Califon Public School
Curriculum

Subject: Math	Grade: 7th	Unit #: 1	Pacing: 7 weeks

Unit Title: Rational Number Operations

OVERVIEW OF UNIT:

Students will represent integer operations (addition, subtraction, multiplication, & division) with concrete models and connect the actions with the models to standardized algorithms. The students will use the order of operations to solve multi-step problems involving integers. Additionally, the students will represent and use rational numbers in a variety of forms, including writing rational numbers as decimals. They will add, subtract, multiply, and divide rational numbers fluently.

Big Ideas

- Add and subtract positive and negative integers
- Add and subtract positive and negative rational numbers
- Calculate the sum and difference of two integers using an algorithm
- Apply properties of operations to add and subtract rational numbers
- Solve real-world and mathematical problems involving addition, subtraction, multiplication, and division with rational numbers
- Multiplying and dividing signed numbers
- Apply rules for multiplying signed numbers to problems with three or more signed numbers
- Use properties to simplify calculations
- Convert among forms of rational numbers
- Solve multi-step real-world and mathematical problems involving the strategic use of operations on rational numbers
- Apply a variety of estimation strategies to check the reasonableness of answers to real-world problems

Essential Questions

- How can you use a number line to add and subtract positive and negative integers and rational numbers?
- How can you solve real-world problems involving addition and subtraction of positive and negative integers and or rational numbers?
- How do you calculate the sum and difference of two integers using an algorithm?
- What strategies can be used to apply properties of operations to add and subtract rational numbers?
- How can you solve real-world and mathematical problems involving addition and subtraction with rational numbers?
- What rules are used for multiplying and dividing signed numbers?
- How can you solve real-world problems involving multiplication and division of integers?

- In what ways can you apply the rules for multiplying signed numbers to problems with three or more signed numbers?
- How can you use the properties of operations to simplify calculations?
- How do you convert among forms of rational numbers as needed when solving a problem?
- How can you solve real-world and mathematical problems involving the strategic use of operations on rational numbers?
- How do you apply a variety of estimation strategies to check the reasonableness of answers to real-world problems?

Objectives

- Students will be able to use a number line to add and subtract positive integers.
- Students will be able to use a number line to add or subtract a negative integer and then assess their results for reasonableness.
- Students will be able to use a number line to add and subtract rational numbers.
- Students will be able to calculate the sum of two integers.
- Students will be able to calculate the difference of two integers without using a number line.
- Students will be able to fluently add and subtract rational numbers without a number line.
- Students will be able to use properties to solve multi-step problems involving sums and differences of positive and negative rational numbers.
- Students will be able to develop rules to find the product or quotient of two integers.
- Students will be able to find the product of three or more signed rational numbers.
- Students will be able to express quotients in different forms.
- Students will be able to use products and quotients of rational numbers to solve problems.
- Students will be able to apply properties and strategies to operate with rational numbers.
- Students will be able to use estimation to check the reasonableness of answers when solving multi-step real-world problems.
- Students will be able to solve multi-step problems involving a combination of rational number operations.

Assessment

Formative Assessment:

- Homework Assignments
- Classwork
- Quizzes
- Skill Worksheets
- Class Discussions

Summative Assessment:

- Module Test
- Unit Test
- Performance Task

Benchmark:

- Link It Benchmark Assessment

Alternative:

- Performance Task
- Modified Tests (independently developed by teacher)
- Projects

Key Vocabulary	
• Addition Property of Opposites	• Product
• Additive inverse	• Quotient
• Absolute value	• Associative Property of Multiplication
• Addend	• Rational number
• Mixed number	• Identity Property of Multiplication
• Dividend	• Inverse Property of Multiplication
• Divisor	• Order of operations
• Factor	• Compatible numbers
• Inverse operations	• Distributive Property

