GREEN TOWNSHIP SCHOOL DISTRICT

Content Area: **Mathematics**

Course/Grade Level: **7th Grade**

Curriculum Committee Members: Grade Level Staff Members

Principal:
Jon Paul Bollette

Board Approval Date:
2/18/26

Mission:

A New Jersey education in Mathematics builds quantitatively and analytically literate citizens prepared to meet the demands of college and career, and to engage productively in an information-driven society. All students will have access to a high-quality mathematics education that fosters a population that:

- **leverages data in decision-making and as a lens for discussing, analyzing, and responding to practical questions.**
- **persists to make sense of and model problems arising in everyday life, society, and the workplace.**
- **thinks critically and strategically to assess quantitative relationships and to solutions to complex problems.**
- **employs precise reasoning and constructs viable arguments to deduce conclusions, recognize false statements and assess peers' reasoning.**
- **interprets, evaluates and critiques the mathematics embedded in social, scientific and commercial systems, as well as the claims made in the private and public sectors.**
- **communicates precisely when conveying, representing, and justifying both qualitative and quantitative perspectives.**

Key Performance and Benchmark Tasks/Assessments

Resources for help in creating assessments

Formative assessments:

- Exit Tickets
- Homework
- Sprints
- Mini Quiz

Summative Assessments:

Examples may include:

- Topic/Chapter Quiz
- Unit Test/Assessment
- Culminating Projects

Benchmark Assessments:

- Teacher-created benchmark assessments to be given periodically during the year.

Alternative Assessments:

- Teacher modifies assignments and activities based on student needs.
- Oral assessments administered in place of written when necessary.
- Accommodation and modification ideas may be found here:
    - Modifications & Accommodations Menu
    - *Assessments other than paper & pencil tests See link for more info: http://education.gmu.edu/assets/docs/forms/mirs/assessment_brochure.pdf*

Integrated Accommodations & Modifications

Please utilize the link below for ideas and strategies to use with ***ELL, Students with IEPS & 504s, At-Risk Students and Gifted & Talented Students***.

The attached worksheets can be printed ahead of each unit during the planning phase to help the teacher plan for the needs of particular students in each class, allowing for differentiation per unit and per year. The worksheets contain suggested accommodations and modifications for Content & Material, Student Organization, Instructional Strategies, Assessments, Attention/Focus, Written Language, and Social/Behavioral.
Modifications & Accommodations Menu

Unit 1

Ratios and Proportional Relationships	Pacing: 6 Weeks
Unit Summary:	
Essential Questions: • **How can we tell if a relationship between two quantities is proportional?** • **What does the unit rate tell us about a proportional relationship, and how can we find it in different ways?** • **How do equations and graphs help us explain and solve real-world proportional problems?**	**Enduring Understandings:** Proportional relationships show a constant rate of change between two quantities. The unit rate (constant of proportionality) connects different representations. Graphs and equations help explain real-world proportional situations.

New Jersey Student Learning Standards	Student Learning Objectives	Practices
7.RP.A.2 Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal	Learning Goal 1: Determine if a proportional relationship exists between two quantities e.g. by testing for equivalent ratios in a table or graph on the coordinate plane and observing whether the graph is a straight line through the origin. Learning Goal 2: Identify the constant of proportionality (unit rate) from tables, graphs, equations, diagrams, and verbal descriptions. Learning Goal 3: Write equations to model proportional relationships in real world problems. Learning Goal 4: Use the graph of a proportional	MP1 Make sense of problems and persevere in solving them. MP2 Reason abstractly and quantitatively. MP3 Construct viable arguments and critique the reasoning of others. MP4 Model with mathematics.

