Pine Hill Public Schools

Content Area:	**Mathematics**
Course Title/ Grade Level:	**Grade 7 Pre-Algebra**

Unit A:	**Ratios and Proportional Relationships**	**Duration:**	**22 days**
Unit B:	**The Number System, Part 1**	**Duration:**	**14 days**
Unit C:	**Expressions and Equations, Part 1**	**Duration:**	**22 days**
Unit D:	**Geometry**	**Duration:**	**20 days**
Unit E:	**Probability**	**Duration:**	**15 days**
Unit F:	**The Number System, Part 2**	**Duration:**	**21 days**
Unit G:	**Expressions and Equations, Part 2**	**Duration:**	**9 days**
Unit H:	**Functions**	**Duration:**	**8 days**
Unit I:	**Geometry, Part 2**	**Duration:**	**10 days**

Date Revision Approved	**August 15, 2017**
Initial BOE Approval Date:	**August 23, 2016**

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Ratios and Proportional Relationships		**Unit A**
Course or Grade Level: 7 Pre-Algebra	**Length of Time:** 22 days	
Pacing	Ratios and Rates: 7 days Proportional Relationships: 7 days Percents: 8 days	
Essential Questions	● How do you distinguish the different kinds of rates? ● What kinds of real-world relationships are rates? ● How can you distinguish relationships that are proportional from relationships that are not proportional? ● When is it most convenient to use percentages?	
Content	● Proportional relationships ● Equivalent ratios ● Constant of proportionality (unit rate); tables, graphs, equations, diagrams, verbal descriptions ● Multi-step problems (ratio, percent) ● Scale Drawings ● Simple Interest ● Markups and markdowns, percent of change	
Skills	● Recognize proportional relationship ● Represent proportional relationships in a variety of ways ● Decide (proportional relationships) ● Identify constant of proportionality ● Explain location of a point (x,y) ● Solve (multi-step problems) ● Compute unit rates, actual lengths/areas for scale drawings ● Reproduce a scale drawing (at a different scale)	
Assessments	● Homework ● Classwork ● Quizzes ● Topic Tests 7: 1-3	
Interventions / differentiated instruction	● Readiness assessments to generate study plans, as necessary ● Readiness lessons to address weaknesses in prior knowledge, as necessary ● Lesson interventions to address weaknesses throughout the units, as necessary ● "Help Me Solve This" in MathXL ● Lesson materials available online in both English and Spanish ● Homework-Individualized to needs of student ● Enrichment activities available as needed	
Inter-disciplinary Connections	● Online Technology Tools ● Math Literacy-"Close and Check" in Student Companion Journal ● Financial Literacy	
Lesson resources / activities	● www.MyMthUniverse.com ● Online tools/Manipulatives ● Student Companion Book ● Homework Book and Assessments(Math XL)	

New Jersey Student Learning Standards for Mathematics	
Standard(s) for Mathematical Practice:	**Standards() for Mathematical Content:**
Math Practices: 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	**Domain: Ratios and Proportional Relationships** **Cluster: Analyze proportional relationships and use them to solve real-world and mathematical problems.** CCSS.Math.Content.7.RP.A.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $^{1/2}/_{1/4}$ miles per hour, equivalently 2 miles per hour*. CCSS.Math.Content.7.RP.A.2 Recognize and represent proportional relationships between quantities. ● CCSS.Math.Content.7.RP.A.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. ● CCSS.Math.Content.7.RP.A.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. ● CCSS.Math.Content.7.RP.A.2c Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn*. ● CCSS.Math.Content.7.RP.A.2d Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate. CCSS.Math.Content.7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error. **Domain: Geometry** **Cluster: Draw construct, and describe geometrical figures and describe the relationships between them.** CCSS.Math.Content.7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
21st Century Themes	

x	Global Awareness:	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy	x	ICT Literacy	x	Life and Career Skills		

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

Strand: A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations. E: Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.	**Content Statement:** Understand and use technology systems. Plan strategies to guide inquiry. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. Evaluate and select information sources and digital tools based on the appropriateness for specific tasks. Process data and report results.	**Indicator:** 8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. 8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

