

Perimeter, Area and Volume

Day 1

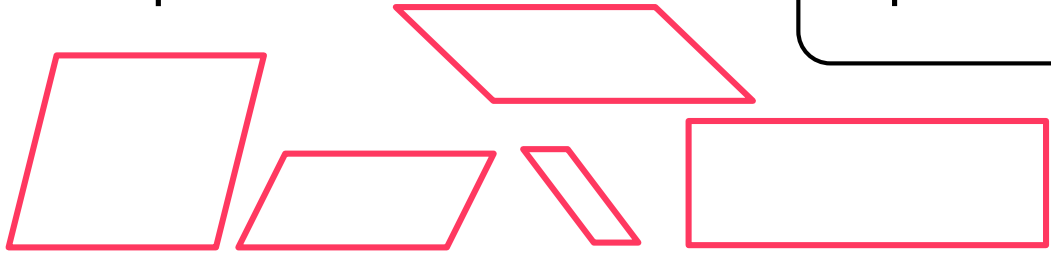
Starter

Find the word ‘parallelogram’ in a dictionary or online. Then copy and complete the table below in your book.

definition:	characteristics:
examples:	non-examples:

parallelogram

Starter - ANSWERS

definition: A parallelogram is a 4-sided shape in which each side is parallel to the side opposite it.	characteristics: opposite sides are parallel and equal in length
examples: 	non-examples: 

Date: Day 1

LO: To calculate the area of a parallelogram.

Date: Day 1

LO: To calculate the area of a parallelogram.

Success Criteria

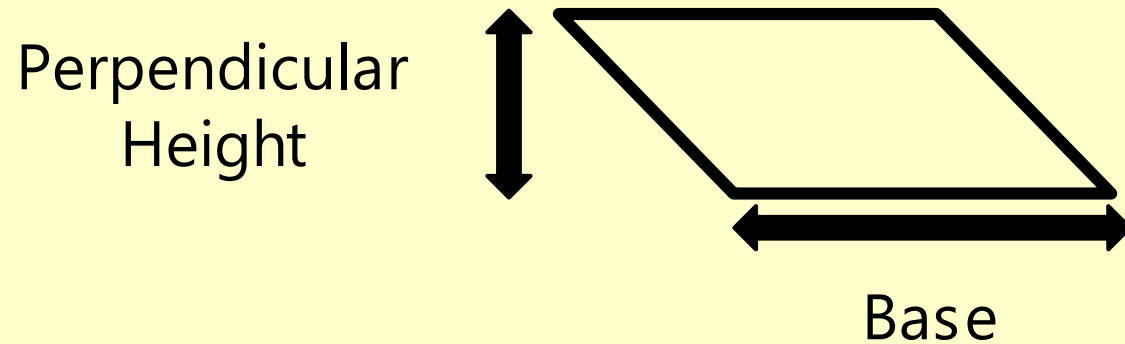
I can use my knowledge of formulae for calculating the areas of rectangles and rectilinear shapes to calculate the areas of parallelograms.

I can explain my reasoning.

Descriptive Teaching

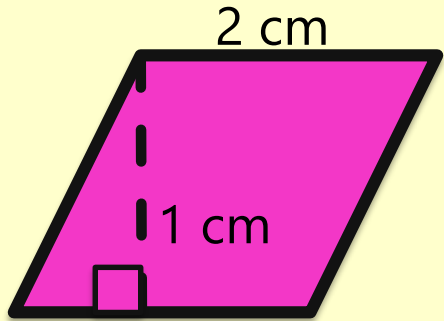
To find the area of a parallelogram:

Area = base x perpendicular height

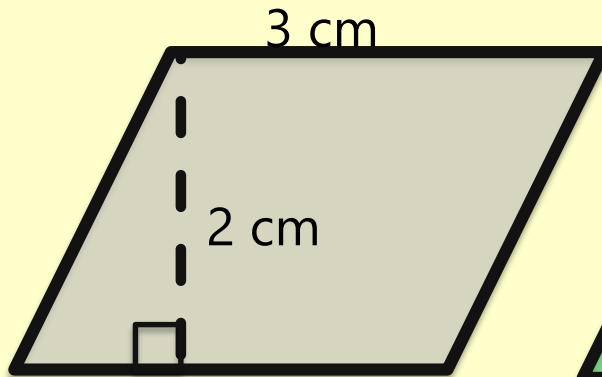


Descriptive Doing

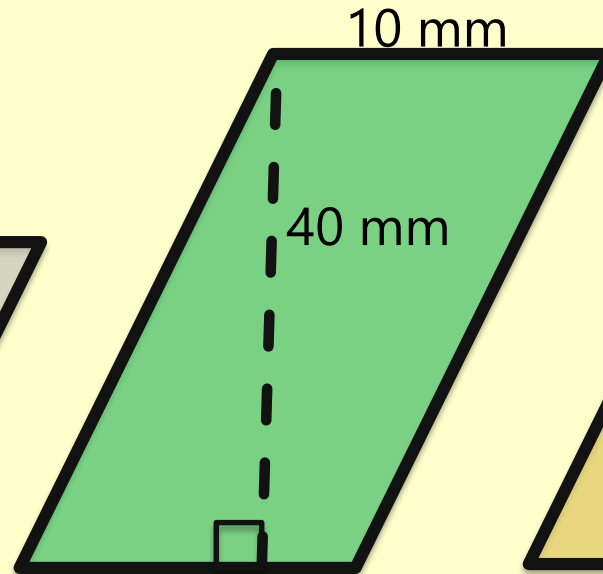
Use the formula on the slide before to calculate:



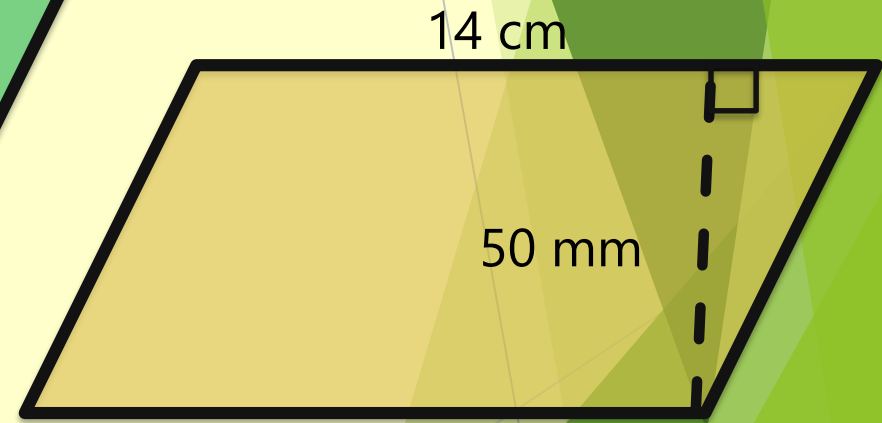
Area:
__ cm²



Area:
__ cm²

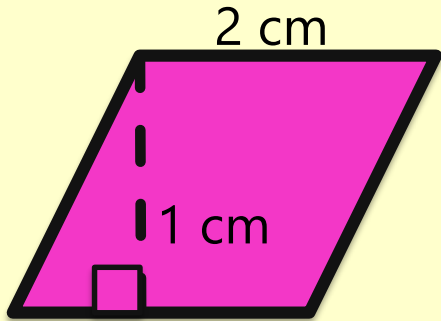


Area:
__ mm²

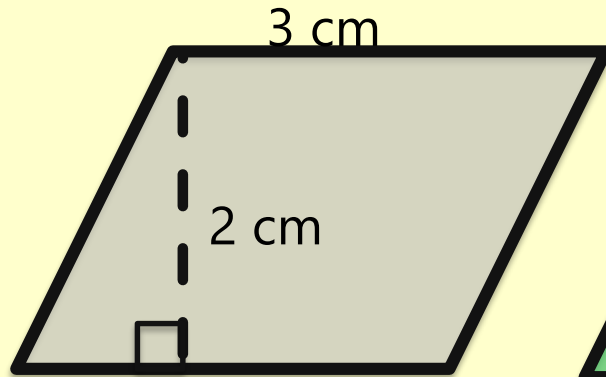


Area:
__ cm²

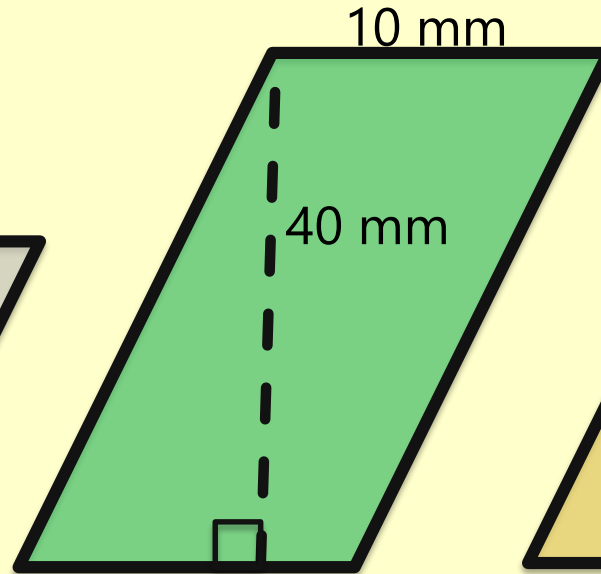
Descriptive Doing - ANSWERS



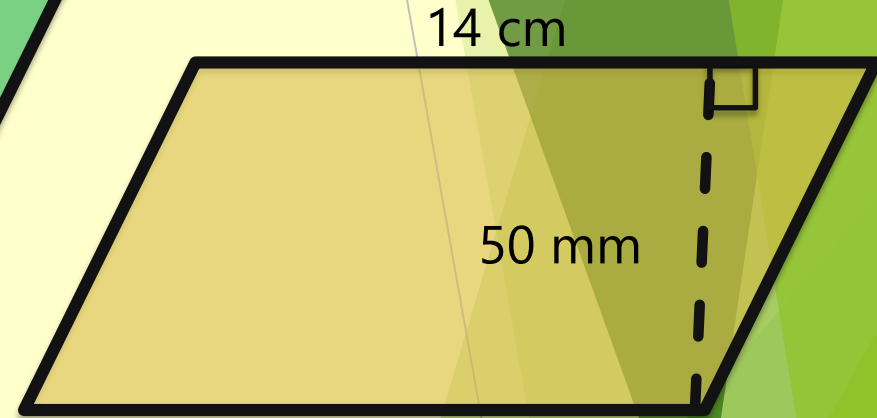
Area:
2 cm²



Area:
6 cm²



Area:
400 mm²



Area:
70 cm²

Descriptive Doing

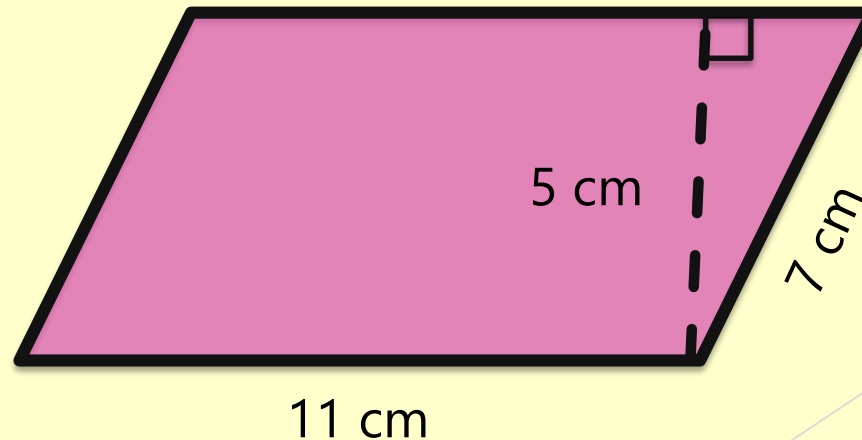
Ruth says, “The area of the parallelogram is 77cm^2 .”

Yasmin says. “The area of the parallelogram is 55cm^2 .”

James says, “The area of the parallelogram is 35cm^2 .”

Only one of them is correct. Who?
Explain your answer.

___ is correct
because...



Descriptive Doing - ANSWERS

Yasmin is correct.

She has multiplied the parallelogram's base by its perpendicular height.

$$11\text{cm} \times 5\text{cm} = 55\text{cm}^2$$

Reflective Doing

Jamal has drawn a parallelogram.

Its area is greater than 36cm^2 but less than 44cm^2 .

- a) Think of possible measurements for the base and perpendicular height for Jamal's parallelogram.
- b) Why is it not possible that the base of his parallelogram is 12cm and its perpendicular height is 4cm, or that its base is 3cm and its perpendicular height is 11cm?

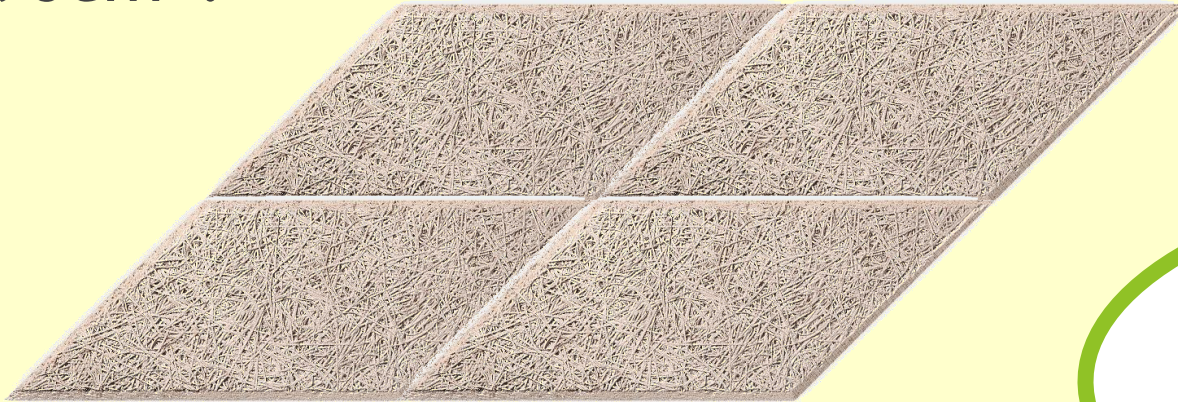
Think of two numbers that multiply together to make an answer between 36 and 44.

Reflective Doing - ANSWERS

- a) e.g. 19cm by 2cm; 20cm by 2cm; 14cm by 3cm; 86cm x 0.5cm...
- b) It is not possible that the base of the parallelogram is 12cm and its perpendicular height is 4cm as that would create a parallelogram of 48cm^2 (greater than the range), or one with a base of 3cm and a perpendicular height of 11cm, as it would create a parallelogram of 33cm^2 (smaller than the range).

Reflective Doing

Four identical parallelograms cover a total area of 96cm^2 .



Find the area of one tile, then think of the possibilities for the base and perpendicular height.

What are the possible base and perpendicular height values for each tile?

Reflective Doing - ANSWERS



Each tile will cover 24cm^2 as $96\text{cm}^2 \div 4 = 24\text{cm}^2$.

Each tile could be:

1cm x 24cm; 2cm x 12cm; 3cm x 8cm; 4cm x 6cm...

Reflective Doing

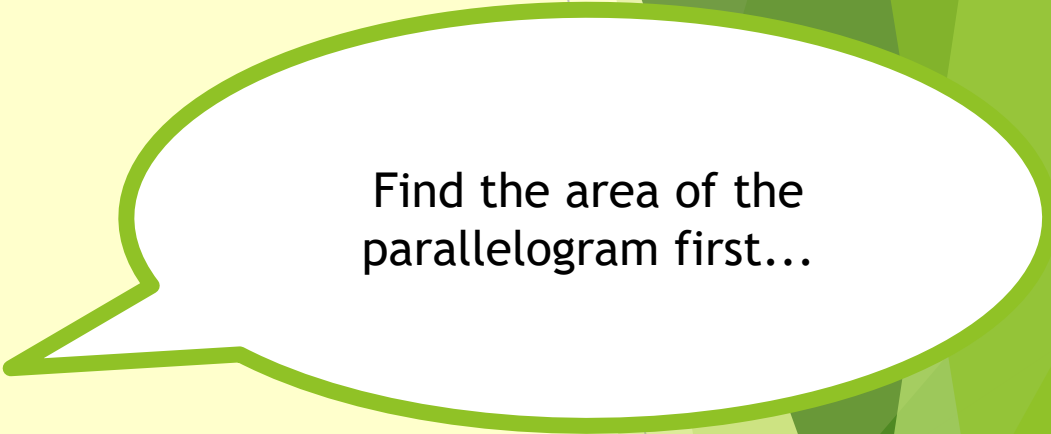
Yasmin has a piece of fabric in the shape of a parallelogram.

The height of the fabric is 12m and the base is 18m.

She cuts the fabric into four equal parallelograms.

She cuts both the base and the height in half.

What is the area of each new parallelogram?



Find the area of the parallelogram first...

Reflective Doing - ANSWERS

Each new parallelogram will have an area of 54m^2 .

$$12\text{m} \times 18\text{m} = 216\text{m}^2.$$

$$216\text{m}^2 \div 4 = 54\text{m}^2$$

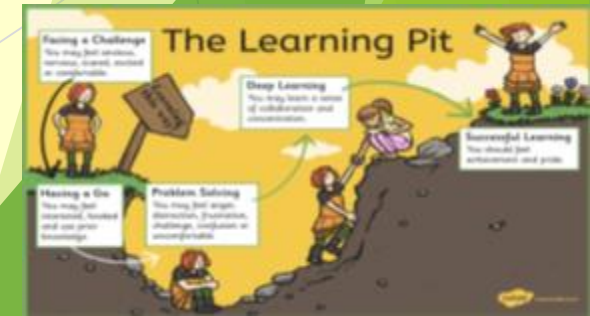
$$(6\text{m} \times 9\text{m} = 54\text{m}^2)$$

Choose your challenge

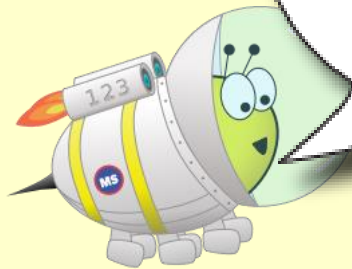
Challenges can be found on the document named 'Maths Challenges Day 1'.

Choose an appropriate challenge OR work through green, orange and red.

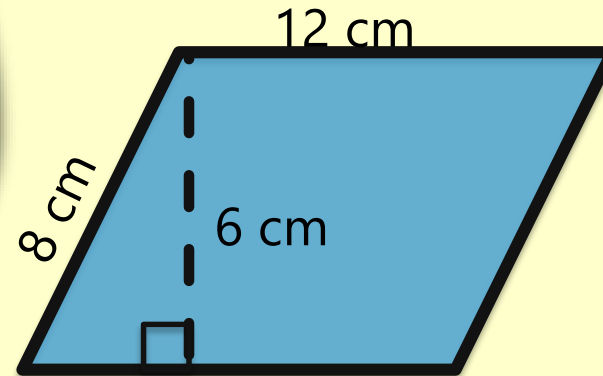
Answers can be found at the bottom of the document.