descriptions of proportional relationships. NJ.gov and, from the extended progression of 7.RP.A.2 (as included in prerequisite resources): c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn. d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate. **7.EE.B.3 — Solve real-life and mathematical problems using numerical and algebraic expressions and equations.** Solve multistep real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers. **7.EE.B.4 — Solve word problems leading to equations of the form px + q = r and p(x + q) = r.** Apply properties of operations as strategies to solve	relationship to interpret the meaning of any point (x, y) on the graph in terms of the situation - including the points (0, 0) and (1, r), recognizing that r is the unit rate. **Learning Goal 5**: Build conceptual understanding of the constant of proportionality as being a rate that can be represented in a table, graph or equation form. **Learning Goal 6**: Calculate and interpret unit rates of various quantities involving ratios of fractions that contain like and different units. **Learning Goal 7:** Use proportional relationships to solve multistep ratio problems. **Learning Goal 8:** Use ratio and proportion to solve problems involving scale drawings of geometric figures.	MP5 Use appropriate tools strategically. MP6 Attend to precision. MP7 Look for and make use of structure. MP8 Look for and express regularity in repeated reasoning.

real-world and mathematical problems. Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are rational numbers. **Assess the reasonableness of solutions using mental computation and estimation strategies including rounding.** 7.RP.A.3 —.Use proportional relationships to solve multistep ratio and percent problems, including simple interest, tax, markups and markdowns, gratuities and commissions, and fees. 7.G.A.1 — Solve problems involving scale drawings of geometric figures.		

Interdisciplinary Connections
2020 Career Readiness, Life Literacies, and Key Skills **9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).** **9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).**

Unit 1: Core Unit Content	
Vocabulary	***Key Concepts***
❏ Constant of proportionality ❏ Proportional Relationship	❏ Understanding Proportional Relationships using tables and graphs ❏ Working with Proportional Relationships and Apply Proportional

❏ Scale ❏ Scale Drawing ❏ Scale Factor ❏ Unit Rate Triangle ❏ Rate ❏ Ratio ❏ Ratio Relationship ❏ Unit Rate	Reasoning ❏ Comparing Proportational Relationships ❏ Scale Factor application in scale drawings

Unit 1: Instructional Materials & Resources	
	• Chart Paper/Tablet • Colored Pencils • Dry-erase Markers • Highlighters • Grid Paper • Interlocking cubes • Stopwatch • Rulers • Scissors • Markers • Paper • Pencils • Student Whiteboards • Whiteboard Erasers • Scientific Calculators • Sticky Notes • Teacher computer or device • Student chromebooks

Unit 1: Assessments
Formative assessments:

- Exit Tickets
- Homework
- Sprints
- Mini Quiz

Summative Assessments:

- Topic/Chapter Quiz
- Unit Test/Assessment
- Culminating Projects

Alternative Assessments:

- Teacher modifies assignments and activities based on student needs.
- Oral assessments administered in place of written when necessary.
- Accommodation and modification ideas may be found here:
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Unit 1: Accommodations & Modifications

Please utilize the link below for ideas and strategies to use with ELL, Students with IEPS & 504s, At-Risk Students and Gifted & Talented Students. Note possible accommodations or modifications for this unit below.
Modifications & Accommodations Menu

Unit 2

Rational Numbers	**Pacing:6 weeks**
Unit Summary: This unit explores the operations of rational numbers, including addition, subtraction, multiplication, and division, using number lines, absolute value, and properties of operations to understand and solve problems. Students will also convert rational numbers to decimals, interpret their meaning, and apply these skills to real-world mathematical situations.	
Essential Questions: **How do we combine positive and negative numbers, and what does the result tell us in context?** **How can properties of operations and number line reasoning help us calculate with rational numbers efficiently?**	**Enduring Understandings:** **Rational numbers can be added, subtracted, multiplied, and divided using consistent rules.** **Number lines, absolute value, and properties of operations help us understand and simplify calculations with rational numbers.** **Rational numbers can be represented in multiple forms (fractions, decimals) and applied to solve real-world problems.**

New Jersey Student Learning Standards	Student Learning Objectives	Practices
7.NS.A.1 — Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers. 7.NS.A.2 — Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.A.3 — Solve real-world and mathematical**	**Learning Goal 1:** Describe real-world situations in which (positive and negative) rational numbers are combined, emphasizing rational numbers that combine to make 0. Represent sums of rational numbers ($p + q$) on horizontal and vertical number lines, showing that the distance along the number line is $\|q\|$ and including situations in which q is negative and positive. **Learning Goal 2:** Add and subtract (positive and negative)	MP1 Make sense of problems and persevere in solving them. MP2 Reason abstractly and quantitatively. MP3 Construct viable arguments and critique the reasoning of others. MP4 Model with mathematics.

