Common Core State Standards Pathway
Through 2nd edition Core-Plus Mathematics

Introduction
For the next few years, schools in many states will be transitioning to the Common Core State Standards for Mathematics (CCSSM) K–12. If your district is currently using Core-Plus Mathematics 2nd edition (2008–2011) or considering adopting the program for next year, this document may be used as a guide to a scope and sequence for CCSSM-aligned courses.

It is advisable to collaborate with middle school mathematics teachers from your feeder school(s) to plan articulation between the Grades 6–8 CCSSM and those for high school. Some topics in the CCSSM are introduced in middle school and used or extended in high school. For these standards you may find that some material in Core-Plus Mathematics will need fewer days to complete than is suggested in each Unit Planning Guide. Typically, the cognitive demand of the problems in Core-Plus Mathematics Course 1 exceeds that of similar content in middle school programs. Thus, it is in students’ best interest to complete the CCSSM Courses 1–3 Pathway outlined in this document with careful consideration of their middle school background. If you complete the investigations and problems listed on pages 2–8 of this document, students will be able to complete subsequent units in Core-Plus Mathematics and will learn the topics specified in the CCSSM. A detailed correlation of 2nd edition Core-Plus Mathematics to the CCSSM can be downloaded from: http://www.wmich.edu/cpmp/2nd/2ndCorrelationCPMP&CCSS.html

Connecting the CCSS for Mathematics to the English Language Arts
In addition to studying the alignment of Core-Plus Mathematics with the CCSS for Mathematics, schools should also consider how Core-Plus Mathematics assists in meeting the CCSS for English Language Arts with respect to the standards for reading informational text and for technical reading.

Connecting the Standards for Mathematical Practice to the Standards for Mathematical Content
“The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter.” (CCSM p. 8) The Core-Plus Mathematics texts regularly provide opportunities for students to develop and reflect on the mathematical dispositions and “habits of mind” described in CCSSM’s Mathematical Practices as an integral part of both class work and homework. Core-Plus Mathematics is designed so that students engage in the mathematical behaviors identified in the Standards for Mathematical Practice as the primary vehicle for learning the mathematics and statistics elaborated in the content standards.

Access and Equity
Downloading the CPMP-Tools public domain software freely available at http://www.wmich.edu/cpmp/CPMP-Tools to school and home computers, or using the software online in libraries and other public Internet access sites enables students to develop the mathematical practice of using appropriate tools strategically. This includes selecting and using technology tools to explore and deepen understanding of concepts; to visualize mathematical ideas and view results of varying assumptions; to model and solve problems; to compare predictions from data; and to become sufficiently familiar with technology tools to make sound decisions about when various features of the software might be helpful.
COURSE 1

Unit 1  Patterns of Change
Lesson 1  Cause and Effect—Optional depending on students middle school background
  Investigation 1  Physics and Business at Five Star Amusement Park
  Investigation 2  Taking Chances
  Investigation 3  Trying to Get Rich Quick
Lesson 2  Change Over Time
  Investigation 1  Predicting Population Change
  Investigation 2  Tracking Change with Spreadsheets
  Problems 1–4
Lesson 3  Tools for Studying Patterns of Change
  Investigation 1  Communicating with Symbols
  Investigation 2  Quick Tables, Graphs, and Solutions
  Investigation 3  The Shapes of Algebra—Optional depending on students middle school background
Lesson 4  Looking Back

Unit 2  Patterns of Data
Lesson 1  Exploring Distributions
  Investigation 1  Shapes of Distributions
  Problems 1–8
  Investigation 2  Measures of Center
Lesson 2  Measuring Variability
  Investigation 1  Measuring Position
  Investigation 2  Measuring and Displaying Variability: The Five-Number Summary and Box Plots
  Investigation 3  Identifying Outliers
  Investigation 4  Measuring Variability: The Standard Deviation
  Investigation 5  Transforming Measurements
Lesson 3  Looking Back

