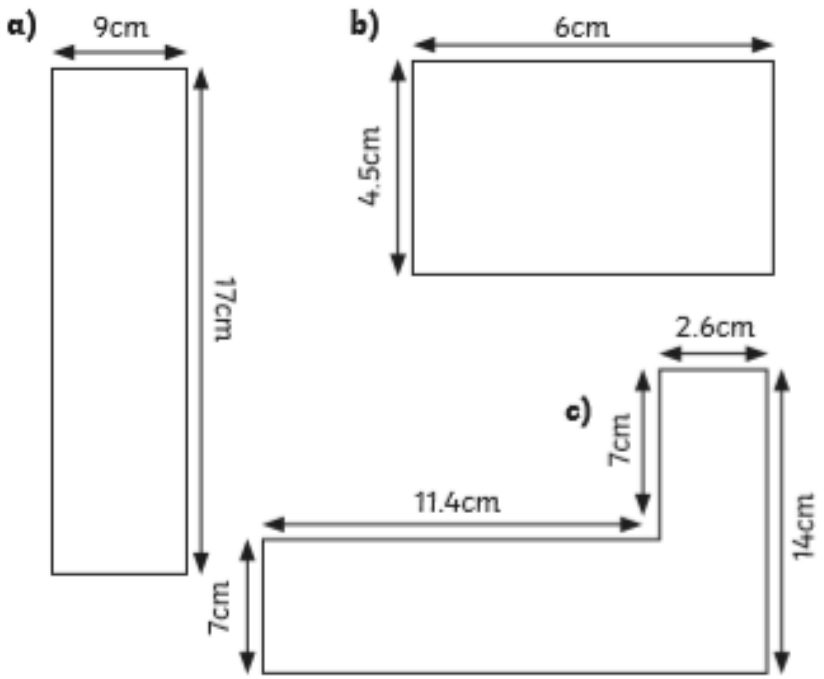
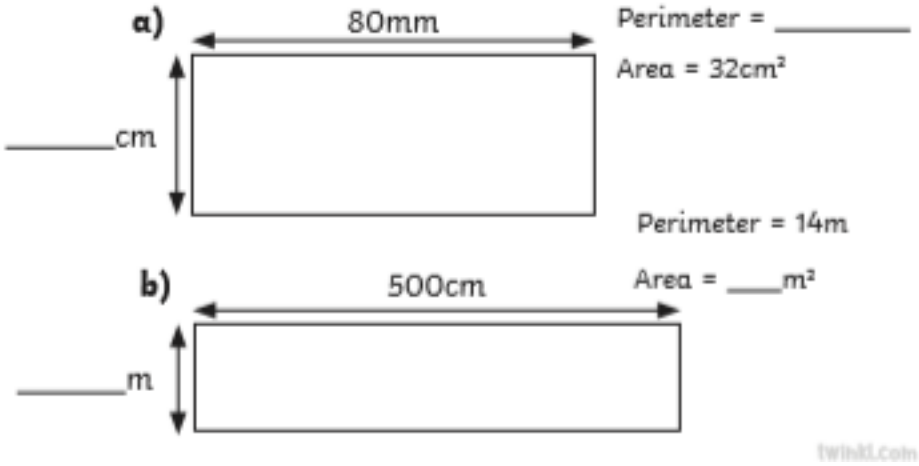
1) Calculate the area and perimeter of the following rectilinear shapes (not to scale).



2) Give the missing values for each shape.



1) Investigate if Alice's and Oliver's statements are true or false by drawing example shapes for each.

Alice

I can draw two shapes that have an area of $4cm^2$ but different perimeters.

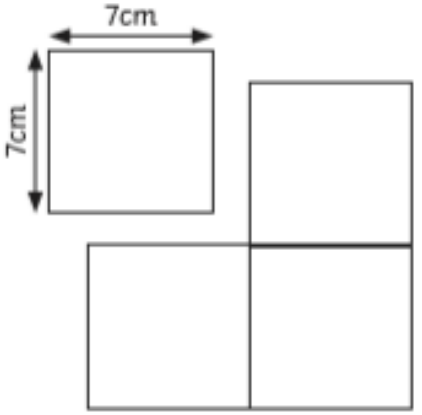
Oliver

I can draw a shape with the same perimeter and the same area.

2) Three of these squares are made into a new shape.

Ben

I think that the new shape has an area and perimeter that is three times that of the original square.



a) Do you agree with Ben's statement? What mistake do you think he has made?

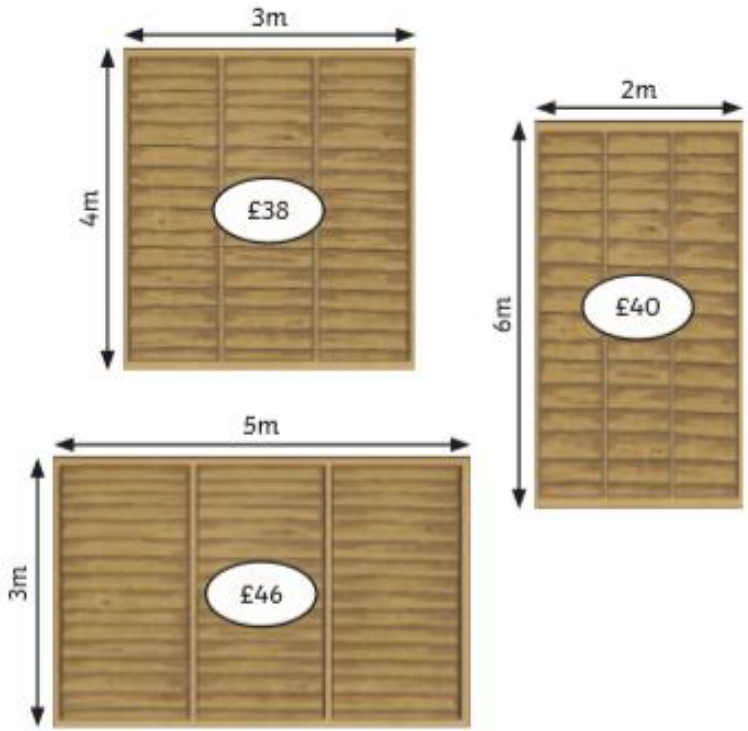
b) Give the area and perimeter of the new shape.

