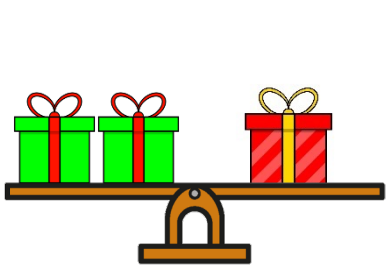
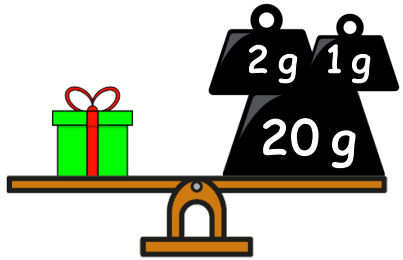
ADVENT – Day 1

White Rose MATHS

These scales are balanced.

Find the mass of each present.





ADVENT – Day 1

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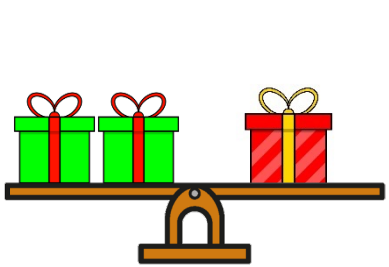
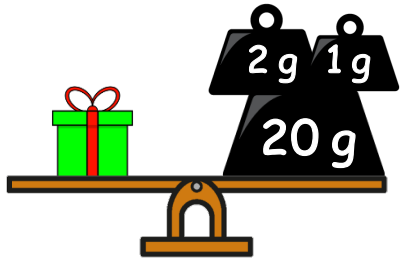




We know:

= 20 g + 2 g + 1 g

= 23 g

Therefore:

= 23 g + 23 g

= 46 g

= 46 g

We now know:

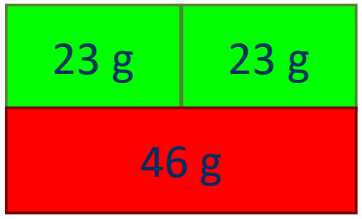
+ 10 g = 46 g + 10 g

+ 10 g = 56 g

Therefore:

56 g =

As a bar model:



ADVENT – Day 1

Here we address the misconception that objects of equal size will have equal mass.

We know children like to work from left to right. This question requires us not to begin on the left, or the middle, but the right.

We can also emphasise the meaning of the equality symbol and show 56 g is equal to the yellow present or the yellow present is equal to 56 g.

ADVENT – Day 2

White Rose MATHS

Can you solve these winter puzzles?

