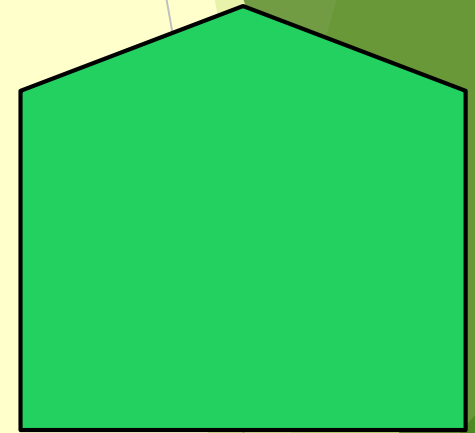
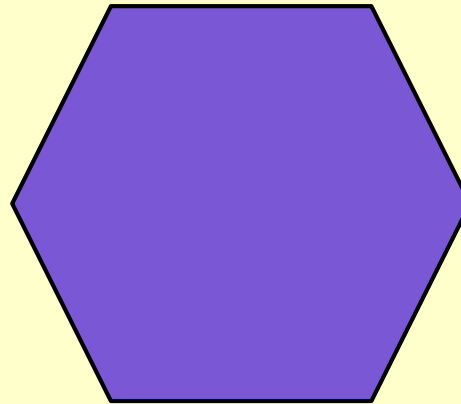
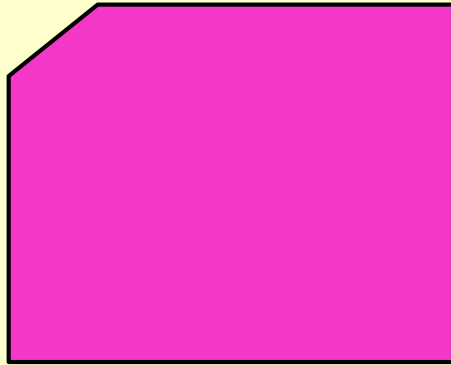
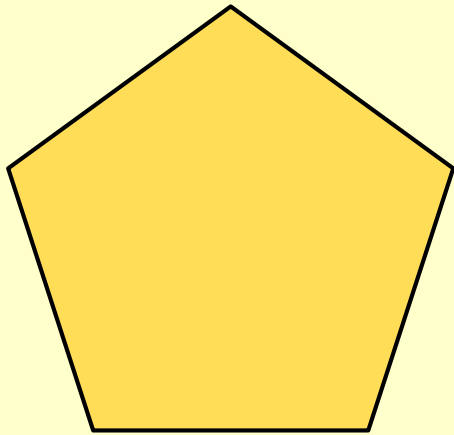


Properties of Shape

Day 1

Starter

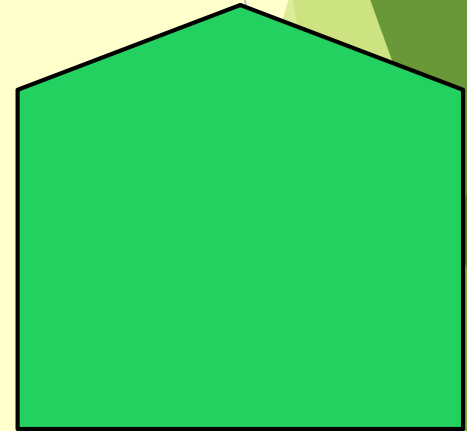
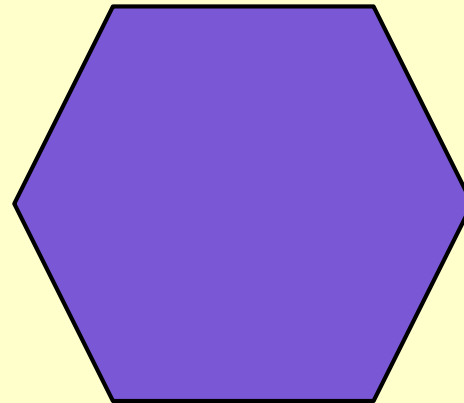
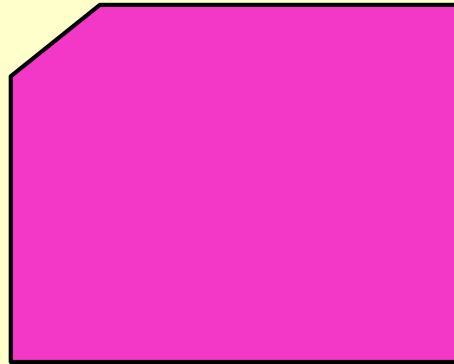
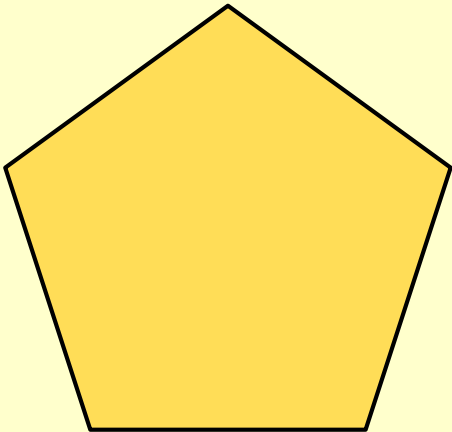
Which one doesn't belong?



Explain your answer by referring to the properties of the shapes above.

Starter - ANSWERS

The purple shape doesn't belong as it is a hexagon, the yellow, pink and green shapes each have five sides, so are all pentagons.



Date: Day 1

LO: To explore interior angles in polygons.

Success Criteria

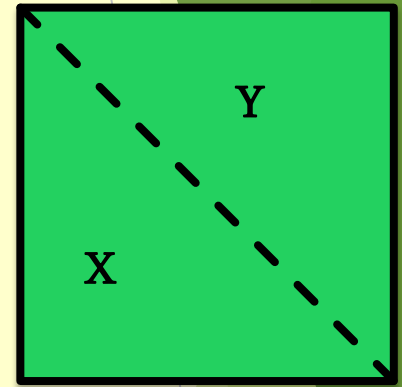
I can explore the total value of the interior angles of a variety of polygons.

I can explain my reasoning.

Descriptive Doing

Draw a square and split it into two triangles.

- a) What do the angles of triangle X add up to?
- b) What do the angles of triangle Y add up to?
- c) So, what is the sum of interior angles in a quadrilateral?



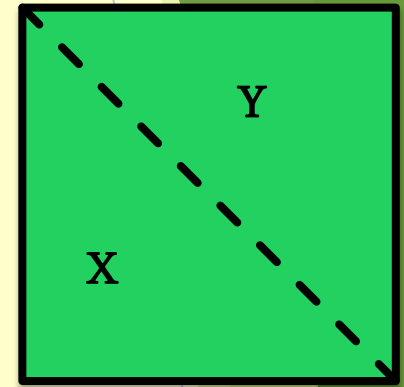
Extension:

Do the same with other quadrilaterals.

Use a ruler.

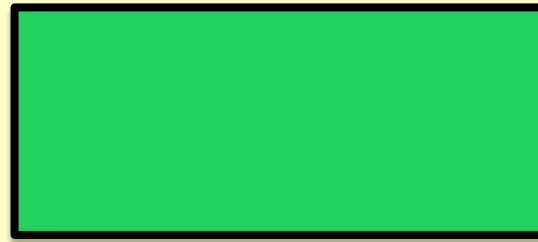
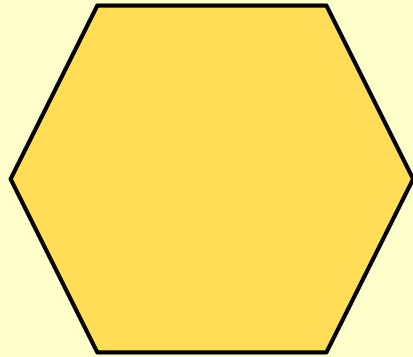
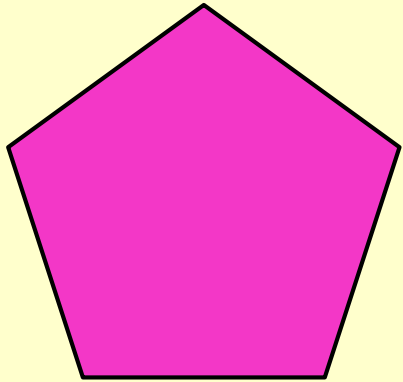
Descriptive Doing - ANSWERS

- a) The angles of triangle X add up to 180° .
- b) The angles of triangle Y add up to 180° .
- c) The sum of the interior angles in a quadrilateral add up to 360° .



Descriptive Doing

Cut a variety of polygons (rectangles, pentagons, hexagons...) out of card/paper. Cut each polygon into sets of triangles. Keep a record of sketches in your books.



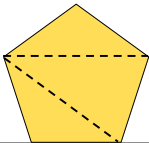
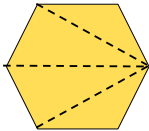
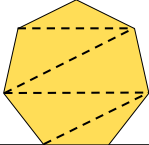
What have you noticed?
Explain your answer.

This activity continues on the next slide.

Write a formula for calculating the total interior angle of any polygon. Use it to calculate the interior angle of other polygons, e.g. a nonagon or a dodecagon.

Descriptive Doing

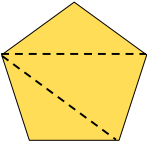
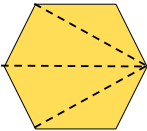
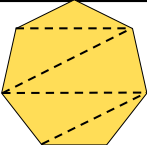
Copy the table in your book:

Shape	number of sides	number of triangles	$180^\circ \times \text{number of triangles}$	sum of internal angles
 square	4	2	$180^\circ \times 2$	360°
 pentagon				
 hexagon				
 heptagon				

Descriptive Doing

$$(s - 2) \times 180^\circ$$

e.g. dodecagon: $(12 - 2) \times 180^\circ = 10 \times 180^\circ = 1,800^\circ$

Shape	number of sides	number of triangles	$180^\circ \times \text{number of triangles}$	sum of internal angles
 square	4	2	$180^\circ \times 2$	360°
 pentagon	5	3	$180^\circ \times 3$	540°
 hexagon	6	4	$180^\circ \times 4$	720°
 heptagon	7	5	$180^\circ \times 5$	900°

Reflective Doing

Which shape is each person below describing?

