Pine Hill Public Schools			
Content Area:	**Mathematics**		
Course Title/ Grade Level:	**Concepts of Math / Grade 12**		
Unit 1:	**Mathematical Ways of Thinking**	Month:	**September**
Unit 2:	**Number Sequences**	Month:	**October**
Unit 3:	**Functions and Their Graphs**	Month:	**November/December**
Unit 4:	**Large Numbers and Logarithms**	Month:	**December/ January**
Unit 5:	**Symmetry and Regular Figures**	Month:	**February**
Unit 6:	**Mathematical Curves**	Month:	**March**
Unit 7:	**Methods of Counting**	Month:	**April/ May**
Unit 8:	**The Mathematics of Chance**	Month:	**May/June**
Unit 9:	**An Introduction to Statistics**	Month:	**June**
BOE Approval Date:	August 28, 2012		

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Mathematical Ways of Thinking		**Unit #: 1**
Course or Grade Level: CP Concepts of Mathematics	**Length of Time: 24 days**	
Date Created: April 9, 2012	**BOE Approval Date:**	

Pacing	24 days, 2 day introduction to course, 3 days per section, covering all sections in chapter 1 , 2 review day and 2 summative assessment days
Essential Questions	• How is the path of a billiard ball related to a path on graph paper. • How does hitting a ball at a 45° angle show on a piece of graph paper • How does reducing the dimensions of the table help predict the path of the ball • What are the limitations of inductive reasoning • How is deductive reasoning helpful in geometry • How are number tricks used to show deductive reasoning
Content	• The path of a billiard ball • Inductive reasoning • Deductive reasoning • Number tricks and deductive reasoning
Skills	• Identify lines and angles on a graph • Notice patterns of numbers • Solving puzzles • Using deductive reasoning to solve problems and number tricks • Visualize a cubes edges, corners and faces • Solve number trick puzzles
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at smart board Summative: • Quizzes, tests and benchmark
Interventions / differentiated instruction	• Students given notes via smart board • Partner or group work • Solve puzzles including numbrix and sudoku
Inter-disciplinary Connections	• Using algebra to solve problems involving line segments, angles, perimeter and area
Lesson resources / Activities	• Mathematics – A Human Endeavor –W.H. Freeman and Co. – Harold R. Jacobs - Third Edition, Copyright-1994 – Chapter 1 • Textbook practice exercises • Graph Paper • Construction and measuring of segments and angles • Solving number tricks using algebra • Smart Board • Scientific Calculator

Common Core State Standards	
Grade or Conceptual Category (HS only): Number and Quality	
Domain (name and #): N-RN : The Real Number System	
Cluster: Extend the	**#. Standard:** N-RN-1

properties of exponents	N-RN- 2

Math Practices: 2) Reason abstractly and quantitatively
4) Model with mathematics

21st Century Themes

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

21st Century Skills

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

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Number Sequences		**Unit #: 2**
Course or Grade Level: CP Concepts of Mathematics	**Length of Time: 26 days**	
Date Created: April 9, 2012	**BOE Approval Date:**	
Pacing	26 days, 3 days per section, covering all chapter 2 , 2 review days and 2 summative assessment days, 4 benchmark review and assessment days	
Essential Questions	• How is inductive reasoning used to identify patterns and make conjectures • How do we analyze the truth value of conditional statements • How do we identify properties of equality and congruence • How do we use deductive reasoning in proving geometric theorems	
Content	• Arithmetic Sequences • Geometric Sequences • Binary Sequences • Sequence of Squares • Higher power sequences • Fibonacci Sequence	
Skills	• To identify characteristics of arithmetic, geometric, binary, Fibonacci, squares and cube sequences • To Notice patterns of numbers	
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at board	Summative: • Quizzes, tests and benchmark
Interventions / differentiated instruction	• Students given notes via smart board • Partner or group work • Solve puzzles including numbrix and sudoku	
Inter-disciplinary Connections	• Using algebra to solve problems involving sequences • Using Biology to show relationships between the Fibonacci sequence and the family tree of bees and rabbits	
Lesson resources / Activities	• Mathematics – A Human Endeavor –W.H. Freeman and Co. – Harold R. Jacobs - Third Edition, Copyright-1994 – Chapter 2 • Textbook practice exercises • Smart Board • Scientific Calculator	

Common Core State Standards	
Grade or Conceptual Category (HS only): Algebra	
Domain (name and #): A-SSE : Seeing Structures in Expressions	
Cluster: Write expressions in equivalent forms to solve problems	**#. Standard**: A-SSE- 4

Math Practices: 1) Make sense of problems and preserve in solving them.
2) Reason abstractly and quantitatively.
3) Construct viable arguments and critique the reasoning of others.

