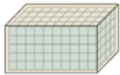



Year 6 maths – Summer 2 Week beginning: 29.6.20

Theme	Position and Movement (Lesson 4 of 4) Describing Movement	Area and volume (Lesson 1 of 1) <u>Recap</u> of year 5 volume	Volume (Lesson 1 of 5) Finding the volume of cubes and cuboids	Volume (Lesson 2 of 5) Finding the volume of cubes and cuboids	Volume (Lesson 3 of 5) Finding the volume of cubes and cuboids
Factual fluency (to aid fluency)	Objects in 4 quadrants <u>Activity</u>	Converting between fractions and decimals <u>Activity</u>	Converting between decimals and fractions <u>Activity</u>	Rounding decimals <u>Activity</u>	Comparing decimals and fractions <u>Activity</u>
<p>Problem/ activity of the day</p> <p>Remember, just like in class, you can still show the depth of your knowledge LINK</p>	<p>(Lesson 1 resources below) MAKING LINKS: Last week, we described movement. Today we are going to continue describing movement.</p> <p>THINK: (support below) Can you help me with this? My friend says that the red figure has been <u>translated</u> to end up where the blue figure is but I think it has been <u>reflected</u> not translated. What do you think? How do you know?</p> <p>Our problem is on <u>textbook</u> page 194. Look at it now.</p> <p>SEE: (model below) Look for how to solve the problem on page 195-196 of your textbook.</p> <p>DO: Use what you have learnt today to solve: <u>Part 1:</u> complete questions 2 and 3, from textbook page 198-199.</p> <p>Check your answers before moving onto: <u>Part 2:</u> Workbook, Chapter 13, Worksheet 8, pages 142-143.</p>	<p>(Lesson 2 resources below) MAKING LINKS: Yesterday we described movement. Today we are going to recap area and volume from year 5.</p> <p>THINK: (support below) Can you help me with this problem? My friend cannot remember how to work out the volume of a figure. Can you help?</p> <div style="text-align: center;"></div> <p>How is this different to calculating area?</p> <p><i>If you have access to the year 5 online parent guides, this problem is based on year 5, textbook 5B, chapter 13, lessons 1 to 4. Or you can watch the year 5 lesson video here.</i></p> <p>SEE: (model below) Look at how to solve the problem below.</p> <p>DO: Use what you have learnt today to solve: <u>Part 1:</u> questions 1 and 2 below. Check your answers before moving onto: <u>Part 2:</u> Complete these questions in your maths books.</p>	<p>(Lesson 3 resources below) MAKING LINKS: Yesterday we recapped our year 5 learning about area and volume. Today we are going to begin our year 6 work on volume.</p> <p>THINK: (support below) Can you help me with this problem? My friend has made different cubes and cuboids with 12 smaller cubes. Can you help check that what he has done is correct?</p> <div style="text-align: center;"></div> <p>Our problem is on <u>textbook</u> page 102. Look at it now.</p> <p>SEE: (model below) Look at the different ways to solve the problem shown on pages 102-103 of your textbook.</p> <p>DO: Use what you have learnt today to solve: <u>Part 1:</u> complete the questions from textbook page 104.</p> <p>Check your answers before moving onto: <u>Part 2:</u> Workbook, Chapter 11, Worksheet 1, pages 89-90.</p>	<p>(Lesson 4 resources below) MAKING LINKS: Yesterday we found the volume of cubes and cuboids. Today we are going to continue with that.</p> <p>THINK: (support below) Can you help me with this problem? My friend says the red cuboid occupies a much larger space than the green cube because it is so much taller. Do you agree?</p> <p>Our problem is on <u>textbook</u> page 105. Look at it now.</p> <p>SEE: (model below) Look at the ways to solve the problem shown on pages 105-106 of your textbook.</p> <p>DO: Use what you have learnt today to solve: <u>Part 1:</u> complete questions 2 - 4 from textbook page 107.</p> <p>Check your answers before moving onto: <u>Part 2:</u> Workbook, Chapter 11, Worksheet 2, pages 91-92.</p>	<p>(Lesson 5 resources below) MAKING LINKS: Yesterday we found the volume of figures. Today we are going to continue with that.</p> <p>THINK: (support below) Can you help me with this problem? If the dimensions of a small cube with a volume of 1 cm³ are 1 cm × 1 cm × 1 cm, then what would the dimensions of a 1 m³ cube be?</p> <p>Our problem is on <u>textbook</u> page 108. You do not need to make a cube with a volume of 1 m³. You can estimate.</p> <p>SEE: (model below) Look at the ways the characters in the textbook solved the problem on pages 108 - 109 of your textbook.</p> <p>DO: Use what you have learnt today to solve: <u>Part 1:</u> complete question 2 from textbook page 110.</p> <p>Check your answers before moving onto: <u>Part 2:</u> Workbook, Chapter 11, Worksheet 3, pages 93-94.</p>
Methods, tips, clues & checks	Day 1 resources and answers (below)	Day 2 resources and answers (below)	Day 3 resources and answers (below)	Day 4 resources and answers (below)	Day 5 resources and answers (below)

