

## **JUNIOR HIGH MATHEMATICS DEPARTMENT**

## **7 MATH (STANDARD)**

### **Contact Information**

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### **The Department's Educational Philosophy**

The study of mathematics will enhance the ability of all students to problem solve and to reason. Through a strong standardized departmental program that emphasizes problem solving, communicating, reasoning and proof, making connections, and using representations, students will develop organizational skills, self-confidence and a positive attitude toward mathematics. Our curriculum matches that of the Massachusetts Mathematics Curriculum Framework, and we are philosophically aligned with the National Council of Teachers of Mathematics Standards.

### **Guiding Principles**

- All students can learn mathematics.
- Mathematical ideas should be explored in ways that stimulate curiosity, create enjoyment of mathematics, and develop depth of understanding.
- Effective mathematics programs focus on problem solving and require teachers who have a deep knowledge of the discipline.
- Technology is an essential tool in a mathematics education, and all students should gain facility in using it where advantageous.
- All students should have a high-quality mathematics program.
- Assessment of student learning in mathematics should take many forms to inform instruction and learning.
- All students should recognize that the techniques of mathematics are reflections of its theory and structure.
- All students should gain facility in applying mathematical skills and concepts.
- All students should understand the role of inductive and deductive reasoning in mathematics and real life situations.

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**Course Frequency:** Full year course, five times per week

**Credits Offered:** None

**Prerequisites:** None

### **Background to the Curriculum**

This course is now using the 2008 edition of the Glencoe Pre-Algebra text: An Integrated Transition to Algebra & Geometry by Price, Rath, Leschensky, Malloy, and Alban. The text is supplemented with designated materials from the “Pre-Algebra with Pizzazz” resource binder. Selected lessons in Chapters 1 through Chapter 12 are covered and address the Massachusetts State Frameworks, as well as the 2000 edition of the National Council of Teachers of Mathematics. The course is well aligned with national and state standards. Teachers utilize other materials to enhance and deepen the curriculum content where appropriate and make minor changes after consultation with the BDL. Core topics that were begun in sixth grade will be expanded in order to prepare students for the eighth-grade math courses, which begin the study of Algebra.

### **Core Topics/Questions/Concepts/Skills**

Improve Study Skills and Organization

Tools for Algebra and Geometry

Exploring Integers

Exploring Factors and Fractions

Rationals: Patterns in Addition and Subtraction

Rationals: Patterns in Multiplication and Division

Solving Equations and Inequalities

Functions and Graphing

Ratio, Proportion, and Percent

Statistics and Probability

Applying Algebra to Geometry

Measuring Area and Volume

## Course-End Learning Objectives

<u>Learning objectives</u>	<u>Corresponding state standards, where applicable</u>
1] Gather and record data in a frequency table	8.D.01
2] Construct and interpret bar graphs, stem and leaf plots, line plots, scatter plots, and box and whisker plots	8.D.02
3] Use measures of central tendency to analyze data	8.D.03
4] Use tree diagrams, tables, organized lists, and the fundamental counting principle to find the probability of compound independent events	8.D.04
5] Find missing angle measures of triangles and quadrilaterals	8.G.01
6] Identify corresponding and congruent parts of plane and solid geometric figures	8.G.02
7] Identify points, lines, planes, rays, segments, angles, and parallel, perpendicular, and skew lines	8.G.02
8] Classify angles, triangles, and quadrilaterals	8.G.02
9] Demonstrate an understanding of the relationships of angles formed by intersecting lines, including parallel lines cut by transversal	8.G.03
10] Construct congruent line segments and angles with a compass and straightedge	8.G.05
11] Investigate tessellations and identify reflections, translations, rotations, and symmetric figures	8.G.06
12] Convert measurements within the metric system	8.M.01
13] Use ratio, proportion and percent to solve problems	8.M.03
14] Find surface areas of triangular and rectangular prisms and cylinders	8.M.03
15] Find volumes of triangular and rectangular prisms and cylinders	8.M.03
16] Find the area, perimeter, and circumference of geometric figures	8.M.03
17] Compare, order, and graph integers, fractions, and mixed numbers on a number line	8.N.01
18] Represent numbers in scientific notation and use them in calculations and problem-solving situations	8.N.04
19] Apply number theory concepts, including prime factorization and relatively prime numbers	8.N.05
20] Use order of operations to evaluate numerical and algebraic expressions with whole numbers, integers and rational numbers	8.N.07
21] Use positive powers and exponents in expressions	8.N.07

22] Use commutative, associative and distributive properties to simplify expressions and equations	8.N.08
23] Estimate sums differences, products, and quotients of rational numbers	8.N.10
24] Calculate sums, differences, products, and quotients of rational numbers without a calculator	8.N.10
25] Identify, compare, rename, and compute using rational numbers	8.N.12
26] Identify and extend the terms of arithmetic and geometric sequences	8.P.01
27] Introduce functions and relations	8.P.01
28] Graph points and line on a coordinate plane using a table of values and slope	8.P.05
29] Introduce slope and be able to identify positive, negative, zero, and no (undefined) slope	8.P.05
30] Determine the slope of a line using a graph or using two points	8.P.05
31] Graph linear equations using a table of x and y values	8.P.06
32] Translate verbal phrases and sentences into algebraic expressions and equations	8.P.07
33] Solve one- and two-step equations and inequalities using rational numbers	
34] Solve verbal problems by writing and solving equations	
35] Use a variety of problem-solving techniques to solve problems	

### Assessment

Students are generally assessed by in-class tests and quizzes, which are administered regularly throughout a marking period. Generally, two quizzes are equivalent to a test. Organization of a math notebook is an emphasis in this grade and is typically assessed as a quiz grade. The students' attitude, effort, and quality of homework preparations will also impact their term grade to a small degree. Teachers informally assess students every day by asking pivotal questions, as well as questions involving mechanics or concepts. A standardized midyear examination and final examination are administered to all students in this course in order to assess their long-term retention of the course material.

**Technology Learning Objectives Addressed in This Course**

(This section is for faculty and administrative reference; students and parents may disregard.)

<b><u>Course activity: skills &amp;/or topics taught</u></b>	<b><u>Standard(s) addressed through this activity</u></b>
1] Appropriate use of a calculator in solving problems 2] Some exposure to use of computers in programs such as Graph Action, Stock Market, Tesselmania	

**Materials and Resources**

Teachers use other texts for supplementary ideas and more challenging examples, in addition to “Pre-Algebra with Pizzazz” puzzle sheets. Worksheets that coordinate to each lesson are used.