Reflection Time

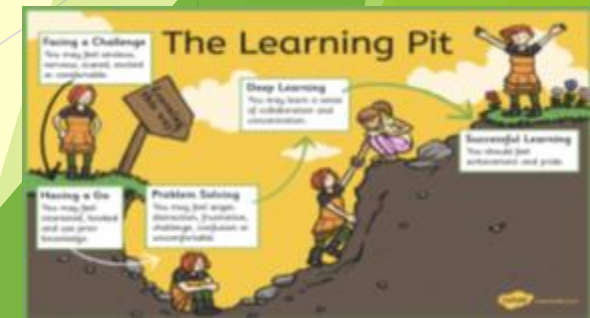


The area of the parallelogram is 96 cm^2 .



The statement is true/false because...

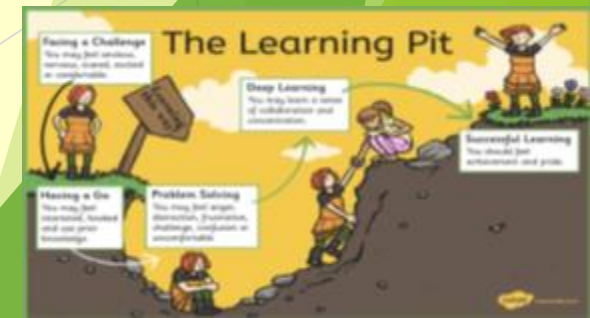
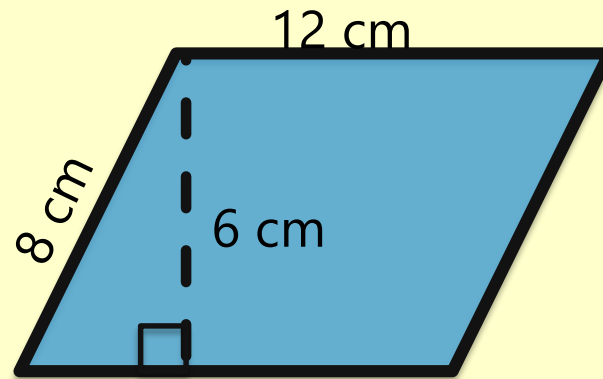
Is Astrobee's statement true or false?
Explain your answer.



Reflection Time - ANSWERS

Astrobee's statement is false. To find the area of a parallelogram, you multiply its base by its perpendicular height:

$$12\text{cm} \times 6\text{cm} = 72\text{cm}^2$$

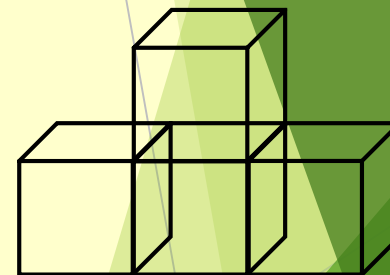
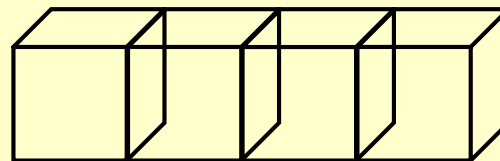
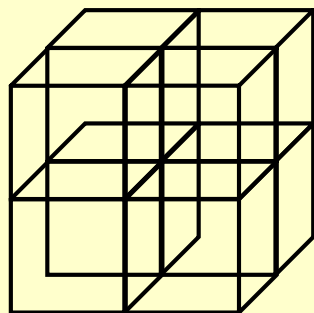
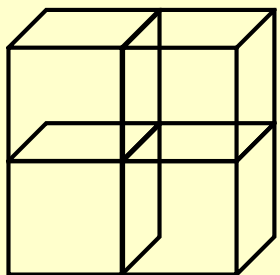


Perimeter, Area and Volume

Day 2

Starter

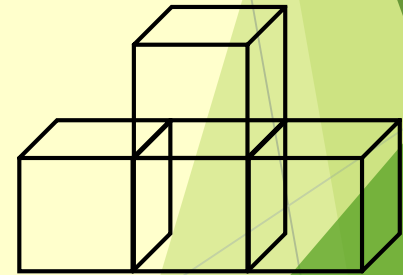
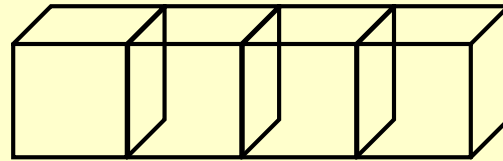
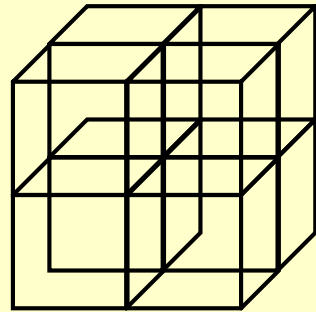
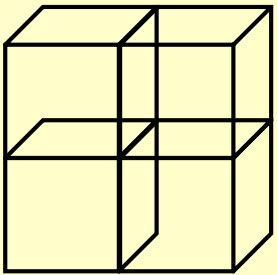
Which one doesn't belong?



Explain your answer.

Starter - ANSWERS

The second shape doesn't belong as it is made using eight cubes. Whereas, the other shapes are made using a total of four cubes.



Date: Day 2

LO: To calculate volume by counting cubes.

Date: Day 2

LO: To calculate volume by counting cubes.

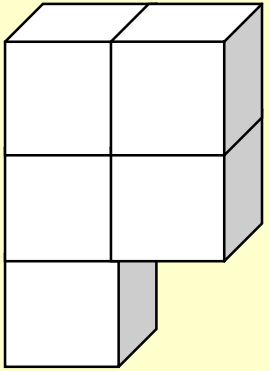
Success Criteria

I can count cubes to find the volume of solid shapes.

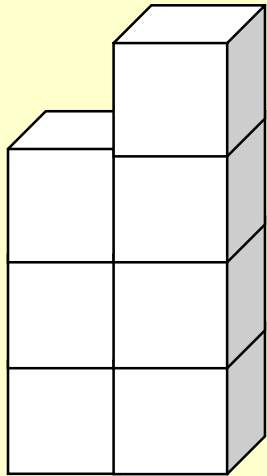
I can explain my reasoning.

Descriptive Doing

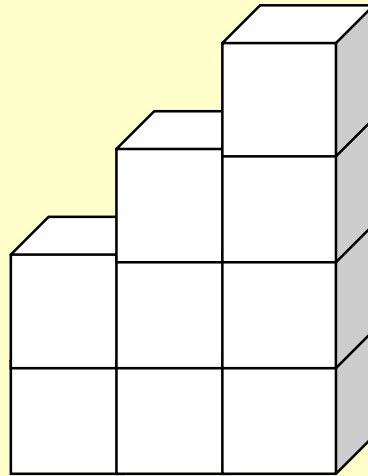
If each cube has a volume of 1cm^3 , find the volume of the solid shapes below:



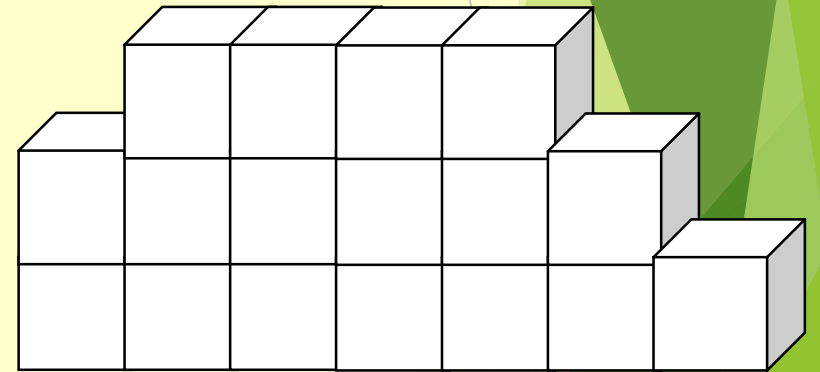
__ cm^3



__ cm^3

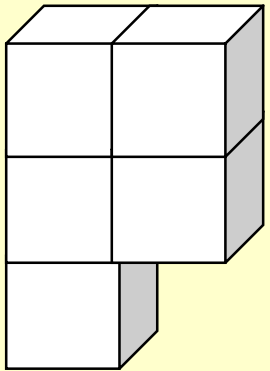


__ cm^3

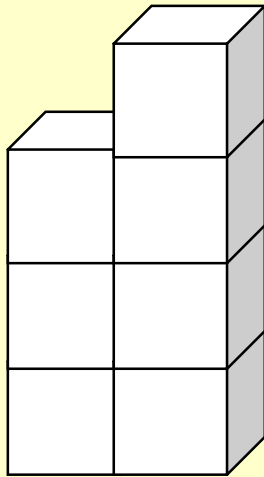


__ cm^3

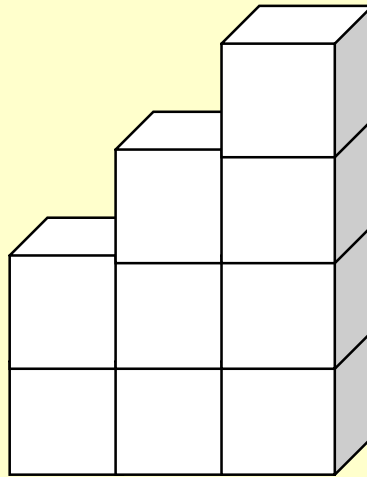
Descriptive Doing - ANSWERS



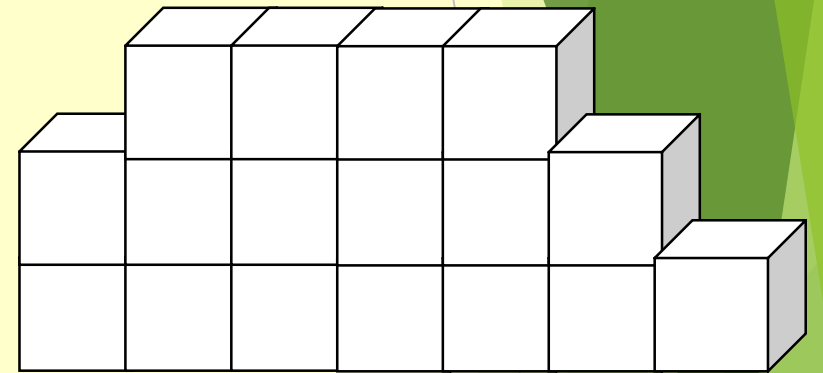
5 cm³



7 cm³



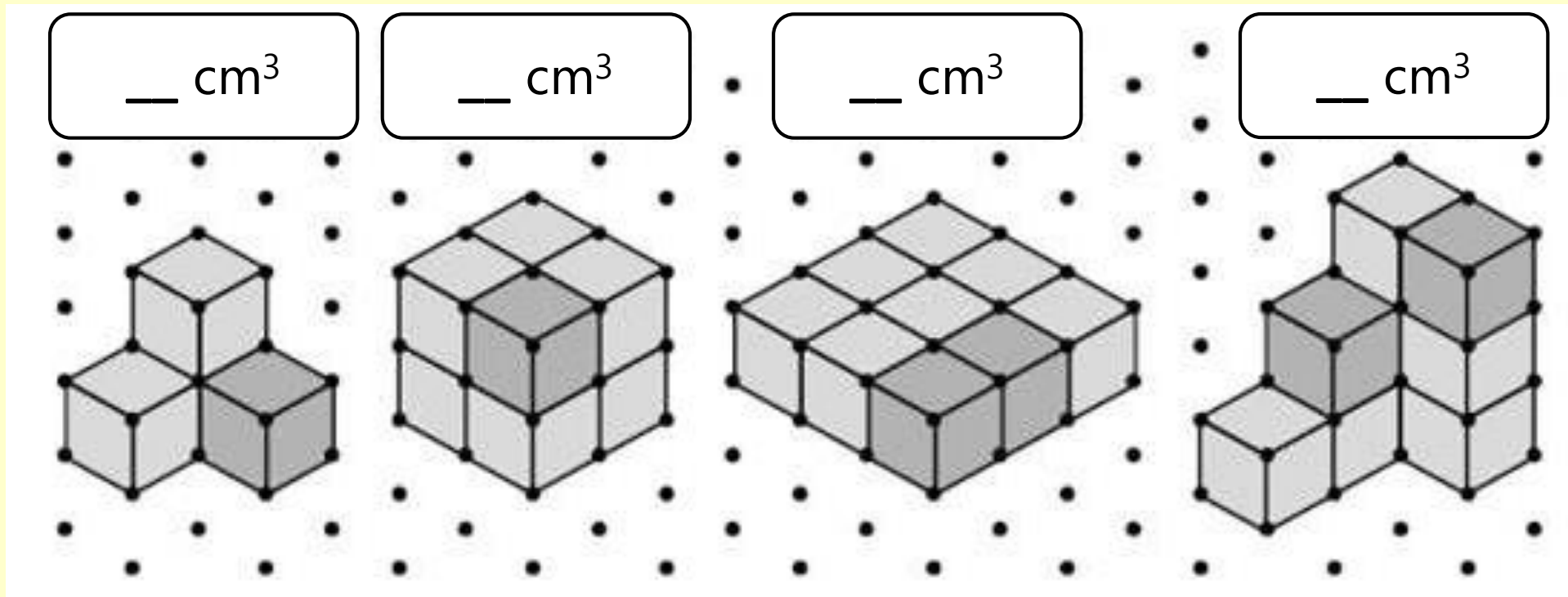
9 cm³



17 cm³

Descriptive Doing

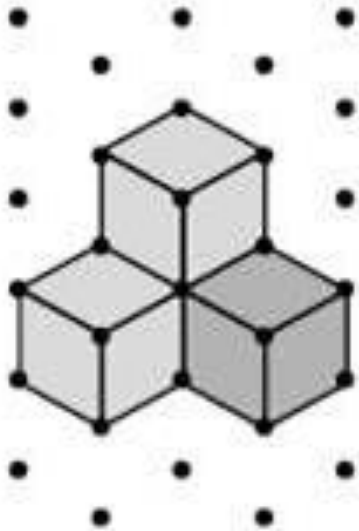
What are the volumes for the solid shapes if each small cube represents a volume of 1cm^3 ?



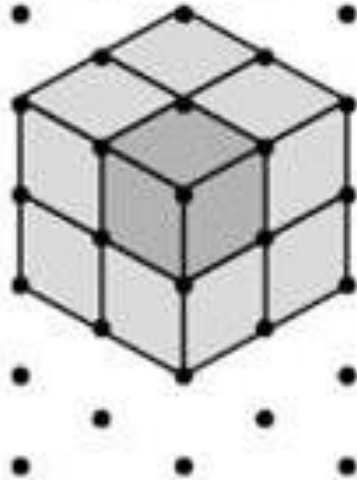
Descriptive Doing - ANSWERS

What are the volumes for the solid shapes if each small cube represents a volume of 1cm^3 ?

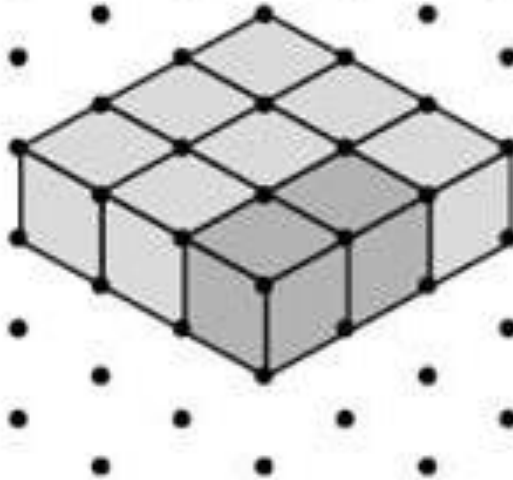
4 cm^3



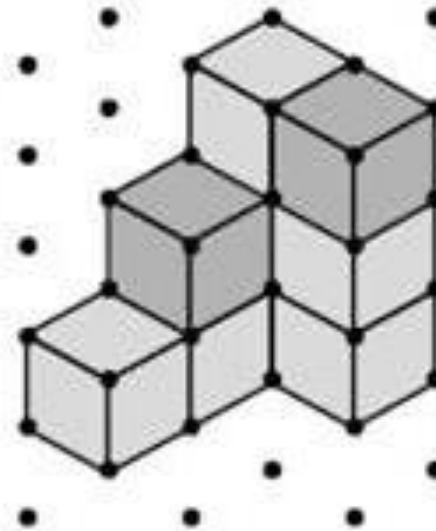
8 cm^3



9 cm^3

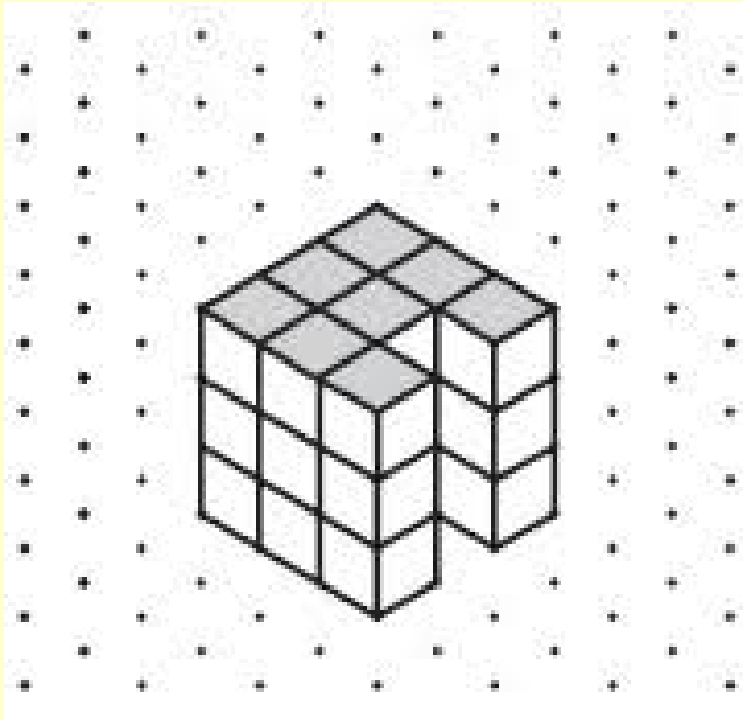


9 cm^3

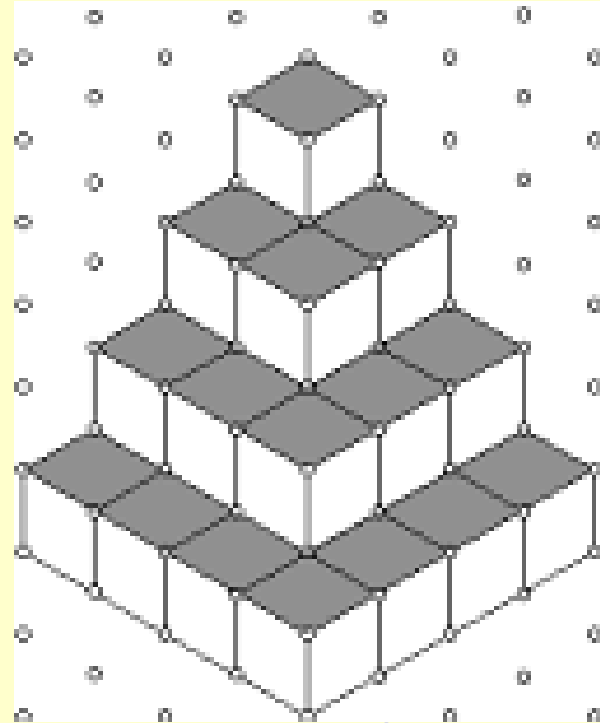


Descriptive Doing

What are the volumes for the solid shapes if each small cube represents a volume of 1cm^3 ?