- a) “The sum of my angles is more than 360° but less than 720° ,” says Jamal.
- b) Ruth says, “The sum of my angles is equivalent to the sum of the total interior angles of four triangles combined.”
- c) Yasmin says, “My polygon is made up of six triangles.”

Reflective Doing - ANSWERS

- a) “The sum of my angles is more than 360° but less than 720° ,” says Jamal.
Jamal is describing a pentagon, as it has an internal angle of 540° .
- b) Ruth says, “The sum of my angles is equivalent to the sum of the total interior angles of four triangles combined.”
Ruth is describing a hexagon, as it has an internal angle of $4 \times 180^\circ = 720^\circ$.
- c) Yasmin says, “My polygon is made up of six triangles.”
Yasmin is describing an octagon, as it has an internal angle of $6 \times 180^\circ = 1,080^\circ$. (A polygon is split into two less triangles than the sides it has...)

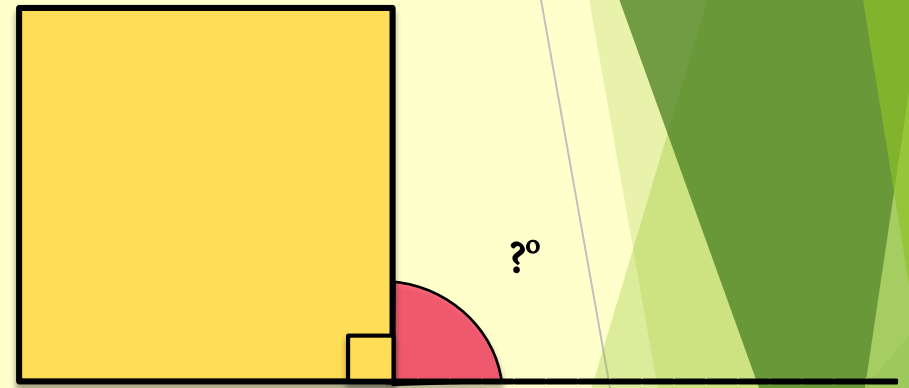
Reflective Teaching

What is the value of the missing angle?

Explain your answer.

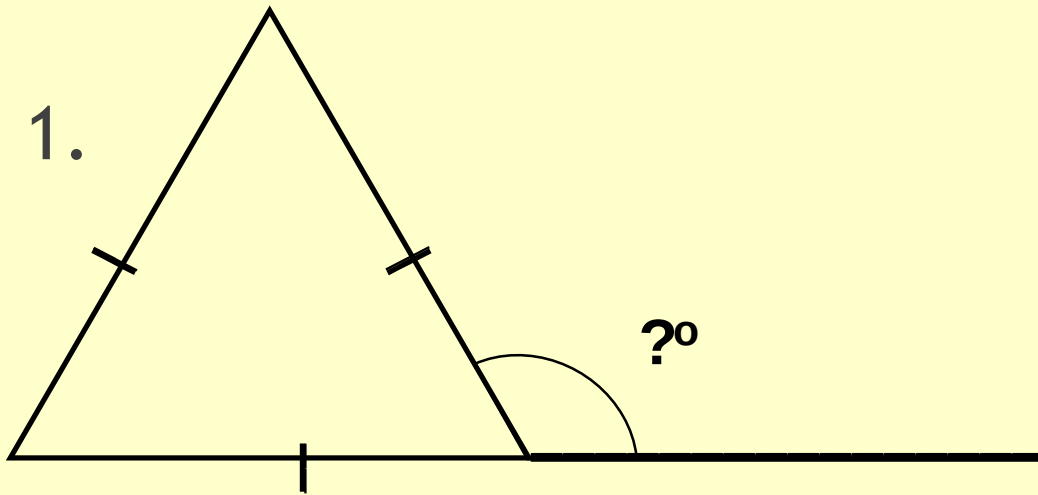
Angles on a straight line equal 180° ,
therefore, $180^\circ - 90^\circ = 90^\circ$

This missing angle is 90° .

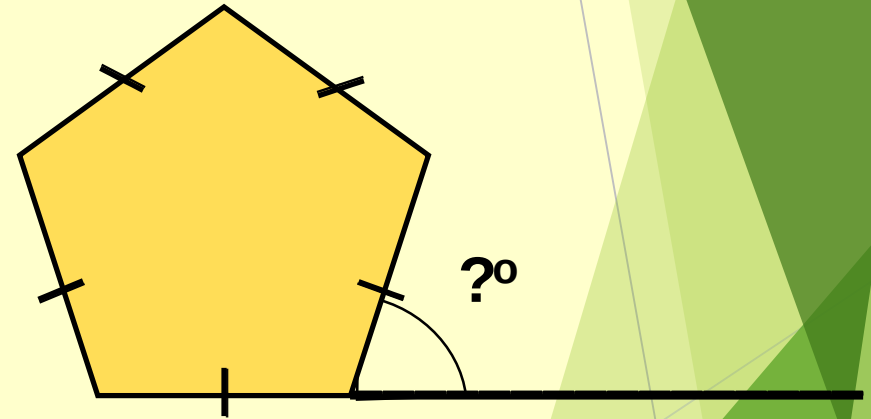


Reflective Doing

What is the value of the missing angles?
Explain your answer.



2.



Remember,
angles on a
straight line add
up to 180° .

Reflective Doing - ANSWERS

1. The value of the missing angle is 120° .
($180^\circ - 60^\circ = 120^\circ$).

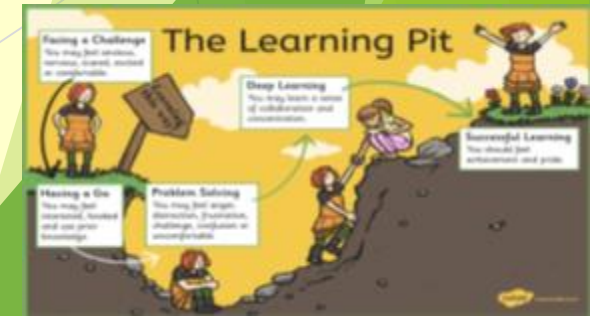
2. The value of the missing angle is 72° .
($180^\circ - 108^\circ = 72^\circ$).

Choose your challenge

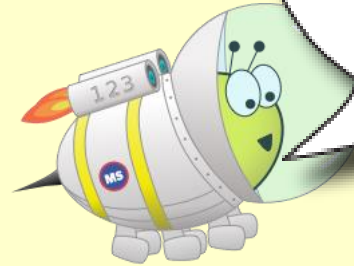
Challenges can be found on the document named 'Maths Challenges Day 1'.

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

Answers can be found at the bottom of the document.



Reflection Time

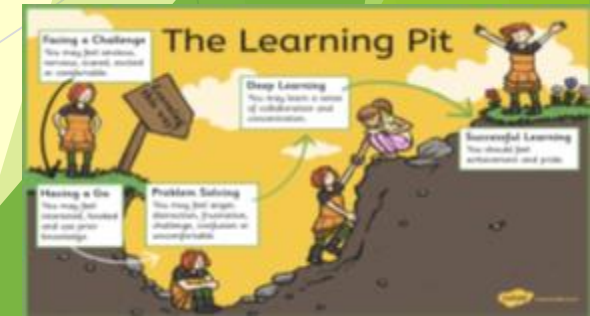


Polygons have total interior angles that are odd.

The statement is ____ true because...

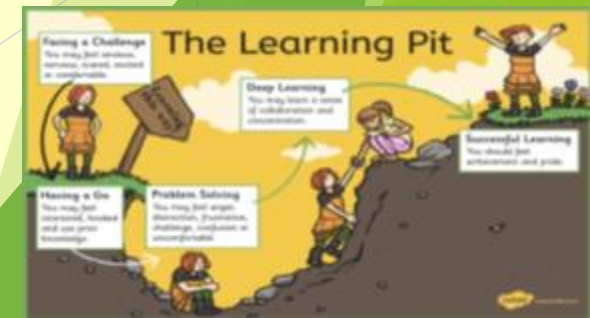
Is Astrobee's statement always, sometimes or never true?

Provide examples to explain your answer.



Reflection Time - ANSWERS

Astrobee's statement is never true. All polygons have interior angles that are multiples of 180° . So, they all have even values. For example, triangles have interior angles of 180° , quadrilaterals have interior angles of 360° and heptagons have total interior angles of 900° .



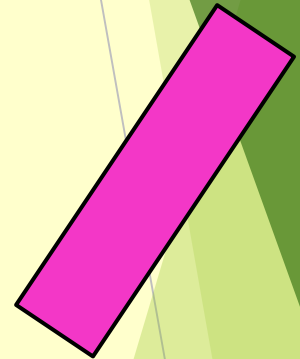
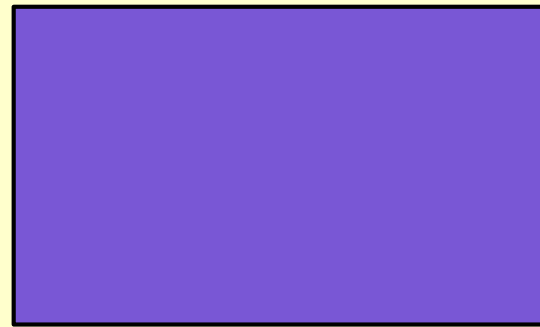
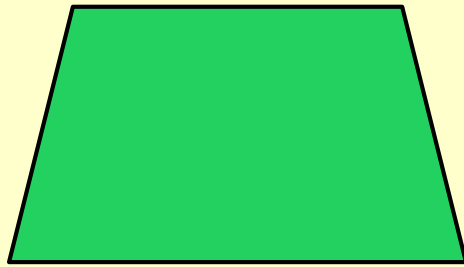
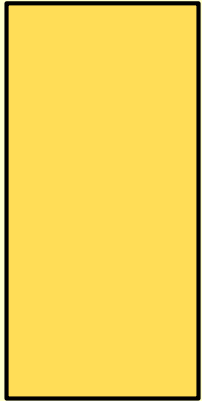
- ▶ For today's lesson, children will need access to 1cm square grid paper.
- ▶ On Week 11 of the website is a link to squared paper.
- ▶ If children do not have access to this, they may skip these questions.