Winter puzzle

Winter puzzle

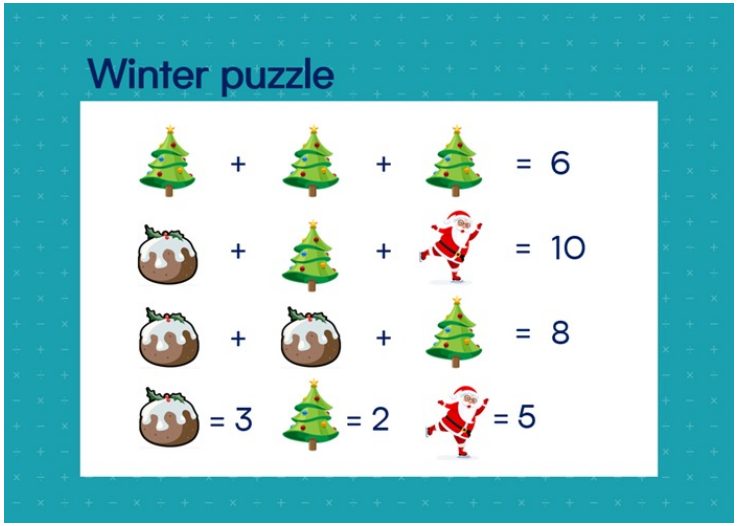
Winter puzzle

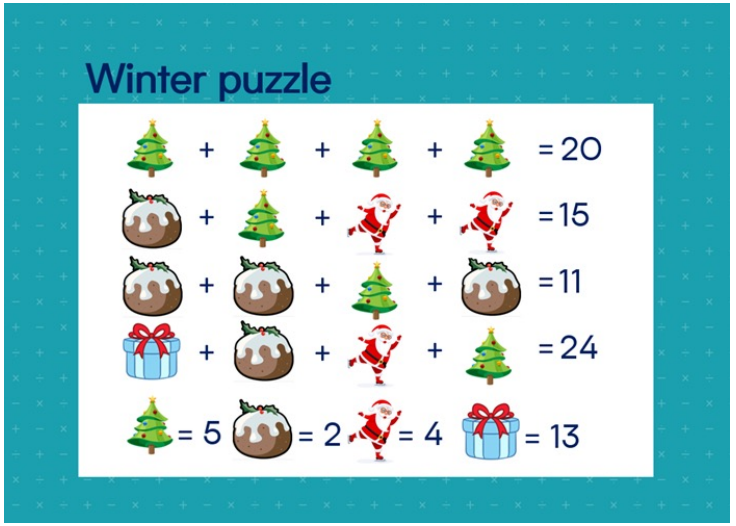
Winter puzzle

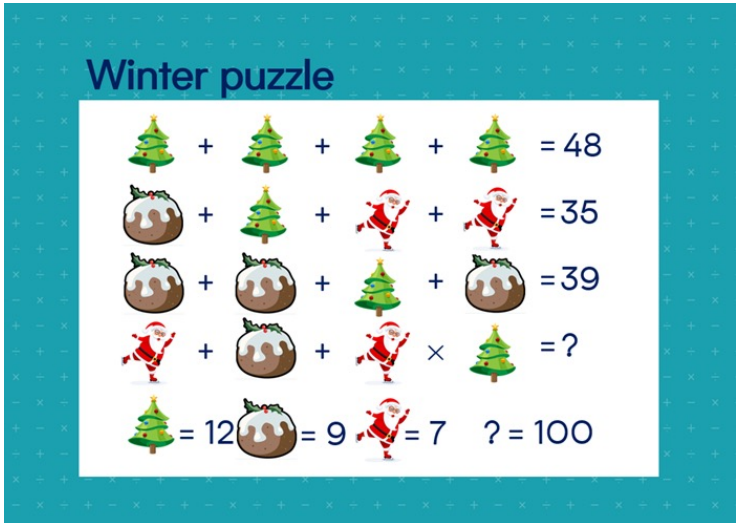
ADVENT – Day 2

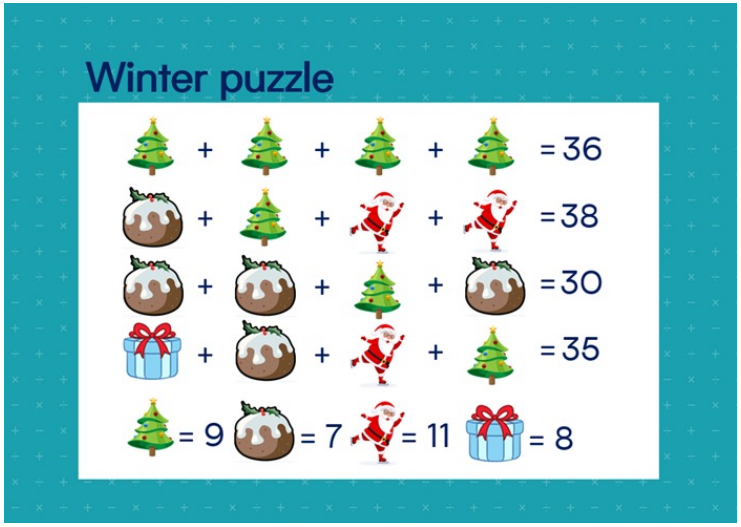
White Rose MATHS

Can you solve these winter puzzles?









ADVENT – Day 2

Puzzles like this allow the children to get stuck.
We should celebrate this and allow all children to get stuck.

We should be ready with a scaffold or a strategy to enable them to access the problem when they need it.

A great first question here is, “What do you know?”

ADVENT – Day 3

Santa is buying apples and carrots for his reindeer.

He buys 5 times as many carrots as apples.

He buys 6 apples.

How many carrots does Santa buy?

ADVENT – Day 3

White Rose MATHS

Santa is buying apples and carrots for his reindeer.

He buys 5 times as many carrots as apples.

He buys 6 apples.

How many carrots does Santa buy?

We know:

Santa buys 6 apples
Santa buys 5 times as many carrots as apples

Therefore:

A | 6 |

C | 6 | 6 | 6 | 6 | 6 |

$6 \times 5 = 30$

Santa buys 30 carrots.

ADVENT – Day 3

A bar model may be something you encourage children to draw, or provide as a scaffold.

ADVENT – Day 4

Santa is packing presents into his sack.

If he puts 16 presents in each sack and has 3 sacks in total, how many presents does Santa have altogether?

A

T	O
●	●●● ●●●
●	●●● ●●●
●	●●● ●●●

B

Double 16 = 32
32 + 16 = 48

Which is your preferred method and why?

ADVENT – Day 4

Santa is packing presents into his sack.

If he puts 16 presents in each sack and has 3 sacks in total, how many presents does Santa have altogether?

A

T	O
●	●●● ●●●
●	●●● ●●●
●	●●● ●●●

B

Double 16 = 32
32 + 16 = 48

Both answers are correct.

