Understand Powers of 10

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.

$$10 = \mathbf{10} = 10^1$$
$$100 = \mathbf{10 \times 10} = 10^2$$
$$1{,}000 = \mathbf{10 \times 10 \times 10} = 10^3$$

When you multiply a decimal by a power of 10, the decimal point moves right.

Multiply by 10.

$$0.03 \times 10 = 0.3$$

Move the decimal point one place to the right. The digit in the hundredths place is now in the tenths place.

Multiply by 100 (10 × 10).

$$0.005 \times 100 = 0.5$$

Move the decimal point two places to the right. The digit in the thousandths place is now in the tenths place.

When you divide a decimal by a power of 10, the decimal point moves left.

Divide by 10.

$$0.3 \div 10 = 0.03$$

Move the decimal point one place to the left. The digit in the tenths place is now in the hundredths place.

Divide by 100 (10 × 10).

$$0.5 \div 100 = 0.005$$

Move the decimal point two places to the left. 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 decimal point moves 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 place his or her finger between the 3 and 4. Your child's finger represents the decimal point.

- Ask your child to multiply the number by 100 and show the answer by moving the decimal point. (Your child should move his or her finger two places to the right.)

- Ask your child to divide the number from the previous step by 10 and show the answer by moving the decimal point. (Your child should move his or her finger one place to the left.)

- Ask your child to show you another multiplication or division by a power of 10. Have your child explain how he or she knows where to move the decimal point.