

# Multiply Multi-Digit Numbers



## Math Tools



Dear Family,

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

One way to find  $124 \times 25$  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.

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

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

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

partial product

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

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.

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

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 they know 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. Suppose 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.

# EXPLORING MARS

Have you ever thought about exploring Mars? Even if you haven't, other people certainly have. Mars was first explored by telescope in the 1700s. Early astronomers observed ice caps, dust clouds, and dark streaks. They wondered if there could be life on Mars.

In modern times, the United States, the former Soviet Union, and other countries have sent spacecraft to gather more information about the "red planet." The first missions to Mars flew near the planet. In November 1964, the U.S. National Aeronautics and Space Administration (NASA) launched Mariner 4. The spacecraft flew past Mars in July 1965 and took the first close-up photographs. The photos were blurry, but they helped scientists learn what Mars looked like.

The Viking 2 spacecraft took this photograph of the Martian surface.

The Martian surface is covered with a dust made of iron oxide, also

NASA also built space rovers that could roam the surface. A solar-powered vehicle that is operated from Earth by a NASA spacecraft have carried rovers to Mars. For example, Sojourner landed the first Mars rover, Sojourner, in 1997. Sojourner sent photographs back to Earth and collected soil samples.

Two more rovers were launched in 2003. After landing on Mars, rovers Spirit and Opportunity discovered evidence of past water. In 2010, Opportunity discovered evidence of past water. In 2010, Opportunity lost contact with Spirit in 2010. But, as of April 2015, Opportunity is still collecting data.

Finally, on November 26, 2011, NASA launched a large Mars rover named Curiosity. Since landing in 2012, this Mars rover has sent back photographs of the planet. Curiosity has ever been able to support life. Curiosity is gathering data on rocks and soil.

Over the past 50 years, scientists have learned a great deal about Mars. For example, they have a better understanding of its climate, its atmosphere. With future missions, they hope to learn even more about the red planet.