Pine Hill Public Schools **Mathematics Curriculum**		
Unit Title: The Number System, Part 1		**Unit B**
Course or Grade Level: 7 Pre-Algebra	**Length of Time: 14 Days**	
Pacing	Adding and Subtracting Rational Numbers: 6 days Multiplying and Dividing Rational Numbers: 8 days Decimals and Percent: Do Nows	
Essential Questions	• What are the different types of rational numbers? • What kinds of problems can you solve by adding and subtracting the different types of rational numbers? • What models and relationships help you make sense of multiplying and dividing positive and negative rational numbers? • Fractions, decimals, and percents – when is it most helpful to use which representation?	
Content	• All operations of positive and negative numbers • Equivalent forms (rational numbers and expressions) • Opposite quantities • Absolute value • Properties of operations • Mental computation strategies • Terminating and repeating decimals	
Skills	• Add, subtract, multiply and divide rational numbers • Describe opposite quantities • Understand positive or negative direction • Show and understand additive inverse • Interpret sums in context • Show and apply absolute value in context • Understand and develop rules for multiplying and dividing signed numbers	

	● Apply properties of operations as strategies ● Solve with and without context ● Assess reasonableness of answers
Assessments	● Homework ● Classwork ● Quizzes ● Topics Tests 7: 4-5
Interventions / differentiated instruction	● Readiness assessments to generate study plans, as necessary ● Readiness lessons to address weaknesses in prior knowledge, as necessary ● Lesson interventions to address weaknesses throughout the units, as necessary ● "Help Me Solve This" in MathXL ● Lesson materials available online in both English and Spanish ● Homework-Individualized to needs of student ● Enrichment activities available as needed
Inter-disciplinary Connections	● Online Technology Tools ● Math Literacy-"Close and Check" in Student Companion Journal ● Financial Literacy
Lesson resources / activities	● www.MyMathUniverse.com ● Online tools/Manipulatives ● Student Companion Book ● Homework Book and Assessments(Math XL)

New Jersey Student Learning Standards for Mathematics	
Standard(s) for Mathematical Practice:	**Standards() for Mathematical Content:**
Math Practices: 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	**Domain: The Number System** **Cluster: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** CCSS.Math.Content.7.NS.A.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. ● CCSS.Math.Content.7.NS.A.1a Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged*. ● CCSS.Math.Content.7.NS.A.1b Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. ● CCSS.Math.Content.7.NS.A.1c Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (–q)$. Show that the distance between two rational numbers

	on the number line is the absolute value of their difference, and apply this principle in real-world contexts. ● CCSS.Math.Content.7.NS.A.1d Apply properties of operations as strategies to add and subtract rational numbers. CCSS.Math.Content.7.NS.A.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. ● CCSS.Math.Content.7.NS.A.2a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(–1)(–1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. ● CCSS.Math.Content.7.NS.A.2b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $–(p/q) = (–p)/q = p/(–q)$. Interpret quotients of rational numbers by describing real-world contexts. ● CCSS.Math.Content.7.NS.A.2c Apply properties of operations as strategies to multiply and divide rational numbers. ● CCSS.Math.Content.7.NS.A.2d Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. CCSS.Math.Content.7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers. **Domain: Expressions and Equations** **Cluster: Use properties of operations to generate equivalent expressions. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.** CCSS.Math.Content.7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."* **Cluster: Solve real-life and mathematical problems using numerical and algebraic expressions and equations.** CCSS.Math.Content.7.EE.B.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as

	appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation*. **Domain: Ratios and Proportional Relationships** **Cluster: Analyze proportional relationships and use them to solve real-world and mathematical problems.** **CCSS.Math.Content.7.RP.A.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

21st Century Themes							
x	Global Awareness:	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy	x	Health Literacy

21st Century Skills							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy	x	ICT Literacy	x	Life and Career Skills		