ADVENT – Day 4

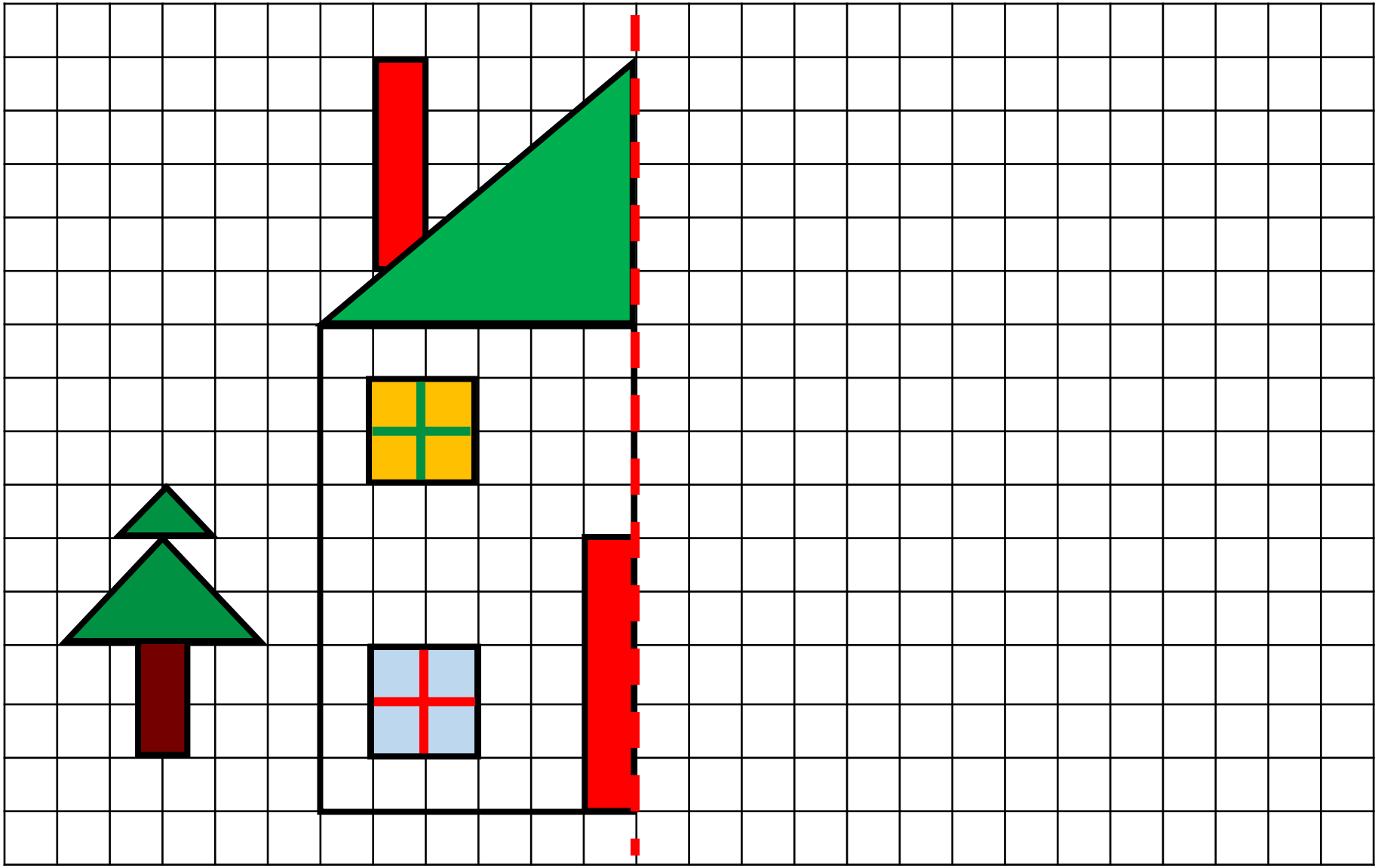
This problem encourages children to explore multiple methods and give justification for using a specific approach.

This encourages children to not focus on the answer but instead discuss their thinking.

ADVENT – Day 5

White Rose MATHS

Use symmetry to complete the picture of Santa's grotto.



ADVENT – Day 5

White Rose MATHS

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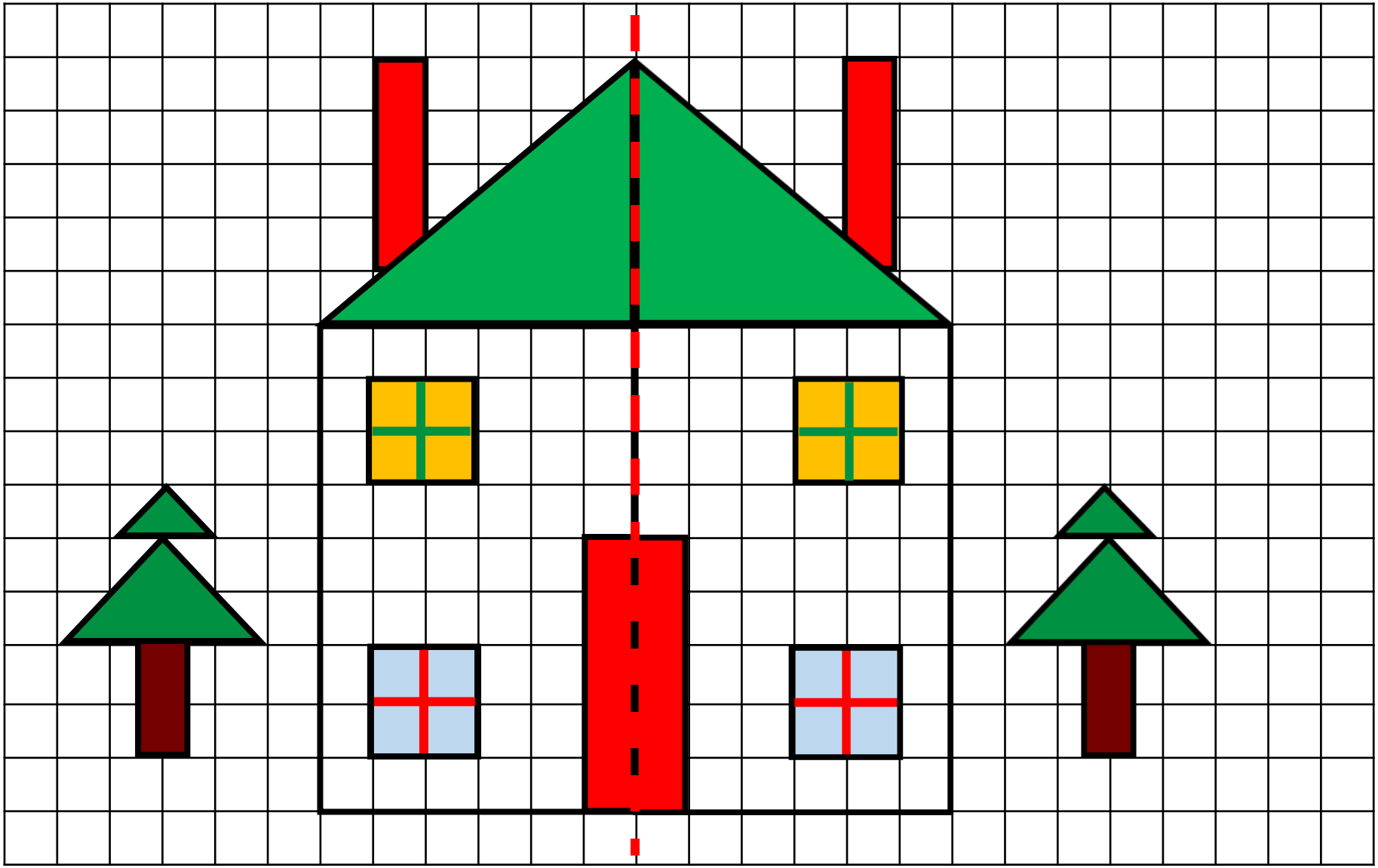


