

# FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT

## INTEGRATED MATH 2 FOUNDATIONS

**Date: January 2016**

**Proposed Grade Level(s): 10-12**

**Grading: A-F**

**Prerequisites: "D" or better in Integrated Math 1**

**Intent to Pursue 'A-G' College Prep Status: No**

**Subject Area: Mathematics**

**Course Length: 1 year**

**Number of Credits: 5 per semester**

### **COURSE DESCRIPTION:**

This is a non-college preparatory course designed for students who have passed Integrated Math 1, but may not be ready for the rigor of Integrated Math 2. The course is structured around problems and investigations that build spatial visualization skills, conceptual understanding of geometry topics, a few Algebra 1 topics not covered in Integrated Math 1, and an awareness of connections between different ideas. Students are encouraged to investigate and conjecture to develop their reasoning skills. Lessons are structured for students to collaborate actively by working collaboratively with peers. The course will focus on the foundational geometry standards that students will learn in Integrated Math 2, without engaging in formal proofs. The big ideas of the course are presented in an integrated Algebra/geometry context.

### **GENERAL GOALS/PURPOSES:**

Successful completion of this geometry course requires students to:

- Pose mathematical questions
- Make conjectures and test their validity
- Recognize and represent patterns mathematically or in prose
- Appreciate geometry as a connected, systematic branch of mathematics
- Apply geometry to solve problems in both mathematical and real-world contexts
- Communicate their mathematical understanding effectively
- Use Algebra to formulate and solve equations arising from the geometric situations
- Write expressions in equivalent forms to solve problems
- Perform arithmetic operations on polynomials
- Solve quadratic equations in one variable
- Exhibit creativity and perseverance in mathematical problem solving

Upon completion of the course, students can move into Integrated Math 2, with a C or better, or continue on a non-college preparatory path. This course will satisfy the Integrated Math 2 (geometry) graduation requirement for FCUSD.

### **CCSS READING/WRITING/SPEAKING and LISTENING COMPONENTS:**

The curriculum has literacy strategies embedded within the text that assists students in the following:

- Understanding math tasks
- Communicating understanding orally and through writing
- Writing about math
- Building math vocabulary
- Building academic vocabulary

The eight *Standards for Mathematical Practice* describe the attributes of mathematically proficient students and expertise that mathematics educators at all levels should seek to develop in their students. Mathematical practices provide a vehicle through which students engage with and learn mathematics – with a heavy focus on reading, writing, and explaining.

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

## **DETAILED UNITS OF INSTRUCTION:**

### **Chapter 1 Shapes and Transformations**

#### ***Section 1.1***

- 1.1.1 Creating Quilt Using Symmetry
- 1.1.2 Making Predictions and Investigating Results
- 1.1.3 Perimeters and Areas of Enlarging Title Patterns
- 1.1.4 Logical Arguments
- 1.1.5 Building a Kaleidoscope

#### ***Section 1.2***

- 1.2.1 Spatial Visualization and Reflection
- 1.2.2 Rigid Transformations: Rotation and Translations
- 1.2.3 Slope of Parallel and Perpendicular Lines
- 1.2.4 Defining Transformations
- 1.2.5 Using Transformations to Create Shapes
- 1.2.6 Symmetry

#### ***Section 1.3***

- 1.3.1 Attributes and Characteristics of Shapes
- 1.3.2 More Characteristics of Shapes

### **Chapter 2 Angles and Measurement**

#### ***Section 2.1***

- 2.1.1 Complementary, Supplementary, and Vertical Angles
- 2.1.2 Angles Formed by Transversals
- 2.1.3 More Angles Formed by Transversals
- 2.1.4 Angles in a Triangle
- 2.1.5 Applying Angle Relationships

### **Chapter 4 Trigonometry**

#### ***Section 4.1***

- 4.1.1 Constant Ratios in Right Triangles
- 4.1.2 Connecting Slope Ratios to Specific Angles
- 4.1.3 Expanding the Trig Table
- 4.1.4 The Tangent Ratio
- 4.1.5 Applying the Tangent Ratio

### **Chapter 5 Completing the Triangle Toolkit**

#### ***Section 5.1***

- 5.1.1 Sine and Cosine Ratios
- 5.1.2 Selecting a Trig Tool
- 5.1.3 Inverse Trigonometry
- 5.1.4 Applications

### **Chapter 6 Congruent Triangles**

#### ***Section 6.1***

- 6.1.1 Congruent Triangles
- 6.1.2 Conditions for Triangle Congruence
- 6.1.3 Congruence of Triangles Through Rigid Transformations

## **Section 2.2**

- 2.2.1 Units of Measure
- 2.2.2 Areas of Triangles and Composite Shapes
- 2.2.3 Areas of Parallelograms and Trapezoids
- 2.2.4 Heights and Areas

