

CoEA Module 3 Case Study 1

Tiling

The resources for this Case Study consist of

Teacher Notes

Case Study Resource Sheet	CR1	<i>Mary's Bathroom</i>
"	"	<i>How Many Tiles (1)</i>
"	"	<i>How Many Tiles (2)</i>
Worksheet	WS1	<i>Mary's Bathroom</i>
Worksheets	WS2.1-2.2	<i>How Many Tiles?</i>
Worksheet	WS3	<i>Pricing the Job (1)</i>
Worksheets	WS4.1-4.2	<i>Tiling Patterns</i>
Worksheet	WS5	<i>Pricing the Job (2)</i>
Homework Sheets	HW1.1-1.2	<i>Pricing the Job (3)</i>
Worksheet	WS6	<i>Kevin's Bathroom</i>
Worksheets	WS7.1-7.3	<i>Kevin's Mix and Match (1)</i>
Homework Sheet	HW2.1-2.3	<i>Kevin's Mix and Match (2)</i>
Homework Sheet	HW3.1-3.3	<i>Kevin's Mix and Match (3)</i>
Worksheets	WS8.1-8.2	<i>Pricing Kevin's Tiles</i>
Case Study Practice Sheet	CP1	<i>Finding Areas and Perimeters (1)</i>
Case Study Practice Sheet	CP2	<i>Finding Areas and Perimeters (2)</i>
Test 1	(3 pages)	

Case Study 1

Tiling

Teacher Notes

Mary wants to tile two surfaces in her bathroom. She measures the side of her bath and the wall space above her bath. Similar exercises are then undertaken with Kevin's bathroom.

Use CR1 as an OHP showing two rectangles: *Bath* and *Wall*. Pupils measure the length and width of both rectangles to work out size. Then use the scale to work out *actual size*.

Pupils then use Sheets CR2 and CR3 to count the number of tiles inside a shape.

Worksheets 1 and 2 (WS1 and WS2) repeat the class exercise, using different measures.

WS3 is used to work out the cost of buying the tiles.

WS4 – designing the patterns. This could be adapted for use as a homework sheet.

HW1 is a follow-up to WS3: costing out the price of certain combinations of tiles.

WS5 – costing the tiling of these areas using different size tiles. (These prices could be compared with the 15 cm × 15 cm tile price.)

WS6 – Kevin's Bathroom. An exercise following similar lines to the original problem (could be used as a homework sheet).

WS7 – Working out fractions of shapes. All fractions should cancel down to $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{10}$.

HW2 follows on from WS7. The fractions are repeated with different designs.

HW3 – shading 25% or $\frac{1}{4}$ of a tiling area.

WS8 – looking at costing using a discount of 25% (following lines of WS3/HW1 and WS5) on 15 cm × 15 cm tiles. Again, comparisons could be made with other tile prices.

(Two sheets, CP1 and CP2, on finding areas and perimeters are included for practice on basic shapes.)

Case Study 1, CR1

Mary's Bathroom

BATH

<i>Length :</i>	.....
<i>Width :</i>	.....
<i>Actual length :</i>	.....
<i>Actual width :</i>	.....

(Scale : 1 cm \equiv 10 cm)

WALL

<i>Length :</i>	.....
<i>Width :</i>	.....
<i>Actual length :</i>	.....
<i>Actual width :</i>	.....

Case Study 1, WS1

Mary's Bathroom

Mary wants to tile the end of her bath and the small area of wall above the bath.

These diagrams are drawn to a scale of 1 cm to 10 cm.

1. Measure accurately the lengths and widths.
Fill in the details.
2. Work out the *actual* lengths and widths using the scale.
Fill in the details.

<i>Length :</i>	.....
<i>Width :</i>	.....
<i>Actual length :</i>	.....
<i>Actual width :</i>	.....

END OF BATH

<i>Length :</i>	.....
<i>Width :</i>	.....
<i>Actual length :</i>	.....
<i>Actual width :</i>	.....

SMALL WALL

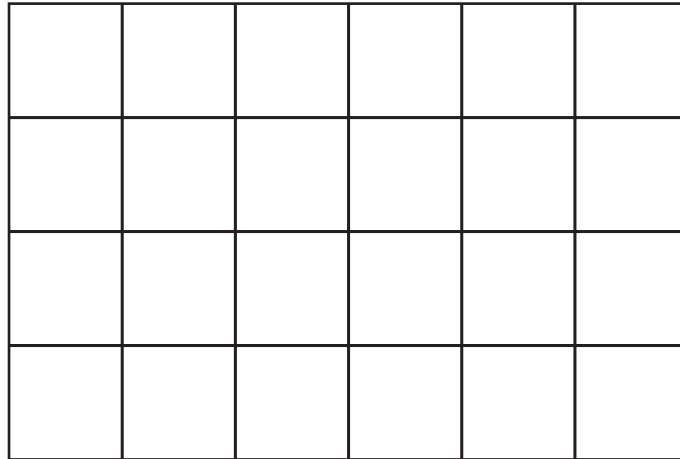
3. Mary wants to put some special edging around the end of her bath. (It must go around the length and width of her bath end.)
How much edging does she need?

Case Study 1, WS2.1

How Many Tiles?

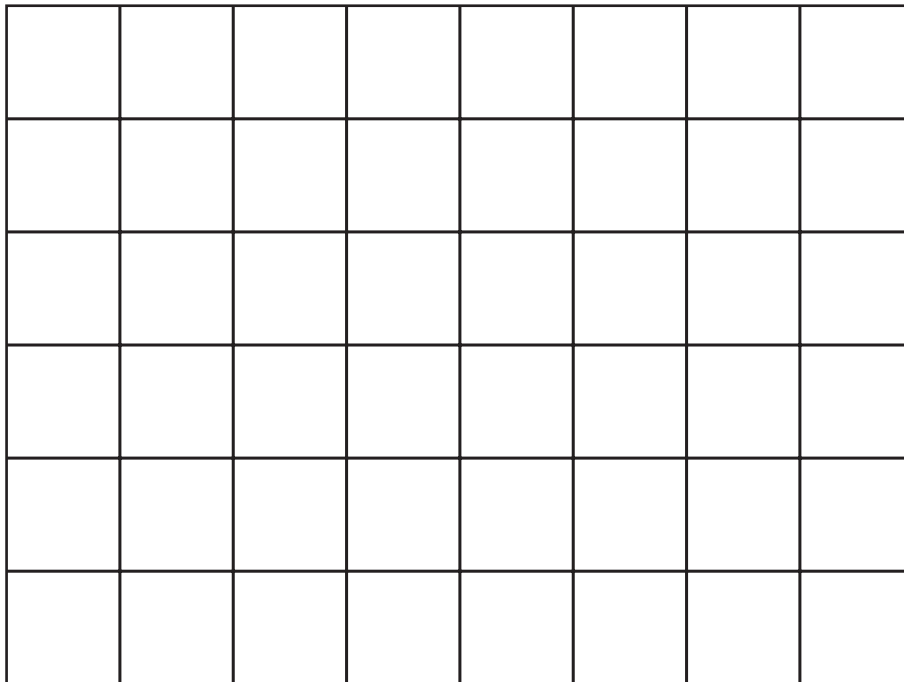
15 cm × 15 cm tiles

*END
OF
BATH*



How many tiles?

*SMALL
WALL*



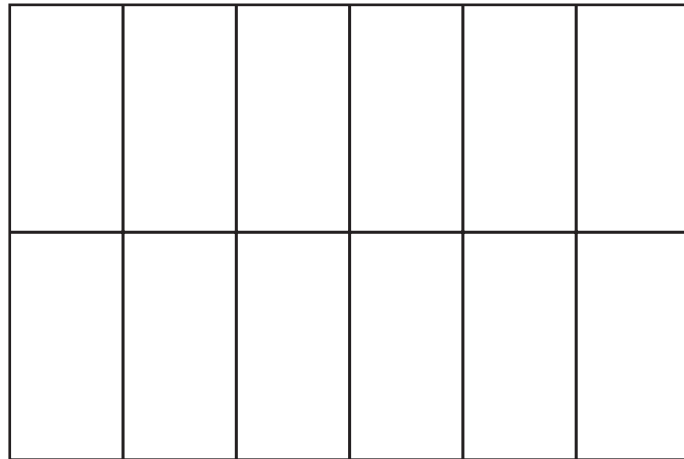
How many tiles?

