Hainesport Township School District 211 Broad Street Hainesport, NJ 08036



Course Title: Pre-Algebra Math Grade 7 Board of Education Adoption Date: January, 2017 Board of Education Re-adoption Date: 8/28/2018, 1/2/2024

# **District Administration**

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# Members of the Hainesport Township Board of Education

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### **Course Description and Concepts**

<u>PRE-ALGEBRA</u> – This course is offered to 7th grade students who have shown the ability to reason and analyze concepts at high-level of thinking such as synthesizing information. Some concepts taught are: integers, decimals, fractions, solving equations and inequalities, percents, coordinate system, functions and equations, probability, and geometry. Group and hands-on activities are incorporated throughout the year as the teacher facilitates the lessons rather than direct teaching. Pre-Algebra closely follows the Mathematics 8 curriculum. Consequently, those students that participate in Pre-Algebra and subsequently do not meet the prerequisites for Algebra will repeat much of the math curriculum in 8th grade to ensure mastery of these skills.

## Pre-Algebra Placement Criteria

To be considered for Pre-Algebra, students must earn at least 5 out of 8 possible points based upon the following criteria:

CRITERIA		SCORE RANGE	POINTS EARNED
	MATH 6	96-100%	1 point
	FINAL GRADE AVERAGE	Less than 96%	0 points
*Points earned for this criteria based on previous year's placement		96%-100%	2 points
	ADVANCED MATH 6 FINAL CRADE AVERACE	90%-95%	1 point
		Less than 90%	0 points
MATHEMATICS PARCC SCORE		Level 5	2 points
		Level 4	1 point
		Levels 1 - 3	0 points
MATHEMATICS READINESS ASSESSMENT		90-100%	2 points
		80-89%	1 point
		Less than 80%	0 points
		85-100%	2 points

MATHEMATICS BENCHMARK ASSESSMENT SCORE AVERAGE	70-84%	1 point
	Less than 70%	0 points

#### New Jersey Student Learning Standards Math

New Jersey Student Learning Standards for Mathematics

## NJ Technology Standards

**<u>8.1 Educational Technology</u>**: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and create and communicate knowledge.

**8.2 Technology Education, Engineering, Design and Computational Thinking - Programming**: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

#### **Career Ready Practices**

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP3. Attend to personal health and financial well-being.
- CRP4. Communicate clearly and effectively and with reason.
- CRP5. Consider the environmental, social and economic impacts of decisions.
- CRP6. Demonstrate creativity and innovation.
- CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

- CRP11. Use technology to enhance productivity.
- CRP12. Work productively in teams while using cultural global competence.

http://www.state.nj.us/education/cccs/2014/career/CareerReadyPractices.pdf

## Pacing Guide

Unit Topic	Unit #	APX Unit Length
Numbers & Operations	Ι	5 weeks (23 days)
Ratios & Proportions Percents	II	4 weeks (18 days)
Expressions Equations & Inequalities	III	6 Weeks (25.5 days)
Geometry	IV	8 weeks (41 days)

Statistics & Probability	V	2 weeks (10 days)
Graphing Linear Equations	VI	8 weeks (38 days)

Pre-Algebra Math 7 Curriculum Unit 1 (2 Parts)		
Title: Numbers & Operations		
Subject: Pre-Algebra Math 7	Length of Time: 5 weeks (23 days)	
<b>Unit 1 Summary:</b> Unit 1 Part 1 will allow students to further their understanding of the number system. They will explore rational numbers and perform numerous operations using them. They will add, subtract, multiply, and divide rational numbers when solving equations. They will also extend their knowledge of rational numbers to decimals and real world applications. Unit 1 Part 2 will then allow students to evaluate squares and radicals. They will explore how to simplify and approximate square roots to help solve expressions. The chapter will also introduce different properties of exponents and solving equations using them. These skills will be necessary when solving problems involving Pythagorean Theorem or exponential notations.		

Learning Targets			
PARCC Major Clu	PARCC Major Clusters; Supporting Clusters; Additional Clusters		
Standard #s:	Standards:		
7.NS.1	<ul><li>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.</li><li>d. Apply properties of operations as strategies to add and subtract rational numbers.(Part 2)</li></ul>		
7.NS.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. c. Apply properties of operations as strategies to multiply and divide rational numbers (Part 2)		
7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.		
8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., $\pi^2$ ).		
8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$ .		
Technology 8.1.8.D.1	Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media.		
Technology 8.1.8.D.4	Assess the credibility and accuracy of digital content		
Technology 8.2.8.C.1	Explain how different teams/groups can contribute to the overall design of a product.		
Technology 8.2.8.C.2	Explain the need for optimization in a design process.		
Standard#:	Standard:		

MP1	Making 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 strategically.		
MP6	Attend to precision.		
MP7	Look for and make use of structure.		
MP8	Look for and express regularity in repeated reasoning.		
Modifications			
Standards-based grading, reassessments, differentiate assignments, scaffold instruction, study guides, peer/teacher tutoring assistance, tiered assignments, student choice, modify pace, lesson tutorial videos, performance assessments, modified rubrics, assessment modified for IDEA, add enrichment activities, add extension activities to projects, challenge activities			
Interdisciplinary Connections			
Science, Language Arts, and Technology			
Integration of 21st Century Themes and Skills			
<ul> <li>21<sup>st</sup> Century Skills</li> <li>Financial, Economic, Business, and Entrepreneurial Literacy</li> <li>21<sup>st</sup> Century Themes</li> <li>Critical Thinking and Problem Solving</li> <li>Communication and Collaboration</li> </ul>			

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Pre-Algebra Math 7 Curriculum Unit 1 Part 1		
& Operations		
ebra Math 7	Length of Time: 3 weeks (14 days)	
Unit 1 Part 1 Summary: Unit 1 Part 1 will allow students to further their understanding of the number system. They will explore rational numbers and perform numerous operations using them. They will add, subtract, multiply, and divide rational numbers when solving equations. They will also extend their knowledge of rational numbers to decimals and real world applications.		
Learning Targets		
Clusters; Supporting Clusters;		
mber System		
nd extend previous understandings of operations with fractions to	add, subtract, multiply, and divide rational numbers	
ard #s: Standards:		
.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtractio on a horizontal or vertical number line diagram.		
S.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.		
NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.		
ential Question:	Unit 1 Part 1 Enduring Understandings:	
ations affect rational numbers?	• Previous understanding of operations of numbers can be directly	
use rational numbers to solve real world application problems?	applied to rational numbers. • Rational numbers can be used to solve real word problems	
	Unit 1 Part 1         & Operations         ebra Math 7         mmary: Unit 1 Part 1 will allow students to further their understanding ons using them. They will add, subtract, multiply, and divide rational ners to decimals and real world applications.         Learning Targe         Clusters; Supporting Clusters; Additional Clusters         nber System         ad extend previous understandings of operations with fractions to a standards:         Apply and extend previous understandings of addition and subtraction on a horizontal or vertical number line diagram.         Apply and extend previous understandings of multiplication and divide solve real-world and mathematical problems involving the four oper the rules for manipulating fractions to complex fractions.         ential Question:         tions affect rational numbers?         see rational numbers?	

# Unit 1 Part 1 Objectives: Students will be applying their prior knowledge of the number system to problems involving rational numbers. Students will be able to add, subtract, multiply and divide rational numbers. Students will transform rational numbers into decimals. Students will solve real world problems using rational numbers. **Evidence of Learning** Formative Assessments: Questioning strategies used throughout the unit. 5 Quizzes Summative Assessment: Cumulative Assessment **Pacing Guide Topics** Timeframe Topic #1: Addition, Natural Numbers & Whole Numbers 0.5 day Topic #2: Addition, Subtraction and Integers (Absolute Value 1.4 in HM textbook) 1.5 days Lab: RAFT – The Absolutely Valuable Game Ouiz #1 Topic #3: Addition and Subtraction of Integers (1.5 and 1.6 in HM textbook) 2 days Quiz #2 Topic #4: Multiplication and Division of Integers (1.7 in HM textbook) 2 days

Quiz #3	
Topic #5: Operations with Rational Numbers	0.5 day
Topic #6: Addition and Subtraction of Rational Numbers (5.2 and 5.3 in HM textbook) Lab: RAFT – Fraction Action Game	1.5 days
Topic #7: Adding and Subtracting Rational Numbers Review Lab: RAFT – Above and Below Zero Game Lab: RAFT – Graphing Race to the Edge	1 days

Quiz #4	
Topic #8: Multiplication and Division of Rational Numbers (5.4 and 5.5 in HM	2 days
textbook)	
Quiz #5	
Topic #9: Converting Rational Numbers to Decimals (5.1 in HM textbook)	1 days
Review and Cumulative Assessment	2 days
Curriculum Resources:	
<u>https://njctl.org/courses/math/7th-grade/</u>	
http://www.raftbayarea.org/ideas/Fraction%20Action%20Game.pdf	
http://www.raftbayarea.org/ideas/Absolutely%20Valuable%20Game.pdf	
http://www.raftbayarea.org/ideas/Above%20and%20Below%20Zero%20Game.pdf	
HYPERLINK "http://www.raftbayarea.org/ideas/Graphing%20Race%20to%20the%20Edge.pdf"	
http://www.raftbayarea.org/ideas/Graphing%20Race%20to%20the%20Edge.pdf	

Pre-Algebra Math 7 Curriculum Unit 1 Part 2		
Title: Numbers and Operations		
Subject: Pre-Algebra Math 7	Length of Time: 2 weeks (9 days)	
Unit 1 Part 2 Summary: Unit 1 Part 2 will then allow students to evaluate squares and radicals. They will explore how to simplify and approximate square roots to help solve expressions. The chapter will also introduce different properties of exponents and solving equations using them. These skills will be necessary when solving problems involving Pythagorean Theorem or exponential notations.		
Learning Targets		
PARCC Major Clusters; Supporting Clusters; Additional Clusters		

Domain: The Number System			
Cluster: Know that there are numbers that are not rational, and approximate them by rational numbers.			
Standard #s:	Standards:		
8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., $\pi^2$ ).		
Domain: Exp	ressions and Equations		
Cluster: Exp	ressions and Equations work with radicals and	integer exponents.	
Standard #s:	Standards:		
8.EE.1	8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$ .		
Unit 1 Part 2 Essential Question:Unit 1 Part 2 Enduring Understanding:• What is the difference between rational and irrational numbers?• Squares and Radicals can help solve real world problems. • Squares and Radicals affect the numbers that are being used within an operation.			
<ul> <li>Unit 1 Part 2 Objectives:</li> <li>Students will be able to find the squares and square roots of both rational and irrational numbers.</li> <li>Students will know the perfect squares. They will also be able to simplify perfect square radical expressions as well as non-perfect square radicands.</li> <li>Students will use the perfect squares to approximate square roots.</li> <li>Students will understand the properties of exponents and will use them to solve equations with perfect square and cube roots.</li> </ul>			
Evidence of Learning			
Formative Assessments:			