ADVENT – Day 5

Children may use their knowledge of 2D shapes to enable them to access the question.

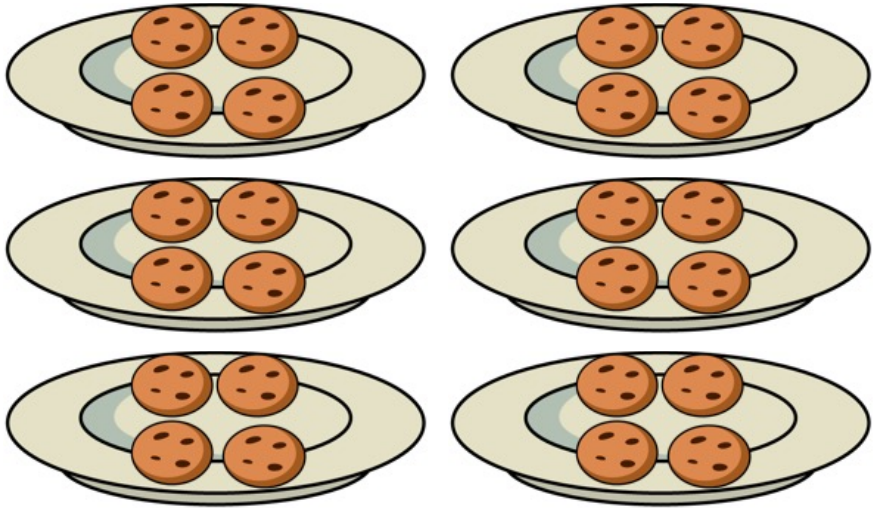
A useful checking strategy is to demarcate vertices and find the distance from the mirror line.

ADVENT – Day 6

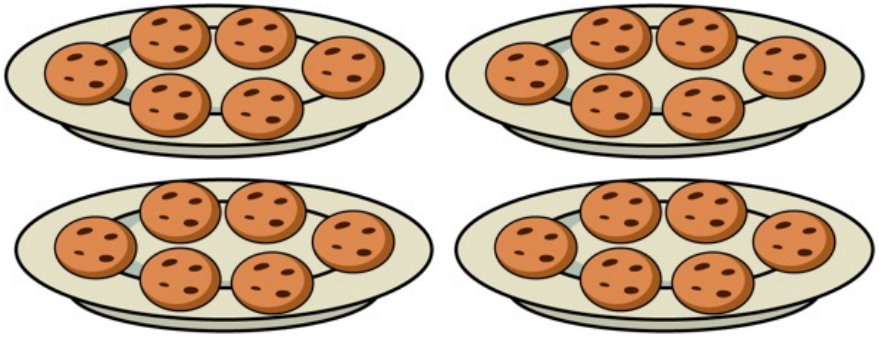
White Rose MATHS

Mrs Claus has baked a batch of 24 delicious cookies for the workshop elves. She wants to share them equally between 6 elves.
Which image represents this problem?
Explain how you know.

A



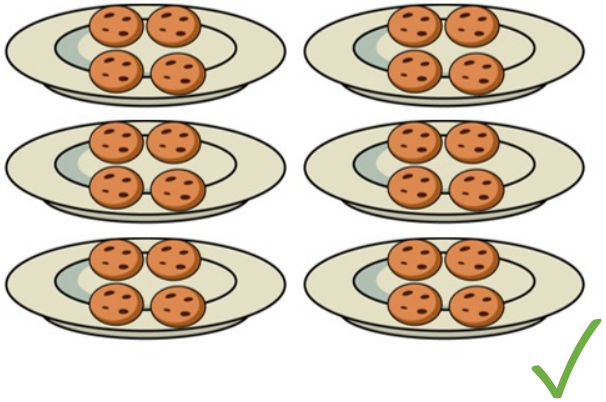
B



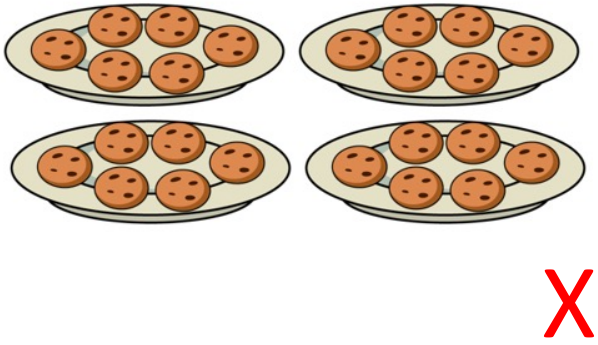
ADVENT – Day 6

Mrs Claus has baked a batch of 24 delicious cookies for the workshop elves. She wants to share them equally between 6 elves.
Which image represents this problem?
Explain how you know.