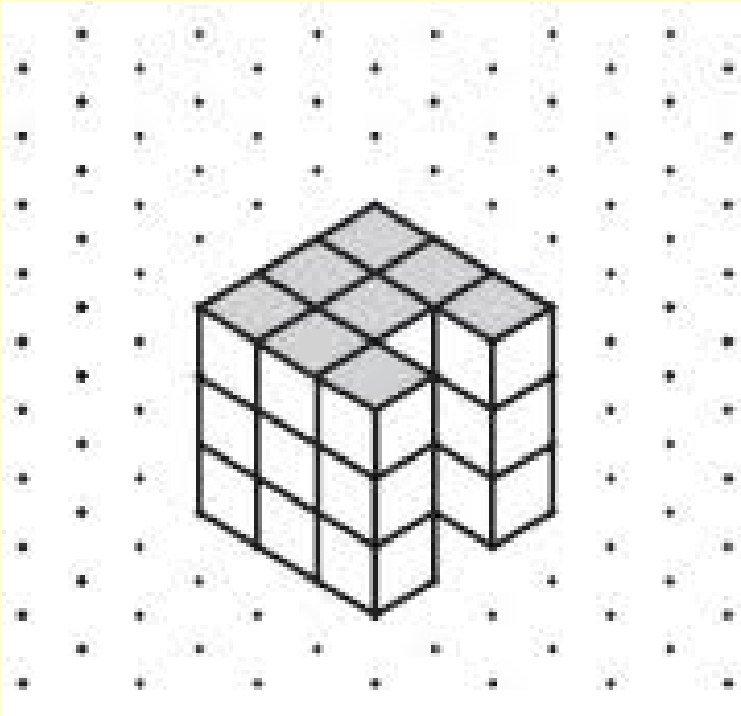


___ cm^3

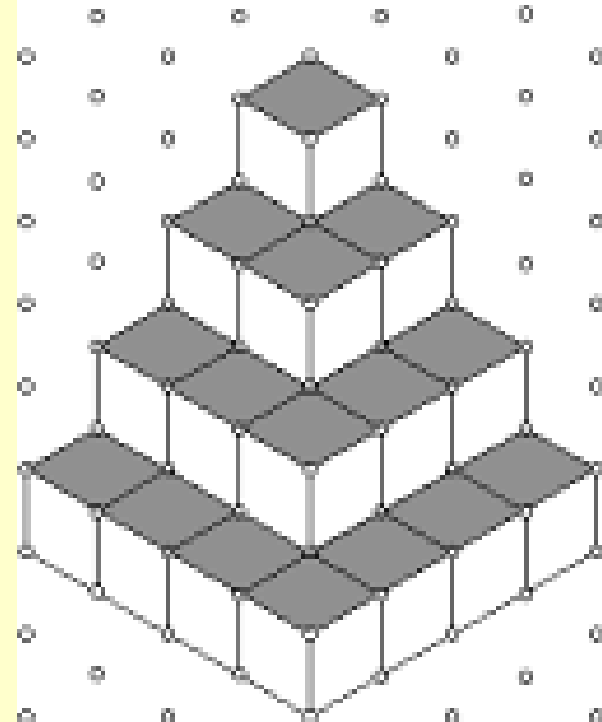


___ cm^3

Descriptive Doing - ANSWERS



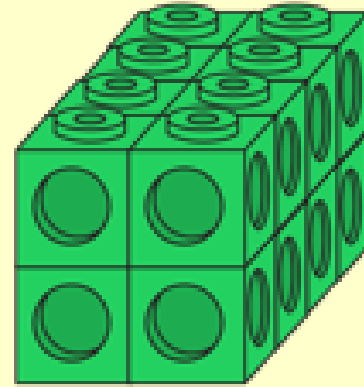
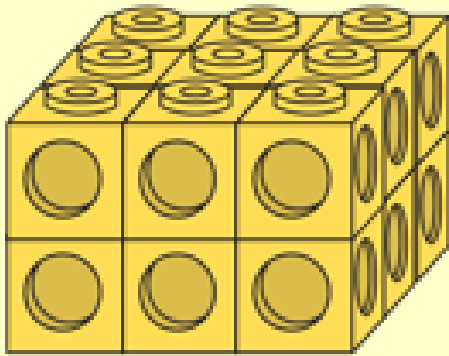
24 cm³



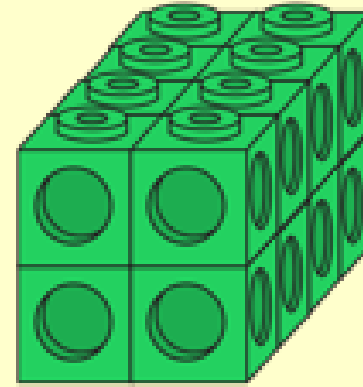
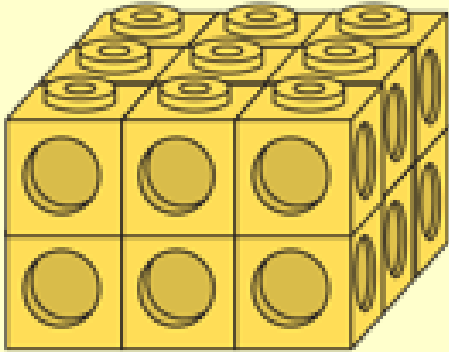
30 cm³

Reflective Doing

Which solid shape has the greater volume?



Reflective Doing - ANSWERS



The yellow shape has a greater volume. Its total volume is 18cm^3 , whereas, the green shape has a total volume of 16cm^3 .

Reflective Doing - have a go!

Ruth and James are making upper-case letters using cubes.

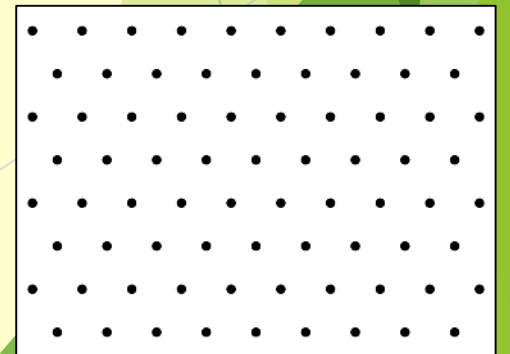
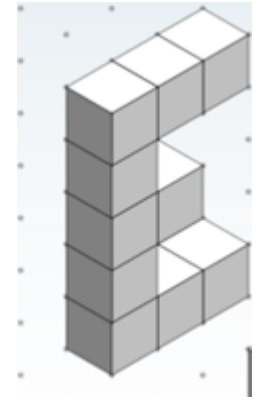
James says, “Upper-case letters can be made using less then ten cubes.”

Is James’s statement always, sometimes or never true?

Provide examples to explain your answer.

I have uploaded printable isometric paper to the webpage.

Use isometric paper to draw upper-case letters (use cubes).

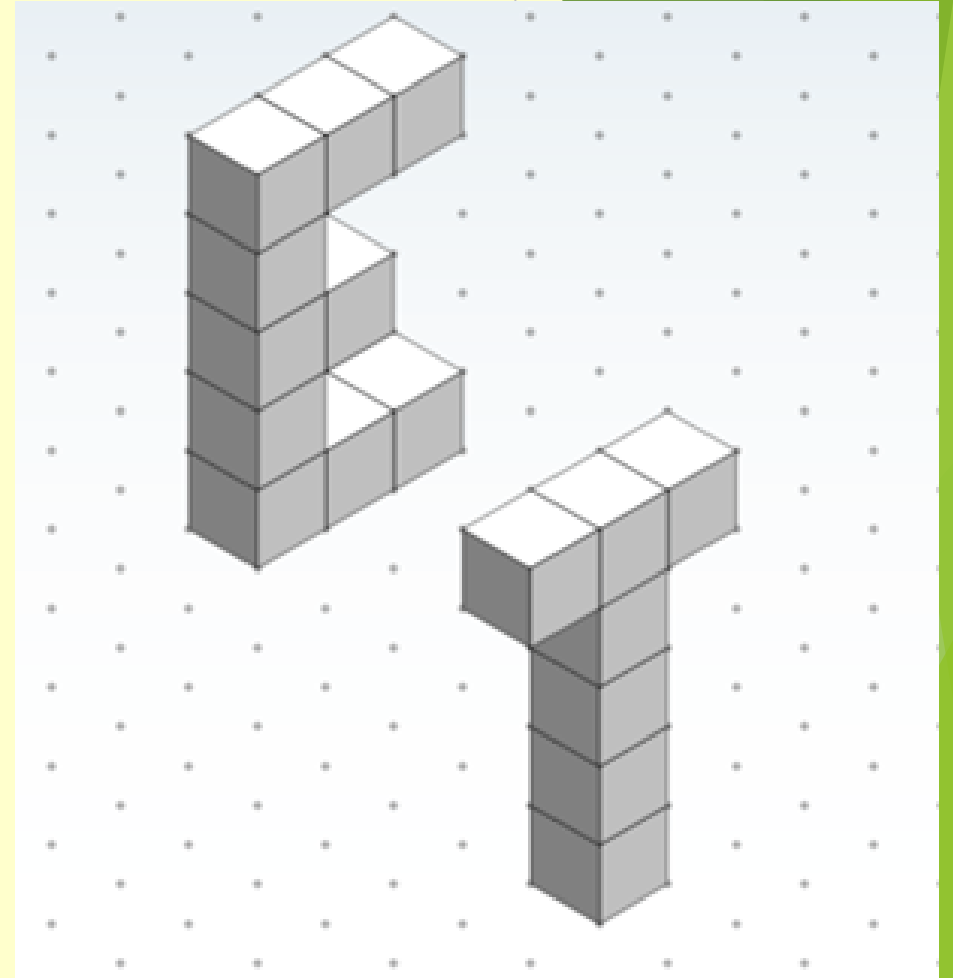


Reflective Doing - ANSWERS

James's statement is only sometimes true.

For example, T has been made using seven cubes.

However, E has been represented using 10 cubes.

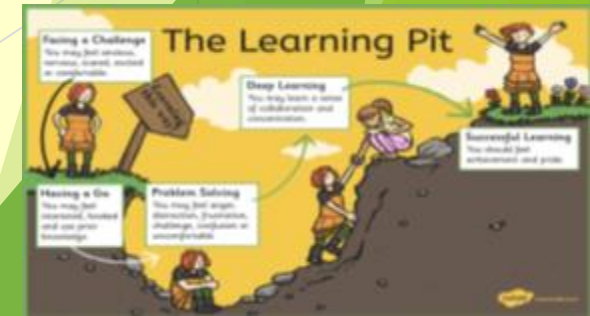


Choose your challenge

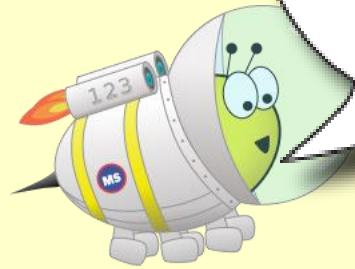
Challenges can be found on the document named 'Maths Challenges Day 2'.

Choose an appropriate challenge OR work through green, orange and red.

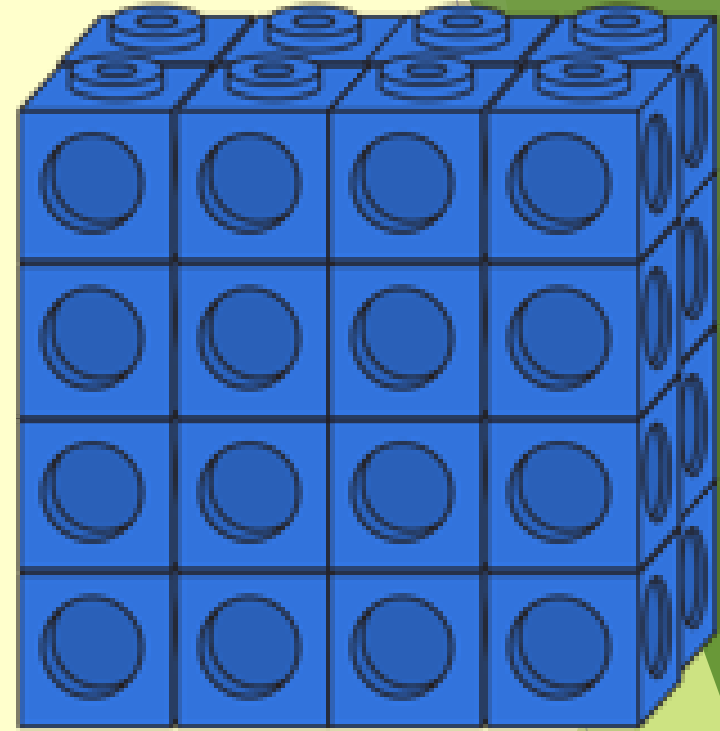
Answers can be found at the bottom of the document.



Reflection Time



I used 24 cubes to make my solid shape.



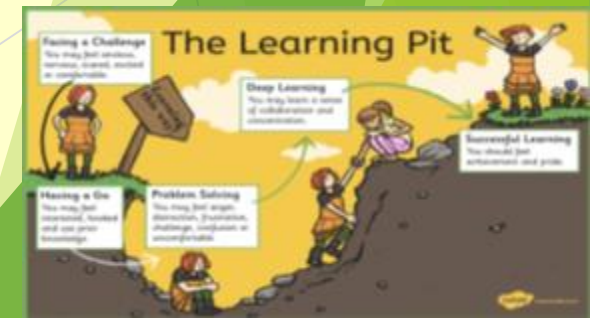
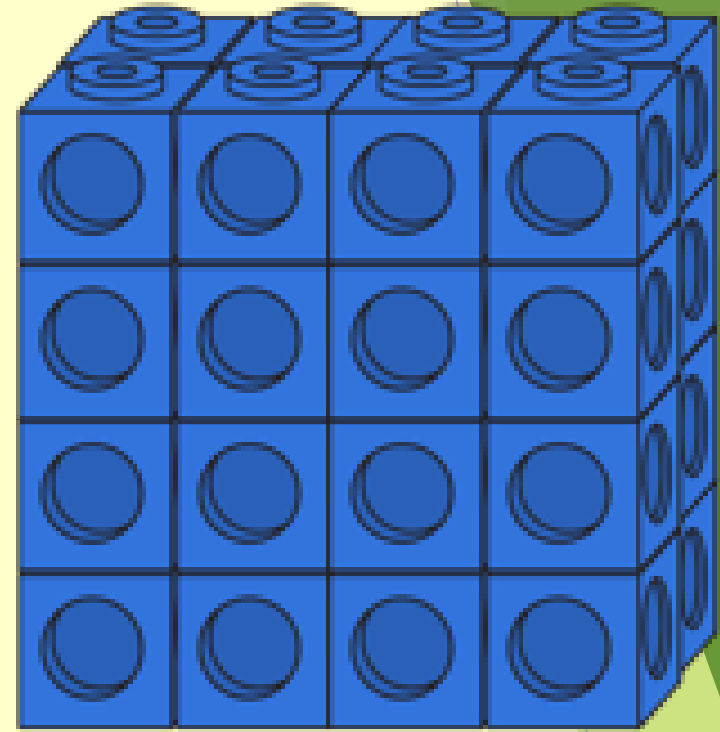
Is Astrobee's statement true or false?
Explain your answer.

The statement is true/false because...



Reflection Time - ANSWERS

Astrobee's statement is false.
Each row is made from eight
cubes and there are four rows,
meaning Astrobee has used 32
cubes.

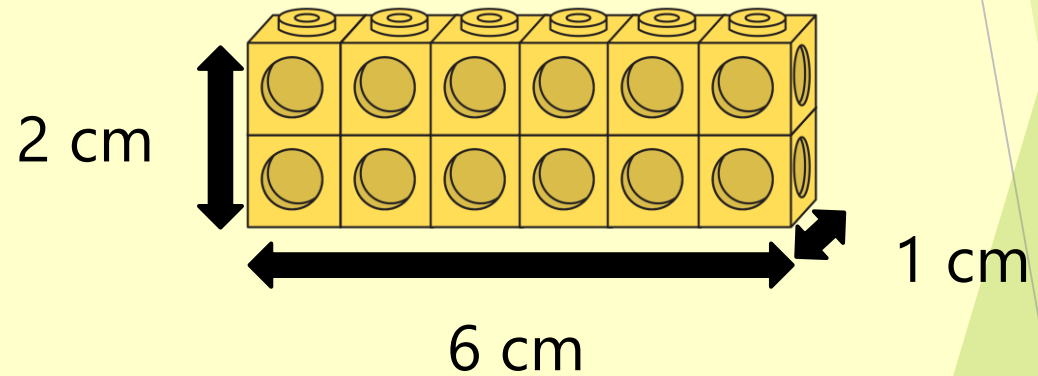
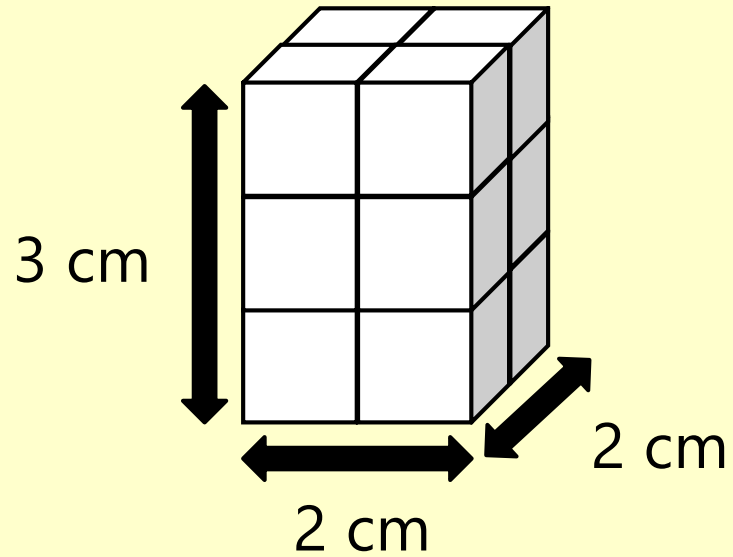


Perimeter, Area and Volume

Day 3

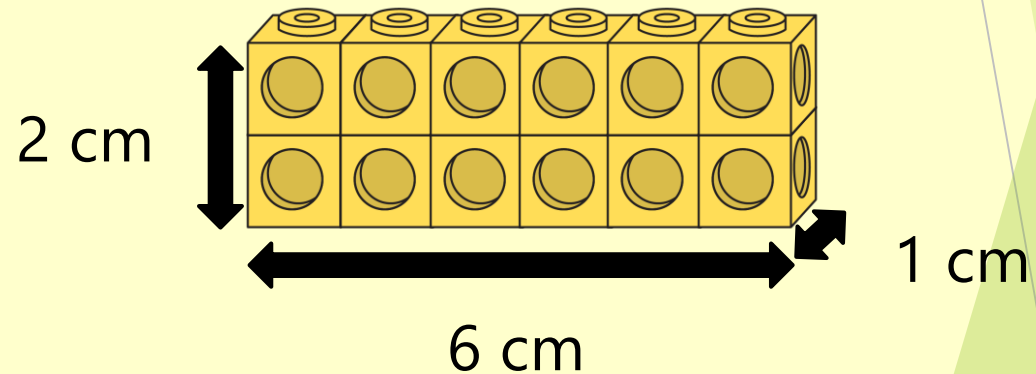
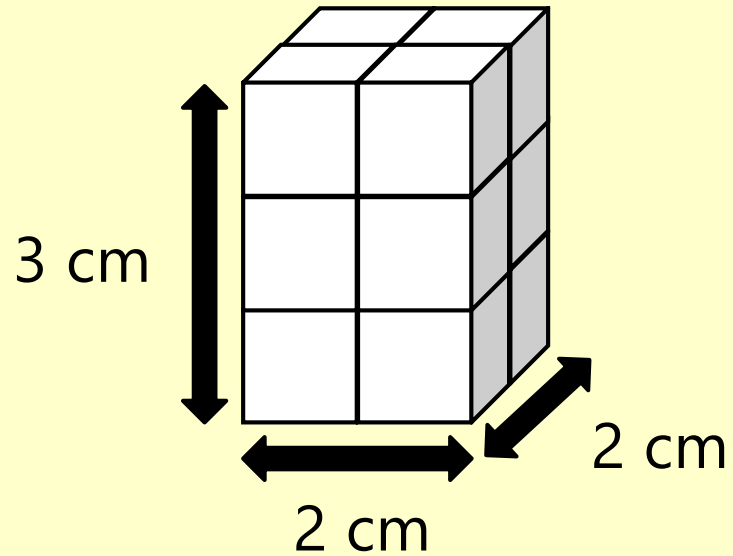
Starter

What's the same? What's different?



