Use Patterns to Write Equations

TOPIC 4 / MATHEMATICS

Write. Represent. Explain.

45-minute lesson • Original classroom examples

What will we learn today?

- Recognize a constant rate of change and write the rule.
- 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 pattern begins 2, 5, 8, 11 for term numbers 1 through 4.

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

Represent the relationship

A pattern begins 2, 5, 8, 11 for term numbers 1 through 4.

$$y = 3n - 1$$

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

Worked example

Explain why the nth term is 3n − 1.

$$3(1) - 1 = 2,\ 3(2) - 1 = 5$$

Check: Does the result match the original relationship?

Independent practice

1. Find a rule for 7, 12, 17, 22.

2. Find a rule for 4, 6, 8, 10.

Check your reasoning

Question 1

$$y = 5n + 2$$

Question 2

$$y = 2n + 2$$

Group challenge

Compare two rules that both make the first table value; which matches all rows?

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

Group challenge • solution

Check every row

Compare methods. Does the answer make sense in context?

Additional Practice — If Time Allows

Find a rule for 4, 6, 8, 10.

Extension: Create a similar problem with different numbers.

2-minute exit ticket

A pattern starts 9, 13, 17 for n = 1,2,3. Write rule.

Work independently. Show enough steps to explain your thinking.

Exit ticket • answer

$$y = 4n + 5$$

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