Resources & Materials

- Textbook (Into Math Gr. 7)
- Maneuvering the Middle Gr. 7
- Promethean Board
- Calculator
- Teacher-Made Materials
- Guided Notes
- Edpuzzle (www.edpuzzle.com)
- Online Games
- IXL (www.ixl.com/math)
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- HMH Online (https://www.hmhco.com/ui/#/dashboard)
- Desmos (www.desmos.com)
- Online Manipulatives (https://illuminations.nctm.org/)

Technology Infusion

Teacher Technology:

- Chromebook
- Promethean Board
- Edpuzzle
- Google Apps for Education
- Google Classroom

Student Technology:

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- Chromebook
- IXL/Quizzizz/Blooket/Kahoot
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Activities:

- Students will use their Chromebooks to access Google Classroom and Edpuzzle to watch videos about math topics and write out explanations for how practice problems were solved or how the math connects to real-life situations.
- Students will use their Chromebooks to access websites like IXL, Khan Academy, Quizzizz, Blooket, Kahoot, etc. to practice and review the skills learned throughout the unit. They will also track their data to demonstrate progress and growth within specified topics.

Standard	Standard Description
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.

Interdisciplinary Integration

Activities:

- Students will practice using the unit vocabulary as they talk and write about the problems they are solving. Understanding the vocabulary will aid their understanding of the concepts covered in this unit.

Resources:

- Quizlet
- Teacher Vision Cross-Curricular Theme Map - https://www.teachervision.com/teaching-methods/curriculum-planning/7167.html
- Engineering Go For It! - http://teachers.egfi-k12.org/
- US Department of Education STEM - http://www.ed.gov/stem
- What Every Educator Should Know About Using Google by Shell Education
- International Literacy Association Read Write Think - http://www.readwritethink.org/

Standard	Standard Description
NJSLS-ELA W.AW.7.1	Write arguments on discipline-specific content (e.g., social studies, science, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.

21st Century Life Skills Standards

Activities:

- Students will work in groups to collaborate, at times taking leadership roles, to communicate project ideas to the whole class.

Standard	Student Learning Objectives
9.4.8.TL.6	Collaborate to develop and publish work that provides perspectives on a real-world problem.

Careers

Activities:

- Students will discuss and then write detailed explanations utilizing appropriate mathematical vocabulary to explain their thought process for obtaining solutions to specific problems

Practice	Description

Use technology to enhance productivity increase collaboration and communicate effectively.	Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Work productively in teams while using cultural/global competence.	Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.
Utilize critical thinking to make sense of problems and persevere in solving them.	Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of the problem and carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through this when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. Their own actions or the actions of others.

Standards for Mathematical Practice	
MP #	Practice
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
3	Construct viable arguments and critique the reasoning of others.
4	Model with mathematics.
6	Attend to precision.

Standards	
Standard #	**Standard Description**
7.NS.A	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers
7.NS.A.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
7.NS.A.1a	Describe situations in which opposite quantities combine to make 0. For example, in the first round of a game, Maria scored 20 points. In the second round of the same game, she lost 20 points. What is her score at the end of the second round?
7.NS.A.1b	Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
7.NS.A.1c	Understand subtraction of rational numbers as adding the additive inverse, p-q=p+(-q). 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.1d	Apply properties of operations as strategies 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.2a	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1)=1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
7.NS.A.2b	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If q and q are integers, then -(p/q)=((-p))/q=p/((-q)) . Interpret quotients of rational numbers by describing real world contexts.
7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers. (Clarification: Computations with rational numbers extend the rules for manipulating fractions to complex fractions.)
7.EE.B	Solve real-life and mathematical problems using numerical and algebraic expressions and equations
7.EE.B.3	Solve multi-step 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 using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

Differentiation
Students with 504 plans
● Preferential seating ● Guided notes ● Extra time ● Teacher check-ins ● Use graphic organizers ● Redirect attention ● Prioritize tasks ● Small group testing ● Provide modifications & accommodations per individual student's 504 plan
Special Education
● Provide modifications & accommodations as listed in the student's IEP ● Position the student near a helping peer or have quick access to the teacher ● Modify or reduce assignments/tasks