## **Section 2.3**

- 2.3.1 Triangle Inequality
- 2.3.2 The Pythagorean Theorem

## **Chapter 3 Similarity**

### **Section 3.1**

- 3.1.1 Dilations
- 3.1.2 Similarity
- 3.1.3 Using Ratios of Similarity
- 3.1.4 Applications and Notation

## **Constructions Unit**

### **Basic Constructions**

- a. Copy a segment
- b. Midpoint
- c. Perpendicular bisector
- d. Copy an angle
- e. Angle bisector
- f. Copy a triangle (SSS or SAS)
- g. Perpendicular from a point not on the line
- h. Parallel lines

### **Project**

Art constructions

## **Chapter 7 Proof and Quadrilaterals**

### **Section 7.1**

- 7.1.1 Properties of a Circle
- 7.1.2 Building a Tetrahedron
- 7.1.3 Shortest Distance Problems
- 7.1.4 Using Symmetry to Study Polygons

### **Section 7.2 (focused on definitions and properties without proof)**

- 7.2.1 Special Quadrilaterals and Proof
- 7.2.2 Properties of Rhombi
- 7.2.3 More Proof with Congruent Triangles
- 7.2.4 More Properties of Quadrilaterals

## **Chapter 8 & 10 Circles**

### **Section 8.3**

- 8.3.1 A Special Ratio
- 8.3.2 Area and Circumference of a Circle
- 8.3.3 Circles in Context

### **Section 10.1**

- 10.1.1 Introduction to Chords
- 10.1.2 Angles and Arcs
- 10.1.3 Chords and Angles
- 10.1.4 Tangents and Secants
- 10.1.5 Problem Solving with Circles

### **Algebra I CCSS**

- Number and Quantity, N-RN 3
- Seeing Structure in Expressions, A-SSE 2, 3a, 3b
- Arithmetic with Polynomials and Rational Expressions, A-APR 1
- Reasoning with Equations and Inequalities, A-REI 4a, 4b, 7
- Interpreting Functions, F-IF 7a, 7b
- Building Functions, F-BF 3, 4a
- Linear, Quadratic, Exponential Models, 1a

## **TEXTBOOKS AND RESOURCE MATERIALS:**

*Core Connections Integrated II*, CPM (College Preparatory Mathematics), 2013

## **SUBJECT AREA CONTENT STANDARDS TO BE ADDRESSED:**

### **GEOMETRY**

- Congruence
  - Experiment with transformations in the plane; Understand congruence in terms of rigid motion; Make geometric constructions; G-CO

- Similarity, Right Triangles, and Trigonometry
  - Understand similarity in terms of similarity transformations; Prove theorems involving similarity; Define trigonometric ratios and solve problems involving right triangles. G-SRT
- Modeling with Geometry
  - Apply geometric concepts in modeling situations. G-MG
- Geometric Measurement and Dimension:
  - Explain volume formulas and use them to solve problems; visualize relationships between two-dimensional and three-dimensional objects. G-GMD
- Expressing Geometric Properties with Equations
  - Use coordinates to prove simple geometric theorems algebraically. G-GMD
- Circles
  - Understand and apply theorems about circles; Find arc lengths and areas of sectors of circles. G-C

## ALGEBRA

- The Real Number System:
  - Use Properties of rational and irrational numbers. N-RN3
- Algebra:
  - Interpret the structure of expressions; Write expressions in equivalent forms to solve problems. A-SSE 2, 3
- Arithmetic with Polynomials and Rational Expressions:
  - Perform arithmetic operations on polynomials. A-APR 1
- Reasoning with Equations and Inequalities:
  - Solve Equations and inequalities in one variable; Solve systems of equations. A-REI 4, 7
- Interpreting Functions:
  - Analyze functions using different representations. F-IF 7
- Building Functions:
  - Build new functions from existing functions. F-BF 3,4
- Linear, Quadratic, and Exponential Models:
  - Construct and compare linear, quadratic, and exponential models and solve problems. F-LE 3

## **DISTRICT ESLRs TO BE ADDRESSED:**

When students exit a secondary mathematics course, they will be:

- **Self-directed Learners** who will be able to use notes and a textbook to assist them in continuing their learning outside of the classroom setting.
- **Efficient Communicators** who can explain mathematical concepts to others and use mathematics to organize and explain data.
- **Quality Producers** who understand the importance of neat, organized, work that demonstrates their thinking and understanding of the solution they've formed to solve a problem.
- **Constructive Thinkers** who are able to attack problems with organization, logic, and mathematical skills they've developed in a systematic fashion.
- **Collaborative Workers** who can work in a variety of settings in culturally diverse groups. They will be able to form and use study groups to strengthen their own understanding in addition to providing the same service for classmates.
- **Responsible Citizens** who accept the consequences of their actions and who demonstrate their understanding of their role in the learning process.

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