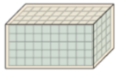
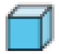
# Year 6 maths – Summer 2 Week beginning: 29.6.20

| Theme | Position and Movement<br>(Lesson 4 of 4)<br>Describing Movement | Area and volume<br>(Lesson 1 of 1)<br>Recap of year 5 volume | Volume<br>(Lesson 1 of 5)<br>Finding the volume of cubes and cuboids | Volume<br>(Lesson 2 of 5)<br>Finding the volume of cubes and cuboids | Volume<br>(Lesson 3 of 5)<br>Finding the volume of cubes and cuboids |
|---|---|---|---|---|---|
| Factual fluency (to aid fluency) | **Objects in 4 quadrants**<br>Activity | **Converting between fractions and decimals**<br>Activity | **Converting between decimals and fractions**<br>Activity | **Rounding decimals**<br>Activity | **Comparing decimals and fractions**<br>Activity |
| **Problem/ activity of the day**<br><br>**Remember, just like in class, you can still show the depth of your knowledge**<br>LINK | **(Lesson 1 resources below)**<br>**MAKING LINKS:** Last week, we described movement. Today we are going to continue describing movement.<br><br>**THINK: (support below)**<br>Can you help me with this? 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?<br><br>Our problem is on textbook page 194.<br>Look at it now.<br><br>**SEE: (model below)**<br>Look for how to solve the problem on page 195-196 of your textbook.<br><br>**DO:** Use what you have learnt today to solve:<br>Part 1: complete questions 2 and 3, from textbook page 198-199.<br><br>Check your answers before moving onto:<br>Part 2: Workbook, Chapter 13, Worksheet 8, pages 142-143. | **(Lesson 2 resources below)**<br>**MAKING LINKS:** Yesterday we described movement. Today we are going to recap area and volume from year 5.<br><br>**THINK: (support below)**<br>Can you help me with this problem? My friend cannot remember how to work out the volume of a figure. Can you help? <br>How is this different to calculating area?<br><br>*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.*<br><br>**SEE: (model below)**<br>Look at how to solve the problem below.<br><br>**DO:** Use what you have learnt today to solve:<br>Part 1: questions 1and 2 below.<br>Check your answers before moving onto:<br>Part 2: Complete these questions in your maths books. | **(Lesson 3 resources below)**<br>**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.<br><br>**THINK: (support below)**<br>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? <br><br>Our problem is on textbook page 102.<br>Look at it now.<br><br>**SEE: (model below)**<br>Look at the different ways to solve the problem shown on pages 102-103 of your textbook.<br><br>**DO:** Use what you have learnt today to solve:<br>Part 1: complete the questions from textbook page 104.<br><br>Check your answers before moving onto:<br>Part 2: Workbook, Chapter 11, Worksheet 1, pages 89-90. | **(Lesson 4 resources below)**<br>**MAKING LINKS:** Yesterday we found the volume of cubes and cuboids. Today we are going to continue with that.<br><br>**THINK: (support below)**<br>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?<br><br>Our problem is on textbook page 105.<br>Look at it now.<br><br>**SEE: (model below)**<br>Look at the ways to solve the problem shown on pages 105-106 of your textbook.<br><br>**DO:** Use what you have learnt today to solve:<br>Part 1: complete questions 2 - 4 from textbook page 107.<br><br>Check your answers before moving onto:<br>Part 2: Workbook, Chapter 11, Worksheet 2, pages 91-92. | **(Lesson 5 resources below)**<br>**MAKING LINKS:** Yesterday we found the volume of figures. Today we are going to continue with that.<br><br>**THINK: (support below)**<br>Can you help me with this problem? If the dimensions of a small cube with a volume of 1 $cm^3$ are 1 cm × 1 cm × 1 cm, then what would the dimensions of a 1 $m^3$ cube be?<br>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.<br><br>**SEE: (model below)**<br>Look at the ways the characters in the textbook solved the problem on pages 108 - 109 of your textbook.<br><br>**DO:** Use what you have learnt today to solve:<br>Part 1: complete question 2 from textbook page 110.<br><br>Check your answers before moving onto:<br>Part 2: Workbook, Chapter 11, Worksheet 3, pages 93-94. |
| 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**

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**DAY 1 RESOURCES:**

**THINK:** Our problem is on textbook page 194.

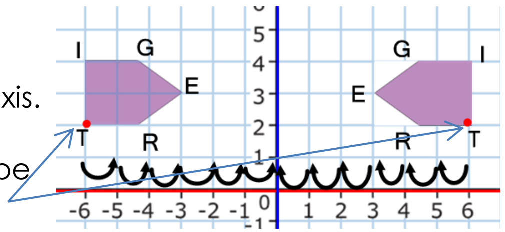
My friend says that the red figure has been translated to end up where the blue figure is but I think it has been reflected not translated.
What do you think?
How do you know?