See below for resources to support you to THINK-SEE-DO

DAY 1 RESOURCES:

THINK: Our problem is on textbook page 194.

My friend says that the red figure has been translated to end up where the blue figure is but I think it has been reflected not translated.

What do you think?
How do you know?

DO:

Part 1: complete questions 2 and 3 from textbook page 198-199.

Check your answers before moving onto:

Part 2: Workbook, Chapter 13, Worksheet 8, pages 142-143.

Deepening:

Complete the Mind workout on page 148 of your workbooks.

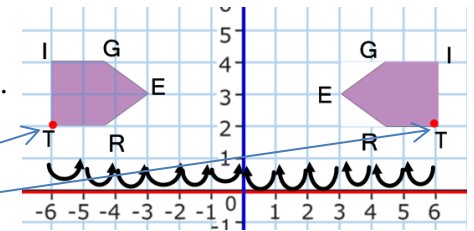
SEE: Look for how to solve the problem on page 195-196 of your textbook.

Last week we looked at how to describe co-ordinates. Watch the lesson [video](#) from last week to remind yourself if you are still unsure.

Remember:

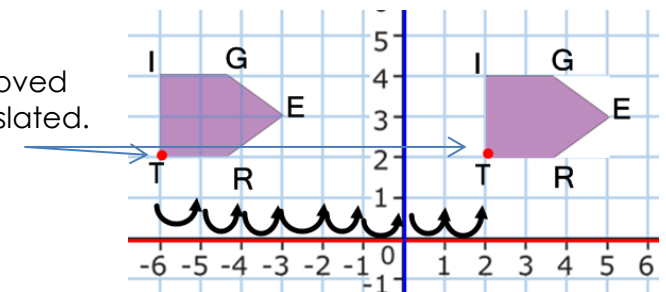
- REFLECTION of a shape means the shape will end up the opposite way around, like you see in a mirror.

So point T would be in the opposite position if it were reflected in the y-axis. If we were to make a fold along the y-axis, the same points on each shape would be the same distance away from the axis.