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

Strand:A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.	**Content Statement:** Understand and use technology systems.	**Indicator:** 8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.
E: Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.	Plan strategies to guide inquiry. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media. Evaluate and select information sources and digital tools based on the appropriateness for specific tasks. Process data and report results.	8.1.8.E.1 Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Expressions and Equations, Part 1		**Unit C**
Course or Grade Level: 7 Pre-Algebra	**Length of Time: 22 Days**	
Pacing	Equivalent Expressions: 6 days Equations and Solutions: 11 days Inequalities: 5 days	
Essential Questions	● How does rewriting an expression help you think about a situation in a new way? ● When is it useful to model a relationship with an equation? How does rewriting an equation help you think about the relationship in a new way? ● How can you represent relationships in a world where equations don't always work?	
Content	● Variables ● Simple equations ● Multistep equations ● Simple and multistep inequalities ● Use distributive property ● Combine Like Terms ● Solution set of an inequality ● Determine solutions ● Properties of operations ● Linear expressions ● Rational coefficients ● Expressions in different forms ● Quantities in a problem are related	
Skills	● Use variables ● Construct simple equations and inequalities ● Solve problems in context, simple equations, simple inequalities ● Reason about quantities ● Compare solutions ● Graph and interpret inequalities ● Apply properties of operations ● Factor and extend linear expressions with rational coefficients ● Write an expression in different forms and understand how the quantities in a problem are related	
Assessments	● Homework ● Classwork ● Quizzes ● Topics Tests 7: 7-9, 8: 2	
Interventions / differentiated instruction	● Readiness assessments to generate study plans, as necessary ● Readiness lessons to address weaknesses in prior knowledge, as necessary ● Lesson interventions to address weaknesses throughout the units, as necessary ● “Help Me Solve This” in MathXL ● Lesson materials available online in both English and Spanish ● Homework-Individualized to needs of student ● Enrichment activities available as needed	

Inter-disciplinary Connections	● Online Technology Tools ● Math Literacy-"Close and Check" in Student Companion Journal ● Financial Literacy
Lesson resources / activities	● www.MyMathUniverse.com ● Online tools/Manipulatives ● Student Companion Book ● Homework Book and Assessments(Math XL)

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	• CCSS.Math.Content.7.EE.B.4b Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions*. **Cluster: Analyze and solve linear equations and pairs of simultaneous linear equations** CCSS.Math.Content.8.EE.C.7 Solve linear equations in one variable. • CCSS.Math.Content.8.EE.C.7a 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 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). CCSS.Math.Content.8.EE.C.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

21st Century Themes							
x	Global Awareness:	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
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Strand:A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations. A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations	**Content Statement:**Understand and use technology systems. Select and use applications effectively and productively.	**Indicator:**8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. 8.1.8.A.3 Use and/or develop a simulation that provides an environment to solve a real world problem or theory.

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Geometry		**Unit D**
Course or Grade Level: 7 Pre-Algebra	**Length of Time: 20 Days**	
Pacing	Angles: 7 days Circles: 7 days Surface Area and Volume: 6 days	
Essential Questions	● Intersecting lines form angles. How can you best describe relationships between those angles? Are some relationships more useful than others in certain situations? ● What makes a circle a circle? What does it mean to talk about the size of a circle? ● How much information do you need to be able to draw a unique figure? ● In what ways can you measure a three-dimensional figure? Are some measurements more useful in certain situations than others?	
Content	● Formulas – area of a circle, circumference of a circle ● Relationship between circumference and area of a circle ● Geometric conditions (points, line segments, angles, parallelism, congruence, and perpendicularity) ● Plane sections of three-dimensional figures ● Angle relationships – supplementary, complementary, vertical, adjacent ● Area – triangles, quadrilaterals, polygons ● Volume – cubes, right prisms ● Surface Area – Cubes, right prisms	
Skills	● Know and develop formulas ● Solve problems using formulas ● Give/derive informally the relationship between circumference and area of a circle ● Solve with and without context ● Draw and construct geometric shapes with given conditions ● Use a ruler, protractor, and technology ● Describe two-dimensional figures that result from plane sections of three-dimensional figures ● Write and solve problems using equations to find an unknown angle in a figure	
Assessments	● Homework ● Classwork ● Quizzes ● Topic Tests 7: 10-11; 8: 11	
Interventions / differentiated instruction	● Readiness assessments to generate study plans, as necessary ● Readiness lessons to address weaknesses in prior knowledge, as necessary ● Lesson interventions to address weaknesses throughout the units, as necessary ● "Help Me Solve This" in MathXL ● Lesson materials available online in both English and Spanish ● Homework-Individualized to needs of student ● Enrichment activities available as needed	
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	Cluster: Understand and apply rules related to transversals. • **CCSS.Math.Content.8.G.A.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.** ***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.***

