



THIRD SPACE
LEARNING

Christmas Tree Relay Maths Activity

Topical Resource



Christmas Tree Relay

Instructions


Students will ideally be in pairs, or threes. You will need a copy of the Christmas Tree Puzzle, one set of questions, one set of hint cards, all pre-cut and one record sheet per group. Keep the puzzle pieces and the question/hint cards on your desk, or a designated area. For ease, group one set of puzzle pieces with one set of question/hint cards, so you can keep track of which group requires which question/hint/puzzle piece next.

Start each group off with one question. They work out the answer and one pupil from each group should communicate this to you. If they are correct, they are given the next question as well as a piece of the puzzle.


If they are not correct, give them the appropriate hint card, so they can have one more attempt at the question.

There are three versions of the relay, that build in complexity:


Candy Cane - Grade 1 to 3

1. Percentage of an amount
 2. Multiples
 3. Multiplying decimals by 1000
 4. Converting minutes to hours
 5. Mean from a list of data
 6. Writing & simplifying ratio
 7. Angles in a triangle
 8. Fraction addition (common denominators)
 9. Calculating with money (addition)
 10. Describing probability with words
 11. Volume of a cuboid
 12. Calculating mass (given density and volume)
- 

Bauble - Grade 3 to 4

1. Percentage increase/decrease
 2. Lowest common multiple
 3. Converting an ordinary number to standard form
 4. Calculating speed, given distance and time
 5. Range problem
 6. Sharing in a ratio
 7. Angles in quadrilaterals
 8. Fraction addition/subtraction (different denominators)
 9. Calculating with money (addition and subtraction)
 10. Probability of an event not happening
 11. Volume of a prism
 12. Density, mass, volume problem
- 

Holly - Grade 4 to 5

1. Depreciation
 2. Highest common factor and lowest common multiple problem
 3. Calculating in standard form
 4. Speed, distance, time with conversions
 5. Reverse mean
 6. Combined ratio problem
 7. Angles in regular polygons
 8. Combined fractions and percentages problem
 9. Money calculations (mixed arithmetic)
 10. Probability of independent events
 11. Volume & capacity problem
 12. Combined density problem
- 

Christmas Tree Relay

The rules

Work in pairs or threes.

You will be given a question to start. You must work out the answer to this question and one person from your group should take this to the teacher.

