Generate Equivalent Expressions

TOPIC 4 / MATHEMATICS

Write. Represent. Explain.

45-minute lesson • Original classroom examples

What will we learn today?

- Use distribution and properties to produce equivalent expressions.
- 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

A fundraiser sells three bags, each containing x pencils and four pens.

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

Represent the relationship

A fundraiser sells three bags, each containing x pencils and four pens.

$$3(x + 4) = 3x + 12$$

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

Worked example

Expand 3(x + 4) and explain the equal groups.

$$3(x + 4) = 3x + 12$$

Check: Does the result match the original relationship?

Independent practice

1. Rewrite 5a + 10 as a product.

2. Explain why 4(x − 2) equals 4x − 8.

Check your reasoning

Question 1

$$5(a+2)$$

Question 2

$$4(x-2)=4x-8$$

Group challenge

Describe two ways to verify equivalent expressions for every x.

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

Group challenge • solution

Distribution and factoring

Compare methods. Does the answer make sense in context?

Additional Practice — If Time Allows

Explain why $4(x - 2)$ equals $4x - 8$.

Extension: Create a similar problem with different numbers.

2-minute exit ticket

Expand 2(y + 7).

Work independently. Show enough steps to explain your thinking.

Exit ticket • answer

$$2y + 14$$

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