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

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Functions and Their Graphs		**Unit #: 3**
Course or Grade Level: CP Concepts of Mathematics	**Length of Time: 22 days**	
Date Created: April 9, 2012	**BOE Approval Date:**	

Pacing	22 days, 3 days per section, covering all sections in chapter 3 , 2 review days and 2 summative assessment days
Essential Questions	• What are the parts of a function • Who is Renee Descartes • What are the characteristics of a linear function • What are the characteristics of a parabolic function • What are the differences between interpolation and extrapolation
Content	• Algebraic functions • Ordered pairs and the coordinate graph • Linear graphs • Parabolic graphs • Other curved functions • Interpolation and extrapolation
Skills	• Solve algebraic functions • Plot points on a coordinate graph • Draw linear functions • Draw parabolic functions • Draw other functions with curves • Show the similarities and differences with interpolation and extrapolation
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at board Summative: • Quizzes, tests and benchmark
Interventions / differentiated instruction	• Students given notes via smart board • Partner or group work • Solve puzzles including numbrix and sudoku
Inter-disciplinary Connections	• Geography and the Mississippi river in the study of interpolation/extrapolation
Lesson resources / Activities	• Mathematics – A Human Endeavor –W.H. Freeman and Co. – Harold R. Jacobs - Third Edition, Copyright-1994 – Chapter 3 • Textbook practice exercises • Smart Board • Scientific Calculator

Common Core State Standards	
Grade or Conceptual Category (HS only): Functions	
Domain (name and #): F-IF : Interpreting functions	
Cluster: Understanding the	**#. Standard:** F-IF – 1, 2, 3

concept of a function and use function notation	

Math Practices: 4) Model with Mathematics
5) Use appropriate tools strategically

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

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Large Numbers and Logarithms		**Unit #: 4**
Course or Grade Level: CP Concepts of Mathematics	**Length of Time: 26 days**	
Date Created: April 9, 2012	**BOE Approval Date:**	
Pacing	26 days, 3 days per section, covering all chapter 4, 2 review days and 2 summative assessment days, 4 benchmark review and assessment days	
Essential Questions	• How can large numbers be written and named • How can large numbers be written in scientific notation • What is the difference between binary and decimal logarithms • How is scientific notation used to write numbers as a logarithm • What are the characteristics of exponential functions	
Content	• Large numbers • Scientific notation • Intro to logarithms • Decimal logarithms • Logarithms and scientific notation • Exponential functions	
Skills	• Write large numbers • Name large numbers • Work with numbers in scientific notation • Multiply numbers using decimal logarithms • Convert large numbers into scientific notation before finding its logarithm	
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at board	Summative: • Quizzes, tests and benchmark
Interventions / differentiated instruction	• Students given notes via smart board • Partner or group work • Solve puzzles including numbrix and sudoku	
Inter-disciplinary Connections	• Astronomy and space travel • World population	
Lesson resources / Activities	• Mathematics – A Human Endeavor –W.H. Freeman and Co. – Harold R. Jacobs - Third Edition, Copyright- 1994 – Chapter 4 • Textbook practice exercises • Smart Board • Scientific Calculator	
Common Core State Standards		
Grade or Conceptual Category (HS only): Number & Quantity		
Domain (name and #): N-RN : The Real Number System		
Cluster: Use properties of rational and irrational numbers	**#. Standard:** N-RN - 1	

Domain (name and #) : NQ -Quantities							
Cluster: Reason quantitatively and use units to solve problems		**#. Standard::** N-Q - 1					
Math Practices: 1) Make sense of problems and preserve in solving problems 2) Model with mathematics							
21st Century Themes							
	Media Literacy		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
	Creativity and Innovation						
	Media Literacy						

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Symmetry and Regular Figures		**Unit #: 5**
Course or Grade Level: CP Concepts of Mathematics	**Length of Time: 22 days**	
Date Created: April 10, 2012	**BOE Approval Date:**	
Pacing	22 days, 3 days per section, covering all chapter 5, 2 review days and 2 summative assessment days	
Essential Questions	• Identify the differences between line and rotational symmetry • What does the word regular mean if it is written before polygon • What are the common polygons that are used for mosaics • What are the characteristics of a regular polyhedral • What sports ball is a perfect example of a semi regular polyhedra • Identify the characteristics of a pyramid • Identify the characteristics of a prism	
Content	• Symmetry • Regular Polygons • Mathematical Mosaics • Regular Polyhedra : The Platonic Solids • Semi Regular Polyhedra • Pyramids and Prisms	
Skills	• To illustrate the lines of symmetry on a polygon • Show symmetry with the use of a normal set of playing cards • Show the characteristics of a mathematical mosaic • Show how a soccer ball is a perfect example of a semi regular polyhedra • Be able to describe the similarity and difference between pyramids and prisms • Make a regular polyhedra with the use of straws and yarn	
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at board	Summative: • Quizzes, tests and benchmark
Interventions / differentiated instruction	• Students given notes via smart board • Partner or group work • Solve puzzles including numbrix and sudoku	
Inter-disciplinary Connections	• Biology and the bee honeycomb • History and pyramids of Egypt • History and pyramids of the Native Indians • Science and the light prisms	
Lesson resources / Activities	• Mathematics – A Human Endeavor –W.H. Freeman and Co. – Harold R. Jacobs - Third Edition, Copyright-1994 – Chapter 5 • Textbook practice exercises • Smart Board • Scientific Calculator • Compass and straight edge • Straws and yarn	
Common Core State Standards		
Grade or Conceptual Category (HS only): Geometry		
Domain (name and #): G-SRT : Similarity, right triangles, and trigonometry		
Cluster: Understanding	**#. Standard:** G-SRT – 1, 1a, 1b, 2	