Unit 3  Linear Functions
Lesson 1  Modeling Linear Relationships
  Investigation 1  Getting Credit
  Investigation 2  Symbolize It
  Investigation 3  Fitting Lines
Lesson 2  Linear Equations and Inequalities
  Investigation 1  Who Will Be the Doctor?
  Investigation 2  Using Your Head
  Investigation 3  Using Your Head ... More or Less
  Investigation 4  Making Comparisons
Lesson 3  Equivalent Expressions
  Investigation 1  Different, Yet the Same
  Investigation 2  The Same, Yet Different
Lesson 4  Looking Back
Unit 4  Vertex-Edge Graphs  
Lesson 1  Euler Circuits: Finding the Best Path—Focus is on explicit attention to the mathematical practice of, and content standards for, mathematical modeling. 
Investigation 1 Planning Efficient Routes 
Investigation 2 Making the Circuit Problems 1–4 and 6 
Investigation 3 Graphs and Matrices 

Unit 5  Exponential Functions  
Lesson 1  Exponential Growth 
Investigation 1 Counting in Tree Graphs 
Investigation 2 Getting Started 
Investigation 3 Compound Interest 
Investigation 4 Modeling Data Patterns 
Some students do Problem 1 others do Problem 2. 
Investigation 5 Properties of Exponents I 
Lesson 2  Exponential Decay 
Investigation 1 More Bounce to the Ounce 
Investigation 2 Medicine and Mathematics 
Investigation 3 Modeling Decay 
Some groups do Problem 1, others do Problem 2, and all do Problem 3. 
Investigation 4 Properties of Exponents II 
Investigation 5 Square Roots and Radicals 
Lesson 3  Looking Back 

Unit 6  Patterns in Shape  
Lesson 1  Two-Dimensional Shapes 
Investigation 1 Shape and Function Problems 1–5 
Investigation 2 Congruent Shapes 
Investigation 3 Reasoning with Shapes 
Investigation 4 Getting the Right Angle 
Lesson 2  Polygons and Their Properties 
Investigation 1 Patterns in Polygons 
Investigation 2 The Triangle Connection 
Investigation 3 Patterns with Polygons Problems 1–4 and 6 
Lesson 3  Three-Dimensional Shapes 
Investigation 1 Recognizing and Constructing Three-Dimensional Shapes 
Investigation 2 Visualizing and Sketching Three-Dimensional Shapes 
Investigation 3 Patterns in Polyhedra Problems 1–5 
Lesson 4  Looking Back
Unit 7  Quadratic Functions
Lesson 1  Quadratic Patterns
  Investigation 1  Pumpkins in Flight
  Investigation 2  Golden Gate Quadratics
  Investigation 3  Patterns in Tables, Graphs, and Rules
Lesson 2  Equivalent Quadratic Expressions
  Investigation 1  Finding Expressions for Quadratic Patterns
  Investigation 2  Reasoning to Equivalent Expressions
Lesson 3  Solving Quadratic Equations
  Investigation 1  Solving $ax^2 + c = d$ and $ax^2 + bx = 0$
  Investigation 2  The Quadratic Formula
Lesson 4  Looking Back

Unit 8  Patterns in Chance
Lesson 1  Calculating Probabilities
  Investigation 1  Probability Distributions
  Investigation 2  The Addition Rule
Lesson 2  Modeling Chance Situations
  Investigation 1  When It’s a 50-50 Chance
  Investigation 2  Simulation Using Random Digits
    Problems 1–6
Lesson 3  Looking Back