<ul> <li>SMART Response questions used throughout the chapter.</li> <li>3 Quizzes</li> </ul>		
Summative Assessment: • Cumulative Assessment		
Lesson Plan		
Topics	Timeframe	
Presentation Part 1		
Topic #1: Exponents, Squares, Square Roots and Perfect Squares (9.1 in HM textbook) Activity: A Penny for Your Thoughts Quiz #1 (Find by topic)	1 days	
Presentation Part 2		
Topic #2: Squares of Numbers Greater than 20	1 day	
Topic #3: Simplifying Perfect Square Radical Expressions (9.2 in HM textbook) Quiz #2 (Find by topic)	1 day	
Topic #4: Approximating Square Roots (Focus on Operations 9.4 Approximating Rational Numbers in HM textbook) <i>Activity: Root Race</i>	1 day	
Topic #5: Rational & Irrational Numbers Quiz #4	1 day	
Topic #6: Real Numbers	1 day	
Topic #7: Properties of Exponents (4.5 in HM textbook) Activity: Laws of Exponents Quiz #3 (Find by topic)	2 days	
Review and Cumulative Assessment	1 day	

# **Curriculum Development Resources:**

- Textbook and online resources
- <u>http://njctl.org/courses/math/8th-grade-math/</u> HYPERLINK "http://njctl.org/courses/math/8th-grade-math/"

Pre-Algebra Math 7 Curriculum Unit 2 (2 Parts)		
Title: Ratios,	Proportional Relationships, and Percents	
Subject: Pre-A	Subject: Pre-Algebra Math 7       Length of Time: 4 weeks (18 days)	
Unit 2 Summary: Unit 2 Part 1 will give students the opportunity to analyze proportional relationships to solve ratios, proportions, and real-world math problems. Unit 2 Part 2 will introduce students to percents. They will learn the different types of percent problems and how to represent the percent equations algebraically. They will also learn how to solve real world application problems involving percents.		
Learning Targets		
PARCC Major Clusters; Supporting Clusters; Additional Clusters		
Standard#:	Standard:	
7.RP.1	Compute unit rates associated with ratios of fractions, including ratios	of lengths, areas and other quantities measured in like or different units.
7.RP.2	<ul> <li>P.2 Recognize and represent proportional relationships between quantities.</li> <li>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.</li> <li>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</li> </ul>	

	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.RP.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.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.		
7.EE.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.		
7.G.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.		
Technology 8.2.8.C.4	Identify the steps in the design process that would be used to solve a designated problem.		
Technology 8.2.8.C.5a	Create a technical sketch of a product with materials and measurements labeled.		
	Domain: Standards for Math Practice		
Standard#:	Standard:		
MP1	Making 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 strategically		

MP6	Attend to precision.	
MP7	Look for and make use of structure.	
MP8	Look for and express regularity in repeated reasoning.	
Modifications		
Standards-based grading, reassessments, differentiate assignments, scaffold instruction, study guides, peer/teacher tutoring assistance, tiered assignments, student choice, modify pace, lesson tutorial videos, performance assessments, modified rubrics, assessment modified for IDEA, add enrichment activities, add extension activities to projects, challenge activities		
Interdisciplinary Connections		
Science, Language Arts, Social Studies, Art, and Technology		
Integration of 21st Century Themes and Skills		
<ul> <li>21<sup>st</sup> Century S</li> <li>Financial, I</li> <li>21<sup>st</sup> Century T</li> <li>Critical Th</li> <li>Communic</li> <li>Life and C</li> </ul>	kills Economic, Business, and Entrepreneurial Literacy Themes inking and Problem Solving ation and Collaboration areer Skills	

Pre-Algebra Math 7 Unit 2 Part 1	
Title: Ratios & Proportions	

Subject: Pre-A	Algebra Math 7	Length of Time: 2 weeks (10 days)
Unit 2 Part 1 math problems	Unit 2 Part 1 Summary: Unit 2 Part 1 will give students the opportunity to analyze proportional relationships to solve ratios, proportions, and real-world math problems.	
	Learning Targets	
PARCC Ma	jor Clusters; <a>Supporting Clusters;</a> Additional Clusters	
Domain: Ratios and Proportional Relationships		
Cluster: Anal	yze proportional relationships and use them to solve real-world and mathematical	problems.
Standard #:	Standard:	
7.RP.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, area units.	as and other quantities measured in like or different
7.RP.2	<ul> <li>Recognize and represent proportional relationships between quantities.</li> <li>a. Decide whether two quantities are in a proportional relationship, e.g., by testing for coordinate plane and observing whether the graph is a straight line through the origin.</li> <li>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagonal relationships.</li> <li>c. Represent proportional relationships by equations. <i>For example, if total cost t is proconstant price p, the relationship between the total cost and the number of items can be determined.</i></li> <li>d. Explain what a point (<i>x</i>, <i>y</i>) on the graph of a proportional relationship means in term (0, 0) and (1, <i>r</i>) where <i>r</i> is the unit rate.</li> </ul>	requivalent ratios in a table or graphing on a rams, and verbal descriptions of proportional opportional to the number n of items purchased at a be expressed as $t = pn$ . ms of the situation, with special attention to the points
Domain: Geometry		
Cluster: Draw, construct, and describe geometrical figures and describe the relationships between them.		
Standard # :	Standard:	
7.G.1	Solve problems involving scale drawings of geometric figures, including computing a reproducing a scale drawing at a different scale.	actual lengths and areas from a scale drawing and

<ul> <li>Unit 2 Part 1 Essential Questions:</li> <li>How do you recognize and represent proportional relationships between quantities?</li> <li>How do you apply proportions?</li> </ul>	<ul> <li>Unit 2 Part 1 Enduring Understandings:</li> <li>Utilize proportional relationships to solve real-world problems.</li> </ul>	
<ul> <li>Unit 2 Part 1 Objectives:</li> <li>Students will be able to write ratios for various situations.</li> <li>Students will be able to determine if ratios are equivalent as well how to determine and unknown in an equivalent ratio.</li> <li>Students will be able to calculate unit rates to solve word problems.</li> <li>Students will use proportions to solve problems.</li> <li>Students will use proportions to determine the relationship in a table and graph, determine the constant of proportionality, write equations and understand graphs or proportions.</li> <li>Students will use proportions to solve problems involving scale drawings and similar figures.</li> </ul>		
Evidence of Learning		
Formative Assessments:         Questioning strategies used throughout the unit.         7 Quizzes         Summative Assessment:         Question of the Assessment		
Lesson Plan		
Topics	Timeframe	
Topic #1: Writing Ratios (6.1 in 7th HM textbook)       0.5 day		
Topic #2: Equivalent Ratios (6.1 in 7th HM textbook) Quiz #1	0.5 day	
Topic #3: Rates (6.1 in 7th HM textbook)       1 day         Quiz #2       1		
Topic #4: Proportions (6.2 and 6.3 in 7th HM textbook)       1 day		

Quiz #3	
Topic #5: Direct & Indirect Relationships in Tables and Graphs (p.290-291 for tables in 7th HM textbook)	1 day
Topic #6: Constant of Proportionality Quiz #4	1 day
Topic #7: Writing Equations for Proportions (6.2 and 6.3 in 7th HM textbook) Quiz #5	1 day
Topic #8: Understanding Graphs of Proportions	0.5 day
Topic #9: Problem Solving	0.5 day
Topic #10: Scale Drawings (6.6 in 7th HM textbook) Lab: RAFT – Planet Beads Lab: RAFT – Sun and Planets to Scale <b>Quiz #6</b>	1 day
Topic #11: Similar Figures (6.4 & 6.5 in 7th HM textbook) Lab: RAFT – Building it Bigger Quiz #7	1 day
Review and Chapter Test	1 day
Curriculum Resources: • Textbook and online resources • <u>https://njctl.org/courses/math/7th-grade/</u> • <u>http://www.raftbayarea.org/ideas/Planet%20Beads.pdf</u> • <u>http://www.raftbayarea.org/ideas/Sun%20and%20Planets%20to%20Scale.pdf</u> • <u>http://www.raftbayarea.org/ideas/Building%20it%20Bigger.pdf</u>	

Pre-Algebra Math 7

Unit 2 Part 2

Title: Percents

Subject: Pre-Algebra Math 7

What are the different ways percent problems are represented?

Length of Time: 2 weeks (8 days)

Percents can be applied to problems in different ways.

Unit 2 Part 2 Summary: Unit 2 Part 2 will introduce students to percents. They will learn the different types of percent problems and how to represent the percent equations algebraically. They will also learn how to solve real world application problems involving percents.

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	Learning Targets	
PARCC 🗖 Majo	or Clusters; 💶 Supporting Clusters; 📀 Additional Clusters	
Domain: Ratios	s and Proportional Relationships	
Cluster: Analyz	ze proportional relationships and use them to solve real-world and mathema	tical problems.
Standard #:	Standard:	
7.RP.3	Use proportional relationships to solve multistep ratio and percent problems. I gratuities and commissions, fees, percent increase and decrease, percent error.	Examples: simple interest, tax, markups and markdowns,
Domain: Expre	ssions and Equations	
Cluster: Use pr	operties of operations to generate equivalent expressions	
Standard # :	Standard:	
7.EE.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.	
Cluster: Solve	real-life and mathematical problems using numerical and algebraic expressi	ons and equations.
Standard #:	Standard:	
7.EE.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.	
Unit 2 Part 2 <b>B</b>	Essential Question:	Unit 2 Part 2 Enduring Understandings:
• How are percents used to help solve real world application problems?		• Percents are used in real world problems.

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# Unit 2 Part 2 Objectives:

- Students will be able to relate fractions, decimals, and percents to each other.
- Students will solve three different types of percent problems.
- Students will represent percent equations in an algebraic context.
- Students will apply percent of increase and percent of decrease when solving problems.
- Students will use their knowledge of percents to help them solve real world problems.

