4th Grade Math

ELG 4.OA.C Generate and analyze patterns

Vertical Progression:

2nd Grade	**2.OA.C Work with equal groups of objects to gain foundations for multiplication.** ○ **2.OA.C.3** Determine whether a group of objects (up to 20) has an even or odd number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends. **2. NBT.A Understand place value.** ○ **2.NBT.A.2** Count within 1000; skip-count by 5s, 10s, and 100s.
3rd Grade	**3.OA.D Solve problems involving the four operations, and identify and explain patterns in arithmetic.** ○ **3.OA.D.9** Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.
4th Grade	**4.OA.C Generate and analyze patterns.** ○ **4.OA.C.5** Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.
5th Grade	**5.OA.B Analyze patterns and relationships.** ○ **5.OA.B.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.

Students will demonstrate command of the ELG by:

- Generating number or shape patterns that follow a given rule.
- Generating both growing and repeating patterns that follow given rules.
- Identifying features that they see in the patterns generated.
- Applying a given rule to continue a number or shape pattern.
- Explaining the rule for a number or shape pattern.
- Determining a future term in a repeating pattern based on the portion of the pattern visible.

Vocabulary:

- pattern
- rule
- term
- variable

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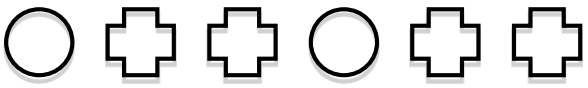
Sample Instructional/Assessment Tasks:

1) **Standard:** 4.OA.C.5

Source: https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.OA.5

Item Prompt:

What shape is the 15th step of this pattern?



Could you figure out the shape without extending the pattern? Explain.

Correct Answer:

15th shape will be a cross. Explanations will vary. Explanations must have sound reasoning and be logical.

2) **Standard:** 4.OA.C.5

Source: https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.OA.5

Item Prompt:

Gabrielle says that if you start with the number 3 and follow the rule n+3, every other number will be even. Mark thinks that since three is odd, this can't be true. Complete the pattern.

Rule : n+ 3

3										

A. Who do you agree with? Explain your thinking.

B. Do you think every other number would be even if you keep the same rule but start with 7 instead? Explain your thinking.

Correct Answer:

A. Gabrielle is correct because every other multiple of 3 is even: 3, 6, 9, 12, 15, 18, etc.

B. Yes because 7 + 3 = 10, and 10 ends in zero. When you add 3 to each number, every other number will be even (13, 16, 19, 22, etc.).