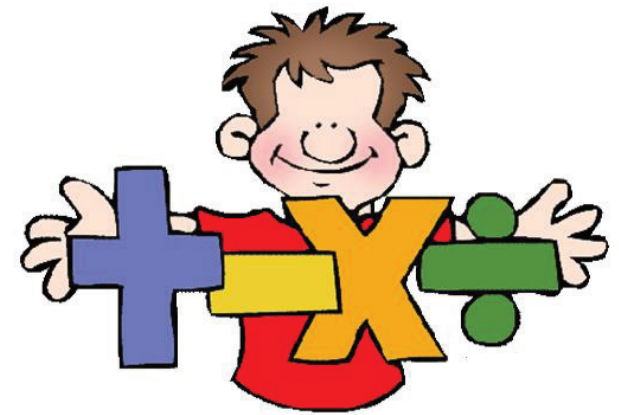# Parent Roadmap

Grade 4

Multiplication & Division
Working with Fractions

Students in fourth grade are encouraged to see the relationship between multiplication and division. Their task is to make sense of division and have a real understanding of the concept thereby preparing for more complicated strategies in subsequent grades. One strategy that supports this is *multiplying up.*

$$624 \div 6$$
$$6 \times 40 = 240$$
$$6 \times 40 = 240$$
$$\overline{480}$$
$$6 \times 20 = 120$$
$$\overline{600}$$
$$6 \times 4 = 24$$
$$\overline{104} \quad \overline{624}$$
$$\text{Ans: } 624 \div 6 = 104$$

This student has used the *multiplying up* strategy to find the solution to 624 ÷ 6.

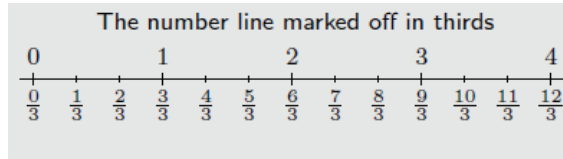One strategy, *partial quotients,* begun in grade 3 continues in grade 4 with larger numbers.

Students are exposed to various strategies to ensure a good foundation is laid as students move into the middle grades.

$$6\overline{)624}$$
$$-240 \quad 40$$
$$\overline{384}$$
$$-240 \quad 40$$
$$\overline{144}$$
$$-120 \quad 20$$
$$\overline{24}$$
$$-24 \quad 4$$
$$\overline{0}$$

A fourth grader has to understand the unit fraction and be able to apply this understanding to addition and subtraction of fractions.

$$\frac{5}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$$

OR $\frac{2}{8} + \frac{3}{8}$ etc.

Students need to see fractions on a number line and apply this to different situations.

The number line marked off in thirds

0			1			2			3			4

$\frac{0}{3}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{3}{3}$ $\frac{4}{3}$ $\frac{5}{3}$ $\frac{6}{3}$ $\frac{7}{3}$ $\frac{8}{3}$ $\frac{9}{3}$ $\frac{10}{3}$ $\frac{11}{3}$ $\frac{12}{3}$

A fourth grader should develop an understanding of a fraction as a number.

Understanding fraction equivalence is very important in grade 4. Students need to understand how an equivalent fraction is obtained. $\frac{2}{3} = \frac{8}{12}$
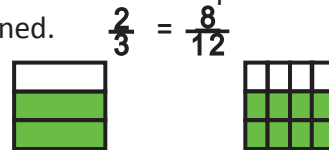
The whole is the square, measured by area. On the left it is divided horizontally into 3 rectangles of equal area, and the shaded region is 2 of these and so represents $\frac{2}{3}$. On the right it is divided into 4 x 3 small rectangles of equal area, and the shaded area comprises 4 x 2 of these and so it represents $\frac{4 \times 2}{4 \times 3}$

Grade 4 expectations when working with fractions are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, and 100.

Math

By the time students reach 4th grade, they have mastered addition and subtraction strategies. Students now understand the standard algorithm for addition and subtraction and are able to apply it fluently to solve real-world problems.

Fourth graders come to this grade level knowing multiplication facts from memory. Students can use strategies to help them with these facts:

8 x 9 could be seen as

8 x 10 = 80	**OR**	8 x 5 = 40
80 − 8 = 72		8 x 4 = <u>32</u>
		72

A fourth grade student is familiar with building simple multiplication problems using base ten blocks. This drawing shows the problem 13 x 4.

|	10	+	3
4	4 x 10		4 x 3
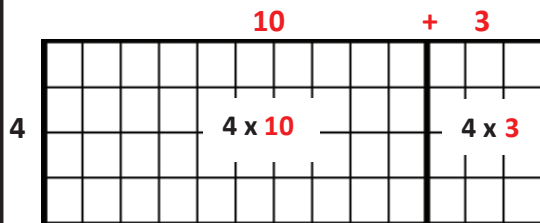
Students investigated working with the distributive property in grade 3.

$$4 \times 13 = 52$$
$$(4 \times 10) + (4 \times 3)$$

A strategy that helps students multiply numbers mentally is *doubling and halving.*

Here the student halves one number and multiplies the other number by two to get a friendly number that is easy to work with mentally.

Students now begin to work with the *area model of multiplication* using 2-digit x 2-digit numbers.
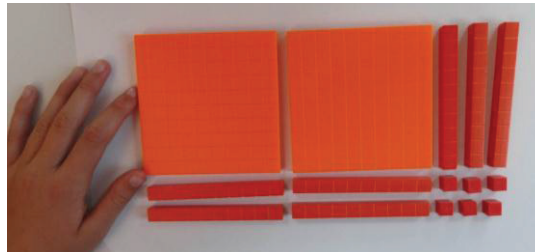
Here a student has built a 12 x 23 area model that shows the product 276.

Once again, the distributive property (based on the model) helps students understand multiplication.

$$12 \times 23 = 276$$
$$(10 \times 20) + (2 \times 20) + (10 \times 3) + (2 \times 3)$$
$$200 \quad + \quad 40 \quad + \quad 30 \quad + \quad 6$$

Once students have understood the models and can apply the distributive property to these multiplication problems they move to *partial products.*

	40	9
20	800	180
6	240	54

Students draw models and calculate the product.

```
    4 9
  x 2 6
    5 4
    240
    180
    800
   1274
```

Fourth graders explore division by finding whole number quotients and remainders using strategies based on place value and the properties of operations. A strategy, based on place value that is used to assist students with understanding division is *explicit trades*.

In this example, the student had to trade 2 tens for 20 ones. This should be clearly explained using place value language.