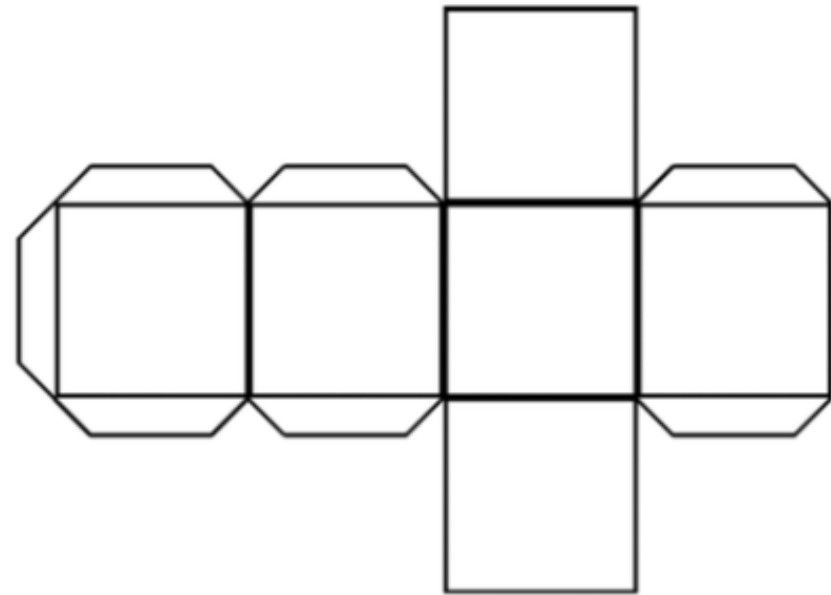
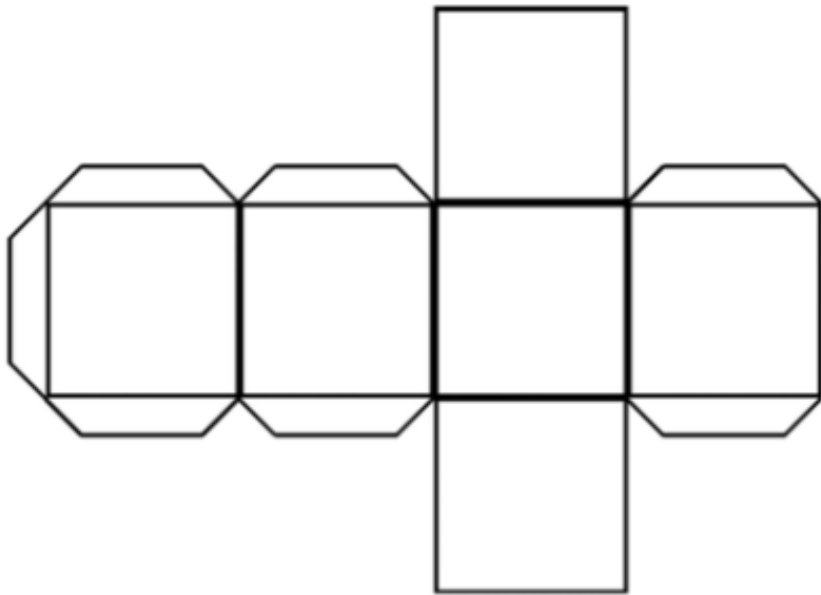
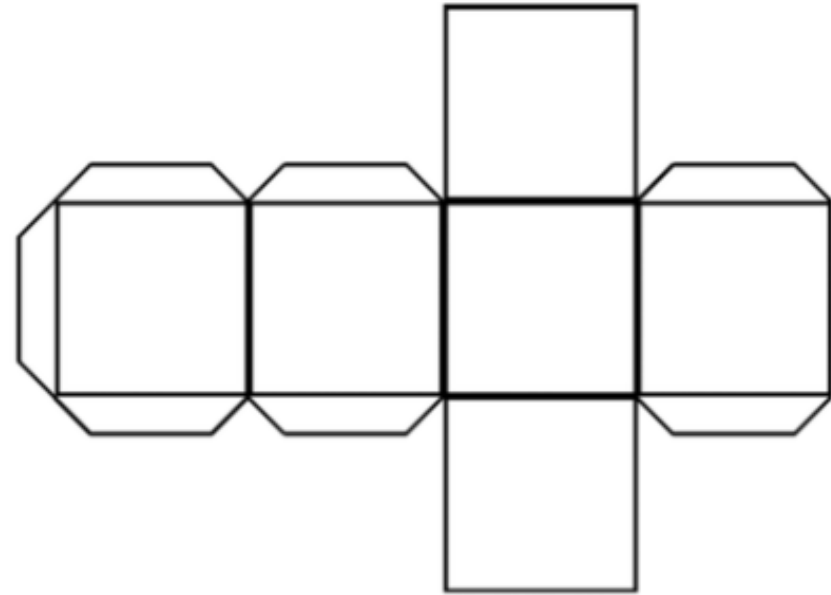
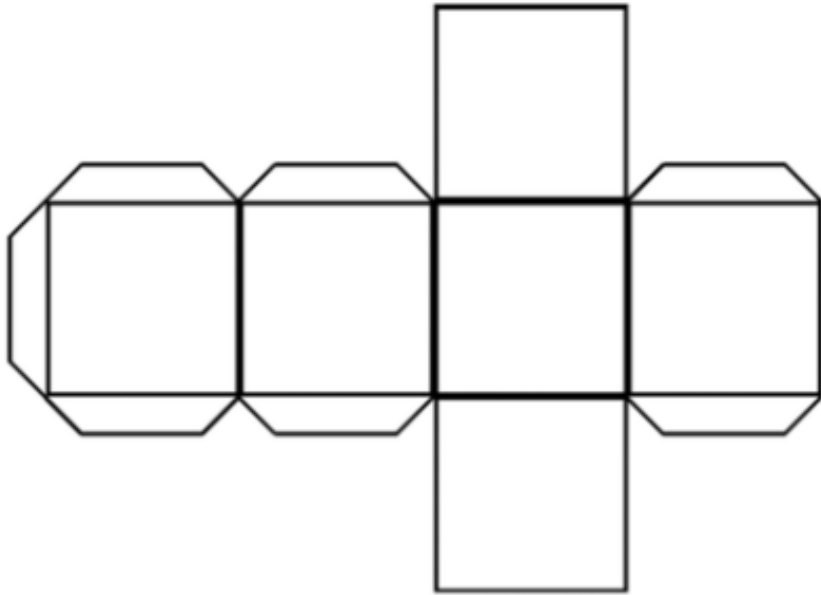
- TRANSLATION of a shape means the figure will remain the same way round but will move position, as if the shape has slid forward or back, up or down.