problems involving rational numbers. Solve real-world and mathematical problems involving rational numbers, including converting rational numbers to decimals. Explain why the decimal expansion terminates or repeats. **7.NS.A.1 & 7.NS.A.2 (combined)** — Apply properties of operations as strategies for addition, subtraction, multiplication, and division of rational numbers. **7.NS.A.1 – 7.NS.A.3** Apply addition, subtraction, multiplication, and division of rational numbers to solve mathematical and real-world problems.	rational numbers, showing that the distance between two points on a number line is the absolute value of **Learning Goal 3:** Multiply and divide signed numbers, including rational numbers, and interpret the products and quotients using real-world contexts. **Learning Goal 4:** Convert a rational number to a decimal using long division and explain why the decimal is either a terminating or repeating decimal. **Learning Goal 5:** Apply properties of operations as strategies to add, subtract, multiply, and divide rational numbers. **Learning Goal 6:** Solve mathematical and real-world problems involving addition, subtraction, multiplication, and division of signed rational numbers.	MP5 Use appropriate tools strategically. MP6 Attend to precision. MP7 Look for and make use of structure. MP8 Look for and express regularity in repeated reasoning.

Interdisciplinary Connections

2020 Career Readiness, Life Literacies, and Key Skills

9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).

Unit 2: Core Unit Content

Vocabulary	*Key Concepts*
❏ Additive inverse ❏ Bar notation ❏ Rational Number ❏ Repeating Decimal ❏ Terminating Decimal ❏ Zero Product Property ❏ Absolute Value ❏ Associative Property (of Addition and Multiplication) ❏ Commutative Property (of Addition and Multiplication) ❏ Distributive Property ❏ Equation ❏ Expression ❏ Integer ❏ Inverse ❏ Multiplicative Inverse ❏ Negative ❏ Opposites ❏ Positive ❏ Adjust ❏ Refer	❏ Adding Rational Numbers ❏ Subtracting Rational Numbers ❏ Multiplying Rational Numbers ❏ Dividing Rational Numbers ❏ Write and Solve Numerical Expressions with Rational Numbers

Unit2: Instructional Materials & Resources	
	• Chart Paper/Tablet • Colored Pencils • Dry-erase Markers • Highlighters • Number Cards • Markers • Paper • Pencils • Student Whiteboards • Whiteboard Erasers

	• Scientific Calculators • Sticky Notes • Teacher computer or device • Student chromebooks

Unit 2: Assessments

Formative assessments:

- Exit Tickets
- Homework
- Sprints
- Mini Quiz
- Online assessments

Summative Assessments:

- Topic/Chapter Quiz
- Unit Test/Assessment
- Culminating Projects

Alternative Assessments:

- Teacher modifies assignments and activities based on student needs.
- Oral assessments administered in place of written when necessary.
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Unit 2: Accommodations & Modifications

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accommodations or modifications for this unit below.
Modifications & Accommodations Menu

Unit 3

Expressions & Equations	**Pacing: 6 weeks**
Unit Summary: This unit explores addition, subtraction, multiplication, and division of positive and negative rational numbers, using number lines, absolute value, and properties of operations to understand and solve problems.	
Essential Questions: • **How do the rules for adding, subtracting, multiplying, and dividing signed numbers help us solve problems in context?** • **How can number lines, absolute value, and properties of operations help us reason about rational numbers?** • **Why is it important to represent rational numbers in different forms, and how does this help us solve real-world problems?**	**Enduring Understandings:** **Rational numbers can be added, subtracted, multiplied, and divided using consistent rules that extend our understanding of whole numbers.** **Number lines, absolute value, and properties of operations provide strategies to simplify calculations and understand the relationships between numbers.** **Rational numbers can be represented in multiple forms—fractions, decimals, and ratios—and applied to model and solve real-world problems.**

New Jersey Student Learning Standards	Student Learning Objectives	Practices
7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent sums and differences on a horizontal or vertical number line diagram. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this	**Learning Goal 1:** Apply the properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. **Learning Goal 2:** Rewrite algebraic expressions in equivalent forms to highlight how the quantities in it are related. **Learning Goal 3:** Solve multi-step real life and mathematical problems with rational numbers in any form	MP1 Make sense of problems and persevere in solving them. MP2 Reason abstractly and quantitatively. MP3 Construct viable arguments and critique the reasoning of others. MP4 Model with mathematics.

