

Multiply Multi-Digit Numbers



Dear Family,

This week your child is learning to multiply multi-digit numbers.

One way to find 124×25 is to set up the problem vertically to find partial products that can be added to find the total product.

First, multiply each digit in 124 by the 5 ones in 25.

$$\begin{array}{r} 124 \\ \times 5 \\ \hline 20 \\ 100 \\ + 500 \\ \hline 620 \end{array}$$

Then multiply each digit in 124 by the 2 tens in 25.

$$\begin{array}{r} 124 \\ \times 20 \\ \hline 80 \\ 400 \\ + 2,000 \\ \hline 2,480 \end{array}$$

partial product

Lastly, add the partial products to find the product: $124 \times 25 = 620 + 2,480 = 3,100$.

Partial products are the basis of the standard algorithm for multiplying multi-digit numbers. An algorithm is a set of routine steps used to solve problems.

Your child is learning how to record the steps of the standard algorithm in a condensed format, with regrouping shown above the problem.

$$\begin{array}{r} 124 \\ \times 25 \\ \hline 20 \\ 100 \\ 500 \\ 80 \\ 400 \\ + 2,000 \\ \hline 3,100 \end{array}$$

Notice how the partial products appear as steps in the standard algorithm.

Another way your child is learning to multiply is with an area model, which gives a visual representation of the multiplication.

Invite your child to share what he or she knows about multiplying multi-digit numbers by doing the following activity together.

ACTIVITY MULTIPLY MULTI-DIGIT NUMBERS

Do this activity with your child to multiply multi-digit numbers.

Materials magazine or newspaper

Work with your child to find a real-life example of using multiplication that involves the number of words in a magazine or newspaper article.

Sometimes a reporter has to write a story with a certain number of words, for example, 500 words. Multiplication is a good way to find the number of words in a story.

- Have your child choose an article from a magazine or newspaper.
- Ask your child to count the number of words in one paragraph and record the number on a sheet of paper.
- Then count the number of paragraphs in the article.
- Ask your child the following questions.
 1. Suppose each paragraph has the same number of words. How could you find how many words are in the article? How many words are in the article?
 2. If each paragraph has a different number of words, is the answer to the previous question an exact answer or an estimate for the total number of words in the article?

Answers:

1. Multiply the number of words in a paragraph by the number of paragraphs.
2. It is an estimate because the number of words in each paragraph varies.



Divide Multi-Digit Numbers



Dear Family,

This week your child is learning to divide multi-digit whole numbers by a two-digit number.

One way to solve a division problem such as $770 \div 14$ is to set it up vertically.

First divide the hundreds in 770 by 14.
There are **50** groups of 14 in 700.

Then divide the tens in 770 by 14.
There are **5** groups of 14 in 70.

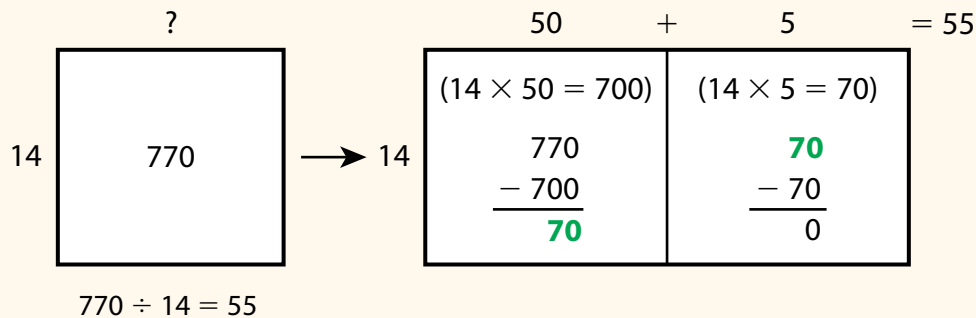
Add the partial quotients to find the quotient.
50 + **5** = 55
So, $770 \div 14 = 55$.

$$\begin{array}{r}
 \underline{55} \text{ quotient} \\
 \underline{5} \text{ partial quotients} \\
 \underline{50} \text{ partial quotients} \\
 14 \overline{)770} \\
 \underline{-700} \\
 70 \\
 \underline{-70} \\
 0
 \end{array}$$

Another way your child is learning to divide is with an area model, similar to the model used in multiplication.

The area model below shows $770 \div 14$.

Because multiplication and division are **inverse operations**, or operations that undo each other, use the relationship between them to divide.



Both methods result in the same quotient, 55. Notice that 50 and 5 appear as partial quotients in each way of dividing.

