Monroe Township Schools



Curriculum Management System

Fundamentals of Mathematics – Summer Enrichment

Grade 10

January 2006

* For adoption by all regular education programs as specified and for adoption or adaptation by all Special Education Programs in accordance with Board of Education Policy # 2220. Board Approved: June 28, 2006

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Monroe Township Schools

Mission and Goals

Mission

The mission of the Monroe Township School District, a unique multi-generational community, is to collaboratively develop and facilitate programs that pursue educational excellence and foster character, responsibility, and life-long learning in a safe, stimulating, and challenging environment to empower all individuals to become productive citizens of a dynamic, global society.

<u>Goals</u>

To have an environment that is conducive to learning for all individuals.

To have learning opportunities that are challenging and comprehensive in order to stimulate the intellectual, physical, social and emotional development of the learner.

To procure and manage a variety of resources to meet the needs of all learners.

To have inviting up-to-date, multifunctional facilities that both accommodate the community and are utilized to maximum potential.

To have a system of communication that will effectively connect all facets of the community with the Monroe Township School District.

To have a staff that is highly qualified, motivated, and stable and that is held accountable to deliver a safe, outstanding, and superior education to all individuals.

Philosophy

Monroe Township Schools are committed to providing all students with a quality education resulting in life-long learners who can succeed in a global society. The mathematics program, grades K-12, is predicted on that belief and is guided by the following six principals as stated by the National Council of Teachers of Mathematics (NCTM) in the *Principles and Standards for School Mathematics, 2000.* First, a mathematics education requires equity. All students will be given worthwhile opportunities and strong support to meet high mathematical expectations. Second, a coherent mathematics curriculum will effectively organize, integrate, and articulate important mathematics, students as learners, and pedagogical strategies, b) having a challenging and supportive classroom environment and c) continually reflecting on and refining instructional practice. Fourth, students must learn mathematics with understanding. A student's prior experiences and knowledge will actively build new knowledge. Fifth, assessment should support the learning of important mathematics and provide useful information to both teachers and students. Lastly, technology enhances mathematics learning, supports effective mathematics teaching, and influences what mathematics is taught.

As students begin their mathematics education in Monroe Township, classroom instruction will reflect the best thinking of the day. Children will engage in a wide variety of learning activities designed to develop their ability to reason and solve complex problems. Calculators, computers, manipulatives, technology, and the Internet will be used as tools to enhance learning and assist in problem solving. Group work, projects, literature, and interdisciplinary activities will make mathematics more meaningful and aid understanding. Classroom instruction will be designed to meet the learning needs of all children and will reflect a variety of learning styles.

In this changing world those who have a good understanding of mathematics will have many opportunities and doors open to them throughout their lives. Mathematics is not for the select few but rather is for everyone. Monroe township Schools are committed to providing all students with the opportunity and the support necessary to learn significant mathematics with depth and understanding. This curriculum guide is designed to be a resource for staff members and to provide guidance in the planning, delivery, and assessment of mathematics instruction.

Educational Goals

Fundamentals of Mathematics is a summer enrichment course geared for students entering the 10th grade. It is designed to strengthen Algebra I skills as well as to prepare students for success in Geometry. Students will continue an in-depth analysis of the real number system, refine the process of algebra, and expand upon the geometrical knowledge attained in the middle school. Topics included are: roots and powers, simplifying mathematical expressions, solving and graphing linear equations and inequalities, rates, ratios, percents, the Pythagorean Theorem, midpoint and distance formulas, patterns, points, lines, angles, planes, parallel lines, and an introduction to relationships of triangles and of quadrilaterals.

A note about Mathematics Standards and Cumulative Progress Indicators.

The New Jersey Core Curriculum Content Standards for Mathematics were revised in 2002. The Cumulative Progress Indicators (CPI's) referenced in this curriculum guide refer to these new standards and may be found in the Curriculum folder on the district servers. A complete copy of the new Core Curriculum Content Standards for Mathematics may also be found at: http://www.nj.gov/njded/cccs/s4_math.htm

Fundamentals of Mathematics – Summer Enrichment

Scope and Sequence

We	ek 1
	Review of Pre-Algebra Skills:
Pre-Test	 Operations with Integers (add, subtract, multiply, divide) Operations with Exponents (positive, zero, negative) Simplify Expressions using Order of Operations. Solving Equations. Solving Inequalities.
Algebra Problem Solving Skills:	Connections to Geometry:
 Graphing Equations, Slope, Slopes of Parallel and Perpendicular Lines Slope-Intercept Form. Solving Word Problems Rates, Ratios, and Percents 	 Simplifying Square Roots The Pythagorean Theorem Distance and Midpoint Formulas
We	ek 2

Introduction to Geometry:

- 1. Patterns
 - a) find the next three terms (arithmetic, geometric, and pictures)
 b) find an equation to represent the nth term
 c) find the nth term

Geometry Relationships:

- 2. Identify points, lines, and planes.
- 3. Measure segments using a ruler.
- 4. Graphing points
- 5. Finding the distance between two points (of a segment) using the distance formula.
- 6. Find the midpoint of a segment.
- 7. Measure angles using a protractor and classify as acute, right, obtuse, or straight.
- 8. Complementary and Supplementary Angles
- 9. Vertical Angles.

Week 3

Parallel Lines:

- 1. Relationships between lines and a transversal
- 2. Relationships when parallel lines are cut by a transversal
- 3. Slopes of Lines, determine whether parallel, perpendicular, or neither.

Triangle Relationships:

- 4. Triangle Classifications
- 5. Angle Measures of Triangles
- 6. Exterior Angle Theorem
- 7. Special properties of Isosceles and Equilateral Triangles
- 8. The Pythagorean Theorem and Distance Formula, classifying triangles using the Pythagorean Theorem.
- 9. In a triangle, a side opposite a larger angle is longer than a side opposite a smaller angle.
- 10. Triangle Inequality, Exterior Angle Inequality.