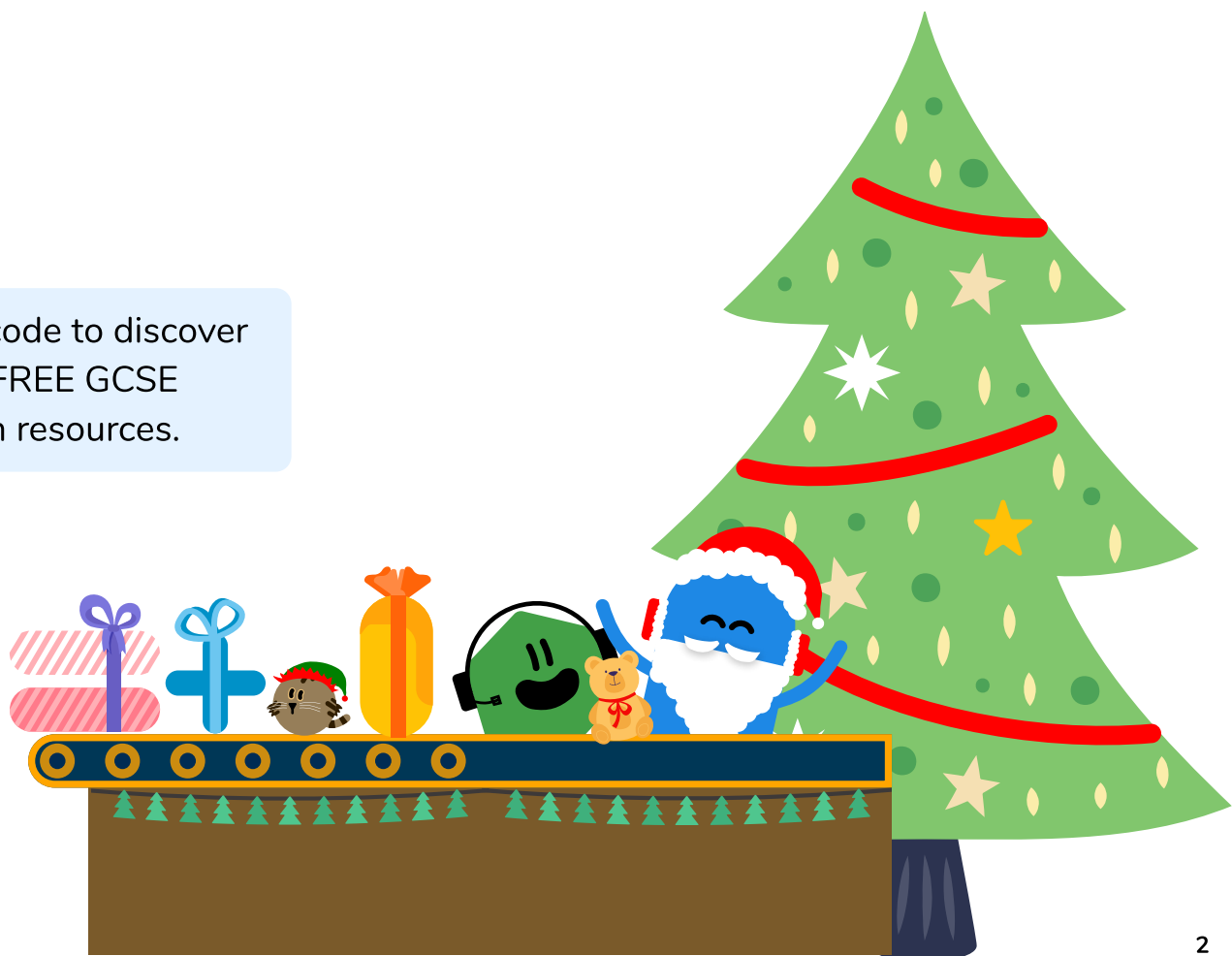
If you are incorrect, you will get a hint card and one extra attempt. If you are incorrect again, you will be given the next question.

If your answer is correct, you will receive the next question and a piece of the puzzle.

There are twelve puzzle pieces to collect and up to 12 questions to attempt, should you need them.

You can complete your puzzle by answering the first ten questions correctly.

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Christmas Tree Relay

Team Name _____

		Answers
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Candy Cane Hint Cards

HINT: What is 10% of £240?
What is 5% of £240?

1



HINT: What is the 12th multiple of 4?

2



HINT: What is 2.26×1000 ?

3



HINT: How many minutes in an hour?

4



HINT: To find the mean, add them all
and divide by the number you have.

5



HINT: How many Christmas tree cookies
are there?
How many candy cane cookies are
there?
How could you write this as a ratio?

6



Candy Cane Hint Cards

HINT: What do angles in a triangle add to?

7



HINT: To simplify a fraction, divide by the HCF of the top and bottom.

8



HINT: What is 10×28 ?
What is 6×28 ?

9



HINT: Use one of the following words

10

Impossible, unlikely, even chance, likely, certain



HINT:

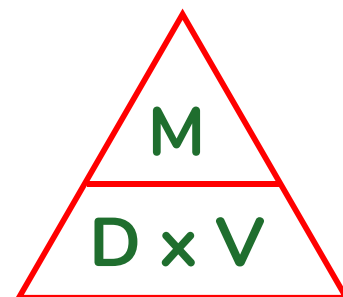
11

Volume of a cuboid = length \times width \times depth



HINT: Use the formula triangle below.

12



Christmas Tree Relay - Candy Cane

In the Christmas sales, all prices are reduced by 15%.

The price of a TV is £240.