similarity in terms of similarity transformations	

Math Practices: 2) Reason abstractly and quantitatively
4) Model with mathematics
7) Look for and make use of structure

21st Century Themes

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

21st Century Skills

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

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Mathematical Curves		**Unit #: 6**
Course or Grade Level: CP Concepts of Mathematics	**Length of Time: 26 days**	
Date Created: April 10, 2012	**BOE Approval Date:**	
Pacing	26 days, 3 days per section, covering all chapter 6, 2 review days and 2 summative assessment days, 4 benchmark review and assessment days	
Essential Questions	• Identify the similarities and differences of a circle and ellipse • What are the characteristics of a parabola • Why is the hyperbola different than any other curve we study • How is the sine curve used to show a sound wave • How are AM and FM radio stations related to the sine curve • What are the characteristics of the two types of spirals • What characteristic does the cycloid have that no other curve has	
Content	• The Circle and Ellipse • The Parabola • The Hyperbola • The Sine Curve • Spirals – Archimedean and Logarithmic • The Cycloid – Curtate and Prolate	
Skills	• Draw circles and ellipses with the use of their equations • Know the four curves derived from the cone – known as the conic sections • Be able to distinguish the differences between all the curves and their equations • Be able to identify both types of spirals • Be able to identify all three types of cycloids	
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at board	Summative: • Quizzes, tests and benchmark
Interventions / differentiated instruction	• Students given notes via smart board • Partner or group work • Solve puzzles including numbrix and sudoku	
Inter-disciplinary Connections	• Science – sound waves and the sine curve • Architecture – Parabolic shapes of bridges	
Lesson resources / Activities	• Mathematics – A Human Endeavor –W.H. Freeman and Co. – Harold R. Jacobs - Third Edition, Copyright-1994 – Chapter 6 • Textbook practice exercises • Smart Board • Scientific Calculator • Graph paper	
Common Core State Standards		
Grade or Conceptual Category (HS only): Geometry		
Domain (name and #): G-GPE : Expressing Geometric Properties with equations		
Cluster: Translate between the geometric	**#. Standard:** G-GPE – 2, 3	

description and the equation for a conic section	

Math Practices: 4) Model with mathematics
5) Use appropriate tools strategically
8) Look for and express regularity in repeated reasoning

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

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: Methods of Counting		**Unit #: 7**
Course or Grade Level: CP Concepts of Mathematics	**Length of Time: 20 days**	
Date Created: April 10, 2012	**BOE Approval Date:**	
Pacing	20 days, 4 days per section, covering all chapter 7, 2 review days and 2 summative assessment days	
Essential Questions	• Identify when the fundamental counting principle is used • When is the factorial symbol used • What is a permutation and when is it used • How are permutations computed when there are more than one of a certain item • What is the symbol we use for permutations • How are combinations different from permutations • What is the symbol we use to compute combinations	
Content	• The Fundamental Counting Principle • Permutations • Factorials • Combinations	
Skills	• Compute the number of ways something can occur by using the fundamental counting principle • Use factorials to compute answers • Use permutations to compute the number of ways that something can occur • Use combinations to find a selection of things where the order doesn't matter	
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at board	Summative: • Quizzes, tests and benchmark
Interventions / differentiated instruction	• Students given notes via smart board • Partner or group work • Solve puzzles including numbrix and sudoku	
Inter-disciplinary Connections	• All Subjects – compute the number of possible answers on a test • History – discover how area codes are assigned • Physical Education – Calculate outcomes of a race or different orders for a batting order	
Lesson resources / Activities	• Mathematics – A Human Endeavor –W.H. Freeman and Co. – Harold R. Jacobs - Third Edition, Copyright-1994 – Chapter 7 • Textbook practice exercises • Smart Board • Scientific Calculator • Playing Cards	
Common Core State Standards		
Grade or Conceptual Category (HS only): Number & Quantity		
Domain (name and #): N-Q : The Complex number system		
Cluster: Perform arithmetic operations with complex numbers	**#. Standard:** N-Q – 1, 2 3	