**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.

**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 before you begin this lesson.**

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

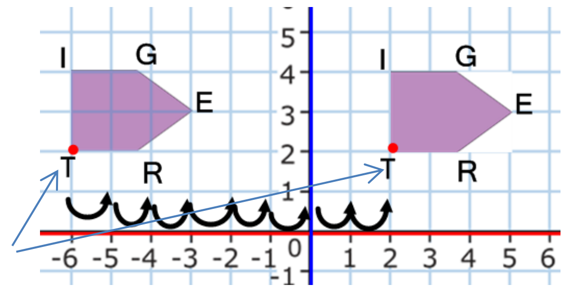



So point T would be in the opposite position if it were reflected in the y-axis. If we were to make a fold along the y-axis, the same points on each shape would be the same distance away from the axis.
**Reflection is like butterfly wings – the same on both sides!**

- 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.

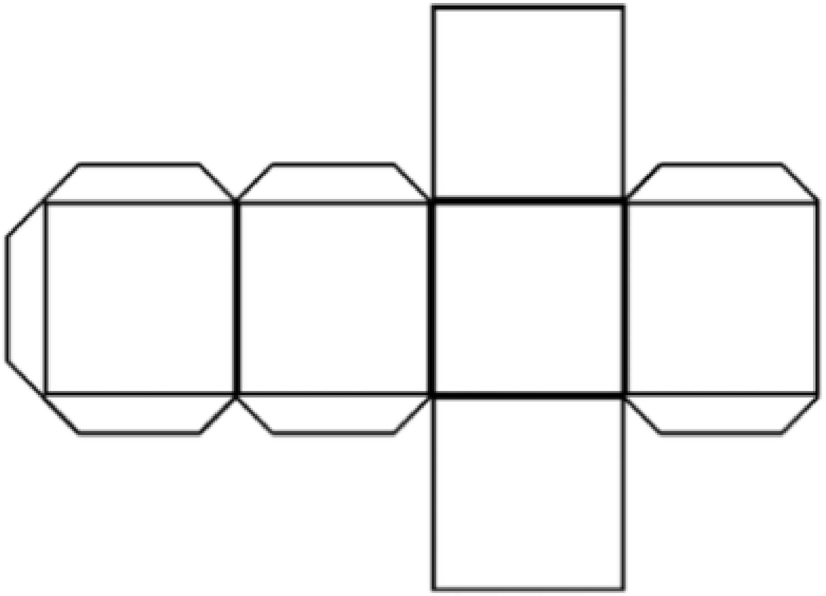
**Translation is like a photocopy that has been moved along!**

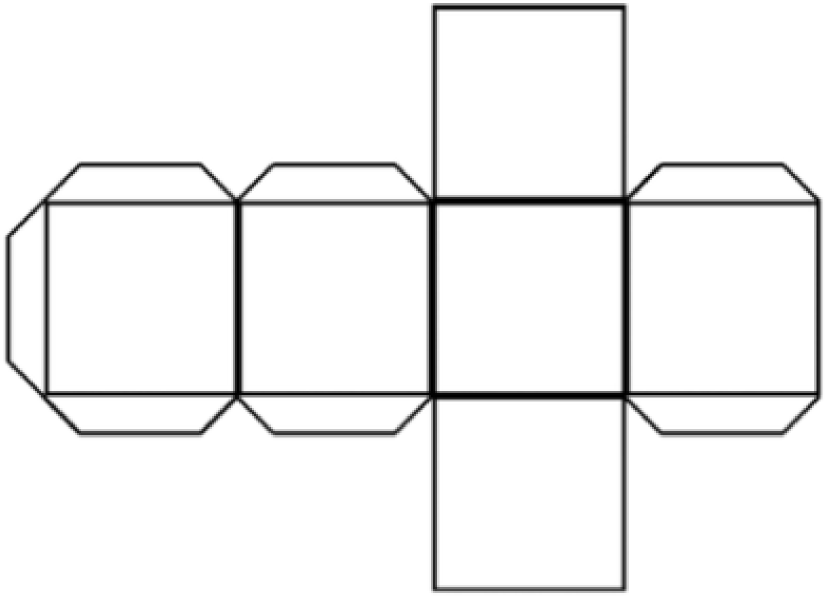
So point T would have moved **8 units right** if it were translated. **Count the jumps from one point to the same point on the shape that has moved!**

