Warren County School District

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Advanced Mathematics – Grade 7

Course Number: 00205

Course Description and Prerequisites: Completion of Mathematics – Grade 6, 80% on proficiency test, 93% average in first three nine weeks & teacher recommendation

This course covers algebraic concepts such as the language of algebra, integers, one-step equations, factors and fractions, adding, subtracting, multiplying and dividing rational numbers, proportions and percents are intertwined with Geometry, statistics and probability. Opportunities in this course provide students with concrete background of algebraic concepts and enrichen the application of problem-solving.

Suggested Grade Level: Seventh grade

Length of Course: ____One Semester __X__ Two Semesters _____Other

Units of Credit: None

PDE *Certification and Staffing Policies and Guidelines (CSPG)* Required Teacher Certification(s) Middle Level Mathematics, Mathematics (7-12)

Certification verified by WCSD Human Resources Department:
__X__ Yes ____No

Board Approved Textbooks, Software, Materials:
Title:
Publisher:
ISBN #:
Copyright Date:
Date of WCSD Board Approval:

BOARD APPROVAL:

Date Written: Spring 2006

Date Approved: June 12, 2006

Implementation Year: 2006-2007

Suggested Supplemental Materials: Geoboard, tangram pieces, pentonimoes, attribute blocks, probability dice, spinner, calculator, ruler and PSSA formula sheet.

Course Standards

PA Academic Standards:

2.1 Numbers, Number Systems and Number Relationships
2.2 Computation and Estimation
2.3 Measurement and Estimation
2.4 Mathematical Reasoning and Connections
2.5 Mathematical Problem Solving and Communication
2.6 Statistics and Data Analysis
2.7 Probability and Predictions
2.8 Algebra and Functions
2.9 Geometry
2.10 Trigonometry
2.11 Concepts of Calculus

WCSD Academic Standards: None

Industry or Other Standards: None

WCSD EXPECTATIONS

WCSD K-12 Expectations for instruction in writing, reading, mathematics and, technology have been developed and revised annually. The teacher will integrate all WCSD Expectations into this planned instruction

SPECIAL EDUCATION AND GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (I.E.P.) or Gifted Individual Education Plan (G.I.E.P.).

REQUIRED COURSE SEQUENCE AND TIMELINE

Content Sequence	Dates
Problem-solving strategies	throughout year
Language of Algebra & Integers	August/September
One-step equations, Factors and Fractions	October
Rational Numbers (+ - x ÷)	November
Data Analysis	November
Solving Equations & Inequalities	December
Graphing Equations & Inequalities	January
Proportion, Percents and Statistics	February
Statistics, graphs and Probability	March
Applying Algebra to Geometry: Measuring Area & Volume	April
Applying Algebra to Right Triangle	May
Review and test taking strategies	June

WRITING TEAM: Kathleen Bertolini
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A yearly review will be done following the PDE release of the annual Eligible Content. Our goal is to keep the math planned instruction updated and effective.

WCSD STUDENT DATA SYSTEM INFORMATION

1. Is there a required final examination? _X_ Yes ____ No
2. Does this course issue a mark/grade for the report card?
   _X_ Yes____ No
3. Does this course issue a Pass/Fail mark? ____ Yes _X_ No
4. Is the course mark/grade part of the GPA calculation?
   ____ Yes _X_ No
5. Is the course eligible for Honor Roll calculation? _X_ Yes ____ No
6. What is the academic weight of the course?
   _X_ No weight/Non credit ____ Standard weight
   ____ Enhanced weight (Describe)_____

SPECIFIC EDUCATIONAL OBJECTIVES/CORRESPONDING STANDARDS AND ELIGIBLE CONTENT WHERE APPLICABLE

The Eligible Content is not in sequence. It is a checklist to be used to comply with state standards.

2.1 Numbers, Number Systems and Number Relationships
Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.1.8A	M7.A.1.1	• Convert between fractions, decimals and/or percents • Identify prime and composite numbers. • Rename decimals as fractions. • Convert a fraction to a repeating or terminating decimal. • Write fractions as terminating or repeating decimals. • Write fractions as percents. • Use percents to solve problems involving discounts and interest. • Write numbers in scientific notation. • Use the GCF to simplify fractions. • Find the LCM and GCF of two or more integers. • Compare fractions by determining the LCD and equivalent forms.	**Formative Assessments:** • Observation • Evaluate written work • Performance assessment • Tests/quizzes • Problem-solving journal/activity • Create an illustration • Develop a model using manipulatives • Hands on representation • Evaluate oral response • Self-evaluation • 4Sight • Portfolio • K-W-L • Venn diagram • Homework • Interview **Summative Assessments:** • Portfolio • Test • Performance assessment • Cooperative project • PSSA • Final Exam • Otis Hannah • Orleans Readiness
2.1.8B	M7.A.2.1.1	• Use the order of operations to evaluate numeric expressions. • Evaluate expressions containing exponents. • Multiply and divide powers.	
2.1.8C	M7.A.1.2.1	• Identify, compare and order rational numbers • Write a math sentence with integers using <, >, or = symbols. • Put integers in order from least to greatest.	
2.1.8D	M7.A.2.2.1 M7.A.2.2.3 M7.A.2.2.5	• Solve for a variable in a given proportion. • Use proportions to determine if two quantities are equivalent. • Solve a proportion given a problem situation involving distance, rate, and/or time. • Write ratios in simplest form and determine unit of rates.	
2.1.8E		Use variables to evaluate algebraic expressions.	

