Making Connections:
Foundations for Algebra, Course 2

Introduction and Overview

Making Connections: Foundations for Algebra, Course 2 is the second of a two-year sequence of courses designed to prepare students for a rigorous college preparatory algebra course. It uses a problem-based approach with concrete models. The course helps students to develop multiple strategies to solve problems and to recognize the connections between concepts. The lessons in the course embed the "Mathematical Practices" of the Common Core State Standards released in June 2010.

Upon completion of this course, students should be able to:

- Analyze data using measures of central tendency.
- Represent data sets using various methods and analyze how changes in data impact the representation.
- Model integers and operations with integers including order of operations.
- Compute area and perimeter of standard and compound shapes.
- Use linear models and equal ratios to represent part-whole relationships. Solve percent problems.
- Compare experimental and theoretical probabilities.
- Describe various transformations on a coordinate grid.
- Use variable expressions to represent quantities in contextual problems.
- Simplify variables expressions by combining like terms and using the distributive property.
- Represent data using scatterplots and describe correlations.
- Compare ratios, calculate unit rates and slope ratios.
- Use percents and scale factors to determine percent increase or decrease, discounts and markups.
- Solve linear equations including those with fractional coefficients and those with no or infinite solutions.
- Solve and graph one variable inequalities.
- Represent linear relationships using tables, graphs and equations.
- Solve systems of equations represented in tables and graphs.
- Solve distance, rate and time problems.
- Compute operations with rational numbers.
- Recognize and solve problems involving proportional relationships.
- Recognize and use the ratio of areas between similar shapes.
- Use the triangle inequality and the Pythagorean theorem.
- Represent and simplify expressions using positive and negative exponents.
- Represent solids using nets and compute the volume of a variety of solids.
- Graph and analyze non-linear functions.
- Represent probabilities of multiple events using systemic lists, charts, or tree diagrams.

Lesson structure and support
The course is structured around problems and investigations that build conceptual understanding of these topics and an awareness of connections between different ideas. Students are encouraged to investigate concepts, communicate their thinking and generalize.

Lessons are structured for students to collaborate actively by working in study teams. During class time, students work in study teams on challenging problems that introduce new material. The teacher provides guidance as needed and helps to consolidate topics.

The homework in the "Review & Preview" section of each lesson reinforces previously-introduced skills and concepts and prepares students for new ones. The homework problems also allow students to apply previously-learned concepts and skills in new contexts and deepen their understanding by solving the same type of problem in different ways. CPM offers open access homework support at the website www.cpm.org/students/homework and also provides teachers with the answers to problems. There are extra practice resources and a parent guide at www.cpm.org and in booklet form.

The Course Structure
Chapters are divided into sections that are organized around core topics. Within each section, lessons include activities, challenging problems, investigations and practice problems. Teacher notes for each lesson include a "suggested lesson activity" section with ideas for lesson ***introduction***, specific tips and strategies for lesson ***implementation*** to clearly convey core ideas, and a means for bring the lesson to ***closure***.

Core ideas are synthesized in "Math Notes" boxes. These notes are placed in a purposeful fashion, often falling a couple a lessons after the initial introduction of a concept. This approach allows students time to explore and build conceptual understanding of an idea before they are presented with a formal definition or an algorithm. "Math Notes" boxes include specific vocabulary definitions and instructions about notation, and occasionally interesting extensions or real-world applications of mathematical concepts.

Technology is integrated throughout the course to allow students to see and explore concepts that lend themselves to this approach. Ideally, classes would have access to a computer lab with computers for pairs of students. This dynamic tool will provide students with a deeper understanding of the concepts involved. A classroom computer equipped with projection technology would suffice but not allow students to explore individually. Students need access to a scientific calculator.

Learning Log reflections appear periodically at the end of lessons to allow students to synthesize what they know and identify areas that need additional explanation. Toolkits are provided as working documents in which students write Learning Logs, interact with Math Notes and create other personal reference tools.