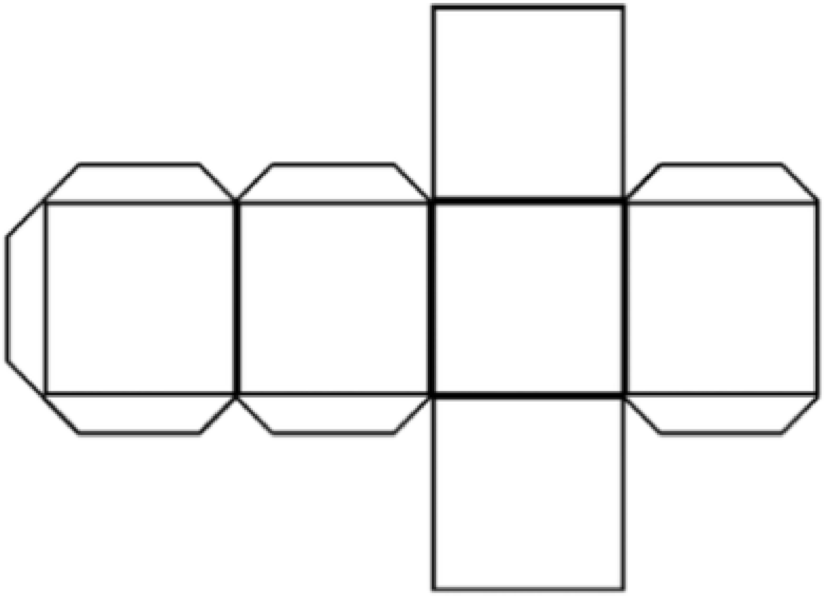


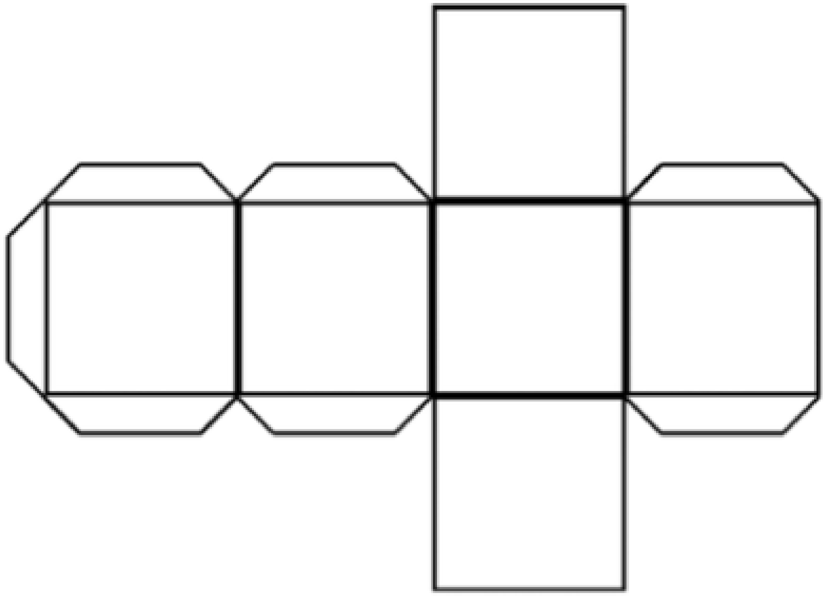

Now check the shapes in the textbook. Which ones are translated and which ones are reflected? **Remember if the shape is translated it will be the same way around but will have moved!**