Week 4 Quadrilaterals: 1. Polygons 2. Properties of Parallelograms 3. Rhombuses, Rectangles, and Squares

4. Trapezoids

Post-Test

ction	Curriculum Management System	Topic: Pre-Algebra Skills	
s of Instru	Grade 10	Goal 1: The student will be able to refine basic skills from Algebra I such and solving equations.	as simplifying expressions
	Fundamentals of Mathematics - Summer Enrichment		
day	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools /
uggested c	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
1	1.1. Operations with Real Numbers(2.2-2.7)	• A submarine is currently 100 feet under water (sea level). To avoid collisions with the ocean floor and other marine vessels, the submarine made the following movements: first it moved 20 feet up, then 50 feet deeper, then 40 feet deeper, then 20 feet up, then surfaced. How far did the submarine have to travel from its last depth to get to the surface?	McDougal-Littell: Algebra 1 2004 -2.2 Addition (pg. 72-77) -2.3 Subtraction (pg. 79-85)
		• Add, Subtract, Multiply, and Divide positive and negative real numbers.	-2.5 Multiplication (pg. 93-98)
		• Students should memorize rules; some may need to use a number line.	-2.7 Division (pg. 109-114)
		 <u>Explanation</u>: Multiplication of Signed Numbers: The story of the good guys (positive) and the bad guys (negative) being in town (positive) and out of town (negative). 	
		If the good guys are in town, it's good, + times + = +	
		If the good guys are out of town, it's bad, + times - = -	
		If the bad guys are in town, it's bad, - times + = -	
		If the bad guys are out of town, it's good, - times - = +	
	1.2. Evaluate Expressions	What is a variable?	<u>McDougal-Littell: Algebra 1</u> 2004
	containing Variables (1.2)	• Evaluate 8x + 4 if x = -3	-1.1 Variables (pg. 3-8)
			-1.2 Exponents and Powers (pg. 9-14)
	1.3. Simplify Expressions Using	 Does it matter if I deposit money in my checking account before I write the checks out? 	McDougal-Littell: Algebra 1
	(1.3)	Why do we need an order of operations?	2004
		 Use either PEMDAS, or GEMDAS, be sure students understand that M and D are equal as well as A and S just move left to right. 	-1.2 Exponents and Powers (pg. 9-14)
		• Do some more difficult problems such as: $\frac{2 \cdot 3 - 1}{4(6 - 8 \cdot 3)} - 7^2 + (-3)^3 + (-2)^4$	-1.3 Order of Operations (pg. 16-22)

tion	Curriculum Management System	Topic: Pre-Algebra Skills	
truc	Grade Level/Subject:	Goal 1: The student will be able to refine basic skills from Algebra I such	as simplifying expressions
nst	Grade 10	and solving equations.	
suggested days of I	Fundamentals of Mathematics - Summer Enrichment		
	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools /
	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
	1.4. Use properties of exponents to multiply and divide	 What is an exponent? What does it mean to have the same base? Simplify (a²)³ 	McDougal-Littell: Algebra 1 2004
	exponential expressions. (8.1,8.3)	• Simplify $a^2 * a^3$ • Simplify $a^2 * a^3$	-1.2 Exponents and Powers (pg. 9-14)
		• Simplify $(2x^3y)^2$	-8.1 Multiplication Properties of Exponents (pg. 450-455)
	1.5. Evaluate powers that have zero and negative	 What does it mean to have a negative exponent? Why divide instead of multiply? 	-8.2 Zero and Negative Exponents (pg. 456-462)
	exponents. (8.2)	 Show students relation of exponents, positive means multiply, negative means divide, show steps in increasing in power one by one, then decreasing: 	-8.3 Division Properties of Exponents (pg. 463-469)
		$2^2 = 4$	
		$2^1 = 2$	
		Look for pattern: $2^\circ = 1$	
		$2^{-1} = \frac{1}{2}$	
		$2^{-2} = \frac{1}{4}$	
		• Simplify 3 ⁻²	
		• Simplify 8 ⁰	
		• Simplify $\frac{1}{(4x)^{-5}}$	
		• Simplify $-\frac{2xy}{-x^{-1}} \cdot \left(\frac{2x^3y^4}{8xy}\right)^3$	

tion	Curriculum Management System	Topic: Pre-Algebra Skills	
istruc	Grade 10	Goal 1: The student will be able to refine basic skills from Algebra I such and solving equations.	as simplifying expressions
suggested days of Ir	Fundamentals of Mathematics - Summer Enrichment		
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to:	Essential Questions Sample Conceptual Understandings	Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
	1.6. Solve one-step equations (3.1-3.2)	 If you have \$28 in your wallet, and you want to purchase a jacket for \$43, how much more money do you need? 28 + x = 43 	McDougal-Littell: Algebra 1 2004
	 Solve multi-step equations (3.3) 	• I can solve these problems in my head. How do I use algebra to solve equations? What does it mean to use the opposite operation?	-3.1 Solving Equations Using Addition (pg. 132-137)
	1.8. Solve equations with variables on both sides of the equation(3.4)	 Solve x - 3 = 5 Solve: x + 5 = 11 	-3.2 Solving Equations Using Multiplication and Division (pg. 138-144)
		• Solve $-4x = 28$ • Solve $\frac{x}{x} = -39$	-3.3 Solving Multi-Step Equations (pg. 145-152)
		 Focus on writing equations from word problems 	-3.4 Solving Equations with Variables on Both Sides (pg. 154-159)
		 Lisa's mother is three more than twice Lisa's age. Lisa's mother is 47, how old is Lisa? 	-3.5 Linear Equations and Problem Solving. (pg. 160-165)
		 Always undo the addition or subtraction first, then the multiplication or division. 	HSPA: Amsco: MATHEMATICS:
		 Solve 3x + 4 = 25 Solve 7x - 3x + 8 = -24 	Preparing for the New Jersey HSPA, Grade 11
		• Solve $5x + 3(x + 4) = 28$	-Cluster 4.C.2 – pg. 221-226
		• Solve $-\frac{5}{2}x = -12$	a balanced scale squares, and circles.
		 How do I get all of the variables together when they are on both sides of the equation? 	
		• Solve 18y + 13 = 12y - 25	
		• Solve $6y - (3y - 6) = -14 - 3y$	
		 Focus on writing equations from word problems and using tables to solve problems. 	