A



B



Representation A shows 24 cookies being shared equally between 6 plates.
Representation B shows 24 cookies being put into 4 equal groups of 6.

ADVENT – Day 6

White Rose MATHS

This problem explores two structures of division (sharing and grouping).

It is important children read and interpret the context of this question in order to match it to the correct representation.

Manipulatives such as counters may be useful to model each structure.

ADVENT – Day 7

White Rose MATHS

Santa, his 9 reindeer and 4 elves land on the roof of a house.

How many legs are on the roof of the house?

ADVENT – Day 7

White Rose MATHS

Santa, his 9 reindeer and 4 elves land on the roof of a house.

How many legs are on the roof of the house?

	Calculation	Number of legs
Santa	1×2	2
Reindeer	9×4	36
Elves	4×2	8

$$2 + 36 + 8 = 2 + 8 + 36$$

$$= 10 + 36$$

$$= 46$$

There are 46 legs on the roof of the house.

ADVENT – Day 7

When adding the number of legs together children could use the bond to 10 to add the numbers in an efficient way.

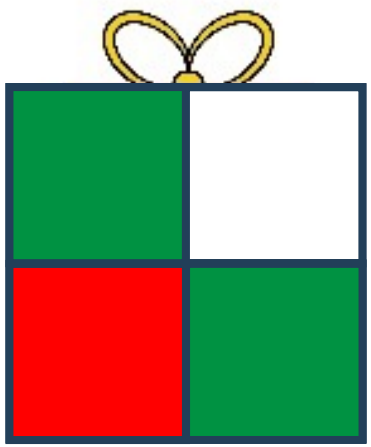
When multiplying 9×4 children could use the fact $10 \times 4 = 40$ to help them find the product of 9 and 4

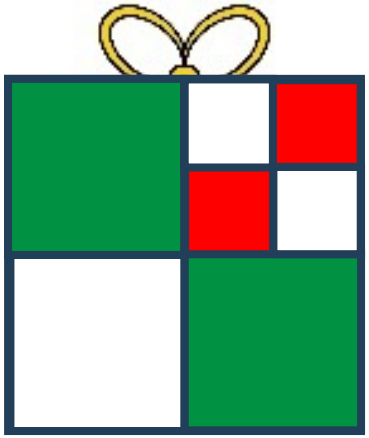
Alternatively they may derive from known facts such as $5 \times 4 = 20$
and $4 \times 4 = 16$
therefore $9 \times 4 = 36$

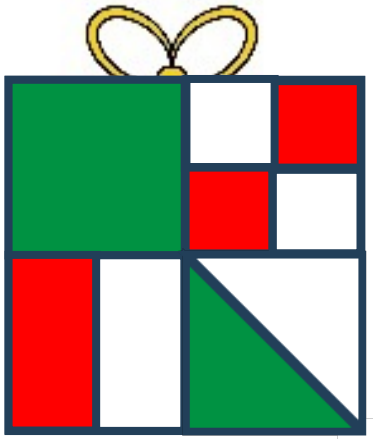
ADVENT – Day 8

White Rose MATHS

Calculate the fraction of the colours on each present.







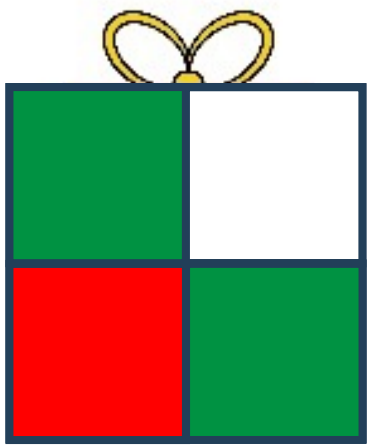
Red:	Green:	White:

Red:	Green:	White:

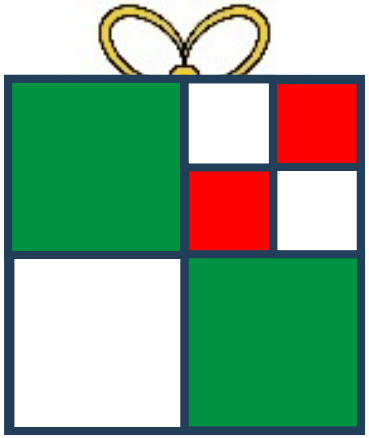
Red:	Green:	White:

ADVENT – Day 8

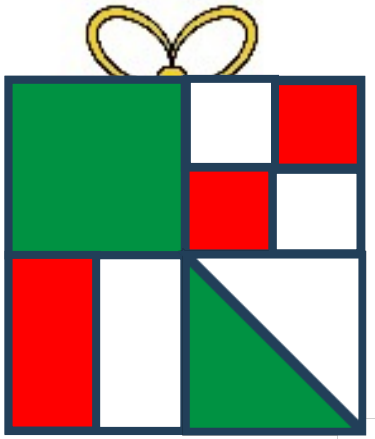
Calculate the fraction of the colours on each present.



