LESSON MAKER PRO

Powers in Action

Write powers and find their values.

GRADE 6 · 6.AT.B.5

6.AT.B.5 "Write numerical expressions involving whole number exponents and positive rational number bases. Use technology to evaluate numerical expressions involving whole number exponents and positive rational number bases."

NAME _____ DATE _____

REPEATED FACTORS

An exponent tells you how many times to multiply a base by itself. When the base is a fraction or decimal, repeat the whole fraction or decimal as one factor.

WORKED EXAMPLE

Evaluate 0.2^3.

1. $0.2^3 = 0.2 \times 0.2 \times 0.2$
2. $0.2 \times 0.2 = 0.04$
3. $0.04 \times 0.2 = 0.008$

Answer: 0.008

PRACTICE 6 problems

1 Evaluate $(1/2)^4$.

ANSWER _____

2 Evaluate $(2/3)^2$.

ANSWER _____

3 Evaluate 0.5^2.

ANSWER _____

4 Write $4/5 \times 4/5 \times 4/5$ as a power. Then find its value.

ANSWER _____

_____

5 Write $0.1 \times 0.1 \times 0.1 \times 0.1$ as a power. Then find its value.

ANSWER _____

_____

6 Evaluate $6 \times (1/3)^2$.

ANSWER _____

APPLY IT Show your work

1 A video file is 16 MB. Each time you compress it, the file keeps 3/4 of its current size. You compress it twice. Write an expression with a power, then find the final file size.

WORK SPACE

ANSWER _____

2 You have 64 points in a game. At the end of each of three rounds, your points are cut in half. Write an expression with a power, then find how many points you have left.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student says $(5/4)^2 = 5/16$ because only the denominator is squared. Explain the mistake and find the correct value.

WORK SPACE AND ANSWER

ANSWER KEY

Powers in Action

GRADE 6 · 6.AT.B.5

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Evaluate $(1/2)^4$.	**1/16**
2	Evaluate $(2/3)^2$.	**4/9**
3	Evaluate 0.5^2.	**0.25**
4	Write 4/5 × 4/5 × 4/5 as a power. Then find its value.	**$(4/5)^3 = 64/125$**
5	Write 0.1 × 0.1 × 0.1 × 0.1 as a power. Then find its value.	**$0.1^4 = 0.0001$**
6	Evaluate 6 × $(1/3)^2$.	**2/3**

PART 2 · APPLY IT

1. **$16 \times (3/4)^2 = 9$ MB** Square 3/4 to get 9/16. Then multiply 16 by 9/16 to get 9 MB.
2. **$64 \times (1/2)^3 = 8$ points** Cube 1/2 to get 1/8. Then multiply 64 by 1/8 to get 8 points.

CHALLENGE

The exponent applies to the whole fraction, so both the numerator and denominator are squared. $(5/4)^2 = 25/16$.

Accept equivalent fractions or decimals for evaluated values. In the word problems, the expression must show the repeated fraction as a power.