Suggested days of Instruction	Curriculum Management System	Topic: Algebra I Skills	
	Grade 10 Fundamentals of Mathematics - Summer Enrichment	<u>Goal 2:</u> The student will be able to refine problem solving and graphing s solving word problems, using slope-intercept form of an equation, a problems.	kills from Algebra I such as nd solve ratio and percent
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to:	Essential Questions Sample Conceptual Understandings	Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
2	2.1. Graph the equation of a line using a table of values (4.2)	 How does a line represent an equation? Given the equation y = 2x - 5, students make a table of at least 3 values and graph in a coordinate plane. Review x-axis, y-axis, origin, quadrants. 	McDougal-Littell: Algebra 1 2004 -4.2 Graphing Linear Equations (pg 210-217) Prentice Hall: Algebra - Tools for a Changing World -Ch 2.3 – Linking Graphs to Tables (pg. 69-72)
	2.2. Find the slope of a line. (4.4)	 What is a rate of change, how is it represented in an equation? What is slope? Given a graph, students identify rise and run, to form slope fraction. Emphasize simplest form of a fraction. Identify that a horizontal line has zero slope, and a vertical line has an undefined slope or no slope. <u>Explanation</u>: Ski Slopes: A positive or negative slope is an acceptable slope for a downhill skier. A cross-country skier skis on a flat surface (horizontal line) which has zero slope. A vertical drop is not acceptable for a skierwould you like to ski off of a cliff? Heck no! Given two points on a line, students use the equation \$\frac{y_2 - y_1}{x_2 - x_1}\$, to find the slope of the line. Emphasize the meaning of the sub numbers to identify the point; it is not for an operation. 	McDougal-Littell: Algebra 1 2004 -4.4 The Slope of a Line (pg 226-234) Prentice Hall: Algebra - Tools for a Changing World (textbook - purple binding) -Ch 5.1 Slope (pg. 215-218) -Ch 5.2 Rates of Change (pg. 220-224)

tion	Curriculum Management System	Topic: Algebra I Skills	
of Instruc	<u>Grade Level/Subject</u> : Grade 10 Fundamentals of Mathematics -	<u>Goal 2:</u> The student will be able to refine problem solving and graphing s solving word problems, using slope-intercept form of an equation, a problems.	kills from Algebra I such as nd solve ratio and percent
uggested days c	Summer Enrichment		· · · · · · · · ·
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to:	Essential Questions Sample Conceptual Understandings	Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
	2.3. Transform an equation into slope-intercept form.(4.6)	 Now that I know the slope of a line, how can I find the slope by looking at an equation? What does the rest of the information in the equation mean? 	McDougal-Littell: Algebra 1 2004
	2.4. Graph the equation of a line using slope-intercept form. (4.6)	 Identify y = mx + b, have students graph and discover the slope and y-intercept. Given the equation y = 2x - 5, graph without making a table of values. Given the equation y = ¹/₂x + 3, graph using slope-intercept form. Emphasize that slope moving up and right is the same as down and left (+/+ and -/-) And slope moving up and left is the same as down and right (+/- and -/+) Put the equation 4x - 2y = 10 into slope-intercept form. 	-4.6 Quick Graphs Using Slope-Intercept Form (pg. 241- 247)
	2.5. Use slope-intercept form to find the equation of a word problem.	 Since a line represents an equation, can I use a line to find an equation? We already know slope and y-intercept from, how can we identify these things in a graph. If the slope of a line is ½ and the y-intercept is -3, what is the equation of the line? Given the graph of a line, find the slope and y-intercept of a line, and write the equation. Write the equation of the line going through the points: (3, 5) and (-4, -9), Students must know to find the slope first, then pick one of the points to find the equation as in 5.3 Review horizontal lines (y = number) and vertical lines (x = number) 	McDougal-Littell: Algebra 1 2004 -5.1 Writing Linear Equations in Slope-Intercept Form (pg. 274- 278) -5.2 Writing Linear Equations Given the Slope and a Point (pg. 279-284) -5.5 Point-Slope form (pg. 300- 306) -5.3 Writing Linear Equations Given Two Points.

