

Repeating patterns and their rule (shape and colour)

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

A repeating pattern is built from one small part, called the unit, that keeps coming back over and over. Once you spot the unit, you can read the whole pattern and name any shape without drawing them all.

→ In red, blue, red, blue the unit is red, blue (two shapes long).

→ In red, blue, green the unit is three shapes long, so every 3rd shape is green.

MODEL THIS ON THE BOARD

NAME THE 6TH SHAPE

- 1 The repeating unit is **star, moon**. It is **2** shapes long.
- 2 Every 2nd position lands on the last shape of the unit, so positions **2, 4, 6** are all **moon**.
- 3 Position **6** is one of those, so the 6th shape is **moon**.

DISCUSSION STARTER

REFLECT

Did naming the repeating unit help you find a far-off position without building the whole strip?

LESSON ARC

Open with a red-blue-red-blue strip of six pattern blocks and ask for the tenth block without laying them all out. In Watch and Notice, ring the two-shape unit, then build a red-red-blue unit and count along in threes to show the blue ones landing on every third position. Pupils design a three-shape unit in their copy, underlining one full repeat. The Class Challenge pushes to the twentieth shape, where counting in the unit length really pays off.

TEACHING MOVES

1. **Getting Started.** Lay out a red-blue-red-blue strip of six pattern blocks as pupils settle, then ask for the tenth block. Give five seconds of quiet think-time, take three hands-up answers only, and don't confirm — the method to be sure is what comes next.
2. **Watch and Notice.** Ring the first triangle-square pair with your finger and say 'this is the unit, it keeps coming back'. On the red-red-blue example, point to the third, sixth and ninth shapes and get the class saying 'every third shape is blue' back to you before you move on — the whole lesson rests on this. Then finger-count along in threes to show counting in threes beats laying out every block.
3. **Try It Together.** Start a unit on the pattern-blocks board (e.g. circle, square, triangle) and call a pupil up to add two full repeats and ring the unit; have the class agree the next shape before it's placed. Watch for the slip of ringing too many or too few shapes — revoice 'where does the pattern start to repeat?' Rotate four pupils across units of length two and three.

4. **Design Your Own in Your Copy.** Walk the room glancing for two things: the unit is exactly three shapes, and the underline sits under one full unit, not the whole row. If a pattern doesn't actually repeat, point at where it should start again rather than fixing it for them. No marking.
5. **Class Challenge.** Brisk practice — pupils take turns at the board and the class confirms each answer before moving on. For the twentieth shape of a three-shape unit, model counting in threes (three, six, nine... eighteen) then stepping the last two on, so pupils see they never lay out twenty shapes. Use the on-screen ✓ as part of your narration, not a re-teach.
6. **What Did We Notice?.** Ask which positions always land on the last shape of a three-shape unit and listen for 'the multiples of three'. Revoice a strong answer: 'so the unit length is the times-table we count in to skip ahead.' Close with one or two real-life examples — music, a jumper, a fence.

COMMON MISCONCEPTIONS

⚠ Asked for the tenth block in red, blue, red, blue, a pupil insists you have to lay out all ten and count one by one to be sure.

Don't lay them out. On the board, finger-count along the strip in twos and land on each blue, showing the even positions are blue. Push: 'is ten even? Then it's blue — we didn't need the other blocks.' The unit length is the count you skip in.

⚠ At the board a pupil rings the unit as red, red, blue, red — four shapes — because they ringed up to the point where they noticed the repeat rather than where it starts again.

Ask 'where does the pattern start to do exactly the same thing again?' Slide your finger to the second red-red-blue and show it matches the first. Ring just the first red, red, blue together — one full unit, three shapes, no extras.

⚠ Finding the twentieth shape of a circle-triangle-star unit, a pupil counts to eighteen, sees star, and answers 'star' for twenty as well.

Stop at eighteen and say 'eighteen is the end of a unit — so nineteen starts a fresh one'. Step the last two on aloud: nineteen is circle, twenty is triangle. The multiple gets you near, then you walk the leftovers.

DIFFERENTIATION

EMERGING

- Keep these pupils on two-shape units while the class moves to threes — name the eighth shape by counting in twos with you on the board.
- In the copy task, let them underline a unit you've drawn the first repeat of, so they only continue and mark the repeat rather than inventing the structure.

DEVELOPING

- After the copy task, ask them to name the fifteenth shape of their own three-shape pattern and write how they knew without drawing fifteen.
- Give a missing-position twist: 'a blue lands on position twelve in a three-shape unit — what's the unit, and where's the next blue?'

PROFICIENT

- During the Class Challenge, narrate a harder variant for fast finishers: 'name the fiftieth shape of a four-shape unit — which multiple of four gets you closest, and how many do you step on?'
- Pose: design a pattern where the twentieth shape is a star but the tenth is not — explain what unit length makes that work.

✓ **Cross-curricular:** Tie to music — clap a three-beat rhythm (loud, soft, soft) and ask which beats are always loud, linking the repeating unit to multiples of three.

ANSWER KEY

- a) blue
b) green
c) square

Q1: blue

Q2: 3rd, 6th and 9th (all)

Spot: Remainder 2 matches the ****2nd**** shape in the unit, not the 3rd. The unit is   , so the 8th shape is ********.

EXTENSION SHEET · STRETCH ANSWERS

S1: blue (the unit is green, green, blue, blue — 4 long)

S2: yellow (the unit is red, red, yellow — 3 long)

S3: green (the unit is green, green, blue, blue — 4 long)

S4: blue (the unit is red, blue — 2 long)

S5: circle (the unit is circle, square — 2 long)

Investigation: What lands on the 100th spot? — open-ended; scan pupils' working for valid solution paths rather than a single answer.