2.1.8F	M7.A.1.2.3	Locate decimals, fractions, mixed numbers and/or integers on a number line.	
2.1.8G		• Solve an open sentence. • Use inverse operations to solve equations.	

2.2 Computation and Estimation

Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.2.8A		Determine the truth value of a statement and its negation.	**Formative Assessments:** • Observation • Evaluate written work • Performance assessment • Tests/quizzes • Problem-solving journal/activity • Evaluate oral response • Homework • Interview • 4Sight **Summative Assessments:** • Test • Final Exam • Otis Hannah • Orleans Readiness
2.2.8B	M7.A.3.2.1 M7.A.3.2.2	• Add, subtract, multiply and divide all forms of rational numbers with and without a calculator. • Solve problems involving addition and subtraction of whole numbers. • Use divisibility rules to determine factors of a number line.	
2.2.8C		• Round and estimate decimals, sums and differences. • Use proportions to solve verbal problems.	
2.2.8D			
2.2.8E		Use = and ≈ correctly.	
2.2.8F	M7.A.3.1.1	Estimate answers to problems involving whole numbers, decimals, fractions or mixed numbers.	

2.3 Measurement and Estimation

Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.3.8A	M7.B.2.1.1 M7.B.2.1.3	• Solve problems using formulas (include perimeter and areas of squares and rectangles). • Introduce the area of triangles and/or all types of parallelograms. • Develop and use formulas to find the volume and surface volume of a rectangular solid.	**Formative Assessments:** • Observation • Evaluate written work • Performance assessment • Tests/quizzes • Problem-solving journal/activity • Create an illustration • Develop a model using manipulatives • Evaluate oral response • Homework • Interview
2.3.8B	M7.A.2.2.4	Calculate and/or apply units of rates or unit prices.	
2.3.8C		• Classify triangles. • Find the missing angle measure of a triangle. • Identify right, acute, and obtuse angles.	

2.3.8D	M7.B.1.1.1 M7.B.2.1.2	• Convert, add and subtract customary measures with or without grouping (e.g., inches, feet, yard, oz, cup, pint, quart, gallon, Lb, second, minute, hour, day). • Find the circumference and area of circles.	• 4Sight **Summative Assessments:** • Test • Performance assessment
2.3.8E		Introduce how a change in increase or decrease in a linear dimension can affect perimeter, area or volume.	
2.3.8F	M7.B.2.2.2	Interpret and/or apply scales shown on maps, blueprints, models, etc.	
2.3.8G	M7.B.2.2.2	Determine and/or apply an appropriate scale for reduction or enlargement.	

2.4 Mathematical Reasoning and Connection
Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.4.8A		• Make inference to prime and composite numbers through estimation, prediction and logical reasoning. • Read analogies using bar graph, double & stacked graph and basic circle. • Determine the truth value and negation of a statement.	**Formative Assessments:** • Observation • Performance assessment • Problem-solving journal/activity • Develop a model using manipulatives • Hands on representation • Evaluate oral response • Homework **Summative Assessments:** • Test • Otis Hannah • Orleans Readiness
2.4.8B			
2.4.8C		Use if…then statements to construct an argument for geometric situations (e.g., if a triangle has three congruent angles then it is equilateral).	
2.4.8D		• Recognize and apply properties. • Explain the procedures for estimating the sum, difference, product and quotients of rational numbers.	
2.4.8E			
2.4.8F		Use measurements and statistics to explain the given solution.	

2.5 Mathematical Problem Solving and Communication
Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.5.8A		• Solve an open sentence. • Solve problems by selecting a strategy from the following list: guess & check, working backwards, elimination, finding a pattern, drawing, or making a list or chart • Use graphs to solve problems.	**Formative Assessments:** • Observation • Evaluate written work • Performance assessment • Problem-solving journal/activity

2.5.8B		Show representation for the solution to a problem using graphing, tables, equations, formulas, charts and diagrams.	• Hands on representation • Evaluate oral response • 4Sight **Summative Assessments:** • Test • Otis Hannah • Orleans Readiness • PSSA
2.5.8C		Explain the procedures or order of operations followed for solving a problem.	
2.5.8D		Solve a problem by using an equation.	

2.6 Statistics and Data Analysis

Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.6.8A	M7.E.2.1.1	Calculate mean, median, mode and range from a stem & leaf plot and a frequency table.	**Formative Assessments:** • Observation • Evaluate written work • Performance assessment • Problem-solving journal/activity • Venn diagram • Evaluate oral response **Summative Assessments:** • Test • PSSA • Otis Hannah • Orleans Readiness
2.6.8B		Interpret, read and analyze graphs.	
2.6.8C		• Read and interpret data using the coordinate plane. • Make a scatter-plot from a given set of data.	
2.6.8D		Design, conduct and display the results from a survey.	
2.6.8E	M7.E.1.1.1	Analyze data pertaining to a stem & leaf plot, box-and-whisker plot, histogram, double bar graph, multiple line graphs.	
2.6.8F		Use the calculator to calculate the mean, median and mode.	
2.6.8G		Analyze the validity of data displayed in a newspaper.	