tion	Curriculum Management System	Topic: Algebra I Skills	
Instruc	Grade Level/Subject: Grade 10	Goal 2: The student will be able to refine problem solving and graphing s solving word problems, using slope-intercept form of an equation, a problems	kills from Algebra I such as nd solve ratio and percent
buggested days of	Fundamentals of Mathematics - Summer Enrichment	problems.	
	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools /
	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
	2.6. Use rates, ratios, and	How do I put a rate or a percent into an equation?	McDougal-Littell: Algebra 1
	problems (3.8)	• The sides of a triangle are related by the ratio 3: 4: 5. The perimeter is 41 cm, what are the lengths of each side?	-3.8 Rates Ratios and Percents
		How can I figure the discount, sales tax, or shipping quickly?	(pg. 160-165) -11.1 Ratio and Proportion (pg.
		• Many students use the method: $\frac{part}{1} = \frac{\%}{100}$ or $\frac{is}{c} = \frac{\%}{100}$.	643-648)
		whole 100 of 100	-11.2 Percents (pg. 649-655)
		• 30 is 15% of what?	HSPA:
		• 30 is what % of 15?	Prentice Hall: New Jersey HSPA Mathematics
		• What is 30% of 15?	Comprehensive Review
		 <u>Discounts</u>: A \$60 pair of shoes is on sale for 20% off, what is the sale price? 	(textbook - purple binding – paperback)
		 <u>Find the original</u>: A jacket is on sale for 20% off; the sale price is \$160, what was the original price? 	-1.1 Real Numbers and Algebraic Expressions pg. 1-6
		• <u>Double Discounts</u> : A \$750 Couch is on sale for 30% off with an additional 10% off? Discuss why this is not the same as 40% off.	-3.2 Problems Involving Linear Equations in One Variable pg.
		 <u>Sales Tax and Discount</u>: A \$200 set of pots and pans is on sale for 25% off, what is the price after 6% sales tax? 	46-50 Amsco: MATHEMATICS:
		• What is the difference between a sketch and a scale drawing?	Preparing for the New Jersey
		Most students remember how to solve a proportion: Cross multiply and	$\frac{\text{HSPA, Grade II}}{\text{Cluster 1 B 1 - pq. 13-14}}$
		• Solve: $\frac{3}{y} = \frac{5}{8}$	-Cluster 1.B.2 – pg. 15-16
		• Solve: $\frac{x}{8} = \frac{2x-1}{20}$	
		 Emphasize ability to solve word problems and real life applications. 	

	Curriculum Management System	Topic: Connecting Algebra to Geometry	
	Grade Level/Subject:	Goal 3: The student will be able to use formulas to solve problems in Geo	ometry and simplify their
	Grade 10	answers in order to give exact answers and rounded answers.	
ys of	Fundamentals of Mathematics - Summer Enrichment		
da	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools / Materials
uggested struction	Cumulative Progress Indicators (CPI's)	Sample Conceptual Understandings	/ Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
ln Si	The student will be able to:		
1	3.1. Simplify Radicals. (CPI 4.1.12 B1, B2)	 A can of paint reads that a quart of paint covers 75 to 100 square feet. What does this mean? How big of a wall will it cover? 	<u>McDougal-Littell: Algebra 1</u> 2004
		• Students must be able to identify solutions to: $\sqrt{9}$, $\sqrt{-9}$, $-\sqrt{9}$, and $\pm\sqrt{9}$	-9.2 Simplifying Radicals (pg. 511-516)
		 Review types of numbers: counting (natural), whole, integers, and rational, and irrational. Emphasize the differences between rational and irrational. (terminating or repeating). Look in HSPA books for questions about types of numbers. 	-12.2 Operations with Radical Expressions (pg. 716-721) – only multiplying and dividing as in Example 2 and 3, or Problem
		• Solve x ² = 121	# \$ 7, 10, 12, 31, 32, 40, 41, 43
		 Solve: x² = 24; this does not have a whole number answer, we must simplify. Emphasize the need for exact answers, the need for simplifying radicals. 	for a Changing World (textbook
		$\sqrt{64}$	-9.4 Simplifying Radicals (pg.
		• Simplify these: $\sqrt{18}$	430-434)
		$\sqrt{\frac{25}{16}}$	
	3.2. Use the Pythagorean	 What whole number side lengths always form right triangles, Pythagorean Triples? How can I use these to solve problems? 	<u>Geometry</u> , Glencoe, © 2005 - Geometry Activity pg. 349
	(CPI 4.2.12 A1, 4.2.12 E1)	$a^2 + b^2 = c^2$	- 8.2 pg. 350-356
		• Pythagorean theorem: $leg^2 + leg^2 = hyp^2$	HSPA: Amsco: MATHEMATICS:
		• In a right triangle one leg is 5, the other leg is 12, find the hypotenuse.	Preparing for the New Jersey
		• In a right triangle one leg is 20, the hypotenuse is 25, find the other leg.	HSPA, Grade 11
		 If two sides of a right triangle are 3 and 4, what are the possible side lengths for the third side? 	- Cluster 2.C.6 Pythagorean Theorem – pg. 87-88

	Curriculum Management System	Topic: Connecting Algebra to Geometry	
	Grade Level/Subject:	Goal 3: The student will be able to use formulas to solve problems in Geo	ometry and simplify their
	Grade 10	answers in order to give exact answers and rounded answers.	
/s of	Fundamentals of Mathematics - Summer Enrichment		
day	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools / Materials
uggested	Cumulative Progress Indicators (CPI's)	Sample Conceptual Understandings	/ Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
s F	The student will be able to:		
	two points. (CPI 4.2.12 C1)	Find the distance on a number line (whether horizontal or vertical)	<u>Geometry</u> , Giencoe, © 2005
	3.4. Identify and find the	• Distance formula $-D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	-1.5 pg. 21-20
	midpoint of a segment. (CPI 4.2.12 C1)	Midpoint formulas:	
		Number Line: $\frac{x_1 + x_2}{2}$	
		Coordinate Plane: $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$	
		Emphasize - coordinates.	
		EX 1: Find AB if A(3, 2) and B(3, -5)	
		EX 2: Find AB if A(-5, 3) and B(7, -2)	
		EX 3: $A(2, -2)$, $B(2,8)$, find the coordinates of M.	