## **Evidence of Learning**

## Formative Assessments:

- · Questioning strategies used throughout the unit.
- · 3 Quizzes

## Summative Assessment:

· Cumulative Assessment

Pacing Guide	
Topics	Timeframe
Lesson #1:Relating Fractions, Decimals and Percents/ Quiz #1	1 days
(7.1 in 7th HM textbook)	
Lesson #2: Three Types of Percent Problems	2 days
(7.2, 7.3 & 7.4 in 7th HM textbook)	
Lesson #3: Percent of Change/ Quiz #2	1 days
(7.5 in 7th HM textbook)	
Lesson #4: Representing Percent Equations Algebraically	1 days
Lesson #5: Applied Percent of Decrease	0.5 day
(7.6 in 7th HM textbook)	
Lesson #6: Applied Percent of Increase	0.5 day
(7.6 and 7.7 in 7th HM textbook)	
Lesson #7: Real-life Application Problems/ Quiz #3	1 day
(7.6 and 7.7 in 7th HM textbook)	
Review and Cumulative Assessment 1 day	
Curriculum Resources:	
Textbook and online resources	
https://njctl.org/courses/math/7th-grade/	

	Pre-Algebra Math 7 Curriculum Unit 3 (3 Parts)
Title: Expression	ons, Equations, Inequalities, and Scientific Notation
Subject: Pre-Alg	gebra Math 7 Length of Time: 6 Weeks (25.5 days)
Unit 3 Summar given a verbal pl will be able to co properties. Unit a progressing to m notation to stude between scientif	y: Unit 3 Part 1 will introduce students to different properties of expressions. They will be able to combine like terms, write expressions when hrase, and evaluate both numeric and algebraic expressions. Unit 3 Part 2 will introduce students to different properties equations can have. They ombine like terms, solve multi-step equations, and deal with inequalities. Also, they will identify the associative, commutative, and distributive 3 Part 2 also explores linear equations. Students learn to solve equations starting with a review of inverse operations and two-step equations and nore complex equations. Unit 3 Part 2 concludes with using the skills to solve word problems. Unit 3 Part 3 will introduce the concept of scientific ents. It will demonstrate the purpose of scientific notation and how to write numbers using this form. They will be able to convert numbers ic notation and standard form, as well as perform different operations within equations.
	Learning Targets
PARCC 🗖 Majo	or Clusters; 🗖 Supporting Clusters; 🖸 Additional Clusters
Standard #s:	Standards:
7.NS.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. d. Apply properties of operations as strategies to add and subtract rational numbers.(Part 2)
7.NS.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.         c. Apply properties of operations as strategies to multiply and divide rational numbers (Part 2)
7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.
7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7.EE.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.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 linches from each edge: this estimate can be used as a check on the exact computation	
9 EE 7	7 Solve linear equations in one variable	
8.EE./	7. Solve linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of	
	these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x	
	= a, a = a, or a = b results (where a and b are different numbers).	
	b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using	
	the distributive property and collecting like terms.	
	Standards for Math Practice	
Standard#:	Standard:	
MP1	Making 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 strategically.	
MP6	Attend to precision.	
MP7	Look for and make use of structure.	
MP8	Look for and express regularity in repeated reasoning.	
Modifications		
Standards-based grading, reassessments, differentiate assignments, scaffold instruction, study guides, peer/teacher tutoring assistance, tiered assignments, student choice, modify pace, lesson tutorial videos, performance assessments, modified rubrics, assessment modified for IDEA, add enrichment activities, add extension activities to projects, challenge activities		
Interdisciplinary Connections		

Science, Language Arts, and Technology

Integration of 21st Century Themes and Skills		
21 <sup>st</sup> Century S	kills	
· Financia	, Economic, Business, and Entrepreneurial Literacy	
21 <sup>st</sup> Century T	hemes	
· Critical	Thinking and Problem Solving	
· Commur	ication and Collaboration	
• Life and	Career Skills	
	Pre-Algebra Math 7 Curi	iculum
	Unit 3 Part 1	
Title: Express	ions	
Subject: Pre-A	lgebra Math 7	Length of Time: 1 week (4.5 days)
Unit 3 Part 1 S when given a v	<b>ummary:</b> Unit 3 Part 1 will introduce students to different properties of experbal phrase, and evaluate both numeric and algebraic expressions.	pressions. They will be able to combine like terms, write expressions
	Learning Targets	
PARCC Ma	or Clusters; 🗖 Supporting Clusters; ᅌ Additional Clusters	
Domain: Num	ber System	
Cluster: Apply	and extend previous understandings of operations with fractions.	
Standard #:	Standard:	
7.NS.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.2	<ul> <li>Apply and extend previous understandings of multiplication and division to multiply and divide rational numbers.</li> <li>c. Apply properties of operations as strategies to multiply and divide rational numbers</li> </ul>	

7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.		
Cluster: Use p	roperties of operations to generate equivale	nt expressions	
Standard #:	Standard:		
7.EE.1	Apply properties of operations as strategies t	o add, subtract, factor, and expand linear expressions with rational coefficients.	
7.EE.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."		
Cluster: Solve	real-life and mathematical problems using	numerical and algebraic expressions and equations.	
Standard #s:	Standards:		
7.EE.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.		
<ul> <li>Unit 3 Part 1 Essential Questions:</li> <li>What is a numeric expression &amp; how is it evaluated?</li> <li>What is an algebraic expression &amp; how is it simplified?</li> <li>How is an algebraic expression evaluated?</li> </ul>		<ul> <li>Unit 3 Part 1 Enduring Understandings:</li> <li>A numeric expression is an expression of numbers and operations. When evaluating them, there is a specific order, called the order of operations.</li> <li>An algebraic expression is an expression that contains both numbers and variables that is simplified using the distributive property and combining like terms.</li> <li>An algebraic expression is evaluated using substitution followed by the order of operations.</li> </ul>	
Unit 3 Part 1 Objectives:			

- Students will identify constants, coefficients, and variables in an algebraic expression.
- Students will evaluate a numerical expression using the correct order of operations.
- Students will use the distributive property to simplify algebraic expressions.
- Students will learn to simplify algebraic expressions by combine like terms.
- Students will translate verbal phrases into mathematical and algebraic expressions.
- Students will evaluate algebraic expressions when each variable is assigned a value using substitution and the order of operations.

## **Evidence of Learning**

#### **Formative Assessments:**

- · Questioning strategies used throughout the unit.
- · 3 Quizzes

## Summative Assessment:

· Cumulative Assessment

Pacing Guide		
Topics	Timeframe	
Topic #1: Mathematical Expressions (1.1 in HM textbook)	0.25 day	
Topic #2: Order of Operations (1.3 in HM textbook) Quiz #1	0.25 day	
Topic #3: The Distributive Property (2.2 in HM textbook)	1 day	
Topic #4: Combining Like Terms (2.3 in HM textbook) Lab – Comparing Cards Lab – Ordering Combo Meals <b>Quiz #2</b>	1 day	

Topic #5: Translating Words into Expressions (1.1 and 2.4 in HM text book)	0.5 day	
Topic #6: Evaluating Expressions #Quiz 3	0.5 day	
Review and Cumulative Assessment	1 day	
Curriculum Resources:		

HYPERLINK "https://njctl.org/courses/math/7th-grade/" https://njctl.org/courses/math/7th-grade/

## Pre-Algebra Math 7 Curriculum Unit 3 Part 2 Plan

**Title:** Solving Equations & Inequalities

Subject: Pre-Algebra Math 7

**Length of Time:** 4 Weeks (16.5 days)

Unit 3 Part 2 Summary: Unit 3 Part 2 will introduce students to different properties equations can have. They will be able to combine like terms, solve multi-step equations, and deal with inequalities. Also, they will identify the associative, commutative, and distributive properties. Unit 3 Part 2 also explores linear equations. Students learn to solve equations starting with a review of inverse operations and two-step equations and progressing to more complex equations. Unit 3 Part 2 concludes with using the skills to solve word problems.

#### **Learning Targets**

PARCC Major Clusters; Supporting Clusters; O Additional Clusters

#### **Domain: Expressions and Equations**

Cluster: Use properties of operations to generate equivalent expressions

Standard #s Standard:

7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	
7.EE.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."	
Cluster: Solve	real-life and mathematical problems using numerical and algebraic expressions and equations.	
Standard #s:	Standards:	
7.EE.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.	
7.EE.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. a. 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 fluently. 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? b. 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	
Domain: Expressions & Equations		
Cluster: Analyze and solve linear equations and pairs of simultaneous linear equations.		

8.EE.7	EE.7 7. Solve linear equations in one variable.			
	a. Give examples of linear equations in one variable with	one solution, infinitely many solutions, or no solutions. Show which of these		
	possibilities is the case by successively transforming the given of	equation into simpler forms, until an equivalent equation of the form $x = a$ , $a =$		
	a, or a = b results (where a and b are different numbers).			
	b. Solve linear equations with rational number coefficient	ts, including equations whose solutions require expanding expressions using the		
	distributive property and collecting like terms.			
Unit 3 Part 2 E	Essential Questions:	Unit 3 Part 2 Enduring Understandings:		
• How are ed	quations solved?	Equations can be solved using different properties.		
· What are d	lifferent properties of equations and how can they help solve	Sometimes there is more than one step to solve in an equation.		
them?		Inequalities are used when solving for real life application problems		
· What happ	ens when two sides of an equation are not equal?	• How to solve an equation in one variable for that variable		
• How can th	he value of an unknown variable be found?	· How to translate word problems into an equation		
	How to translate word problems into an equation.			
Unit 3 Part 2 C	Objectives:			
· Students	• Students will examine commutative and associative properties of different equations.			
· Students	• Students will combine like terms within an equation and learn to use the distributive property to solve equations.			
· Students	will solve multi-step equations involving different techniques.			
· Students	• Students will graph and solve inequalities involving addition, subtraction, multiplication, and division.			
· Students wi	ill be able to solve multiple-step equations.	-		
· Students wi	• Students will be able to solve equations that contain fractions.			
· Students wi	Students will be able to solve equations that contain the same variable on both sides of the equation.			
· Students wi	• Students will be able to simplify and compare algebraic expressions that contain the same variable			
· Students wi	• Students will be able to and translate word problems into equations and solve them			
Students will be able to and translate word problems into equations and solve them.				
Evidence of Learning				
Formative Assessments:				

·	Questioning	strategies	used	throughout	the uni	it.
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· 8 Quizzes

## Summative Assessment:

· Cumulative Assessment

Pacing Guide		
Topics	Timeframe	
Topic #1: Equations & Identities	0.5 day	
Topic #2: Solving an Equation for a Variable Quiz #1	1.5 days	
Topic #3: One Step Equations (2.5 and 2.6 in HM textbook)	1 day	
Topic #4: Two Step Equations (Combine 7th and 8th) (3.1 in HM textbook) Lab: RAFT – Shape up with Algebra (7th) Quiz #2	1 days	
Topic #5: Multi-Step Equations (Combine 7th and 8th) (3.2 in HM textbook) Lab: RAFT – Modeling Simple Equations (7th) Quiz #3 - Multi-Step Equations (8th)	1 days	
Topic #6: Distributing Fractions in Equations (5.6 in HM textbook)	1 day	
Topic #7 Solving Equations that Contain Fractions (8th) Quiz #4 (7th) (5.6 in HM textbook)	1 day	
Topic #8: Equations with the Same Variable on Both Sides (8th)(3.3 in HM text book)	1 day	
Topic #9: Comparing Expressions with the Same Variable (8th)	1 day	

