

# Perimeter of regular polygons

## Notes and guidance

In this small step, children are introduced to the term “regular polygon” for the first time. Explain that, in a regular polygon, all sides are equal in length and the angles are equal in size. For this step, children only need to understand that a regular polygon has equal side lengths, as they will not be exposed to shapes that have the same side lengths with different angles.

Children use the equality of sides to calculate the perimeter of regular polygons by making links with repeated addition and/or multiplication facts. Similarly, they use division to find the length of one side of a regular polygon when given its perimeter.

Children may need reminding that a polygon is a flat shape with straight sides.

## Things to look out for

- Children may need support to learn the names of different polygons and the number of sides they have.
- Children need to be secure with multiplication and division facts.
- Children may misunderstand the word “regular” and think that, for example, a rectangle is regular.

## Key questions

- What is a polygon?
- How do you know if a polygon is regular?
- If one side is \_\_\_\_\_ cm, what is the length of each of the other sides of the shape? How can you find the perimeter?
- Is an equilateral triangle a regular shape?
- Is a rectangle a regular shape?
- If you know the perimeter of a regular polygon, how can you work out the length of each side?

## Possible sentence stems

- Each side is \_\_\_\_\_ cm.  
There are \_\_\_\_\_ sides, so the perimeter of the polygon is  
\_\_\_\_\_ × \_\_\_\_\_ cm = \_\_\_\_\_ cm.
- \_\_\_\_\_ cm + \_\_\_\_\_ cm + \_\_\_\_\_ cm = 3 × \_\_\_\_\_ cm  
= \_\_\_\_\_ cm

## National Curriculum links

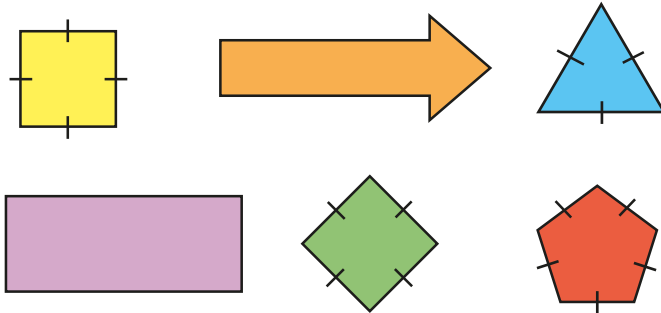
- This small step is not taken from the Year 4 National Curriculum. It is included to take into account the non-statutory DfE Ready to Progress guidance.

# Perimeter of regular polygons

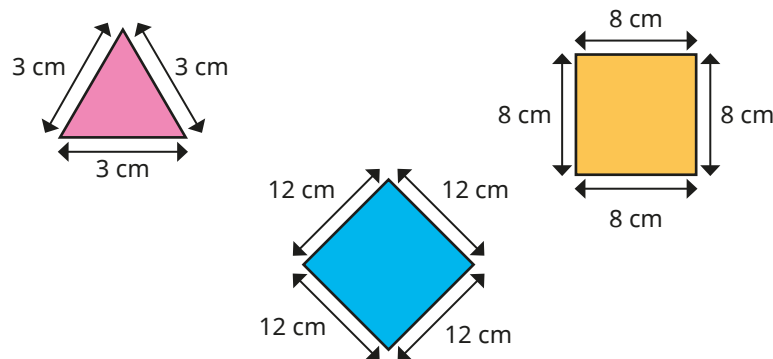
## Key learning

- A polygon is regular if all its sides are equal in length and all its angles are equal in size.

Which of these polygons are regular?



- Work out the perimeters of the regular polygons.

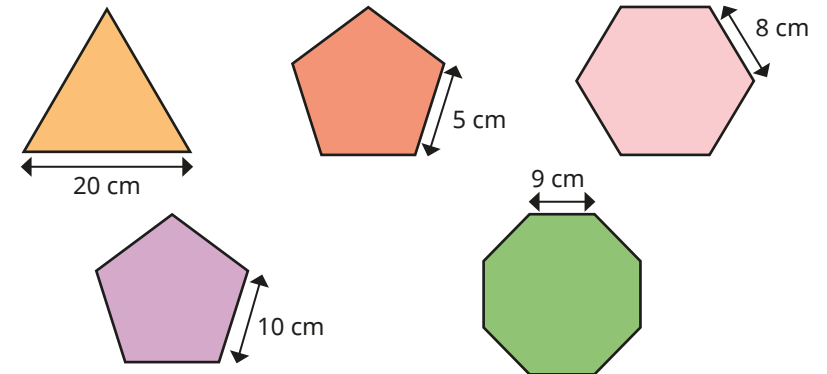


How did you work out the perimeters?

- Tommy has found a rule to work out the perimeter of a regular polygon.

$$\text{perimeter} = \text{number of sides} \times \text{length of one side}$$

Use this rule to work out the perimeters of these regular polygons.



- Which has the greater perimeter?

a square with a side length of 12 cm

a regular octagon with a side length of 6 cm

## Perimeter of regular polygons

### Reasoning and problem solving

The perimeter of an equilateral triangle is 45 cm.

Work out the length of each side of the triangle.

The perimeter of a regular pentagon is 60 cm.

Work out the length of each side of the pentagon.

15 cm

12 cm

Filip has drawn some regular polygons.

Each polygon has a perimeter of 40 cm.

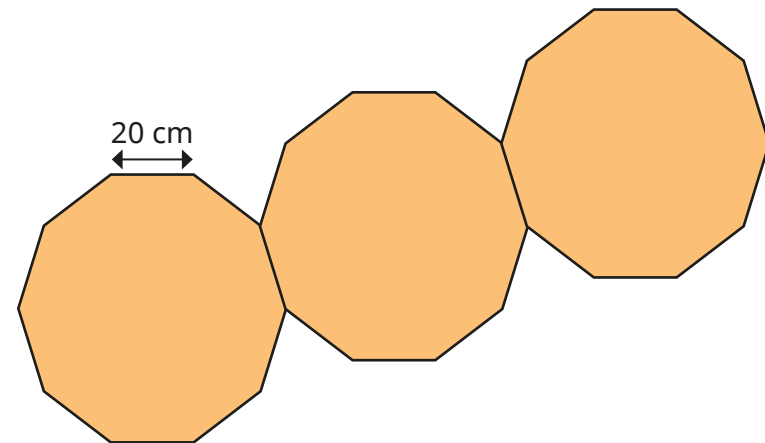
All the sides measure whole numbers of centimetres.

How many sides might the polygon have?

Compare answers with a partner.

4, 5, 8, 10, 20, 40

Dani has joined together three regular decagons to make a new shape.



What is the perimeter of the new shape?

How did you work it out?

Talk about it with a partner.

520 cm