COURSE 2

Unit 1  Functions, Equations, and Systems
Lesson 1  Direct and Inverse Variation
  Investigation 1  On a Roll
  Investigation 2  Power Models
Lesson 2  Multivariable Functions
  Investigation 1  Combining Direct and Inverse Variation
  Investigation 2  Linear Functions and Equations
Lesson 3  Systems of Linear Equations
  Investigation 1  Solving with Graphs and Substitution
  Investigation 2  Solving by Elimination
  Investigation 3  Systems with Zero and Infinitely Many Solutions
Lesson 4  Looking Back
Unit 2  Matrix Methods
Lesson 1  Constructing, Interpreting, and Operating on Matrices
  Investigation 1  There’s No Business Like Shoe Business
  Investigation 3  Combining Matrices
    Problems 3–6
Lesson 2  Multiplying Matrices
  Investigation 1  Brand Switching
  Investigation 2  More Matrix Multiplication
Lesson 3  Matrices and Systems of Linear Equations
  Investigation 1  Properties of Matrices

Unit 3  Coordinate Methods
Lesson 1  A Coordinate Model of a Plane
  Investigation 1  Representing Geometric Ideas with Coordinates
  Investigation 2  Reasoning with Slopes and Lengths
  Investigation 3  Representing and Reasoning with Circles
Lesson 2  Coordinate Models of Transformation
  Investigation 1  Modeling Rigid Transformations
  Investigation 2  Modeling Size Transformations
  Investigation 3  Combining Transformations
Lesson 4  Looking Back

Unit 4  Regression and Correlation
Lesson 1  Bivariate Relationships
  Investigation 1  Rank Correlation
    Problems 1–2
  Investigation 2  Shapes of Clouds of Points
    Problems 1–3
Lesson 2  Least Squares Regression and Correlation
  Investigation 1  How Good Is the Fit?
  Investigation 2  Behavior of the Regression Line
  Investigation 3  How Strong Is the Association?
  Investigation 4  Association and Causation
Lesson 3  Looking Back
Unit 5  Nonlinear Functions and Equations
Lesson 1  Quadratic Functions, Expressions, and Equations
  Investigation 1  Functions and Function Notation
  Investigation 2  Designing Parabolas
  Investigation 3  Expanding and Factoring
  Investigation 4  Solving Quadratic Equations
Lesson 2  Nonlinear Systems of Equations
  Investigation 1  Supply and Demand
  Investigation 2  Making More by Charging Less
Lesson 3  Common Logarithms and Exponential Functions
  Investigation 1  How Loud Is Too Loud?
  Investigation 2  Solving for Exponents
Lesson 4  Looking Back

Unit 6  Network Optimization
Lesson 2  Scheduling Projects Using Critical Paths – Focus is explicitly on attention to the mathematical practice of, and content standards for, mathematical modeling and optimization.
  Investigation 1  Building a Model
  Investigation 2  Critical Paths and the Earliest Finish Time
Problems 1–6

Unit 7  Trigonometric Methods
Lesson 1  Trigonometric Functions
  Investigation 1  Connecting Angle Measures and Linear Measures
  Investigation 2  Measuring Without Measuring
  Investigation 3  What’s the Angle?
Lesson 2  Using Trigonometry with Any Angle
  Investigation 1  The Law of Sines
  Investigation 2  The Law of Cosines
Lesson 3  Looking Back

Unit 8  Probability Distributions
Lesson 1  Probability Models
  Investigation 1  The Multiplication Rule for Independent Events
  Investigation 2  Conditional Probability
  Investigation 3  The Multiplication Rule When Events Are Not Independent
Lesson 2  Expected Value
  Investigation 1  What’s a Fair Price?
  Investigation 2  Expected Value of a Probability Distribution
Lesson 4  Looking Back
COURSE 3

Unit 1  Reasoning and Proof
Lesson 1  Reasoning Strategies
  Investigation 1  Reasoned Arguments
  Investigation 2  Reasoning with If-Then Statements
Lesson 2  Geometric Reasoning and Proof
  Investigation 1  Reasoning about Intersecting Lines and Angles
  Investigation 2  Reasoning about Parallel Lines and Angles
Lesson 3  Algebraic Reasoning and Proof
  Investigation 1  Reasoning with Algebraic Expressions
    Problems 1–2 and 4–9
  Investigation 2  Reasoning with Algebraic Equations
Lesson 4  Statistical Reasoning
  Investigation 1  Design of Experiments
  Investigation 2  By Chance or from Cause?
  Investigation 3  Statistical Studies
Lesson 5  Looking Back