Quiz #5 – Equations with the Same Variable on Both Sides (8th)		
Topic #10: Writing & Solving Algebraic Equations (Combine 7th and 8th) Lab: RAFT – Dive into Square Pools (7th) <b>Quiz #6</b>	2 days	
Topic #11: Graphing & Writing Inequalities with One Variable Quiz #7 (3.4 and 3.5 in HM text book)	2 days	
Topic #12: Simple Inequalities Involving Addition & Subtraction (3.4 in HM textbook)	1 day	
Topic #13: Simple Inequalities involving Multiplication & Division (3.5 in HM textbook) Lab: Multiplying or Dividing by a Negative Number Quiz #8	1 days	
Review and Cumulative Assessment	1.5 days	
Curriculum Resources: <ul> <li>https://njctl.org/courses/math/7th-grade/</li> <li>http://www.raftbayarea.org/ideas/Shape%20Up%20with%20Algebra.pdf</li> <li>http://www.raftbayarea.org/ideas/Modeling%20Simple%20Equations.pdf</li> <li>http://www.raftbayarea.org/ideas/Dive%20into%20Square%20Pools.pdf</li> <li>http://njctl.org/courses/math/8th-grade-math/</li> <li>http://www.raftbayarea.org/ideas/Occasions%20for%20an%20Equation.pdf HYPERLINK</li> <li>"http://www.raftbayarea.org/ideas/Dive%20into%20Square%20Pools.pdf"</li> </ul>		

Pre-Algebra Math 7 Curriculum Unit 3 Part 3		
Fitle: Scientific Notation		
Subject: Pre-Algebra Math 7 (NJCTL 8th)	Length of Time: 1 week (4.5 days)	

Unit 3 Part 3 Summary: Unit 3 Part 3 will introduce the concept of scientific notation to students. It will demonstrate the purpose of scientific notation and how to
write numbers using this form. They will be able to convert numbers between scientific notation and standard form, as well as perform different operations within
equations.

Learning Targets PARCC 📕 Major Clusters; 💶 Supporting Clusters; 🔾 Additional Clusters **Domain: Expressions & Equations** Cluster: Expressions and equations work with radicals and integer exponents. S Standards: Use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret Escientific notation that has been generated by technology.

Unit Spart 3 Executing Question.       Scientific notation up, Ordermann, G.         • How will scientific notation vell help demonstrate very large and very small numbers when solving real world application problems?         • How is scientific notation?       Scientific notation will help demonstrate very large and very small numbers when solving real world application problems?         • How numbers are compared and manipulated using scientific notation?       Numbers can be represented in scientific notation and still be manipulated using operations such as addition, subtraction, multiplication, and division.         • Students will express numbers using scientific notation.       Students will scientific notation?         • Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.         • Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.         • Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.         • Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.         • Questioning strategies used throughout the unit.         • Suizzes         • Cumulative Assessment:         • Cumulative Assessment         • Cumulative Assessment         • Cumulative Assessment         • Cumulative Assessment         • Cumulative Aspecientific Notation <th>Unit 2 Dant 2 Eccontial On action</th> <th>Unit 3 Part 3 Enduring Understanding.</th> <th></th>	Unit 2 Dant 2 Eccontial On action	Unit 3 Part 3 Enduring Understanding.				
How will scientific notation help when writing numbers and equations?     How is scientific notation used in real world application problems?     Numbers can be represented in scientific notation and still be manipulated using operations such as addition, subtraction, multiplication, and division.     Numbers can be represented in scientific notation and still be manipulated using operations such as addition, subtraction, multiplication, and division.     Students will express numbers using scientific notation.     Students will express numbers using scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction and standard form.     Quizzes     Summative Assessment:     Cumulative Assessment:     Topic #1: Purpose of Scientific Notation and Standard Form (4.7 in HM textbook)     0.25 day     Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)     0.5 day     Quiz #4     Topic #3: Comparing Numbers in Scientific Notation     Topic #3: Comparing Numbers in Scientific Notation     Topic #3: Comparing Numbers in Scientific Notation	Unit 5 Part 5 Essential Question:	Unit 5 Fart 5 Enduring Understanding: Scientific notation will help demonstrate very large and very small numbers when solving real world				
within numbers and equations?       • Mow is scientific notation used in real world application problems?         • How numbers are compared and manipulated using scientific notation?       Sumbers can be represented in scientific notation and still be manipulated using operations such as addition, subtraction, multiplication, and division.         Unit 3 Part 3 Objectives:       • Students will express numbers using scientific notation.         • Students will recognize the difference between scientific notation and standard form.       • Students will solve equations with addition, subtraction, and division using numbers in scientific notation.         • Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.       • Students will solve equations with addition, subtraction, and division using numbers in scientific notation.         • Questioning strategies used throughout the unit.       • 5 Quizzes         Summative Assessment:       • Cumulative Assessment:         • Cumulative Assessment:       • Cumulative Assessment         Topic #1: Purpose of Scientific Notation [4.7 in HM textbook]       0.25 day         Topic #3: How to convert between scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Topic #3: How to convert between scientific Notation and Standard Form (4.7 in HM textbook)       0.5 day         Topic #3: How to convert between scientific Notation and Standard Form (4.7 in HM textbook)       0.5 day         Topic #3: Magnitude       0.5 day	How will scientific notation help	application problems				
How is scientific notation used in real world application problems?     How numbers are compared and manipulated using scientific notation?     Unit 3 Part 3 Objectives:     Students will express numbers using scientific notation.     Students will ecognize the difference between scientific notation and standard form.     Students will recognize the difference between scientific notation, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication and standard form.     Students will solve equations with addition subtraction multiplication and standard form.     Students will express summers     Quizzes     Summative Assessment:     Cumulative Assessment     Topics Timeframe     Topic #1: Purpose of Scientific Notation [4.7 in HM textbook]     Quiz #1     Topic #2: How to write Numbers in Scientific Notation and Standard Form (4.7 in HM textbook]     Quiz #3     Topic #4: Magnitude	when writing numbers and equations?	• Numbers can be represented in scientific	c notation and still be manipulated using operations such as			
real world application problems?       Intervention and problems?         How numbers are compared and manipulated using scientific notation?       Intervention and problems?         Unit 3 Part 3 Objectives:       Students will express numbers using scientific notation and standard form.         Students will recognize the difference between different numbers written in scientific notation.       Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.         Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.       Evidence of Learning         Formative Assessment:       Questioning strategies used throughout the unit.       5 Quizzes         Summative Assessment:       Cumulative Assessment:       Iday         ·       Cumulative Assessment:       Iday         Iday: RAFT - One in a Million Quiz #1       Iday       Quiz #1         Topic #1: Purpose of Scientific Notation (4.7 in HM textbook)       0.25 day       0.25 day         Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day       0.25 day         Topic #3: Magnitude       0.5 day       0.5 day       0.25 day       0.5 day         Topic #3: How to convert between Scientific Notation       I day       0.5 day       0.5 day       0.5 day       0.5 day       0.5 day       0.5 day </td <td>How is scientific notation used in</td> <td>addition, subtraction, multiplication, and divisio</td> <td>n.</td>	How is scientific notation used in	addition, subtraction, multiplication, and divisio	n.			
How numbers are compared and manipulated using scientific notation?  Unit 3 Part 3 Objectives:     Students will express numbers using scientific notation and standard form.     Students will express numbers between scientific notation and standard form.     Students will solve equations with addition, subtraction, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction gravity and division using numbers in Scientific Notation (4.7 in HM textbook)     Ouz #1 Topic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)     Ouz 5 day     Ouz #4 Topic #3: How to convert between Scientific Notation (4.7 in HM textbook)     Ouz 5 day     Ouz #3 Topic #4: Magnitude     Out #4	real world application problems?					
manputated using scientific notation?         Unit 3 Part 3 Objectives:         • Students will express numbers using scientific notation.         • Students will distinguish the difference between scientific notation and standard form.         • Students will object equations with addition, subtraction, multiplication, and division using numbers in scientific notation.         • Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.         • Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.         • Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.         • Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.         • Questioning strategies used throughout the unit.         • 5 Quizzes         Summative Assessment:         • Cumulative Assessment         • Cumulative Assessment         Inpic #1: Purpose of Scientific Notation         1 day         0uiz #1         Topic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)         0.25 day         0pic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)         0.5 day         0uiz #3         Topic #4: Magnitude       0.5	How numbers are compared and					
Unit 3 Part 3 Objectives: <ul> <li>Students will express numbers using scientific notation.</li> <li>Students will recognize the difference between scientific notation and standard form.</li> <li>Students will objectives:</li> <li>Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.</li> </ul> Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation. <ul> <li>Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.</li> <li>Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.</li> </ul> <ul> <li>Questioning strategies used throughout the unit.</li> <li>S Quizzes</li> </ul> Summative Assessment: <ul> <li>Cumulative Assessment:</li> <li>Cumulative Assessment</li> <li>I day</li> </ul> <li>Dive #1: Purpose of Scientific Notation (4.7 in HM textbook)</li> <li>O.25 day</li> <li>Ouiz #3: How to convert between Scientific N</li>	manipulated using scientific notation?					
Students will express numbers using scientific notation.     Students will ecognize the difference between scientific notation and standard form.     Students will distinguish the difference between different numbers written in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation     Students will solve equations with addition and Standard Form (4.7 in HM textbook)     O.25 day     Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)     O.25 day     Topic #4: Magnitude     O.5 day     Topic #3: How to convert between Scientific Notation     Topic #4: Magnitude     O.5 day	Unit 3 Part 3 Objectives:					
Students will recognize the difference between scientific notation and standard form.     Students will distinguish the difference between different numbers written in scientific notation.     Students will distinguish the difference between different numbers written in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction, and division using numbers in scientific notation.     Students will solve equations with addition, subtraction gravity and division using numbers in scientific Notation     Pacing Guide     Topics     Timeframe     Topic #1: Purpose of Scientific Notation (4.7 in HM textbook)     O.25 day     O.25 day     Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)     Quiz #1     Topic #4: Magnitude     O.5 day     Ouiz #3     Topic #5: Comparing Numbers in Scientific Notation     I day	Students will express numbers using s	cientific notation.				
Students will distinguish the difference between different numbers written in scientific notation.     Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.      Evidence of Learning  Formative Assessments:     Questioning strategies used throughout the unit.     SQuizzes  Summative Assessment:     Cumulative Assessment     Cumulative Assessment     Ouiz #1     Topic #1: Purpose of Scientific Notation     (4.7 in HM textbook)     O.25 day     Ouiz #2     Topic #3: How to convert between Scientific Notation (4.7 in HM textbook)     O.25 day     Ouiz #3     Topic #1: Magnitude     Ouiz #4     Ouiz #4	• Students will recognize the difference	between scientific notation and standard form.				
Students will solve equations with addition, subtraction, multiplication, and division using numbers in scientific notation.      Evidence of Learning  Formative Assessments:     Questioning strategies used throughout the unit.     S Quizzes  Summative Assessment:     Cumulative Assessment     Cumulative Assessment     Cumulative Assessment     Outive Assessment	· Students will distinguish the differenc	e between different numbers written in scientific nota	ation.			
Evidence of Learning         Formative Assessments: <ul> <li>Questioning strategies used throughout the unit.</li> <li>S Quizzes</li> </ul> <li>Summative Assessment:             <ul> <li>Cumulative Assessment:</li> <li>Cumulative Assessment</li> </ul> </li> <li>Cumulative Assessment:         <ul> <li>Cumulative Assessment:</li> <li>Cumulative Assessment</li> </ul> </li> <li>Topics</li> <li>Timeframe</li> <li>Tage of Scientific Notation</li> <li>Lab: RAFT – One in a Million</li> <li>Quiz #1</li> <li>Topic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)</li> <li>0.25 day</li> <li>Quiz #2</li> <li>Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)</li> <li>Quiz #2</li> <li>Topic #4: Magnitude</li> <li>Quiz #3</li> <li>Topic #3: Comparing Numbers in Scientific Notation</li> <li>I day</li>	· Students will solve equations with add	lition, subtraction, multiplication, and division using	numbers in scientific notation.			
Formative Assessments:         ·       Questioning strategies used throughout the unit.         ·       5 Quizzes         Summative Assessment:         ·       Cumulative Assessment         ·       Topic #1: Purpose of Scientific Notation (4.7 in HM textbook)       0.25 day         Ouiz #1       Ouiz #2       Ouiz #3       Ouiz #4         Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Ouiz #4       Ouiz #4       Ouiz #4 <th></th> <th>Evidence of Learning</th> <th></th>		Evidence of Learning				
· Questioning strategies used throughout the unit.         · S Quizzes         Summative Assessment:         · Cumulative Assessment	Formative Assessments:					
S Quizzes         Summative Assessment:         Cumulative Assessment         Pacing Guide         Topics       Timeframe         Topic #1: Purpose of Scientific Notation       1 day         Lab: RAFT – One in a Million       0.25 day         Quiz #1       0.25 day         Topic #3: How to convert between Scientific Notation (4.7 in HM textbook)       0.25 day         Quiz #2       0.5 day         Topic #3:       Output for the scientific Notation         Topic #3:       Output for the scientific Notation         Topic #3:       Output for the scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Quiz #3       0.5 day       0.5 day         Topic #5:       Comparing Numbers in Scientific Notation       1 day	· Questioning strategies used through	ghout the unit.				
Summative Assessment:         Cumulative Assessment:         Pacing Guide         Topics         Timeframe         Topic #1: Purpose of Scientific Notation         Lab: RAFT – One in a Million         Quiz #1         Topic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)       0.25 day         Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Quiz #2       0.5 day         Topic #3:       0.5 day         Quiz #3       1 day         Topic #5: Comparing Numbers in Scientific Notation       1 day	· 5 Quizzes	-				
Cumulative Assessment         Pacing Guide         Topic Guide         Topic #1: Purpose of Scientific Notation       1 day         Lab: RAFT – One in a Million       1 day         Quiz #1       0.25 day         Topic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)       0.25 day         Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Quiz #2       0         Topic #4: Magnitude       0.5 day         Quiz #3       1 day         Topic #5: Comparing Numbers in Scientific Notation       1 day	Summative Assessment:					
Pacing GuideTopicsTimeframeTopic #1: Purpose of Scientific Notation Lab: RAFT – One in a Million1 dayQuiz #11Topic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)0.25 dayTopic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)0.25 dayQuiz #20Topic #4: Magnitude0.5 dayQuiz #30Topic #5: Comparing Numbers in Scientific Notation1 dayQuiz #41 day	· Cumulative Assessment					
TopicsTimeframeTopic #1: Purpose of Scientific Notation Lab: RAFT – One in a Million Quiz #11 dayTopic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)0.25 dayTopic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)0.25 dayQuiz #20.5 dayTopic #4: Magnitude0.5 dayQuiz #31 dayTopic #5: Comparing Numbers in Scientific Notation1 day		Pacing Guide				
Topic #1: Purpose of Scientific Notation       1 day         Lab: RAFT – One in a Million       1         Quiz #1       0.25 day         Topic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)       0.25 day         Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Quiz #2       0.5 day         Topic #4: Magnitude       0.5 day         Quiz #3       1 day         Topic #5: Comparing Numbers in Scientific Notation       1 day	Topics Timeframe					
Lab: RAFT - One in a Million       Quiz #1         Topic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)       0.25 day         Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Quiz #2       0.5 day         Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Quiz #2       0.5 day         Topic #5: Comparing Numbers in Scientific Notation       1 day         Quiz #4       1 day	Topic #1: Purpose of Scientific Notation		1 day			
Quiz #1       Image: Constraint of the second standard form (4.7 in HM textbook)         Topic #2: How to Write Numbers in Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Quiz #2       0.5 day         Topic #4: Magnitude       0.5 day         Quiz #3       1 day         Quiz #4       0.5 day	Lab: RAFT – One in a Million	Lab: RAFT – One in a Million				
Topic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)       0.25 day         Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Quiz #2       0.5 day         Topic #4: Magnitude       0.5 day         Quiz #3       1 day         Topic #5: Comparing Numbers in Scientific Notation       1 day	Quiz #1					
Topic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)       0.25 day         Quiz #2       0.5 day         Topic #4: Magnitude       0.5 day         Quiz #3       1 day         Topic #5: Comparing Numbers in Scientific Notation       1 day	Topic #2: How to Write Numbers in Scientific Notation (4.7 in HM textbook)       0.25 day					
Quiz #2       0.5 day         Topic #4: Magnitude       0.5 day         Quiz #3       1 day         Topic #5: Comparing Numbers in Scientific Notation       1 day         Quiz #4       1 day	Fopic #3: How to convert between Scientific Notation and Standard Form (4.7 in HM textbook)0.25 day					
Opic #4: Magnitude     0.5 day       Quiz #3	Quiz #2 Tania #4: Magnituda		0.5 day			
Topic #5: Comparing Numbers in Scientific Notation 1 day Quiz #4	Ouiz #3	Topic #4: Magnitude     0.5 day       Oniz #3     0.5 day				
Quiz #4	Topic #5: Comparing Numbers in Scientific N	otation	1 dav			
	Quiz #4					