Suggested days of Instruction	Curriculum Management System	Topic: Basics of Geometry – Segments and Angles	
	Grade Level/Subject: Grade 10	Goal 4: The student will be able to use inductive and deductive reasoning	g to solve problems.
	Fundamentals of Mathematics - Summer Enrichment		
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to:	Essential Questions Sample Conceptual Understandings	Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
2	 4.1. Identify the next three terms in a pattern. (CPI 4.3.12 A1) 4.2. Find the nth term of an arithmetic pattern. (CPI 4.2.13 A1) 	 If you start a savings account with \$500, and add \$20 each week, how much money will you have after 1 year? Visual patterns – repeating shapes. Number patterns, arithmetic, geometric, Fibonacci Repeating patterns: what is the 38th term in GEOMETRYGEO? What is the 47th digit in ¹/₇? Or what is the units digit in 3²⁵? In the pattern 4, 6, 8, 10, what are the next three terms? What is the 40th term? What is the nth term (write an equation)? 	HSPA: <u>Amsco: MATHEMATICS:</u> <u>Preparing for the New Jersey</u> <u>HSPA, Grade 11</u> - Cluster 2.A.4 Inductive and Deductive Reasoning – pg. 36- 38 - Cluster 4.A.1 Patterns – pg. 177-181 - Cluster 4.A.2 Sequences and Series – pg. 181-187 - Cluster 4.A.3 Representation of Relationships and Patterns – pg. 188-189 <u>Prentice Hall: New Jersey</u> <u>HSPA Mathematics</u> <u>Comprehensive Review</u> - 13.1 Patterns and Sequences pg. 298-301

tion	Curriculum Management System	Topic: Geometry Relationships	
struc	Grade Level/Subject: Grade 10	<u>Goal 5:</u> The student will be able to identify and use parts and types of line problems solving.	es, angles, and planes in
uggested days of In	Fundamentals of Mathematics - Summer Enrichment	h	
	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools / Materials / Technology /
	(CPI's) The student will be able to:	Sample Soneeptual Shaerstandings	Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
3	5.1. Identify and use points,	Why do chairs sometimes wobble?	Geometry, Glencoe, © 2005
	lines, and planes in space.	 Identify collinear and coplanar points. 	-Review of plotting points pg.
	(011112711)	 Name points, lines, line segments, and planes both in words and by symbols 	720 -1.1 pg. 6-12
		• Coordinate Geometry: identify the x-axis, y-axis, origin, quadrants, and plot	HSPA:
		points.	Amsco: MATHEMATICS:
		Introduce z-axis (mention)	HSPA, Grade 11
		I wo lines intersect to form a point	- Cluster 2.A.1Geometric
		 I wo planes intersect to form a line. Skew lines are in two different planes, never intersect, but are not parallel. 	Terms – pg. 23-26
		• Skew lines are in two different planes, never intersect, but are not parallel.	Prentice Hall: New Jersey HSPA Mathematics Comprehensive Review
			- 10.1 Points, Lines, Planes, and Segments pg. 206-210
	5.2. Find the length and midpoint of a segment. (CPI 4.2.12 C1)	• I want to make a garden that is 12 feet by 4 feet. If the border pieces are 4 feet long, how many pieces will I need?	<u>Geometry</u> , Glencoe, © 2005
	5.3. Identify and use segments,	 Name distance in words and by symbols. Find the distance on a number line (whether herizontal or vertical) 	-Activity – The Pythagorean
	bisectors. (CPI 4.2.12 C1)	 Use a ruler to measure the distance of a segment, in inches and in centimeters. 	Theorem pg. 28

truction	Curriculum Management System	Topic: Geometry Relationships		
	Grade Level/Subject:	Goal 5: The student will be able to identify and use parts and types of line	es, angles, and planes in	
lns	Grade 10	problems solving.		
s of	Summer Enrichment			
day	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools /	
Suggested	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model	
	5.4. Measure and Classify	• Why when it is the brightest outside does no one use their visors in their	Geometry, Glencoe, © 2005	
	Angles.	cars, yet in the early morning or evening they do?	- 1.4 pg. 29-36	
	(CPI 4.2.12 C1)	 Identify the sides, vertex, interior, and exterior of an angle. 	HSPA:	
		Name a ray in words and by symbols.	Prentice Hall: New Jersey	
	5.5. Identify and use congruent angles in problem solving.	 Name an angle by symbols, using one letter (the vertex), three letters, and a number. 	<u>HSPA Mathematics</u> Comprehensive Review	
	(CPI 4.2.12 CT)	• Know the difference between the symbols: \Box ABC and m \Box ABC	- 10.2 Rays and Angles pg.	
		Measure an angle using a protractor (optional)		
		 Angles are measured in degrees: Emphasize - students must have degree signs next to angle measures. 	Prentice Hall Mathematics: - TI – 83/84 PLUS Activities for	
		Classify Angles as acute, right, obtuse, or straight.	Algebra, Geometry, and	
		Identify and label congruent angles	Algebra II (resource workbook)	
		Use Algebra to find angle measurements.	- Angle Bisectors – pg. 55	
		 Identify and use properties of angle bisectors: 		
		Bisector is exactly in middle.		
		Bisector cuts the whole angle in half.		
		The measure of each angle on either side of the bisector is equal.		
		EX. \overrightarrow{BD} is the angle bisector of $\Box ABC$, If $\Box ABD = (8X - 10)^o$ and		
		$\Box DBC = (10x - 20)^{\circ}$, find x, $m\Box ABC$		
		Angle addition postulate		

