

NWEA Assessment Item Illustrating 5.OA.B.3

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Domain: Operations and Algebraic Thinking

5.OA.B: Analyze patterns and relationships.

Calculator Availability: No

This question has two parts. Use the information to answer Part A and Part B.

Rafael and Charla each create a pattern. Rafael's pattern starts at 2 and increases by 3 each time. Charla's pattern starts at 4 and increases by 6 each time.

Part A

Complete the table to show the first 4 numbers in Rafael's and Charla's patterns. Enter the answers in the boxes.

Rafael's Pattern	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Charla's Pattern	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Part B

When the number in Rafael's pattern is 245, what is the corresponding term in Charla's pattern? Enter the answer in the box.

Alignment: 5.OA.B.3: Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

This item attends to the first part of the standard by asking students to extend two patterns given two rules and then to apply the relationship between those patterns to find a corresponding term. The standard requires the rule to be given for each pattern in order to keep the focus on the relationship between them. The item asks for a corresponding term that would be tedious to determine by extending both patterns, thus encouraging students to use the relationship between them to solve.

Coherence: This standard builds upon previous pattern work that began in grade 3 when students explored arithmetic patterns, including those in the multiplication and addition tables.^{3.OA.D.9} In grade 4, students looked for features in patterns that were not explicit in the pattern's rule.^{4.OA.B.5} The focus of the grade 5 standard is not simply extending a pattern but also finding relationships between corresponding terms and then graphing the corresponding terms on the coordinate plane. Graphing points in the first quadrant is introduced in grade 5.^{5.G.A} These standards address the conceptual foundation for future work in ratios,^{6.RP.A} understanding the relationship between dependent and independent variables,^{6.EE.C.9} and graphing linear relationships.^{8.F.A}

Rigor: This item attends to conceptual understanding and procedural skill. Students reason about the relationship between the patterns, and then they apply this relationship to find the number in one pattern that corresponds with a given number in the other pattern. The required computation is below grade level because the focus of this item is on the conceptual understanding of the relationship between patterns.

Answer Key:

This question has two parts. Use the information to answer Part A and Part B.

Rafael and Charla each create a pattern. Rafael's pattern starts at 2 and increases by 3 each time. Charla's pattern starts at 4 and increases by 6 each time.

Part A

Complete the table to show the first 4 numbers in Rafael's and Charla's patterns. Enter the answers in the boxes.

Rafael's Pattern	<input type="text" value="2"/>	<input type="text" value="5"/>	<input type="text" value="8"/>	<input type="text" value="11"/>
Charla's Pattern	<input type="text" value="4"/>	<input type="text" value="10"/>	<input type="text" value="16"/>	<input type="text" value="22"/>

Part B

When the number in Rafael's pattern is 245, what is the corresponding term in Charla's pattern? Enter the answer in the box.

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