Topic #6: Multiply and Divide with Scientific Notation (Focus on Operations 4.7 Operations in       0.5 day         Scientific Notation in HM textbook)       0.5 day		
Topic #7: Addition and Subtraction with Scientific Notation (Focus on Operations 4.7 Operations in Scientific Notation in HM textbook) Quiz #5	0.5 day	
Review and Cumulative Assessment	1 day	
Curriculum Development Resources:		
Textbook and online resources		
https://njctl.org/courses/math/8th-grade-math/		
http://www.raftbayarea.org/ideas/One%20in%20a%20Million.pdf HYPERLINK "http://www.raftba	ayarea.org/ideas/One%20in%20a%20Million.pdf"	
Pre-Algebra Math 7 Curriculum Unit 4 (5 Parts)		
Title: 2D and 3D Geometry		
Subject: Pre-Algebra Math 7         Length of Time: 8 weeks (41 days)		
<b>Unit 4 Summary:</b> Unit 4 Part 1 will have students determining if a triangle can be created using the given conditions. Students will also create some simple geometric constructions. In Unit 4 part 2, students will be able to use models to show their understanding of congruent and similar figures. Unit 4 Part 3 will allow students to solve for area and perimeter of different 2D geometrical shapes. They will calculate the area of rectangles, parallelograms, triangles, trapezoids, circles, irregular figures, and shaded figures. They will also explore special pairs of angles and the relationships they hold. Unit 4 Part 4 will introduce students to different properties of 3D figures. They will be able to compute the surface area of 3D figures, as well as their volume. This part will also provide problems of how 3D figures are found in everyday life. Unit 4 Part 5 will provide a deeper understanding of the Pythagorean Theorem and its converse for students. They will apply the theorem to problems involving right triangles that model real world problems. They will also find distances and midpoints between two points.		
Learning Targets		
PARCC Major Clusters; Supporting Clusters; Additional Clusters		
Standard#: Standard:		
8 G 1 Verify experimentally the properties of rotations, reflections, and translations;		

	<ul><li>a. Lines are taken to lines, and line segments to line segments of the same length.</li><li>b. Angles are taken to angles of the same measure.</li><li>c. Parallel lines are taken to parallel lines.</li></ul>
8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
8.G.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
8.G.4	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.
8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. <i>For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.</i>
8.G.6	Explain a proof of the Pythagorean Theorem and its converse.
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
7.G.2	Draw (freehand, with ruler and protractor, and with technology) 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.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.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.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.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.	
7.EE.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.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.	
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	
Technology 8.2.8.A.4	Redesign an existing product that impacts the environment to lessen its impact (s) on the environment.	
Technology 8.2.8.A.5	Describe how resources such as material, energy, information, time, tools, people, and capital contribute to a technological product or system.	
Technology 8.2.8.C.5.a	Create a technical sketch of a product with materials and measurements labeled.	
Technology 8.2.8.C.8	Develop a proposal for a chosen solution that include models (physical, graphical, or mathematical) to communicate the solution to peers.	
Technology 8.2.8.D.1	Design and create a product that addresses a real world problem using a design process under specific constraints.	
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.	
Modifications		

Standards-based grading, reassessments, differentiate assignments, scaffold instruction, study guides, peer/teacher tutoring assistance, tiered assignments, student choice, modify pace, lesson tutorial videos, performance assessments, modified rubrics, assessment modified for IDEA, add enrichment activities, add extension activities to projects, challenge activities