truction	Curriculum Management System	Topic: Geometry Relationships	
	<u>Grade Level/Subject</u> : Grade 10	Goal 5: The student will be able to identify and use parts and types of line	es, angles, and planes in
i Ins	Fundamentals of Mathematics -	problems solving.	
s of	Summer Enrichment		
day	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools /
uggested	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
•	5.6. Identify and use special	Streets intersect to form many different types of angles, discuss the angels	Geometry, Glencoe, © 2005
	types of angles and pairs of	of roads around Monroe and Jamesburg.	- 1.5 pg. 37-43
	angles. (CPI 4.2.12 C1)	 Identify and name adjacent angles 	HSPA:
		Identify vertical angles - congruent	Amsco: MATHEMATICS:
		 Complementary angles - two angles whose sum is 90° 	Preparing for the New Jersey HSPA Grade 11
		 Supplementary angles – two angles whose sum is 180° 	- Cluster 2.A.3 – pg. 33-36
		 Linear Pair of angles form a line; they are supplementary and their sum is 180° 	TECHNOLOGY:
		Perpendicular lines form 4 right angles.	Prentice Hall Mathematics: - TI
		Use Algebra to find angle measurements using each angle type listed above.	<u>– 83/84 PLUS Activities for</u> <u>Algebra, Geometry, and</u> Algebra II (resource workbook)
			- Linear Pairs – pg. 57
			- Vertical Angles – pg. 59

stion	Curriculum Management System	Topic: Parallel and Perpendicular Lines	
s of Instruc	Grade Level/Subject: Grade 10	Goal 6: The student will be able to use angle relationships with parallel a	nd perpendicular lines to
	Fundamentals of Mathematics - Summer Enrichment		
day	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools / Materials / Technology /
Suggested	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Activities / Assessment Model
2	6.1. Identify angles formed by two lines and a transversal. (CPI 4.2.12 A3, 4.2.12 A4,	• When a house is built, Construction workers must up walls straight. They use beams in the walls called studs to stabilize the wall. How can the workers determine if the studs are parallel?	<u>Geometry</u> , Glencoe, © 2005 - 3.1 pg. 126-131
	4.2.12 C1)	Discuss parallel lines and parallel planes.	p. 132
		 Introduce types of angles: Alternate exterior, Alternate interior, Corresponding, Consecutive (Same-Side Interior) 	HSPA: Prentice Hall: New Jersey
		 Identify angles when three lines cross (not parallel), and when four lines cross (two sets of parallel lines). 	HSPA Mathematics Comprehensive Review - Intersecting, Perpendicular, and Parallel Lines pg. 215-219
			RESOURCES:
	6.2. Identify and use angle relationships formed by two parallel lines and a	• A railroad train travels along two rails. The two rails must be the same distance apart along the entire track. How can we make sure the train will not derail?	<u>Geometry</u> , Glencoe, © 2005 - Geometer sketchpad activity pg. 132
	transversal. (CPI 4.2.12 A3, 4.2.12 C1, 4.5.12 C1, 4.5.12	 Identify the alternate interior, alternate exterior, and corresponding angles, and identify the congruent angles 	- 3.2 pg. 133-138 - 3.5 pg. 151-158
	5)	 Identify the consecutive angles and the supplementary angles, show relationship is supplementary. 	TECHNOLOGY:
		 Congruent angles can be identified by making a "Z", zigzagging across the transversal. 	<u>– 83/84 PLUS Activities</u> for Algebra, Geometry, and
		Perpendicular transversal theorem.	Algebra II (resource workbook)
		Use algebra to solve problems involving parallel lines and a transversal.	 Parallel Lines, Related Angles pg. 61

ion	Curriculum Management System	Topic: Parallel and Perpendicular Lines	
ruct	Grade Level/Subject:	Goal 6: The student will be able to use angle relationships with parallel a	nd perpendicular lines to
nst	Grade 10	solve problems.	
s of lı	Fundamentals of Mathematics - Summer Enrichment		
day	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools /
Suggested c	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
	6.3. Use the slope of a line to	• When driving in the mountains, or a very hilly area, there are signs posted	Geometry, Glencoe, © 2005
	determine whether two lines	with pictures of a truck and percentages on them. What are these used for,	- 3.3 pg. 139-144
	perpendicular. (CPI 4.2.12 C1 4.3.12 B2)	Poviow slope formula: $\frac{y_2 - y_1}{y_2 - y_1}$	 pg. 741 – Review graphing using intercepts and slopes.
	01, 1012 22)	• Review slope formula. $\frac{1}{x_2 - x_1}$	HSPA:
		Review relationships of slopes of parallel and perpendicular lines.	Amsco: MATHEMATICS: Preparing for the New Jersey
		Review slope-intercept form of an equation.	HSPA, Grade 11 (navy blue
		• Use slope to graph a line: given the slope and a point, given slope-intercept	binding – paperback)
		form.	- Cluster 2.B.5 Coordinate Geometry – pg. 58-61

ction	Curriculum Management System	Topic: Triangle Relationships	
truc	Grade Level/Subject:	Goal 7: The student will be able to use the relationships of sides and ang	les in triangles to solve
of Inst	Grade 10	problems.	
	Summer Enrichment		
day:	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools /
uggested c	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
3	7.1. Classify triangles by sides	Construction workers use triangles when building houses, office buildings.	RESOURCES:
	and angles (CPI 4.2.12 A3, 4.2.12 A4)	and bridges, name some locations where you've seen triangles used in construction. Why do you think this is?	<u>Geometry</u> , Glencoe, © 2005
		 Identify the vertices, angles, and sides of a triangle. 	HSPA:
		 Side Classifications – scalene, isosceles, and equilateral 	Prentice Hall: New Jersev
		 Angle Classifications – acute, obtuse, right, and equiangular 	HSPA Mathematics
		 Emphasize: In a right triangle, there is at most 1 right angle. And, in an obtuse triangle, there is at most 1 obtuse angle. 	<u>Comprehensive Review</u> (textbook - purple binding –
		• In a right triangle, identify the right angle, the legs and the hypotenuse.	10.4 Trionglos
		• In an isosceles triangle, identify the base, the vertex, and the base angles.	-10.4 Thangles
	7.2. Use the exterior and interior angles of a triangle to solve problems.(CPI 4.2.12 A3, 4.2.12 A4)	 Angle Sum Theorem, the sum of the angles inside an triangle is 180° Exterior Angles Theorem, the exterior angle is equal to the sum of the two remote interior angles. Solve problems involving interior and exterior angles 	<u>Geometry</u> , Glencoe, © 2005 - 4.2 pg. 216-221
	7.3. Use properties of isosceles	 Review the vertex, the base, and the base angels. If the triangle is isosceles, then the base angles are congruent. (If sides 	<u>Geometry</u> , Glencoe, © 2005
	(CPI 4.2.12 A3, 4.2.12 A4)	then angles).	- 4.6 pg. 216-221
		 If the base angles are congruent then the triangle is isosceles. (If angles then sides). 	
		Given one angle in an isosceles triangle, find the other two angels.	
		Use algebra to solve isosceles triangle problems.	
		EX. In isosceles triangle ABC, where A is the vertex, $AB = 4x - 5$, $AC = 11 + 2x$, $BC = 3X$. Find x, BC.	