Case Study 1, WS2.2

How Many Tiles?

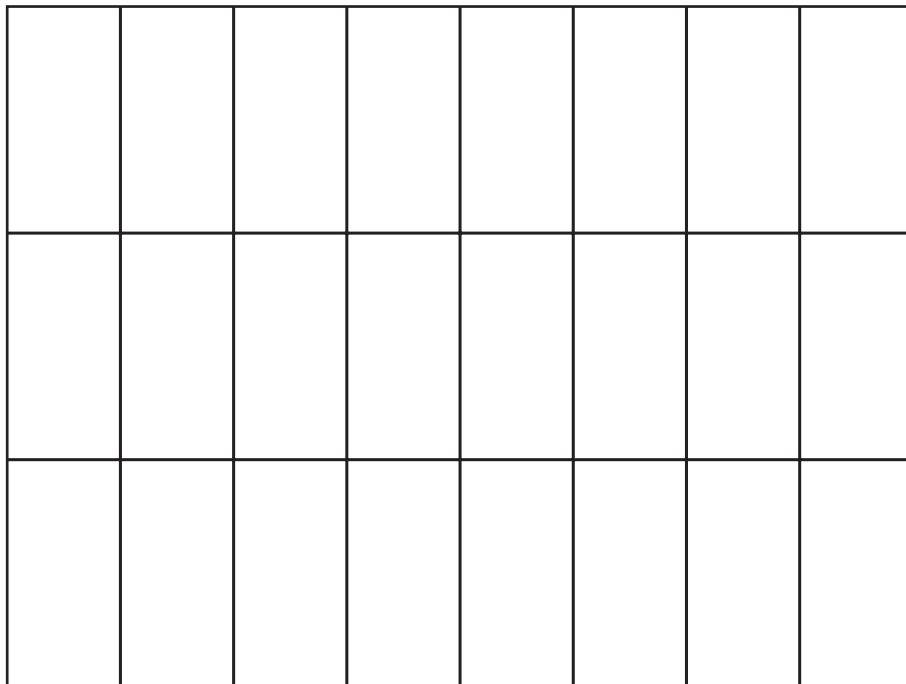
15 cm × 30 cm tiles

*END
OF
BATH*



How many tiles?

*SMALL
WALL*



How many tiles?

Case Study 1, WS3

Pricing the Job (1)

To tile the side of her bath, Mary needs 48 tiles (using the 15 cm × 15 cm tiles).

The table below is part of the *D+Q* price list for bathroom tiles.

<i>Tile type</i> (Size 15 cm × 15 cm)	<i>Colour</i>	<i>Price</i> (per pack of 10 tiles)
ARABIAN	<i>Blue</i>	£4.85
	<i>Green</i>	
COSTA	<i>Orange</i>	£6.25
	<i>Yellow</i>	
	<i>Pink</i>	

- How many packs of tiles will Mary need to buy?
- How many tiles will Mary have left over?
- How much will it cost for her to buy the number of tiles she needs?
- If Mary uses COSTA tiles, how much will it cost for her to buy the number of tiles she needs?
- Mary decides to mix the tile colours and types.
She wants *Green* and *Yellow* tiles.

Complete the table below showing the cost of buying a mix of *Green* and *Yellow* tiles.

<i>Number of packs of Green ARABIAN tiles</i>	(A)	<i>Number of packs of Yellow COSTA tiles</i>	(B)	<i>TOTAL COST (A + B)</i>
	<i>COST</i>		<i>COST</i>	
1		4		
2		3		
3		2		
4		1		

Case Study 1, WS4.1

Tiling Patterns

Mary has 30 green tiles and 20 yellow tiles. She makes the design shown here using these two colours. (Yellow tiles are shown with a **Y**; green tiles are shown as blank.)

Using the tile layouts on WS4.2, make 3 *different* designs using these tiles.

	Y		Y					Y		Y	
Y		Y		Y			Y		Y		Y
	Y		Y		Y	Y		Y		Y	
		Y		Y			Y		Y		

Case Study 1, WS4.2

Tiling Patterns

Make three different tile designs using the diagrams below. You have 30 green tiles and 20 yellow tiles for each design.

Case Study 1, WS5

Pricing the Job (2)

To tile the small wall at the end of her bath, Mary needs 48 tiles (using the 15 cm × 30 cm tiles).

The table below is part of the *D+Q* price list for bathroom tiles.

<i>Tile type</i> (Size 15 cm × 30 cm)	<i>Colour</i>	<i>Price</i> (per pack of 5 tiles)
RIO	<i>Desert Flower</i>	£4.99
	<i>Terracotta</i>	
FLAMENCO	<i>Peach</i>	£6.55
	<i>Avocado</i>	
	<i>Burnt Lemon</i>	

- How many packs of tiles will Mary need to buy?
- How many tiles will Mary have left over?
- If Mary chooses to use the RIO tiles, how much will it cost for her to buy the number of tiles she needs?
- If Mary chooses to use the FLAMENCO tiles, how much will it cost for her to buy the number of tiles she needs?
- Mary decides to mix the tile colours and types. She wants *Terracotta* and *Peach* tiles.

Complete the table below showing the cost of buying a mix of *Terracotta* and *Peach* tiles.

<i>Number of packs of Terracotta RIO tiles</i>	(A) <i>COST</i>	<i>Number of packs of Peach FLAMENCO tiles</i>	(B) <i>COST</i>	<i>TOTAL COST (A + B)</i>
1		4		
2		3		
3		2		
4		1		

Case Study 1, HW1.1

Pricing the Job (3)

To tile the wall along the side of her bath, Mary needs 84 tiles (using the 15 cm × 15 cm tiles).

The table below is part of the *Homeplace* price list for bathroom tiles.

<i>Tile type</i> (Size 15 cm × 15 cm)	<i>Colour</i>	<i>Price</i> (per pack of 10 tiles)
SUNSET	Pink Flame	£4.75
OCEANIC	Aqua Teal	£6.10

1. How many packs of tiles will Mary need to buy?
2. How many tiles will Mary have left over?
3. If Mary chooses to use SUNSET tiles, how much will it cost for her to buy the number of tiles she needs?
4. If Mary uses OCEANIC tiles, how much will it cost for her to buy the number of tiles she needs?
5. Mary decides to mix the tile colours and types.
She wants *Flame* and *Aqua* tiles.
Complete the table on sheet HW1.2 to show the cost of buying a mix of *Flame* and *Aqua* tiles. (The first line has been completed for you.)

Case Study 1, HW1.2

Pricing the Job (3)

	Ⓐ		Ⓑ	
<i>Number of packs of Flame SUNSET tiles</i>	<i>COST</i>	<i>Number of packs of Aqua OCEANIC tiles</i>	<i>COST</i>	<i>TOTAL COST (A + B)</i>
1	£4.75	10	£61.00	£65.75
2		9		
3		8		
4		7		
5		6		
6		5		
7		4		
8		3		
9		2		
10		1		

Case Study 1, WS6

Kevin's Bathroom

Kevin is tiling part of the wall in his bathroom. He has measured accurately the area to be tiled, and has made this *scale* drawing to show it.

Length :

Width :

Actual length :

Actual width :

The scale used is 1 cm to 10 cm.

1. Measure accurately the length and width Kevin is going to tile.
2. Work out the *actual* lengths and widths using the scale.
3. Kevin is going to put some special edging around the outside of the area he is tiling. How much edging does he need?
4. Bathroom tiles come in *two* different sizes,

15 cm × 15 cm



and

15 cm × 30 cm .