Red: $\frac{1}{4}$ Green: $\frac{1}{2}$ White: $\frac{1}{4}$



Red: $\frac{1}{8}$ Green: $\frac{1}{2}$ White: $\frac{3}{8}$



Red: $\frac{1}{4}$ Green: $\frac{3}{8}$ White: $\frac{3}{8}$

ADVENT – Day 8

The whole has been divided into __ equal parts.
___ has been shaded (colour).

This question encourages the children to reason. If the red part is difficult to calculate, they can use their knowledge of the white and green parts to find the red part. It could be helpful to encourage children to visualise moving parts around to combine sections that are the same colour.

ADVENT – Day 9

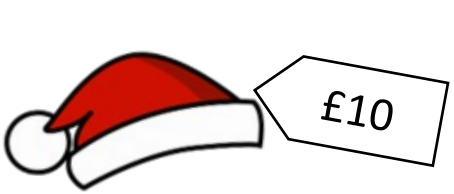
White Rose MATHS

In a shop, each item has £5 off.

Tom has £30 to spend.

He buys 2 items.

What could Tom buy?



ADVENT – Day 9

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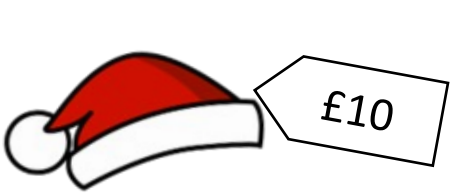


Hat price $= 10 - 5 = £5$

Coat price $= 32 - 5 = £27$

Socks price $= 8 - 5 = £3$

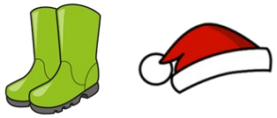
Gloves price $= 16 - 5 = £11$

Boots price $= 22 - 5 = £17$

Total cost £30

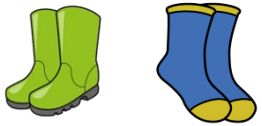
Total cost £28

Total cost £16

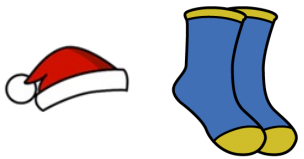


Total cost £22

Total cost £14



Total cost £20



Total cost £8

ADVENT – Day 9

Spotting connections allows children to reason about future calculations and improve efficiency and understanding.
Here our two connected calculations are: 22 – 5 and 32 – 5

Manipulatives could be used alongside the calculations to support children's understanding of the concept.

ADVENT – Day 10

White Rose MATHS

On Christmas Eve, Santa travels 12,500 km.

He flies at a speed of 1,000 km per hour.

After travelling for 4 hours and 45 minutes, how much further does he have to fly?

ADVENT – Day 10

White Rose MATHS

On Christmas Eve, Santa travels 12,500 km.

He flies at a speed of 1,000 km per hour.

After travelling for 4 hours and 45 minutes, how much further does he have to fly?

45 minutes = 0.75 hours

Santa has travelled for 4.75 hours

$4.75 \times 1{,}000 = 4{,}750$ km travelled

$12{,}500 - 4{,}750 = 7{,}750$ km left to travel

TTh	Th	H	T	O	Tth	Hth	Thth
				●● ●● ●	●● ●● ●● ●	●● ●● ●	

12,500	
4,750	7,750

ADVENT – Day 10

Children apply their knowledge of fractions of amounts and find that 45 is three-quarters of 60, and therefore 45 minutes is 0.75 hours, in order to determine the total time travelled in hours.

ADVENT – Day 11

There are 9 reindeer pulling the sleigh.

On each reindeer's harness there are 3 bells.

Santa's hat has 1 bell.

Each elf has 1 bell on each shoe.

The total number of bells on the sleigh is a multiple of 10

There is more than 1 but fewer than 10 elves.

How many elves are there travelling with Santa?

ADVENT – Day 11

White Rose MATHS

There are 9 reindeer pulling the sleigh.

On each reindeer's harness there are 3 bells.

Santa's hat has 1 bell.

Each elf has 1 bell on each shoe.

The total number of bells on the sleigh is a multiple of 10

There is more than 1 but fewer than 10 elves.

How many elves are there travelling with Santa?

Bells on reindeer: $9 \times 3 = 27$

Bells on Santa: 1

Bells on reindeer	Bells on Santa	Number of elves	Bells on elves	Total bells
27	**1**	1	**2**	**30**
27	**1**	2	**4**	**32**
27	**1**	3	**6**	**34**
27	**1**	4	**8**	**36**
27	**1**	5	**10**	**38**
27	**1**	6	**12**	**40**

ADVENT – Day 11

Encourage children to work systematically to present the number of elves.

If children are struggling, provide a table which has been partly completed along with counters to represent the bells.

ADVENT – Day 12

White Rose MATHS

Find the value of Santa, the reindeer and the snowman.

$3\ (6 + \square) = 72$

$(6 + 3) = 72$

$3 + 6 + \square = 72$

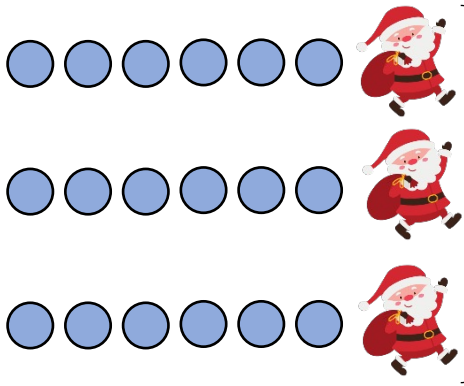
ADVENT – Day 12

Find the value of Santa, the reindeer and the snowman.