principle in real-world contexts. 7.NS.A.2 Apply and extend previous understandings of multiplication and division to multiply and divide rational numbers. Interpret products and quotients of rational numbers in real-world contexts. 7.NS.A.3 Solve real-world and mathematical problems involving rational numbers, including converting rational numbers to decimals. Explain why the decimal expansion terminates or repeats. 7.NS.A.1 – 7.NS.A.3 Use addition, subtraction, multiplication, and division of rational numbers to solve real-world and mathematical problems.	(fractions, decimals) by applying properties of operations and converting rational numbers between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies. **Learning Goal 4:** Use variables to represent quantities in a real-world or mathematical problem by constructing simple equations and inequalities to represent problems. **Learning Goal 5:** Fluently solve equations; solve inequalities, graph the solution set of the inequality and interpret the solutions in the context of the problem **Learning Goal 6:** Know the formulas for the area and circumference of a circle and use them to solve problems. Give an informal derivation of the relationship between the circumference and area of a circle. **Learning Goal 7:** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	MP5 Use appropriate tools strategically. MP6 Attend to precision. MP7 Look for and make use of structure. MP8 Look for and express regularity in repeated reasoning.

Interdisciplinary Connections
2020 Career Readiness, Life Literacies, and Key Skills

9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).

Unit 3: Core Unit Content

Vocabulary	*Key Concepts*
❏ Adjacent angles ❏ Angles on a line ❏ Equation ❏ Equivalent Expression ❏ Expression ❏ Factor ❏ Grouping Symbols ❏ Inequality ❏ Like Terms ❏ Linear Pair ❏ Number Sentence ❏ Straight Angles ❏ Term ❏ Variable	❏ Equivalent Expressions ❏ Using the Distributive Property ❏ Adding and Subtracting Expressions ❏ Solving Equations with Unknown Angle Measurements ❏ Solving Equations ❏ Inequalities

Unit 3: Instructional Materials & Resources

	• Chart Paper/Tablet • Colored Pencils • Dry-erase Markers • Highlighters • Scissors

	• Tape • Markers • Paper • Pencils • Student Whiteboards • Whiteboard Erasers • Scientific Calculators • Sticky Notes • Teacher computer or device • Student chromebooks

Unit3: Assessments
Formative assessments: • Exit Tickets • Homework • Sprints • Mini Quiz • Online assessments
Summative Assessments: • Topic/Chapter Quiz • Unit Test/Assessment • Culminating Projects

Alternative Assessments:
• Teacher modifies assignments and activities based on student needs.
• Oral assessments administered in place of written when necessary.
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Unit 3: Accommodations & Modifications
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Unit 4

Percent and Proportional Relationships	**Pacing: 5 weeks:**
Unit Summary: This unit explores how ratios, proportions, and percents can be used to solve real-world problems, including taxes, interest, markups, discounts, and scale drawings. Students will also apply operations with rational numbers in multiple forms, convert between fractions, decimals, and percents, and solve multi-step problems using properties of operations.	
Essential Questions: **How can proportional relationships and percents help us solve real-world problems like taxes, tips, interest, and discounts?** **How do ratios, proportions, and percents help us understand and work with scale drawings and geometric relationships?** **Why is it important to represent rational numbers in different forms and use properties of operations when solving complex, multi-step problems?**	**Enduring Understandings:** **Proportional relationships and percents allow us to model, analyze, and solve real-world problems involving rates, tax, interest, markups, gratuities, and fees.** **Ratios, proportions, and percents are connected to geometry, enabling accurate use of scale drawings and understanding changes in length, area, and other dimensions.** **Rational numbers in multiple forms (fractions, decimals, percents) can be converted and manipulated using properties of operations to solve multi-step real-world and mathematical problems.**

New Jersey Student Learning Standards	Student Learning Objectives	Practices
7.RP.A.3 — Use proportional relationships to solve real-world and mathematical problems. *Use proportional relationships to solve multistep ratio and percent problems, including simple interest, tax,*	**Learning Goal 1:** Solve multi-step ratio and percent problems using proportional relationships (*simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error).*	MP1 Make sense of problems and persevere in solving them. MP2 Reason abstractly and quantitatively.

