COURSE: Mathematics

GRADE LEVEL: Seventh Grade/Basic – Applied – General

LENGTH OF COURSE: 90 Days/70 Minutes Per Day

TEXT: Passport to Mathematics Book 2 Middle Grade Math Tools for Success

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COURSE DESCRIPTION:

The sixth, seventh and eighth grade math curriculum covers a number of skills and concepts through a rich yet balanced curriculum. The structure of the lessons promotes understanding, retention and preparation for standardized tests.

AREAS OF STUDY:

Number Sense
Computation
Measurement
Estimation
Problem Solving
Statistics and Data Analysis
Algebra and Functions
Geometry
Trigonometry

CURRICULUM WRITING TEAM:

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DATE OF REVISION:

March 2002

Course: Mathematics

Grade Level: Grade 7
PA Standard: 2.1.8

Topics:	**Skills:**
Numbers, nuber systems, number relationships	Represent and use numbers in equivalent forms (e.g., integers, fractions, decimals percents, exponents, scientific notation, square roots) Simplify numerical expressions involving exponents, scientific notation and using order of operations Distinguish between and order rational and irrational numbers Apply ratio and proportion to mathematical problem situations involving distance, rate, time and similar triangles Simplify and expand algebraic expressions using exponential forms Use the number line model to demonstrate integers and their applications Use the inverse relationships between addition, subtraction, multiplication, division, exponentiation and root extraction to determine unknown quantities in equations
Activities:	**Performance Assessments:**
Draw to scale using a protractor Explain problems step by step Problem of the week	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Textbook tests Homework

Course: Mathematics **Grade Level:** Grade 7
PA Standard: 2.2.8.

Topics:	**Skills:**
Computation and estimation	Complete calculations by applying the order of operations Add, subtract, multiply and divide different kinds and forms of rational numbers including integers, decimal fractions, percents and proper and improper fractions Estimate the value of irrational numbers Estimate amount of tips and discounts using ratios, proportions and percents Determine the appropriateness of overestimating or underestimating in computation
Activities:	**Performance Assessments:**
Restaurant activity Problem of the week	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Textbook tests

Course: Mathematics

Grade Level: Grade 7
PA Standard: 2.3.8.

Topics:	**Skills:**
Measurement and estimation	Develop formulas for determining measurements (e.g., area, volume, distance) Solve rate problems (e.g., rate x time=distance, principal x interest rate=interest) Measure angles in degrees and determine relations of angles Estimate, use and describe measures of distance, rate, perimeter, area, volume, weight, mass and angles
Activities:	**Performance Assessments:**
Calculators Use of protractors Problem of the week	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Textbook tests Homework

Course: Mathematics

Grade Level: Grade 7
PA Standard: 2.4.8

Topics:	**Skills:**
Mathematical reasoning	Make conjectures based on logical reasoning and test conjectures by using counter-examples Combine numeric relationships to arrive at a conclusion Use if…then statements to construct simple, valid arguments Construct, use and explain algorithmic procedures for computing and estimating with whole numbers, fractions, decimals and integers Distinguish between inductive and deductive reasoning
Activities:	**Performance Assessments:**
Problem of the week (open ended questions)	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Textbook tests Homework

Course: Mathematics **Grade Level:** Grade 7
PA Standard: 2.5.8.

Topics:	**Skills:**
Mathematical problem solving	Invent, select, use and justify the appropriate methods, materials and strategies to solve problems Verify and interpret results using precise mathematical language, notation and representations, including numerical tables and equations, simple algebraic equations and formulas, charts, graphs and diagrams Justify strategies and defend approaches used and conclusion reached Determine pertinent information in problem situations and whether any further information is needed for solution
Activities:	**Performance Assessments:**
Problem of the week (Open-ended questions)	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Teacher tests Homework

Course: Mathematics

Grade Level: Grade 7
PA Standard: 2.6.8

Topics:	**Skills:**
Statistics and data analysis	Compare and contrast different plots of data using values of mean, median, mode, quartiles and range Explain effects of sampling procedures and missing or incorrect information on reliability
Activities:	**Performance Assessments:**
Problems of the week (Open-ended questions)	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Textbook tests Homework