Starter - ANSWERS

Although some length measurements differ, they both have the same volume of 12cm^3 .



Date: Day 3

LO: To calculate the volume of a cuboid.

Date: Day 3

LO: To calculate the volume of a cuboid.

Success Criteria

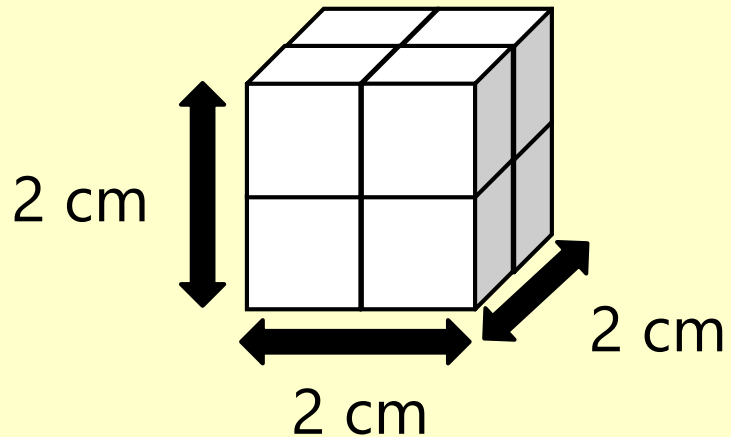
I can use my knowledge of counting cubes to find a shape's volume to apply the formula for calculating the volume of a cuboid.

I can explain my reasoning.

Descriptive Teaching

To find the volume of a cuboid:

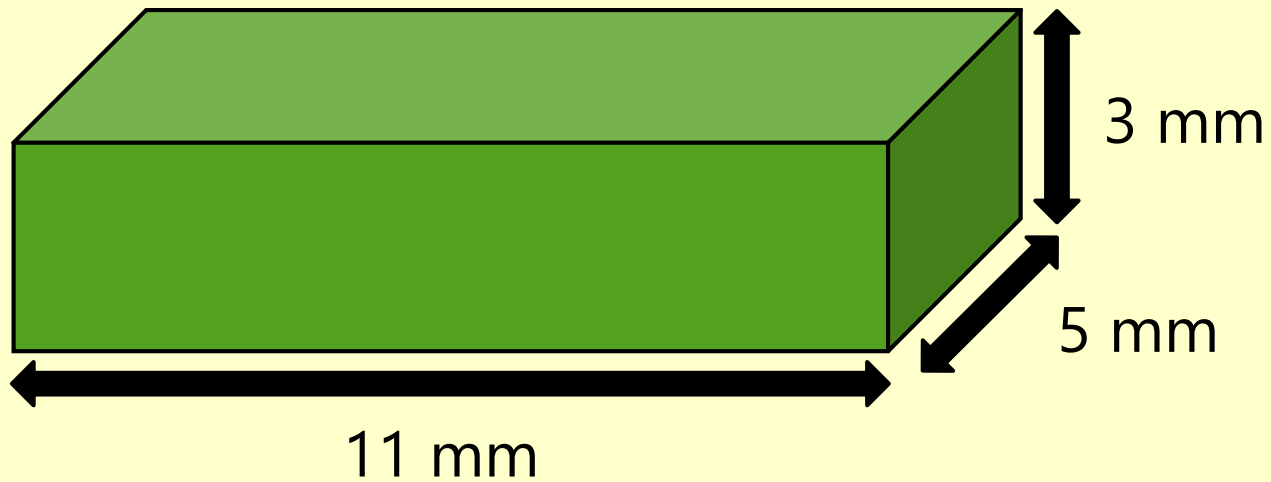
Volume = length x width x height



$$2\text{cm} \times 2\text{cm} \times 2\text{cm} = 8\text{cm}^3$$

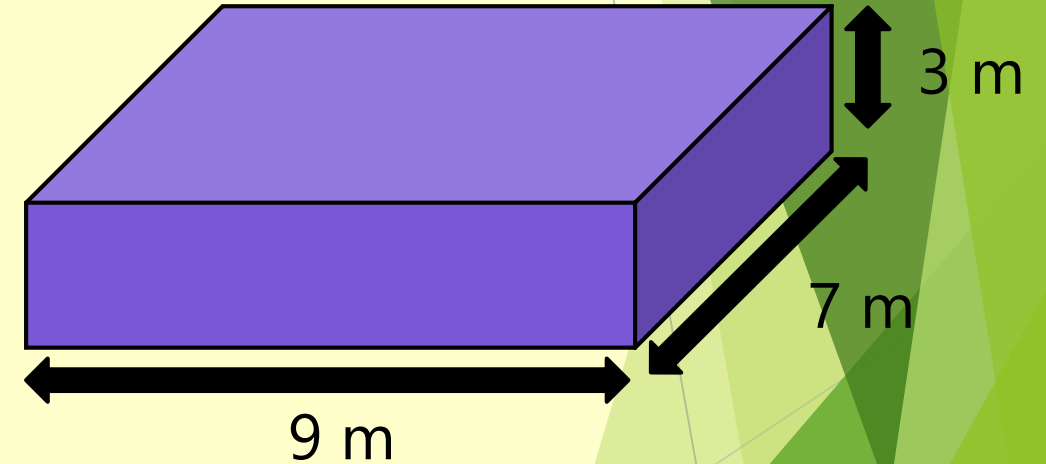
Descriptive Doing

What are the volumes of the cuboids?



Volume:

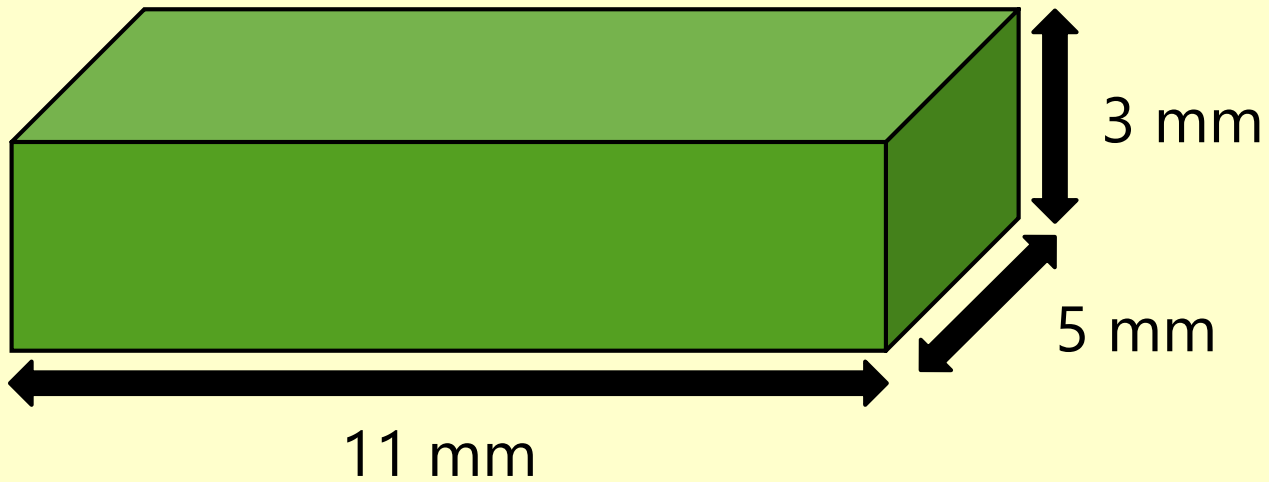
___ m³



Volume:

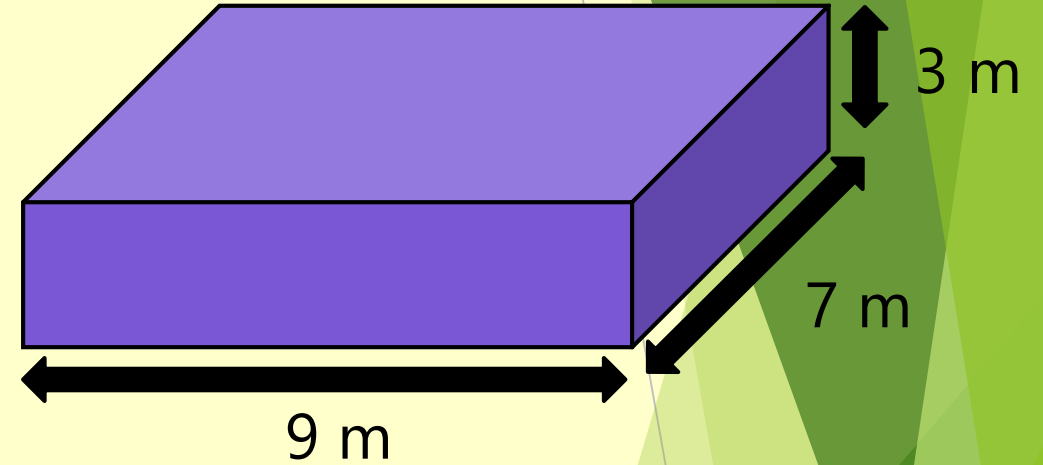
___ m³

Descriptive Doing - ANSWERS



Volume:

165 m³

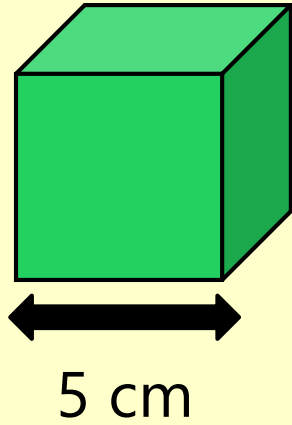


Volume:

189 m³

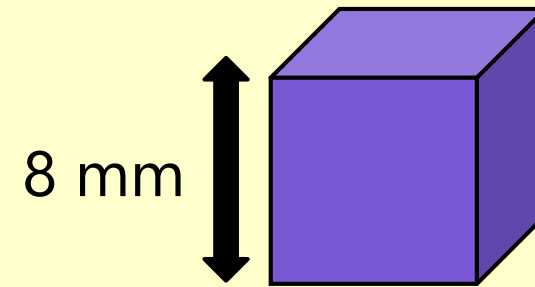
Descriptive Doing

What are the volumes of the cuboids?



Volume:

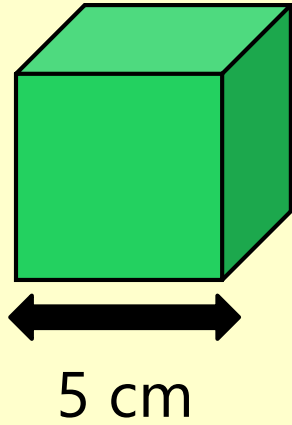
___ m³



Volume:

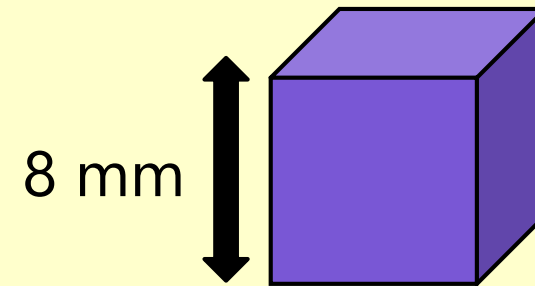
___ m³

Descriptive Doing - ANSWERS



Volume:

125 m³

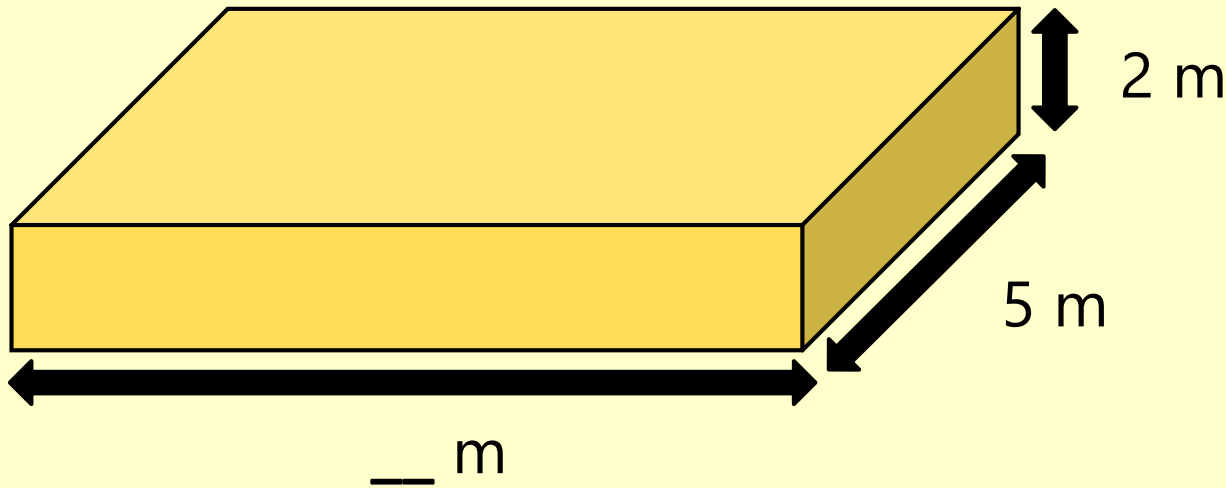


Volume:

512 m³

Reflective Teaching

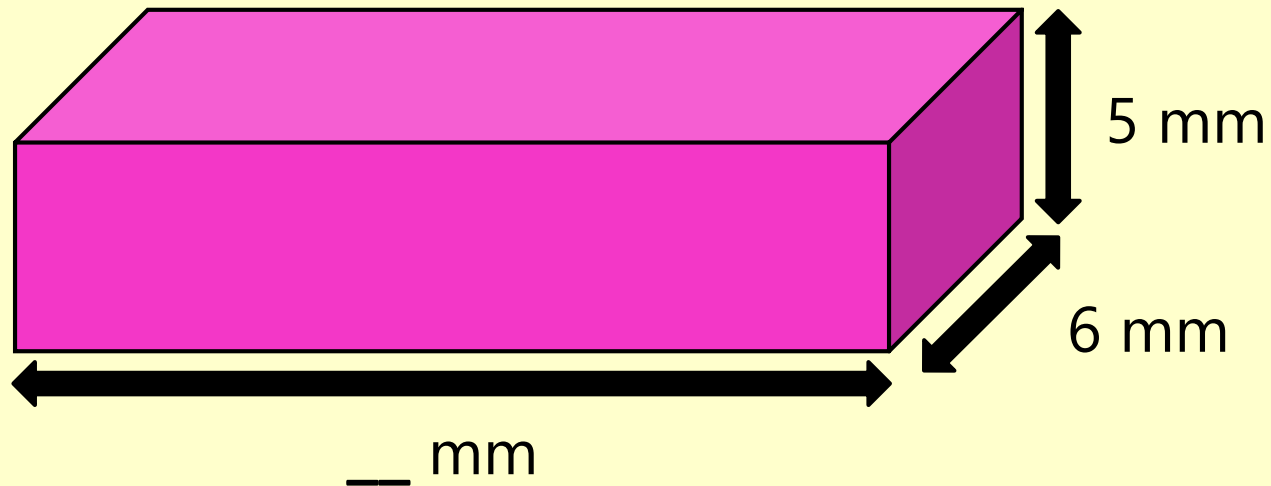
If the volume of the cuboid is 120m^3 , what is the value of the missing length?



To find the missing value, you need to use inverse operations. Find the total of the given sides:
 $2\text{m} \times 5\text{m} = 10\text{m}^2$. Then, $120\text{m}^3 \div 10\text{m}^2 = 12\text{m}$

Reflective Doing

If the volume of the cuboid is 330mm^3 , what is the value of the missing length?

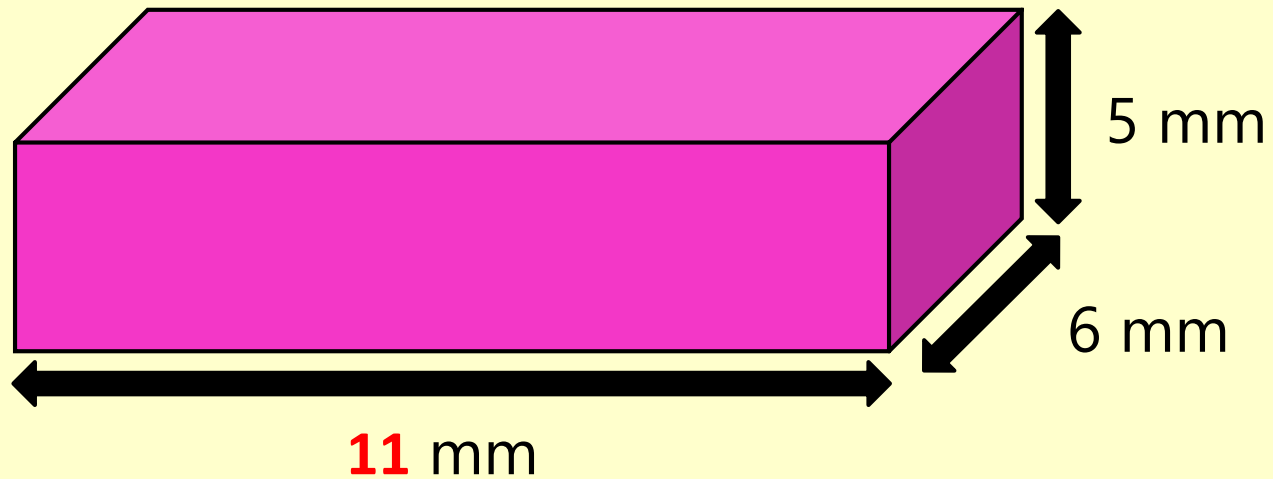


Use the method shown on the slide before.