Work out how much money you will save in the sale.

1

Rudolf is given four reindeer treats every hour.

How many reindeer treats will he have been given after 12 hours?



2

It takes Santa's fastest elf 2.26 seconds to make a wooden train.



How many seconds will it take the elf to make 1000 wooden trains?

3

Santa flew his sleigh from the North Pole to the United Kingdom.



The flight time was 7 hours 36 minutes. Work out the flight time in minutes.

4

The heights of six elves are listed below.

80cm, 50cm, 40cm, 40cm, 60cm, 30cm

What is the mean height?



5

Mr Claus bakes cookies for Mrs Claus.



Write down the ratio of Christmas tree cookies to candy cane cookies.

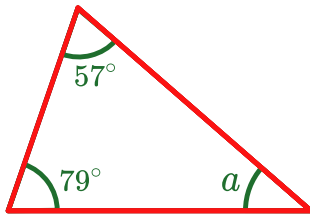
Give your answer in its simplest form.

6

Christmas Tree Relay - Candy Cane

The base of Santa's workshop is a triangle shape.

7



Find the value of a .

On Tuesday, Santa ate $\frac{1}{8}$ of a Christmas cake.

8

On Wednesday, he ate $\frac{3}{8}$ of the same cake.



How much of the cake has Santa eaten in total?

Give your answer in its simplest form.

Annie wants to buy 16 candy canes for her Christmas tree.

9



Each candy cane costs 28p.
How much will it cost for 16 candy canes?

It is Christmas jumper day at elf school tomorrow.

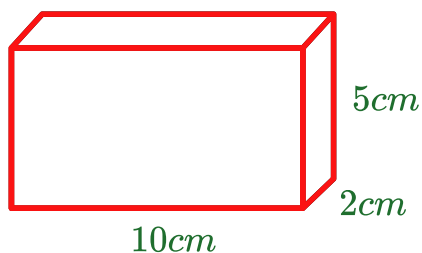
10

Eddie the elf has 10 Christmas jumpers.
Three of the jumpers have Christmas trees on them.
Five of the Christmas jumpers have candy canes on them.
Two of the Christmas jumpers have Rudolf the reindeer on them.

Describe in words, the probability that Eddie wears a Christmas jumper with candy canes on for school tomorrow.

A present is in the shape of a cuboid.

11



It measures 10cm by 2cm by 5cm.
What is the volume of the present?

A train with a volume of 120cm^3 is made from wood which has a density of 2g/cm^3 .

12



Work out the mass of the train.

Bauble Hint Cards

HINT: In a sale, do prices increase **or** decrease?

1



HINT: What is the lowest common multiple of 8 and 12?

2



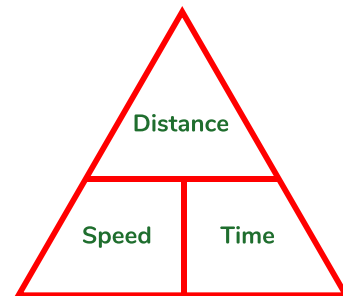
HINT: Will this be a big number **or** a small number?

3



HINT: First convert the time to hours. Then use the formula triangle below.

4



HINT: What is the height of the tallest elf in Class A?
What is the height of the tallest elf in Class B?

5



HINT: How many parts are in the ratio 7 : 3 in total?

6



Bauble Hint Cards

HINT: What do angles in a quadrilateral add to?

7



HINT: Can you find a common denominator?

8



HINT: How many boxes can Jack buy?

9



HINT: What is the sum of the probabilities of all outcomes?

10



HINT:

11

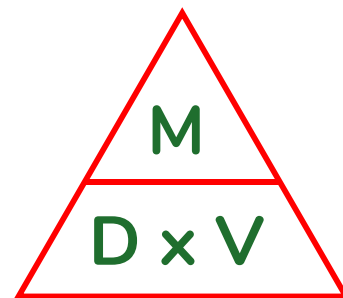
Volume of a prism = area of cross section x depth

What shape is the cross section of this prism?