Work out how many of each tile Kevin would need to tile the area above.

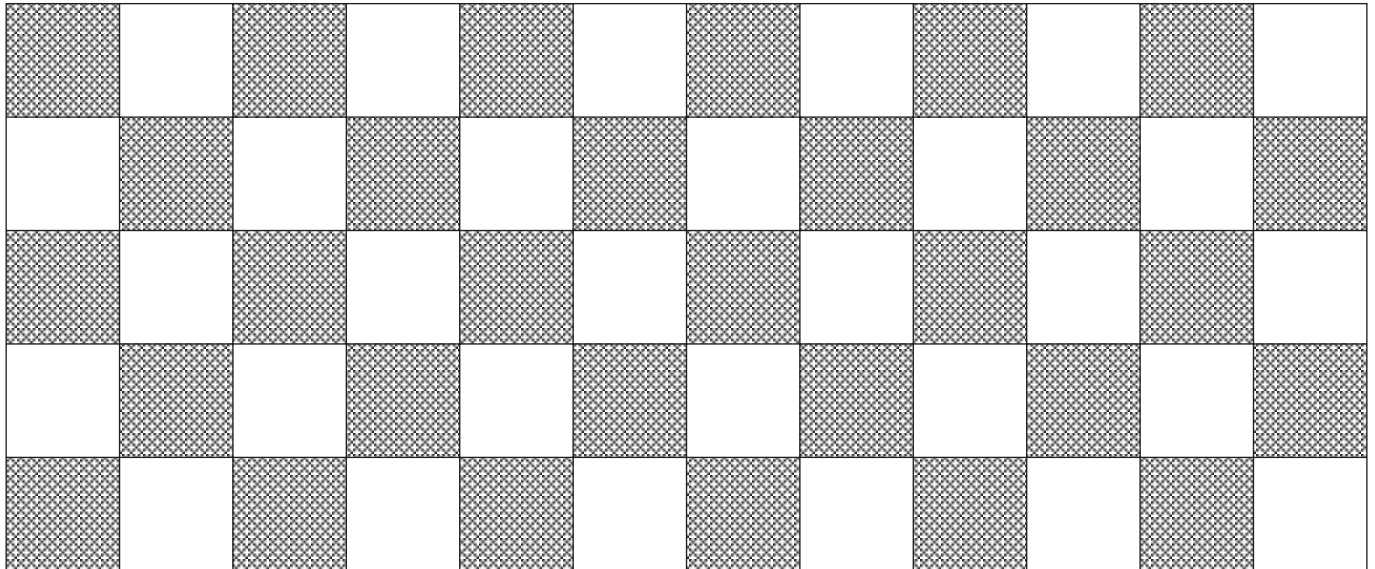
Case Study 1, WS7.1

Kevin's Mix and Match (1)

Kevin decides to use 15 cm × 15 cm tiles. He also decides he wants to use two contrasting colours.

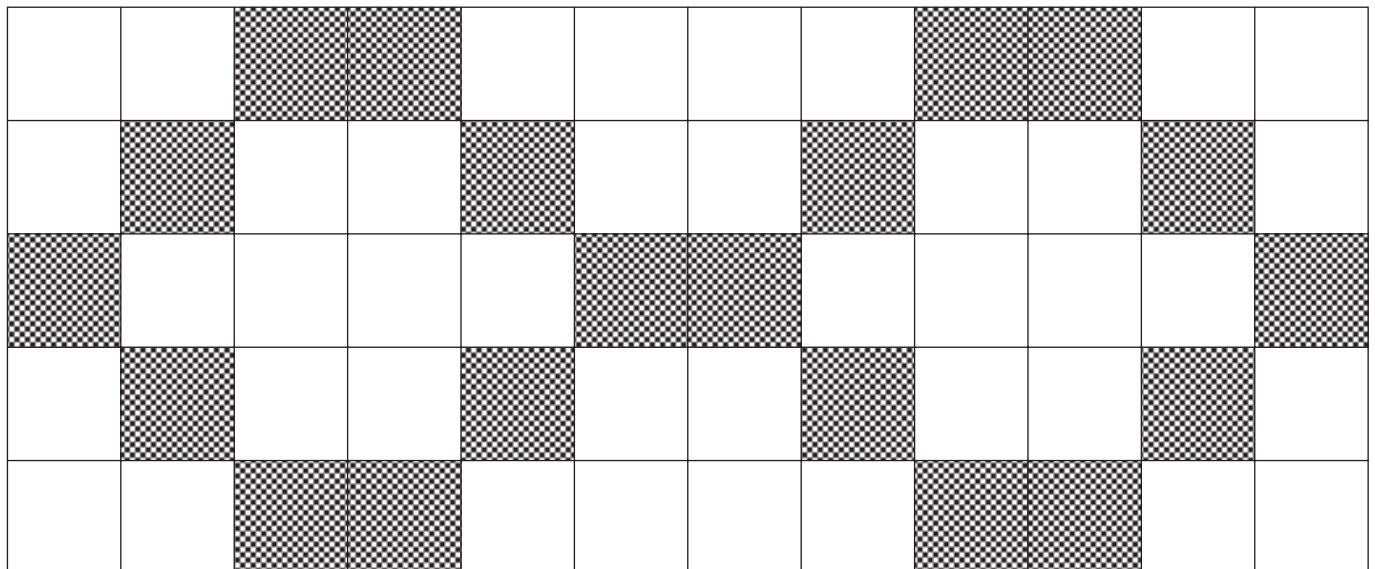
For each of the designs below, fill in the correct number of tiles in (a) to (d).

Design 1



- (a) Number blank (b) Number coloured
- (c) Fraction blank (d) Fraction coloured

Design 2



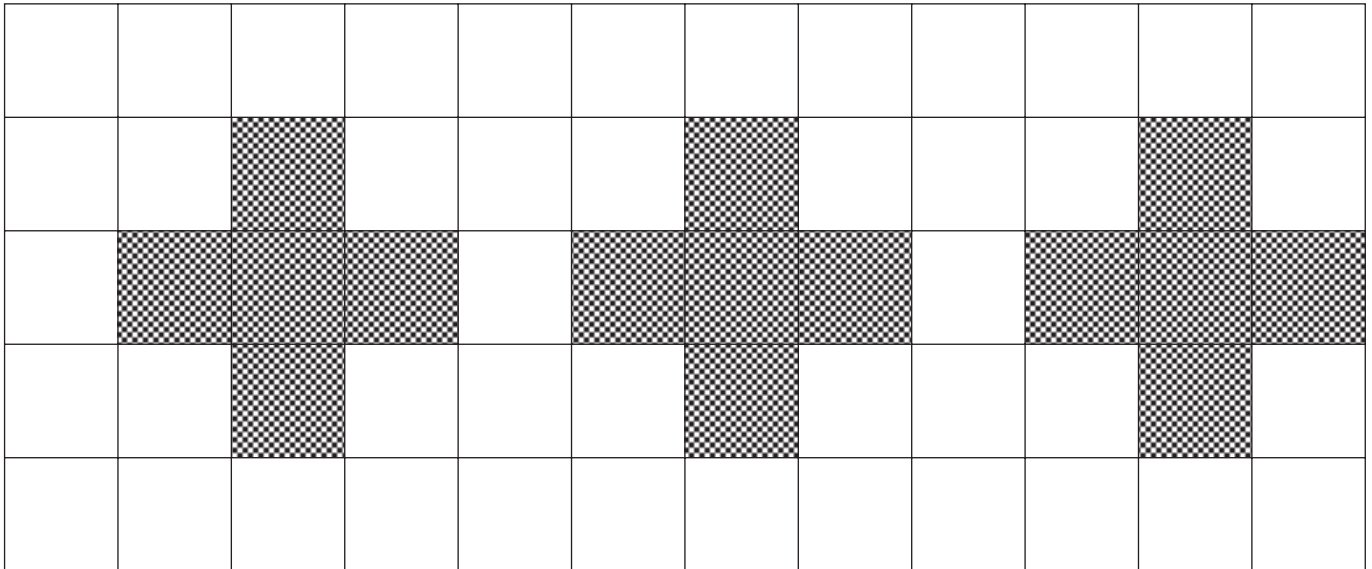
- (a) Number blank (b) Number coloured
- (c) Fraction blank (d) Fraction coloured