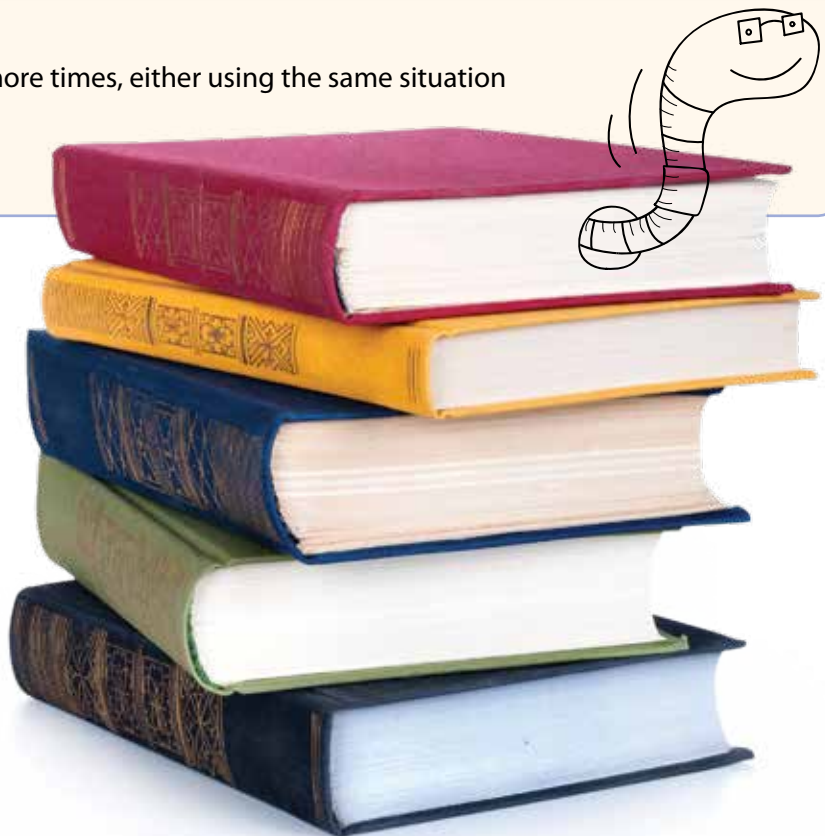
Invite your child to share what he or she knows about dividing whole numbers by doing the following activity together.

ACTIVITY DIVISION IN THE WORLD

Do this activity with your child to divide multi-digit numbers.

Work with your child to solve real-life problems involving division.

- Choose a favorite book with your child and look at the total number of pages in it. The book should have more than 100 pages. Pick a two-digit number of pages to read each day. Ask: *How many days would it take to read the entire book?*
- Use division to find the answer. For example, suppose the book has 286 pages and the number of pages to be read each day is 15. Divide 286 by 15 to find the number of days it will take to read the book.
- Work together to write and solve the division problem about the book. Encourage your child to use rounding and multiplication to help estimate the quotient first.
- Decide what to do if there is a remainder. Will you read the remaining number of pages on the next day, or will you read the remaining number of pages on the last day of reading?
- Repeat this activity at least 3 more times, either using the same situation or another.



Understand Powers of 10

LESSON

7

Dear Family,

This week your child is exploring powers of 10.

Your child is learning that numbers such as 10, 100, or 1,000 can be written as products of the number 10.

These numbers are called **powers of 10**. The **exponent** tells how many times to use 10 as a factor.

$$10 = 10 = 10^1$$

$$100 = 10 \times 10 = 10^2$$

$$1,000 = 10 \times 10 \times 10 = 10^3$$

When you multiply a decimal by a power of 10, the digits in the product will be to the left of where they were in the factor and will have a new value.

Multiply by 10.

$$0.03 \times 10 = 0.3$$

The digit in the hundredths place is now in the tenths place.

Multiply by 100 (10×10).

$$0.005 \times 100 = 0.5$$

The digit in the thousandths place is now in the tenths place.

When you divide a decimal by a power of 10, the digits in the quotient will be to the right of where they were in the dividend and will have a new value.

Divide by 10.

$$0.3 \div 10 = 0.03$$

The digit in the tenths place is now in the hundredths place.

Divide by 100 (10×10).

$$0.5 \div 100 = 0.005$$

The digit in the tenths place is now in the thousandths place.

Invite your child to share what he or she knows about powers of 10 by doing the following activity together.

ACTIVITY MULTIPLY AND DIVIDE BY POWERS OF 10

Do this activity with your child to explore multiplying and dividing by a power of 10.

Work together with your child to show how the value of the product or quotient changes when you multiply or divide a decimal number by a power of 10.

- Have your child write the number 12345 with large digits on a separate sheet of paper or use the number below. Have your child read the five-digit number aloud.
- Have your child place his or her finger between the 3 and 4. Your child's finger represents the decimal point. Have your child read the new number aloud.
- Ask your child to multiply the number from the previous step by 100 and show the product by moving his or her finger to show the placement of the decimal point. (Your child should move his or her finger two places to the right.) Ask your child to explain the relationship between the factor 100, the placement of the decimal point, and the value of each digit in the product.
- Ask your child to divide the number from the previous step by 10 and show the quotient by moving his or her finger to show the placement of the decimal point. (Your child should move his or her finger one place to the left.) Again, have your child read the new number aloud and then explain the relationship between the divisor 10 and the value of each digit in the quotient.
- Ask your child to show you another multiplication or division by a power of 10. Have your child explain how the power of 10 is related to the placement of the decimal point in the product or quotient.

