Factor and Multiple Patterns

Generate patterns and use factors to explain them.

4.PAR.3 · Generate and analyze patterns, including those involving shapes, input/output diagrams, factors, multiples, prime numbers, and composite numbers.

Name _____ Date _____

Classify and justify

A prime number has exactly two positive factors; a composite has more than two. Classify 14, 23, 27 and 29. List all factors for two of them.

Generate multiples

Generate the first six positive multiples of 3. Which are prime and which are composite? Explain why all terms after the first are composite.

Build a shape pattern

Stage 1 has one row of 3 square tiles. Add a row of 3 at each stage. Draw stages 1, 2 and 3, then write the first six tile counts. Explain the connection to your multiples above.

Input and output

Rule: multiply each input by 3. Create a table for inputs 1 through 6. Describe how the table, tile pattern and multiples connect.

Input	Output

Teaching and assessment

Read directions aloud as needed. Let children inspect the printed stimuli before responding. Accept pointing, drawing or oral explanation. Do not supply the core or rule. Assess the pattern, not artistic neatness.

1

14 composite (1,2,7,14); 23 prime (1,23); 27 composite (1,3,9,27); 29 prime (1,29).

2

3,6,9,12,15,18. Only 3 is prime. Every later term has factors 1,3 and itself, so is composite.

3

Draw 1×3, 2×3, 3×3 square-tile arrays. Counts 3,6,9,12,15,18.

4

Rows (1,3),(2,6),(3,9),(4,12),(5,15),(6,18). Input is rows/stage; output is tiles and a multiple of 3. This sheet focuses on multiples, factors and representations within the broad standard.