## **Interdisciplinary Connections**

Science, Language Arts, and Technology

## **Integration of 21st Century Themes and Skills**

## 21<sup>st</sup> Century Skills

• Financial, Economic, Business, and Entrepreneurial Literacy

## 21<sup>st</sup> Century Themes

- Critical Thinking and Problem Solving
- Communication and Collaboration
- Life and Career Skills

Pre-Algebra Math 7 Curriculum	
Title: Drawing Geometric Figures	
Subject: Pre-Algebra Math 7	Length of Time: 1 week (4 days)
Unit 4 Part 1 Summary: Unit 4 Part 1 will have students determining if a triangle can be created us simple geometric constructions.	ing the given conditions. Students will also create some
Learning Targets	
PARCC  Major Clusters; Supporting Clusters; O Additional Clusters	
Domain: Geometry	

elationships between them.
eometric shapes with given conditions. Focus on constructing triangles from stermine a unique triangle, more than one triangle, or no triangle.
Unit 4 Part 1 Enduring Understandings:
· Geometric figures can be drawn based on given conditions.
and with technology.
earning
uide
Timeframe
2 days
2 days

Pre-Algebra Math 7 Curriculum Unit 4 Part 2

Title: 2D Geometry (1	from 8th)	
Subject: Pre-Algebra Math 7       Length of Time: 2 weeks (9 days)		Length of Time: 2 weeks (9 days)
Unit 4 Part 2 Summa	ry: In Unit 4 part 2, students will be able to use models to show their understanding of cong	gruent and similar figures.
	Learning Targets	
PARCC Major Clust	ters; Supporting Clusters; O Additional Clusters	
Domain: Geometry		
Cluster: Understand co	ongruence and similarity using physical models, transparencies, or geometry software.	
Standard #s:	Standards:	
8.G.1	<ul><li>Verify experimentally the properties of rotations, reflections, and translations:</li><li>a. Lines are taken to lines, and line segments to line segments of the same length.</li><li>b. Angles are taken to angles of the same measure.</li><li>c. Parallel lines are taken to parallel lines.</li></ul>	
8.G.2	Understand that a two-dimensional figure is congruent to another if the second can be obtreflections, and translations; given two congruent figures, describe a sequence that exhibit	tained from the first by a sequence of rotations, its the congruence between them.
8.G.3	.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	
8.G.4	Understand that a two-dimensional figure is similar to another if the second can be obtain reflections, translations, and dilations; given two similar two-dimensional figures, describ between them.	ned from the first by a sequence of rotations, be a sequence that exhibits the similarity
8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triang lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For triangle so that the sum of the three angles appears to form a line, and give an argument	gles, about the angles created when parallel r example, arrange three copies of the same in terms of transversals why this is so.

<ul> <li>Unit 4 Part 2 Essential Questions:</li> <li>How can you use models of one and two-dimensional figures to show congret.</li> <li>How can you use models of one and two-dimensional figures to show similar</li> </ul>	<ul> <li>uent figures?</li> <li>Congruent figures can be formed by a series of transformations.</li> <li>Similar figures can be formed by a series of transformations.</li> <li>Similar figures can be formed by a series of transformations.</li> <li>Understand angle relationships in one and two-dimensional figures.</li> </ul>
<ul> <li>Unit 4 Part 2 Objectives:</li> <li>Students will be able to transform figures on a coordinate plane.</li> <li>Students will be able to use their understanding of angle relationships to fin</li> <li>Students will be able to describe a sequence of transformations that will res</li> <li>Students will be able to describe a sequence of transformations and dilation</li> </ul>	nd unknown angles. sult in congruent figures. ns that will result in similar figures.
Evidenc	e of Learning
<ul> <li>Formative Assessments:</li> <li>Questioning strategies used throughout the unit.</li> <li>7 Quizzes</li> </ul>	
<ul><li>Summative Assessment:</li><li>Cumulative Assessment</li></ul>	
Paci	ng Guide
Topics - 8th Grade unless otherwise noted	Timeframe
Topic #1: Translations (12.4 in HM textbook) Lab: Translations Quiz #1	1 days
Topic #2: Rotations (12.6 in HM textbook) Quiz #2	1 days
Topic #3: Reflections (12.5 in HM textbook)	1 days

Quiz #3	
Topic #4: Dilations (12.7 in HM textbook) Lab: Dilations	1 days
Topic #5: Symmetry (12.5 and 12.6 in HM textbook) Quiz #4	1 days
Topic #6: Congruence & Similarity (Concept Activity 12.6 and 12.7) Quiz #5	1 days
Topic #7: Special Pairs of Angles (Also has resources in 7th grade) (12.1 and 12.2 in HM textbook) Quiz #6	1 days
Topic #8: Remote Exterior Angles Quiz #7	1 days
Review and Cumulative Assessment	1 days
Curriculum Development Resources <ul> <li>Textbook and online resources</li> <li><u>https://njctl.org/courses/math/8th-grade-math/</u></li> <li><u>https://www.engageny.org/resource/grade-8-mathematics-module-2-topic-or</u></li> <li>"https://www.engageny.org/resource/grade-8-mathematics-module-2-topic-or</li> </ul>	<u>verview</u> HYPERLINK -topic-overview"

Pre-Al	gebra Math 7 Curriculum
	Unit 4 Part 3
Title: 2D Geometry	
Subject: Pre-Algebra Math 7	Length of Time: 2 weeks (10 days)
<b>Unit 4 Part 3:</b> Unit 4 Part 3 will allow students to solve for area and perparallelograms, triangles, trapezoids, circles, irregular figures, and shad	erimeter of different 2D geometrical shapes. They will calculate the area of rectangles, led figures. They will also explore special pairs of angles and the relationships they hold.
Learning Targets	

PARCC 🗖 Major	PARCC 📕 Major Clusters; 💶 Supporting Clusters; 으 Additional Clusters		
Domain: Geome	try		
Cluster: Solve re	eal-life and mathematical problems involving angle measure, area, surface area, and volume.		
Standard #s:	Standards:		
7.G.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.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.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.		
Domain: Expres	ssions and Equations		
Cluster: Solve re	eal-life and mathematical problems using numerical and algebraic expressions and equations.		
Standard # :	Standard:		
7.EE.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.		
7.EE.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.		
Unit 4 Part 3 Essential Question: Unit 4 Part 3 Enduring Understandings:			
What is difference between area and perimeter? Formulas can be determined and used to calculate the area of both regular and irregular share			
Unit 4 Part 3::			
• Students will be able to determine is a triangle is possible.			
• Students will be able to draw triangles freehand, with ruler and protractor and with technology.			
• Students will calculate the perimeter of different 2D geometrical figures.			
• Students will calculate the circumference and area of different circles.			
· Students	will be able to determine whether a triangle is possible or not.		
• Students will calculate the area of rectangles, parallelograms, triangles and trapezoids.			
· Students	will use previous knowledge of area formulas to calculate the area of irregular and shaded figures.		

Evidence of Learning		
Formative Assessments:		
• Questioning strategies used throughout the unit.		
· 5 Quizzes		
Summative Assessment:		
Cumulative Assessment		
Pacing Gu	de	
Topics - 7th Grade	Timeframe	
Topic #1: Perimeter & Circumference	1 days	
(10.4 in HM textbook)		
Lab: RAFT – Finding Pi		
Quiz #1		
Topic #2: Area of Rectangles (p.71 in 7th HM textbook)	0.5 day	
Topic #3: Area of Parallelograms	0.5 day	
(10.3 in HM textbook)		
Quiz #3		
Topic #4: Area of Triangles (p.71 in 7th HM textbook)	1 day	
Topic #5: Area of Trapezoids (10.3 in HM textbook)	1 day	
Topic #6: Area of Circles (10.4 in HM textbook)	1 day	
Quiz #4		
Topic #7: Mixed Review	1 day	
Topic #8: Area of Irregular Figures (10.3 in HM text book)	1 day	
Topic #9: Area of Shaded Regions	1 day	
Quiz #5	,	
Review and Cumulative Assessment	2 day	
Curriculum Resources:		
https://njctl.org/courses/math/7th-grade/		
https://njctl.org/courses/math/7th-grade/		
http://www.raftbayarea.org/ideas/Finding%20Pi.pdf		

Pre-Algebra Math 7 Unit 4 Part 4 Title: 3-D Geometry

Subject: Pre-Algebra Math 7

Length of Time: 3 weeks (13 Days)

Unit 4 Part 4: Unit 4 Part 4 will introduce students to different properties of 3D figures. They will be able to compute the surface area of 3D figures, as well as their volume. This part will also provide problems of how 3D figures are found in everyday life.

	Learning Targets
PARCC	Major Clusters; Supporting Clusters; Additional Clusters
Domain	: Geometry
Cluster:	Draw, construct, and describe geometrical figures and describe the relationships between them.
Standar d #:	Standard:
7.G.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.
<b>Cluster:</b>	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.
7.G.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.
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
Domain	: Expressions and Equations
Cluster:	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
7.EE.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.
7.EE.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.

Unit 4 Part 4 Essential Questions:	Unit 4 Part 4 Enduring Understandings:	
• How are 3D figures different from 2D figures?	• 3D figures have unique characteristics and properties.	
• What is a cross section of a figure and how will that help compute properties of the figure?	• Perimeter and area of 2D figures are useful when finding volume and surface area of 3D figures.	
• How are surface area and volume found for a 3D figure?	• There are different formulas that can be used when solving	
• What is a 3-dimensional figure?	for the volume of a 3-dimensional figure.	
• How can I find the volume of a 3-dimensional figure?		
• How can the volume of a 3-dimensional figure help me solve real world problems?		
Unit 4 Part 4 Objectives:	•	
• Students will be introduced to 3D solids and cross sections of 3D figures.		
• Students will learn how to compute the volume of different 3D figures.		
<ul> <li>Students will compute surface area of different 3D figures.</li> </ul>		
• Students will identify what a 3-dimensional figure is.		
Evidence of Learning		
Formative Assessments:		
· Questioning strategies used throughout the unit		
· 3 Quizzes		
Summative Assessment:		
Cumulative Assessment		
Pacing Guide		
Topics - (Combination of 7th and 8th grade)	Timeframe	
Topic #1: 3D Solids	1 day	
Lab: RAFT – Making 3D Shapes		
Copic #2: Cross Sections of 3D Figures (Focus on Geometry 10.6 in HM textbook)1 day		
Quiz #1		
Topic #3: Volume: Prisms & Cylinders (10.7 in HM textbook) 1 day		
Lab: Volume Activity		
Lau. KAF I – The Long and the Short of R Tonia #4: Volume: Duramida, Conas & Subaras		
(10.8 just pyramids and cones in HM textbook)		
Lab: RAFT - Volume Verification (8th Grade)		
Quiz #2		