HINT: First work out the volume of the prism.
Then use the formula triangle below.

12



Christmas Tree Relay - Baubles

In the Christmas sales, all prices are reduced by 15%.

The price of a TV is £240.

1



Work out the sale price of the TV.

Brian the elf can build a doll in 8 seconds.
 Lisa the elf can build a doll in 12 seconds.

2



They have both just finished building a doll at the same time.



After how many seconds will they have finished a doll together again?

Santa's elves have to make
 940 000 000 000 toys each year.

3

Write this number in standard form



Santa flew his sleigh from the North Pole to the United Kingdom.

4



The sleigh flew a distance of 3849km.

The flight time was 7 hours 45 minutes.

Work out the average speed of the sleigh in kilometers per hour.



Give your answer to the nearest whole number.

All elves in the North Pole go to elf school.

5

The shortest elf in Class A is 39cm tall.
 The range of heights in Class A is 57 cm.

The shortest elf in Class B is 33cm tall.
 The range of heights in Class B is 60cm.



Find the range of heights for all the elves in both classes.

Mrs Claus has 150 cookies.

6

The ratio of Christmas tree cookies to candy cane cookies is 7 : 3

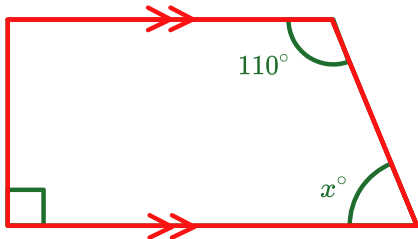
How many candy cane cookies are there?



Christmas Tree Relay - Baubles

The base of Santa's workshop is a trapezium shape.

7



Find the value of x .

Lizzie the elf has a flask that contains $\frac{7}{10}$ litre of hot chocolate.

8

She pours some hot chocolate into her mug and now has $\frac{1}{4}$ litre left.



Write the fraction in its simplest form

Jack wants to buy as many Christmas selection boxes as he can.

9

He has £20 to spend on selection boxes. Each selection box costs £1.65.

Work out how much change he will get from £20.



The probability of Eddie the elf wearing a Christmas jumper to elf school is 0.75.

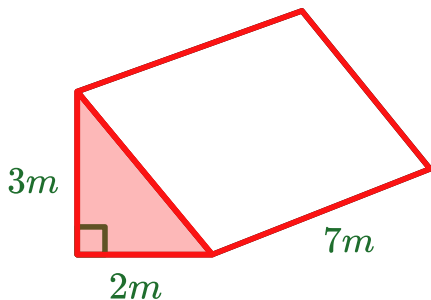
10

What is the probability that Eddie does not wear a Christmas jumper?



A toy chest is shown below.

11

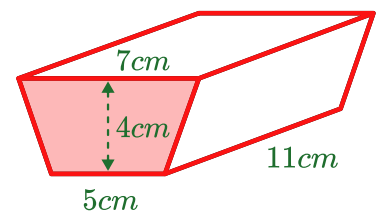


What is the volume of the toy chest?

This present is a solid prism.

12

The cross section of the present is a trapezium.



The present is made from wood with density 0.6g/cm^3 . What is the mass of the present?

Holly Hint Cards

HINT: What is the multiplier for a 3% decrease?

1



HINT: If two numbers have a HCF of 5, what must they be multiples of?

2



HINT: Work out the total number of marks gained by the boy elves and girl elves altogether

3



HINT: How many metres in a kilometre?
How many minutes in an hour?

4



HINT: To find the mean, add them all and divide by the number you have.

5



HINT: How do you find equivalent fractions?
Can you use a similar process with these two ratios?
What do these two ratios have in common?

6



Holly Hint Cards

HINT: Split the hexagon into four triangles
 What do angles on a straight line equal?

7



HINT: What is 25% as a fraction?

8



HINT: How much will he need to borrow from Mrs Claus?

