

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT

MATH COURSE 1

Date: January 2019

Course Length: 3 Trimesters

Proposed Grade Level(s): 6th

Subject Area: Mathematics

Grading: A - F

Credits: N/A

Prerequisite(s): Completion of 5th grade Math Standards

Intent to Pursue ‘A-G’ College Prep Status: No

A-G Course Identifier: N/A

COURSE DESCRIPTION:

Math Course 1 is a 6th grade level course that is aligned with the California Common Core Standards for Mathematics. In this course students build on a strong number foundation to prepare for higher level mathematics, bridging the concrete concepts of arithmetic and the abstract thinking of Algebra. The Standards provide content to be developed throughout the school year through rich instructional experiences represented in a coherent manner. Instructional time will focus on four critical areas: (1) connecting ratio, rate, and percentage to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking. Students will also work toward fluency with multi-digit division and multi-digit decimal operations.

The bulk of instructional time should be given to “Major” clusters and the Standards within them, identified later in this document. However, Standards in the “Additional/Supporting” clusters should not be neglected, as to do so would result in gaps in students’ learning, including skills and understandings they may need in later grades. Instruction in this course should reinforce topics in major clusters by using topics in the additional/supporting clusters, including problems and activities that support natural connections between clusters.

GENERAL GOALS:

Goals:

- Students connect their understanding of multiplication and division with ratios and rates, solving a wide variety of problems.
- Students extend the number system to working with rational numbers.
- Students connect ratios and fractions.
- Students read, write, and simplify expressions, along with creating equivalent expressions.
- Students read, write, and solve simple one-variable equations.
- Students work with statistical data and create common data plots.
- Students continue work with multi-digit division.
- Students continue work with multi-digit decimal operations.

DETAILED UNITS OF INSTRUCTION:

UNIT 1: RATIOS AND PROPORTIONAL RELATIONSHIPS

Chapter 1: Ratios and Rates

Chapter 2: Fractions, Decimals, and Percent

Content: Students will be able to use ratio concepts to describe change and model real-world situations. Concepts that are studied include the ratio relationships between two quantities, unit rate, and using rate language, in the context of a ratio relationship. Students will also solve real-world problems using ratio and rate reasoning, using tables of equivalent ratios, tape diagrams, double line diagrams, and equations. Students will be able to make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Unit pricing and constant speed are another focus for unit rate. Students will work with percent problems, solving for missing values.

Math Practice Standards: Through the lessons and practice, there is an emphasis on making sense of problems and persevering in solving them, constructing viable arguments and critiquing the reasoning of others, modeling with mathematics, and looking for and expressing regularity in repeated reasoning.

UNIT 2: THE NUMBER SYSTEM

Chapter 3: Compute with Multi-Digit Numbers

Chapter 4: Multiply and Divide Fractions

Chapter 5: Integers and the Coordinate Plane

Content: Students will interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, using visual models and equations. They will also divide multi-digit numbers using the standard algorithm. Working with decimals, students will fluently add, subtract, multiply, and divide multi-digit decimals using the algorithm for each operation. The number system is extended into rational numbers. Students use positive and negative numbers to represent quantities in real-world contexts explaining the meaning of 0 in each situation. They also understand a rational number as a point on the number line and in the coordinate plane. Absolute value of rational numbers is introduced. Students will learn to graph points in all four quadrants of the coordinate plane and find distances between those points. Real-world mathematical problems are also used while working on the graphing standards.

Math Practice Standards: Through the lessons and practice, there is an emphasis on making sense of problems and persevering in solving them, constructing viable arguments and critiquing the reasoning of others, using appropriate tools strategically, attending to precision, modeling with mathematics, and looking for and expressing regularity in repeated reasoning.

UNIT 3: EXPRESSIONS AND EQUATIONS

Chapter 6: Expressions

Chapter 7: Equations

Chapter 8: Functions and Inequalities

Content: Students will apply and extend previous understandings of arithmetic to algebraic expressions. They will read, write, and evaluate numerical expressions involving whole numbers, whole number exponents, and variables. Students will also identify and create equivalent expressions. The use of academic vocabulary is important as students identify parts of an expression. Moving from expressions to equations, students will reason and solve one-variable equations and inequalities. Applications of expressions and equations is applied to real-world math problems.