1) A shop sells fence panels with a wooden frame going all the way round each panel. The price of each panel is based on the area of the panel and the length of the wooden frame around the panel.

Use the prices given to investigate how much the shop charges per square metre of the panel and per metre for the wooden frame.

a) Each $1m^2$ of fence panel costs:

b) 1 metre of wooden frame costs:



2) Give the size of rectilinear fence panel you could buy from the shop with the following amounts of money. (Remember the shop only sells fence panels which have sides measuring a **whole number** of metres.)

a) £28

b) £30

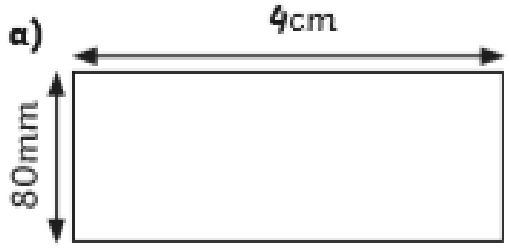
ANSWERS

1) a) Perimeter = 52cm Area = 153cm^2

b) Perimeter = 21m Area = 27 m^2

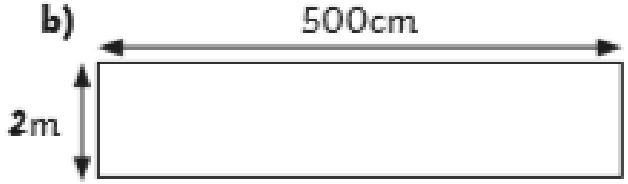
c) Perimeter = 56cm Area = 116.2cm^2

2) a)



Perimeter = 24cm
Area = 32cm^2

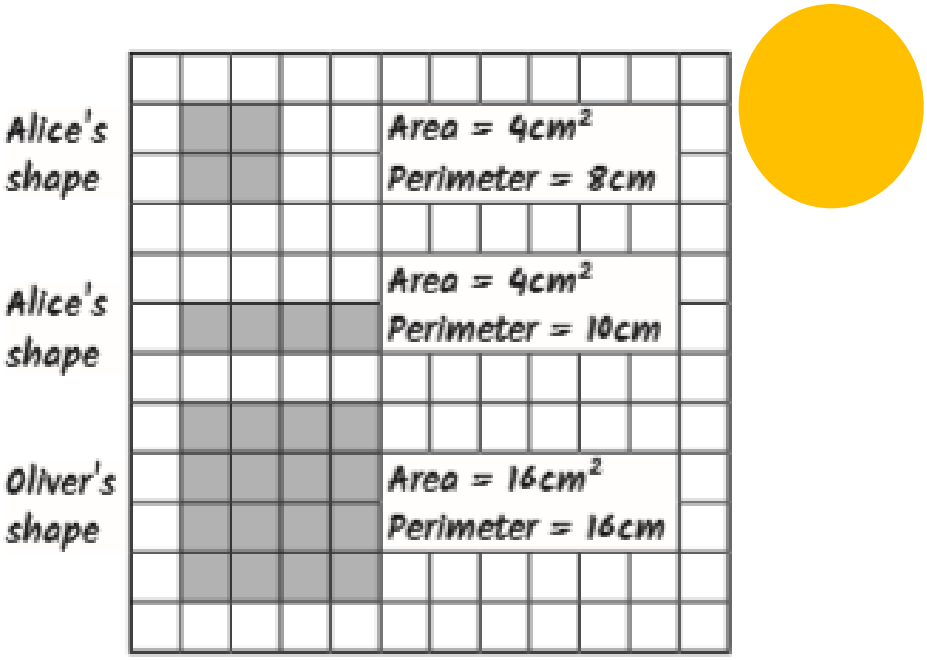
b)



Perimeter = 14m
Area = 10m^2

1) Alice's statement is true. A 2cm x 2cm square will give an area of 4cm^2 and a perimeter of 8cm. A 1cm x 4cm rectangle will give an area of 4cm^2 and a perimeter of 10cm. Shapes with different dimensions are also possible.

Oliver's statement is true. A 4cm x 4cm square will give an area of 16cm^2 and a perimeter of 16cm. Another solution is a 6cm x 3cm rectangle which will give an area of 18 cm^2 and a perimeter of 18cm.



2) a) Ben is partly correct. He is correct in thinking that the area will be three times that of the original square, however, the new shape has four of the original sides inside the shape, therefore its perimeter will not be three times as large as the original square's perimeter.

b) The area of the new shape will be 147cm^2 as
7 x 7 = 49cm^2 and
3 x 49cm^2 = 147cm^2
The new shape has four of the original square's sides inside the shape, therefore its perimeter is 56cm.

1) a) $1m^2$ of a fence panel = £2 per m^2

b) 1 metre of the length of wooden frame around the panel = £1 per metre

2) a) £28 = 4m x 2m or 2m x 4m panel

b) £30 = 7m x 1m or 1m x 7m panel or 3m x 3m panel.