

Same perimeter, different area – an investigation

WHAT THIS LESSON TEACHES

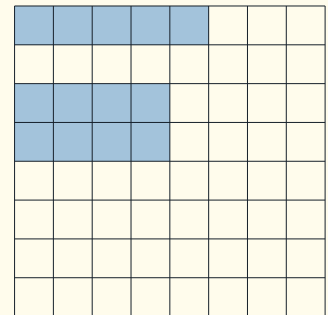
The perimeter is the total distance all the way around the outside of a flat shape, found by adding the length of every side. Two rectangles can share the same perimeter yet cover a different number of squares inside.

- A 4 cm by 2 cm rectangle has a perimeter of $4 + 2 + 4 + 2 = 12$ cm and covers 8 cm^2 .
- A 1 by 5 and a 2 by 4 rectangle both have perimeter 12 cm, but the 2 by 4 holds 8 cm^2 while the 1 by 5 holds only 5 cm^2 .

MODEL THIS ON THE BOARD

SAME FENCE, DIFFERENT SPACE

- ① Both rectangles use the same fence of **12 cm**: $1 + 5 + 1 + 5 = 12$ and $2 + 4 + 2 + 4 = 12$.
- ② The long thin rectangle is **1** row of **5** squares, so its area is **5 cm^2** .
- ③ The fatter rectangle is **2** rows of **4** squares, so its area is **8 cm^2** .
- ④ Same perimeter, yet **8 cm^2** holds more space than **5 cm^2** .



DISCUSSION STARTER

REFLECT What surprised you most about shapes that share a perimeter but have different areas?

ANSWER KEY

b) 5 cm^2 , 8 cm^2

Q1: 16 cm

a) **Sometimes** — Same-perimeter rectangles can differ in area (1 by 5 and 2 by 4 both have perimeter 12 cm yet areas 5 cm^2 and 8 cm^2) or match if congruent, so only sometimes.

b) **Never** — Perimeter is the total length around the shape and is measured in cm; square centimetres measure area.

c) **Never** — Perimeter is found by adding every side (e.g. $4+2+4+2$); multiplying length by width gives area.

d) **Always** — Every rectangle's area is length times width, matching the lesson examples ($4 \times 2 = 8$, $2 \times 4 = 8$, $1 \times 5 = 5$).

EXTENSION SHEET · STRETCH ANSWERS

S1: 10 cm^2

S2: 30 cm^2

S3: 20 m

S4: 20 m

S5: 58 m

Investigation: Fence the biggest garden — open-ended; scan pupils' working for valid solution paths rather than a single answer.