Course: Mathematics

Grade Level: Grade 7
PA Standard: 2.7.8

Topics:	**Skills:**
Probability and predictions	Determine the number of combinations and permutations for an event Present the results of an experiment using visual representations (e.g., tables, charts, graphs) Analyze predictions (e.g., election polls) Compare and contrast results from observations and mathematical models Make valid inferences, predictions and arguments based on probability
Activities:	**Performance Assessments:**
Numbered cube What is the probability of rolling a 3 on a single roll? What is the probability of rolling an even number? Predictions – using existing data to predict a future event	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Textbook tests Homework

Course: Mathematics **Grade Level:** Grade 7
PA Standard: 2.8.8

Topics:	**Skills:**
Algebra and functions	Apply simple algebraic patterns to basic number theory and to spatial relations Discover, describe and generalize patterns, including linear, exponential and simple quadratic relationships Create and interpret expressions, equations or inequalities that model problem situations Use concrete objects to model algebraic concepts
Activities:	**Performance Assessments:**
Hands-on equations Problem of the week Distinguish between an expression, equation and an inequality Use of pawns to represent the variables ad numbered cubes for the numbers to physically show the equation	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Textbook tests Homework

Course: Mathematics **Grade Level:** Grade 7
PA Standard: 2.9.8

Topics:	**Skills:**
Geometry	Construct figures incorporating perpendicular bisector of a line segment and an angle bisector using computer software Draw, label, measure and list the properties of complementary, supplementary and vertical angles Classify familiar polygons as regular or irregular up to a decagon Identify, name, draw and list all properties of squares, cubes, pyramids, parallelograms, quadrilaterals, trapezoids, polygons, rectangles, rhombi, circles, spheres, triangles, prisms and cylinders Construct parallel lines, draw a transversal and measure and compare angles formed (e.g., alternate interior and exterior angles) Distinguish between similar and congruent polygons Approximate the value of pi through experimentation Use simple geometric figures (e.g., triangles, squares) to create, through rotation, transformational figures in three dimensions
Activities:	**Performance Assessments:**
Construct an icosahedron out of straws and dental floss Develop why pi is 3.14 using a string	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Textbook tests Homework

Course: Mathematics

Grade Level: Grade 7
PA Standard: 2.10.8

Topics:	**Skills:**
Trigonometry	Compute measures of sides and angles using proportions, the Pythagorean Theorem and right triangle relationships Solve problems requiring indirect measurement for lengths of sides of triangles
Activities:	**Performance Assessments:**
Real world construction problems Protractor activities	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Textbook tests Homework

Course: Mathematics

Grade Level: Grade 7
PA Standard: 2.11.8

Topics:	**Skills:**
Calculus	Analyze graphs of related quantities for minimum and maximum values and justify the findings Describe the concept of unit rate, ratio and slope in the context of rate of change Continue a pattern of number or objects that could be extended infinitely
Activities:	**Performance Assessments:**
Open-ended problems Rate/unit rate/comparison shopping (use of proportions and advertisements)Outline steps to follow for problem solving	Teacher observation Oral questions Board work Classroom participation Paper/pencil activities Teacher made tests Textbook tests Homework

TERMS USED IN THE ACADEMIC STANDARDS FOR MATHEMATICS THROUGH GRADE 8:
Angle Measurement in Degrees
Bisector
Box-and-Whisker Plot
Combination
Complimentary Angle
Conjecture
Coordinate Plane
Counter Example
Deductive Reasoning
Dimensions
Equation
Evaluate the Expression
Exponent
Exponential Relationship
Functional Relationship
Inductive Reasoning
Inequality
Irrational Number
Linear Function
Linear Relationship
Logical Reasoning
Number Line
Order of Operations
Percent
Permutation
Proportion
Pythagorean Theorem
Quadratic Relationship
Quartile
Random Sampling
Ratio
Rational Number
Regular Polygon
Reliability
Scale Mode
lScientific Notation
Sequence
Slope
Square Root
Stem-and-Leaf Plot
Supplementary Angle
Transformation
Transversal
Unit Rate
Verbal, Symbolic Rules
Vertical Angle

INTERNET RESOURCES:
www.aaamath.com
www.coolmath4kids.com
www.funbrain.com
www.moneyopolis.com (teacher can set up for class access)
www.schoolcentral.com/willoughby
www.stfx.caspecial/mathproblems
www.learningwave.com/abmath