markups and markdowns, gratuities and commissions, and fees. Solve problems involving percent increase and decrease, including percent error. **7.G.A.1 — Solve problems involving scale drawings of geometric figures.** *Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.* **7.NS.A.1 — Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers.** *Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent sums and differences on a horizontal or vertical number line diagram. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.* **7.NS.A.2 — Apply and extend previous understandings of multiplication and division to multiply and divide rational numbers.** *Apply and extend previous understandings of multiplication and division to multiply and divide rational numbers. Interpret products and quotients of rational numbers in real-world contexts.*	**Learning Goal 2:** Use proportional relationships to solve multistep ratio problems that are related to real world applications. **Learning Goal 3**: Use percent increase and decrease in relation to length and area of scale drawings. **Learning Goal 4:** Reinforce goal from earlier unit: Use ratio and proportion to solve problems involving scale drawings of geometric figures. **Learning Goal 5:** Solve multi-step real life and mathematical problems with rational numbers in any form (fractions, decimals) by applying properties of operations and converting rational numbers between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies.	MP3 Construct viable arguments and critique the reasoning of others. MP4 Model with mathematics. MP5 Use appropriate tools strategically. MP6 Attend to precision. MP7 Look for and make use of structure. MP8 Look for and express regularity in repeated reasoning.

7.NS.A.3 — Solve real-world and mathematical problems involving rational numbers. *Solve real-world and mathematical problems involving rational numbers in any form (fractions, decimals, and percents), including converting between forms as appropriate. Apply properties of operations as strategies to add, subtract, multiply, and divide rational numbers.*		

Interdisciplinary Connections

2020 Career Readiness, Life Literacies, and Key Skills

9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).
9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).

Unit 4: Core Unit Content

Vocabulary	*Key Concepts*
❑ Absolute error ❑ Percent error ❑ Proportion ❑ Absolute value ❑ Associative property of multiplication ❑ Constant of Proportionality ❑ Cross Section	❑ Proportion and Percent ❑ Part of 100 ❑ More or Less than 100% ❑ Applications of Percent

❑ Equation ❑ Percent ❑ Profit ❑ Proportional relationship ❑ Rate ❑ Ratio ❑ Scale drawing ❑ Scale factor ❑ Unit rate	

Unit 4: Instructional Materials & Resources	
	• Chart Paper/Tablet • Colored Pencils • Dry-erase Markers • Highlighters • Scissors • Tape • Markers • Paper • Pencils • Student Whiteboards • Whiteboard Erasers • Scientific Calculators • Sticky Notes • Teacher computer or device • Student chromebooks

Unit 4: Assessments
Formative assessments: • Exit Tickets • Homework

- Sprints
- Mini Quiz
- Online assessments

Summative Assessments:
- Topic/Chapter Quiz
- Unit Test/Assessment
- Culminating Projects

Alternative Assessments:
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Unit 4: Accommodations & Modifications

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Modifications & Accommodations Menu

Unit 5

Statistics & Probability	**Pacing: 5 weeks**
Unit Summary: This unit explores probability and statistics by analyzing chance events, developing and using probability models, and representing compound events through sample spaces and simulations. Students also use random sampling and data displays to compare distributions and make informed inferences about populations.	
Essential Questions: **How can probability models, simulations, and data help us predict and explain chance events?** **Why does the way a sample is selected affect the conclusions we draw about a population?** **How can we use measures of center and variability to compare groups and make meaningful inferences?**	**Enduring Understandings:** **Probability is a way to measure how likely an event is to occur and can be represented with numbers between 0 and 1.** **Data collected from samples can be used to make predictions and inferences about a population.** **Comparing data distributions helps us understand similarities and differences between groups.**