- Reduce the length of the assignment for different modes of delivery
- Increase one-to-one time
- Prioritize tasks
- Use graphic organizers
- Use online resources for skill-building
- Provide teacher notes
- Use collaborative grouping strategies, such as small groups
- NJDOE resources - http://www.state.nj.us/education/specialed/

Response to Intervention (RTI)

- Tiered interventions following the RTI framework
- Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/
- Intervention Central - http://www.interventioncentral.org/

English Language Learners (ELL)

- Provide text-to-speech
- Use of a translation dictionary or software
- Provide graphic organizers
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- Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm

Enrichment

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
- Utilize project-based learning for greater depth of knowledge
- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
- Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied
- NJDOE resources

Califon Public School
Curriculum

Subject:	Grade:	Unit #:	Pacing:
Math	7th	2	8 weeks

Unit Title: Model with Expressions, Equations, and Inequalities

OVERVIEW OF UNIT:

This unit will start off by having students look at how to write linear expressions in different forms. It will then have students adding, subtracting, and factoring linear expressions with Rational coefficients. Next, students work on writing two-step equations to represent real-world problems and write a real-world problem to represent an equation. Then they will learn the process to solve two-step equations. Additionally, they will learn how to write and solve two-step inequalities.

Big Ideas

- Add, subtract, factor, and expand linear expressions
- Rewrite expressions
- Construct simple equations and inequalities
- Write and solve equations to find unknown angles
- Write one- and two-step inequalities
- Solve one- and two-step inequalities
- Graph the solution sets of inequalities

Essential Questions

- How do you add, subtract, factor, and expand linear expressions with rational coefficients?
- How does rewriting expressions help to shed light on a problem, and how the quantities are related?
- How can you construct simple equations and inequalities to solve problems by reasoning about the quantities?
- How can you write and solve equations for an unknown angle in a figure?
- How can you solve one- and two-step inequalities for real-world problems?
- How do you write and solve inequalities in the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers?
- How do you graph the solution sets of inequalities and interpret them in the context of the problem?

Objectives

- Students will be able to use linear expressions to represent a quantity in different ways.
- Students will be able to add, subtract, factor, and expand linear expressions with rational coefficients.
- Students will be able to represent a real-world situation with an equation.
- Students will be able to solve real-world situations using an equation.
- Students will be able to write and solve two-equations involving unknown angle measurements.
- Students will be able to apply properties to solve one-step inequalities.

- Students will be able to write two-step inequalities to represent situations.
- Students will be able to write and solve two-step inequalities to solve problems.

Assessment

Formative Assessment:

- Homework Assignments
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Key Vocabulary

- Associative Property of Addition
- Commutative Property of Addition
- Equilateral triangle
- Greatest common factor
- Like terms
- Term
- Isosceles triangle
- Perimeter
- Division Property of Equality
- Solution of an equation
- Right angle
- Adjacent angles
- Complementary angles
- Supplementary angles
- Vertical angles
- Equivalent
- Inequality
- Solution of an inequality

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Standard	**Student Learning Objectives**
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Standards for Mathematical Practice	
MP #	Practice
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
4	Model with mathematics.
6	Attend to precision.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.

Standards	
Standard #	**Standard Description**
7.EE.A	Use properties of operations to generate equivalent expressions

7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7.EE.B	Solve real-life and mathematical problems using numerical and algebraic expressions and equations
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.EE.B.4a	Solve word problems leading to equations of the form px+q=r and p(x+q)=r, where p, q, and r are specific rational numbers. Solve equations of these forms with accuracy and efficiency. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
7.EE.B.4b	Solve word problems leading to inequalities of the form px+q>r or px+q<r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make and describe the solutions.