21st Century Themes							
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21st Century Skills							
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Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Probability		**Unit E**
Course or Grade Level: 7 Pre-Algebra	**Length of Time: 15 Days**	
Pacing	Probability Concepts: 7 days Compound Events: 8 days	
Essential Questions	● How do you measure the probability of an event? Can you use probability to predict future events? ● How confident can you be in your predictions? ● How do you measure the probability of more than one event? Can you use probability to predict future events? How confident can you be in your predictions?	
Content	● Probability Models (uniform and non-uniform) ● Compound Events ● Frequencies ● Outcomes ● Probability of a chance event ● Relative Frequency ● Organized List, Table, Tree Diagram ● Simulation ● Sample Space	
Skills	● Develop/Use uniform and non-uniform probability models ● Find probabilities of simple events and compound events ● Find frequencies for compound events ● Compare probabilities from a model to observed frequencies ● Explain possible sources of the discrepancy between the model and observed frequencies ● Observe frequencies in data ● Understand probability of a chance event is a number between 0 and 1 ● Understand probability of a compound event is the fraction of outcomes in the sample space ● Predict approximate relative frequency ● Represent sample spaces for compound events using various methods ● Design/Use simulation	
Assessments	● Homework ● Classwork ● Quizzes ● Topic Tests 7: 16-17	
Interventions / differentiated instruction	● Readiness assessments to generate study plans, as necessary ● Readiness lessons to address weaknesses in prior knowledge, as necessary ● Lesson interventions to address weaknesses throughout the units, as necessary ● “Help Me Solve This” in MathXL ● Lesson materials available online in both English and Spanish ● Homework-Individualized to needs of student ● Enrichment activities available as needed	
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	event is the fraction of outcomes in the sample space for which the compound event occurs. • CCSS.Math.Content.7.SP.C.8b Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. CCSS.Math.Content.7.SP.C.8c Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*

21st Century Themes							
x	Global Awareness:	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy	x	ICT Literacy	x	Life and Career Skills		

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.		
Strand:A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations. B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.	**Content Statement:**Understand and use technology systems. Apply existing knowledge to generate new ideas, products, or processes. Create original works as a means of personal or group expression.	**Indicator:**8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. 8.1.2.B.1 Illustrate and communicate original ideas and stories using multiple digital tools and resources.

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Number System, Part 2		**Unit F**
Course or Grade Level: 7 Pre-Algebra	**Length of Time:** 21 days	
Pacing	Rational and Irrational Numbers: 2 days Integer Exponents: 11 days Scientific Notation: 8 days	
Essential Questions	● What other types of numbers are there besides rational numbers? ● Why do we need numbers besides rational numbers? ● How can you make very large or very small numbers easy to use and compare? ● How can you make scientific measurements easy to use and compare?	
Content	● Rational Number ● Irrational Number ● Decimal expansion ● Properties of integer exponents ● Square Root ● Perfect Square	

	● Cube root ● Perfect Cube ● Integer Power of 10 (Scientific Notation)
Skills	● Know rational and irrational numbers ● Compare rational and irrational numbers ● Approximate irrational numbers ● Locate rational numbers on a number line ● Covert repeating decimal expansion to a rational number ● Evaluate perfect squares and perfect cubed roots ● Estimate square and cubed roots ● Apply properties of integer exponents ● Calculate numbers expressed in scientific notation into decimal form ● Interpret scientific notation generated by technology ● Calculate zero and negative exponents ● Calculate multiplication and division of exponents
Assessments	● Homework ● Classwork ● Quizzes ● Topic Tests 8: 1, 3, 4
Interventions / differentiated instruction	● Readiness assessments to generate study plans, as necessary ● Readiness lessons to address weaknesses in prior knowledge, as necessary ● Lesson interventions to address weaknesses throughout the units, as necessary ● "Help Me Solve This" in MathXL ● Lesson materials available online in both English and Spanish ● Homework-Individualized to needs of student ● Enrichment activities available as needed
Inter-disciplinary Connections	● Online Technology Tools ● Math Literacy-"Close and Check" in Student Companion Journal ● Financial Literacy
Global Awareness , Cultural Diversity & 21st Century Skills	21st Century Skills: Problem Solving ● Creativity and Innovation ● Critical Thinking and Problem Solving ● Communication and Collaboration ● Flexibility and Adaptability
Lesson resources / activities	● www.MyMathUniverse.com ● Online tools/Manipulatives ● Student Companion Book ● Homework Book and Assessments(Math XL)

