Reasoning and Problem Solving
Step 2: Area and Perimeter

National Curriculum Objectives:

Mathematics Year 6: (6M7a) Recognise that shapes with the same areas can have different perimeters and vice versa
Mathematics Year 6: (6M7c) Recognise when it is possible to use formulae for the area of shapes

Differentiation:

Questions 1, 4 and 7 (Problem Solving)
Developing Calculate out the area and perimeter of a new shape using given information. Whole numbers only, using known multiplication facts within 12 x 12.
Expected Calculate the area and perimeter of a new shape using given information. Includes up to 2-digit by 2-digit whole numbers and some conversion between units of measure. The formula for finding area and perimeter is used.
Greater Depth Calculate the area and perimeter of a new shape using given information. Includes some conversion between units of measure and decimal numbers up to 2 dp. The formula for finding area and perimeter is used.

Questions 2, 5 and 8 (Problem Solving)
Developing Calculate the largest and smallest areas possible using the information given. Whole numbers only, using known multiplication facts within 12 x 12.
Expected Calculate the largest and smallest areas possible using the information given. Includes up to 2-digit by 2-digit whole numbers and some conversion between units of measure. The formula for finding area and perimeter is used.
Greater Depth Calculate the largest and smallest areas possible using the information given. Includes some conversion between units of measure and decimal numbers up to 2 dp. The formula for finding area and perimeter is used.

Questions 3, 6 and 9 (Reasoning)
Developing Children explain whether they agree or disagree with a statement. Whole numbers only, using known multiplication facts within 12 x 12.
Expected Children explain whether they agree or disagree with a statement. Includes up to 2-digit by 2-digit whole numbers and some conversion between units of measure. The formula for finding area and perimeter is used.
Greater Depth Children explain whether they agree or disagree with a statement. Includes some conversion between units of measure and decimal numbers up to 2 dp. The formula for finding area and perimeter is used.

More Year 6 Perimeter, Area and Volume resources.

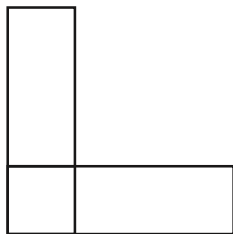## Did you like this resource? Don't forget to review it on our website.

classroomsecrets.co.uk

Area and Perimeter

1a. Eddie draws two equal rectangles.
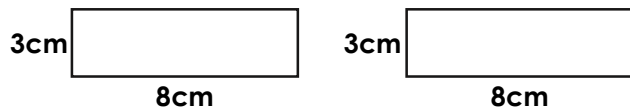
3cm [   ] 3cm [   ]
8cm   8cm

He puts them together to make a new shape.

What is the area and perimeter of the new shape?

D

Not to scale   PS

1b. Sadie draws two equal rectangles.
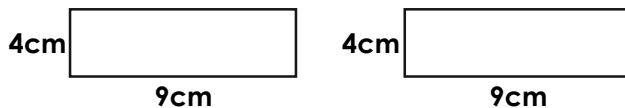
4cm [   ] 4cm [   ]
9cm   9cm

She puts them together to make a new shape.

What is the area and perimeter of the new shape?

D
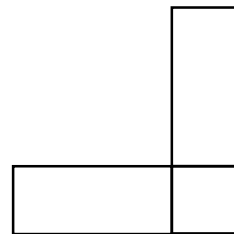
Not to scale   PS

2a. A shape has a perimeter of 18cm.
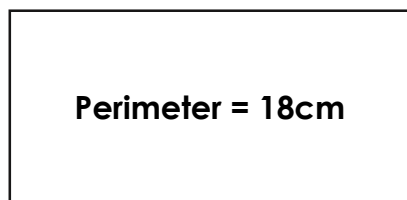
Perimeter = 18cm

What is the largest area the shape could have?

What is the smallest area the shape could have?

D

Not to scale   PS

2b. A shape has a perimeter of 24cm.
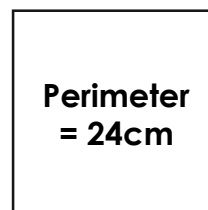
Perimeter = 24cm

What is the largest area the shape could have?

What is the smallest area the shape could have?

D

Not to scale   PS

3a. Rosa says,

Squares have the same area and perimeter because you multiply by 4.

