

Repeating patterns (shape and colour) and their rule

CURRICULUM ALIGNMENT

ALG.PRR.3a

identify rules that describe the structure of a pattern and use these rules to make predictions.

INTERACTIVES **Pattern Blocks** · challenge, display, explore

WHAT THIS LESSON TEACHES

The repeating unit is the smallest part of a pattern that keeps coming back over and over. Spotting that unit lets you continue the pattern or name a shape far along it by counting whole units.

→ In red, blue, red, blue the unit is red, blue

→ Knowing the unit triangle, square lets you fill the next gap or find the 10th shape

MODEL THIS ON THE BOARD

FIND THE 10TH SHAPE IN A GAME PATH

- 1 The path repeats star, moon, star, moon and so on
- 2 The repeating unit is **star, moon** so it has **2** shapes
- 3 Count in whole units: **5** units give exactly **10** shapes
- 4 The **10th** shape is the last shape of the unit, so moon

DISCUSSION STARTER

REFLECT What helped you spot the repeating unit most quickly?

LESSON ARC

Open with a red, blue border on the IWB and squeeze the class past 'what's next?' to 'which little part keeps coming back?' — that's the repeating unit. Walk three worked patterns of growing unit length, ringing one full unit each time. Pupils build units at the board, then draw and box a three-shape unit in their copy. The Class Challenge pivots on bracketing units to find the 10th shape without drawing all ten.

TEACHING MOVES

1. **Getting Started.** Take two or three hands for the next colour, then change the question: 'which little part keeps coming back?' Pause and let the class hunt. Re-voice the answer: 'so the part that repeats is red then blue.'
2. **Watch and Notice.** Ring the first two shapes in the triangle, square pattern and say 'this is one full unit', then point to the next pair and the next. On triangle, triangle, square, head off the slip of breaking the unit in the wrong place — show the two triangles belong together before pointing out where the unit restarts.
3. **Try It Together.** Call a unit like triangle, hexagon, hexagon and send one pupil to lay three full repeats. Before moving on, ask the class 'does every repeat match?' and have them point to where one unit ends and the next begins. Rotate four pupils — talk it through, don't mark it.

4. **Draw a Pattern in Your Copy.** Walk the room glancing for a clean three-shape unit and a box around exactly one repeat. Watch for pupils boxing two shapes when their unit is three — point to their own pattern and ask them to count the shapes before the repeat starts again.
5. **Class Challenge.** Keep board work brisk — pupils take turns, the class confirms each answer, then move on. For the 10th-shape prompt, bracket the units along the line so the class sees two shapes make one unit and five whole units reach the 10th place. Ask 'how do you know?' before each check; let pupils count units, not redraw ten shapes.
6. **What Did We Notice?.** Listen for pupils naming the unit as the key that lets you skip ahead. Re-voice a strong answer: 'so you count in whole units, not one shape at a time.' Gently redirect any pupil still wanting to draw all ten shapes.

COMMON MISCONCEPTIONS

⚠ Pupils break the unit in the wrong place — in triangle, triangle, square they call the unit 'triangle, square' and lose a triangle, so their repeats drift out of step.

Lay the pattern with shape cards and ring the first three shapes as one unit. Slide the next ring along and check it lands on triangle, triangle, square again. If it doesn't match, the unit was cut short — count the shapes before the first repeat.

⚠ Asked for the 10th shape, pupils insist on drawing or laying all ten one by one instead of counting in units.

Bracket the units along the line with pattern blocks: two shapes per bracket, five brackets to reach place ten. Show the 10th shape is the second one inside the fifth bracket — no need to draw the in-between shapes.

DIFFERENTIATION

EMERGING

- Keep these pupils on two-shape units (red, blue) while the class moves to three-shape units. They box one unit in the copy with the unit already laid in shape cards in front of them.
- For the position question, stay at the 4th or 6th shape so the count of whole units is small and visible.

DEVELOPING

- After the copybook box, ask: where would the next box go, and the one after — without drawing more shapes? They mark the unit boundaries only.
- Pose a missing-shape gap inside a three-shape unit and ask which shape fills it and how they know.

PROFICIENT

- Narrate a harder Class Challenge variant from the front: with a three-shape unit, what sits in the 15th place? Have these pupils explain the count of whole units aloud to justify it, then carry them into the Student Activity Book page.

✚ **Cross-curricular:** Tie to Visual Arts — pupils design a repeating border for a class poster and name their own unit, then swap to predict each other's next shape.

ANSWER KEY

a) red

b) moon

c) 4

Q1: red

Q2: triangle, square

Q3: star

Q4: moon

Spot: Aoife only looked at the first two shapes. The unit that repeats is ****red, blue, blue**** (three parts), not red, blue.

EXTENSION SHEET · STRETCH ANSWERS

Investigation: Invent a repeating pattern — open-ended; scan pupils' working for valid solution paths rather than a single answer.