Reflective Doing - ANSWERS

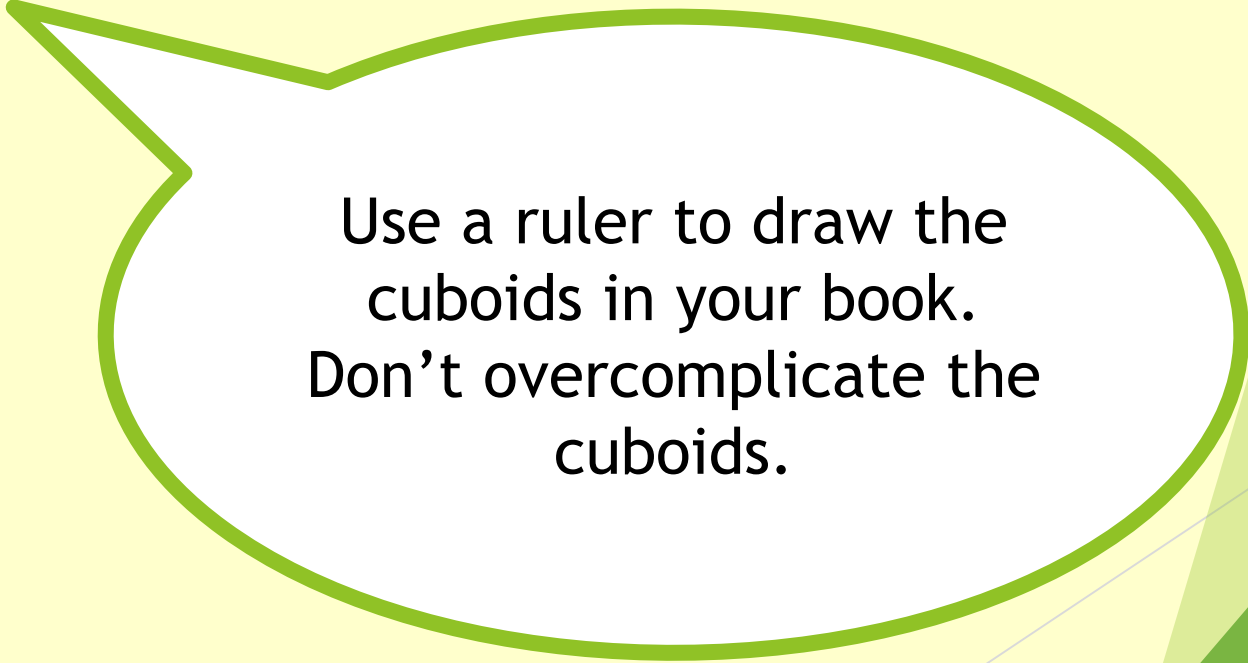
$$5\text{mm} \times 6\text{mm} = 30\text{mm}^2.$$

$$330\text{mm}^3 \div 30\text{mm}^2 = 11\text{mm}$$



Reflective Doing

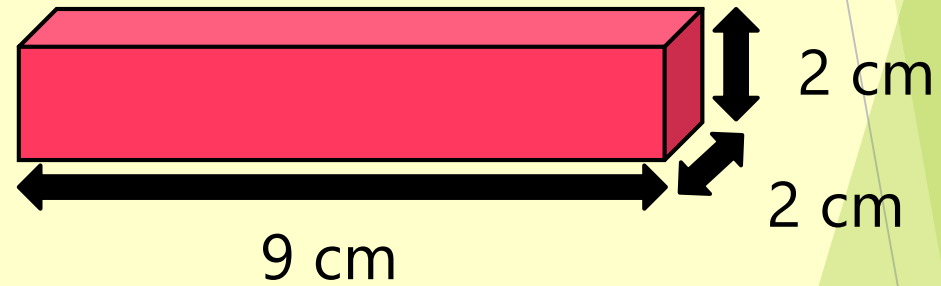
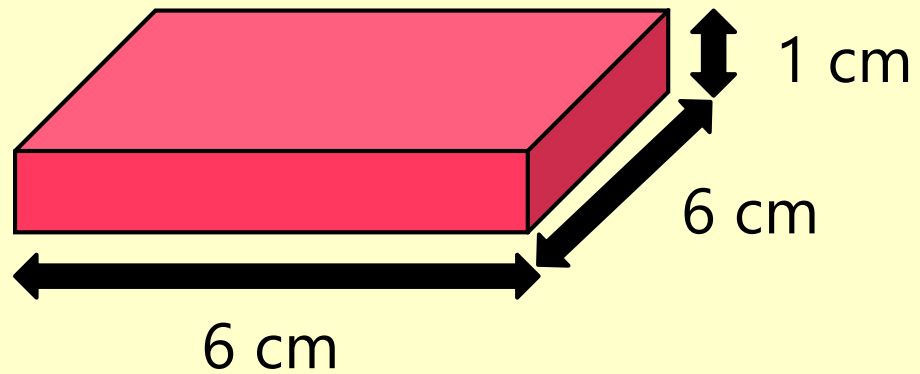
Draw two different cuboids that each have a volume of 36cm^3 .



Use a ruler to draw the cuboids in your book.
Don't overcomplicate the cuboids.

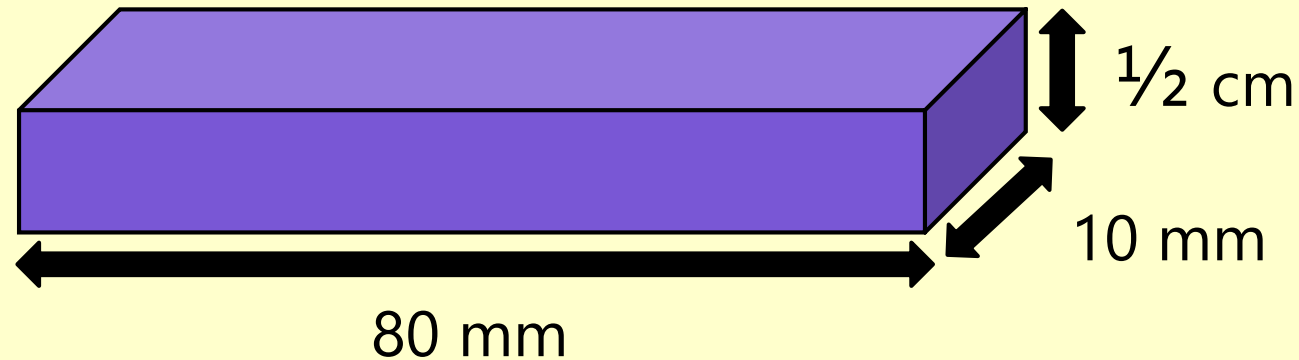
Reflective Doing - ANSWERS

Examples:



Reflective Teaching

What is the volume of the cuboid?



Convert $\frac{1}{2}$ cm into mm = 5mm

$5\text{mm} \times 10\text{mm} \times 80\text{mm} = 4000\text{mm}^3$

Reflective Doing

What is the volume of the cuboid?



Convert 0.7cm
to mm.

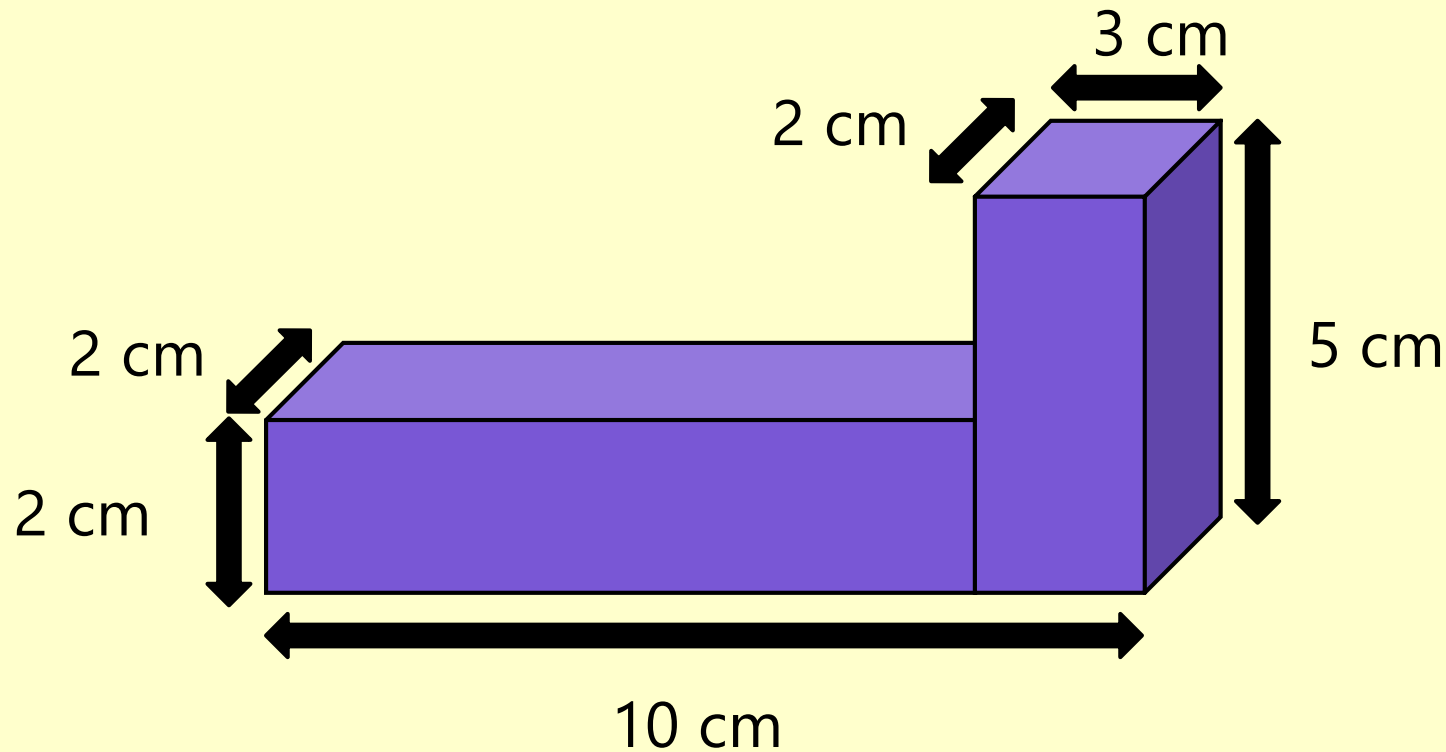
Reflective Doing - ANSWERS



$$7\text{mm} \times 20\text{mm} \times 100\text{mm} = 14000\text{mm}^3$$

Reflective Doing

What is the volume of the shape?



Split the shape
into two
cuboids.

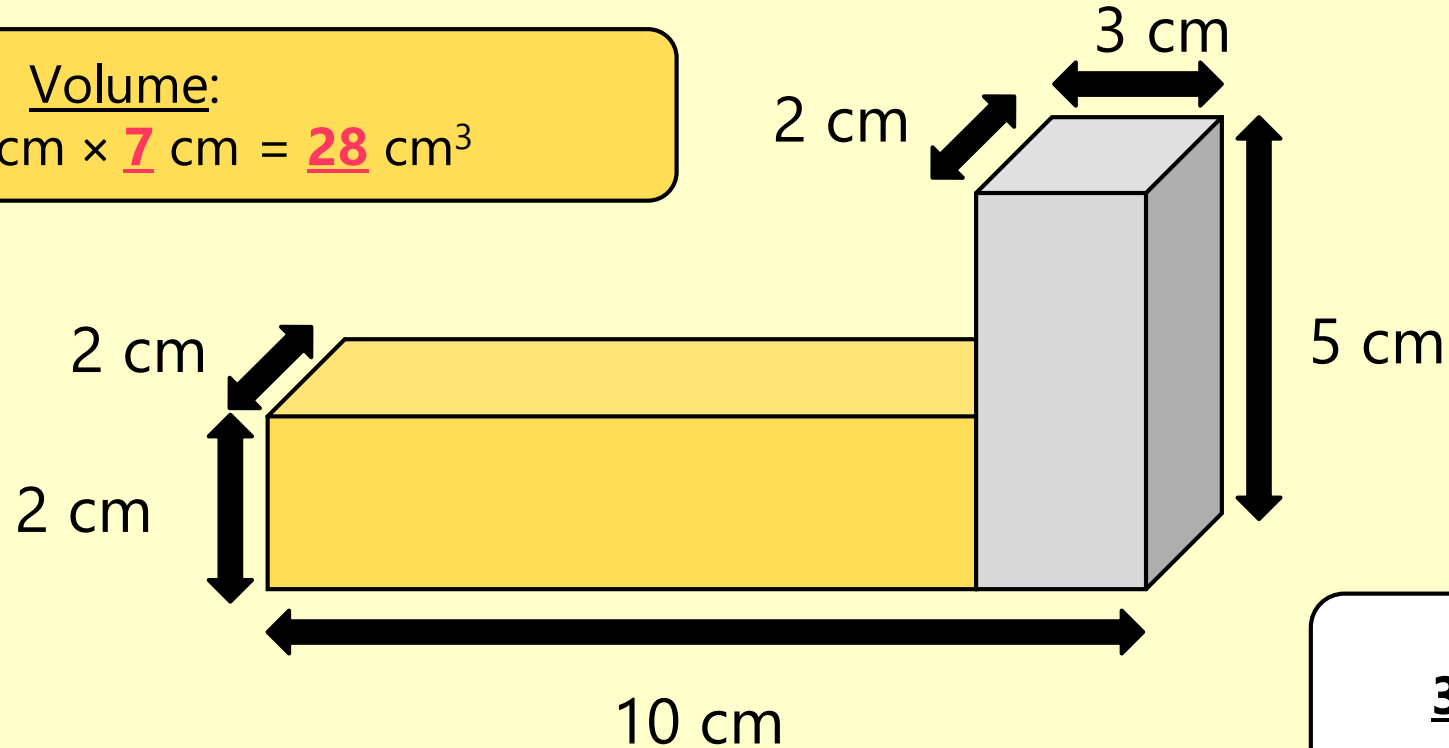
Reflective Doing - ANSWERS

Volume:

$$\underline{2} \text{ cm} \times \underline{3} \text{ cm} \times \underline{5} \text{ cm} = \underline{30} \text{ cm}^3$$

Volume:

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



Volume:

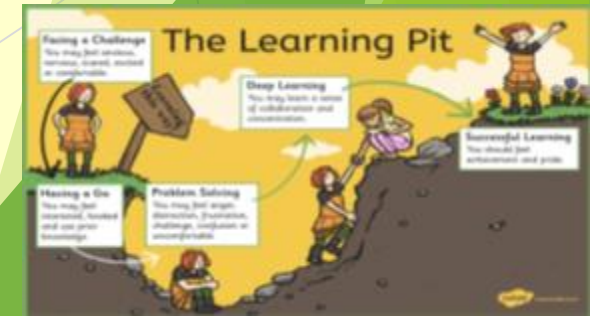
$$\underline{30} \text{ cm}^3 + \underline{28} \text{ cm}^3 = \underline{58} \text{ cm}^3$$

Choose your challenge

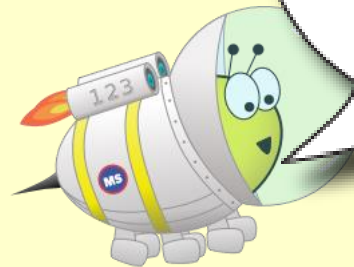
Challenges can be found on the document named 'Maths Challenges Day 3'.

Choose an appropriate challenge OR work through green, orange and red.

Answers can be found at the bottom of the document.



Reflection Time

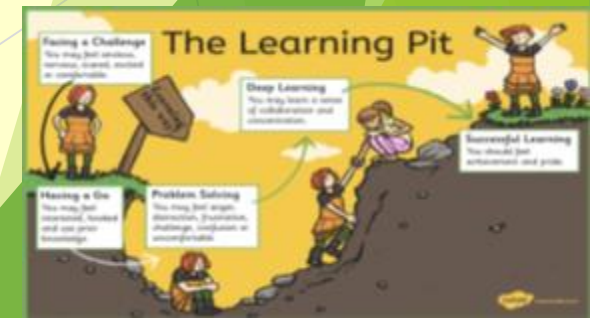


If a cuboid has three odd measurements, its volume will be an odd amount of cubic units.

The statement is ____ true because...

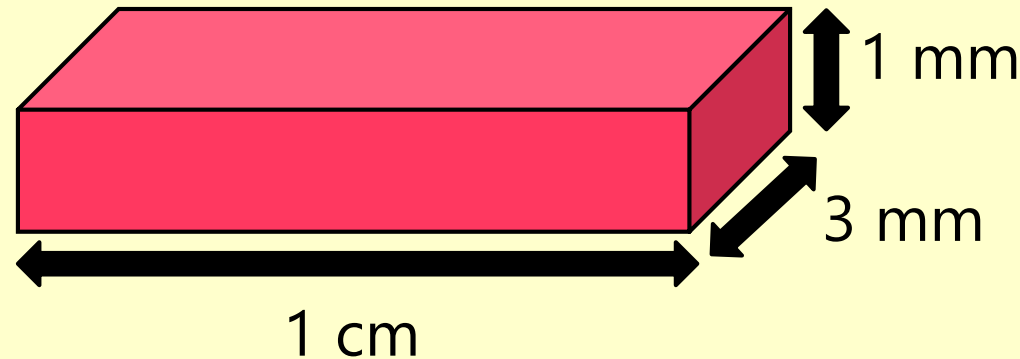
Is Astrobee's statement sometimes, always or never true?

Provide examples to explain your answer.



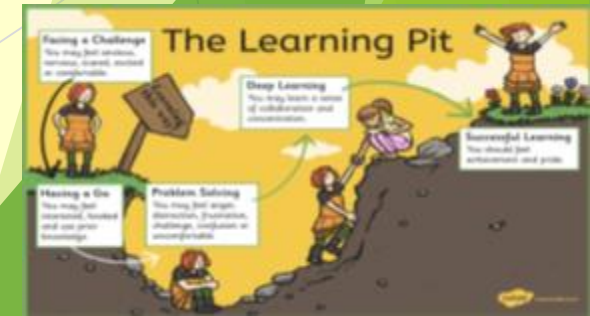
Reflection Time - ANSWERS

Astrobee's statement is always true if the measurements all use the same cubic unit. However, it is never true if one of the cubic units is different (as shown).