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Enrichment

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
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- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
- Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied
- NJDOE resources

Califon Public School
Curriculum

Subject: Math	Grade: 7th	Unit #: 3	Pacing: 7 weeks

Unit Title: Proportional Relationships

OVERVIEW OF UNIT:

Students will calculate unit rates from rates. They will represent constant rates of change given a table, verbal description, equation, or graph. Also, they will determine the constant of proportionality in real-world situations. In addition, the students will be introduced to numerous percent problems including percent increase, percent decrease, percent of change, markup, markdown, sales tax, tips, total cost, and simple interest.

Big Ideas

- Identify the constant of proportionality
- Represent proportional relationships by equations
- Solve problems of length and area using scale drawings
- Percent applications
- Use proportional reasoning to assess the reasonableness of their answers

Essential Questions

- How are tables, graphs, equations, diagrams, and verbal descriptions used to identify the constant of proportionality?
- How are equations used to represent proportional relationships?
- How can you solve problems of length and area using scale drawings?
- How is proportional reasoning used to calculate percent applications?
- How can you use proportional reasoning to assess the reasonableness of their answers?

Objectives

- Students will be able to use patterns and unit rates to analyze and describe relationships.
- Students will be able to determine if a relationship represented in a table is proportional.
- Students will be able to identify the constant of proportionality and write an equation in the form of $y = kx$.
- Students will be able to use unit rates involving fractions to solve real-world problems.
- Students will be able to identify the characteristics of a proportional relationship when graphed.
- Students will be able to use a proportional relationship to solve multi-step problems.
- Students will be able to use scale drawings to solve problems.
- Students will be able to use proportional reasoning to calculate percent increase or decrease.
- Students will be able to calculate markups, markdowns, retail prices, and discount prices.

- Students will be able to represent markups, markdowns, retail prices, and discounts using equation of the form $y = kx$.
- Students will be able to represent taxes, gratuities, and total cost using equations in the form of $y = kx$ by applying proportional reasoning.
- Students will be able to use equations to solve problems and assess reasonableness of their answers.
- Students will be able to use proportional reasoning to find total earnings for someone earning a base salary plus a commission.
- Students will be able to find fees (including fees as percent and as a constant) and assess the reasonableness of their answers.
- Students will be able to use proportional reasoning to calculate simple interest, the total value of an account earning simple interest, and assess the reasonableness of their answers.

Assessment

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Key Vocabulary

- Unit rate
- Equation
- Ratio
- Constant of proportionality
- Proportional relationship
- Reciprocal
- Dimension
- Scale
- Scale drawing
- Percent change
- Percent decrease
- Percent increase
- Cost
- Markdown
- Markup
- Retail price
- Gratuity
- Sales tax
- Tip
- Fee
- Commission
- Commission rate
- Principal
- Simple interest

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Standards for Mathematical Practice	
MP #	Practice
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
4	Model with mathematics.
6	Attend to precision.

Standards	
Standard #	**Standard Description**
7.RP.A	Analyze proportional relationships and use them to solve real-world and mathematical problems
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $(\frac{\frac{1}{2}}{\frac{1}{4}})$ miles per hour, equivalently 2 miles per hour.
7.RP.A.2	Recognize and represent proportional relationships between quantities.
7.RP.A.2a	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.
7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
7.RP.A.2c	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.
7.RP.A.2d	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.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
7.EE.A	Use properties of operations to generate equivalent expressions
7.EE.A.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a+0.05a=1.05a means that “increase by 5%” is the same as “multiply by 1.05.”
7.EE.B	Solve real-life and mathematical problems using numerical and algebraic expressions and equations
7.EE.B.3	Solve multi-step 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 using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her

	salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

Differentiation
Students with 504 plans
• Preferential seating • Guided notes • Extra time • Teacher check-ins • Use graphic organizers • Redirect attention • Prioritize tasks • Small group testing • Provide modifications & accommodations per individual student's 504 plan
Special Education
• Provide modifications & accommodations as listed in the student's IEP • Position the student near a helping peer or have quick access to the teacher • Modify or reduce assignments/tasks • Reduce the length of the assignment for different modes of delivery • Increase one-to-one time • Prioritize tasks • Use graphic organizers • Use online resources for skill-building • Provide teacher notes • Use collaborative grouping strategies, such as small groups • NJDOE resources - http://www.state.nj.us/education/specialed/
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• Tiered interventions following the RTI framework • Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ • Intervention Central - http://www.interventioncentral.org/
English Language Learners (ELL)
• Provide text-to-speech • Use of a translation dictionary or software • Provide graphic organizers • NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm • Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm
Enrichment
• Process should be modified: higher order thinking skills, open-ended thinking, discovery

- Utilize project-based learning for greater depth of knowledge
- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
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- NJDOE resources

Califon Public School
Curriculum

Subject: Math	Grade: 7th	Unit #: 4	Pacing: 7 weeks

Unit Title: Geometry

OVERVIEW OF UNIT:

Students will use ratios to determine if two figures are similar, use similar shapes to find unknown measures, and understand the relationship between different types of angle pairs. Additionally, students will write and solve equations using formulas and geometry concepts, including finding the circumference of a circle, finding the area of a circle, and finding the area of composite figures.

Big Ideas

- Draw and construct circles and other figures
- Analyze how many triangles can be made from given side lengths or angle measures
- Circumference and area of circles
- Cross sections
- Area of composite figures
- Three-dimensional figures
- Volume of three-dimensional figures
- Surface Area of Three-Dimensional Figures

Essential Questions

- How can you draw and construct circles and other figures with given conditions using technology and freehand?
- How do you determine how many, if any, triangles can be made from given side lengths or angle measures?
- How can you use the formulas for circumference to solve problems?
- How can you describe cross sections of circular solids that result in circles, rectangles, and triangles?
- How can you calculate the areas and circumferences of cross sections?
- How can you calculate the area of composite figures?
- How can you solve multi-step real-life and mathematical problems?
- How can you describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and pyramids?
- How can you solve real-world and mathematical problems involving the volume and surface area of three-dimensional objects?

Objectives

- Students will be able to draw and construct circles and other figures using technology and freehand with given conditions.

- Students will be able to determine how many triangles or quadrilaterals can be made given the side lengths (none, one, or many.)
- Students will be able to determine how many triangles can be made given the angle measures (none, one, or many.)
- Students will be able to draw, construct, and analyze two-dimensional figures; to solve real-world problems.
- Students will be able to derive and apply formulas for circumference.
- Students will be able to derive and apply formulas for area of circles.
- Students will be able to describe and analyze cross sections of circular solids that result in circles, rectangles, and triangles.
- Students will be able to use known formulas to calculate the areas of composite figures.
- Students will be able to identify and describe the two-dimensional figures resulting from horizontal and vertical cross sections of pyramids and prisms.
- Students will be able to calculate the surface area of a right prism using the surface area formula.
- Students will be able to calculate the volume of a right prism using the volume formula.
- Students will be able to solve multi-step problems involving three-dimensional figures using formulas for surface area and volume.

Assessment

Formative Assessment:

- Homework Assignments
- Classwork
- Quizzes
- Skill Worksheets
- Class Discussions

Summative Assessment:

- Module Test
- Unit Test
- Performance Task

Benchmark:

- Link It Benchmark Assessment

Alternative:

- Performance Task
- Modified Tests (independently developed by teacher)
- Projects

Key Vocabulary

- Parallel
- Perpendicular
- Diameter
- Radius
- Circumference
- Pi (π)
- Base
- Height
- Cross section
- Plane
- Pyramid
- Rectangular prism
- Vertex
- Net
- Surface area
- Volume

Resources & Materials

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- Maneuvering the Middle Gr. 7
- Promethean Board
- Calculator
- Teacher-Made Materials
- Guided Notes
- Edpuzzle (www.edpuzzle.com)
- Online Games
- IXL (www.ixl.com/math)
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Technology Infusion