Topic	Topic #5: Surface Area – Prisms (10.5 in HM textbook)2 days	
Lab: S	Surface Area Activity	
Topic	#6: Surface Area – Pyramids (10.6 in HM textbook)	1 day
Topic	#7: Surface Area – Cylinders (10.5 in HM textbook)	1 day
Topic #8: Surface Area – Spheres		1 day
Quiz #	#3	
Topic	#9: More Practice	1 day
Review	Review and Cumulative Assessment 2 days	
Curri	culum Resources:	
	Textbook and online resources	
	https://njctl.org/courses/math/7th-grade/	
	http://www.raftbayarea.org/ideas/Making%203D%20Shapes.pdf	
	http://www.raftbayarea.org/ideas/Long%20and%20Short%20of%20It.pdf	
	https://njctl.org/courses/math/8th-grade-math/	
	http://www.njctl.org/courses/math/8th-grade-math/3d-geometry/volume-activity/	<u>/</u>
.	http://www.raftbayarea.org/ideas/Volume%20Verification.pdf	

Pre-Algebra Math 7 Curriculum Unit 4 Part 5	
Title: Pythagorean Theorem, Distance and Midpoints	
Subject: Pre-Algebra Math 7	Length of Time: 1 Week (5 Days)
Unit 4 Part 5 Summary: Unit 4 Part 5 will provide a deeper understanding of the Pythagorean Theorem and its converse for students. They will apply the theorem to problems involving right triangles that model real world problems. They will also find distances and midpoints between two points.	
Learning Targets	
PARCC Major Clusters; Supporting Clusters; Additional Clusters	

Domain: Geometry		
Cluster: Understand and apply the Pythagorean Theorem		
Standard #s:	Standards:	
8.G.6	Explain a proof of the Pythagorean Theorem and its converse.	
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	
8.G.8	Apply the Pythagorean T	heorem to find the distance between two points in a coordinate system.
<ul> <li>Unit 4 Part 5 Essential Question:</li> <li>How does the Pythagorean Theorem help solve real world problems?</li> <li>How do we compute the distance and midpoint within problems?</li> <li>Unit 4 Part 5 Enduring Understanding:</li> <li>The Pythagorean Theorem can be used to solve real world problems.</li> <li>The Pythagorean Theorem aids in solving problems involving right triangles.</li> </ul>		
<ul> <li>Unit 4 Part 5 Objectives:</li> <li>Students will be able to explain the proof of the Pythagorean Theorem.</li> <li>Students will find unknown side lengths using the Pythagorean Theorem.</li> <li>Students will use the Pythagorean Theorem to solve problems involving distance and midpoints.</li> <li>Students will solve real world application problems using the Pythagorean Theorem.</li> </ul>		
Evidence of Learning		
<ul> <li>Formative Assessments:</li> <li>Questioning Strategies used throughout the unit.</li> <li>2 Quizzes</li> </ul>		
Summative Assessment: <ul> <li>Cumulative Assessment</li> </ul>		
Lesson Plan		

Topics (from 8th NJCTL)	Timeframe
Topic #1: Proofs Lab #1: Introduction to Proofs	1 day
Topic #1: Pythagorean Theorem (9.3 in HM textbook) Quiz #1	1 day
Topic #2: Distance Formula (Concept Activity 9.3 Proving Pythagorean Theorem and its Converse in HM textbook)	1 day
Topic #3: Midpoints (9.5 in HM textbook) Quiz #2	1 day
Review and Cumulative Assessment	1 day
Curriculum Development Resources: • Textbook and online resources • <u>http://njctl.org/courses/math/8th-grade-math/</u>	

• Water Park Project HYPERLINK "http://njctl.org/courses/math/8th-grade-math/"

Pre-Algebra Math 7 Curriculum Unit 5 (1 Part)	
Title: Statistics & Probability	
Subject: Pre-Algebra Math 7	Length of Time: 2 weeks (10 days)
Unit 5 Summary: This unit will introduce students to the concept of solving problems that involve different types of events. They will examine sampling, compare two populations, and distinguish properties of events. Permutations, combinations, and probability will be learned to help solve problems. The fundamental counting principle will also be utilized throughout the chapter. Students will also work with statistical measures.	
Learning Targets	
PARCC  Major Clusters; Supporting Clusters; Additional Clusters	

Domain: Statistics and Probability		
Cluster: Use random sampling to draw inferences about a population.		
Standard #s:	Standards:	
7.SP.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.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.	
Cluster: Draw informal comparative inferences about two populations.		
Standard #s :	Standards:	
7.SP.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.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	
Cluster: Investigate chance processes and develop, use, and evaluate probability models.		
Standard #s:	Standards:	
7.SP.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 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	

7.SP.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.7	<ul> <li>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.</li> <li>a. 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.</li> <li>b. 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?</li> </ul>
7.SP.8	<ul> <li>Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.</li> <li>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.</li> <li>b. 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.</li> <li>c. 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?</li> </ul>
Technology 8.1.8.A.4	Graph and calculate data within a spreadsheet and present a summary of the results
Technology 8.1.8.A.5	Create a database query, sort and create a report and describe the process, and explain the report results
Technology 8.1.8.F.1	Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision

#### Unit 5 Objectives:

- Students will be introduced to the concept of sampling.
- Students will be able to draw inferences about a population based off a sample.
- Students will be able to compare two populations and solve real world application problems with them.
- Students will be able to measure the difference between the centers by expressing it as a multiple of a measure of variability.
- Students will understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.

**Evidence of Learning** 

- Students will be able to use experimental and theoretical probability to determine the likelihood of an event occurring.
- Students will use the fundamental counting principle to solve problems.
- Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

#### Formative Assessments:

- · Questioning strategies used throughout the unit.
- 7 Quizzes

#### Summative Assessment:

· Cumulative Assessment

Pacing Guide	
Topics	Timeframe
Topic #1:Introduction to Probability (6.7 in HM textbook)	1 day
Topic #2:Experimental and Theoretical	1 day
Quiz #1	
Topic #3:Sampling (11.4 and Focus on Data Analysis 11.5 Comparing Population in HM textbook)	1 day
Lab: RAFT – Ample Samples	
Quiz #2	
Topic #4: Simulations (Find Resources)	1 day
Topic #5:Word Problems	1 day
Quiz #3	

Topic #6:Probability of Compound Events (6.8 and 11.9 in HM textbook)		1 day
Lab: RAFT – Adventures in Probability		
Lab: RAFT – Monty Hall Makes a	Deal	
Quiz #4		
Topic #7:Measures of Center		1 day
Quiz #5		
Topic #8:Measures of Variation (11	.2 in HM textbook)	1 day
Quiz #6		
Topic #9:Mean Absolute Deviation	(Not in HM textbook)	1 day
Quiz #7		
Review & Cumulative Assessment		1 day
Curriculum Resources:		
+ https://njctl.org/courses/math/7	'th-grade/	
http://www.raftbayarea.org/ideas/Ample%20Samples.pdf		
http://www.raftbayarea.org/ideas/Adventures%20in%20Probability.pdf		
<ul> <li>HYPERLINK "http://www.raftbayarea.org/ideas/Monty%20Hall%20Makes%20a%20Deal.pdf"</li> </ul>		
http://www.raftbayarea.org/ideas	Monty%20Hall%20Makes%20a%20Deal.pdf	
	Standards for Math Practice	
Standard#:	Standard:	
MP1	Making 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 strategically.	
MP6	Attend to precision.	
MP7	Look for and make use of structure.	
MP8	Look for and express regularity in repeated reasoning.	

## Modifications

Standards-based grading, reassessments, differentiate assignments, scaffold instruction, study guides, peer/teacher tutoring assistance, tiered assignments, student choice, modify pace, lesson tutorial videos, performance assessments, modified rubrics, assessment modified for IDEA, add enrichment activities, add extension activities to projects, challenge activities

## **Interdisciplinary Connections**

Science, Language Arts, and Technology

**Integration of 21st Century Themes and Skills** 

## 21<sup>st</sup> Century Skills

Financial, Economic, Business, and Entrepreneurial Literacy

## 21<sup>st</sup> Century Themes

- · Critical Thinking and Problem Solving
- · Communication and Collaboration
- Life and Career Skills

 

 Pre-Algebra Math 7 Curriculum Unit 6 (4 Parts)

 Title:
 Graphing Linear Equations

 Subject:
 Pre-Algebra Math 7

 Length of Time:
 8 weeks (38 days)

 Unit Summary:
 Unit 6 Part 1 covers how to graph and write linear equations. Students will develop the relationship of the slope and points on a line and write

Unit Summary: Unit 6 Part 1 covers how to graph and write linear equations. Students will develop the relationship of the slope and points on a line and write linear equations in Point-Slope form and Slope-Intercept form. Students will also learn how write the equation of a line with different given quantities. They can use these different graphs to solve the equation as well. Unit 6 Part 2 will allow students to interpret functions. They will also construct graphs from two quantities that form a linear relationship and describe the relationship using that graph. Unit 6 Part 3 will allow students to understand how functions operate and relates to a graph. They will compare properties of two functions and represent functions in multiple ways. They will be introduced to slope-intercept form and recognize that the graph will be a straight line. Unit 6 Part 4 will allow students to examine scatter plots and interpret data into a graph. They will be able to

understand different patterns and lines of best fit within graphs. They will use linear models and two variable data to explain real life situations. They also will examine frequencies and bivariate data.

Learning Targets			
PARCC Major Clus	PARCC Major Clusters; Supporting Clusters; O Additional Clusters		
Standard #s:	Standards:		
8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.		
8.EE.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b		
8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.		
8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two $(x, y)$ values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.		
8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association		
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.		