Properties of Shape

Day 2

Starter

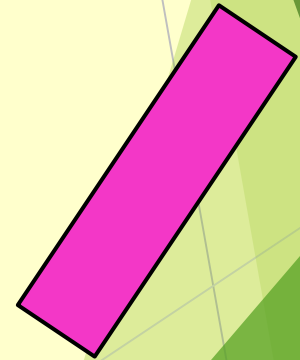
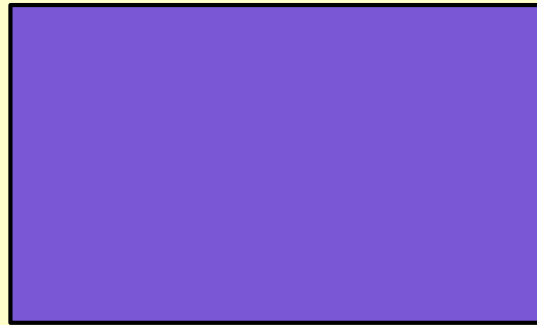
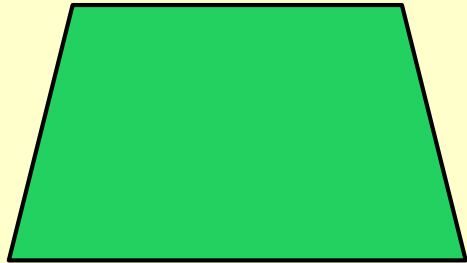
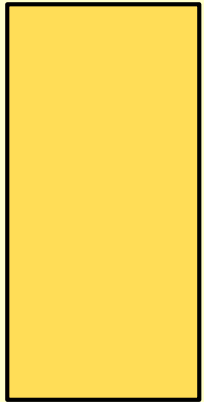
Which one doesn't belong?



Explain your answer by referring to the properties of the shapes above.

Starter - ANSWERS

The green shape doesn't belong as it is an isosceles trapezium (trapezoid), whereas the other shapes are all rectangles.



Date: Day 2

LO: To draw shapes accurately.

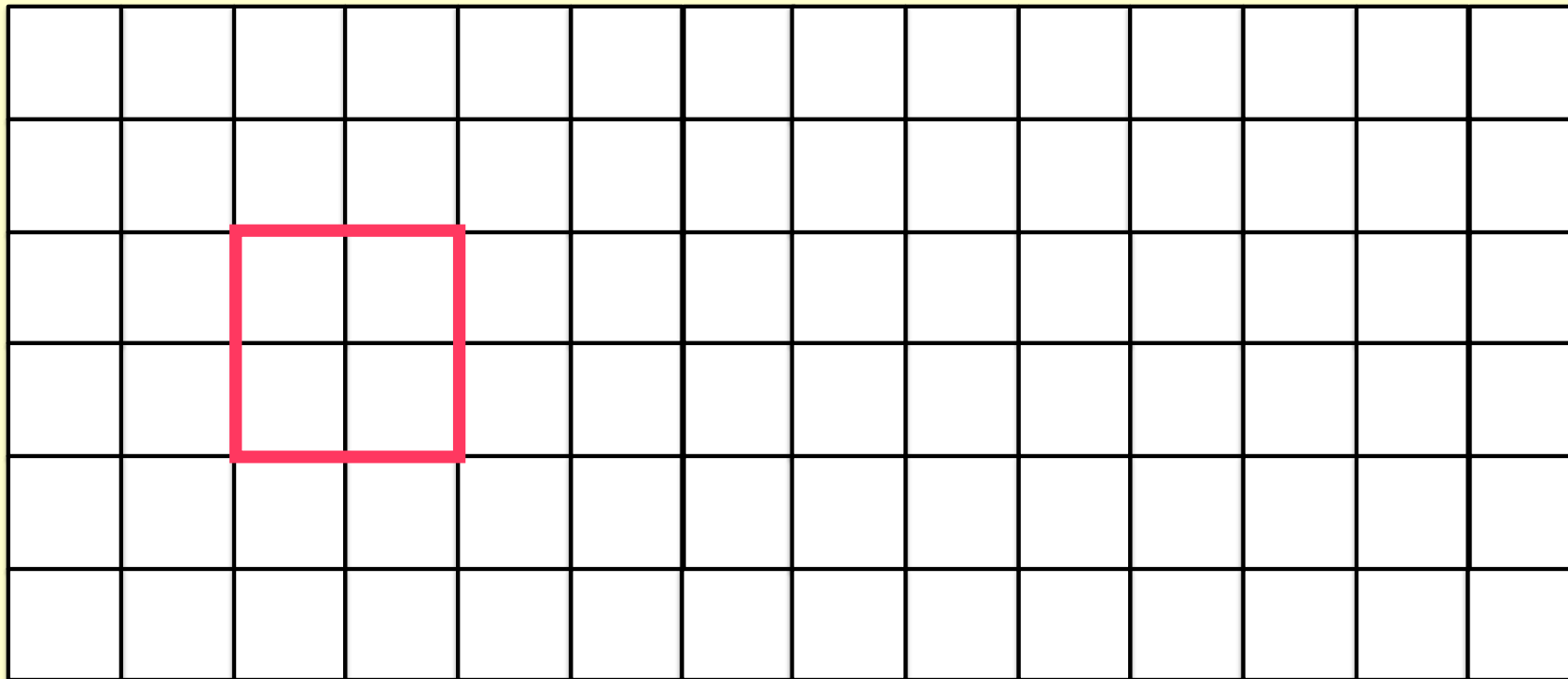
Success Criteria

I can draw 2-D shapes accurately both on 1cm grid paper and on plain paper.

I can explain my reasoning.

Descriptive Teaching

Using 1 cm square grid paper, draw a square with a perimeter of 8 cm.



Each side of the squares is 1cm².

Descriptive Doing

Using 1 cm square grid paper, draw:

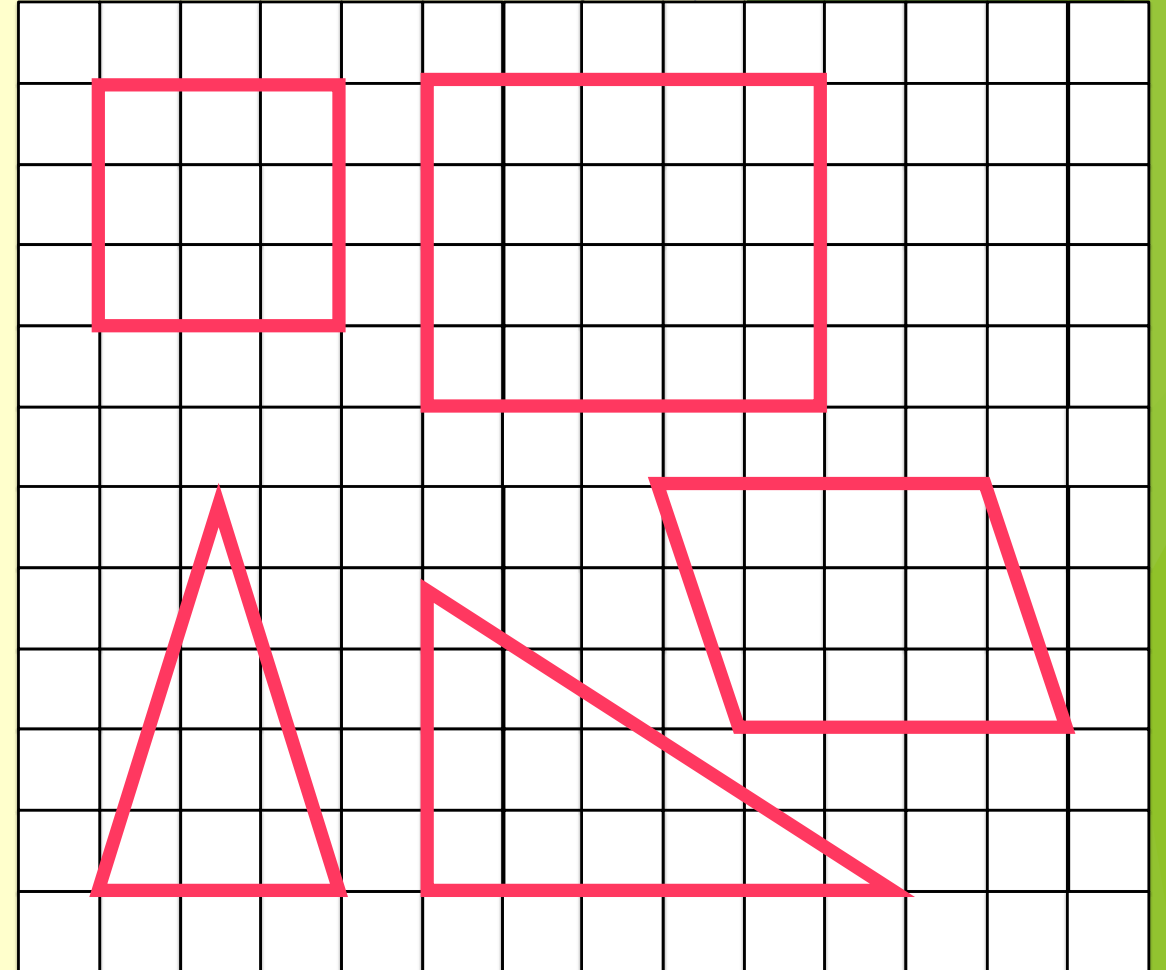
- a) a square with an area of 9 cm^2 ;
- b) a 5 cm by 4 cm rectangle;
- c) an isosceles triangle with a base of 3 cm and a height of 5 cm;
- d) a right-angled triangle with a height of 4 cm and a base of 6 cm;
- e) a parallelogram with a base of 4 cm and a height of 3 cm.

Use a ruler.

