Essential Learning from 4th Grade to 5th Grade

(CA Math Framework pp. 224-226)

For more in-depth examples of tasks, expectations, and student reasoning on these topics, refer to the 4th Grade CA Math Framework at http://www.cde.ca.gov/ci/ma/cf/documents/mathgrade4fwlmg2.pdf

In kindergarten through grade five, the focus is on the addition, subtraction, multiplication, and division of whole numbers, fractions, and decimals, with a balance of concepts, procedural skills, and problem solving. Arithmetic is viewed as an important set of skills and also as a thinking subject that, done thoughtfully, prepares students for algebra. Measurement and geometry develop alongside number and operations and are tied specifically to arithmetic along the way. Multiplication and division of whole numbers and fractions are instructional foci in grades three through five.

To be prepared for grade-five mathematics, students should be able to demonstrate that they have learned certain mathematical concepts and acquired procedural skills by the end of grade four and have met the fluency expectations for the grade level. For students in grade four, the expected fluencies are to add and subtract multi-digit whole numbers using the standard algorithm within 1,000,000 (4.NBT.4). These fluencies and the conceptual understandings that support them are foundational for work in later grades.

Of particular importance at grade four are concepts, skills, and understandings needed to use the four operations with whole numbers to solve problems (4.OA.1–3); generalize place-value understanding for multi-digit whole numbers (4.NBT.1–3); use place-value understanding and properties of operations to perform multi-digit arithmetic (4.NBT.4–6); extend understanding of fraction equivalence and ordering (4.NF.1–2); build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers (4.NF.3–4); and understand decimal notation for fractions and compare decimal fractions (4.NF.5–7).

Fractions

Fraction equivalence is an important theme in the standards. Understanding fraction equivalence is necessary to extend arithmetic from whole numbers to fractions and decimals. Students need to understand fraction equivalence and that $\frac{a}{b}=\frac{n\times a}{n\times b}$. They should be able to represent equivalent common fractions and apply this understanding to compare fractions and express their relationships using the symbols >, =, or <. Students understand how to represent and read fractions and mixed numbers in multiple ways.

Grade-four students should understand addition and subtraction with fractions having like denominators. This understanding represents a multi-grade progression, as students add and subtract fractions in grade four with like denominators by thinking of adding or subtracting so many unit fractions. Students should be able to solve word problems involving addition and subtraction of fractions that refer to the same whole and have like denominators (e.g., by using visual fraction models and equations to represent the problem). Students should understand how to add and subtract fractions and mixed numbers with like denominators.

Students further extend their understanding of multiplication to multiply fractions by whole numbers. To support their understanding, students should understand a fraction as the numerator times the unit

fraction with the same denominator. Students should be able to rewrite fractions as multiples of the unit fraction of the same denominator, use a visual model to multiply a fraction by a whole number, and use equations to represent problems involving the multiplication of a fraction by a whole number by multiplying the whole number times the numerator.

Four Operations with Whole Numbers

By the end of grade four, students should fluently add and subtract multi-digit whole numbers to 1,000,000 using the standard algorithm. Students should also be able to use the four operations to solve multi-step word problems with whole-number remainders.

In grade four, students develop their understanding and skills with multiplication and division. They combine their understanding of the meanings and properties of multiplication and division with their understanding of base-ten units to begin to multiply and divide multi-digit numbers. Fourth-grade students should know how to express the product of two multi-digit numbers as another multi-digit number. They also should know how to find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors. Using a rectangular area model to represent multiplication and division helps students visualize these operations. This work will develop further in grade five and culminates in fluency with the standard algorithms in grade six.