**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.**





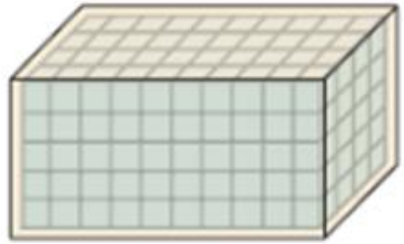




## DAY 2 RESOURCES:

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

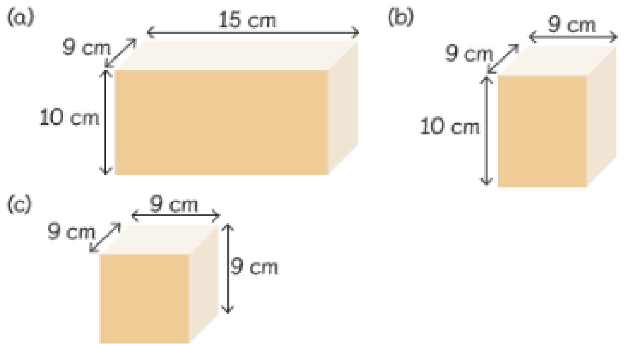
My friend cannot remember how to work out the volume of a figure. Can you help?



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?



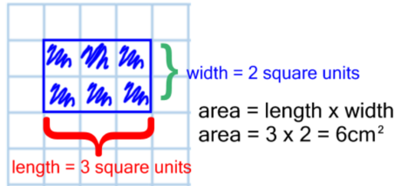

Check your answers before moving onto:
Part 2: Complete the questions below in your maths books.

**SEE:** Look for how to solve the problem below. **Before you start watch the year 5 lesson [video here.]**

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

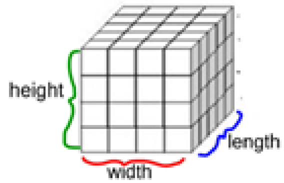
**Area** = the amount of space contained within the outline of a 2-D figure, measured in squared units (such as $cm^2$ , $m^2$ ).

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

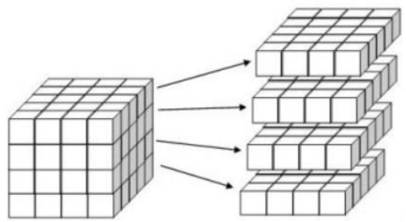



**Volume** = the amount of space inside a 3-D object, measured in cubed units, (such as cm³, m³).

We calculate volume of a cube or cuboid by multiplying its length, width and height (v = l x w x h)
**Remember, length x width will give us the amount of cubes on one layer. Then we multiply that by the number of layers.**




**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 rows x 4 cubes = 20 cubes on each layer.**

There are 4 layers of 20 cubes each.
4 x 20 = 80 cm³

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 | |

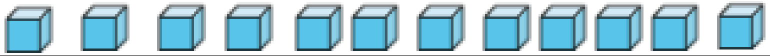
Which box would be most suitable for a 500g portion of Choco Crispy Poppers?

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

**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.

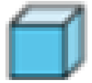
Check your answers before moving onto:

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

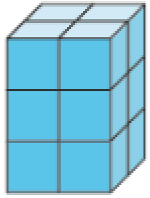
**SEE:** Look at the different ways to solve the problem shown on pages 102-103 of your textbook.

Each small cube takes up 1 cubic centimetre of space.

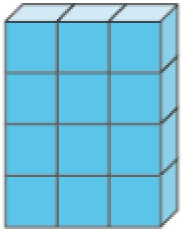
That means that the dimensions of each small cube are:
1 cm × 1 cm × 1 cm
This is its volume and can be written as 1 cm³.



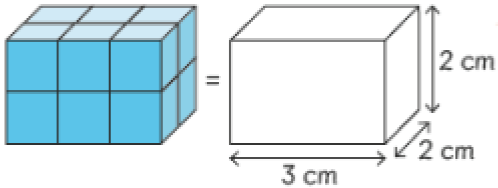
All these shapes are made with 12 x 1 cm³ cubes so they all have a volume of 12 cm³.



Each layer is 2 x 2 cubes = 4 cubes.
**length x width = 2 x 2 = 4 cubes on 1 layer**
There are 3 layers.
3 x 4 cubes = 12 cm³.
**length x width x height = 2 x 2 x 3**



Each layer is 3 x 1 cubes = 3 cubes.
There are 4 layers.
4 x 3 cubes = 12 cm³.
**L x w x h = 3 x 1 x 4**




Each layer is 3 x 2 cubes = 6 cubes.
There are 2 layers.
2 x 6 cubes = 12 cm³.

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

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**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?