Case Study 1, WS7.2

Kevin's Mix and Match (1)

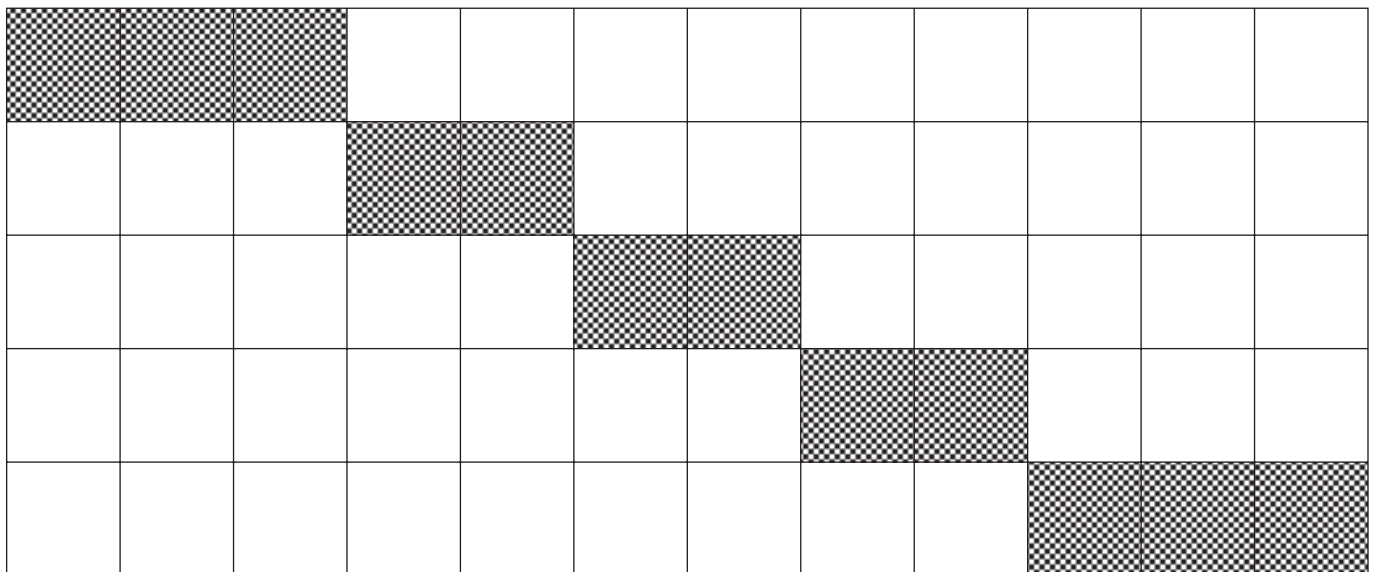
For each of the designs below, fill in the correct number of tiles in (a) to (d).

Design 3



- (a) Number blank (b) Number coloured
- (c) Fraction blank (d) Fraction coloured

Design 4



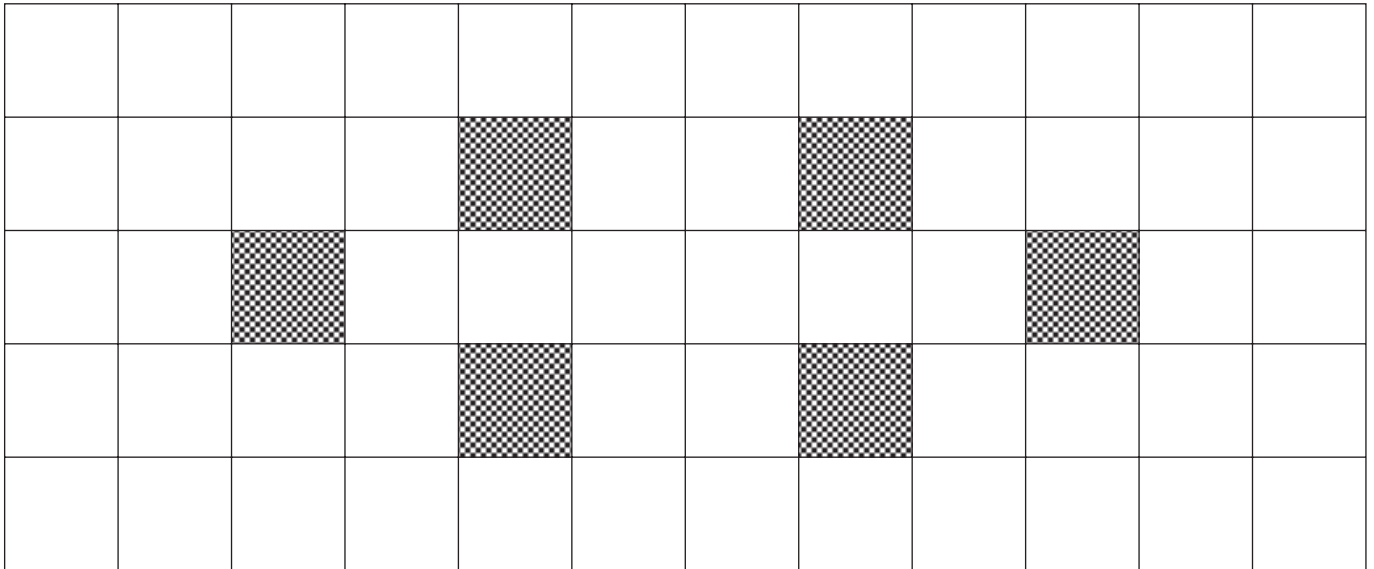
- (a) Number blank (b) Number coloured
- (c) % blank (d) % coloured

Case Study 1, WS7.3

Kevin's Mix and Match (1)

For each of the designs below, fill in the correct number of tiles in (a) to (d).

Design 5



- (a) Number blank
- (b) Number coloured
- (c) % blank
- (d) % coloured

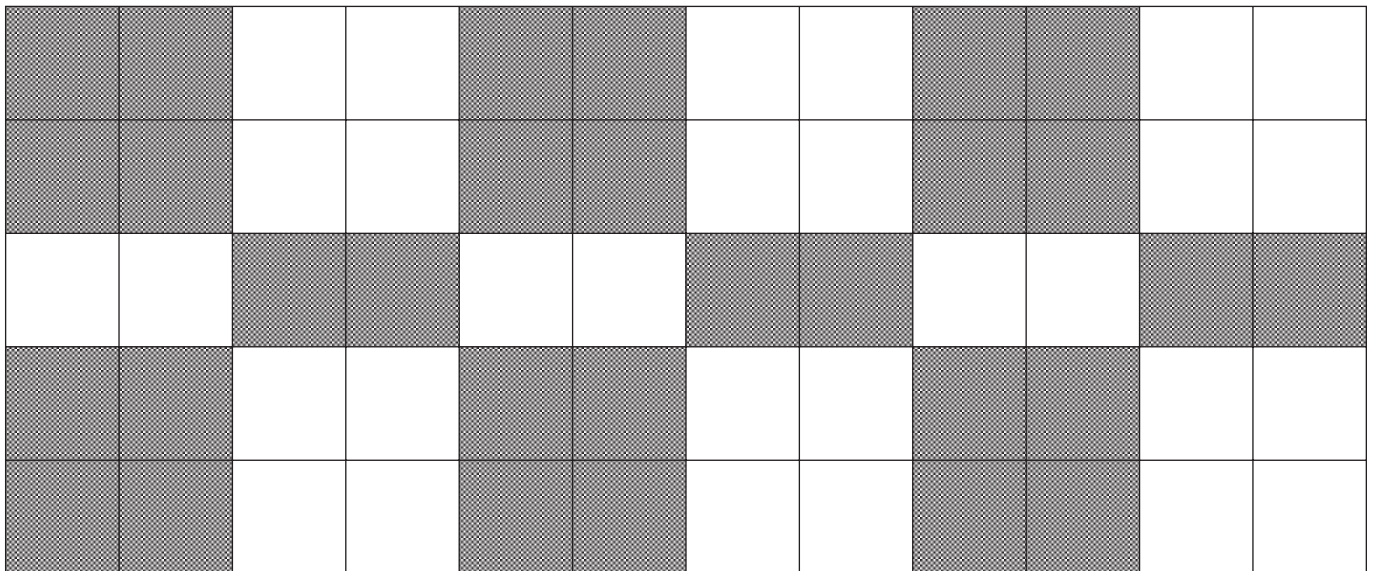
Case Study 1, HW2.1

Kevin's Mix and Match (2)

Kevin is using two contrasting colours of tiles.

