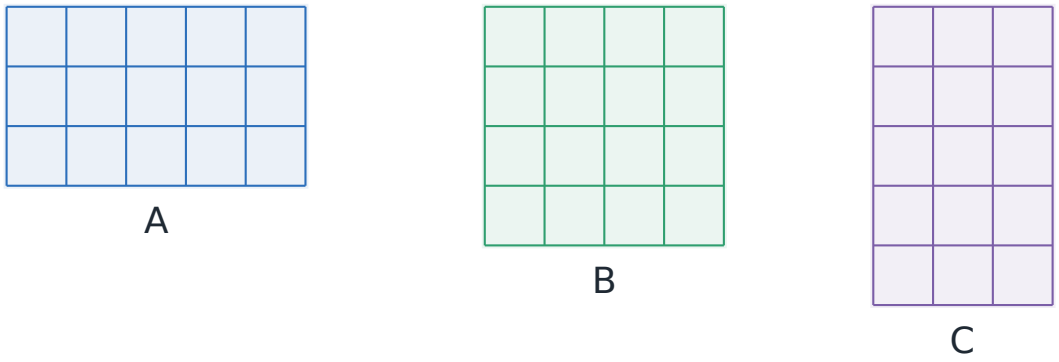
Extension & Challenge — Area & 2D Shapes

Part A — Area & Perimeter

Area is the space inside a shape, measured in square units. For a rectangle, area = length × width. **Perimeter** is the distance all the way around the edge.

> **Worked example.** A 6×2 rectangle has area $6 \times 2 = 12$ square units and perimeter $6 + 2 + 6 + 2 = 16$ units.

Count squares to find the area



Three rectangles drawn on a square grid.

1 Find the area of each rectangle above by counting squares or by multiplying length × width.

A: _____ B: _____ C: _____ (square units)

2 Which rectangle has the **largest** area? Which two rectangles are **congruent** (identical, just turned)?

3 Find the **perimeter** of each rectangle.

A: _____ B: _____ C: _____

4 A rectangle has an area of $24\ cm^2$. Give **two** different pairs of whole-number side lengths it could have.

5 An L-shape is made from a 5×3 rectangle with a 2×2 square cut out of one corner. What is the area of the L-shape?

6 **Reasoning.** Can two rectangles have the *same perimeter* but *different area*? Give an example to prove your answer.

Part B — Properties of 2D Shapes

Shapes are classified by their sides, angles and symmetry. A **polygon** is a closed shape with straight sides; a **quadrilateral** has exactly four. The angles of any triangle always add to $180°$.

> A shape can belong to more than one family. A square is a special rectangle (4 right angles) *and* a special rhombus (4 equal sides).

1 Name the polygon with each number of sides: 3 _____, 4 _____, 5 _____, 6 _____, 8 _____.

2 How many lines of symmetry does each shape have? A square _____, a rectangle _____, an equilateral triangle _____.

3 Sort these quadrilaterals by the property given: square, rectangle, rhombus, parallelogram, trapezium.

(a) Has 4 equal sides: _____

(b) Has exactly one pair of parallel sides: _____

(c) Has 4 right angles: _____

4 True or false? "Every square is also a rectangle." Explain your answer.

5 A triangle has angles of $90°$ and $35°$. Find the third angle and classify the triangle.

6 **Open challenge.** Draw a quadrilateral that has *exactly one* line of symmetry. Name it.