$3\ (6 + $  $) = 72$

 $(6 + 3) = 72$

$3 + 6 +$  $= 72$



$72 - 18 = 3 \times$ 

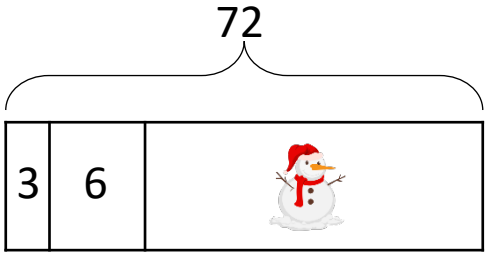
$54 = 3 \times$ 

 $= 18$

 $\times$  $= 72$

 $\times\ 9 = 72$

 $= 8$



$72 - 9 =$ 

 $= 63$

ADVENT – Day 12

The numbers are deliberately the same, encouraging children to consider the order in which they complete each calculation.

Using counters, or a bar model, to represent each calculation supports children to recognise which operation is needed to find the missing value.

ADVENT – Day 13

Holly the elf helps Santa by wrapping presents.

She wraps one present in 3 minutes.

Can Holly wrap 25 presents in an hour?

Explain how you know.

ADVENT – Day 13

Holly the elf helps Santa by wrapping presents.

She wraps one present in 3 minutes.

Can Holly wrap 25 presents in an hour?

Explain how you know.

 takes 3 minutes to wrap

$\_\_ \times 3 = 60$

60 minutes ÷ 3 minutes = 20 presents

Holly can only wrap 20 presents in an hour.

25 presents would take her longer than an hour.

ADVENT – Day 13

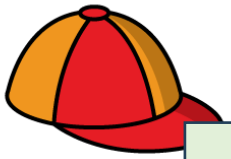
This problem encourages children to use the inverse operation to solve the problem.

It also encourages them to check how reasonable their answer is in the context of the question.

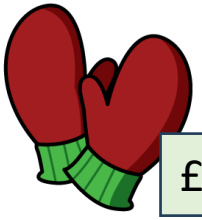
ADVENT – Day 14

An elf has £20 to spend on an outfit to wear on Christmas Day.
They buy **at least** two items.
Each item is different.
Which items could they buy?
Find as many different combinations as you can.

£10

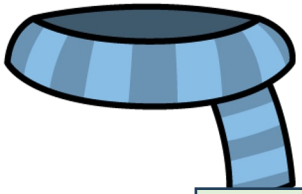


£17



£5 and 50p

£12



£11

£2 and 50p

ADVENT – Day 14

White Rose MATHS

An elf has £20 to spend on an outfit to wear on Christmas Day.
They buy **at least** two items.
Each item is different.
Which items could they buy?
Find as many different combinations as you can.

T-shirt	Trousers	Cap	Gloves	Scarf	Socks	Total
✓					✓	£12 and 50p
✓			✓		✓	£18
✓			✓			£15 and 50p
	✓		✓			£17 and 50p
	✓		✓		✓	£20
	✓				✓	£14 and 50p
		✓			✓	£19 and 50p
			✓	✓		£16 and 50p
			✓		✓	£8
				✓	✓	£13 and 50p
			✓	✓	✓	£19

There are 11 possible combinations.

ADVENT – Day 14

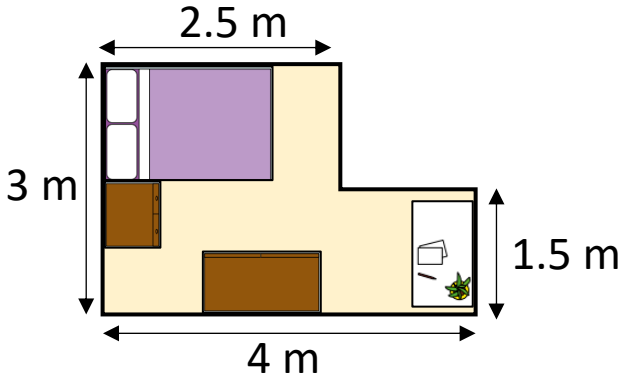
Being systematic and children organising their findings is key here.

A table could be a clear way of organising this.

ADVENT – Day 15

Ron is putting Christmas lights all the way around his bedroom.

Ron needs 14 metres of Christmas lights.

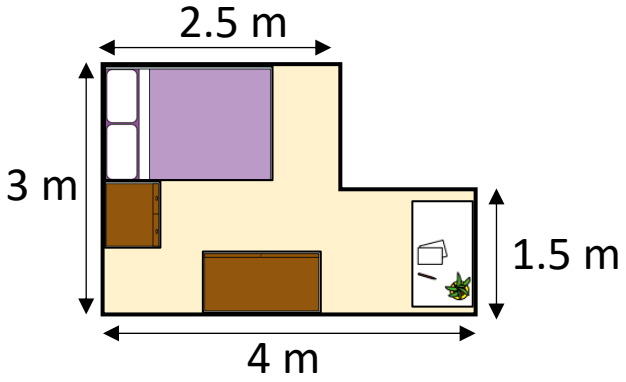


Is Tiny correct? Explain your reasons.

ADVENT – Day 15

Ron is putting Christmas lights all the way around his bedroom.

Ron needs 14 metres of Christmas lights.