Unit 2  Inequalities and Linear Programming
Lesson 1  Inequalities in One Variable
  Investigation 1  Getting the Picture
  Investigation 2  Quadratic Inequalities
  Investigation 3  Complex Inequalities
Lesson 2  Inequalities in Two Variables
  Investigation 1  Solving Inequalities
  Investigation 2  Linear Programming—A Graphic Approach
    Problems 1–2
  Investigation 3  Linear Programming—Algebraic Methods
    Problems 1–5
Lesson 3  Looking Back

Unit 3  Similarity and Congruence
Lesson 1  Reasoning about Similar Triangles
  Investigation 1  When Are Two Polygons Similar?
  Investigation 2  Sufficient Conditions for Similarity of Triangles
  Investigation 3  Reasoning with Similarity Conditions
Lesson 2  Reasoning about Congruent Triangles
  Investigation 1  Congruence of Triangles Revisited
  Investigation 2  Congruence in Triangles
  Investigation 3  Congruence in Quadrilaterals
  Investigation 4  Congruence-Preserving Transformations
Lesson 3  Looking Back
Unit 4  Samples and Variation
Lesson 1  Normal Distributions
  Investigation 1  Characteristics of a Normal Distribution
  Investigation 2  Standardized Values
  Investigation 3  Using Standardized Values to Find Percentiles
Lesson 2  Binomial Distributions
  Investigation 1  Shapes, Center, and Spread
  Investigation 2  Binomial Distributions and Making Decisions
Lesson 4  Looking Back

Unit 5  Polynomial and Rational Functions
Lesson 1  Polynomial Expressions and Functions
  Investigation 1  Modeling with Polynomial Functions
  Investigation 2  Addition, Subtraction, and Zeroes
  Investigation 3  Zeroes and Products of Polynomials
Lesson 2  Quadratic Polynomials
  Investigation 1  Completing the Square
  Investigation 2  The Quadratic Formula and Complex Numbers
Lesson 3  Rational Expressions and Functions
  Investigation 1  Domains and Graphs of Rational Functions
  Investigation 2  Simplifying Rational Expressions
  Investigation 3  Adding and Subtracting Rational Expressions
  Investigation 4  Multiplying and Dividing Rational Expressions
Lesson 4  Looking Back

Unit 6  Circles and Circular Functions
Lesson 1  Properties of Circles
  Investigation 1  Tangents to a Circle
  Investigation 2  Chords, Arcs, and Central Angles
  Investigation 3  Angles Inscribed in a Circle
Lesson 2  Circular Motion and Periodic Functions
  Investigation 1  Angular and Linear Velocity
  Problems 1–3
  Investigation 2  Modeling Circular Motion
  Investigation 3  Angular Revolutions, Degrees, and Radians
  Investigation 4  Patterns of Periodic Change
  Problems 1–7
Lesson 3  Looking Back
Unit 7  Recursion and Iteration
  Lesson 1  Modeling Sequential Change Using Recursion and Iteration
  Investigation 1  Modeling Population Change
  Investigation 2  The Power of Notation and Technology
  Lesson 2  A Recursive View of Functions
  Investigation 1  Arithmetic and Geometric Sequences

Unit 8  Inverse Functions
  Lesson 1  What Is an Inverse Function?
  Investigation 1  Coding and Decoding Messages
  Investigation 2  Finding and Using Inverse Functions
  Lesson 2  Common Logarithms and Their Properties
  Investigation 1  Common Logarithms Revisited
  Investigation 2  Covering All the Bases
  Investigation 3  Properties of Logarithms
  Lesson 4  Looking Back