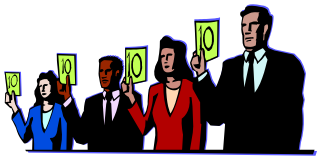
Name: _____ Date: _____

Powers of Ten



Warm-up: Circle the correct response to complete each statement.

1) When we multiply a value by a number greater than one, the value gets (**bigger, smaller**).

Example: $20 \times 6 =$ 120

2) When we multiply a value by a number less than one, the value gets (**bigger, smaller**).

Example: $20 \times 0.6 =$ 12

3) When we divide a value by a number greater than one, the value gets (**bigger, smaller**).

Example: $20 \div 5 =$ 4

4) When we divide a value by a number less than one, the value gets (**bigger, smaller**).

Example: $20 \div 0.05 =$ 400

When multiplying and dividing by powers of 10, special patterns occur that allow us to find the answers mentally! YAY mental math!!!

Powers of 10 > 1

I. Multiplying

What "trick" can we use to find these answers mentally?

Example 1: $56.78 \times 10 =$ 567.8

Example 2: $56.78 \times 100 =$ 5678

Example 3: $56.78 \times 1{,}000 =$ 56,780

Example 4: $56.78 \times 10{,}000 =$ 567,800

56.78 × 100 = 5678.00

Move the decimal point to the RIGHT the number of zeros in the power of ten.

II. Dividing

Example 1: $56.78 \div 10 =$ 5.678

Example 2: $56.78 \div 100 =$ 0.5678

Example 3: $56.78 \div 1000 =$ 0.05678

Move the decimal point to the LEFT the number of zeros in the power of ten.

Now you try!

1) $7.19 \times 100 =$ 719

2) $4376 \div 1000 =$ 4.376

3) $0.00379 \times 10{,}000 =$ 37.9

Powers of 10 < 1

OPPOSITE to Powers of 10 > 1!

What "trick" can we use to find these answers mentally?

III. Multiplying

Example 1: 56.78 × 0.1 = 5.678

Example 2: 56.78 × 0.01 = 0.5678

Example 3: 56.78 × 0.001 = 0.05678

Move the decimal point to the LEFT the number of decimal places in the power of 10.

IV. Dividing

Example 1: 56.78 ÷ 0.1 = 567.8

Example 2: 56.78 ÷ 0.01 = 5678

Example 3: 56.78 ÷ 0.001 = 56,780

Move the decimal point to the RIGHT the number of decimal places in the power of 10.

Now you try!

1) 7.19 × 0.1 = 0.719

2) 5.4 ÷ 0.01 = 540

3) 8 ÷ 0.0001 = 80,000

Let's see if you can do these on your own!

1) 7.678 × 100 = 767.8

2) 63.950 × 0.001 = 63.95

3) 0.5432 ÷ 0.01 = 54.32

4) 81.53 ÷ 10 = 8.153

5) 2 × 0.1 = 0.2

6) 0.0007 ÷ 0.001 = 0.7

7) 10,000 × 1.036 = 10,360

8) 085 ÷ 1000 = 0.085