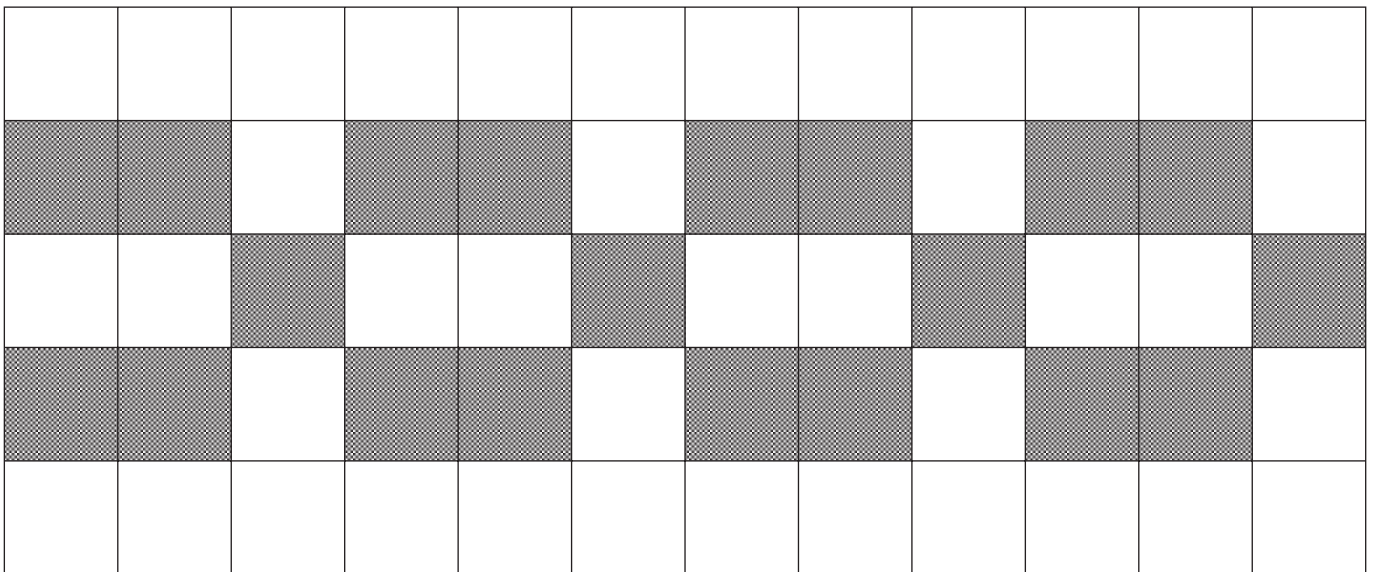
For each of the designs below, fill in the correct number of tiles in (a) to (d).

Design 1



- (a) Number blank (b) Number coloured
- (c) Fraction blank (d) Fraction coloured

Design 2



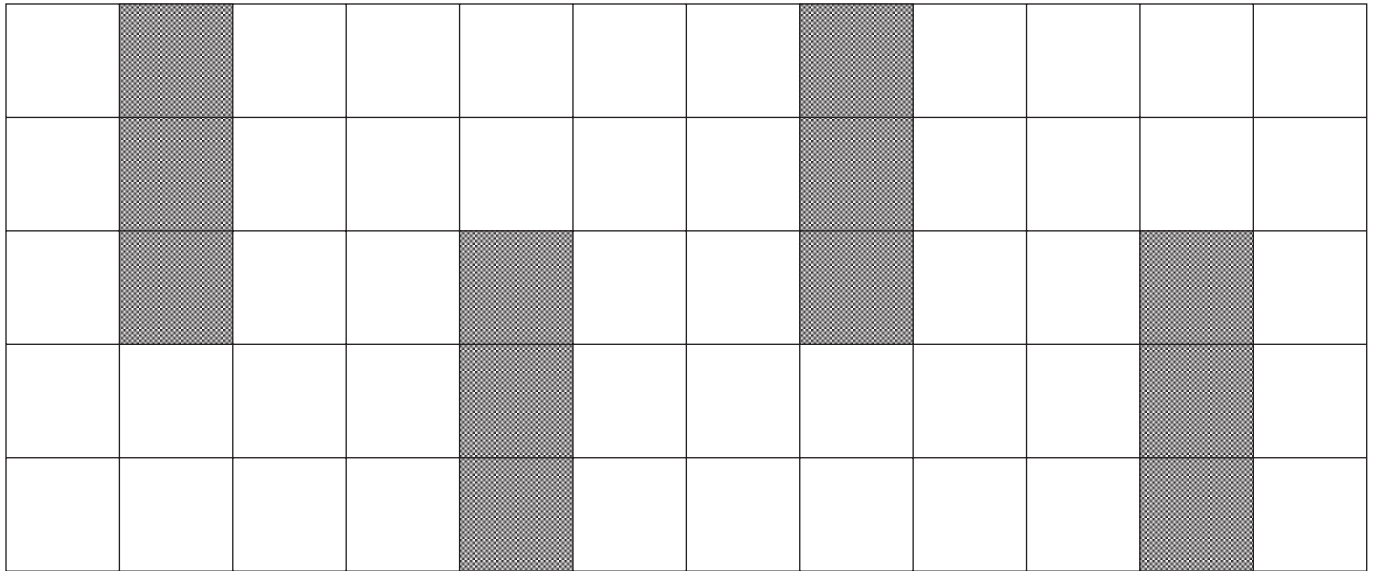
- (a) Number blank (b) Number coloured
- (c) Fraction blank (d) Fraction coloured

Case Study 1, HW2.2

Kevin's Mix and Match (2)

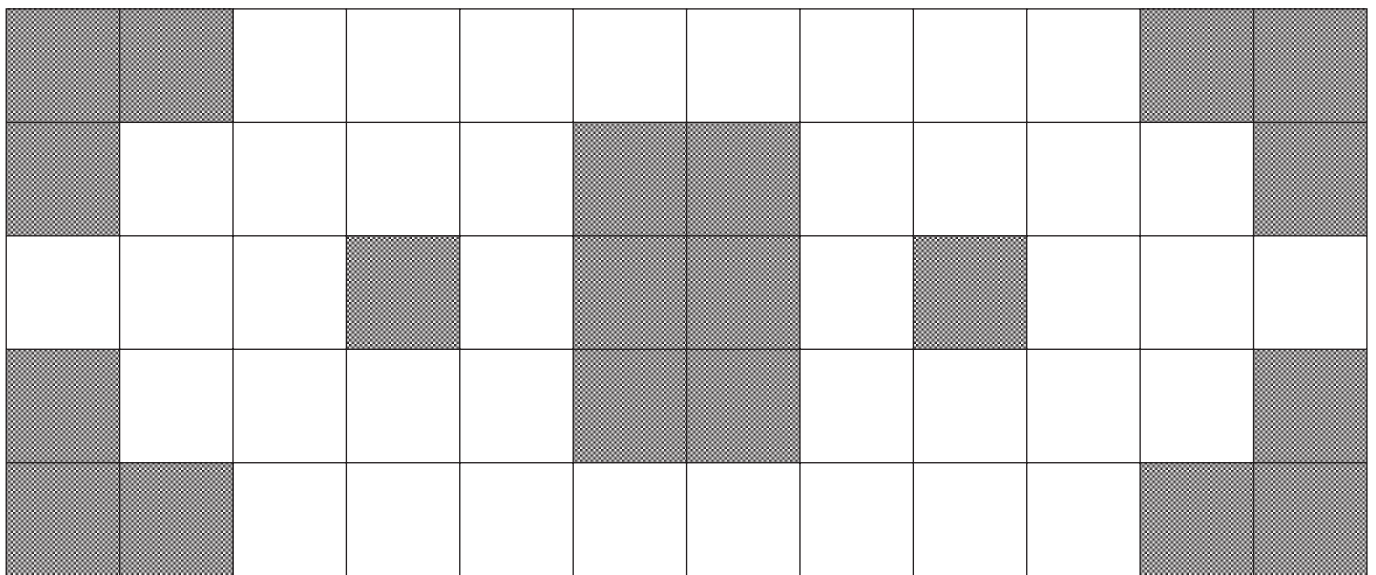
For each of the designs below, fill in the correct number of tiles in (a) to (d).