Do you agree? Prove it.

D

R

3b. Jacob says,

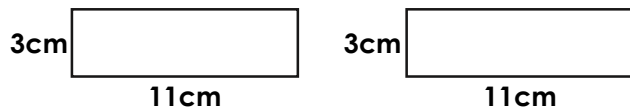**Rectangles have the same area and perimeter because you just multiply the length by width.**
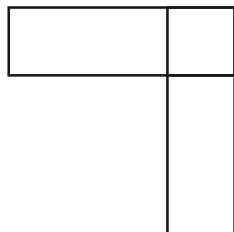
Do you agree? Prove it.

D

R

classroomsecrets.co.uk

Reasoning and Problem Solving – Area and Perimeter – Year 6 Developing

Area and Perimeter

Area and Perimeter

4a. Freddy draws two equal rectangles.

3cm ☐ 3cm ☐
11cm   11cm

He puts them together to make a new shape.

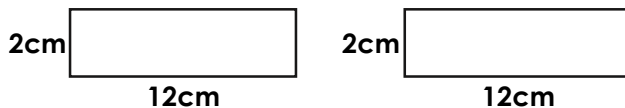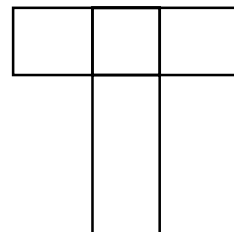Using the correct formulae, find the area and perimeter of the new shape.

E ⭐   *Not to scale*   PS

4b. Hayley draws two equal rectangles.

2cm ☐ 2cm ☐
12cm   12cm
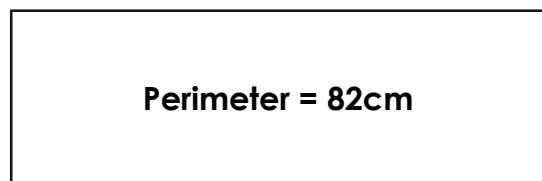
She puts them together to make a new shape.

Using the correct formulae, find the area and perimeter of the new shape.

E ⭐   *Not to scale*   PS

5a. A shape has a perimeter of 82cm.

Perimeter = 82cm

What is the largest area the shape could have?

What is the smallest area the shape could have?

E ⭐   *Not to scale*   PS

5b. A shape has a perimeter of 68cm.
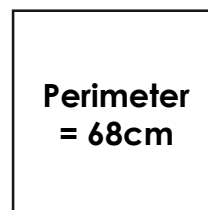
Perimeter = 68cm

What is the largest area the shape could have?

What is the smallest area the shape could have?

E ⭐   *Not to scale*   PS

6a. Cally says,

A square can have the same area and perimeter.

Do you agree? Prove it.

E ⭐   R

6b. Brendan says,
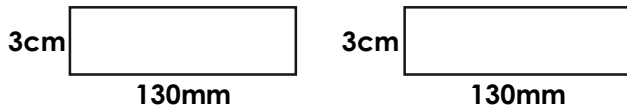
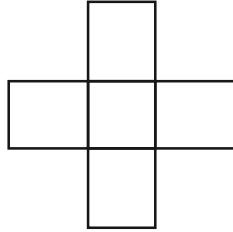A rectangle will always have a different area and perimeter.

Do you agree? Prove it.

E ⭐   R

---

classroomsecrets.co.uk
Reasoning and Problem Solving – Area and Perimeter – Year 6 Expected

Area and Perimeter

7a. Hamza draws two equal rectangles.

3cm ▭   3cm ▭

130mm   **130mm**

He puts them together to make a new shape.

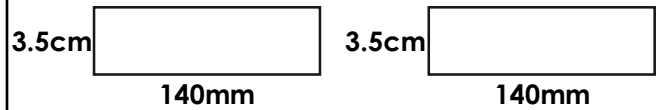> Using the correct formulae, find the area and perimeter of the new shape.

Not to scale   PS

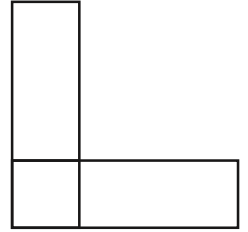**7b.** Joanna draws two equal rectangles.

