

GRADE 8 MATHEMATICS

The Eighth Grade Mathematics curriculum will incorporate concepts that provide a smooth transition from concrete to abstract relationships in preparation for high school mathematics courses. Concepts include real numbers, algebraic concepts, geometric principles, ratio, proportion, percents, number theory, measurement, data analysis and the coordinate system. A variety of problem-solving techniques and technology will be used when applying these concepts, which will enable students to solve real life problems. This course is designed to prepare students for Algebra I.

NUMBER SENSE AND OPERATIONS

- 8.N1 Compare, order and estimate rational numbers and percents.
- 8.N1 Translate among fractions, decimals and percents.
- 8.N10 Add, subtract, multiply and divide rational numbers.
- 8.N2 Define, compare, order and apply frequently used irrational numbers such as $\pi, \sqrt{2}$.
- 8.N4 Represent numbers in standard form, exponential and scientific notation.
- 8.N6 Understand the meaning of absolute value.
- 8.N7 Understand and apply the Order of Operations including positive integer exponents and square roots.
- 8.N12 Identify and use the properties of arithmetic operations on rational numbers.
- 8.N3 Understand, apply and explain ratios and proportions.
- 8.N3 Be able to solve proportions by a variety of methods.
- 8.N9 Understand and apply number theory concepts including prime factorization and inverse relationships of operations to simplify computations.
- 8.N12 Apply and explain a variety of math concepts, skills and processes to solve problems.

PATTERNS, RELATIONS AND ALGEBRA

- 8.P1 Describe and extend patterns and sequences including arithmetic and geometric.
- 8.P2 Evaluate simple algebraic expressions.
- 8.P3 Demonstrate an understanding of the identity $(-x)(-y)=xy$
- 8.P4 Translate between algebraic expressions and verbal phrases.
- 8.P7 Set up and solve one and two-step linear equations and inequalities.
- 8.P7 Set up and solve multi-step linear equations and inequalities.
- 8.P7 Graph solutions to inequalities on a number line.
- 8.P10 Create table of values for two-variable linear equations and graph on coordinate plane.
- 8.P5 Identify, describe, analyze and graph linear relationships between two variables, including slope.
- 8.P5 Use algebraic concepts and functions to solve problems.

GEOMETRY

- 8.G1 Identify polygons to ten sides.
- 8.G1 Classify and compare the properties of quadrilaterals and triangles.
- 8.G3 Locate and identify angles formed by parallel lines cut by a transversal.
- 8.G2 Classify figures in terms of congruence and similarity and apply these relationships to solve problems.
- 8.G7 Identify three-dimensional figures by relationships of faces, vertices and edges.
- 8.G4 Use the Pythagorean Theorem to solve problems.
- 8.G6 Predict the results of transformations on coordinate planes including translations, reflections and rotations.

MEASUREMENT

- 8.M1 Convert within a standard measurement system.
- 8.M2 Given the formulas, convert from one system of measurement to another.
- 8.M3 Given the formulas, find the perimeter and area of polygons, and circumference and area of circles.
- 8.M3 Given the formulas, find the surface area and volume of rectangular prisms, cylinders and spheres.
- 8.M4 Use ratio and proportion in the solution of problems involving similar figures and indirect measure.

Data Analysis, Statistics and Probability

- 8.D2 Collect, organize, display and interpret data using frequency tables, histograms, line plots, stem-and-leaf plots, scatter plots, box-and-whisker plots, bar, line, circle graphs, and Venn diagrams.
- 8.D3 Determine and interpret measures of central tendency including range, mean, median, mode and outlier.
- 8.D4 Determine theoretical or experimental probability by using tree diagrams, tables, sample space and area models for simple compound events.
- 8.D1 Explore data through surveys and sampling techniques.

TECHNOLOGY RESOURCES

- Calculators
- Graphing calculators
- Computer software
- Online resources

RESOURCES

Charles, Randall I. et al. Mathematics, Course 3, Upper Saddle River, New Jersey; Prentice Hall, Inc., 2004.

Online MCAS Preparation Program: www.studyisland.com

Software: Understanding Math

Online: www.phsuccessnet.com

ASSESSMENT STRATEGIES

- Student work samples
- Teacher observation
- Class participation, written and oral
- Class work
- Homework
- Math Journal
- Class projects and presentations
- Quizzes
- Tests