Design 3



- (a) Number blank (b) Number coloured
- (c) Fraction blank (d) Fraction coloured

Design 4



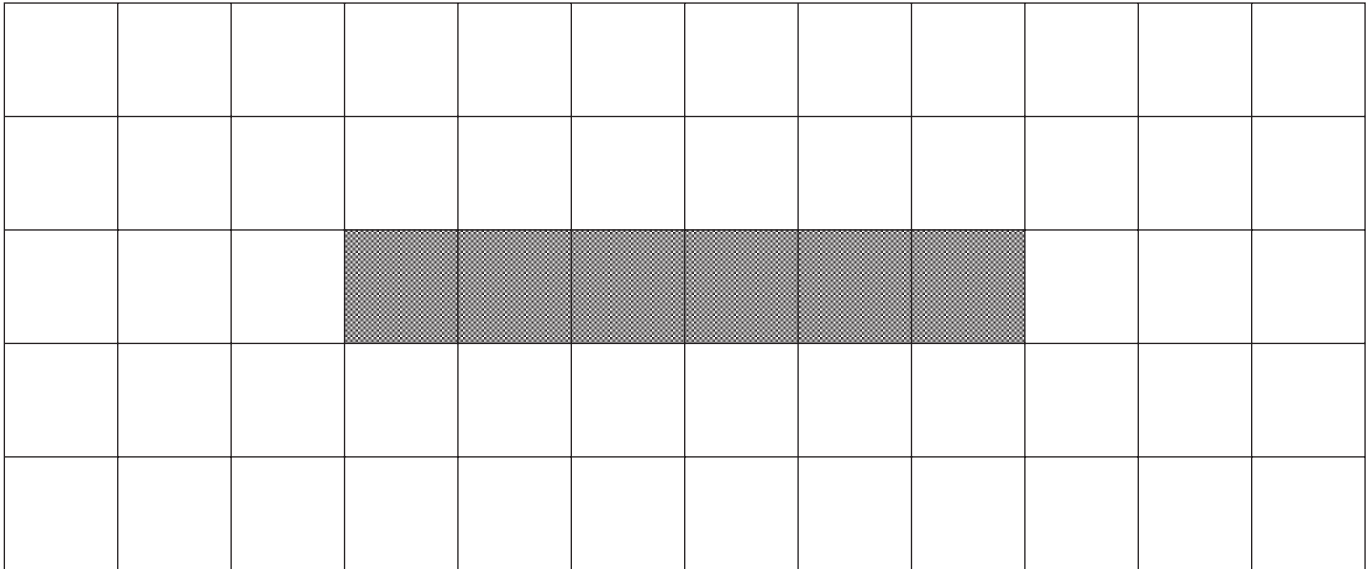
- (a) Number blank (b) Number coloured
- (c) Fraction blank (d) Fraction coloured

Case Study 1, HW2.3

Kevin's Mix and Match (2)

For each of the designs below, fill in the correct number of tiles in (a) to (d).

Design 5



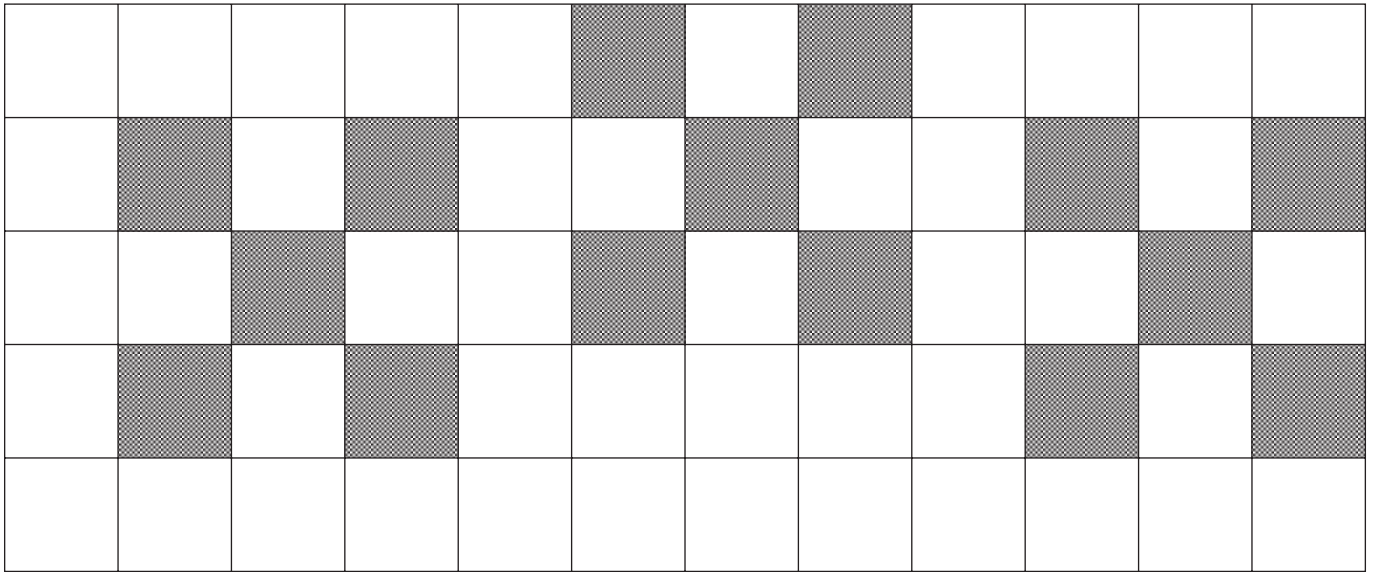
- (a) Number blank
- (b) Number coloured
- (c) Fraction blank
- (d) Fraction coloured

