

Lesson 1-1

Wednesday, August 14, 2019 9:36 AM

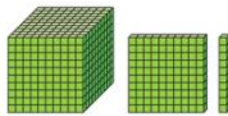
Name _____



Solve & Share

A store sells AA batteries. There are 10 batteries in a package. How many batteries are in 10 packages? 100 packages? *Solve these problems any way you choose.*

You can use appropriate tools. Place-value blocks can be used to help solve the problems. Show your work!



100 batteries in 10 packages
1,000 batteries in 100 packages.

Lesson 1-1 Patterns with Exponents and Powers of 10

I can ...
write numbers using exponents.

I can also choose and use a math tool to solve problems.

Look Back! Model with Math How many 10s are in 100?
How many 10s are in 1,000? Write equations to show your work.

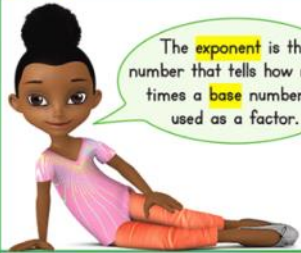
$10 \times 10 = 100$; There are 10-tens in 100.
 $10 \times 100 = 1,000$; There are 100 tens in 1,000

10 tens
10 0

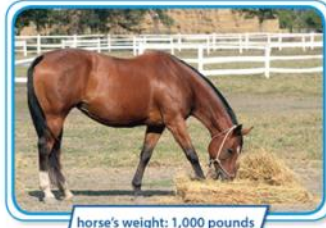
100 tens
1,00 0

Essential Question: How Can You Explain Patterns in the Number of Zeros in a Product?

Tamara's new horse weighs about 1,000 pounds. How can you show 1,000 as a power of 10 using an exponent?

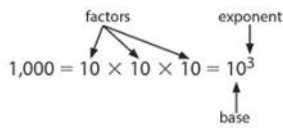


The exponent is the number that tells how many times a base number is used as a factor.



horse's weight: 1,000 pounds

B Write 1,000 as a product using 10 as a factor.



The exponent, 3, shows that the base number, 10, is multiplied 3 times.

So, 1,000 is written as 10^3 using exponents.

C Tamara estimates that her horse will eat about 5,000 pounds of hay each year. How can you write 5,000 using exponents?

$$5 \times 10^1 = 5 \times 10 = 50$$

$$5 \times 10^2 = 5 \times 10 \times 10 = 500$$

$$5 \times 10^3 = 5 \times 10 \times 10 \times 10 = 5,000$$

The number of zeros in the product is the same as the exponent.

So, 5,000 is written as 5×10^3 using exponents.

Convince Me! Look for Relationships What pattern do you notice in the number of zeros in the products in Box C above?

The number of zeros in the product is the same as the exponent.

$$10^5 = 100,000$$

Name _____

Guided Practice



Do You Understand?

1. Reasoning Why are there three zeros in the product of 6×10^3 ?

There are 3 zeros because the exponent is a 3.
 $6 \times 10^3 = 6 \times 1,000 = 6,000$

2. Susan said that 10^5 is 50. What mistake did Susan make? What is the correct answer?

She multiplied 5×10 . She should have multiplied $10 \times 10 \times 10 \times 10 \times 10 = 100,000$

Do You Know How?

In 3 and 4, complete the pattern.

3. $10^1 =$	0 10
$10^2 =$	0 10 x 10 = 100
$10^3 =$	10 x 10 x 10 = 1,000
$10^4 =$	10 x 10 x 10 x 10 = 10,000
$7 \times 10^1 =$	7 x 10 = 70
$7 \times 10^2 =$	7 x 100 = 700
$7 \times 10^3 =$	7 x 1,000 = 7,000
$7 \times 10^4 =$	7 x 10,000 = 70,000

Complete # 8, 12, 22, & 23

8. 8×10^4

$8 \times 10,000 = 80,000$

12. 4×10^1

$4 \times 10 = 40$

22. **Higher Order Thinking** Santiago hopes to buy a 4-horse trailer for about \$12,000. Describe all the numbers that when rounded to the nearest hundred are 12,000.

Numbers greater than or equal to 11,950 are rounded up to 12,000. Numbers less than 12,050 round down to 12,000.

23. Choose all the equations that are true.

- $10 \times 10 \times 10 \times 10 = 40$ = 10,000
- ~~$10 \times 10 \times 10 \times 10 = 10^4$~~
- $10 \times 10 \times 10 \times 10 = 1,000$ = 10,000
- ~~$10 \times 10 \times 10 \times 10 = 10,000$~~
- $10 \times 10 \times 10 \times 10 = 4 \times 10^4$ ☐

$4 \times 10 \times 10 \times 10 \times 10 = 4 \times 10^4$