Descriptive Doing - ANSWERS

Using 1 cm square grid paper, draw:

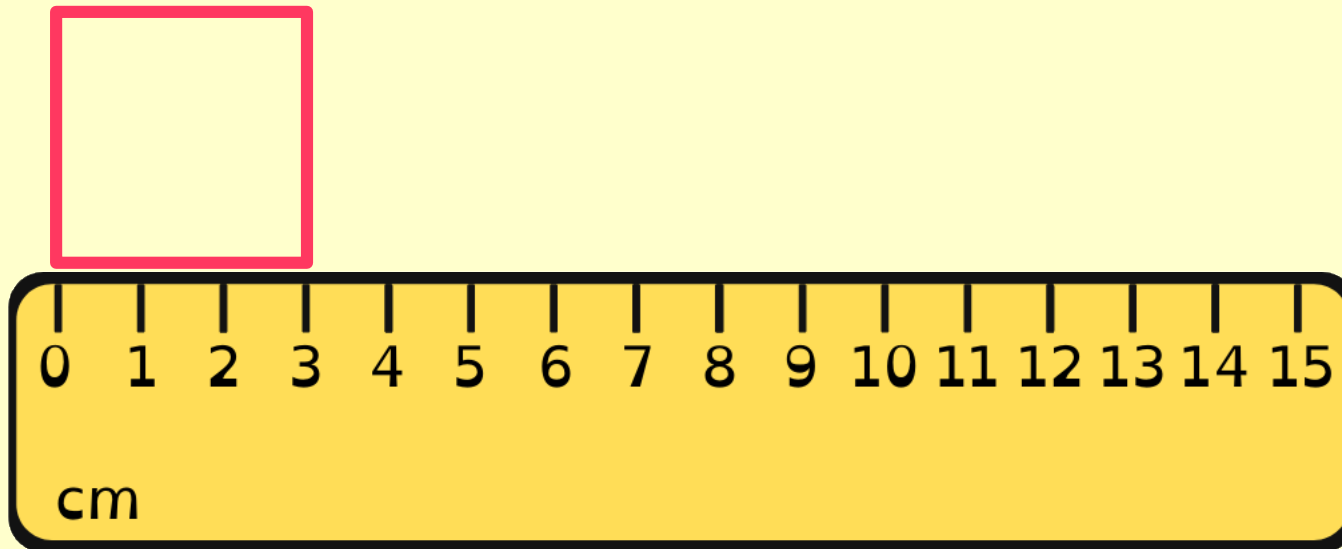
- a) a square with an area of 9 cm^2 ;
- b) a 5 cm by 4 cm rectangle;
- c) an isosceles triangle with a base of 3 cm and a height of 5 cm;
- d) a right-angled triangle with a height of 4 cm and a base of 6 cm;
- e) a parallelogram with a base of 4 cm and a height of 3 cm.



Descriptive Teaching

Using a ruler and plain paper, draw a square with a perimeter of 12 cm.

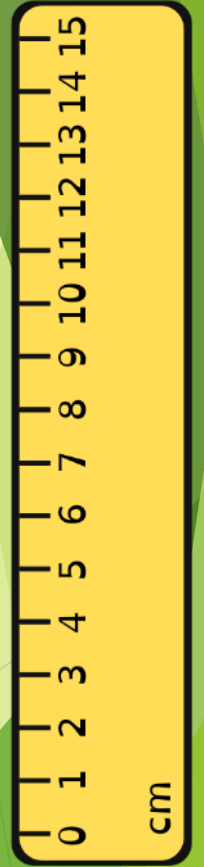
I know a square has 4 equal sides, therefore $12 \div 4 = 3$. Each side will be 3cm.



Descriptive Doing

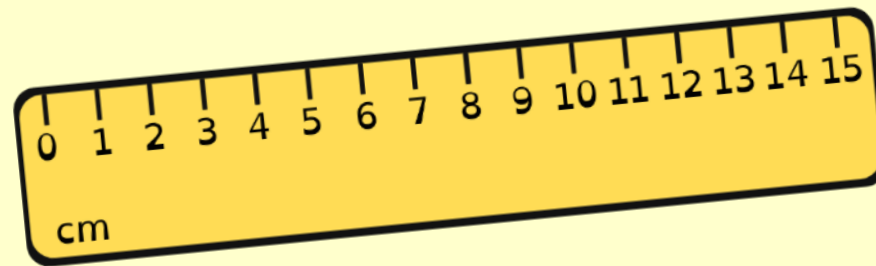
Using a ruler and plain paper, draw:

- a) a square with an area of 25 cm^2
- b) rectangles with perimeters of 24 cm
- c) a rectangle with a base of 35 mm and a height of 60 mm
- d) a right-angled triangle with an area of 12 cm^2
- e) an isosceles triangle with an area of 15 cm^2



Descriptive Doing - ANSWERS

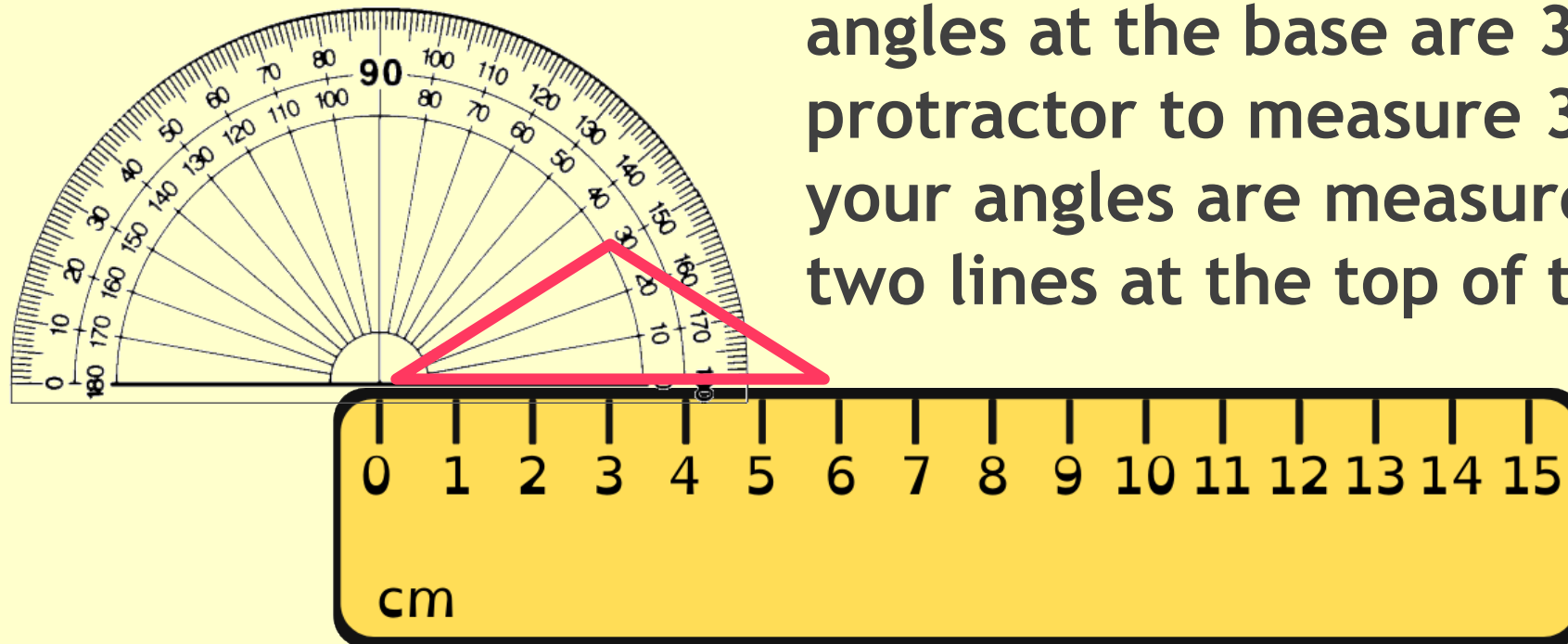
Ask an adult to check your shapes meet the criteria.



Reflective Teaching

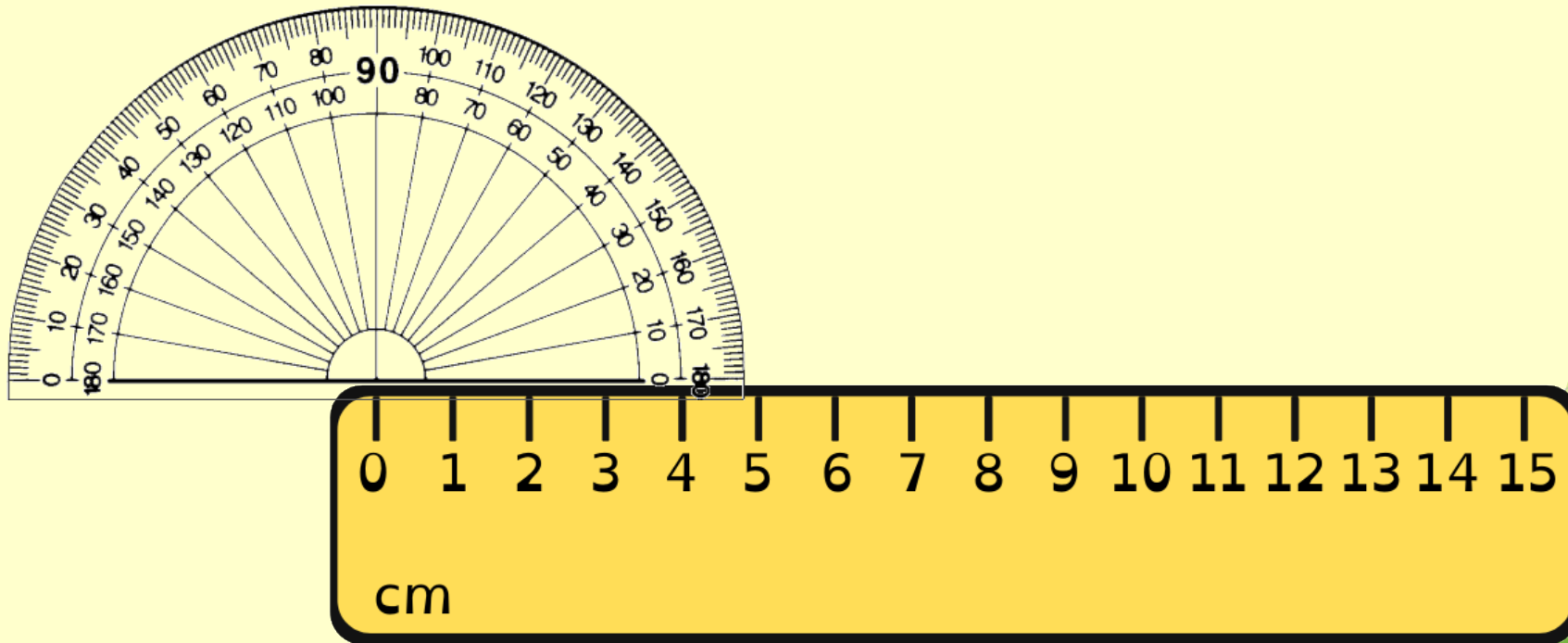
Using a ruler and plain paper, draw an isosceles triangle with a base of 6 cm and two angles of 30° each.

