LESSON MAKER PRO

Power Up Expressions

Write and evaluate expressions with exponents.

GRADE 6 · MT.6.EE.1

MT.6.EE.1 "Write and evaluate numerical expressions involving whole-number bases and exponents."

NAME _____ DATE _____

EXPONENTS FIRST

An exponent tells you how many times to use the base as a factor. Evaluate powers first, then follow the order of operations to finish the expression.

WORKED EXAMPLE

Evaluate $11^2 + 17$.

1. $11^2 = 11 \times 11$
2. $11 \times 11 = 121$
3. $121 + 17 = 138$

Answer: 138

PRACTICE 6 problems

1 Evaluate 4^3.

ANSWER _____

2 Evaluate $5^2 + 8$.

ANSWER _____

3 Evaluate 2×6^2.

ANSWER _____

4 Evaluate $(2 + 4)^2$.

ANSWER _____

5 Evaluate $2 + 4^2$.

ANSWER _____

6 Evaluate $8^2 - 2^4$.

ANSWER _____

APPLY IT Show your work

1 A game designer puts 3 rows of 3 coins on each of 4 levels. You collect every coin and spend 5 coins on a hint. Write and evaluate an expression using an exponent for the coins you have left.

WORK SPACE

ANSWER _____

2 At a school festival, 2^5 tickets are left at a booth. Your group buys 6 tickets, and another group buys 7 tickets. Write and evaluate an expression for the tickets left at the booth.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Find the value of $(4 + 2)^3$ and the value of $4^3 + 2^3$. Explain in one sentence why the values differ.

WORK SPACE AND ANSWER

ANSWER KEY

Power Up Expressions

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Evaluate 4^3.	**64**
2	Evaluate $5^2 + 8$.	**33**
3	Evaluate 2×6^2.	**72**
4	Evaluate $(2 + 4)^2$.	**36**
5	Evaluate $2 + 4^2$.	**18**
6	Evaluate $8^2 - 2^4$.	**48**

PART 2 · APPLY IT

1. **$4 \times 3^2 - 5 = 31$ coins** Each level has $3^2 = 9$ coins. Multiply by 4 levels, then subtract 5 coins.
2. **$2^5 - (6 + 7) = 19$ tickets** Evaluate $2^5 = 32$, then subtract the 13 tickets bought by the two groups.

CHALLENGE

$(4 + 2)^3 = 216$; $4^3 + 2^3 = 72$. The parentheses make the whole sum the base in the first expression, while the second expression adds two separate powers.

For the word problems, accept equivalent expressions with the correct values. In the challenge, the explanation must distinguish the base inside parentheses from the separate bases.