

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT

Integrated Math 1

Date: January 2014

Proposed Grade Level(s): 9th-12th

Grading: A-F

Prerequisites: "C" or better in Course 3

Subject Area: Mathematics

Course Length: One year

Number of Credits: 5 per semester

COURSE DESCRIPTION:

Integrated Math 1 is an integrated math course designed to formalize and extend the mathematics that students learned in the middle grades. The standards are based on the Common Core State Standards for Mathematics and include topics from the conceptual categories: Number and Quantity, Algebra, Functions, Geometry, and Statistics and Probability. Instructional time will focus on six critical areas: (1) extend understanding of numerical manipulation to algebraic manipulation; (2) synthesize understanding of function; (3) deepen and extend understanding of linear relationships; (4) apply linear models to data that exhibit a linear trend; (5) establish criteria for congruence based on rigid motions; and (6) apply the Pythagorean Theorem to the coordinate plane.

GENERAL GOALS/PURPOSES:

As stated in the *Mathematics Framework (2013)*, the fundamental purpose of Integrated Math 1 is to formalize and extend students' understanding of linear functions and their applications. The critical topics of study deepen and extend understanding of linear relationships, in part by contrasting them with exponential phenomena, and in part by applying linear models to data that exhibit a linear trend. Integrated Math 1 uses properties and theorems involving congruent figures to deepen and extend understanding of geometric knowledge from prior grades. The courses in the Integrated Pathway follow the structure began in the K-8 standards of presenting mathematics as a coherent subject, mixing standards from various conceptual categories. Integrated Math 1 is intended to be an introductory high school course and will satisfy the Algebra 1 graduation requirement.

STUDENT READING/WRITING/ORAL COMPONENT:

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.

TEXTBOOKS AND RESOURCE MATERIALS:

Integrated Math I, A Common Core Math Program; Carnegie Learning, 2013

DETAILED UNITS OF INSTRUCTION:

Chapters	Standards	Chapter Overview
1: Understanding Quantities and Their Relationships	N.Q.2 F.IF.1 F.IF.2 F.IF.4 F.IF.5 F.IF.9 F.LE.1b F.LE.2 A.CED.2 A.REI.10	This chapter introduces students to the concept of functions. Lessons provide opportunities for students to explore functions, including linear, exponential, quadratic, linear absolute value functions, and linear piecewise functions through problem situations, graphs, and equations. Students will classify each function family using graphs, equations, and graphing calculators. Each function family is then defined and students will create graphic organizers that represent the graphical behavior and examples of each.
2: Graphs, Equations, and Inequalities	A.REI.1 A.REI.3 A.REI.10 A.CED.1 A.CED.2 A.CED.3 A.SSE.1a N.Q.1 N.Q.2 N.Q.3 F.IF.2 F.IF.6 F.LE.1b F.LE.1c	This chapter reviews solving linear equations and inequalities with an emphasis towards connecting the numeric, graphic, and algebraic methods for solving linear functions. Students explore the advantages and limitations of using tables, functions, and graphs to solve problems. A graphical method for solving linear equations, which involves graphing the left and right side of a linear equation, is introduced. Upon student understanding of solving and graphing equations by hand, the chapter introduces the use of a graphing calculator. Finally, the graphical method for solving problems is extended to include non-linear equations and inequalities.
3: Linear Functions	A.SSE.1a A.SSE.1b A.CED.2 A.CED.3 A.CED.4 A.REI.1 A.REI.3	This chapter guides student exploration and comprehension of different forms of linear equations. Questions ask students to compare the mathematical and contextual meanings of various linear equations and to determine when to use the most appropriate form of a linear equation to represent a problem situation.
4: Sequences	F.IF.1 F.IF.2 F.IF.3 F.IF.4 F.BF.1 F.BF.1a F.BF.2 F.LE.1b F.LE.1c	This chapter introduces students to sequences, and then focuses student attention on arithmetic and geometric sequences. Students then use recursive and explicit formulas to determine subsequent terms of a sequence. The relationship between arithmetic sequences and linear functions and some geometric sequences and exponential functions is developed.

