

# **Toms River Regional Schools**

## **Course Proficiency Outline**

### **Grade Eight Mathematics**

The focus and the goal of the mathematics curriculum is to enable all children to function in the 21<sup>st</sup> century with the mathematical skills, understandings, and attitudes that they will need to be successful in their careers and daily lives.

To compete in a global economy, students must be able to solve problems, reason effectively, and make logical connections. Future careers requiring mathematical knowledge and skills in areas such as data analysis, problem-solving, pattern recognition, statistics, and probability are growing exponentially.

To meet these challenges the NJ Department of Education created a set of mathematical standards. In understanding the eighth grade mathematics curriculum one needs to understand the standards. This outline seeks to provide an overview of the standards along with the content and classroom expectations for all eighth grade students in the Toms River Regional School District.

The vision, if it is to be realized, must include learning environments with the following characteristics, as described in the mathematics standards:

- Students excited by and interested in their activities.
- Students learning important mathematical concepts rather than simply memorizing and practicing procedures.
- Students posing and solving meaningful problems.
- Students working together to learn mathematics.
- Students writing and talking about math topics every day.
- Students using calculators and computers as important tools of learning.
- Students whose teachers who have high expectations for ALL of their students.
- Students being assessed by a variety of assessment strategies, not just traditional short-answer tests.

The equity and excellence component of the vision has four features:

- Fostering respect for the power of mathematics.
- Setting high expectations.
- Providing opportunities for success.
- Encouraging all students to go beyond the standards.

## **Standards and Strands**

There are five standards altogether, each of which has a number of lettered strands. These standards, and their associated strands, are enumerated below:

### **4.1. Number and Numerical Operations**

- A. Number Sense
- B. Numerical Operations
- C. Estimation

### **4.2. Geometry and Measurement**

- A. Geometric Properties
- B. Transforming Shapes
- C. Coordinate Geometry
- D. Units of Measurement
- E. Measuring Geometric Objects

### **4.3. Patterns and Algebra**

- A. Patterns and Relationships
- B. Functions
- C. Modeling
- D. Procedures

### **4.4. Data Analysis, Probability, and Discrete Mathematics**

- A. Data Analysis (Statistics)
- B. Probability
- C. Discrete Mathematics--Systematic Listing and Counting
- D. Discrete Mathematics--Vertex-Edge Graphs and Algorithms

### **4.5. Mathematical Processes**

- A. Problem Solving
- B. Communication
- C. Connections
- D. Reasoning
- E. Representations
- F. Technology

## Content, Texts, and Materials

Students in grades seven and eight will primarily be using the materials from *Connected Mathematics*, a complete mathematics curriculum that helps students develop understanding of important concepts, skills, procedures, and ways of thinking and reasoning in number sense, geometry, measurement, algebra, probability, and statistics.

Other materials will be supplemented as necessary.

*Connected Mathematics* is guided by the following five themes:

1. *Connected Mathematics* is organized around a selected number of important mathematical content and process goals, each of which is studied in depth.
2. *Connected Mathematics* emphasizes significant connections, meaningful to students, among various mathematical topics and between mathematics and problems in other disciplines.
3. The instruction in *Connected Mathematics* emphasizes inquiry and discovery of mathematical ideas through the investigation of rich problem situations.
4. *Connected Mathematics* helps students grow in their ability to reason effectively with information represented in graphics, numeric, symbolic, and verbal forms and to move flexibly among these representations.
5. The goals and teaching approaches of *Connected Mathematics* reflect the information processing capabilities of calculators and computers and the fundamental changes such tools are making in the way people learn mathematics and apply their knowledge of problem solving.

The Connected Mathematics materials categorized by content area for grade eight:

Standard 4.5, Mathematical Processes is integrated into each of the following areas.

### **Algebra (Standard 4.3)**

Moving Straight Ahead – Investigating linear relationships; representing linear relationships with tables, graphs, and equations; solving simple linear equations.

Thinking with Mathematical Models – Modeling relationships with graphs and equations; describing relationships given in graph form.

### **Number Sense (Standard 4.1)**

Looking for Pythagoras – Investigating the Pythagorean Theorem, irrational numbers, area, slope, and distance.

**Probability (Standard 4.4)**

Clever Counting – Developing strategies for counting in situations with large numbers of possibilities.

**Geometry (Standard 4.2)**

Kaleidoscopes, Hubcaps, and Mirrors – Exploring symmetry and symmetry transformations; connecting geometry and algebra.

**Statistics (Standard 4.4)**

Data Around Us – Developing reasoning skills working with large numbers, writing large numbers using scientific notation.

Samples and Populations – Selecting and analyzing samples, and using the results to make predictions about the populations.

**Materials**

1. The Connected Mathematics Program, 2002. Prentice Hall.
2. New Jersey Pre-GEPA Mathematics, 2000. Educational Design.
3. Accompanying supplementary materials.
4. Use of computers, calculators, and various manipulative materials.

**Classwork**

1. There will be lectures, discussions, cooperative work, note taking, audio-visual materials, and regular tests and quizzes.
2. There will be hands on laboratories and demonstrations.
3. General principles of career education, attitudes, work habits, and competencies, as well as information relating to careers in the mathematics will be explored where appropriate.
4. Assignments will be given related to lesson objectives. These assignments will be graded and reviewed by teachers and pupils.

## **Evaluation**

1. Students will bring needed materials to class and be ready to work.
2. Students will complete classwork and homework assignments in a timely fashion.
3. Students will be expected to complete assigned reports and/or projects as specified by the teacher.
4. Students will prepare adequately for and successfully complete quizzes, tests, and the final exam.
5. Students will be expected to participate in class.
6. The final grade represents the teacher's professional judgment of student performance. All of the items above are included in the final evaluation process.

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