So point T would have moved **8 units right** if it were translated.



Now check the shapes in the textbook. Which ones are translated and which ones are reflected?

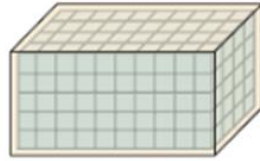
As in year 5, the use of cubes is referenced in some of our volume lessons. Stock cubes, sugar cubes, liquorice allsorts or toy bricks could be used or use the nets below to make your own cubes. The use of 'real' cubes is useful but not essential.



DAY 2 RESOURCES:

THINK: Our problem is a recap of the year 5 learning on volume.

My friend cannot remember how to work out the volume of a figure. Can you help?



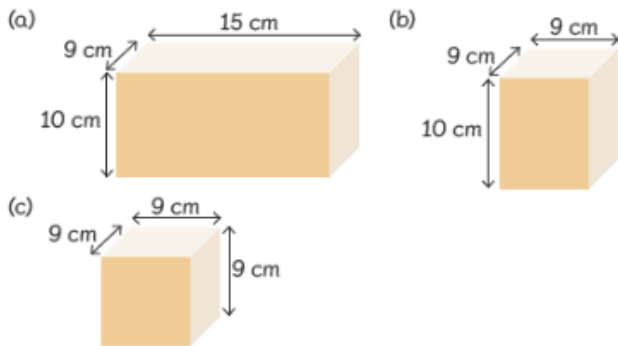
How is this different to calculating area?

If you have access to the year 5 online parent guides, this problem is based on year 5, textbook 5B, chapter 13, lessons 1 to 4. Or you can watch the year 5 lesson [video here](#).

DO:

Part 1: complete the question below.

What is the volume of each of these figures?



Check your answers before moving onto:

Part 2: Complete the questions below in your maths books.

Deepening:

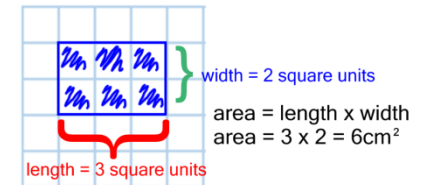
A cuboid has a volume of 72cm^3 . If the length, width and height are all whole numbers, how many different sets of measurements can you find?

SEE: Look for how to solve the problem below.

If you remember, in year 4 and 5 we learnt about area and volume:

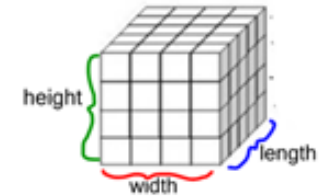
Area = the amount of space contained within the outline of a 2-D figure, measured in squared units (such as cm^2 , m^2).

We calculate area of a rectangle by multiplying its length and width ($a = l \times w$).



