence map tasks) ● Math Playground ● Fact Monster ● Greg Tang Math ● Grade 6 NJ Digital Item Library
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INTEGRATED ACCOMMODATIONS AND MODIFICATIONS

Special Education:

- Provide modified notes and access to extra copies online
- Provide oral reminders and check student work during independent work time
- Model skills/techniques to be mastered
- Check and sign assignment planner
- Preferential seating
- Pair visual prompts with verbal presentations
- Modified or scaffolded homework and classwork
- Extended time as needed
- Provide graphic organizers and study guides

English Learners:

- Provide scaffolded assignments and assessments
- Pair visual prompts with visual presentations
- Check and sign assignment planner
- Native Language translation (peer, online assistive technology, translation device, bilingual dictionary)
- Extended time for assignment and assessment as needed
- Highlight key vocabulary
- Use graphic organizers
- Provide verbal and written directions
- Preferential seating with a English-speaking peer

At Risk of Failure:

- Check and sign assignment planner
- Encourage class participation and reinforce skills
- Model skills and assignments
- Extended to time to complete class work
- Preferential seating
- Provide extra help outside of class and 1:1 instruction when needed

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Communicate regularly with students' other teachers

Provide positive feedback for tasks well done

Encourage student to proofread assessments and projects and ask for teacher proofreading of large writing assignments

Gifted and Talented:

Pose higher-level thinking questions

Provide higher level reading and writing materials for literacy based activities

Probe student to extend thinking beyond the text or connect two or more texts

Provide alternate or project-based assessments and assignments

Students with 504 Plans

Provide extended time as needed

Modify length of writing assignment

Provide short breaks within the lesson

Provide scaffolding for students

Utilize graphic organizers