Volume:

$$\underline{1} \text{ cm} \times \underline{3} \text{ mm} \times \underline{1} \text{ mm} = \underline{30} \text{ mm}^3$$
$$\underline{10} \text{ mm} \times \underline{3} \text{ mm} \times \underline{1} \text{ mm} = \underline{30} \text{ mm}^3$$



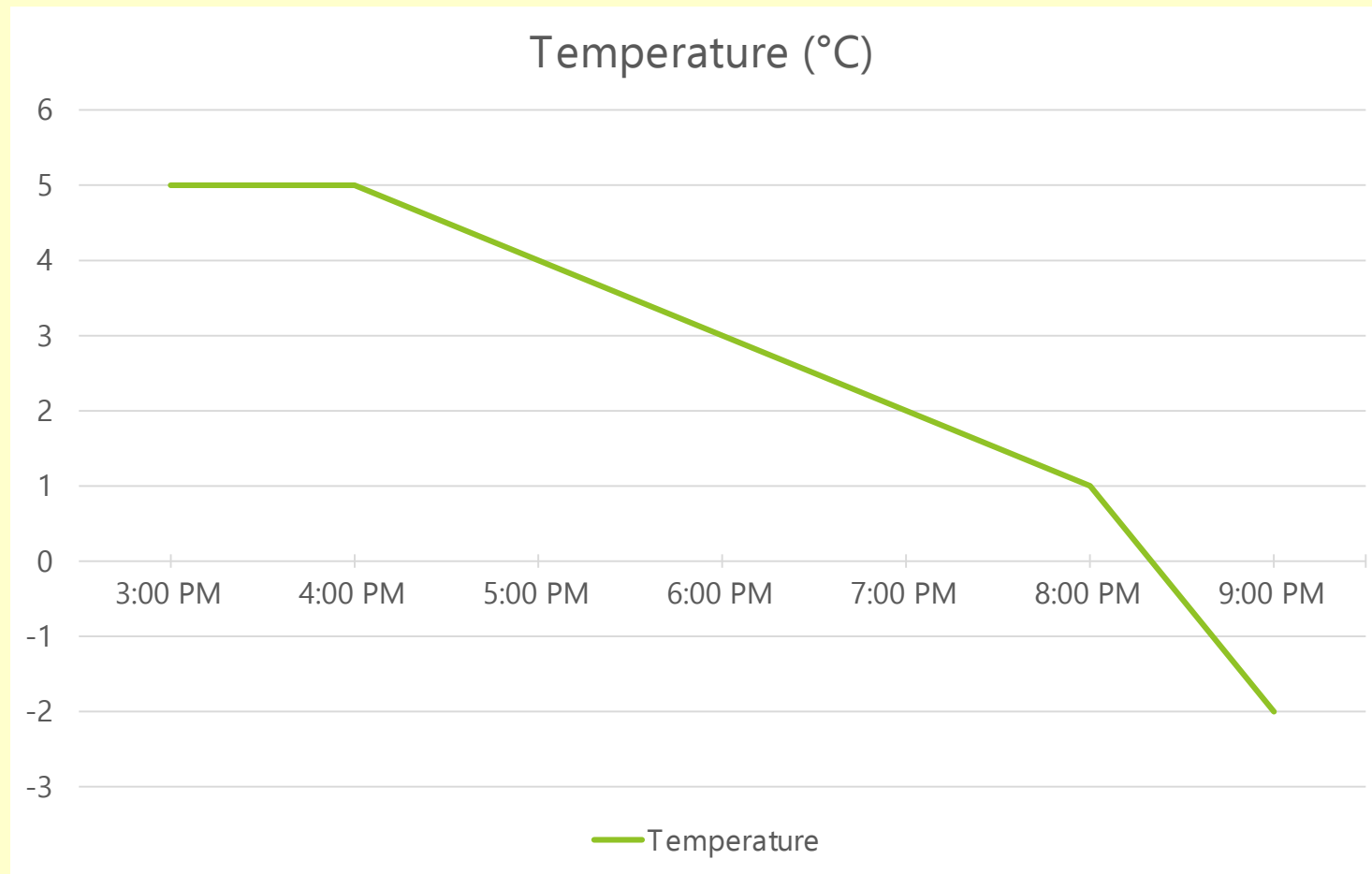
- ▶ The next unit of work is statistics. For some activities, children will need squared paper to draw graphs on.
- ▶ If you do not have access to squared paper, or are unable to print squared paper from the website, the children may need to miss the activities that require this resource.

Statistics

Day 4

Starter

Which measurement is the odd one out?



Starter - ANSWERS

The 9:00pm measurement is the odd one out as it is the only measurement that is a negative value.

Date: Day 4

LO: To read and interpret line graphs.

Date: Day 4

LO: To read and interpret line graphs.

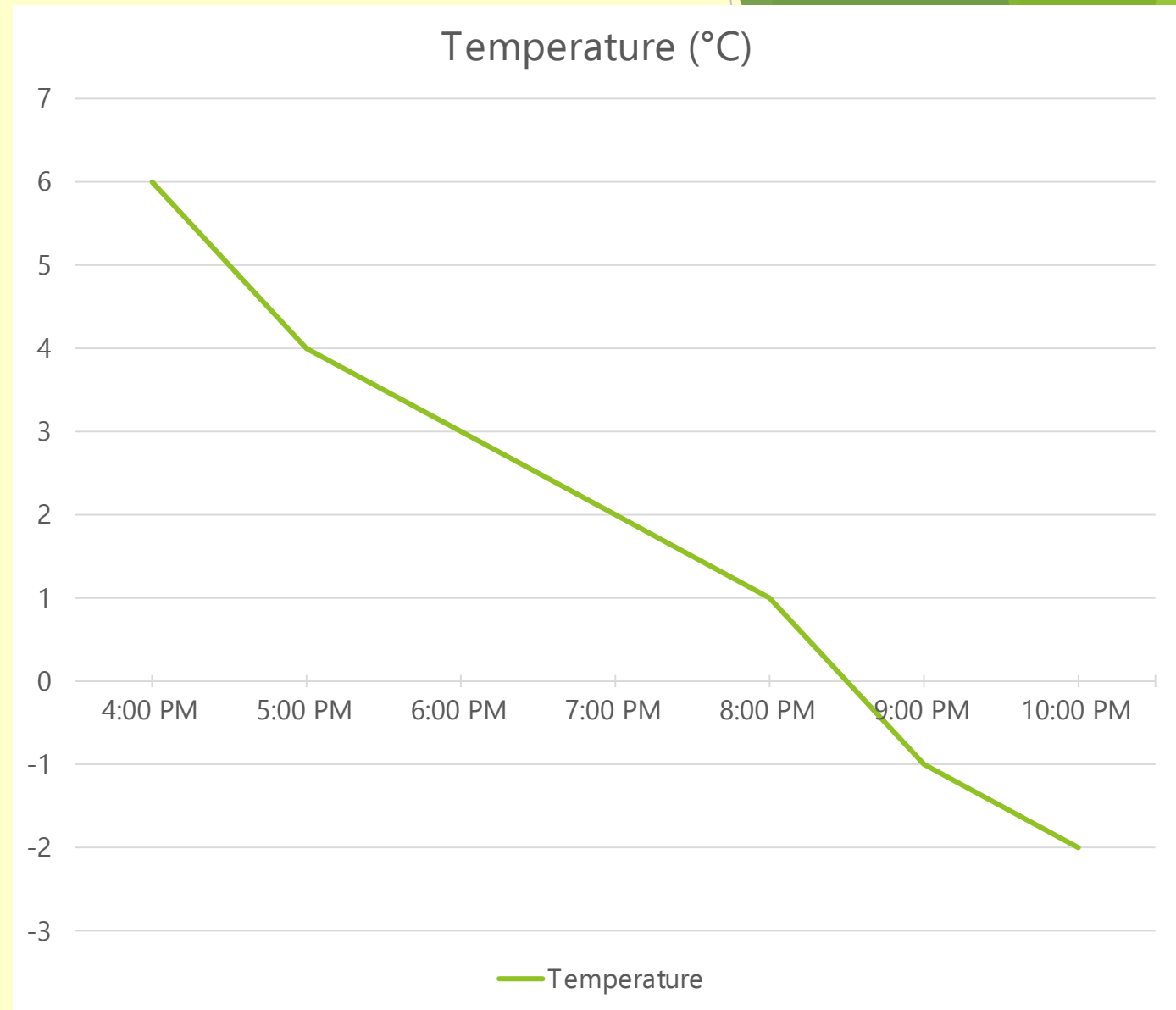
Success Criteria

I can use my knowledge of number lines to read values on horizontal and vertical lines and drawing vertical and horizontal lines to give accurate readings.

I can explain my reasoning.

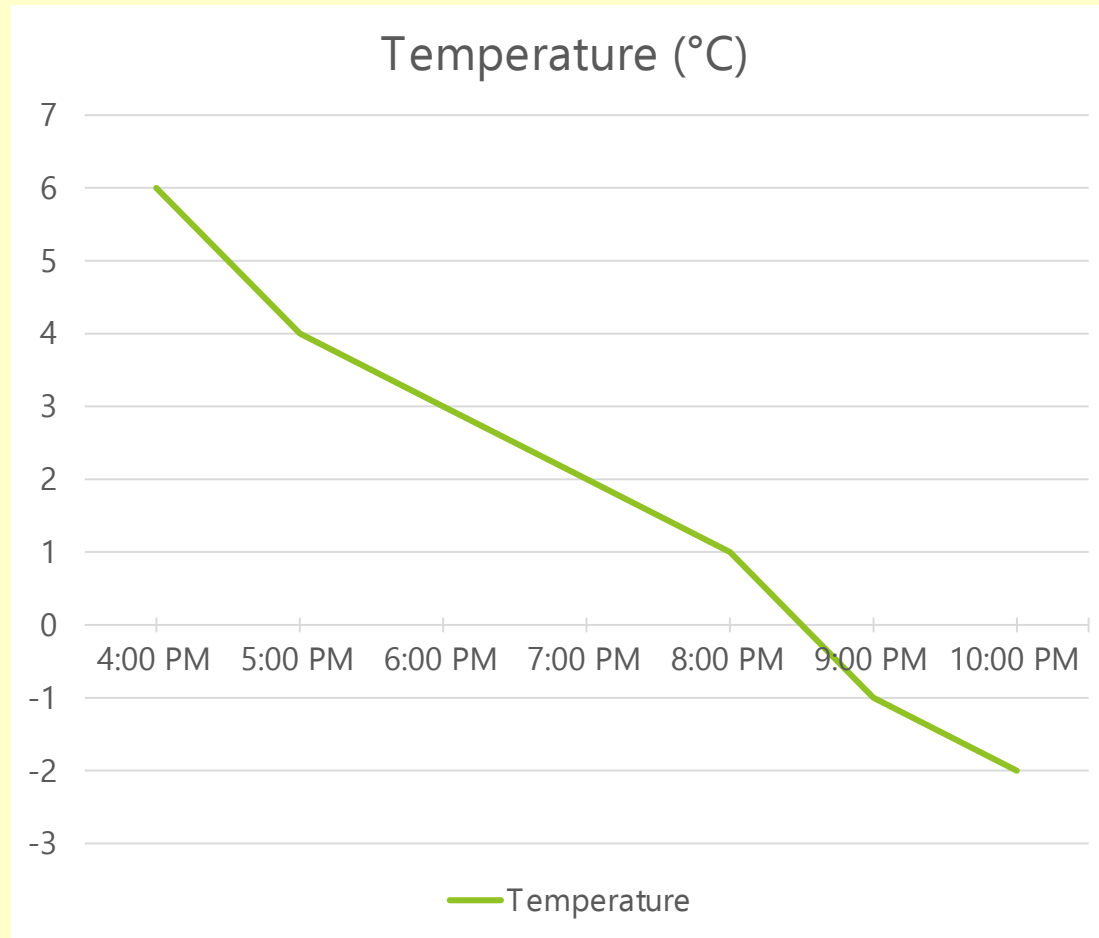
Descriptive Doing

- 1) What was the temperature at 4:00pm?
- 2) What is the coldest recorded temperature?
- 3) At what time was the temperature -1°C ?
- 4) At what time was the temperature 3°C ?



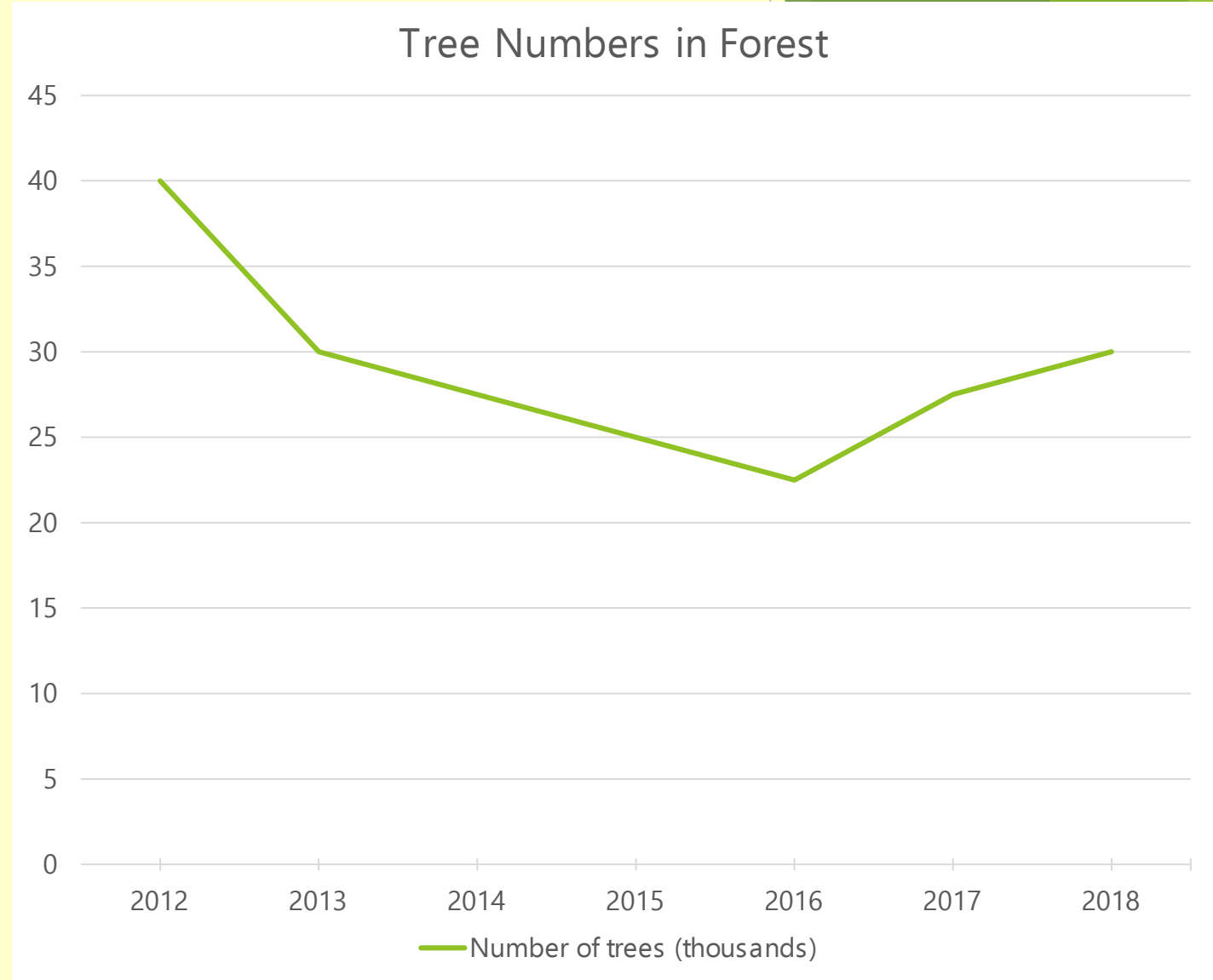
Descriptive Doing - ANSWERS

- 1) 6°C
- 2) -2°C
- 3) 9:00pm
- 4) 6:00pm



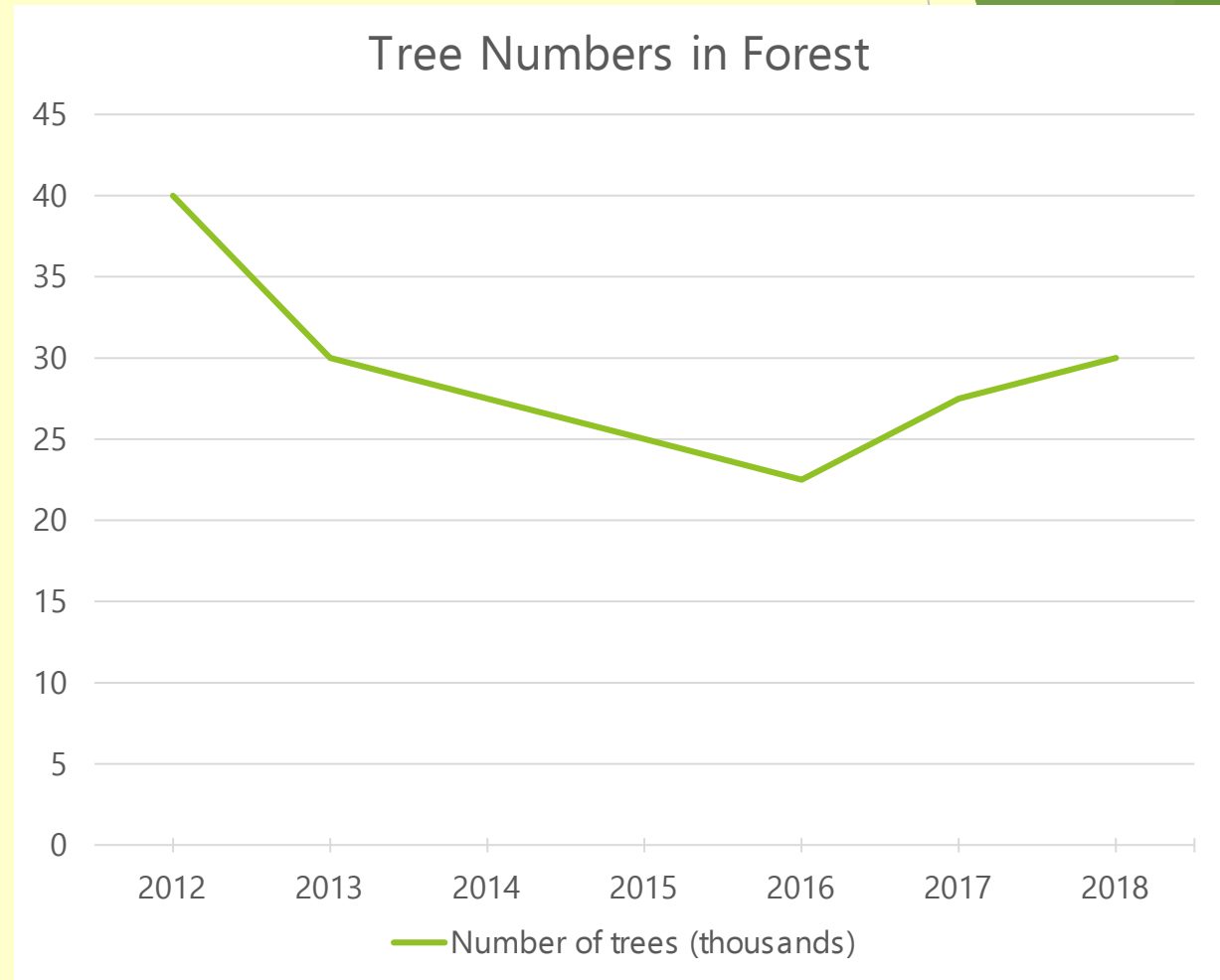
Descriptive Doing

- 1) What is the difference between the most and least amount of trees the forest has had?
- 2) Which year saw a 10,000 decrease in trees?
- 3) What do you think will happen after 2016?