Math Practices: 1) Make sense of problems and persevere in solving them. 2) Reason abstractly and quantitatively. 8) Look for and express regularity in repeated reasoning.							
21st Century Themes							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: The Mathemastics of Chance		**Unit #: 8**
Course or Grade Level: CP Concepts of Mathematics	**Length of Time: 32 days**	
Date Created: April 10, 2012	**BOE Approval Date:**	
Pacing	32 days, 4 days per section, covering all chapter 8, 2 review days and 2 summative assessment days, 4 benchmark review and assessment days	
Essential Questions	• How do you calculate the probability of an event • How do we calculate the probabilities of an event when two dice are used • What is the probability of drawing three aces out of a deck when the cards are not replaced in deck • Identify different examples of binomial probabilities • How is Pascal's Triangle used to compute binomial probabilities • When are events dependent or independent • What are complementary events	
Content	• Probability: The Measure of Chance • Dice Games and Probability • Probabilities of Successive events • Binomial Probabilities • Pascal's Triangle • The Birthday Problem: Complementary Events	
Skills	• Use the probability of an event to compute the probability of an event happens • Use dice and cards to show the events can be computed • Use factorials and combinations to find the probabilities of successive events • Use fractions to compute the probabilities of successive events • Use percents to answer the probability of an event • Develop a Pascal triangle to answer a binomial probability • Compute complementary events	
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at board	Summative: • Quizzes, tests and benchmark
Interventions / differentiated instruction	• Students given notes via smart board • Partner or group work • Solve puzzles including numbrix and sudoku	
Inter-disciplinary Connections	• Biology – Outcomes in successive generations	
Lesson resources / Activities	• Mathematics – A Human Endeavor –W.H. Freeman and Co. – Harold R. Jacobs - Third Edition, Copyright-1994 – Chapter 8 • Textbook practice exercises • Smart Board • Scientific Calculator • Graph paper • Playing Cards • Dice	

Common Core State Standards							
Grade or Conceptual Category (HS only): Statistics and Probability							
Domain (name and #): S-CP : Conditional Probability and the rules of Probability							
Cluster: Use the rules of probability to compute probabilities of a compound event in a uniform probability model	**#. Standard:** S-CP - 9						
Math Practices: 1) Make sense of problems and persevere in solving them 6) Attend to precision. 7) Look for and make use of structure							
21st Century Themes							
	Global Awareness		Financial, Economic, Business, and Entrepreneurial Literacy		Civic Literacy		Health Literacy
21st Century Skills							
	Creativity and Innovation		Critical Thinking and Problem Solving		Communication and Collaboration		Information Literacy
	Media Literacy		ICT Literacy		Life and Career Skills		

Pine Hill Public Schools Mathematics Curriculum		
Unit Title: An Introduction to Statistics		**Unit #: 9**
Course or Grade Level: CP Concepts of Mathematics	**Length of Time: 22 days**	
Date Created: April 14, 2012	**BOE Approval Date:**	
Pacing	22 days, 3 days per section, covering all chapter 9, 2 review days and 2 summative assessment days,	
Essential Questions	• How do we organize data • What is a frequency distribution • How is central tendencies measured • What is the measure of variability • How do we graph data • What are the means to collect a sample of data	
Content	• Organizing Data: Frequency Distributions • The Breaking of Ciphers and Codes – An Application of Statistics • Measures of Central Tendency • Measures of Variability • Displaying Data : Statistical Graphs • Collecting Data : Sampling	
Skills	• Use frequency distributions to organize data • Be able to read and interpret bar graphs • Use the letters of the English language to break ciphers and codes • Use measures of central tendency to interpret data (mean, median & mode) • Find the measure of variability using the standard deviation • Be able to collect data using sampling	
Assessments	Formative: • Teacher observation and questioning • Seat and or group work • Homework • Student participation at board	Summative: • Quizzes, tests and benchmark
Interventions / differentiated instruction	• Students given notes via smart board • Partner or group work • Solve puzzles including numbrix and sudoku	
Inter-disciplinary Connections	• History – Interpreting data for previous elections	
Lesson resources / Activities	• Mathematics – A Human Endeavor –W.H. Freeman and Co. – Harold R. Jacobs - Third Edition, Copyright-1994 – Chapter 9 • Textbook practice exercises • Smart Board • Scientific Calculator	
Common Core State Standards		
Grade or Conceptual Category (HS only): Statistics and Probability		
Domain (name and #): S-ID – Interpreting Categorical and Quantitative data		
Cluster: Summarize, represent and interpret data on a single count or measurement variable	**#. Standard:** S-ID – 1, 2, 3, 4	

Math Practices:	1) Make sense of problems and persevere in solving them. 4) Model with mathematics 5) Use appropriate tools strategically

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