Evaluate Expressions with Exponents

TOPIC 4 / MATHEMATICS

Write. Represent. Explain.

45-minute lesson • Original classroom examples

What will we learn today?

- Recognize squared variables and evaluate expressions in context.
- Use an equation, inequality, table, or diagram to justify your reasoning.
- Explain your answer using mathematical vocabulary and units.

5-minute warm-up

Discuss with a partner: What previous algebra or number skill will help with today’s lesson?

Show one calculation or example in your notebook.

Why this lesson matters

The area of a square with side x is x squared, not 2x.

What is known? What is unknown? Which quantities are related?

Represent the relationship

The area of a square with side x is x squared, not 2x.

$$A = x^2$$

Explain the meaning of the variable, numbers, and operations.

Worked example

Evaluate $4x^2 + 3x^2 - 2x$ for $x = 2$.

$$7(2)^2 - 2(2) = 24$$

Check: Does the result match the original relationship?

Independent practice

1. Simplify $3a^2 + 5a - a^2 + 2a$.

2. Evaluate $2t^2 - 3$ for $t = -2$.

Check your reasoning

Question 1

$$2a^2 + 7a$$

Question 2

$$2(-2)^2 - 3 = 5$$

Group challenge

Explain why x^2 and x are not like terms.

Each group member must explain one step or defend one claim.

Group challenge • solution

$x^2 \neq x$ in general

Compare methods. Does the answer make sense in context?

Additional Practice — If Time Allows

Interpret $4x^2 + 3x^2 - 2x$ for $x = 2$.

Extension: Create a similar problem with different numbers.

2-minute exit ticket

Evaluate $5x^2 - x$ for $x = 3$.

Work independently. Show enough steps to explain your thinking.

Exit ticket • answer

$$5(3)^2 - 3 = 42$$

Reflect: What would you check before moving to the next lesson?