Draw the base using a ruler. The two angles at the base are 30° . Use a protractor to measure 30° . Once your angles are measured, join the two lines at the top of the triangle.



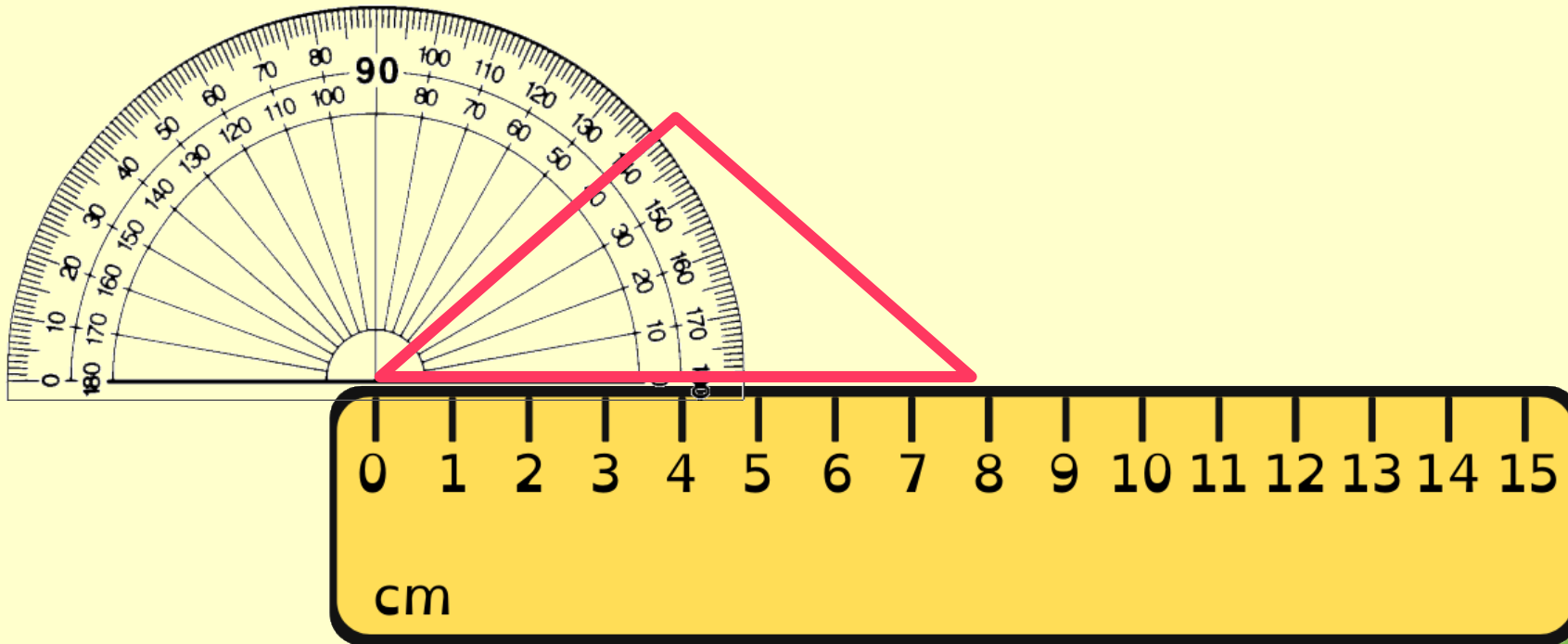
Reflective Doing

Using a ruler and plain paper, draw an isosceles triangle with a base of 8 cm and two angles of 40° each.



Reflective Doing - ANSWERS

Using a ruler and plain paper, draw an isosceles triangle with a base of 8 cm and two angles of 40° each.



Reflective Doing

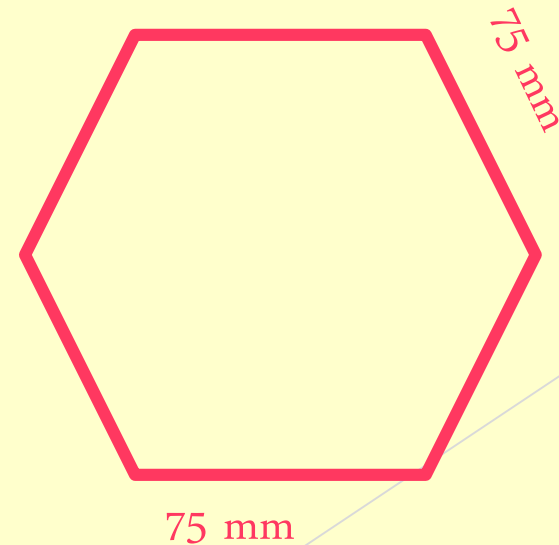
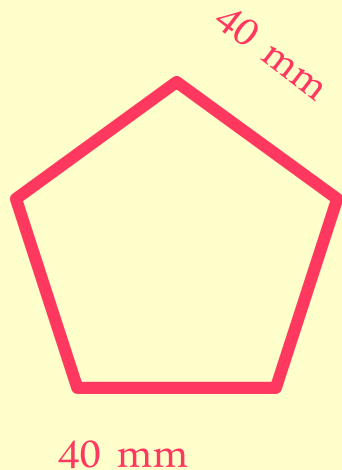
Using a ruler and plain paper, draw:

- a) a regular pentagon with side lengths of 40 mm;
- b) a regular hexagon with side lengths of 75 mm.

Reflective Doing - ANSWERS

Using a ruler and plain paper, draw:

- a) a regular pentagon with side lengths of 40 mm;
- b) a regular hexagon with side lengths of 75 mm.



Reflective Doing

Use the following clues to draw a scalene triangle:

- ▶ Angle X is the largest angle
- ▶ Angle Y is 100° less than Angle X
- ▶ Angle Z is a third of the size of Angle X

Reflective Doing - ANSWERS

A possible answer is:

Angle X is 120°

Angle Y is 20°

Angle Z is 40°

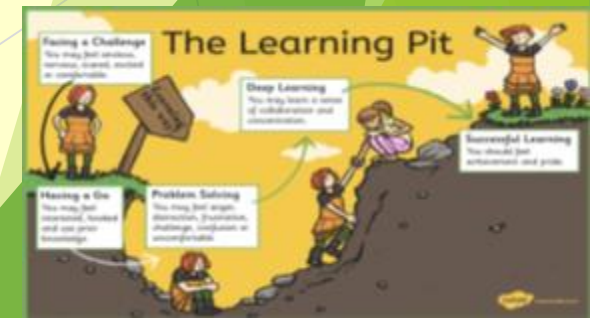
Ask an adult to check your shape.

Choose your challenge

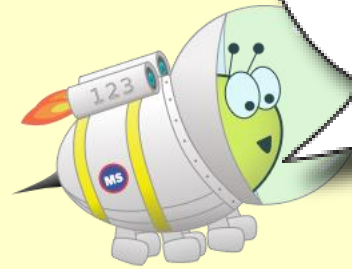
Challenges can be found on the document named 'Maths Challenges Day 2'.

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

Answers can be found at the bottom of the document.



Reflection Time

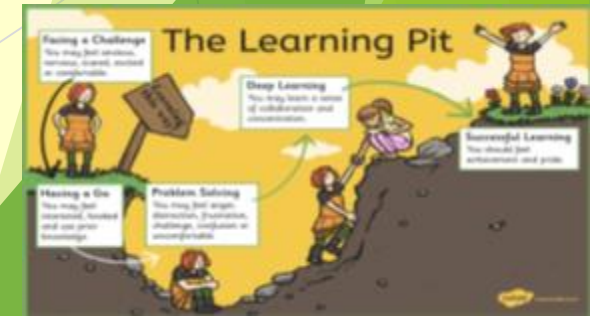


You can accurately draw a triangle just using a ruler.

The statement is ___ true because...

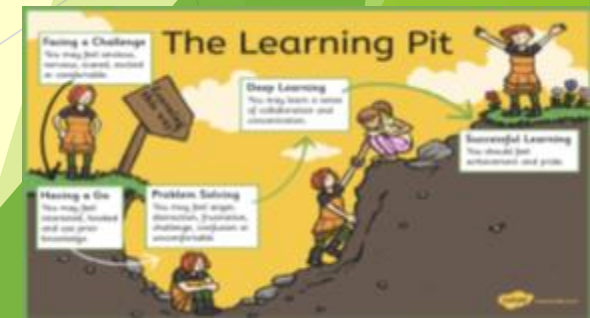
Is Astrobee's statement always, sometimes or never true?

Provide examples to explain your answer.



Reflection Time - ANSWERS

Astrobee's statement is only sometimes true. If the instructions given give a base and height for an isosceles or right-angled triangle, it can work. However, if the instructions include a mixture of lengths and angle measurements, you need a ruler and a protractor to accurately draw the triangle.

