Generating Number Patterns

Generating Number Patterns: Apply, Compare, and Design

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Step 0 is the starting value. Apply the rule once for each step. Pair values from the same step. In (A, B), read A horizontally and B vertically.

Worked example

Two shelves start with 2 and 6 books. Each gains 3 books per round. Give the pair after four rounds and explain the gap.

1. Each shelf gains $4 \times 3 = 12$ books.

2. Add to the starts: $(2 + 12, 6 + 12) = (14, 18)$. The gap is $18 - 14 = 4$ books.

Answer: $(14, 18)$ books; the second shelf has 4 more.

Practice Problems

Show your thinking.

1. Counter A starts with 2 tokens and gains 3 per round. B starts with 8 and gains 1. When do they first match, and what is the pair?

2. Banner A starts with 4 triangles and gains 2 daily. B starts with 1 and gains 4 daily. Give the pair after five days and the total across both banners.

3. A starts at 2 and adds 2. Design a starting value and fixed add rule for B so B is always 3 more. Give pairs at steps $0, 1, 2$.

4. A stamp count starts at 0 and grows by 4 each round. B starts at 2 and grows by 3. Find the first round their total reaches 30 and give the pair.

5. Rack A starts with 22 items and loses 3 daily. B starts with 5 and gains 2 daily. Find the first day B has more and give both counts.

6. Two counters start at 0. Every round A adds 3 and B adds 6. Find a round with A at least 8 and B at most 20. Explain why it is the only one.

7. Design two add rules from $(0, 0)$ so step 4 lands at $(12, 16)$. Verify that target and give the pair one step later.

8. A starts at 3 and adds 2. B starts at 9 and adds 4. Build the B-minus-A pattern through step 2, then use its rule to predict the gap at step 5.

Answer Key

1. Round 3; $(11, 11)$ tokens.
2. $(14, 21)$; 35 triangles.
3. B starts at 5 and adds 2: $(2, 5), (4, 7), (6, 9)$.
4. Round 4; $(16, 14)$ stamps.
5. Day 4; A has 10 items, B has 13.
6. Round 3; $(9, 18)$.
7. Add 3 to A and 4 to B; next pair $(15, 20)$.
8. $6, 8, 10$; add 2; step 5 gap 16.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. B starts $8 - 2 = 6$ ahead. A closes $3 - 1 = 2$ tokens of the gap per round.

2. $6 \div 2 = 3$ rounds. Then $(2 + 3 \times 3, 8 + 3 \times 1) = (11, 11)$.

Problem 2

1. A: $4 + 5 \times 2 = 14$ triangles. B: $1 + 5 \times 4 = 21$ triangles.

2. The pair is $(14, 21)$ and the total is $14 + 21 = 35$ triangles.

Problem 3

1. Start B at $2 + 3 = 5$. Give it the same increase of 2 to keep the gap.

2. Check $(2, 5), (4, 7), (6, 9)$: $5 - 2 = 7 - 4 = 9 - 6 = 3$.

Problem 4

1. The total starts at 2 and gains $4 + 3 = 7$ stamps per round.

2. Round 3 totals $2 + 3 \times 7 = 23$. Round 4 totals $2 + 4 \times 7 = 30$.

3. At round 4: A is $4 \times 4 = 16$ and B is $2 + 4 \times 3 = 14$.

Problem 5

1. A starts $22 - 5 = 17$ ahead. The gap shrinks by $3 + 2 = 5$ daily.

2. After 3 days A still leads by $17 - 3 \times 5 = 2$. After 4 days, $22 - 4 \times 3 = 10$ and $5 + 4 \times 2 = 13$.

Problem 6

1. At round 2, A is only $2 \times 3 = 6$. At round 3 the pair is $(9, 18)$, meeting both conditions.

2. At round 4, B is $4 \times 6 = 24$, already above 20. Counts increase, so no later round fits.

Problem 7

1. Four equal gains must total 12 and 16: $12 \div 4 = 3$ and $16 \div 4 = 4$.

2. Check $(4 \times 3, 4 \times 4) = (12, 16)$. Then $(12 + 3, 16 + 4) = (15, 20)$.

Problem 8

1. Pair the first terms: $(3, 9), (5, 13), (7, 17)$. The gaps are $9 - 3 = 6$, $13 - 5 = 8$, and $17 - 7 = 10$.

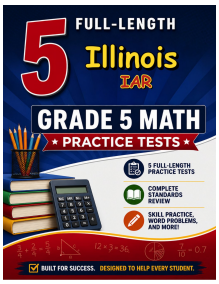
2. The gap grows by $4 - 2 = 2$ each step. At step 5 it is $6 + 5 \times 2 = 16$.

TESTINAR

Keep Building Grade 5 Math Skills

Choose the practice book matched to your state assessment and turn worksheet practice into a complete test-prep plan.

All Grade 5 books



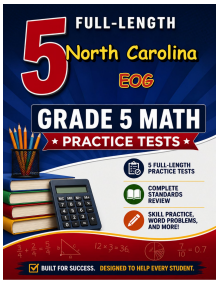
ILLINOIS IAR

5 Full-Length Math Practice Tests

Build Grade 5 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook



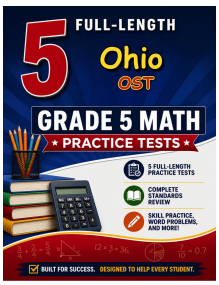
NORTH CAROLINA EOG

5 Full-Length Math Practice Tests

Build Grade 5 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook



OHIO OST

5 Full-Length Math Practice Tests

Build Grade 5 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook

Need a different state?
Testinar has Grade 5 math practice books for state assessments across the country.

TESTINAR.COM/GRADES/5