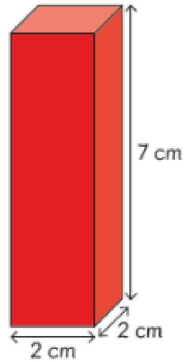
**DO:**

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

Check your answers before moving onto:

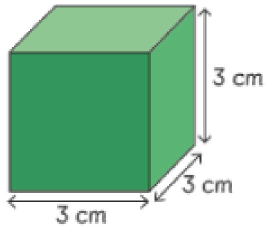
Part 2: Workbook, Chapter 11, Worksheet 2, pages 91-92.

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




**If our cuboid was made of 1 cm³ cubes we would calculate each layer as 2 x 2 cubes = 4 cubes.**
**Then we would multiply 4 cubes by the number of layers: 7 x 4 = 28 cubes.**

Now we can use the measurements shown:
2cm x 2cm x 7cm = 28cm³
**L x w x h = 2 x 2 x 7**




**If our cube was made of 1 cm³ cubes we would calculate each layer as 3 x 3 cubes = 9 cubes.**
**Then we would multiply 9 cubes by the number of layers: 3 x 9 = 27 cubes.**

Now we can use the measurements shown:
3cm x 3cm x 3cm = 27cm³
**L x w x h = 3 x 3 x 3**

NOTE: the formula in the textbooks is v = l x b x 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 m³. You can estimate.

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?

How many 1 m³ 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.

**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 m³ cubes could fit into their classroom.

To give you an idea of what 1 m³ looks like see below. Eight of those boxes make 1 m³.

How many 1 m³ 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**

**l x w = 2.5 x 2**

2.5 x 2 = 5

**5 x height = 5 x 2**

5 x 2 = 10 m³

**length x width x height = 2.5 x 2 x 2**

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

2 x 2 = 4

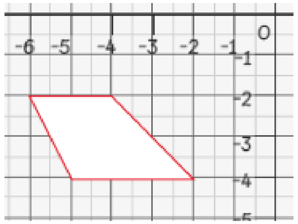
4 x 2.5 = 10 m³

## ANSWERS – part 1:

### Day 1

Part 1:

Q.1a:




| 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.1b: 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: $10 \times 15 \times 20 = 3000$ $cm^3$

$3000 - (6 \times 6 \times 6) = 2784$ $cm^3$ of clay is needed to make the vase.

### Day 5

Part 1:

Q.2:

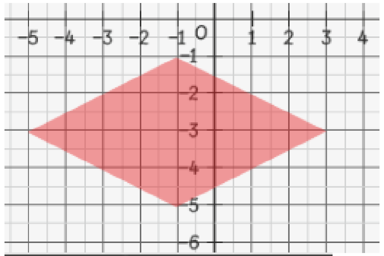
a) 6 $m^3$, b) 1.5 $m^3$, c) 0.125 $m^3$

## ANSWERS – part 2:

### Day 1

Part 2: Workbook,

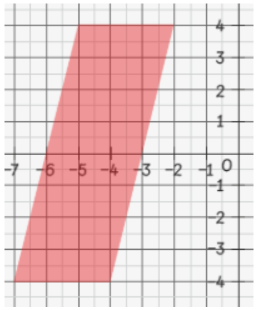
Q.1:




| 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 |

### Day 3

Part 2: Workbook,

Q.1:

a) 24 $cm^3$, b) 45 $cm^3$,
c) 64 $cm^3$, d) 108 $cm^3$.

Q.2:

a) 8$cm^3$, b) 64 $cm^3$,
c) 27 $cm^3$, d) 125 $cm^3$.

### Day 4

Part 2: Workbook,

Q.1:

a) 648 $cm^3$, b) 216 $cm^3$,
c) 729 $cm^3$, d) 1144 $cm^3$.

Q.2:

Could be 4 x 4 x 9 = 144 $cm^3$
Or 9 x 9 x 4 = 324 $cm^3$

### Day 5

Part 2: Workbook,

Q.1:

a) 72$m^3$, b) 125$m^3$,
c) 12$m^3$, d) 150$m^3$.

Q.2:

a) 720$m^3$, b) 787.5$m^3$,
c) 750$m^3$, d) 729$m^3$,
e) 793.8 $m^3$, f) 720 $m^3$.

Q.3:

a) E, b) A and F.

| 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.