9



HINT: Draw a tree diagram.

10



HINT:

11

Volume of a cuboid = length x width x depth



HINT: Sort the information you have into the table below.
 What information do you have missing?

12

	Density	Mass	Volume
Material A			
Material B			
Material C			



Christmas Tree Relay - Holly


Santa bought a new sleigh for 240 000 North Pole (NP) dollars.

The Value of the sleigh depreciates by 3% each year.

Work out the value of the sleigh at the end of 4 years.



1


 Give your answer correct to the nearest NP dollar.

Rudolf the reindeer thinks of two numbers.

The highest common factor (HCF) of his two numbers is 5.

The lowest common multiple of his two numbers is a multiple of 12.

2

 Write down two possible numbers Rudolf could be thinking of.

Santa's elves have to make 4.2×10^7 bikes and 0.57×10^8 scooters each year.

What is the total number of bikes and scooters they need to make?

Give your answer in standard form.




3

Santa flew his sleigh from the North Pole to the United Kingdom.

The sleigh flew a distance of 3849000m.

The flight time was 465 minutes.

Work out the average speed of the sleigh in kilometers per hour.

 Give your answer to 3 significant figures.

4



All elves in the North Pole go to elf school.

There are 10 boy elves and 20 girl elves in the class.

The class has a Christmas pop quiz.

The mean mark for all of the class is 60.

The mean mark for the girl elves is 54.




Work out the mean mark for the boy elves.

5

Mrs Claus made some cookies for the elves.

The ratio of Christmas tree cookies to candy cane cookies was 3 : 1

The ratio of candy cane cookies to snowman cookies was 2 : 3

 Write down the ratio of Christmas tree to candy cane to snowman cookies.

6

Christmas Tree Relay - Holly

The base of Santa's workshop is a regular hexagon shape.

7

Calculate the size of each interior angle of the workshop.



Joe spends his pocket money on Christmas presents for his family.

8

He spent $\frac{1}{5}$ of his money on his mum.
He spent 25% of his money on his dad.

What fraction of his pocket money is left to spend on the rest of his family?



A junior elf wants to buy a Christmas jumper for Santa.

9

It will cost 65.50 North Pole (NP) Dollars, but he has only saved 14.50 NP Euros.

Mrs Claus is willing to pay 19.99 NP Euros towards it and will lend him the rest of the money.

How many whole weeks will it take the elf to pay back the money he owes to Mrs Claus if he pays back 1.8 NP Euros per week?



The probability of Eddie the elf wearing a Christmas jumper to elf school is 0.8.

10

The probability of Eddie wearing Christmas socks is 0.3.

The two events are independent.

What is the probability that Eddie wears at least one of these items?



A toy chest in the shape of a cuboid measures 30cm by 20cm by 32cm.

11

The chest has a lid.

A present measures 6cm by 6cm by 6cm.

Ronny the elf has 100 presents.



Can Ronny put all 100 presents in the toy chest and shut the lid?

The head elf is creating a new stronger material, Material C, for making toys.

12

Material A has a density of 5g/cm^3

Material B has a density of 10g/cm^3

4kg of Material A and 800g of Material B are combined to form Material C.

What is the density of Material C?



Christmas Tree Relay - Answers

Candy Cane:

1. £36
2. 48
3. 2260
4. 456 minutes
5. 50cm
6. 1 : 2
7. 44°
8. $\frac{1}{2}$
9. 448p or £4.48
10. Even chance
11. 100cm^3
12. 240g



Bauble:

