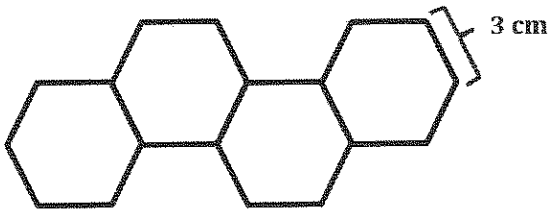
2. David traces 4 regular hexagons to create the shape shown below. The perimeter of 1 hexagon is 18 cm. What is the perimeter of David's new shape?



This is a two-step problem. First I need to find the side length of each hexagon. I know David traces regular hexagons, so all of the side lengths are equal. To find the side length, I can divide the perimeter of 1 hexagon, 18 cm, by its 6 sides to get 3 cm.

$$\text{Perimeter of 1 hexagon} = 18 \text{ cm} \div 6$$
$$= 3 \text{ cm}$$

$$\text{Perimeter of the shape} = 18 \times 3 \text{ cm}$$
$$= (10 \times 3 \text{ cm}) + (8 \times 3 \text{ cm})$$
$$= 30 \text{ cm} + 24 \text{ cm}$$
$$= 54 \text{ cm}$$

Next, I can count to find the total number of sides on David's new shape. I can't just multiply 4×6 to get the total number of sides because each hexagon shares 1 or 2 sides with another hexagon. I can mark the sides to help me count them. David's new shape has 18 sides. Now I can multiply 18 by 3 cm to get the perimeter of the shape.

The perimeter of the shape is 54 cm.