Case Study 1, HW3.1

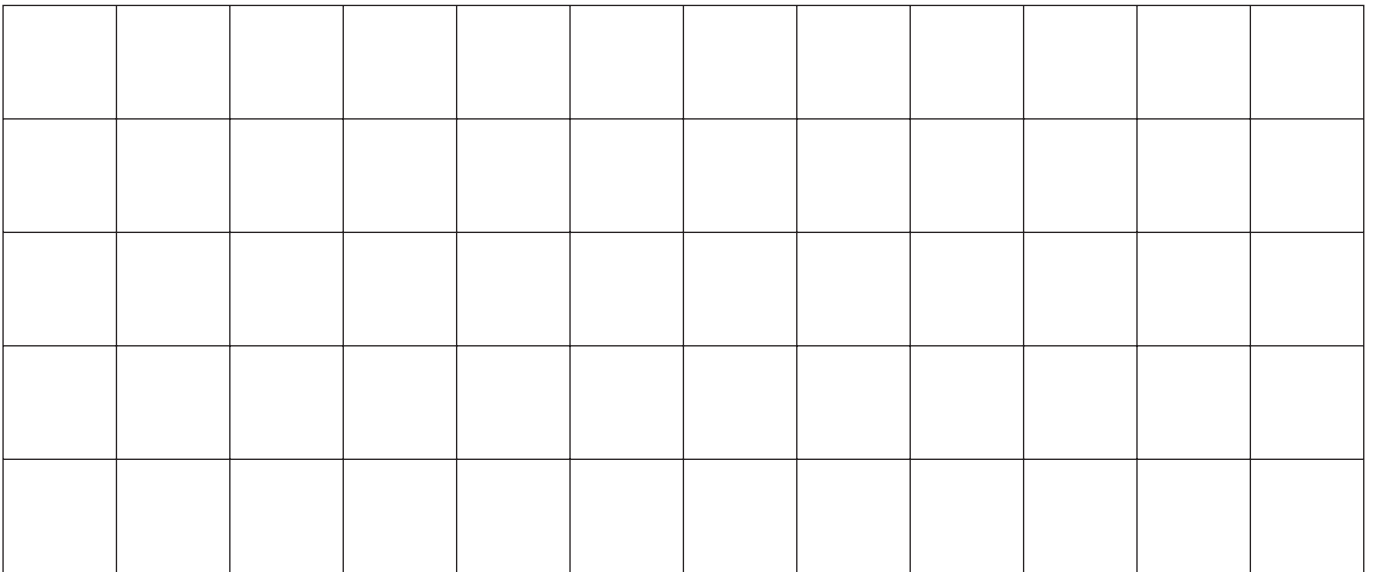
Kevin's Mix and Match (3)

Kevin has decided to use two contrasting colours of tiles.
In *Design 1* he has used coloured tiles for 25% of the design.
Shade 25% of the tiles in *Design 2*, to give a different pattern.

Design 1 : 25% COLOURED



Design 2 : 25% COLOURED



Case Study 1, HW3.2

Kevin's Mix and Match (3)

Shade 10% of the tiles in *Design 3*.

Shade 75% of the tiles in *Design 4*.

Design 3 : 10% COLOURED

Design 4 : 75% COLOURED

Case Study 1, HW3.3

Kevin's Mix and Match (3)

Shade 50% of the tiles in *Design 5*.

Shade 20% of the tiles in *Design 6*.

Design 5 : 50% COLOURED

Design 6 : 20% COLOURED

Case Study 1, WS8.1

Pricing Kevin's Tiles

To tile the space in his bathroom, Kevin needs 60 tiles (using the 15 cm × 15 cm tiles).

The *TILE WAREHOUSE* has a special offer. All tile prices are reduced by 25%. The table below shows the prices.

<i>Tile type</i> (Size 15 cm × 15 cm)	<i>Colour</i>	<i>Full Price</i> (per pack of 8 tiles)	<i>SALE PRICE</i> 25% off <i>Full Price</i>
NEW MEXICO	<i>Sierra</i> <i>Beige</i>	£3.92	.....
CONTESSA	<i>Lilac</i> <i>Cream</i>	£4.04	.....
EMPEROR	<i>Maroon</i> <i>Midnight Blue</i>	£6.96	.....

1. Work out the sale prices and write them in on the table.
2. How many packs of tiles will Kevin need to buy?
3. How many tiles will Kevin have left over?
4. If Kevin chooses the NEW MEXICO tiles, how much will it cost him to buy the tiles he needs at the *SALE PRICE*?
5. If Kevin had to pay the *FULL PRICE* for these tiles, how much would they cost him?
6. If Kevin chooses the CONTESSA tiles, how much will it cost him to buy the tiles he needs at the *SALE PRICE*?

Case Study 1, WS8.2

Pricing Kevin's Tiles

7. Kevin decides to buy two contrasting colours. He chooses *Midnight Blue* and *Lilac* tiles.

Complete the table to show the cost of buying a mix of *Midnight Blue* and *Lilac* tiles.

	Ⓐ		Ⓑ	
<i>Number of packs of Midnight Blue EMPEROR tiles</i>	<i>COST</i>	<i>Number of packs of Lilac CONTESSA tiles</i>	<i>COST</i>	<i>TOTAL COST (A + B)</i>
1		7		
2		6		
3		5		
4		4		
5		3		
6		2		
7		1		

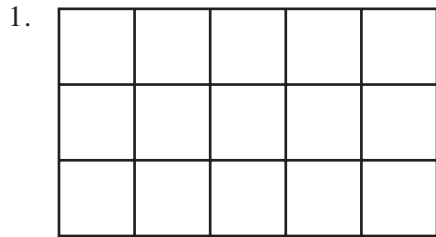
8. If Kevin is going to use 25% of the *Lilac* tiles, what percentage of *Midnight Blue* tiles will he use?
9. How many packs of *Lilac* tiles will Kevin need to buy if he wants to cover 25% of the wall in that colour?

Case Study 1, CP1 *Finding Areas and Perimeters (1)*

Remember: *Perimeter* is the distance *around the outside* of a shape.

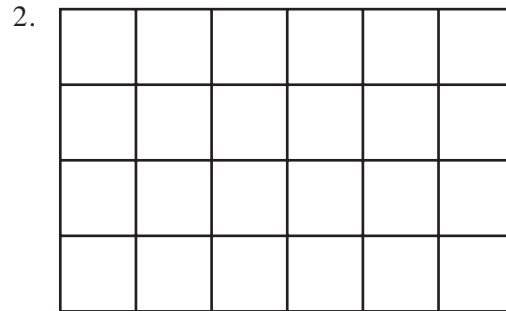
Area is the amount of space *inside* a shape.

Find the area and perimeter of each of these rectangles.



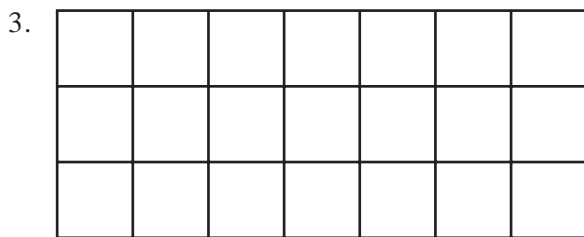
Area

Perimeter



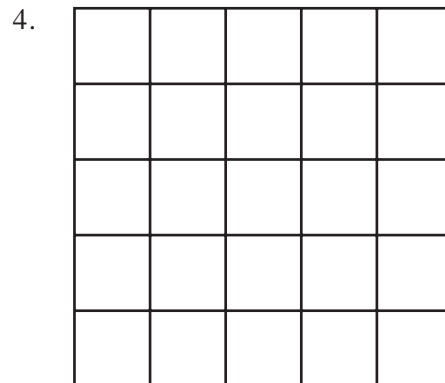
Area

Perimeter



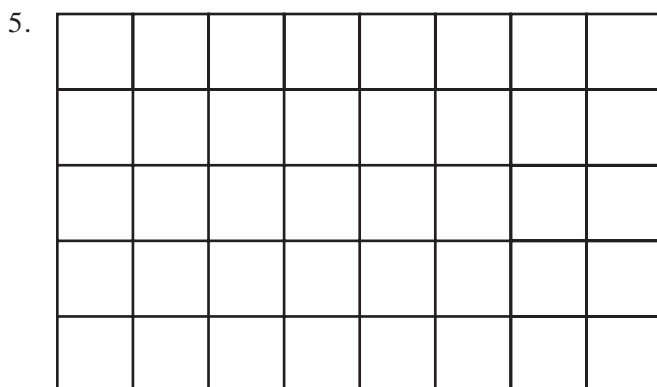
Area

Perimeter



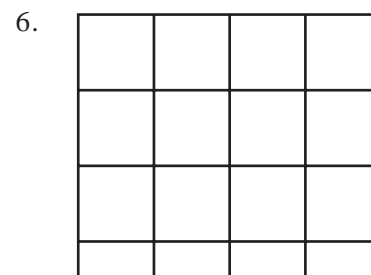
Area

Perimeter



Area

Perimeter



Area

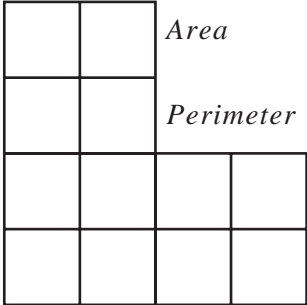
Perimeter

Case Study 1, CP2 *Finding Areas and Perimeters (2)*

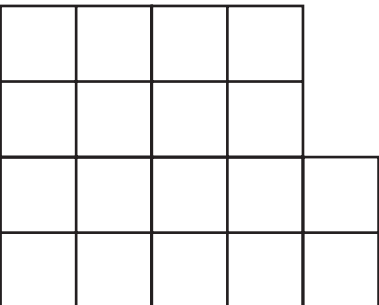
Remember: *Perimeter* is the distance *around the outside* of a shape.