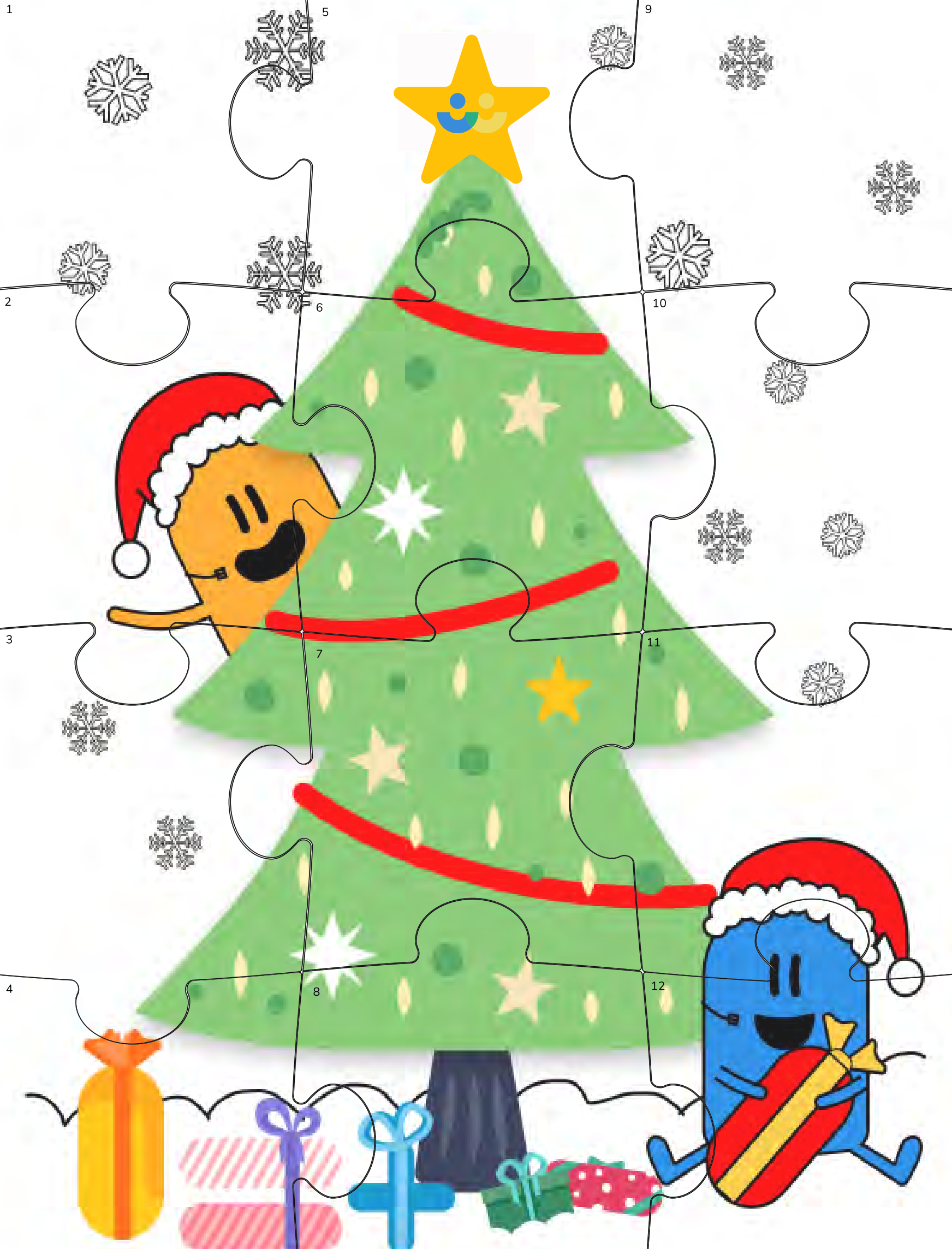
1. £204
2. 24 seconds
3. 9.4×10^{11}
4. 497km/h
5. 63cm
6. 45
7. 70°
8. $\frac{9}{20}$ litre
9. 20p (12 boxes)
10. 0.25
11. 21m^3
12. 158.4g



Holly:

1. 212470 NP Dollar
2. 5 & 60 or 5 & 120
3. 9.9×10^7
4. 497km/h
5. 72
6. 6 : 2 : 3
7. 120°
8. $\frac{11}{20}$
9. 18
10. 0.86
11. No
12. 5.45g/cm^3





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