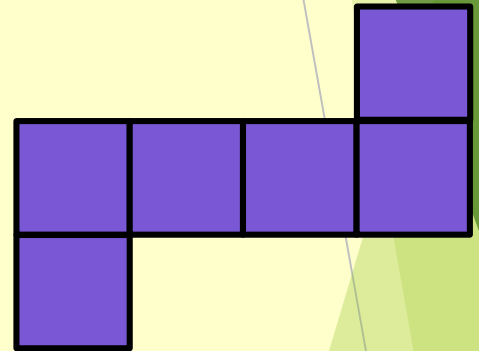
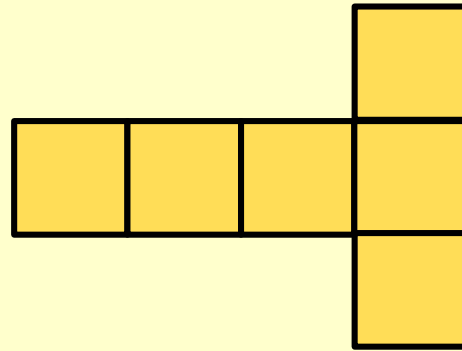
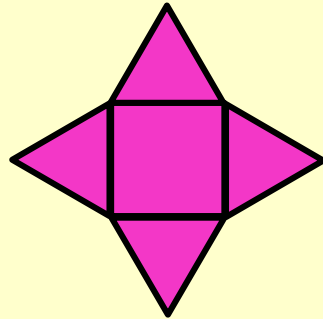
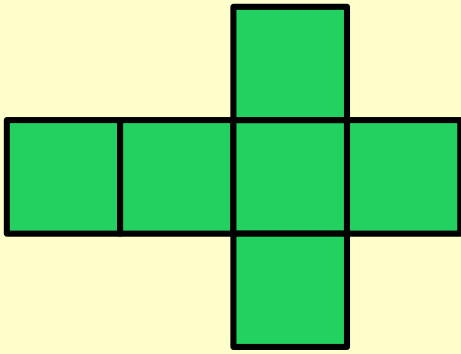


Properties of Shape

Day 3

Starter

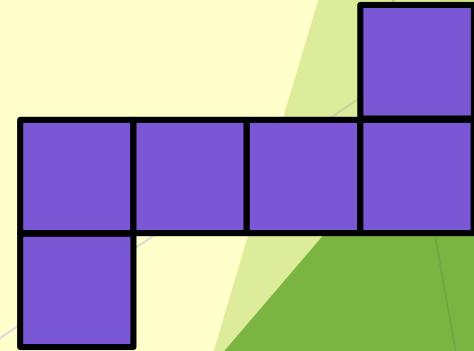
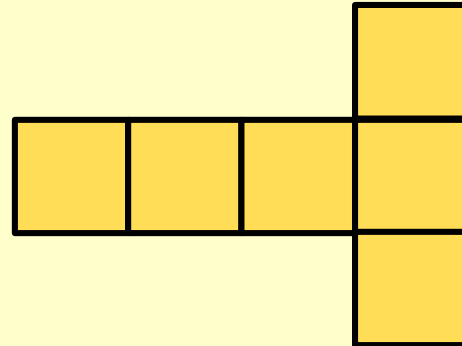
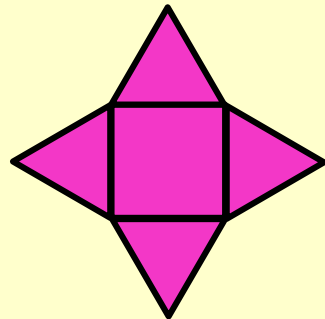
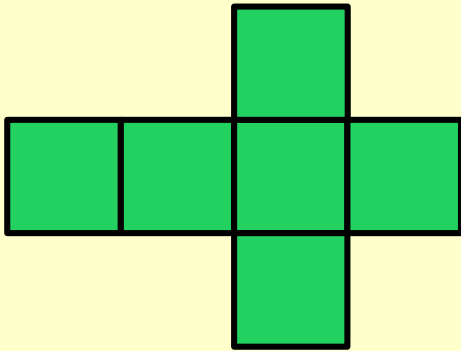
Which one doesn't belong?



Explain your answer.

Starter - ANSWERS

The pink net doesn't belong as it represents a square-based pyramid, whereas the other nets are for cubes. The pink shape is made from three squares and four triangles, whereas the others are each made from six squares.



Date: Day 3

LO: To identify 3-D shapes from their nets.

Success Criteria

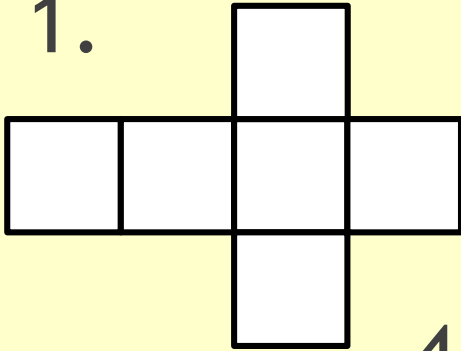
I can use my knowledge of 2-D and 3-D shapes' properties to identify 3-D shapes by their nets.

I can explain my reasoning.

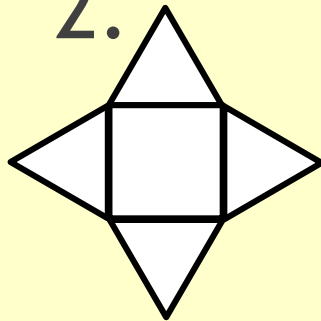
Descriptive Doing

Which 3-D shapes can be made from the nets below?

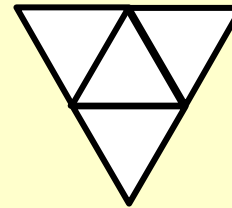
1.



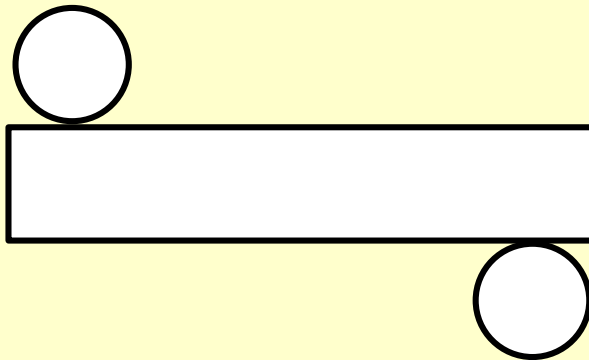
2.



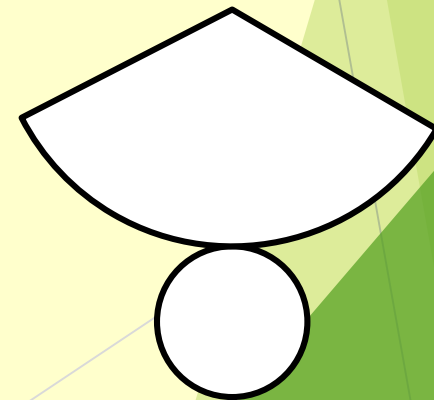
3.



4.



5.

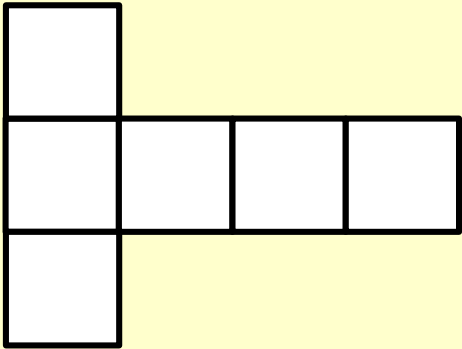


Descriptive Doing - ANSWERS

1. Cube
2. Square-based pyramid
3. Triangle-based pyramid
4. Cylinder
5. Cone

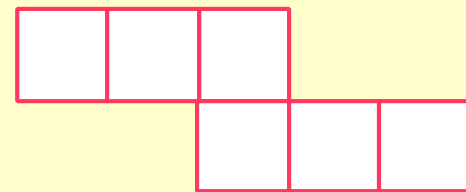
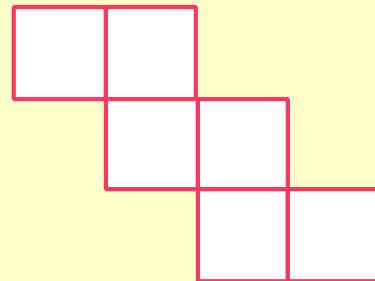
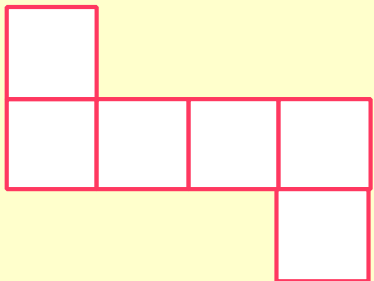
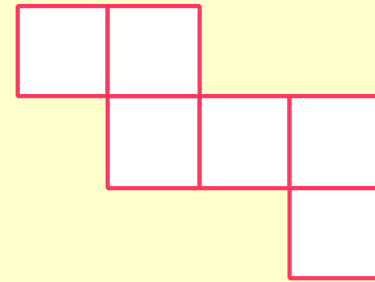
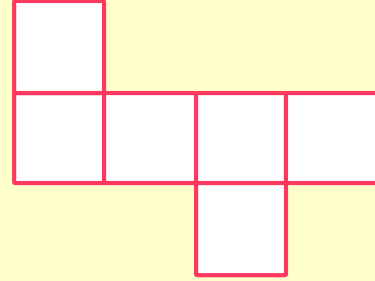
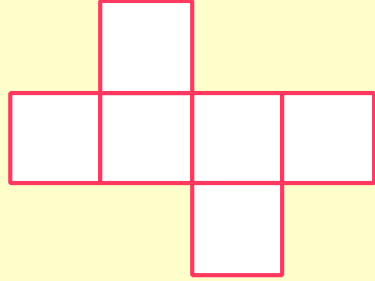
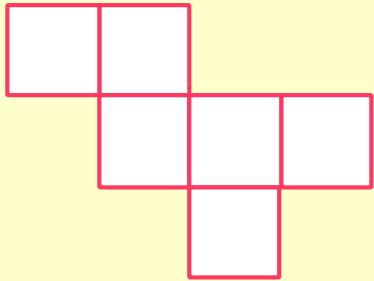
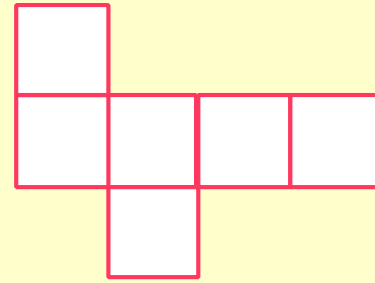
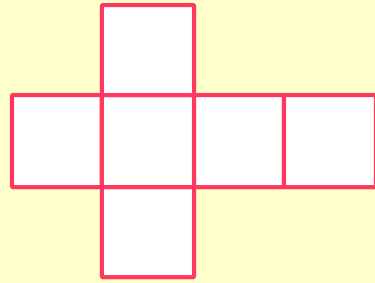
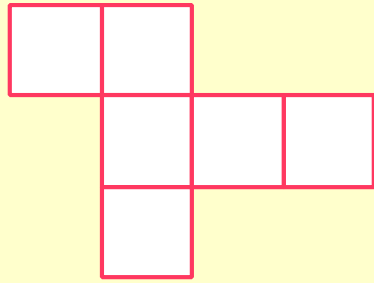
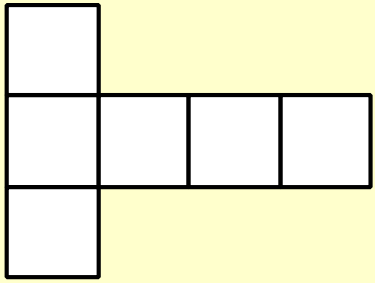
Reflective Doing

A cube has eleven different net configurations.
One is shown below.