Math Practice Standards: Through the lessons and practice, there is an emphasis on making sense of problems and persevering in solving them, reasoning abstractly and quantitatively, constructing viable arguments and critiquing the reasoning of others, attending to precision, modeling with mathematics, and looking for and making use of structure.

UNIT 4: GEOMETRY

Chapter 9: Area

Chapter 10: Volume and Surface Area

Content: Students will solve practice and real-world mathematical problems involving area, surface area, and volume using whole numbers and fractions. They will also find the area of triangles, special quadrilaterals, and polygons through composing rectangles and decomposing into triangles and other shapes. The coordinate plane will be used when students are given vertices and coordinates and when finding side lengths. The study of three-dimensional figures is done through the use of nets.

Math Practice Standards: Through the lessons and practice, there is an emphasis on making sense of problems and persevering in solving them, constructing viable arguments and critiquing the reasoning of others, using appropriate tools strategically, attending to precision, look for and make use of structure, modeling with mathematics, and looking for and expressing regularity in repeated reasoning.

UNIT 5: STATISTICS AND PROBABILITY

Chapter 11: Statistical Measures

Chapter 12: Statistical Displays

Content: Students will develop an understanding of statistical variability. They will recognize a statistical question as one that anticipates variability in the data related to the question, and accounting for its answers. Study of the distribution of data along with the use of academic vocabulary, is emphasized. Data studies are done using plots on number lines, dot plots, histograms and box plots. Summarizing numerical data sets in relation to their context is done using observations, measurement, quantitative measures, and the shape of the distribution models.

Math Practice Standards: Through the lessons and practice, there is an emphasis on making sense of problems and persevering in solving them, constructing viable arguments and critiquing the reasoning of others, using appropriate tools strategically, attending to precision, modeling with mathematics, and looking for and expressing regularity in repeated reasoning.

SUBJECT AREA CONTENT STANDARDS TO BE ADDRESSED:

Standards for Mathematical Practice

The *Standards for Mathematical Practice* (SMP) describe the attributes and expertise that mathematics educators at all levels should seek to develop in their students. The Standards for Mathematical Practice represent a picture of what it looks like for students to *do mathematics*. Mathematical practices provide a vehicle through which students engage with and learn mathematics with a focus on reading, writing, and explaining. The Standards for Mathematical Practice along with the Standards for Mathematical Content (which follow this section), prescribe that students experience mathematics as a coherent, relevant, and meaningful subject.

SMP 1: Make sense of problems and persevere in solving them.

- SMP 2: Reason abstractly and quantitatively.
SMP 3: Construct viable arguments and critique the reasoning of others.
SMP 4: Model with mathematics.
SMP 5: Use appropriate tools strategically.
SMP 6: Attend to precision.
SMP 7: Look for and make use of structure.
SMP 8: Look for and express regularity in repeated reasoning.

Mathematics Content Standards

The bulk of instructional time should be given to “major” clusters and the Standards within them. However, Standards in the “additional/supporting” clusters should not be neglected. To do so would result in gaps in students’ learning, including skills and understanding they may need in later grades. Instruction in this course should reinforce topics in major clusters by using topics in the additional/supporting clusters and including problems and activities that support natural connections between clusters.

Ratios and Proportional Relationships

Understand ratio concepts and use ratio reasoning to solve problems.

- 6.RP.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
- 6.RP.2. Understand the concept of a unit rate associated with a ratio, and use rate language in the context of a ratio relationship.
- 6.RP.3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
- Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
 - Solve unit rate problems including those involving unit pricing and constant speed.
 - Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means times the quantity); solve problems involving finding the whole, given a part and the percent.
 - Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

The Number System

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

- 6.NS.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

Compute fluently with multi-digit numbers and find common factors and multiples.

- 6.NS.2. Fluently divide multi-digit numbers using the standard algorithm.
- 6.NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
- 6.NS.4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.

