CPM Course 3

Course Overview/Description

In this course, students will learn to use new models and methods to think about problems as well as solve them. They will be developing powerful mathematical tools and learning new ways of thinking about and investigating situations. Students will be making connections, discovering relationships, figuring out what strategies can be used to solve problems, and explaining their thinking. Learning to think in these ways and communicate about their thinking is useful in mathematical contexts, other subjects in school, and situations outside the classroom.

Scope and Sequence

Timeframe	Unit	Instructional Topics
8 - 10 days ***Note- all time frames do not include homework quizzes, closure, team tests, or individual tests**	**Problem Solving**	- Interpreting graphs - Describing growth in a pattern - Generalizing to predict attributes of a figure in a pattern without drawing it *xy*-coordinate grid system - Linear equations or rules - Collecting and organizing data - Using data to make predictions - Proportional relationships using graphs and tables - Strategies for solving proportions written as equivalent ratios
10-12 days	**Simplifying with Variables**	- Exploring Variables and Expressions - Simplifying Expressions by Combining Like Terms

		- Writing Algebraic Expressions - Using Zero to Simplify Algebraic Expressions - Using Algebra Tiles to Simplify Algebraic Expressions - Using Algebra Tiles to Compare Expressions - Simplifying and Recording Work - Using Algebra Tiles to Solve for x
13 - 15 days	**Graphs and Equations**	- Extending Patterns and Finding Rules - Using Tables, Graphs, and Rules to Make Predictions - Using the Graphing Calculator and Identifying Solutions - Completing Tables and Drawing Graphs - Graphs, Tables, and Rules - Complete Graphs - Identifying Common Graphing Errors - Solving Equations and Checking Solutions - Determining the Number of Solutions - Problem Solving With Equations - More Solving Equations to Solve Problems - Distributive Property Equations
10- 12 days	**Multiple Representations**	Finding Connections Between Representations

		● Seeing Growth in Different Representations ● Connecting Linear Rules and Graphs ● $y = mx + b$ ● Checking the Connections ● Graphing a Line Without an $x \rightarrow y$ Table ● Completing the Web
9-11 days	**Systems of Equations**	● Working with Multi-Variable Equations ● Solving Equations with Fractions ● Introduction to Systems of Equations ● Writing Rules from Word Problems ● Solving Systems Algebraically ● Strategies for Solving Systems
10-12 days	**Transformations Similarity**	● Rigid Transformations ● Rigid Transformations on a Coordinate graph ● Describing Transformations ● Using Rigid Transformations ● Multiplication and Dilation ● Dilations and Similar Figures ● Identifying Similar Shapes ● Similar Figures and Transformations ● Working With Corresponding Sides ● Solving Problems Involving Similar Shapes

11 - 13 days	Slope and Association	- Circle Graphs - Organizing Data in a Scatterplot - Identifying and Describing Association - y=mx+b revisited - Slope - Slope in Different Representations - Proportional Equations - Using Equations to make Predictions
11-13 days	Exponents and Functions	- Patterns of Growth in Tables and Graphs - Compound Interest - Linear and Exponential Growth - Exponents and Scientific Notation - Exponent Rules - Negative Exponents - Operations with Scientific Notation - Functions in Tables and Graphs

15-17 days	Angles and the Pythagorean	- Parallel Line Angle Pair Relationships - Finding Unknown Angles in Triangles - Exterior Angles in Triangles - AA Triangle Similarity - Side Lengths and Triangles - Pythagorean Theorem - Understanding Square Root - Real Numbers - Applications of Pythagorean Theorem - Pythagorean Theorem in Three Dimensions - Pythagorean Theorem Proofs
10 -12 days	Surface Area and Volume	- Cube Roots - Surface Area and Volume of a Cylinder - Volumes of Cones and Pyramids - Volumes of a Sphere - Indirect Measurement - Finding Unknowns - Analyzing Data to Identify a Trend