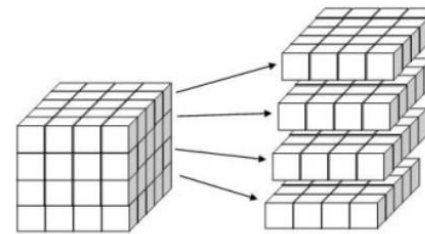
Volume = the amount of space inside a 3-D object, measured in cubed units, (such as cm^3 , m^3).

We calculate volume of a cube or cuboid by multiplying its length, width and height ($v = l \times w \times h$).



Volume:

We work out volume by looking at the amount of cubes that make up the figure. We cannot see all the cubes.



In this figure we have 4 layers of cubes. Each layer is made of 5 rows of 4 cubes because the width is 4 cubes wide and the length is 5 cubes long. $5 \times 4 = 20$ cubes on each layer.

There are 4 layers of 20 cubes each. $4 \times 20 = 80 \text{ cm}^3$

Remember, **volume = width x length x height**

You can work out how many cubes there are in each layer by multiplying the number of cubes in the **width** by the number of cubes in the **length**. Then multiply the amount of cubes in each layer by the number of layers (its **height**).

DAY 2 RESOURCES continued:

DO:

Part 2:

Complete the table.

Kloggs Cereal Company is wanting to sell its new breakfast cereal—Choco Crispy Poppers. A 500g portion will take up 700cm^3 . The box manufacturer makes 3 sizes of cardboard boxes:

Box	Length (cm)	Width (cm)	Height (cm)	
A	40	4	4	
B	25	5	6	
C	30	6	4	

Which box would be most suitable for a 500g portion of Choco Crispy Poppers?

DAY 3 RESOURCES:

THINK: Our problem is on textbook page 102.

My friend has made different cubes and cuboids with 12 smaller cubes. Can you help check that what he has done is correct?



DO:

Part 1: complete the questions from textbook page 104.

Check your answers before moving onto:

Part 2: Workbook, Chapter 11, Worksheet 1, pages 89-90.

Deepening:

Find the missing measurements in this table:

Length	Width	Height	Volume
10cm	4cm	3cm	
	6cm	2cm	60cm^3
8cm	2cm		48cm^3
10m		6m	180m^3
9mm	2mm		72mm^3

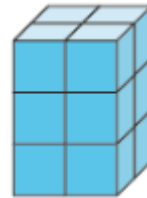
SEE: Look at the different ways to solve the problem shown on pages 102-103 of your textbook.

Each small cube takes up 1 cubic centimetre of space.

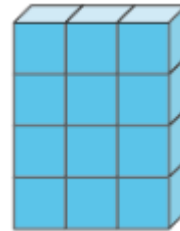
That means that the dimensions of each small cube are:
 $1\text{ cm} \times 1\text{ cm} \times 1\text{ cm}$
This is its volume and can be written as 1 cm^3 .



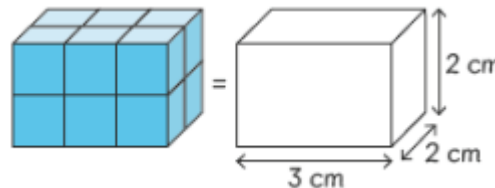
All these shapes are made with $12 \times 1\text{ cm}^3$ cubes so they all have a volume of 12 cm^3 .



Each layer is 2×2 cubes = 4 cubes.
There are 3 layers.
 3×4 cubes = 12 cm^3 .



Each layer is 3×1 cubes = 3 cubes.
There are 4 layers.
 4×3 cubes = 12 cm^3 .



Each layer is 3×2 cubes = 6 cubes.
There are 2 layers.
 2×6 cubes = 12 cm^3 .

When we have the measurements for the length, width and height of the figure we can multiply them together to find the volume.

DAY 4 RESOURCES:

THINK: Our problem is on textbook page 105.

My friend says the red cuboid occupies a much larger space than the green cube because it is so much taller. Do you agree?

DO:

Part 1: complete the questions 2 - 4 from textbook page 107.

Check your answers before moving onto:

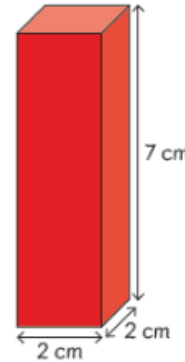
Part 2: Workbook, Chapter 11, Worksheet 2, pages 91-92.