Teacher Technology:

- Chromebook
- Promethean Board
- Edpuzzle
- Google Apps for Education
- Google Classroom

Student Technology:

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- Chromebook
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Activities:

- Students will use their Chromebooks to access Google Classroom and Edpuzzle to watch videos about math topics and write out explanations for how practice problems were solved or how the math connects to real-life situations.
- Students will use their Chromebooks to access websites like IXL, Khan Academy, Quizzizz, Blooket, Kahoot, etc. to practice and review the skills learned throughout the unit. They will also track their data to demonstrate progress and growth within specified topics.

Standard	Standard Description
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.

Interdisciplinary Integration

Activities:

- Students will practice using the unit vocabulary as they talk and write about the problems they are solving. Understanding the vocabulary will aid their understanding of the concepts covered in this unit.

Resources:

- Quizlet
- Teacher Vision Cross-Curricular Theme Map - https://www.teachervision.com/teaching-methods/curriculum-planning/7167.html
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Standard	Standard Description
NJSLS-ELA W.AW.7.1	Write arguments on discipline-specific content (e.g., social studies, science, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.

21st Century Life Skills Standards

Activities:

- Students will work in groups to collaborate, at times taking leadership roles, to communicate project ideas to the whole class.

Standard	Student Learning Objectives
9.4.8.TL.6	Collaborate to develop and publish work that provides perspectives on a real-world problem.

Careers

Activities:

- Students will discuss and then write detailed explanations utilizing appropriate mathematical vocabulary to explain their thought process for obtaining solutions to specific problems

Practice	Description
Use technology to enhance productivity increase collaboration and communicate effectively.	Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Work productively in teams while using cultural/global competence.	Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.
Utilize critical thinking to make sense of problems and persevere in solving them.	Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of the problem and carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through this when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. Their own actions or the actions of others.

Standards for Mathematical Practice	
MP #	Practice
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
3	Construct viable arguments and critique the reasoning of others.
4	Model with mathematics.
5	Use appropriate tools strategically.
6	Attend to precision.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.

Standards	
Standard #	**Standard Description**
7.G.A	Draw, construct, and describe geometrical figures and describe the relationships between them
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 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	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume
7.G.B.4	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.
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.

Differentiation
Students with 504 plans
● Preferential seating ● Guided notes ● Extra time

- Teacher check-ins
- Use graphic organizers
- Redirect attention
- Prioritize tasks
- Small group testing
- Provide modifications & accommodations per individual student's 504 plan

Special Education

- Provide modifications & accommodations as listed in the student's IEP
- Position the student near a helping peer or have quick access to the teacher
- Modify or reduce assignments/tasks
- Reduce the length of the assignment for different modes of delivery
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- Tiered interventions following the RTI framework
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English Language Learners (ELL)

- Provide text-to-speech
- Use of a translation dictionary or software
- Provide graphic organizers
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- Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm

Enrichment

- Process should be modified: higher order thinking skills, open-ended thinking, discovery
- Utilize project-based learning for greater depth of knowledge
- Utilize exploratory connections to higher-grade concepts
- Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations
- Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied
- NJDOE resources

Califon Public School
Curriculum

Subject: Math	Grade: 7th	Unit #: 5	Pacing: 5 weeks

Unit Title: Sampling & Data Analysis

OVERVIEW OF UNIT:

The students will learn how to use a sample to gain information about a population using random and nonrandom sampling, make inferences from dot plots and box plots, and use data about a sample and proportional reasoning to make inferences or predictions about a population. Additionally, students will learn how to compare two sets of data displayed in dot plots or two sets of data displayed in box plots.