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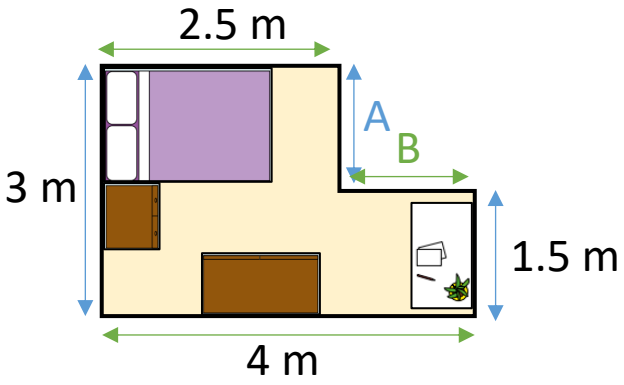

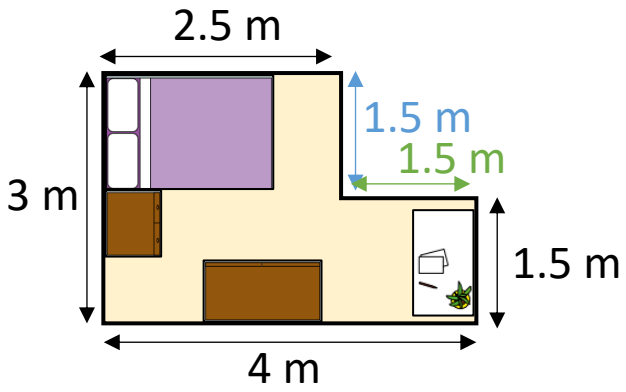

Alternate method:

Double 3 m = 6 m

Double 4 m = 8 m

6 + 8 = 14 m

$A = 3 - 1.5$

$= 1.5$ m

$B = 4 - 2.5$

$= 1.5$ m

Perimeter $= 3 + 2.5 + 1.5 + 1.5 + 1.5 + 4$

$= 1.5$ m

Tiny is correct.

Tiny has calculated the missing lengths.

Ron needs 14 metres of Christmas lights.

ADVENT – Day 15

Here we address the misconception that when finding the perimeter of a compound shape you just add the lengths that are given.

This question also lends itself to exploring different methods.
Rather than finding all the lengths and having to add decimals, children could simply double 4 m and double 3 m and add them together.

ADVENT – Day 16

8 Christmas presents have a mean mass of 1.3 kg.

Santa delivers a present with mass 0.4 kg to Jack.

He also delivers a present of mass 1.6 kg to Sam.

What is the total mass of the presents left?

ADVENT – Day 16

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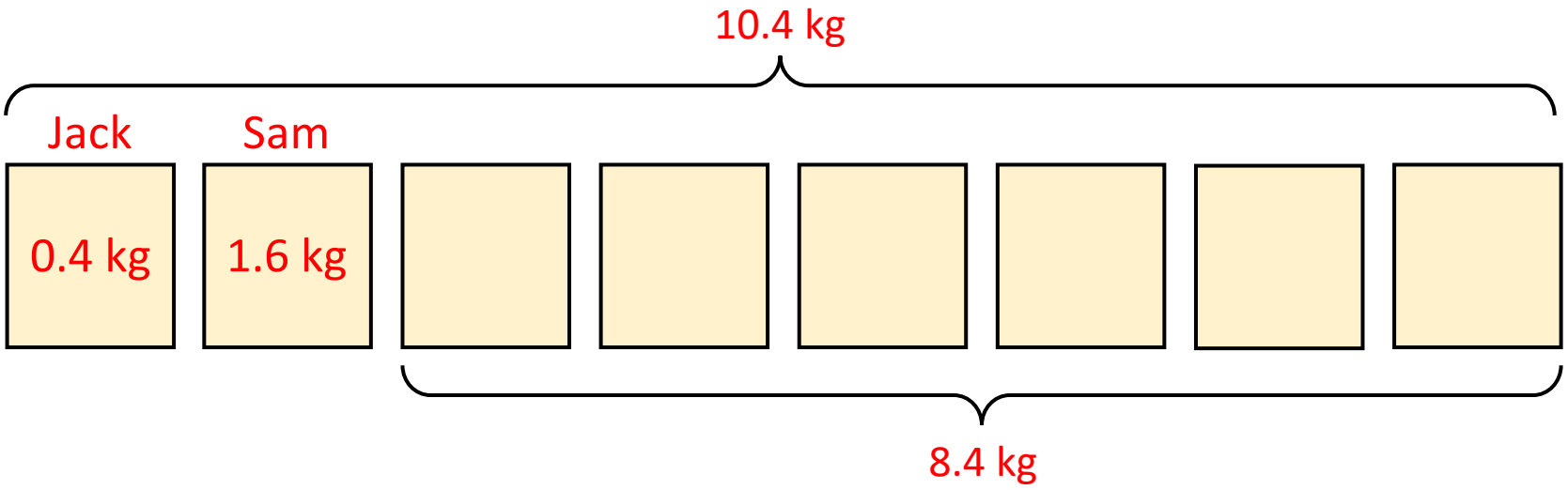

Mean $= 1.3$ kg

$1.3 \times 8 = 10.4$

Total mass of all presents $= 10.4$ kg

$10.4 - (0.4 + 1.6) = 8.4$

Total mass of the presents left $= 8.4$ kg

ADVENT – Day 16

Representing this question visually can help students make connections with the information given and what they can work out from that.

Facilitate discussions with students using questions such as, “How do we calculate the mean?” and, “How could we find the total from that?”