2.7 Probability and Predictions

Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.7.8A		Determine and display (graph, chart, tree diagram) all possible combinations and permutations of a given set of data.	**Formative Assessments:** • Evaluate written work • Problem-solving journal/activity • Create an illustration • Develop a model using manipulatives **Summative Assessments:** • Test • Otis Hannah • Orleans Readiness
2.7.8B		Conduct and display the results of an experiment in a chart, table, bar graph, circle graph or line plot.	
2.7.8C		Use and validate predictions using guess and check.	
2.7.8D		Determine the probability of a simple event.	
2.7.8E	M7.E.3.1.1 M7.E.3.1.2	• Find the theoretical probability of a simple and/or compound event. • Find the theoretical probability of an event not occurring.	

2.8 Algebra and Functions

Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.8.8A		Recognize and extend a pattern for a sequence.	**Formative Assessments:** • Observation • Evaluate written work • Performance assessment • Tests/quizzes • Problem-solving journal/activity • Create an illustration • Hands on representation • Evaluate oral response • Self-evaluation • Homework • Interview • 4Sight **Summative Assessments:** • Test • Otis Hannah • Orleans Readiness • PSSA
2.8.8B	M7.D.1.1.1	Describe, extend or find a missing element of a pattern.	
2.8.8C	M7.D.2.1.1 M7.D.2.2.1	• Write verbal phrases as algebraic expressions. • Evaluate inequalities. • Select and/or use appropriate strategies to solve one- and two-step equations. • Identify expressions, equations or inequalities that model mathematical situations. • Solve equations and inequalities with variables on both sides.	
2.8.8D			
2.8.8E	M7.D.2.1.2	• Solve an open sentence. • Use addition, subtraction, multiplication and division to solve an equation. • Use substitution of one and/or two variable to simplify expressions.	
2.8.8F			
2.8.8G	M7.C.2.1.1 M7.C.2.1.2	• Plot and/or identify ordered pairs on a coordinate plane (all four quadrants). • Identify Quadrants I, II, III, IV the x- & y-axes and the origin on a coordinate plane.	
2.8.8H		• Graph solutions to equations and inequalities on a number line. • Graph a linear equation by using the x- and y- intercept.	
2.8.8I			
2.8.8J			

2.9 Geometry

Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.9.8A	M7.C.1.1.3	Identify parallel, perpendicular and/or skew line segments within three-dimensional figures.	**Formative Assessments:** • Observation • Evaluate written work • Performance assessment • Tests/quizzes • Create an illustration • Develop a model using manipulatives • Hands on representation • Evaluate oral response • Homework **Summative Assessments:** • Test • Performance assessment • Otis Hannah • Orleans Readiness
2.9.8B		• Explain and use complementary and supplementary angles. • Correctly label angles.	
2.9.8C		Identify the difference between a regular and irregular polygon.	
2.9.8D	M7.C.1.1.1	Identify, describe and define diameter, radius, chord and/or circumference in circles.	
2.9.8E			
2.9.8F	M7.C.1.2.1	Identify and/or use polygons that are similar and/or congruent, given either measurements or tic and angle marks.	
2.9.8G		Measure the circumference, diameter and radius of circular objects.	
2.9.8H			
2.9.8I			
2.9.8J			
2.9.8K		• Identify a pair of shapes as congruent or similar. • Recognize and use the line of symmetry.	

2.10 Trigonometry

Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.10.8A	M7.A.2.2.6 M7.C.1.2.2	Identify corresponding sides and/or angles of congruent or similar polygons.	**Formative Assessments:** • Observation • Evaluate written work • Performance assessment
2.10.8B		Introduce the Pythagorean Theorem.	

2.11 Concepts of Calculus

Advanced Mathematics – Grade 7

	Eligible Content	Performance Indicator	Assessment
2.11.8A			**Formative Assessments:** • Evaluate written work • Performance assessment **Summative Assessments:** • Test • Otis Hannah • Orleans Readiness
2.11.8B	M7.D.3.1.1 M7.D.3.1.2	• Solve problems involving a constant rate of change. • Describe and/or use the relationship of data displayed on a rate of change graph. • Graph the slope of a line.	
2.11.8C		Identify and extend patterns and sequences.	

ASSESSMENTS

PSSA Assessment Anchors Addressed: The teacher must be knowledgeable of the PDE Assessment Anchors and/or Eligible Content and incorporate them into this planned instruction. Current assessment anchors can be found at pde@state.pa.us.

Formative Assessments: The teacher will develop and use standards-based assessments throughout the course.

Portfolio Assessment: ____ Yes __X__ No

District-wide Final Examination Required: __X__ Yes ____ No

Course Challenge Assessment: To be developed by Math Team.