Apply and extend previous understandings of numbers to the system of rational numbers.

- 6.NS.5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits,

positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

6.NS.6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g. $-(-3) = 3$, and that 0 is its own opposite.

b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

6.NS.7. Understand ordering and absolute value of rational numbers.

a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret $-3 > -7$ as a statement that -3 is located to the right of -7 on a number line oriented from left to right.

b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write $-3^{\circ}\text{C} > -7^{\circ}\text{C}$ to express the fact that -3°C is warmer than -7°C .

c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.

d. Distinguish comparisons of absolute value from statements about order.

6.NS.8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Expressions and Equations

Apply and extend previous understandings of arithmetic to algebraic expressions.

6.EE.1. Write and evaluate numerical expressions involving whole-number exponents.

6.EE.2. Write, read, and evaluate expressions in which letters stand for numbers.

a. Write expressions that record operations with numbers and with letters standing for numbers.

b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, and coefficient); view one or more parts of an expression as a single entity.

c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).

6.EE.3. Apply the properties of operations to generate equivalent expressions.

6.EE.4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).

Reason about and solve one-variable equations and inequalities.

6.EE.5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.

6.EE.7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q, x , and are all non-negative rational numbers.

6.EE.8. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams.

Represent and analyze quantitative relationships between dependent and independent variables.

9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

Geometry

Solve real-world and mathematical problems involving area, surface area, and volume.

6.G.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

6.G.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas and to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

6.G.3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

6.G.4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Statistics and Probability

Develop understanding of statistical variability.

6.SP.1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.

6.SP.2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

6.SP.3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. Summarize and describe distributions.

Summarize and describe distributions.

6.SP.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

6.SP.5. Summarize numerical data sets in relation to their context, such as by:

a. Reporting the number of observations.

b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

- c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data was gathered.
- d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which data was gathered.

COMMON CORE STATE ANCHOR STANDARDS FOR READING (K-12):

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
3. Analyze how and why individuals, events, or ideas develop and interact over the course of a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
6. Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas

7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning, as well as the relevance and sufficiency of the evidence.
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Reading Range / Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

COMMON CORE STATE ANCHOR STANDARDS FOR WRITING (K-12):

Text Types and Purposes

1. Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.
2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details and well-structured event sequences.

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
5. Develop and strengthen writing, as needed, by planning, revising, editing, rewriting, or trying a new approach.
6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build Knowledge

7. Conduct short, as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Range of Writing

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

COMMON CORE STATE ANCHOR STANDARDS FOR SPEAKING AND LISTENING (K-12):

Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas

4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and ensure that the organization, development, and style are appropriate to task, purpose, and audience.
5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

TEXTBOOKS AND RESOURCE MATERIALS:

Textbook

California Math Course 1, by McGraw Hill, 2015.

DISTRICT ESLRS TO BE ADDRESSED:

Students 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.
- **Constructive Thinkers:** who are able to engage in problems from a variety of approaches.
- **Effective Communicators:** who can explain mathematical concepts to others and use mathematics to organize, explain and justify their reasoning.
- **Collaborative Workers:** who can work effectively in a variety of settings in culturally diverse groups.
- **Quality Producers/Performers:** who understand the importance of neat, organized work that demonstrates their thinking and understanding.

- **Responsible Citizens:** who make positive decisions that benefit their personal, social, and professional circles.

The Folsom Cordova Unified School District prohibits discrimination, intimidation, harassment (including sexual harassment) or bullying based on a person's actual or perceived ancestry, color, disability, race or ethnicity, religion, gender, gender identity or gender expression, immigration status, national origin, sex, sexual orientation, or association with a person or group with one or more of these actual or perceived characteristics. **For concerns/questions or complaints, contact the Title IX Coordinator(s) and Equity Compliance Officer(s): Curtis Wilson, cmwilson@fcusd.org (grades K-5) and Jim Huber, ED. D., jhuber@fcusd.org (grades 6-12), 1965 Birkmont Drive, Rancho Cordova, CA 96742, 916-294-9000 ext.104625**