3.5cm ▭   3.5cm ▭

140mm   **140mm**
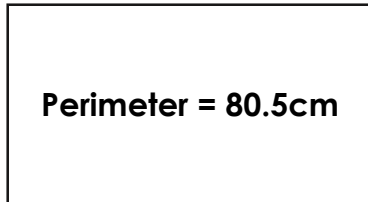
She puts them together to make a new shape.

> Using the correct formulae, find the area and perimeter of the new shape.

Not to scale   PS

8a. A shape has a perimeter of 80.5cm.

Perimeter = 80.5cm

What is the largest area the shape could have?

What is the smallest area the shape could have?

Not to scale   PS

8b. A shape has a perimeter of 75cm.
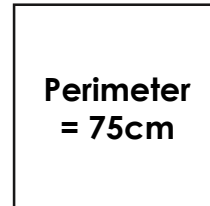
Perimeter = 75cm

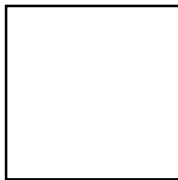**What is the largest area the shape could have?**

What is the smallest area the shape could have?

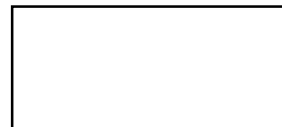*Not to scale*   PS

9a. Suzie says,

> If a square has an area that is a decimal, then its perimeter will always be a decimal too.

Do you agree? Prove it.

R

9b. Kevin says,

> If a rectangle has a perimeter that is a decimal, then its area will always be a decimal too.

Do you agree? Prove it.

R

© Classroom Secrets Limited 2019

classroomsecrets.co.uk

Reasoning and Problem Solving – Area and Perimeter – Year 6 Greater Depth

Reasoning and Problem Solving
Area and Perimeter

Developing
1a. Area = 39cm², Perimeter = 32cm
2a. Largest area = 4cm x 5cm = 20cm²
Smallest area = 8cm x 1cm = 8cm²
3a. Disagree; to find the area you multiply length by width, to find the perimeter, you add all the sides together. For example: in a square that measures 6cm x 6cm, the area is 36cm², but the perimeter is 24cm.

Expected
4a. Area = 57cm², Perimeter = 44cm
5a. Largest area = 20cm x 21cm = 420cm²
Smallest area = 40cm x 1cm = 40cm²
6a. Agree; some squares have an equal area and perimeter (for example, 4cm x 4cm), however, others do not (such as 5cm x 5cm).

Greater Depth
7a. Area = 69cm², Perimeter = 52cm
8a. Largest area = 20cm x 20.25cm = 405cm² (Accept this answer, however, if children wish to take this further, other decimals can produce larger areas such as 20.1cm x 20.15cm = 405.015. This may require a calculator).
Smallest area = 40cm x 0.25cm = 10cm²
9a. Disagree; if the area of a square is a decimal number, it does not mean that the perimeter will be a decimal as well. For example; Perimeter = 4.5cm + 4.5cm + 4.5cm + 4.5cm = 18cm.
Area = 4.5 x 4.5 = 20.25cm².

Reasoning and Problem Solving
Area and Perimeter

Developing
1b. Area = 56cm², Perimeter = 36cm
2b. Largest area = 6cm x 6cm = 36cm²
Smallest area = 11cm x 1cm = 11cm²
3b. Disagree; to find the area, you multiply length by width, to find the perimeter you add all the sides together. For example: in a rectangle that measures 3cm x 4cm, the area is 12cm², but the perimeter is 14cm.

Expected
4b. Area = 44cm², Perimeter = 48cm
5b. Largest area = 17cm x 17cm = 289cm²
Smallest area = 33cm x 1cm = 33cm²
6b. Disagree; some rectangles have an equal area and perimeter (for example, 3cm x 6cm), however others do not (such as 7cm x 5cm).

Greater Depth
7b. Area = 85.75cm², Perimeter = 56cm
8b. Largest area = 18.5cm x 19cm = 351.5cm²
Smallest area = 37cm x 0.5cm = 18.5cm²
9b. Disagree; although a rectangle may have a perimeter with a decimal number, it is still possible for the area to be a whole number. For example; Perimeter = 1.2cm + 5cm + 1.2cm + 5cm = 12.4cm.
Area = 1.2 x 5 = 6cm².

classroomsecrets.co.uk