

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**THE BASE-TEN NUMBER SYSTEM**  
**N-GEN MATH® 6**



In our base-ten number system, each place represents a **power of 10**. These can be represented using **exponents** (how many times a number is multiplying itself).

**Exercise #1:** Write each of the following products as a power of 10 and then give its result.

(a)  $10 \times 1$

(b)  $10 \times 10$

(c)  $10 \times 10 \times 10$

(d)  $10 \times 10 \times 10 \times 10$

We represent whole numbers using this system by keeping track of how many ones, tens, hundreds, thousands, etcetera, a quantity has in it.

**Exercise #2:** Write the following numbers in their expanded form. Represent them using powers of 10 exponents. The first is done as an example.

(a)  $2,475 = 2 \times 1,000 + 4 \times 100 + 7 \times 10 + 5 = 2 \times 10^3 + 4 \times 10^2 + 7 \times 10^1 + 5$

(b)  $5,762 =$  \_\_\_\_\_

(c)  $16,703 =$  \_\_\_\_\_

It is extremely important to understand how a digit's (0, 1, 2, 3, 4, ..., 9) decimal place effects its value in the overall number.

**Exercise #3:** Fill in the missing blanks below.

(a)  $30 =$  \_\_\_\_\_  $\times 3$

(b)  $7,000 =$  \_\_\_\_\_  $\times 700$

(c)  $2 =$  \_\_\_\_\_  $\times 20$

(d)  $50 =$  \_\_\_\_\_  $\times 500$

(e) A digit represents \_\_\_\_\_ times its value one place to the right and \_\_\_\_\_ times its value one place to the left.

**Exercise #4:** Explain why  $10 \times 243 = 2,430$  by using the **distributive property** and the **expanded form** of the number 243.



Because our number system is based on powers of ten, multiplying and dividing by powers of 10 should be relatively easy, as we saw in the last exercise. Review these easy multiplication and division problems below.

**Exercise #5:** Find each of the following products or quotients.

(a)  $10 \times 57$                       (b)  $10 \times 60$                       (c)  $100 \times 36$                       (d)  $1,000 \times 457$

(e)  $650 \div 10$                       (f)  $7400 \div 10$                       (g)  $120,000 \div 100$                       (h)  $2,456,000 \div 1000$

We can extend the base-ten number system to include quantities that are **less than one** by adding in **decimals**. Just as in Exercise #3, each decimal place is **one-tenth** of the value of the same one to the left.

**Exercise #6:** Represent each of the following decimals in terms of fractions involving base-ten denominators.

(a)  $0.1 =$                       (b)  $0.3 =$                       (c)  $0.01 =$                       (d)  $0.07 =$

(e)  $0.001 =$                       (f)  $0.004 =$                       (g)  $0.0001 =$                       (h)  $0.0005 =$

We can take a multidigit number that includes decimals and also break it down in terms of its base ten numbers.

**Exercise #7:** Write the following numbers in their expanded form. The first is done as an example.

(a)  $28.34 = 2 \times 10 + 8 \times 1 + 3 \times \frac{1}{10} + 4 \times \frac{1}{100}$

(b)  $315.62 =$  \_\_\_\_\_

(c)  $58.395 =$  \_\_\_\_\_



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**THE BASE-TEN NUMBER SYSTEM**  
**N-GEN MATH<sup>®</sup> 6 HOMEWORK**

**FLUENCY**

1. Write the following numbers in their expanded form. Represent them using powers of 10 exponents.

(a)  $4,529 =$  \_\_\_\_\_

(b)  $9,053 =$  \_\_\_\_\_

(c)  $25,930 =$  \_\_\_\_\_

(d)  $503,752 =$  \_\_\_\_\_

2. Write the following numbers that include decimals in expanded form.

(a)  $32.71 =$  \_\_\_\_\_

(b)  $126.92 =$  \_\_\_\_\_

(c)  $76.835 =$  \_\_\_\_\_

(d)  $28.0942 =$  \_\_\_\_\_

3. Find the following products and quotients that involve powers of 10.

(a)  $72 \times 10$

(b)  $512 \times 100$

(c)  $1,000 \times 147$

(d)  $100 \times 100$

(e)  $710 \div 10$

(f)  $9,100 \div 10$

(g)  $1,040,500 \div 100$

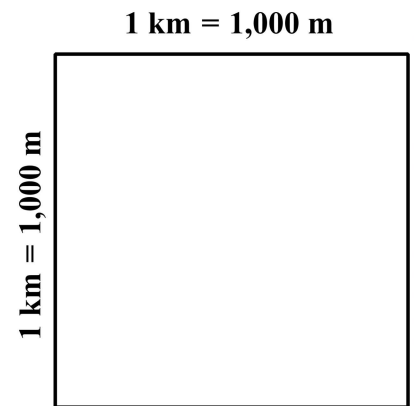
(h)  $20,560,000 \div 1000$

(i)  $1,000,000 \div 10,000$



## USING YOUR MATH

4. Maggie buys 0.4 pounds of rice and claims that she has bought two-fifths of a pound. Explain why Maggie is correct.
5. A square measures one kilometer by one kilometer. Given that one kilometer is equal to 1,000 meters, what is the area of this square in **square meters**? Justify.



## REVIEWING YOUR MATH

6. Find each of the following.

(a) 
$$\begin{array}{r} 437 \\ \times 25 \\ \hline \end{array}$$

(b) 
$$63 \overline{)15,183}$$

(c) 
$$\frac{4}{9} \div \frac{10}{3} \text{ (simplest form)}$$

7. Find the following in simplest form:  $\left(\frac{5}{4} + \frac{1}{2}\right) \times \left(\frac{3}{2} - \frac{1}{6}\right)$ . Show your work.