Find the other ten configurations.

Reflective Doing - ANSWERS

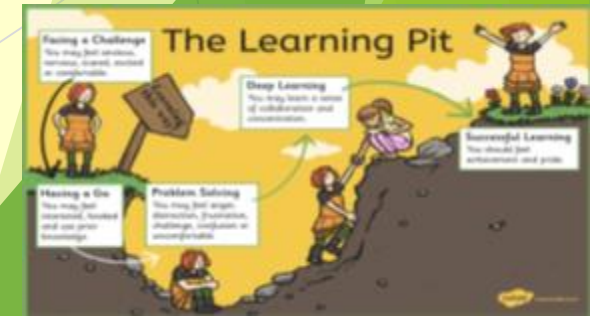


Choose your challenge

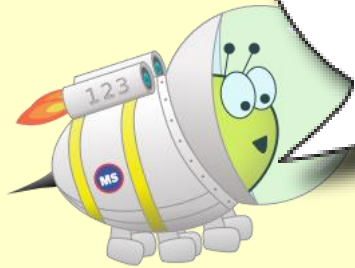
Challenges can be found on the document named 'Maths Challenges Day 3'.

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

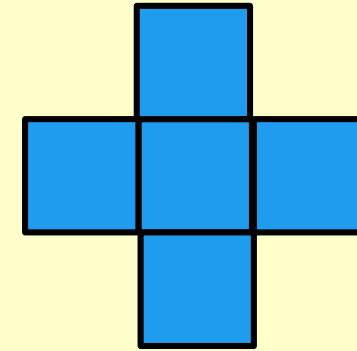
Answers can be found at the bottom of the document.



Reflection Time

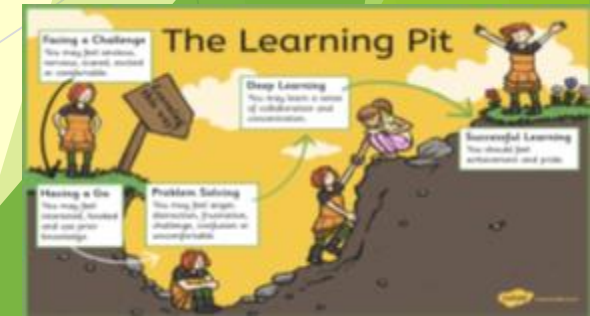


I can make a cube using
the blue net.



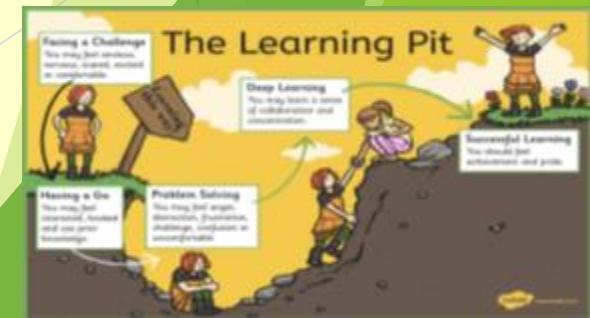
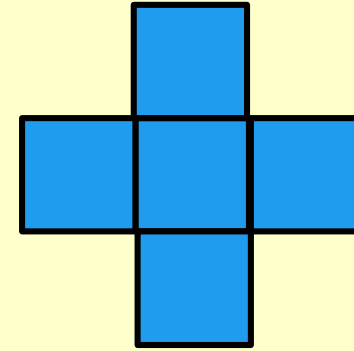
Do you agree?
Explain your answer.

I
agree/disagree
because.



Reflection Time - ANSWERS

No, I do not agree. Cubes have six square faces and the net shown above would only make five square faces. It needs one more appropriately placed face.



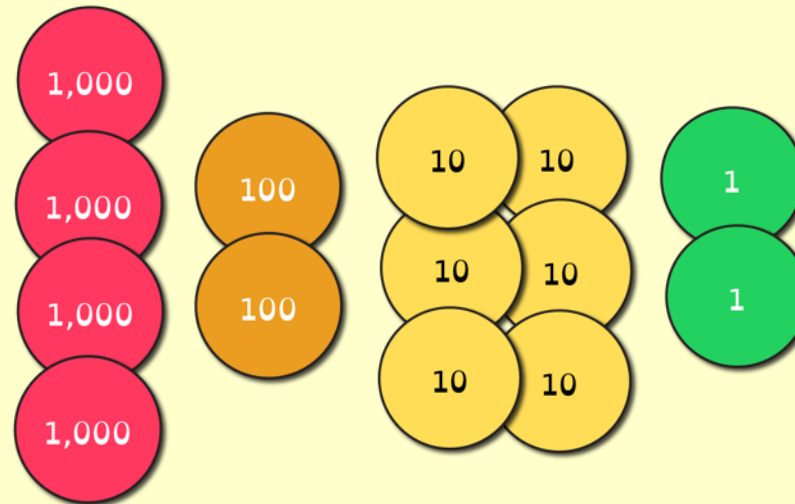
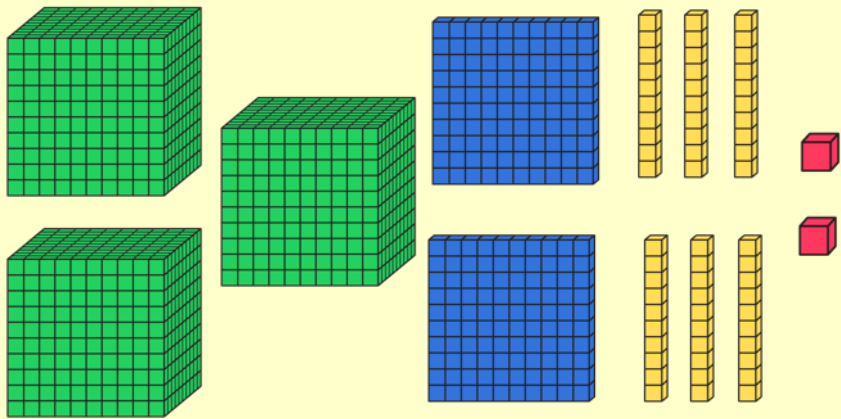
- ▶ The next series of lessons will be reviewing learning from the Autumn term.
- ▶ The slides will briefly recap learning, therefore children may choose to complete the independent activities immediately.

Addition & Subtraction

Day 4

Starter

What's the same? What's different?



CCLXII

five thousand, one hundred and
sixty-two

Explain your answer.

Starter - ANSWERS

All of the representations have the same amount of hundreds, tens and ones, apart from the worded form which only has one hundred, while the others each have two hundreds. They all have different amounts of thousands: the Base 10 has 3 thousands, the counters have 4 thousands, Roman numerals have none and the worded form has 5 thousands,

Date: Day 4

LO: To add together 5-digit and 4-digit numbers.

Success Criteria

I can use a formal method of addition to add together 5-digit and 4-digit number (with exchanges).

I can explain my reasoning.

Descriptive Teaching

Begin by adding together the digits in the ones column.

$$7 + 4 = 11$$

(The 10 must be exchanged in the tens column).

Then work through the place value columns in order.

$$30 + 90 + 10 = 130$$

$$200 + 100 + 100 = 400$$

$$1000 + 1000 = 2000$$

	TH	H	T	O	
	1	2	3	7	
+	1	1	9	4	
	2	4	3	1	
		1	1		

Descriptive Doing

	TTH	TH	H	T	O	
	1	2	7	5	8	
+		2	7	5	4	

	TTH	TH	H	T	O	
	2	9	7	0	9	
+		4	7	0	3	

Descriptive Doing - ANSWERS

	TTH	TH	H	T	O	
	1	2	7	5	8	
+		2	7	5	4	
	1	5	5	1	2	
		1	1	1		

	TTH	TH	H	T	O	
	2	9	7	0	9	
+		4	7	0	3	
	3	4	4	1	2	
	1	1		1		

Descriptive Doing

Jamal, Yasmin and Chen have been playing Maths Shed. Jamal has 4,579 points, Yasmin has 5,437 points and Chen has 11,987 points.

- a) How many points do Jamal and Yasmin have combined?
- b) How many points do Jamal and Chen have combined?
- c) How many point do Yasmin and Chen have combined?
- d) How many points do Jamal, Yasmin and Chen have altogether?

Descriptive Doing - ANSWERS

- a) How many points do Jamal and Yasmin have combined?
 $4,579 + 5,437 = 10,016$ points
- b) How many points do Jamal and Chen have combined?
 $11,987 + 4,579 = 16,566$ points
- c) How many point do Yasmin and Chen have combined?
 $11,987 + 5,437 = 17,424$ points
- d) How many points do Jamal, Yasmin and Chen have altogether?
 $11,987 + 4,579 = 16,566$ points
 $16,566 + 5,437 = 22,003$ points

Reflective Doing

Figure out and fill in the missing digits within the calculations below.