Deepening:

At a factory, a 1 m^3 cube of sponge is cut into smaller cubes with 8-cm sides.

What is the greatest number of smaller cubes that can be cut from the large sponge cube?

SEE: Look at the ways to solve the problem shown on pages 105-106 of your textbook.

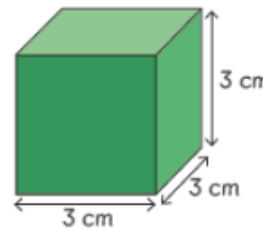


If our cuboid was made of 1 cm^3 cubes we would calculate each layer as 2×2 cubes = 4 cubes.

Then we would multiply 4 cubes by the number of layers: $7 \times 4 = 28$ cubes.

Now we can use the measurements shown:

$$2\text{cm} \times 2\text{cm} \times 7\text{cm} = 28\text{cm}^3$$



If our cube was made of 1 cm^3 cubes we would calculate each layer as 3×3 cubes = 9 cubes.

Then we would multiply 9 cubes by the number of layers: $3 \times 9 = 27$ cubes.

Now we can use the measurements shown:

$$3\text{cm} \times 3\text{cm} \times 3\text{cm} = 27\text{cm}^3$$

NOTE: the formula in the textbooks is $v = l \times b \times h$.
In this formula the initials stand for: volume = length x breadth x height.
Breadth is another word to describe width.

DAY 5 RESOURCES:

THINK: Our problem is on textbook page 108. You do not need to make a cube with a volume of 1 m^3 . You can estimate.

If the dimensions of a small cube with a volume of 1 cm^3 are $1 \text{ cm} \times 1 \text{ cm} \times 1 \text{ cm}$, then what would the dimensions of a 1 m^3 cube be?

How many 1 m^3 cubes do you think would fit into your kitchen or your classroom?

DO:

Part 1: complete question 2 from textbook page 110.

Check your answers before moving onto:

Part 2: Workbook, Chapter 11, Worksheet 3, pages 93-94.

Deepening:

Find the largest number of 3cm^3 cubes that can be fitted into a box with the measurements below:

Length = 50cm

Width = 20cm

Height = 36cm

SEE: Look at the ways the characters in the textbook solved the problem on pages 108 - 109 of your textbook. Each character estimated how many 1 m^3 cubes could fit into their classroom.

To give you an idea of what 1 m^3 looks like see below. Eight of those boxes make 1 m^3 .

How many 1 m^3 do you think it would take to fill your kitchen or your classroom?



Calculate the volume of these storage boxes:



Remember,
volume = width x length x height

$$2.5 \times 2 = 5$$

$$5 \times 2 = 10 \text{ m}^3$$

Does it matter if I multiply the whole numbers first? Let's check:

$$2 \times 2 = 4$$

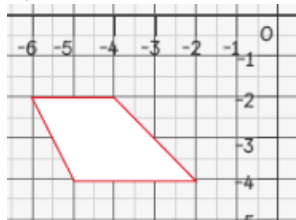
$$4 \times 2.5 = 10 \text{ m}^3$$

ANSWERS – part 1:

Day 1

Part 1:

Q.2a:



vertex	coordinates before reflection
P	(-6, 2)
E	(-4, 2)
A	(-2, 4)
R	(-5, 4)

coordinates after reflection	
	(-6, -2)
	(-4, -2)
	(-2, -4)
	(-5, -4)

Q.2b: Yes, translation down by 4 units.

Q.3:

a) 8 units left,

b) 8 units up,

c) reflection in the x-axis,

d) 6 units down and then reflection in the y-axis.

Day 2

Part 1:

a) 1350 cm^3 , b) 810 cm^3 ,
c) 729 cm^3

Day 3

Part 1:

Q.1:

a) 12 cm^3 , b) 24 cm^3

Q.2:

a) 8 cm^3 , b) 24 cm^3 ,

c) 27 cm^3 , d) 9 cm^3

Day 4

Part 1:

Q.2:

a) 90 cm^3 , b) 1800 cm^3

Q.3: 64 cm^3

Q.4: $10 \times 15 \times 20 = 3000 \text{ cm}^3$
 $3000 - (6 \times 6 \times 6) = 2784 \text{ cm}^3$ of
clay is needed to make the
vase.