Big Ideas

- Selecting a representative sample
- Bias in samples
- Making inferences about a population
- Using data from a random sample to make inferences about a population
- Comparing data in dot plots and box plots
- Drawing conclusions based on sample data
- Using measures of center and variability

Essential Questions

- How can you select a representative sample?
- How can you determine if a sample is biased or not?
- How can proportional reasoning be used to make inferences about a population from a random sample?
- How can you use proportional reasoning to make inferences about a population?
- How can data from a random sample be used to draw inferences about a population?
- How can you compare the shapes, centers, and spreads of data displayed in dot plots and box plots?
- What conclusions can be drawn about populations based on sample data displayed in dot plots and box plots?
- How can you use measures of center and variability, including mean absolute deviation, for data from random samples to draw informal comparisons about the populations?

Objectives

- Students will be able to understand populations and random samples.
- Students will be able to select a representative sample.
- Students will be able to use a random sample to make inferences about a population.
- Students will be able to understand that repeatedly sampling a population with the same size random sample will cause the data to vary.

- Students will be able to compare the center and spread of data displayed in dot plots.
- Students will be able to compare data displayed in box plots.
- Students will be able to use comparisons to draw inferences about two populations.
- Students will be able to use means and MADs to compare two populations.

Assessment

Formative Assessment:

- Homework Assignments
- Classwork
- Quizzes
- Skill Worksheets
- Class Discussions

Summative Assessment:

- Module Test
- Unit Test
- Performance Task

Benchmark:

- Link It Benchmark Assessment

Alternative:

- Performance Task
- Modified Tests (independently developed by teacher)
- Projects

Key Vocabulary

- Bias
- Population
- Random sample
- Representative sample
- Sample
- Mean
- Median
- Range
- Interquartile range
- Lower quartile
- Upper quartile
- Mean absolute deviation

Resources & Materials

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Standard	Standard Description
8.1.8.DA.1	Organize and transform data collected using computational tools to make it usable for a specific purpose.

Interdisciplinary Integration

Activities:

- Students will practice using the unit vocabulary as they talk and write about the problems they are solving. Understanding the vocabulary will aid their understanding of the concepts covered in this unit.

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Standard	Standard Description
NJSLS-ELA W.AW.7.1	Write arguments on discipline-specific content (e.g., social studies, science, technical subjects, English/Language Arts) to support claims with clear reasons and relevant evidence.

21st Century Life Skills Standards	
Activities: ● Students will work in groups to collaborate, at times taking leadership roles, to communicate project ideas to the whole class.	
Standard	**Student Learning Objectives**
9.4.8.TL.6	Collaborate to develop and publish work that provides perspectives on a real-world problem.

Careers	
Activities: ● Students will discuss and then write detailed explanations utilizing appropriate mathematical vocabulary to explain their thought process for obtaining solutions to specific problems	
Practice	**Description**
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Standards	
Standard #	**Standard Description**
7.RP.A.2c	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.
7.SP.A	Use random sampling to draw inferences about a population

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 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. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.
7.SP.B	Draw informal comparative inferences about two populations
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. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.
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. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.

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Califon Public School
Curriculum

Subject: Math	Grade: 7th	Unit #: 6	Pacing: 5 weeks

Unit Title: Probability

OVERVIEW OF UNIT:

Students will find the probability of a simple event and its complement, find experimental probabilities of simple and compound events, and use experimental probability to make a prediction. In addition, students will find the theoretical probability of simple and compound events, compare theoretical and experimental probabilities, use theoretical probability to make a prediction, and use technology to conduct different simulations for simple and compound events.

Big Ideas

- Experimental Probability
- Conduct experiments to infer probabilities
- Represent sample spaces
- Design and use simulations for simple and compound events
- Approximating the probability of chance events
- Theoretical Probability
- Comparing probabilities
- Developing a uniform probability model
- Calculating theoretical probabilities
- Design and use simulations to generate frequencies for compound events

Essential Questions

- How can you conduct experiments to infer probabilities and rank outcomes by likelihood?
- How can you represent sample spaces for compound events?
- How can you design and use simulations to generate frequencies for simple and compound events?
- How do you approximate the probability of a chance event by collecting data?
- How do you predict the approximate relative frequence when given the probability?
- How can you compare probabilities from a model to observed frequencies?
- How do you develop a uniform probability model by assigning equal probabilities to all outcomes and then using it to determine probabilities of events?
- How can you calculate the theoretical probabilities of compound events?
- How can you design and use a simulation to generate frequencies for compound events?