Course Details

UNIT 1 : Problem Solving

Learning Targets

Section 1.1	**This section includes several problems and activities that use many of the big ideas of algebra. Each problem or activity requires your study team to work together and use various problem-solving strategies.**

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Section 1.2   **In this section,you will use what you know about proportional relationships to solve proportional problems.**

UNIT 2 Simplifying with Variables

Learning Targets

Section 2.1   This section, the only section of the chapter, introduces algebra tiles. Using algebra tiles will help develop the symbolic manipulation skills of combining like terms and solving linear equations. A special focus will be placed on the meaning of "minus" and how to make "zero."

UNIT 3 Graphs and Equations

Learning Targets

Section 3.1   In this section, you will add to your existing graphing skills. You will learn new graphing skills and strategies that will help you throughout the rest of this course. You will also learn how to create tables, write rules, and draw graphs to represent situations and patterns.

Section 3.2   In Section 3.2, you will extend the work you did in Chapter 2. You will learn how to solve linear equations without using algebra tiles and will learn the significance of solutions.

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UNIT 4: Multiple Representations
Learning Targets

Section 4.1   **You will shift between different representations of linear patterns, using the web diagram shown at left. By finding connections between each representation, you and your team will find ways to change from one representation to each of the other three representations.**

UNIT 5: Systems of Equations
Learning Targets

Section 5.1   In Section 5.1, you will continue the solving focus that you began in Chapter 3. You will study how to solve multi-variable equations for one of the variables. You will also learn how to solve equations that contain fractions.

Section 5.2   This section will start by examining word problems in which two amounts are compared. You will use your knowledge of graphs and rules to write equations for word problems. Then, using the Equation Mat, you will solve a pair of linear equations to determine where two lines cross.

UNIT 6: Transformations & Similarity
Learning Targets

Section 6.1   You will use a technology tool to move a shape on a coordinate graph using slides, flips,

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and turns, and will use integers to describe those moves.

Section 6.2   This section will introduce similarity and congruence for polygons.

UNIT 7: Slope and Association
Learning Targets

Section 7.1   **In this section, you will first create and interpret circle graphs. You will also learn how to make graphs that compare two sets of data. Then, you will use scatterplots and linear graphs to make observations and predictions about the data based on correlations.**

Section 7.2   **Here, you will compare ratios and rates using different representations, including numbers, tables, and graphs. You will find out how to measure the steepness of a line on a graph.**

Section 7.3   **In this section, you will find equations of lines that fit data and will use them to make predictions based on trends.**

UNIT 8: Exponents and Functions
Learning Targets

Section 8.1   **You will learn about compound interest and use patterns of growth to write expressions. You will analyze the patterns in tables, graphs, and expressions to compare linear and exponential growth.**

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Section 8.2 **You will learn new ways to rewrite numbers and expressions involving exponents. You will also learn how to perform operations with these numbers and expressions.**

Section 8.3 **This section is devoted to special relationships called functions. You will learn how to distinguish functions from other relationships by examining their graphs and tables. Finally, you will investigate a variety of functions and learn how to describe them completely.**

UNIT 9: Angles and the Pythagorean

Learning Targets

Section 9.1 You will look at angles formed when a third line intersects a set of parallel lines, identifying the relationships between certain pairs of angles. You will also learn about the special relationships between the angles inside and outside a triangle and how to tell if two triangles are similar without knowing anything about their side lengths.

Section 9.2 You will learn how to determine if any three lengths will form a triangle, and, if they do, whether that triangle will be acute, obtuse, or right. You will find missing sides of right triangles using the Pythagorean Theorem. You will also learn about the square root operation and irrational numbers.

UNIT 10: Surface Area and Volume
Learning Targets

Section 10.1 You will begin by learning how to find the cube root of a number. Then you will learn how to find the surface areas of cylinders and pyramids and the volumes of cylinders, pyramids, cones, and spheres.

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