Day 5

Part 1:

Q.2:

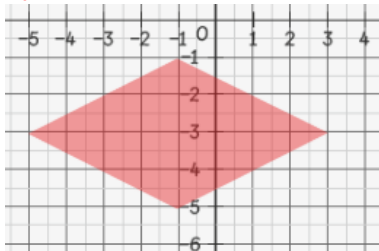
a) 6 m^3 , b) 1.5 m^3 , c) 0.125 m^3

ANSWERS – part 2 and deepening:

Day 1

Part 2: Workbook,

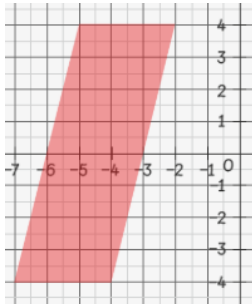
Q.1:



point	coordinates
A	(3, 3)
B	(-1, 1)
C	(-5, 3)
D	(-1, 5)

after translation	after reflection
(3, -3)	(3, -3)
(-1, -5)	(-1, -1)
(-5, -3)	(-5, -3)
(-1, -1)	(-1, -5)

Q.2:



point	coordinates
P	(2, 4)
Q	(5, 4)
R	(7, -4)
S	(4, -4)

Day 2

Part 2:

Box	Length (cm)	Width (cm)	Height (cm)	Volume cm ³
A	40	4	4	640
B	25	5	6	750
C	30	6	4	720

Volume cm ³
640
750
720

Box C would be most suitable.

DEEPENING:

$$72 \times 1 \times 1$$

$$36 \times 2 \times 1$$

$$24 \times 3 \times 1$$

$$18 \times 4 \times 1$$

$$18 \times 2 \times 2$$

$$12 \times 6 \times 1$$

$$12 \times 3 \times 2$$

$$9 \times 8 \times 1$$

$$9 \times 4 \times 2$$

$$6 \times 4 \times 3$$

Day 3

Part 2: Workbook,

Q.1:

- a) 24 cm³, b) 45 cm³,
c) 64 cm³, d) 108 cm³.

Q.2:

- a) 8cm³, b) 64 cm³,
c) 27 cm³, d) 125 cm³.

DEEPENING:

Length	Width	Height	Volume
10cm	4cm	3cm	120cm ³
5cm	6cm	2cm	60cm ³
8cm	2cm	3cm	48cm ³
10m	3m	6m	180m ³
9mm	2mm	4mm	72mm ³

Day 4

Part 2: Workbook,

Q.1:

- a) 648 cm³, b) 216 cm³,
c) 729 cm³, d) 1144 cm³.

Q.2:

Could be $4 \times 4 \times 9 = 144 \text{ cm}^3$
Or $9 \times 9 \times 4 = 324 \text{ cm}^3$

DEEPENING:

100 divided by 8 = 12.5
 $12 \times 12 \times 12 = 1728$ smaller cubes.

Day 5

Part 2: Workbook,

Q.1:

- a) 72m³, b) 125m³,
c) 12m³, d) 150m³.

Q.2:

- a) 720m³, b) 787.5m³,
c) 750m³, d) 729m³,
e) 793.8 m³, f) 720 m³.

Q.3:

- a) E, b) A and F.

DEEPENING:

36 divided by 3 = 12
20 divided by 3 = 6.67
 $50 \times 3 = 16.67$

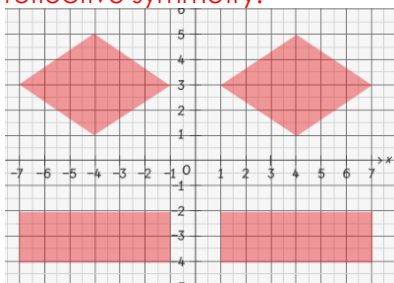
$12 \times 6 \times 16 = 1152$ cubes

after translation	after reflection
$(-2, 4)$	$(-2, 4)$
$(1, 4)$	$(-5, 4)$
$(3, -4)$	$(-7, -4)$
$(0, -4)$	$(-4, -4)$

P remains in the same position whilst the other points move.

DEEPENING:

- a) Yes.
- b) Yes, if it has a line of reflective symmetry.



Reflect in the y-axis.
Translate 8 units right.