Area is the amount of space *inside* a shape.

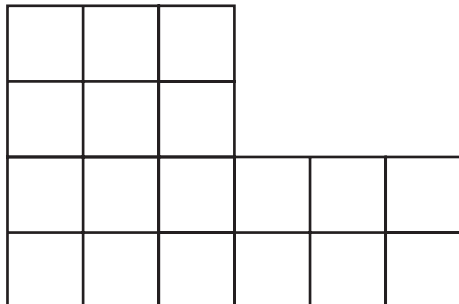
Find the area and perimeter of each of these shapes. (You may find it easier to break them up into rectangles.)

1.  *Area*

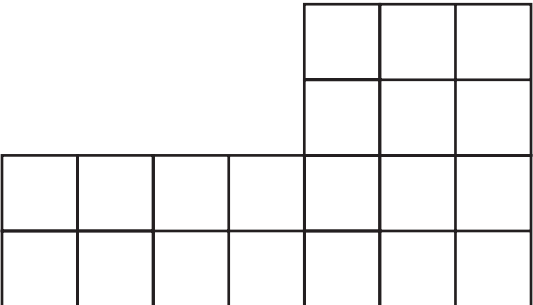
Perimeter

2.  *Area*

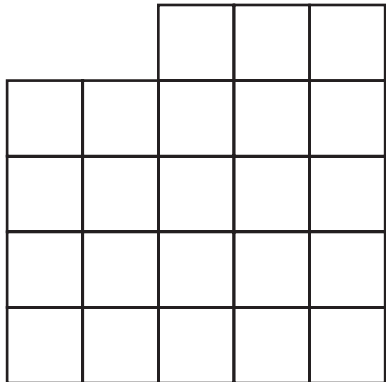
Perimeter

3.  *Area*

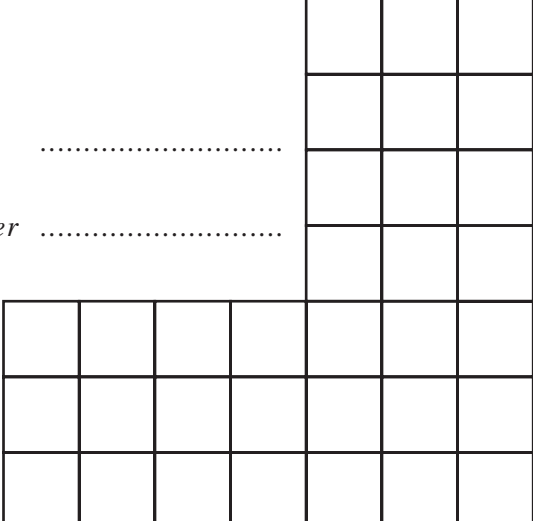
Perimeter

4.  *Area*

Perimeter

5.  *Area*

Perimeter

6.  *Area*

Perimeter

Case Study 1, Test 1

Tiling the Bathroom

Alice wants to tile part of a wall in her bathroom. She makes a scale drawing of the area she wants to tile.

The scale is 1 cm to 10 cm.

<i>Length :</i>	.....
<i>Width :</i>	.....
<i>Actual length :</i>	.....
<i>Actual width :</i>	.....

1. Measure the length and width of Alice's drawing.
2. Work out the *actual* length and width of the area to be tiled.
3. If Alice want to place edging around the outside of this area, how much edging would she need?
4. (a) Show how Alice could tile this area with the 15 cm × 15 cm tiles.

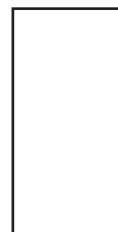


Use this tile
←
in here



Case Study 1, Test 1

4. (b) Show how Alice could tile this area with the 15 cm × 30 cm tiles.



Use this tile
←
in here

5. Alice decides to use the 15 cm × 15 cm tile.
How many tiles will she need?

6. The tiles are sold in packs of 10.
How many packs will Alice need to buy?

7. How many tiles will Alice have left over?

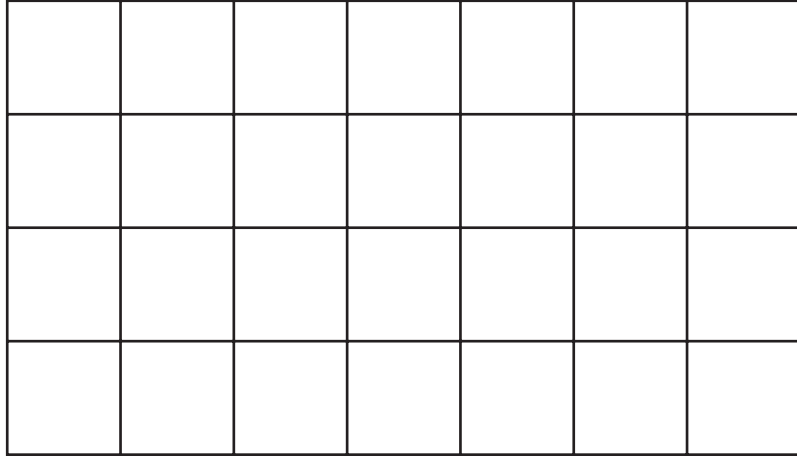
8. Alice decides to use two colours of tiles. She will use 25%
or one quarter of red tiles and the remainder will be pink.
(a) How many packs of red tiles will Alice need to buy?

(b) How many packs of pink tiles will Alice need to buy?

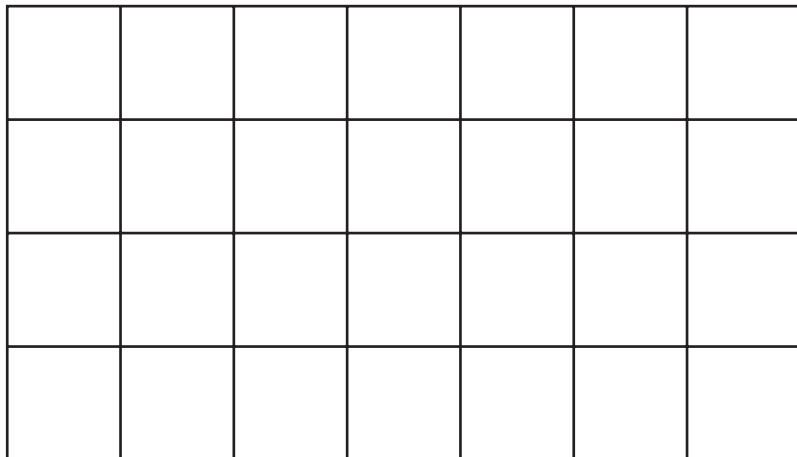
9. The red tiles cost £5.58 per pack and the pink tiles cost
£5.36 per pack.
How much will Alice have to pay for her tiles?

Case Study 1, Test 1

10. (a) Shade in 25% of this tiling area.



- (b) Shade in 50% of this tiling area.



- (c) Shade in $\frac{2}{3}$ of this tiling area.