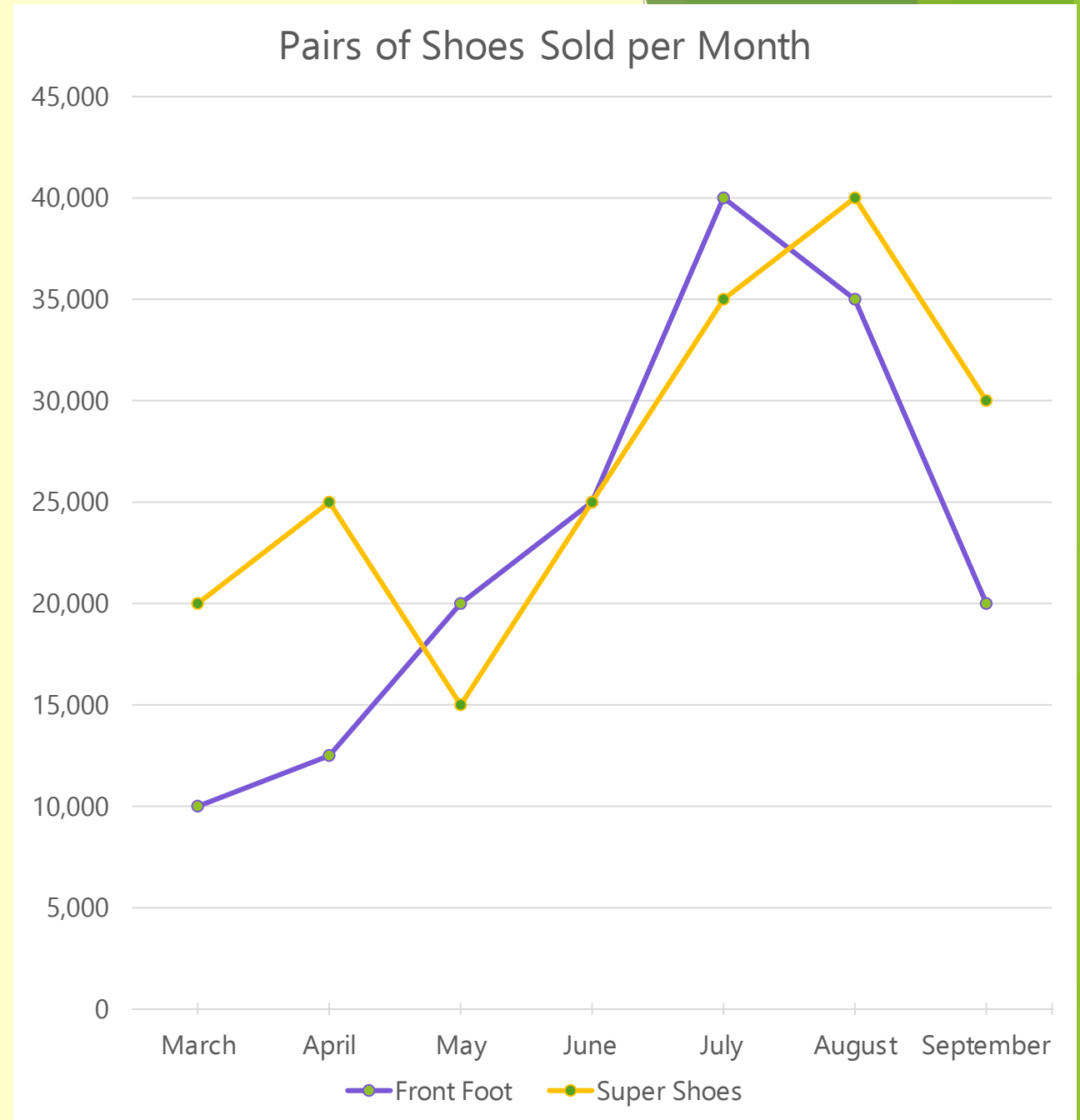
Descriptive Doing - ANSWERS

- 1) The most trees was 40,000 and the least was 22,500. So, the difference is 17,500.
- 2) 10,000 trees were lost between 2012 and 2013.
- 3) The forest started having trees re-planted after 2016, as the tree numbers rise again.



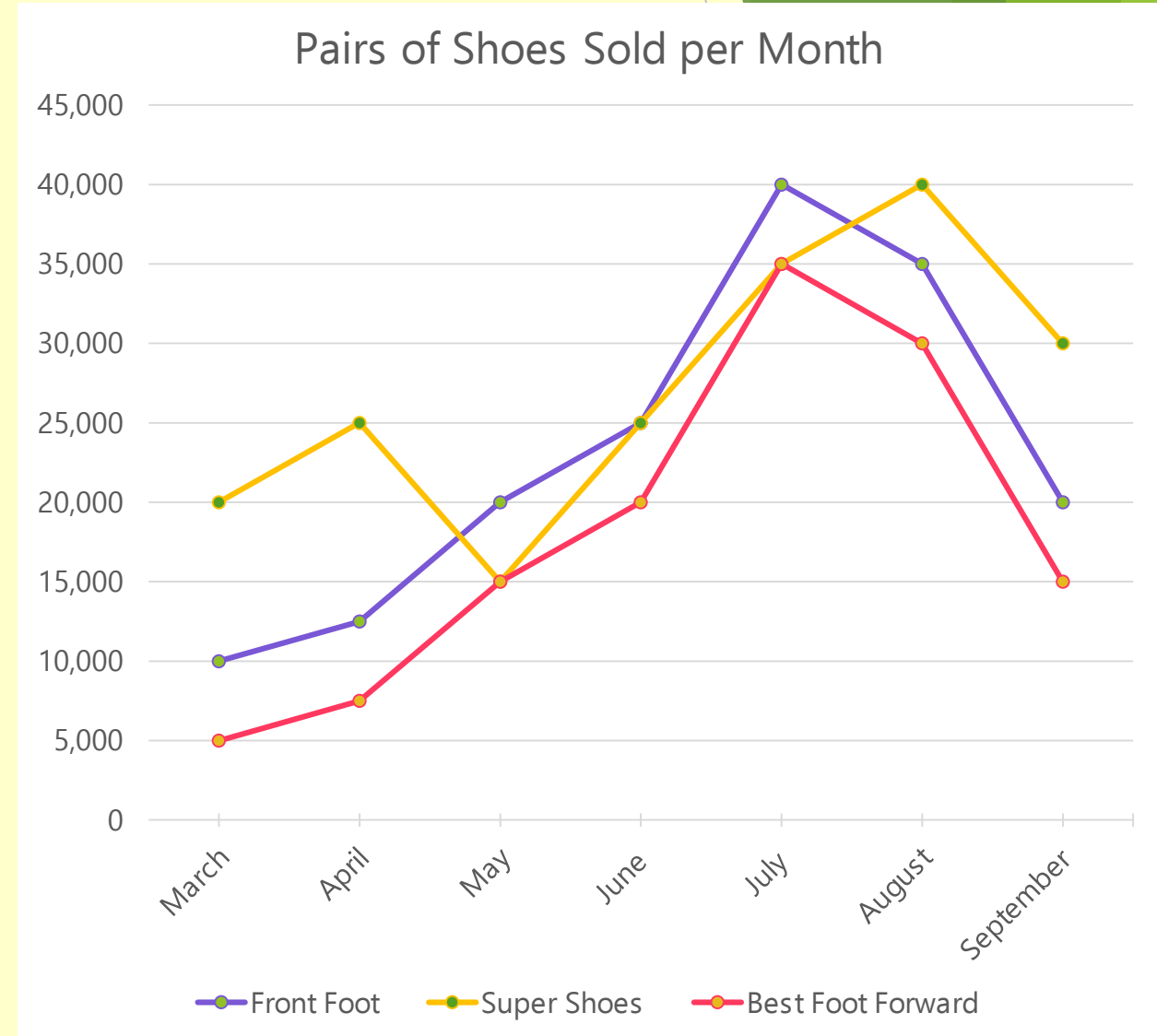
Descriptive Doing

- 1) In which month did both shops sell the same number of shoes?
- 2) How many more shoes did Front Foot sell than Super Shoes in May?
- 3) Another shoe shop - Best Foot Forward - sold 5000 less shoes than Front Foot each month. Where would the line go on the graph?



Descriptive Doing - ANSWERS

- 1) They both sold 25000 in June.
- 2) Front Foot sold 5000 more shoes than Super Shoes in May.
- 3) See red line on graph.



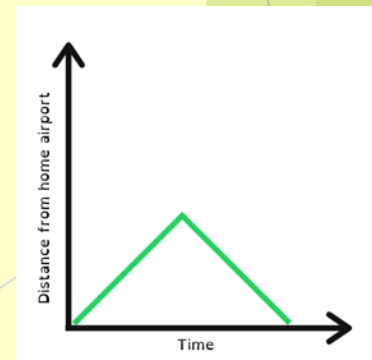
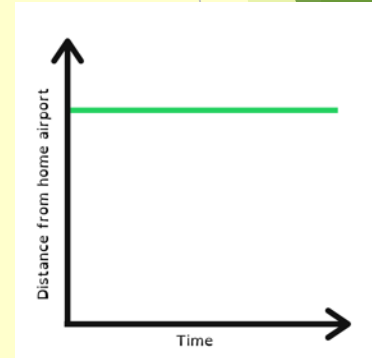
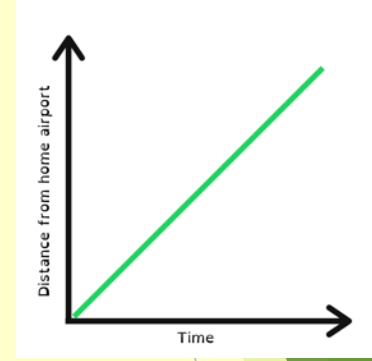
Reflective Doing

Match the labels to the correct graph.

A plane is parked on a runway that isn't at its home airport.

A plane flies halfway to another destination, but has to come back.

A plane is flying away from its base at a steady rate of 500 miles per hour.

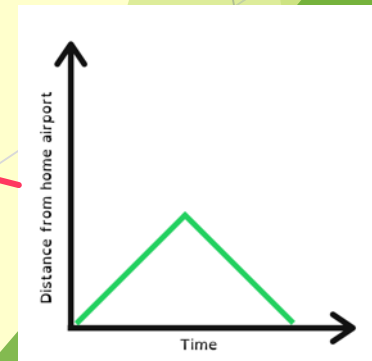
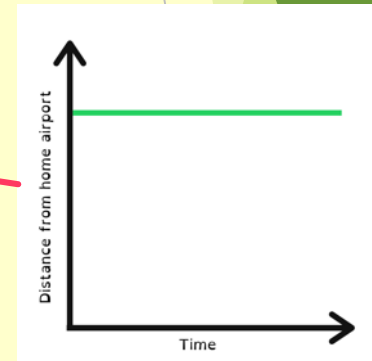
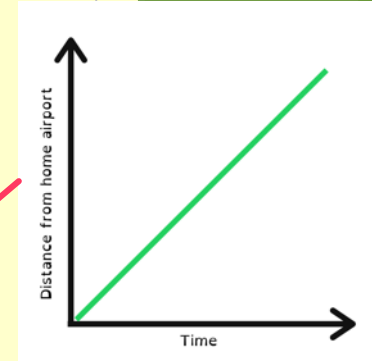


Reflective Doing - ANSWERS

A plane is parked on a runway that isn't at its home airport.

A plane flies halfway to another destination, but has to come back.

A plane is flying away from its base at a steady rate of 500 miles per hour.

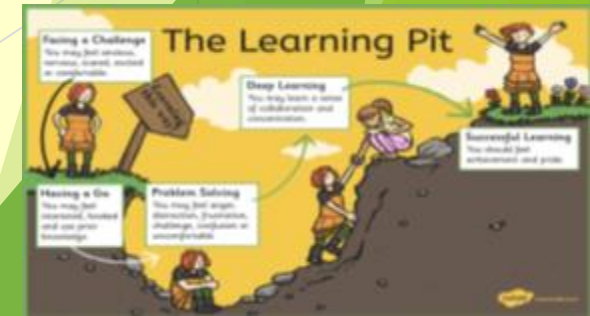


Choose your challenge

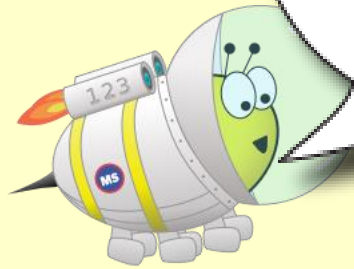
Challenges can be found on the document named 'Maths Challenges Day 4'.

Choose an appropriate challenge OR work through green, orange and red.

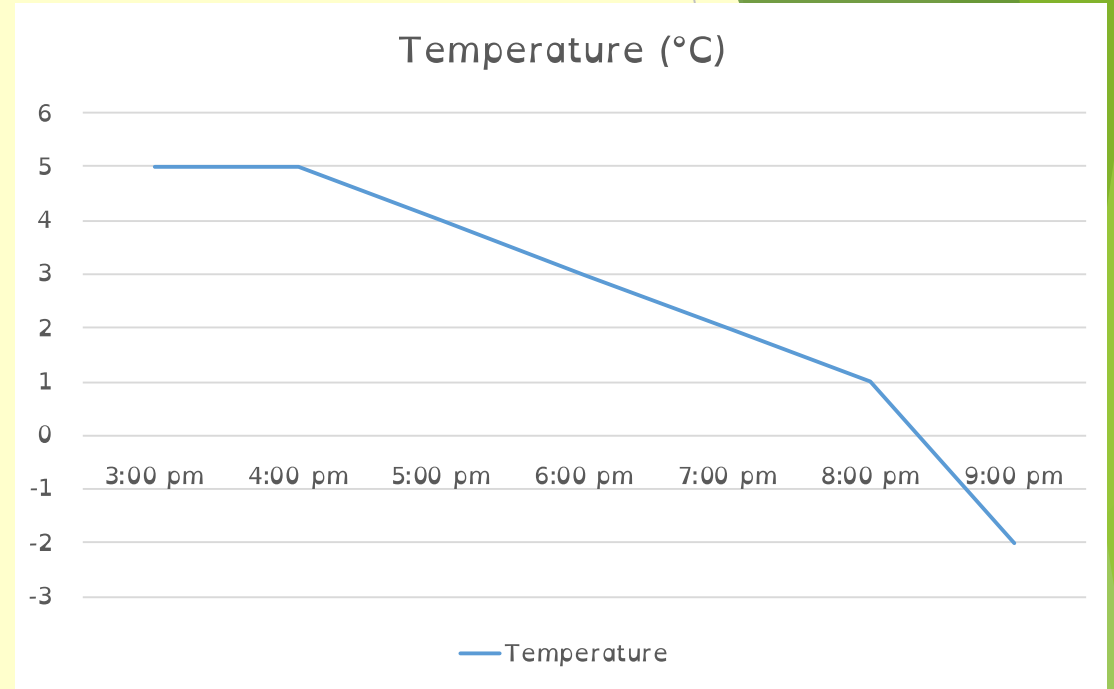
Answers can be found at the bottom of the document.



Reflection Time



The temperature is warmer at 3 pm than it is at 4 pm.



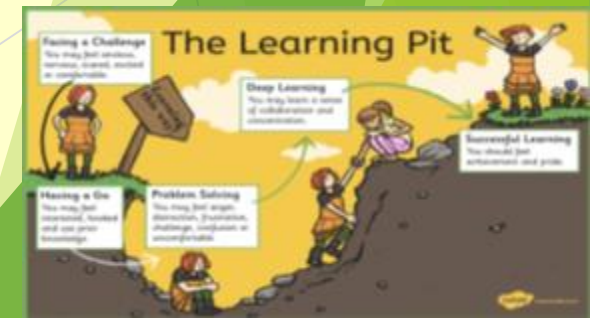
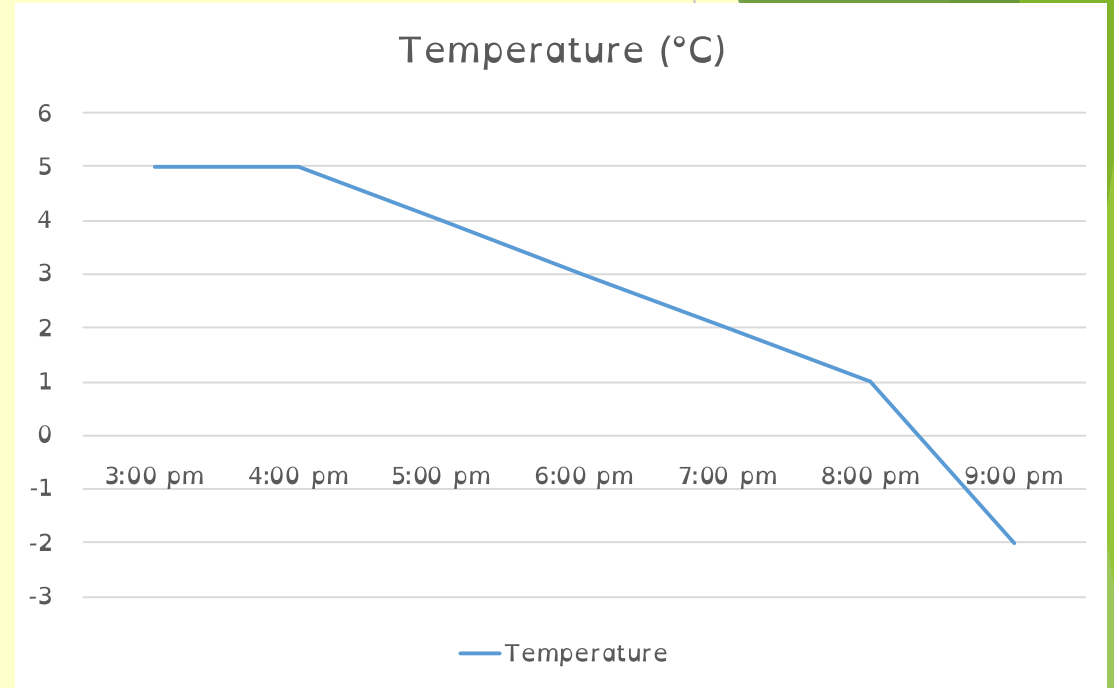
Is Astrobee's statement true or false?
Explain your answer.

The statement is ____ because...



Reflection Time

Astrobee has made a false statement - the temperature is 5°C at 3pm and 5°C at 4pm, which means the temperatures are the same not warmer at 3pm.



Statistics

Day 5

Starter

What's the same? What's different?

Rainfall in 2018	
Month	Precipitation (mm)
Jan	67
Feb	64
Mar	55
Apr	50
May	47
Jun	58

Rainfall in 2019	
Month	Precipitation (mm)
Jan	79
Feb	73
Mar	62
Apr	55
May	51
Jun	48

Starter - ANSWERS

In 2018, the rainfall figures fell from January until May, but then increased again in June, whereas in 2019 the rainfall figures fell consistently from January until June.