New Jersey Student Learning Standards	Student Learning Objectives	Practices
7.SP.A.1 *Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.* **7.SP.A.2** *Use data from a random sample to draw*	**Learning Goal 1:** Interpret and express the likelihood of a chance event as a number between 0 and 1, relating that the probability of an unlikely event happening is near 0, a likely event is near 1, and 1/2 is neither likely nor unlikely. **Learning Goal 2:** Approximate the probability of a chance event by collecting data and observing long-run relative frequency; predict the approximate relative frequency given the	MP1 Make sense of problems and persevere in solving them. MP2 Reason abstractly and quantitatively. MP3 Construct viable arguments and critique the reasoning of others. MP4 Model with mathematics.

inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. ***7.SP.B.3*** *Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability* ***7.SP.B.4*** *Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.* ***7.SP.C.5*** *Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event* ***7.SP.C.6*** *Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability*	probability **Learning Goal 3:** Develop a uniform probability model by assigning equal probability to all outcomes; develop probability models by observing frequencies and use the models to determine probabilities of events; compare probabilities from a model to observed frequencies and explain sources of discrepancy when agreement is not good **Learning Goal 4:** Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams, identifying the outcomes in the sample space which compose the event. Use the sample space to find the probability of a compound event. **Learning Goal 5:** Design and use a simulation to generate frequencies for compound events. **Learning Goal 6:** Distinguish between representative and non-representative samples of a population (*e.g. if the class had 50% girls and the sample had 10% girls, then that sample was not representative of the population*). **Learning Goal 7:** Use random sampling to produce a representative sample. **Learning Goal 8:** Develop inferences about a population using data from a random sample and assess the variation in estimates after generating multiple samples of the same size. **Learning Goal 9:** Visually compare the means of two	MP5 Use appropriate tools strategically. MP6 Attend to precision. MP7 Look for and make use of structure. MP8 Look for and express regularity in repeated reasoning.

• ***7.SP.C.7.a*** *Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.* • ***7.SP.C.7.b*** *Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process.* ***7.SP.C.8*** *Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.* ***7.SP.C.8.a*** *Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.* ***7.SP.C.8.b*** *Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language, identify the outcomes in the sample space which compose the event.* ***7.SP.C.8.c*** *Design and use a simulation to generate frequencies for compound events*	distributions that have similar variability; express the difference between the centers as a multiple of a measure of variability. **Learning Goal 10:** Draw informal comparative inferences about two populations using their measures of center and measures of variability.	

Interdisciplinary Connections

2020 Career Readiness, Life Literacies, and Key Skills

9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).

Unit 5: Core Unit Content

Vocabulary	*Key Concepts*
❑ Chance experiment ❑ Empirical Probability ❑ Probability ❑ Probability model ❑ Random sample ❑ Event ❑ Outcome ❑ Sample ❑ Population Characteristic ❑ Population Proportion ❑ Sample Proportion ❑ Sample Space ❑ Sample Statistic ❑ Sampling Distribution ❑ Sampling Variability	❑ Calculating and Interpreting Probabilities ❑ Estimating Probabilities ❑ Random Sampling ❑ Comparing Populations

❑ Tree Diagram ❑ Simulation ❑ Theoretical Probability ❑ Categorical data ❑ Data ❑ Data distribution ❑ Decimal ❑ Denominator ❑ Divide ❑ Dot plot ❑ Estimate ❑ Equal ❑ fraction ❑ frequency ❑ histogram ❑ mean ❑ mean absolute deviation ❑ median ❑ numerator ❑ numerical data ❑ observation ❑ percent ❑ range ❑ ratio ❑ relative frequency ❑ round ❑ statistical question ❑ total ❑ value ❑ variability	

Unit 5: Instructional Materials & Resources	
	• Buckets or large cups

	• Calculators • Chips, blue • Chips, red • Coins • Colored pencils, set of 5 colors • Computer with internet access • Dot dice, set of 12 • Dry-erase markers • Grid paper, sheets • Highlighters in two colors • Interlocking cubes, 1 cm • Learn books • Marker • Paper bags • Pencils • Personal whiteboards • Personal whiteboard erasers • Projection device • Small paper clip • Small paper cups • Spinners, transparent, sets of 5 • Tape, transparent roll • Teach book

Unit 5: Assessments

Formative assessments:

- Exit Tickets
- Homework
- Sprints
- Mini Quiz

Summative Assessments:

- Topic/Chapter Quiz
- Unit Test/Assessment
- Culminating Projects

Alternative Assessments:

- Teacher modifies assignments and activities based on student needs.
- Oral assessments administered in place of written when necessary.
- Accommodation and modification ideas may be found here:
    - Modifications & Accommodations Menu
    - *Assessments other than paper & pencil tests See link for more info: http://education.gmu.edu/assets/docs/forms/mirs/assessment_brochure.pdf*

Unit 5: Accommodations & Modifications

Please utilize the link below for ideas and strategies to use with ELL, Students with IEPS & 504s, At-Risk Students and Gifted & Talented Students. Note possible accommodations or modifications for this unit below.
Modifications & Accommodations Menu

Unit 6

Geometry	**Pacing: 6 weeks**
Unit Summary: This unit focuses on using algebraic reasoning to solve problems involving angle relationships and applying geometric tools to construct accurate figures. Students will also analyze two- and three-dimensional shapes, including cross-sections, and solve real-world problems involving area, surface area, and volume.	
Essential Questions: **How can algebraic reasoning help us describe and solve problems involving geometric relationships?** **Why is precision important when constructing geometric figures, and how do different tools support accuracy?** **How do the properties of two- and three-dimensional figures help us analyze shapes and solve real-world measurement problems?**	**Enduring Understandings:** **Geometric relationships can be represented and solved using algebraic equations.** **Precise constructions help model and analyze geometric figures** **Two- and three-dimensional figures are connected through their attributes and measurements.**

New Jersey Student Learning Standards	Student Learning Objectives	Practices
7.G.A.1 *Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.* **7.G.A.2** *Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given*	**Learning Goal 1:** Write and solve ***simple*** multi-step algebraic equations involving supplementary, complementary, vertical, and adjacent angles. **Learning Goal 2:** Use freehand, mechanical (i.e. ruler, protractor) and technological tools to draw geometric shapes with given conditions (e.g. scale factor), focusing on constructing triangles. **Learning Goal 3:** Describe all of the 2-dimensional figures that result when a 3-dimensional figures are sliced	MP1 Make sense of problems and persevere in solving them. MP2 Reason abstractly and quantitatively. MP3 Construct viable arguments and critique the reasoning of others. MP4 Model with mathematics. MP5 Use appropriate tools

conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. **7.G.A.3** *Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.* ***7.G.B.5*** *Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.* ***7.G.B.6*** *Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.*	from multiple angles. **Learning Goal 4:** Reinforce concepts learned in earlier unit: Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	strategically. MP6 Attend to precision. MP7 Look for and make use of structure. MP8 Look for and express regularity in repeated reasoning.

Interdisciplinary Connections

2020 Career Readiness, Life Literacies, and Key Skills

9.4.8.CT.1: Evaluate diverse solutions proposed by a variety of individuals, organizations, and/or agencies to a local or global problem, such as climate change, and use critical thinking skills to predict which one(s) are likely to be effective (e.g., MS-ETS1-2).

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MS-ETS1-4, 6.1.8.CivicsDP.1).

Unit 6: Core Unit Content

Vocabulary	*Key Concepts*
❑ Circle ❑ Circumference ❑ Cross section ❑ Diameter ❑ Faces ❑ Lateral Faces ❑ Pi ❑ Pyramid ❑ Radius ❑ Prism ❑ Right Prism ❑ Right Pyramid ❑ Slant Height ❑ Angle ❑ Area ❑ Base ❑ Circle ❑ Complementary Angles ❑ Composite Area ❑ Composite Figure ❑ Composite Solid ❑ Cube ❑ Edge Length ❑ Figure	❑ Constructing Geometric Figures ❑ Constructing Triangles ❑ Circumference and Area of Circles ❑ Area and Surface Area ❑ Cross Sections and Volume

❑ Kite ❑ Line Segment ❑ Lines ❑ Net ❑ Parallel ❑ Parallelogram ❑ Perimeter ❑ Perpendicular ❑ Plane ❑ Quadrilateral ❑ Raio ❑ Ray ❑ Rectangle ❑ Rhombus ❑ Right Rectangular Prism ❑ Solid ❑ Square ❑ Supplementary Angles ❑ Surface Area ❑ Trapezoid ❑ Triangle ❑ Vertex ❑ Vertical Angles	