8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.
8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?
8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.
8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two $(x, y)$ values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally

Standards for Math Practice		
Standard#:	Standard:	
MP1	Making 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 strategically.	
MP6	Attend to precision.	
MP7	Look for and make use of structure.	
MP8	Look for and express regularity in repeated reasoning.	
Modifications		
Standards-based grading, reassessments, differentiate assignments, scaffold instruction, study guides, peer/teacher tutoring assistance, tiered assignments, student choice, modify pace, lesson tutorial videos, performance assessments, modified rubrics, assessment modified for IDEA, add enrichment activities, add extension activities to projects, challenge activities		
Interdisciplinary Connections		
Science, Language Arts, and Technology		
Lesson Components		
<b>21st Century Skills</b> · Financial, Economic, Business, and Entrepreneurial Literacy		

# 21st Century Themes

- · Critical Thinking and Problem Solving
- · Communication and Collaboration
- · Life and Career Skills

Pre-Algebra Math 7 Curriculum Unit 6 Part 1			
Title: Graphing Linear Equations			
Subject: Pre-Alge	Subject: Pre-Algebra Math 7       Length of Time: 3 weeks (13 days)		
<b>Unit 6 Part 1 Summary:</b> Unit 6 Part 1 covers how to graph and write linear equations. Students will develop the relationship of the slope and points on a line and write linear equations in Point-Slope form and Slope-Intercept form. Students will also learn how write the equation of a line with different given quantities. They can use these different graphs to solve the equation as well.			
Learning Targets			
PARCC Major Clusters; Supporting Clusters; Additional Clusters			
Domain: Expressions & Equations			
Cluster: Understand the connections between proportional relationships, lines, and linear equations.			
Standard #s:	Standards:		
8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Comparepresented in different ways.	are two different proportional relationships	

8.EE.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b	
Domain: Functior	15	
Cluster: Define, e	valuate, and compare functions	
Standard #s:	Standards:	
8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.	
Cluster: Use func	tions to model relationships between quantities	
8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two $(x, y)$ values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	
<ul> <li>Unit 6 Part 1 Essential Questions: <ul> <li>What is meant by the slope of a line, and how can knowing a line's slope help to graph a line and find parallel and perpendicular lines?</li> <li>How can real world situations be modeled by proportional relationships?</li> <li>How can solutions be found within an equation?</li> </ul> </li> <li>Unit 6 Part 1 Enduring Understanding: <ul> <li>Various methods can be used to solve equations and the solution to an equation can be checked by substituting into the original equation.</li> <li>Linear relationships can be graphed to help solve real world problems and make predictions.</li> </ul> </li> <li>Unit 6 Part 1 Objectives:</li> </ul>		
<ul> <li>Students will be able to identify point on a line given its equation.</li> <li>Students will be able to graph a line given different forms of the equation.</li> <li>Students will be able to describe how slope relates to horizontal and vertical lines.</li> </ul>		

<ul> <li>Students will be able to relate similar triangles to slope.</li> <li>Students will be able to identify a linear function from a table.</li> <li>Students will be able to use proportional relationships to solve real world problems.</li> <li>Students will be able to solve linear equations for desired variables and values.</li> </ul>		
Evidence	of Learning	
Formative Assessments:         • Questioning Strategies used throughout the unit.         • 5 Quizzes		
Summative Assessment: Cumulative Assessment		
Pacing Guide		
Topics	Timeframe	
Topic #1: Linear Equations (8.2 in HM textbook) Quiz #1	1 day	
Topic #2: Graphing Linear Equations Using Intercepts (8.3 in HM textbook) Quiz #2	2 days	
Topic #3: Horizontal and Vertical Lines	1 day	
Topic #4: Slope of a Line (8.4 in HM textbook) Quiz #3	1 day	
Topic #5: Slope and Similar Triangles Quiz #4	1 day	

Topic #7: Slope-Intercept Form (8.5 in HM textbook) Labs: Select one of the following - Connect Three - Slippery Slopes! - Marble Masters Quiz #5	2 days	
Lab: Proportional Relationships Topic #8: Proportional Relationships	2 days	
Topic #9: Solving Linear Equations	1 day	
Review and Cumulative Assessment 2 days		
Curriculum Development Resources: <u>https://njctl.org/courses/math/8th-grade-math/</u> <u>http://www.raftbayarea.org/ideas/Connect%20Three.pdf</u> <u>http://www.raftbayarea.org/ideas/Slippery%20Slopes.pdf</u> HYPERLINK "http://www.raftbayarea.org/ideas/Marble%20Masters.pdf"		

Pre-Algebra Math 7 Curriculum Unit 6 Part 2		
Title: Modeling Relationships		
Subject: Pre-Algebra Math 7	Length of Time: 1 week (5 days)	
<b>Unit 6 Part 2 Summary:</b> Unit 5 Part 2 will allow students to interpret functions. They will also construct graphs from two quantities that form a linear relationship and describe the relationship using that graph.		

Learning Targets			
PARCC Major	PARCC Major Clusters; Supporting Clusters; O Additional Clusters		
Domain: Functio	ons		
Cluster: Define,	evaluate, and compare functions.		
Standard #s:	ard #s: Standards:		
8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.		
Cluster: Use functions to model relationships between quantities.			
8.F.4	.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.		
8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally			
Unit 6 Part 2 Essential Question:Unit 6 Part 2 Enduring Understanding:• What is a function?• The definition of a function and what it's graph represents.• Are properties of functions and graphs the same for all functions?• The ability to graph a function and write a function from a graph.			
<ul> <li>Unit 6 Part 2 Objectives:</li> <li>Students will construct a function and determine the rate of change and initial value.</li> <li>Students will describe a functional relationship by examining a graph.</li> </ul>			

Evidence of Learning		
Formative Assessments:• Questioning strategies used throughout the unit.• 3 Quizzes		
Summative Assessment: Cumulative Assessment		
Pacing Guide		
Topics	Timeframe	
Topic #1: Interpreting with Functions Quiz #1	1 day	
Topic #2: Analyzing a Graph Quiz #2	1 day	
Topic #3: Comparing Different Representations of Functions <b>Quiz #3</b>	1 day	
Review and Cumulative Assessment	2 days	
Curriculum Development Resources:		

HYPERLINK "https://njctl.org/courses/math/8th-grade-math/" https://njctl.org/courses/math/8th-grade-math/

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# Pre-Algebra Math 7 Curriculum

Unit 6 Part 3

Title:	Functions
The:	Functions

Subject: Pre-Algebra Math 7

**Length of Time:** 2 weeks (10 days)

**Unit 5 Part 3 Summary:** Unit 5 Part 3 will allow students to understand how functions operate and relates to a graph. They will compare properties of two functions and represent functions in multiple ways. They will be introduced to slope-intercept form and recognize that the graph will be a straight line.

## Learning Targets

PARCC Major Clusters; Supporting Clusters; O Additional Clusters

**Domain: Functions** 

Cluster: Define, evaluate, and compare functions.

Standard #s:	Standards:
8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
8.F.3	Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.
Cluster: Use functions to model relationships between quantities	
Standard #s:	Standards:
8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

<ul> <li>Unit 6 Part 3 Essential Question:</li> <li>What is a function?</li> <li>How are functions represented?</li> <li>What can a relationship between numbers tell about a problem</li> </ul>	<ul> <li>Unit 6 Part 3 Enduring Understanding:         <ul> <li>Properties of functions and their graphs are similar but not identical.</li> <li>Slope-intercept form is an easy way of graphing functions.</li> </ul> </li> <li>n?</li> </ul>	
Unit 6 Part 3 Objectives:         ·       Students will understand what a function is and its corresponding graph.         ·       Students will compare properties of different functions and relate the information to real world situations.         ·       Students will graph slope-intercept form of a line.		
Evidence of Learning		
Formative Assessments:         ·       Questioning strategies used throughout the unit.         ·       3 Quizzes         Summative Assessment:		
· Cumulative Assessment		
Pacing Guide		
Topics	Timeframe	
Topic #1: Relationships and Functions (8.1 and 8.7 in HM text book) Lab – Intro to Functions (either group or individual)	2 days	
Topic #2: Domain and Range (8.1 and Focus on Functions 8.6 Function Domain and Range in HM textbook) Quiz #1	2 days	

Topic #3: Vertical Line Test (8.1 in HM text book) Quiz #2	2 days
Topic #4: Linear Vs. Non-Linear Functions (Focus on Functions 8.2 Linear and Non-Linear Functions in HM textbook) Quiz #3	2 days
Review and Cumulative Assessment	2 days
Curriculum Development Resources:	

+ HYPERLINK "https://njctl.org/courses/math/8th-grade-math/" https://njctl.org/courses/math/8th-grade-math/

Pre-Algebra Math 7 Curriculum Unit 6 Part 4				
Title: Data				
Subject: Pre-Algebra Math 7		Length of Time: 2 weeks (10 days)		
<b>Unit 6 Part 4:</b> Unit 6 Part 4 will allow students to examine scatter plots and interpret data into a graph. They will be able to understand different patterns and lines of best fit within graphs. They will use linear models and two variable data to explain real life situations. They also will examine frequencies and bivariate data.				
Learning Targets				
PARCC Major Clusters; Supporting Clusters; Additional Clusters				
Domain: Statistics & Probability				
Cluster: Investigate patterns of association in bivariate data.				
andard #s: Standards:				

8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association			
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.			
8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.			
8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?			
<ul> <li>Unit 5 Part 4 Essential Questions:</li> <li>How can information from a problem be represented in a way to see a pattern or a frequency?</li> <li>What is a line of best fit and how can it simply a conclusion?</li> <li>Are interpretation and prediction an accurate conclusion for a problem?</li> </ul>		<ul> <li>Unit 5 Part 4 Enduring Understandings:</li> <li>Scatter plots, line of best fit, and frequencies all help interpret data within a problem.</li> <li>Patterns can be modeled using different graphs.</li> <li>Straight lines are widely used to model relationships.</li> </ul>		
Unit 5 Part 4 Objectives:         Student will be able to         Students will interpret a         Students will know about         Students will understar         Students will understar         Students will use freque	graph scatter plots. and examine data to come to a conclusion. but line of best fit and two variable data relation and patterns of association in bivariate categoric ency to solve real life problems and make prec	nships. al data. dictions for future ones.		
Evidence of Learning				
Formative Assessments:				
· Questioning strategies used throughout the unit.				

· 4 Quizzes				
Summative Assessment:				
· Cumulative Assessment				
Pacing Guide				
Topics	Timeframe			
Topic #1: Two Variable Data Lab: RAFT – Stars on the HR Diagram Quiz #1	3 days			
Topic #2: Line of Best Fit (8.6 in HM textbook) Lab: Illustrative Mathematics – Bird Eggs Quiz #2	3 days			
Topic #3: Determining the Prediction Equation Quiz #3	4 days			
Topic #4: Two Way Table Focus on Data Analysis 11.5 Two-Way Tables Quiz #4	3 days			
Review and Cumulative Assessment	2 days			
Curriculum Development Resources: <u>https://njctl.org/courses/math/8th-grade-math/</u> <u>http://www.raftbayarea.org/ideas/Stars%20on%20the%20HR%20Diagram.pdf</u> HYPERI INK "http://www.illustrativemathematics.org/illustrations/41" http://www.illustrativemathematics.org/illustrations/41" http://www.illustrativemathematics.org/illustrations/41" http://www.illustrativemathematics.org/illustrations/41" http://www.illustrativemathematics.org/illustrativemathemathematics.org/illustrativemathemathemathemathemathemathemathemath	n <sup>.</sup> //www.illustrativemathematics.org/illustrations/41			