They both had decreasing rainfall figures for the first five months of the year.

Date: Day 5

LO: To draw line graphs.

Date: Day 5

LO: To draw line graphs.

Success Criteria

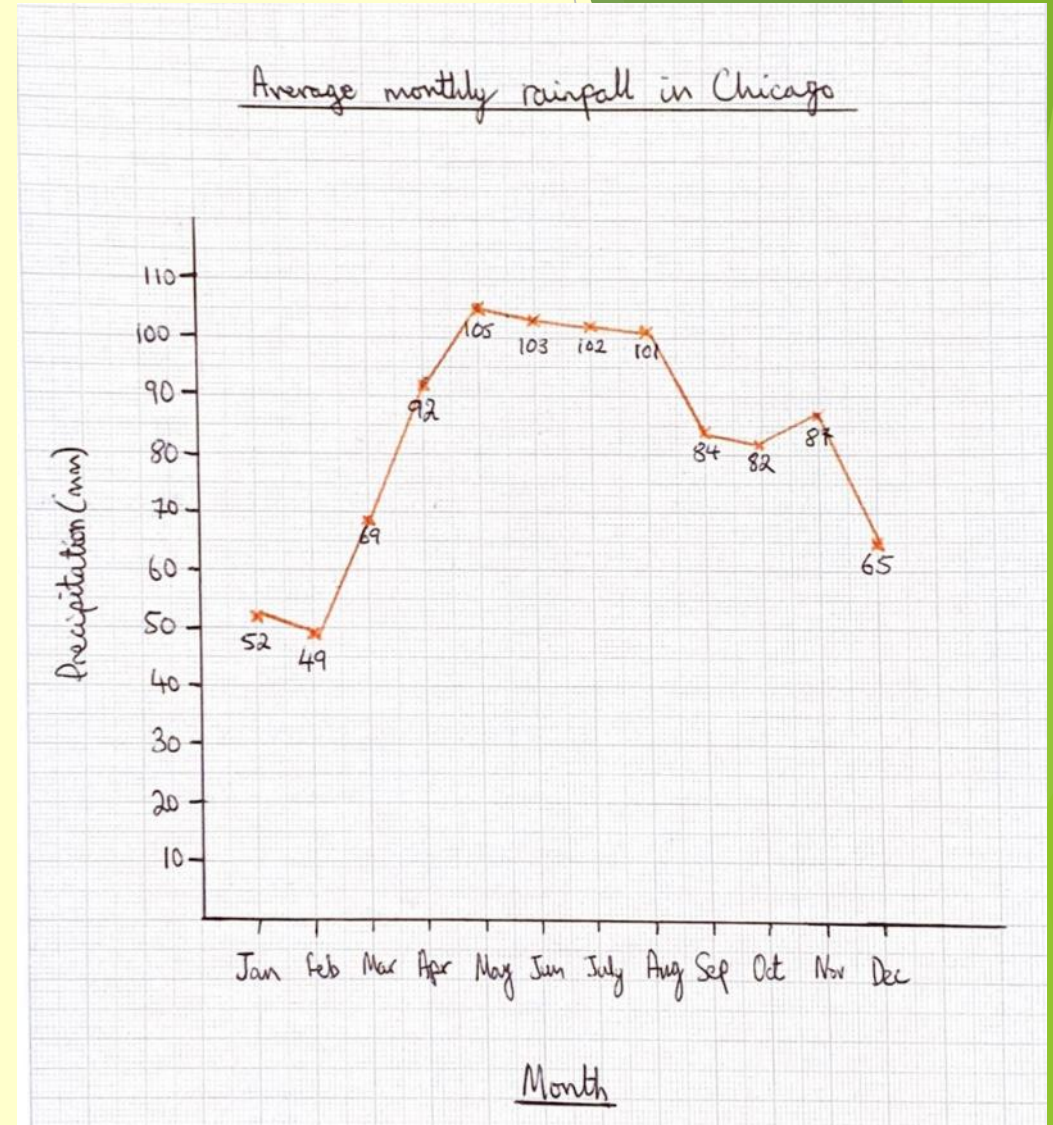
I can use my knowledge of scales and co-ordinates to plot data on to a line graph.

I can explain my reasoning.

Descriptive Teaching

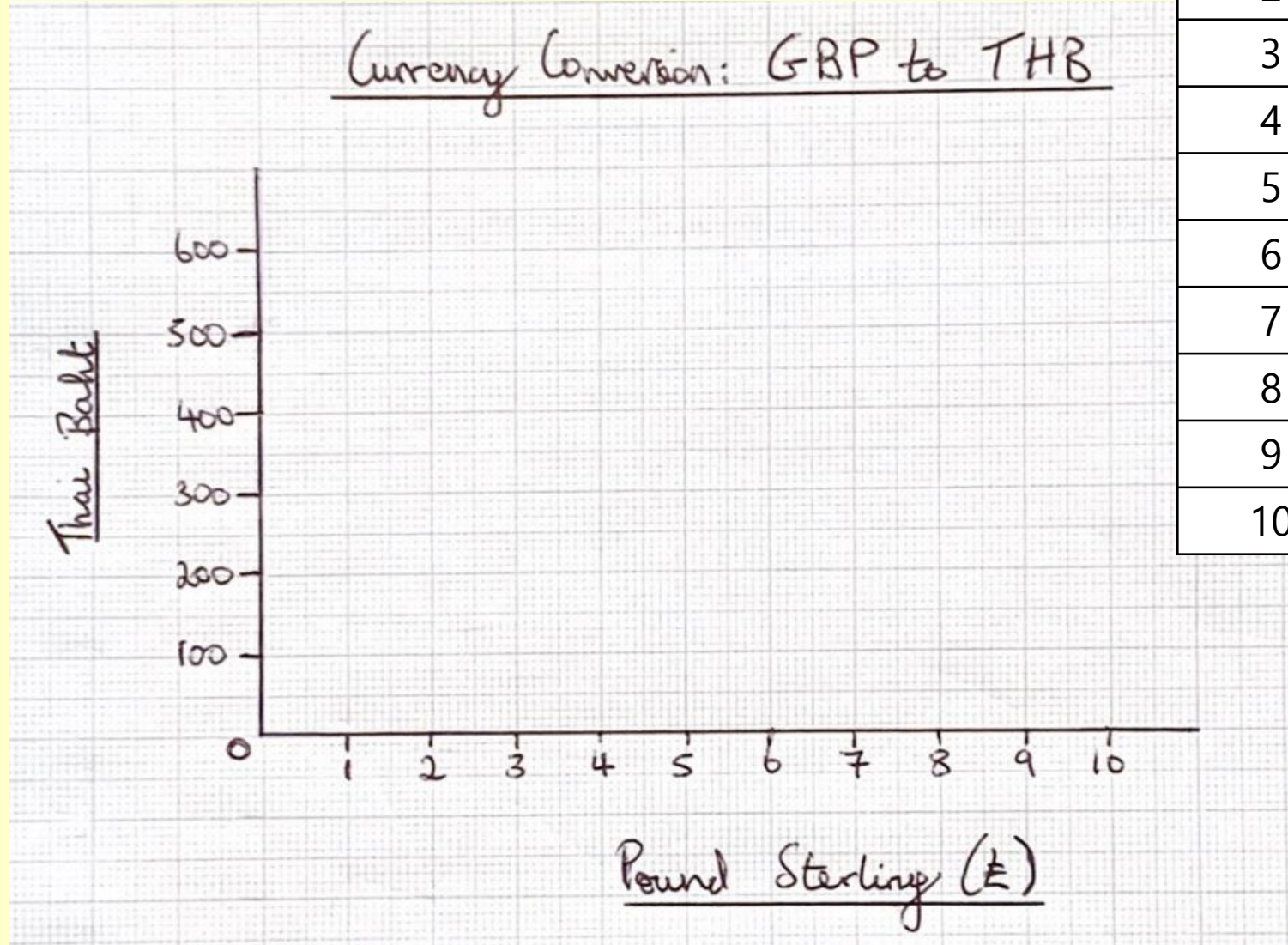
You need to be accurate when plotting points on a grid. When drawing a line graph, remember to join the points together.

Month	Precipitation (mm)
Jan	52
Feb	49
Mar	69
Apr	92
May	105
Jun	103
Jul	102
Aug	101
Sep	84
Oct	82
Nov	87
Dec	65



Descriptive Doing

Copy the graph onto squared paper, then plot the points (squared paper is provided on the webpage).



GBP (£)	Thai Baht
1	40
2	80
3	120
4	160
5	200
6	240
7	280
8	320
9	360
10	400

Reflective Doing

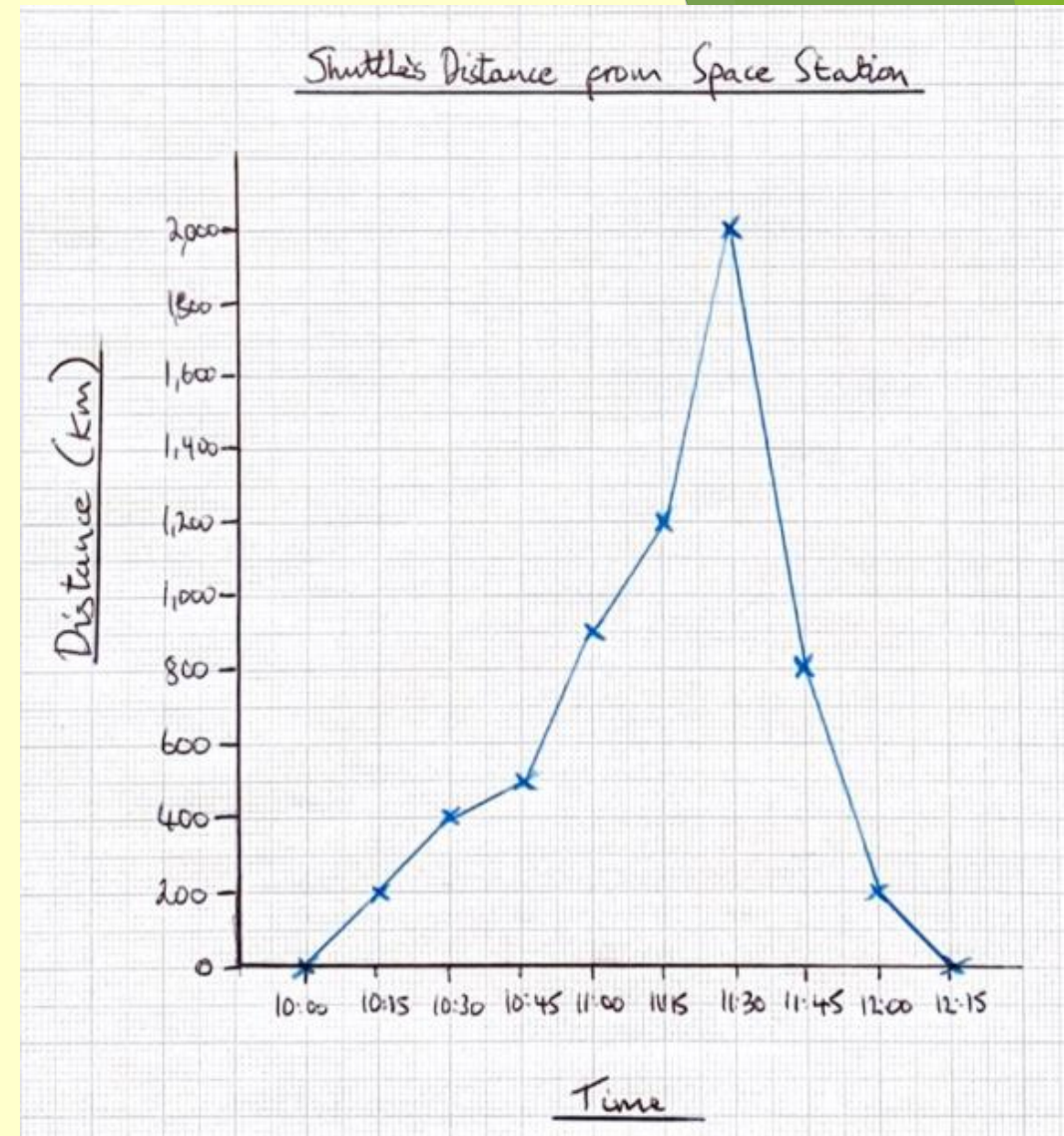
Research a topic of interest to you (e.g. favourite colour, food etc.).

Create a line graph based on this topic!

Reflective Doing

James has used the data in the table to plot a line graph.

What errors has James made?



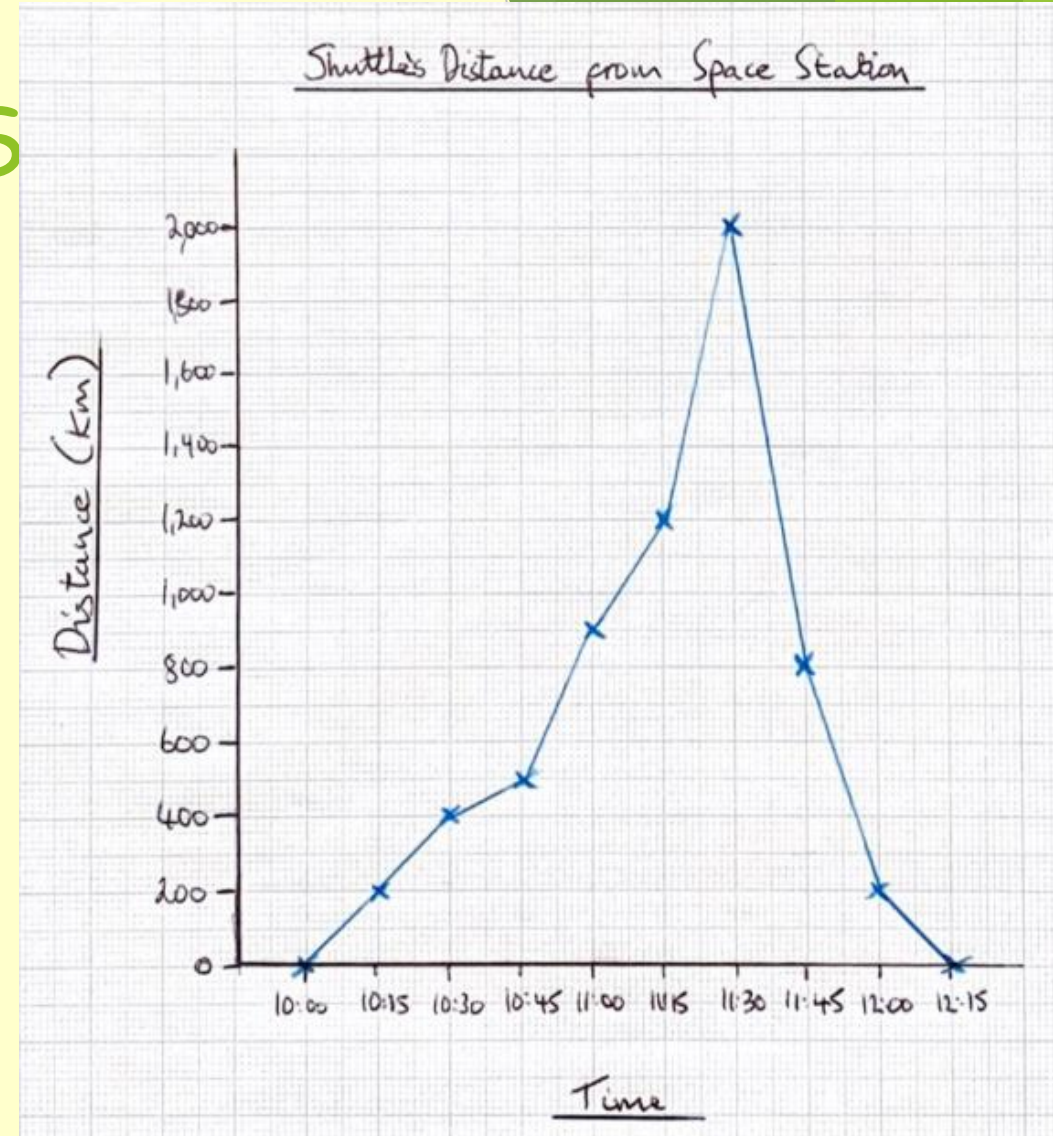
Time	10:00	10:15	10:30	10:45	11:00	11:15	11:30	11:45	12:00
Distance (km)	0	200	500	400	900	1,200	1,700	800	0

Reflective Doing - ANSWERS

James confused the data points at 10:30 and 10:45.

James also plotted 11:30 incorrectly, as 2,000 km instead of 1,700 km.

Finally, James had plotted 12:00 as 200 km, when 12:00 is the time when the shuttle returns to 0 km.



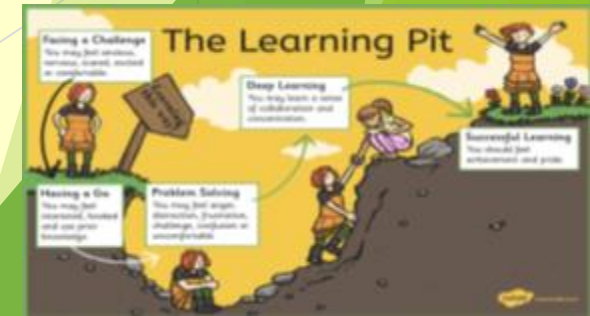
Time	10:00	10:15	10:30	10:45	11:00	11:15	11:30	11:45	12:00
Distance (km)	0	200	500	400	900	1,200	1,700	800	0

Choose your challenge

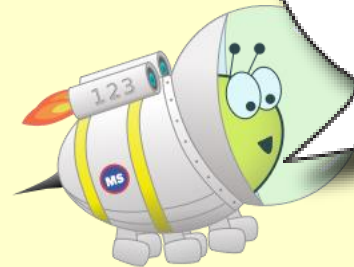
Challenges can be found on the document named 'Maths Challenges Day 5'.

Choose an appropriate challenge OR work through green, orange and red.

Answers can be found at the bottom of the document.



Reflection Time

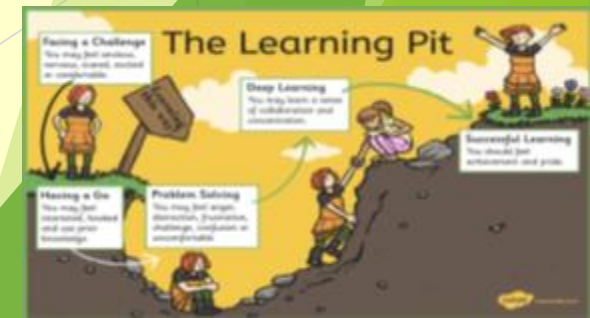


When plotting line graphs, one section of your data must end in zero.

The statement is ____ true because...

Is Astrobee's statement sometimes, always or never true?

Explain your answer.



Reflection Time - ANSWERS

Astrobee's statement is sometimes true. For example, if you were measuring how long it took cars to drive lots of 100 m, you might have your y-axis labels as 0, 100 m, 200 m; however, most line graphs do not require one set of data always ending in 0.