	TH	H	T	O	
		3	6		
+	1	4		4	
	3		4	2	

	TTH	TH	H	T	O	
		7	8	2		
+			9		8	
	3	2		3	5	

Reflective Doing - ANSWERS

	TH	H	T	O	
	2	3	6	8	
+	1	4	7	4	
	3	8	4	2	
		1	1		

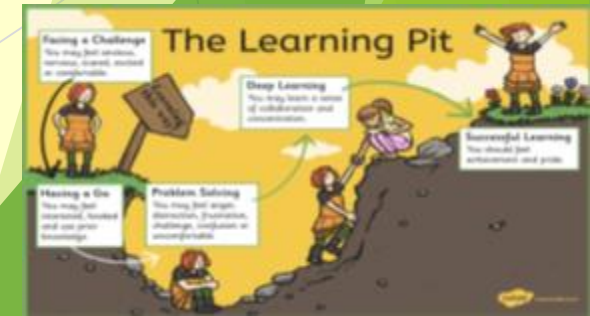
	TTH	TH	H	T	O	
	2	7	8	2	7	
+		4	9	0	8	
	3	2	7	3	5	
	1	1		1		

Choose your challenge

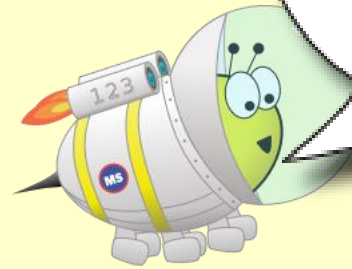
Challenges can be found on the document named 'Maths Challenges Day 4'.

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

Answers can be found at the bottom of the document.



Reflection Time

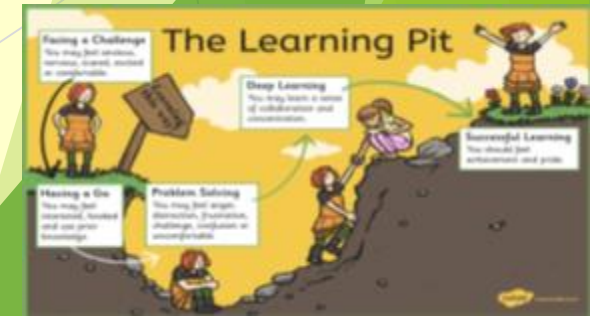


When you add two even numbers together, you don't have to make an exchange.

The statement is ____ true because...

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

Provide example calculations to help you explain your response.

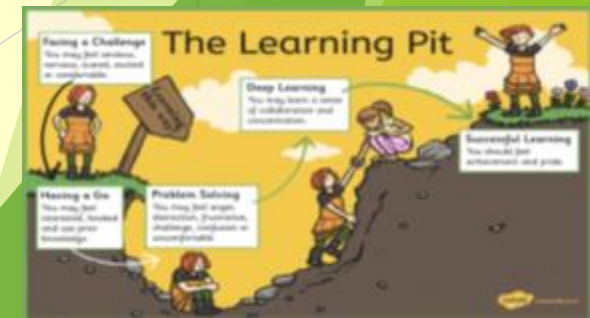


Reflection Time - ANSWERS

Astrobee's statement is sometimes true - in the left-hand calculation we can see 8 and 4 in the ones places requiring an exchange for 10 of the 12 ones to carry forward as a ten and leave 2 ones; in the right-hand calculation the two 2 digits in the thousands places do not require an exchange.

	TH	H	T	O	
	2	3	6	8	
+	1	4	7	4	
	3	8	4	2	
		1	1		

	TTH	TH	H	T	O	
	1	2	7	5	8	
+		2	7	5	4	
	1	5	5	1	2	
		1	1	1		

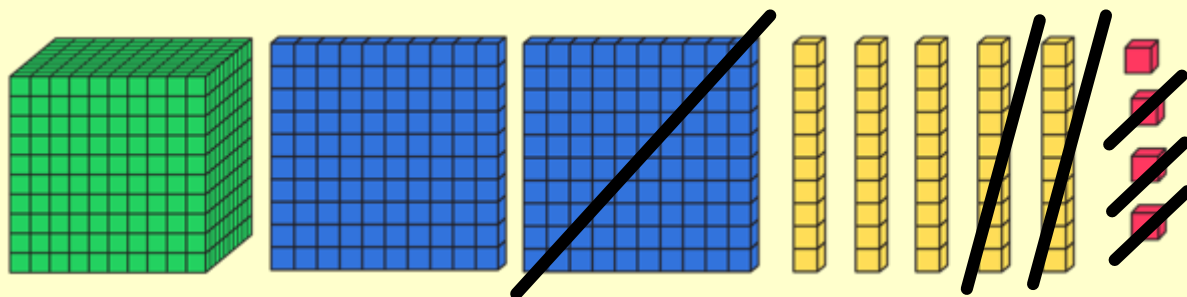


Addition & Subtraction

Day 5

Starter

What's the same? What's different?



TTH	TH	H	T	O
10,000	1,000	100	10	1
10,000		100	10	1
			10	1
			10	1
			10	1

Explain your answer.

Starter - ANSWERS

Both representations have the same result: 1,131; however, the starting numbers are different, as are the numbers used for subtraction too. The Base 10 had a starting number of 1,254 and has had 123 subtracted from it, while the place value counters had a starting number of 21,254 with 20,123 subtracted.

Date: Day 5

LO: To subtract a 4-digit number from a 4-digit or 5-digit number.

Success Criteria

I can use a formal method of subtraction to subtract a 4-digit number from a 4-digit or 5-digit number (with exchanging).

I can explain my reasoning.

Descriptive Teaching

Begin by subtracting the digits in the ones column.

You can't subtract 8 from 4, so you need to borrow 10 ones from the tens column. Therefore 60 becomes 50 and 4 becomes 14.

$$14 - 8 = 6$$

Continue subtracting the digits, moving up the place value columns. Remember to borrow from the column to the left if you need to.

	TH	H	T	O	
		2	15	1	
	2	3	6	4	
-	1	0	9	8	
	1	2	6	6	

Descriptive Doing

	TH	H	T	O	
	5	4	3	2	
-	3	4	5	6	

	TTH	TH	H	T	O	
	2	3	4	5	6	
-		9	7	8	6	

Descriptive Doing - ANSWERS

	TH	H	T	O	
	4	13	12	1	
	5	4	3	2	
-	3	4	5	6	
	1	9	7	6	

	TTH	TH	H	T	O	
	1	12	13	1		
	2	3	4	5	6	
-		9	7	8	6	
	1	3	6	7	0	

Descriptive Doing

Solve the following word problems:

- a) Last year there were 27,895 mahogany trees in the Amazon rainforest.
8,907 mahogany trees have burnt down this year.
How many mahogany trees are there in the Amazon rainforest now?

- b) Jamal has £34,586 in his bank.
Yasmin has £6,973 in her bank account.
How much more money is there in Jamal's account than in Yasmin's account?

Descriptive Doing - ANSWERS

- a) Last year there were 27,895 mahogany trees in the Amazon rainforest.
8,907 mahogany trees have burnt down this year.
How many mahogany trees are there in the Amazon rainforest now?

$27,895 - 8,907 = 18,988$ mahogany trees left

- b) Jamal has £34,586 in his bank.
Yasmin has £6,973 in her bank account.
How much more money is there in Jamal's account than in Yasmin's account?

$£34,586 - £6,973 = £27,613$ more money in Jamal's account

Reflective Doing

Solve the following word problems:

- a) A bakery made cupcake sales of £35,457 in January. They made £7,829 less in cupcake sales in February. How much money did they make selling cupcakes in total during the 2 months?

- b) A pilot flew 41,847 miles in August. She flew 8,992 less miles in September. How many miles did she fly in August and September combined?

Reflective Doing - ANSWERS

- a) A bakery made cupcake sales of £35,457 in January. They made £7,829 less in cupcake sales in February. How much money did they make selling cupcakes in total during the 2 months?

$$£35,457 - £7,829 = £27,628$$

$$£35,457 + £27,628 = £63,085 \text{ in cupcake sales}$$

- b) A pilot flew 41,847 miles in August. She flew 8,992 less miles in September. How many miles did she fly in August and September combined?

$$41,847 \text{ miles} - 8,992 \text{ miles} = 32,855 \text{ miles}$$

$$41,847 \text{ miles} + 32,855 \text{ miles} = 74,702 \text{ miles altogether}$$

Reflective Doing

James has tried to complete the following subtraction calculation.

	TTH	TH	H	T	O	
	3	9	5	0	3	
-		8	4	3	3	
	3	1	1	7	0	

Have you spotted any mistakes?

Explain your answer.

Reflective Doing - ANSWERS

James forgot to exchange a hundred for 10 tens and remove a hundred from the hundreds place.

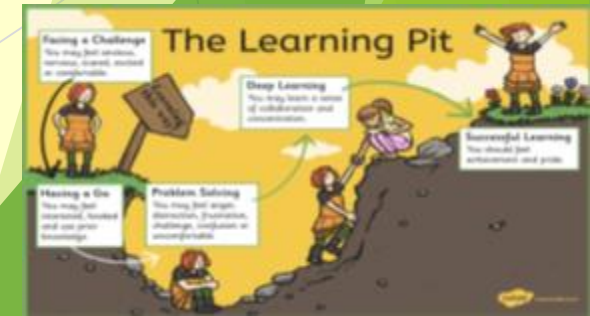
	TTH	TH	H	T	O	
			4	1		
	3	9	5	0	3	
-		8	4	3	3	
	3	1	0	7	0	

Choose your challenge

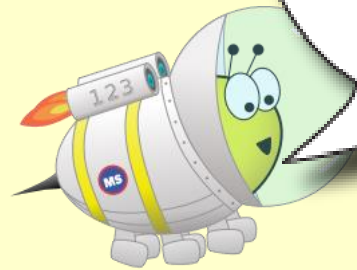
Challenges can be found on the document named 'Maths Challenges Day 5'.

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

Answers can be found at the bottom of the document.



Reflection Time



I have calculated the missing digits
in the five-digit number.

	TTH	TH	H	T	O	
	2	3	5	2	2	
-		6	9	8	0	
	2	3	4	6	2	

Astrobee has made some errors.

Find the correct result and explain what you
think Astrobee has done wrong.

Astrobee has
done ____
wrong
because...



Reflection Time - ANSWERS

Astrobee has done a lot wrong here!
Asrobee has just written the difference between the two digits in each of the place value columns on the top line of the calculation. Astrobee should have added 23,467 and 6,980 together, then checking the result using subtraction. The correct number is 30,442.

	TTH	TH	H	T	O	
	2	3	5	2	2	
-		6	9	8	0	
	2	3	4	6	2	