Unit 6: Instructional Materials & Resources	
	• Chart Paper/Tablet • Colored Pencils • Dry-erase Markers • Highlighters • Interlocking Cubes • Pens - 3 colors • Rulers • String • Notecards

	• Scissors • Tape • Markers • Paper • Pencils • Student Whiteboards • Whiteboard Erasers • Scientific Calculators • Sticky Notes • Teacher computer or device • Student chromebooks

Unit 6: Assessments
Formative assessments: • Exit Tickets • Homework • Sprints • Mini Quiz
Summative Assessments: • Topic/Chapter Quiz • Unit Test/Assessment • Culminating Projects

Alternative Assessments:
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Unit 7

Integer Exponents & Intro to Functions	**Pacing:4 weeks**
Unit Summary: This unit develops students' understanding of exponents, scientific notation, and volume formulas to represent, compare, and compute with very large and very small numbers in real-world contexts. Students also explore functions by analyzing and comparing multiple representations to classify relationships as linear or non-linear and interpret their key features.	
Essential Questions: **How do exponents and scientific notation help us represent and compute with very large or very small quantities?** **How can formulas and operations be used to model and solve real-world measurement problems?** **How can different representations of functions help us classify, compare, and interpret relationships between quantities?**	**Enduring Understandings:** **Exponents and scientific notation provide efficient ways to represent, compare, and compute with very large and very small numbers.** **Mathematical formulas and operations model real-world quantities and measurements.** **Functions describe relationships where each input has exactly one output.**

New Jersey Student Learning Standards	Student Learning Objectives	Practices
7.EE.A.1 — Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. *(Note: This is the core Expression standard that includes understanding equivalent numerical expressions — extended to support exponent work in instruction.)*	**Learning Goal 1:** Apply the properties of integer exponents to write equivalent numerical expressions; apply formulas to find the volume of a cone, a cylinder, or a sphere when solving real-world and mathematical problems. **Learning Goal 2:** Estimate and express the values of very large or very small numbers with numbers expressed in the form of a single digit times an integer power of 10. Compare numbers expressed in this form, expressing how many times larger or	MP1 Make sense of problems and persevere in solving them. MP2 Reason abstractly and quantitatively. MP3 Construct viable arguments and critique the reasoning of others. MP4 Model with mathematics.

7.EE.B.4 — Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities. *This includes solving equations like px+q=rpx + q = rpx+q=r and laying the groundwork for function thinking by associating input/output structures* *7.G.B.6 — Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.* ***7.EE.A.1** — Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.* ***7.EE.B.4** — Use variables to represent quantities in a real-world or mathematical problem and construct simple equations and inequalities to solve problems by reasoning about the quantities.* ***7.G.B.6** — Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right*	smaller one is than the other. **Learning Goal 3:** Perform operations using numbers expressed in scientific notation, including problems where both decimals and scientific notation are used. In real-world problem-solving situations, choose units of appropriate size for measurement of very small and very large quantities and interpret scientific notation generated when technology has been used for calculations. **Learning Goal 4:** Define a function as a rule that assigns one output to each input and determine if data represented as a graph or in a table is a function. **Learning Goal 5:** Compare two functions each represented in a different way (numerically, verbally, graphically, and algebraically) and draw conclusions about their properties (rate of change and intercepts) **Learning Goal 6:** Classify functions as linear or non-linear by analyzing equations, graphs, and tables of values; interpret the equation $y = mx + b$ as defining a linear function.	MP5 Use appropriate tools strategically. MP6 Attend to precision. MP7 Look for and make use of structure. MP8 Look for and express regularity in repeated reasoning.

prisms.		

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Unit 7: Core Unit Content

Vocabulary	*Key Concepts*
❑ Function ❑ Graph of a function ❑ Increasing linear function ❑ Initial value ❑ Linear function ❑ Rate of change ❑ Exponent ❑ Rate ❑ Ratio ❑ Edge length ❑ Dependent variable ❑ Independent variable ❑ Vertex ❑ Y-intercept ❑ Slope intercept form	❑ Functions ❑ Linear and Nonlinear Functions ❑ Volume ❑ Scientific Notation ❑ Exponents

Unit 7: Instructional Materials & Resources	
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