LESSON MAKER PRO

Zero Power

Find products and explain their ending zeros.

GRADE 5 · 5.NBT.A.3.a

5.NBT.A.3.a "Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, using whole-number exponents to denote powers of 10."

NAME _____ DATE _____

COUNT THE ZEROS

The exponent in a power of 10 tells you how many zeros to place after a whole number when you multiply. If the starting number already ends in zeros, count those too when you count the zeros at the end of the product.

WORKED EXAMPLE

Find 23×10^5. How many zeros are at the end of the product?

1. $10^5 = 100{,}000$.
2. $23 \times 100{,}000 = 2{,}300{,}000$.
3. The product ends in 5 zeros.

Answer: 2,300,000; 5 zeros

PRACTICE 6 problems

1 Find 37×10^2.

ANSWER _____

2 Find 8×10^4.

ANSWER _____

3 Find 450×10^2. How many zeros are at the end of the product?

ANSWER _____

4 Find $6{,}200 \times 10^3$. How many zeros are at the end of the product?

ANSWER _____

5 Fill in the exponent: $56 \times 10^{__} = 56{,}000$.

ANSWER _____

6 Find 14×10^0.

ANSWER _____

APPLY IT Show your work

1 A video game awards 10^3 coins for each completed quest. You complete 35 quests. How many coins do you earn?

WORK SPACE

ANSWER _____

2 A school library orders 120 packs of 10^2 stickers for a reading event. How many stickers arrive? How many zeros are at the end of the total?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Fill in the exponent: 700 × 10— has exactly 6 zeros at the end. Find the product and explain why it has 6 ending zeros.

WORK SPACE AND ANSWER

ANSWER KEY # Zero Power

GRADE 5 · 5.NBT.A.3.a

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find 37×10^2.	**3,700**
2	Find 8×10^4.	**80,000**
3	Find 450×10^2. How many zeros are at the end of the product?	**45,000; 3 zeros**
4	Find $6{,}200 \times 10^3$. How many zeros are at the end of the product?	**6,200,000; 5 zeros**
5	Fill in the exponent: $56 \times 10\text{—} = 56{,}000$.	**3**
6	Find 14×10^0.	**14**

PART 2 · APPLY IT

1. **35,000 coins** Each quest earns 1,000 coins, so 35 × 1,000 = 35,000.
2. **12,000 stickers; 3 zeros** Multiply 120 × 100 to get 12,000. The starting number has 1 ending zero, and multiplying by 10^2 adds 2 more.

CHALLENGE

The exponent is 4, and the product is 7,000,000. The 2 zeros in 700 and the 4 zeros added by 10^4 make 6 ending zeros.

Accept products written with or without commas. For explanations, look for the starting number's ending zeros plus the number of zeros added by the power of 10.