New Jersey Student Learning Standards for Mathematics

New Jersey Student Learning Standards for Mathematics

Standard(s) for Mathematical Practice:	**Standards() for Mathematical Content:**
Math Practices: 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics.	**Domain: Number System** **Cluster: Know that there are numbers that are not rational and approximate them by rational numbers.**

5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	CCSS.Math.Content.8.NS.A.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number. CCSS.Math.Content.8.NS.A.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., π^2). *For example, by truncating the decimal expansion of* $\sqrt{2}$*, show that* $\sqrt{2}$ *is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations* **Domain Name: Expressions and Equations** CCSS.Math.Content.8.EE.A.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$. CCSS.Math.Content.8.EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational. CCSS.Math.Content.8.EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 times* 10^8 *and the population of the world as 7 times* 10^9*, and determine that the world population is more than 20 times larger*. CCSS.Math.Content.8.EE.A.4 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 scientific notation that has been generated by technology

21st Century Themes

x	Global Awareness:	x	Financial, Economic, Business, and Entrepreneurial Literacy	x	Civic Literacy		Health Literacy

21st Century Skills

x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy	x	ICT Literacy	x	Life and Career Skills		

8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.			
Strand:A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.	**Content Statement:** Understand and use technology systems.	**Indicator:** 8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools.	**Strand:A.** Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Expressions and Equations, Part 2		**Unit G**
Course or Grade Level: 7 Pre-Algebra	**Length of Time: 9 Days**	
Pacing	Proportional Relationships, Lines, and Linear Functions: 9 days	
Essential Questions	● How can you recognize a proportional relationship? ● How are proportional relationships and linear equations related? ● Do all linear equations model proportional relationships?	
Content	● Proportional relationships ● Unit Rate ● Slope ● Y-intercept ● Linear Equations y=mx +b	
Skills	● Graph proportional relationships ● Interpret unit rate as slope ● Compare proportional relationships ● Explain why slope is the same between any two points on a non-vertical line ● Derive linear equations	
Assessments	● Homework ● Classwork ● Quizzes ● Topic Test 8: 5	
Interventions / differentiated instruction	● Readiness assessments to generate study plans, as necessary ● Readiness lessons to address weaknesses in prior knowledge, as necessary ● Lesson interventions to address weaknesses throughout the units, as necessary ● "Help Me Solve This" in MathXL ● Lesson materials available online in both English and Spanish ● Homework-Individualized to needs of student ● Enrichment activities available as needed	
Inter-disciplinary Connections	● Online Technology Tools ● Math Literacy-"Close and Check" in Student Companion Journal ● Financial Literacy	
Lesson resources / activities	● www.MyMathUniverse.com ● Online tools/Manipulatives ● Student Companion Book ● Homework Book and Assessments(Math XL)	
New Jersey Student Learning Standards for Mathematics		
Standard(s) for Mathematical Practice:	**Standards() for Mathematical Content:**	
Math Practices: 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively.	**Domain: Expression and Equations Part 2**	

3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	**Cluster: Understand the connection between proportional relationships, lines and linear equations.** CCSS.Math.Content.8.EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. CCSS.Math.Content.8.EE.B.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.

21st Century Themes

x	Global Awareness:	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy

21st Century Skills

x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy	x	ICT Literacy	x	Life and Career Skills		

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

F: Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.	**Content Statement:** Plan and manage activities to develop a solution or complete a project.	Indicator: Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision.

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Functions		**Unit H**
Course or Grade Level: 7 Pre-Algebra	**Length of Time: 8 days**	
Pacing	Defining and Comparing Functions: 8	
Essential Questions	● What is a function? ● What are functions used for? ● How do you know a linear function when you see one?	
Content	● Properties of Functions Linear/Non Linear ● Ordered pairs ● Input/output ● Linear/Functional relationship ● Rate of Change ● Initial Value ● Graph ● Table ● Construct a Linear Function	
Skills	● Explain why slope is the same between any two points on a non-vertical line ● Solve linear equations ● Understand function is a rule ● Graph ordered pairs ● Compare functions Algebraically/Graphically/Numerically in table/Verbal descriptions ● Construct functions and Model relationships ● Determine rate of change and initial value of function ● Read table or graph ● Interpret rate of change ● Give examples of nonlinear functions ● Describe relationship between two quantities	
Assessments	● Homework ● Classwork ● Quizzes ● Topic Test 8: 8	
Interventions / differentiated instruction	● Readiness assessments to generate study plans, as necessary ● Readiness lessons to address weaknesses in prior knowledge, as necessary ● Lesson interventions to address weaknesses throughout the units, as necessary ● “Help Me Solve This” in MathXL ● Lesson materials available online in both English and Spanish ● Homework-Individualized to needs of student ● Enrichment activities available as needed	
Inter-disciplinary Connections	● Online Technology Tools ● Math Literacy-“Close and Check” in Student Companion Journal ● Financial Literacy	