ction	Curriculum Management System	Topic: Triangle Relationships	
Suggested days of Instruc	Grade Level/Subject: Grade 10	Goal 7: The student will be able to use the relationships of sides and ang problems.	les in triangles to solve
	Fundamentals of Mathematics - Summer Enrichment		
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to:	Essential Questions Sample Conceptual Understandings	Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
	7.4. Name congruent triangles and identify corresponding parts. (CPI 4.2.12 A3, 4.2.12 A4)	 I need to get to the other side of the river, but I need to know how long of a bridge to make, how can I use markings on this side of the river to see if I have enough? Review reflexive, symmetric, and transitive properties. Identify all congruent angles and all congruent sides of congruent triangles. Make congruence statements Emphasize: order of letters matters. CPCTC 	<u>Geometry</u> , Glencoe, © 2005 - 4.3 pg. 192-198 TECHNOLOGY: <u>Prentice Hall Mathematics: - TI - 83/84 PLUS Activities for Algebra, Geometry, and Algebra II (resource workbook) - Exterior Angle of a Triangle – pg. 63</u>
	7.5. Recognize and Apply triangle inequalities. (CPI 4.2.12 A3, 4.3.12 C1, 4.5.12 A3)	 Without using a protractor, How can you tell which angle is the biggest angle? Angle-Side Relationships: The angle opposite a longer side is larger than an angle opposite a shorter side and vice-versa. Determine side-angle relationships when there are two adjacent triangles. Triangle Inequality Theorem: The sum of the lengths of any two sides of a triangle is greater than the length of the third side. EX. Is it possible for a triangle to have side lengths of 3, 5, and 8? 2, 4, and 5? 3, 3, 10? Given two side lengths, find the range of lengths for the 3rd side. EX. If two sides of a triangle are 10 and 13, what is the range of sizes for the third side? Also, apply algebra to solving inequalities. 	<u>Geometry</u> , Glencoe, © 2005 - 5.2 pg. 247-254 - 5.4 pg. 261-266 - 5.5 pg. 267-273 TECHNOLOGY: <u>Prentice Hall Mathematics: - TI - 83/84 PLUS Activities for</u> <u>Algebra, Geometry, and</u> <u>Algebra II (resource workbook)</u> - Inequalities in Triangles – pg. 75

s of Instruction	Curriculum Management System	Topic: Triangle Relationships	
	<u>Grade Level/Subject</u> :	Goal 7: The student will be able to use the relationships of sides and ang	les in triangles to solve
	Grade 10	problems.	
	Fundamentals of Mathematics - Summer Enrichment		
day	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools /
uggested c	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
Su	The student will be able to: 7.6. Use side lengths to determine if a triangle is acute, right, or obtuse (CPI 4.2.12 A1, 4.2.12 E1) 4.2.12 A1, 4.2.12 E1)	 If I am not given any angle measurements, how can I tell if a triangle is acute, right, or obtuse? Use Pythagorean Theorem. If hypotenuse is smaller than what c should be according to the theorem, then the triangles is acute, if hypotenuse is larger than what c should be, then the triangle is obtuse. EX. Is a triangle with side lengths 3, 4, 6 is acute, right, or obtuse? 	Model <u>Geometry</u> , Glencoe, © 2005 - 7.2 pg. 350-356

ted days of Instruction	Curriculum Management System	Topic: Quadrilaterals	
	Grade Level/Subject: Grade 10	Goal 8: The student will be able to use properties of quadrilaterals to solv	ve problems.
	Fundamentals of Mathematics - Summer Enrichment		
	Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)	Essential Questions Sample Conceptual Understandings	Instructional Tools / Materials / Technology / Resources / Learning
Sugges	The student will be able to:		Activities / Interdisciplinary Activities / Assessment Model
2	 8.1. Recognize and apply the properties of parallelograms. (4.2.12 A3) 8.2. Recognize and apply the properties that ensure a quadrilateral is a parallelogram. (CPI 4.2.12 A3) 	 There are many quadrilaterals in nature, where do we see quadrilaterals, and where to we see parallel lines? Why are these so special in architecture? Define the five properties of a parallelogram: two pairs of parallel sides, opposite sides are congruent, opposite angles are congruent, consecutive angles are supplementary, and diagonals bisect each other. Name the parallelogram in words and by symbols. Label parallelogram with arrows to indicate parallel lines and with slashes to indicate congruence. Use algebra to solve parallelogram problems Apply properties that ensure a quadrilateral is a parallelogram. Use algebra to create conditions that ensure a quadrilateral is a parallelogram. Use algebra to create conditions that ensure a quadrilateral is a parallelogram. EX. In □ <i>ABCD</i>, AB = 15, CD = 2x + 3 Find x. Do many board examples giving 3 angles in a parallelogram, students must find the rest of the angles. 	RESOURCES: <u>Geometry</u> , Glencoe, © 2005 - 8.2 pg. 411-416 - 8.3 pg. 417-419 HSPA: <u>Amsco: MATHEMATICS:</u> <u>Preparing for the New Jersey</u> <u>HSPA, Grade 11</u> (navy blue binding – paperback) - Cluster 2.A.2 Properties of Geometric Figures pg. 27-33 <u>Prentice Hall: New Jersey</u> <u>HSPA Mathematics</u> <u>Comprehensive Review</u> (textbook - purple binding – paperback) -10.5 Quadrilaterals pg. 226- 231 TECHNOLOGY: <u>Exploring Geometry with The Geometer's Sketchpad</u> (resource workbook)
			- Frop. of Farallelograms - 91

