Common Core Math in 4th Grade

The two most important areas of focus for this grade are skill with multiplication and division and building understanding of fractions.

Fourth graders will develop understanding of and fluency with multi-digit multiplication and division. Eventually, they should be comfortable with methods for multiplication and division that work quickly and accurately. This includes the usual procedures, as well as some which could be faster in some cases or more understandable to the students. For example, 35 x 12 = 35 x 2 x 6 = 70 x 6 = 420. This not only helps when calculator or pencil-and-paper are not available, but helps to prepare for algebra. To be sure these processes work, and to better prepare for algebra, the students will use pictures and other methods to explain why they work.

Working with fractions is another key element of 4th grade math. To understand why fractions have many names for the same number — for example $\frac{1}{2}$ is the same as $\frac{2}{4}$ is the same as $\frac{3}{6}$ and so on — students will use pictures, instead of "canceling," which doesn't really have any meaning for kids at that point, or using fraction multiplication, which would be using an advanced topic for more basic understanding.

Examples:
From Eureka Math: Grade 4 Module 3 Topic C Overview
https://www.engageny.org/resource/grade-4-mathematics-module-3-topic-c-overview
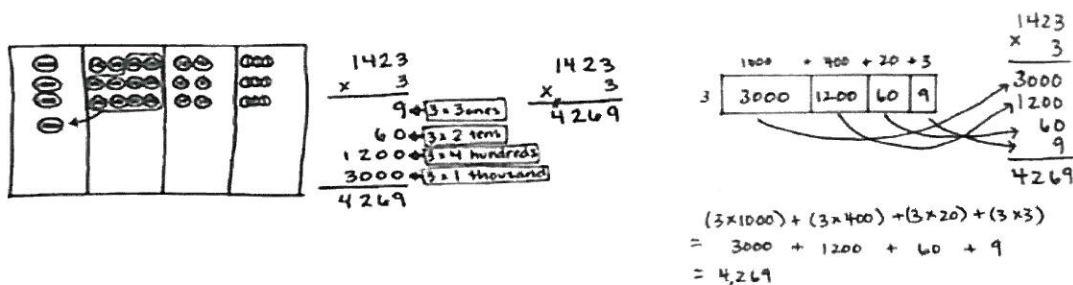
Each of these descriptions of how to calculate 1423 times 3 is useful in different ways. The first uses place value (the meaning of ones, tens, hundreds and thousands) and connects multiplication to addition. The middle two descriptions are expanded and condensed versions of the standard algorithm. The last uses area to represent the multiplication and connects the other descriptions with ideas needed in algebra. Students will learn to see the connections between these methods both to check their work and to reinforce why each process works.

Tips for parents:

- Communicate with your child's teacher if you are regularly unable to help your child with unfamiliar multiplication or division methods.

- Do math in everyday settings. Encourage your child to recognize fraction equivalence in activities like cooking, for example "I can put in one cup and a half cup of milk or three half-cups of milk." There are lots of multiplication and division examples, for example estimating how many candies they'll get from trick-or-treating.

- Especially if your child catches on to procedures quickly, make sure she or he can explain why something makes sense.
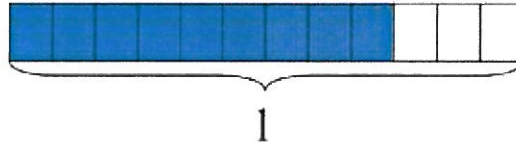
Example: Explaining Fraction Equivalence with Pictures

https://www.illustrativemathematics.org/illustrations/743

a. The rectangle below has length 1. What fraction does the shaded part represent?
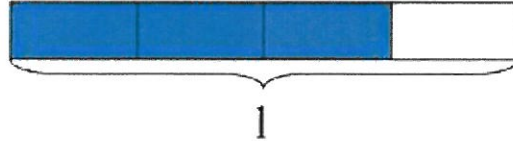
b. The rectangle below has the same length as the rectangle above. What fraction does the shaded part represent?

c. Use the pictures to explain why the two fractions represented above are equivalent.

Commentary:

The purpose of this task is to provide students with an opportunity to explain fraction equivalence through visual models in a particular example. Part C should be approached as a discussion before students are asked to write an explanation. Students can talk generally about the relationship between the pictures ("Each of the larger pieces is broken up into 3 little pieces"), which can then be refined and connected to the appropriate operations ("There are three times as many smaller pieces as bigger pieces"). Students will need more opportunities to think about fraction equivalence with different examples and models, but this task represents a good first step.

Solutions:

a) ¾   b) 9/12

c. Three pieces in the bottom rectangle have the same size as 1 piece in the top rectangle. We can even show this by darkening the lines around groups of three small pieces in the rectangle that represents $\frac{9}{12}$:
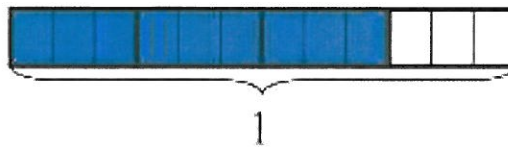
When we make groups of three in the bottom rectangle, there are 3 groups of 3 shaded pieces and 4 groups of 3 in the whole rectangle. Using these groups, we see that

$$\frac{9}{12} = \frac{(3 \times 3)}{(4 \times 3)}$$
$$= \frac{3}{4}$$

of the bottom rectangle is shaded. Since the shaded portion is the same in each case but we just look at it in a different way and describe it with a different fraction, the fractions are equal. So

$$\frac{9}{12} = \frac{3}{4}$$