Global Awareness , Cultural Diversity & 21st Century Skills	21st Century Skills: Problem Solving ● Creativity and Innovation ● Critical Thinking and Problem Solving ● Communication and Collaboration ● Flexibility and Adaptability
Lesson resources / activities	● www.MyMathUniverse.com ● Online tools/Manipulatives ● Student Companion Book ● Homework Book and Assessments(Math XL)

New Jersey Student Learning Standards for Mathematics

New Jersey Student Learning Standards for Mathematics

Standard(s) for Mathematical Practice:	**Standards() for Mathematical Content:**
Math Practices: 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. Look for and express regularity in repeated reasoning.	**Domain: Functions** **Cluster: Define, evaluate, and compare functions.** **Cluster: Use functions to model relationships between quantities** CCSS.Math.Content.8.F.A.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.[1] CCSS.Math.Content.8.F.A.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*. CCSS.Math.Content.8.F.A.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** CCSS.Math.Content.8.F.B.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. CCSS.Math.Content.8.F.B.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.				
21st Century Themes							
x	Global Awareness:	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy	x	ICT Literacy	x	Life and Career Skills		
8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.							
Strand: A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.			**Content Statement:** Select and use applications effectively and productively.		**Indicator:** 8.1.8.A.2 Create a document (e.g. newsletter, reports, personalized learning plan,business letters or flyers) using one or more digital applications to be critiqued by professionals for usability.		

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Geometry, Part 2		**Unit I**
Course or Grade Level: 7 Pre-Algebra	**Length of Time: 10 days**	
Pacing	Using the Pythagorean Theorem: 10 days	
Essential Questions	● How does the Pythagorean Theorem apply to real world situations?	
Content	● Pythagorean Theorem ● Right triangles ● Coordinate system ● Square root ● Perfect square	
Skills	● Apply Pythagorean theorem – determine unknown sides lengths, find distance between two points ● Explain Pythagorean and its converse	
Assessments	● Homework ● Classwork ● Quizzes ● Topic Test 8: 12	
Interventions / differentiated instruction	● Readiness assessments to generate study plans, as necessary ● Readiness lessons to address weaknesses in prior knowledge, as necessary ● Lesson interventions to address weaknesses throughout the units, as necessary ● "Help Me Solve This" in MathXL ● Lesson materials available online in both English and Spanish ● Homework-Individualized to needs of student ● Enrichment activities available as needed	
Inter-disciplinary Connections	● Online Technology Tools ● Math Literacy-"Close and Check" in Student Companion Journal ● Financial Literacy	
Lesson resources / activities	● www.MyMathUniverse.com ● Online tools/Manipulatives ● Student Companion Book ● Homework Book and Assessments(Math XL)	
New Jersey Student Learning Standards for Mathematics		
Standard(s) for Mathematical Practice:	**Standards() for Mathematical Content:**	
Math Practices: 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others.	**Domain: Geometry** **Cluster: Understand and apply the Pythagorean Theorem.** ● CCSS.Math.Content.8.G.B.6 Explain a proof of the Pythagorean Theorem and its converse.	

4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	• CCSS.Math.Content.8.G.B.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. • CCSS.Math.Content.8.G.B.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. **Cluster: Understand and apply the Pythagorean Theorem.** • CCSS.Math.Content.8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

21st Century Themes

x	Global Awareness:	x	Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy

21st Century Skills

x	Creativity and Innovation	x	Critical Thinking and Problem Solving	x	Communication and Collaboration		Information Literacy
	Media Literacy	x	ICT Literacy	x	Life and Career Skills		

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Strand: A. Technology Operations and Concepts: *Students demonstrate a sound understanding of technology concepts, systems and operations.*	**Content Statement:** Understand and use technology systems	**Indicator:** Demonstrate knowledge of a real world problem using digital tools.