s of Instruction	Curriculum Management System	Topic: Quadrilaterals	
	Grade Level/Subject: Grade 10	Goal 8: The student will be able to use properties of quadrilaterals to solv	ve problems.
	Fundamentals of Mathematics - Summer Enrichment		
day	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools /
suggested d	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
	8.3. Recognize and apply the	The floor and the walls of a house must be rectangular in order for	RESOURCES:
	properties of special	everything else in the house to be plum. How do construction workers	Geometry, Glencoe, © 2005
	parallelograms – rectangles,	ensure that the floor and the walls are rectangular?	- 8.4 pg. 424-430
	4.2.12 A3)	 Understand that Rectangles, Rhombi, and Squares are still parallelograms, therefore all the properties of parallelograms still hold for these shapes. 	- 8.5 pg. 431-437
	,	Special Properties:	TECHNOLOGY:
		Special Properties. Bestandles:	Exploring Geometry with The
		• Rectangles.	Geometer's Sketchpad
		All angles are equal (90)	(resource workbook)
		Diagonais are equal	Properties of a Phombus 05
			- Properties of a Knorhous – 95
		All sides are equal Diagonals are perpendicular	
		Diagonals are perpendicular Diagonals bisect opposite angles	
		Is a parallelogram, a rhombus, and a rectangle, and has all the properties of each.	
		 Solve problems involving special parallelograms, using algebra. 	
		EX. In rhombus ABCD, AB=15, BC=3x -6, find x.	
		 Use the Pythagorean Theorem when solving a Rhombus. 	
		EX. In rhombus ABCD, BD=15, AC=20, find AB.	
		 Do many board examples given 1 angle in a special parallelogram, and students must find other angles. 	

tion	Curriculum Management System	Topic: Quadrilaterals	
s of Instruc	Grade Level/Subject: Grade 10	<u>Goal 8:</u> The student will be able to use properties of quadrilaterals to solv	ve problems.
	Fundamentals of Mathematics - Summer Enrichment		
day	Objectives / Cluster Concepts /	Essential Questions	Instructional Tools /
Suggested a	Cumulative Progress Indicators (CPI's) The student will be able to:	Sample Conceptual Understandings	Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model
	8.4. Recognize and apply the	• Define properties of trapezoids: one pair of parallel sides, define sides,	RESOURCES:
	properties of trapezoids.	bases and legs, angles connecting the bases are consecutive, therefore are	Geometry, Glencoe, © 2005
		 Define isosceles trapezoids: congruent legs, base angles are congruent 	- 8.6 pg. 439-446
		and diagonals are congruent.	- Hierarchy of Polygons (Quadrilaterals)
		• Median of a trapezoid, use the formula: $2 \cdot \text{median} = \text{base}_1 + \text{base}_2$ as	TECHNOLOGY:
		students relate to this better than using a fraction.	Exploring Geometry with The
		 Solve various problems using algebra with trapezoids – angles, sides in isopagles triangles and medians. 	<u>Geometer's Sketchpad</u> (resource workbook)
			- Properties of Isosceles Trapezoids - 97
			- Midsegments of a Trapezoid and a Triangle - pg. 100
			- Summarizing Properties of Quadrilaterals.
	8.5. Recognize and apply the	 Introduce other types of quadrilaterals such as kites. 	RESOURCES:
	properties of other	• Review the sum of the interior angles must be 360°.	Geometry, Glencoe, © 2005
	A3)	•	- pg. 438 Activity - Kites
	8.5. Recognize and apply the properties of other quadrilaterals. (CPI 4.2.12 A3)	 Solve various problems using algebra with trapezoids – angles, sides in isosceles triangles and medians. Introduce other types of quadrilaterals such as kites. Review the sum of the interior angles must be 360°. 	Geometer's Sketchpad (resource workbook) - Properties of Isosceles Trapezoids - 97 - Midsegments of a Trapezo and a Triangle - pg. 100 - Summarizing Properties of Quadrilaterals. RESOURCES: <u>Geometry</u> , Glencoe, © 2005 - pg. 438 Activity - Kites

Fundamentals of Mathematics – Summer Enrichment

Grade 10

COURSE BENCHMARKS

- 1. The student will be able to apply basic skills from Algebra I such as simplifying expressions and solving equations.
- 2. The student will be able to apply problem solving and graphing skills from Algebra I such as solving word problems, using slopeintercept form of an equation, and solve ratio and percent problems.
- 3. The student will be able to use formulas in solving Geometry problems and simplify answers to give exact and rounded answers.
- 4. The student will be able to use inductive and deductive reasoning to solve problems.
- 5. The student will be able to identify and use parts and types of lines, angles, and planes in problems solving.
- 6. The student will be able to use angle relationships with parallel and perpendicular lines to solve problems.
- 7. The student will be able to use the relationships of sides and angles in triangles to solve problems.
- 8. The student will be able to use properties of quadrilaterals to solve problems.