	F.LE.2 F.LE.5 A.SSE.1a	
5: Exponential Functions	A.SSE.1a A.SSE.1b A.CED.1 A.CED.2 A.REI.3 A.REI.10 A.REI.11 N.RN.1 N.RN.2 N.Q.2 F.IF.3 F.IF.4 F.IF.6 F.IF.7e F.LE.2 F.LE.3 F.LE.5	This chapter examines the graphical behavior of exponential functions, including intercepts, domain and range, intervals of increase or decrease, and asymptotes. Students also explore the transformations of exponential functions. The chapter then introduces students to the relationship between rational exponents and radical form. Students will learn the strategy to use common bases to solve simple exponential equations algebraically.
6: Systems of Equations	A.REI.5 A.REI.6 A.REI.10 A.REI.11 A.CED.2	This chapter focuses on solving systems of linear equations graphically and algebraically using the substitution method and the linear combinations method.
7: Systems of Inequalities	A.REI.12 A.CED.3	This chapter extends student comprehension of graphing linear equations to include graphing and solving linear inequalities. Students will solve systems of inequalities and use that skill to model mathematics with linear programming.
8: Analyzing Data Sets for One Variable	S.ID.1 S.ID.2 S.ID.3	This chapter reviews data analysis of data sets with one variable. Students first learn to represent data graphically through dot plots, histograms, and box-and-whisker plots. The chapter leads students to determining measures of center for a data set, determining any outliers in a data set, and determining the interquartile range (IQR) and standard deviation for data sets.
9: Correlation and Residuals	S.ID.6a S.ID.6b S.ID.6c S.ID.7 S.ID.8 S.ID.9	This chapter reviews data analysis of data sets with one variable. Students first learn to represent data graphically through dot plots, histograms, and box-and-whisker plots. The chapter leads students to determining measures of center for a data set, determining any outliers in a data set, and determining the interquartile range (IQR) and standard deviation for data sets.
10: Analyzing Data Sets for Two Categorical Variables	S.ID.5	This chapter reviews data analysis of data sets with one variable. Students first learn to represent data graphically through dot plots, histograms, and box-and-whisker plots. The chapter leads students to determining measures of center for a data set, determining any outliers in a data set, and determining the interquartile range (IQR) and standard

		deviation for data sets.
11: Modeling Mathematics (optional)	F.IF.4 F.IF.5 F.IF.7 F.BF.1 F.BF.4 F.LE.1b F.LE.1 F.LE.2	This chapter presents opportunities to model real-world data using linear and exponential functions. The focus builds student decision-making to determine the appropriate function or functions for a given data set. (This chapter is optional since it goes beyond the study of linear and exponential functions).
12: Geometry on the Coordinate Plane	G.CO.1 G.CO.2 G.CO.4 G.CO.5 G.CO.6 G.CO.12 G.CO.13 G.GPE.5 G.GPE.6 G.GPE.7	This chapter uses distance, midpoint, and slope to examine segments and lines in the coordinate plane. Patty paper and constructions are used to duplicate segments and angles, bisect segments and angles, construct parallel and perpendicular lines, and construct triangles and quadrilaterals.
13: Congruence through transformations	G.CO.2 G.CO.4 G.CO.5 G.CO.6 G.CO.7 G.CO.8 G.CO.12	This chapter addresses transformations of figures on the coordinate plane, focusing on similarity and congruence, and the effects of transformation on coordinates. The chapter leads student exploration of the conditions for triangle congruence and opportunities for constructions of congruent triangles under the stated conditions are provided.
14: Perimeter and Area of Geometric Figures on the Coordinate Plane	G.GPE.5 G.GPE.7	This chapter focuses on calculating perimeter and area of various geometric figures represented on the coordinate plane. The use of transformation is explored to ease arithmetic operations
15: Connecting Algebra and Geometry with Polygons	G.GPE.4 G.GPE.5	This chapter focuses on using slope and distance to classify triangles and quadrilaterals on the coordinate plane. Given a subset of vertices and a set of conditions, the remaining possible vertices are determined

COMMON CORE STATE STANDARDS ADDRESSED:

The content standards addressed in this course come from each of the conceptual categories:

- Number and Quantity
- Algebra
- Functions
- Modeling
- Geometry
- Statistics and Probability

***See attachment for specific standards addressed.**

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.