Objectives

- Students will be able to describe the likelihood of an event in terms of probability between 0 and 1.
- Students will be able to find the experimental probability of an event.

- Students will be able to determine the probability of compound events.
- Students will be able to use experimental probability and proportional reasoning to make predictions about real-world scenarios.
- Students will be able to find the theoretical probability of simple events.
- Students will be able to compare theoretical probability and experimental probability.
- Students will be able to find and compare theoretical probabilities of compound events using a table, a tree diagram, and an organized list.
- Students will be able to use theoretical probability and proportional reasoning to make a prediction about a simple or compound event and make a qualitative prediction.
- Students will be able to design and perform a simulation to test the probability of a simple event or a compound event.

Assessment

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Summative Assessment:

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Benchmark:

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Alternative:

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Key Vocabulary

- Event
- Experiment
- Outcome
- Probability
- Probability of an event
- Sample space
- Trial
- Complement
- Experimental probability
- Simulation
- Compound event
- Proportion
- Theoretical probability
- Tree diagram

Resources & Materials

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Standard	Standard Description
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Use technology to enhance productivity increase collaboration and communicate effectively.	Students find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Work productively in teams while using cultural/global competence.	Students positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.
Utilize critical thinking to make sense of problems and persevere in solving them.	Students readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of the problem and carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through this when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. Their own actions or the actions of others.

Standards for Mathematical Practice

MP #	Practice
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
4	Model with mathematics.

5	Use appropriate tools strategically.
6	Attend to precision.
7	Look for and make use of structure.

Standards	
Standard #	**Standard Description**
7.SP.C	Investigate chance processes and develop, use, & evaluate probability models
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. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.
7.SP.C.7	Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
7.SP.C.7a	Develop a uniform probability model by assigning equal probability to all outcomes and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.
7.SP.C.7b	Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?
7.SP.C.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
7.SP.C.8a	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.8b	Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.
7.SP.C.8c	Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?

Differentiation
Students with 504 plans
• Preferential seating • Guided notes • Extra time • Teacher check-ins • Use graphic organizers • Redirect attention • Prioritize tasks • Small group testing • Provide modifications & accommodations per individual student's 504 plan
Special Education
• Provide modifications & accommodations as listed in the student's IEP • Position the student near a helping peer or have quick access to the teacher • Modify or reduce assignments/tasks • Reduce the length of the assignment for different modes of delivery • Increase one-to-one time • Use graphic organizers • Use online resources for skill-building • Provide teacher notes • Use collaborative grouping strategies, such as small groups • NJDOE resources - http://www.state.nj.us/education/specialed/
Response to Intervention (RTI)
• Tiered interventions following the RTI framework • Effective RTI strategies for teachers - http://www.specialeducationguide.com/pre-k-12/response-to-intervention/effective-rti-strategies-for-teachers/ • Intervention Central - http://www.interventioncentral.org/
English Language Learners (ELL)
• Provide text-to-speech • Use of a translation dictionary or software • Provide graphic organizers • NJDOE resources - http://www.state.nj.us/education/aps/cccs/ELL.htm • Adapt a Strategy – Adjusting strategies for ESL students - http://www.teachersfirst.com/content/esl/adaptstrat.cfm
Enrichment
• Process should be modified: higher order thinking skills, open-ended thinking, discovery • Utilize project-based learning for greater depth of knowledge • Utilize exploratory connections to higher-grade concepts • Contents should be modified: real-world problems, audiences, deadlines, evaluations, transformations • Learning environments should be modified: student-centered learning, independence, openness, complexity, and groups should be varied