Family Maths Toolkit

Family Maths Scrapbook Activities

Year 6

Any questions, please email:
enquiries@nationalnumeracy.org.uk

familymathstoolkit.org.uk

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Family Maths Toolkit

1 2 3 4

Introduction

Proven to improve children's and parents' confidence in maths, this family engagement resource aims to promote enjoyment of maths through discussion and working together on everyday maths.

This activity pack, created by National Numeracy, contains short, fun, 'real life' activities for families to do with their children. They are aligned to the English National Curriculum and compatible with the Scottish Curriculum for Excellence, with a strong focus on problem solving and reasoning.

There are 30 activities, one for each week of the school year. They are organised in this pack so that they get progressively harder - but they can be selected to match the curriculum area on which your children are working.

The individual activity sheets are not marked with the age or year group, but they are colour coded so you can tell the difference. Please note that the level is based on average expectations for the year group - children may be working below or above this, so draw on activities from other year groups if you need to.

This pack contains:

- An overview showing the suggested split of the activities by school term and by numeracy topic from the English National Curriculum.
- 30 activities, in the order given in the overview.
- 3 answer sheets, one per term. (Please note that many of the activities are designed to be open-ended, so answers are only given for activities that require them)

For schools

We recommend the following approach for schools using the activities:

- A whole class approach and even a whole school approach.
- If children are working well above or below age-related expectations, select an activity from a different year group pack.
- Hold a workshop to model the activity discussions for less confident parents.
- Have a launch event, giving out scrapbooks if you are using them. (Family Maths scrapbooks, in which children and families can record their work on these activities, are available to order through National Numeracy's website.)
- Emphasise that any member of the family can work with the child being given the activity.
- If there are no adults helping out at home, we suggest finding an older school buddy to help in an after or pre-school club.
- The parent/carer does not have to have any special knowledge of school maths or equipment.
- Encourage children to be creative: take photos, draw pictures, write calculations or create diagrams.
- Encourage both adult and child to use the comment box to promote reflection and help you understand what they think about each activity.
- Put completed activities on show so that children and families can learn from each other that there is not just one answer but many ways of approaching problems.

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For parents and carers

However you might feel about maths, you can make a huge difference to your children's numeracy learning.

All the evidence shows that talking about everyday maths helps develop children's maths confidence. Here are some questions that you can ask each other when tackling the activities:

- What do we need to do?
- What information do we have? What do we need to find out?
- Would any equipment help?
- What do you notice when...?
- Shall we make a guess and see if it works?
- What could we do if we get stuck?
- If we were doing this again, is there anything we could do differently?

You can adapt these activities to suit your family's interests and use whatever items you may have to hand, at home or out and about.

You might want to take photos, draw pictures, write calculations or create diagrams - it's up to you!

Do use the comment boxes to reflect your discussions and thoughts as you complete each activity together.

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Note for Yr 5 & 6 children and families

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As lots of people love to do puzzles in magazines and newspapers, some of the activities are mathematical puzzles to encourage mathematical talk and problem solving together – enjoy!

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Y6 Overview and Curriculum links

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Term	Topic	Activities	Main Curriculum link	Also covers
Autumn	**Numbers** (calculations)	Multiplication pyramid puzzle	Multiply multi digit numbers up to 4 digits, working systematically to find all possibilities.	Working systematically
		Juggling rings*	Use mental calculations to solve problems; working systematically.	
		How much?	Multiply/divide multi digit numbers, including decimals in the context of money to solve problems.	Currency conversion
	Numbers (FDPRP)	Sports - Sometimes, always, never	Reason and justify using a range of calculations including fractions and percentages.	Rounding to a degree of accuracy
		Exploding fireworks*	Problems involving the calculation of percentages and fractions.	
		FDP domino game	Recall and use simple fractions, decimals and percentages.	Identify the value of each digit in numbers up to 3 decimal places.
	Algebra	Balanced fruit equations*	Use simple formula, express missing number problems algebraically.	
	Geometry	Squash a box	Recognise, describe and build simple 3D shapes, including making nets.	
	Measurement	A mile of baked beans	Convert between miles and kilometres.	
		A desert trek	Solve problems involving the calculation and conversion of units of measure of mass and volume.	

*Needs to be printed in colour

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Term	Topic	Activities	Main Curriculum link	Also covers
Spring	**Number** (calculations)	Supermarket offers	Multiply and divide using whole numbers and up to 2 decimal places in the context of money.	
	Numbers (FDPRP)	Wizard Olympics	Solve problems using the calculation of percentages, fractions and ratio.	
		Clothes for tallest man	Solve problems involving similar shapes where the scale factor can be found.	
		Baked potatoes	Solve problems involving percentages and the use of percentages for comparison.	
	Algebra	Presents under the tree	Find pairs of numbers that satisfy an equation with two unknowns and enumerate possibilities of two variables.	Estimation.
	Measurement	A feather or an elephant	Solve problems involving the calculation and conversion of units of measure (up to three decimal places where appropriate- this activity uses four decimal places).	Rounding decimals; estimation.
		World's longest nails	Solve problems involving the calculation and conversion of units of measure, using decimal notation, converting measurements of length.	
	Geometry	Angles all around you	Recognise angles where they meet at a point or are on a straight line.	
	Statistics	Fast skipping	Calculating the mean.	Estimation.
		Breakfast cereals*	Interpret and construct pie charts to solve problems.	

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Y6 Overview and Curriculum links

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Term	Topic	Activities	Main Curriculum link	Also covers
Summer	**Numbers** (place value)	Eid biscuits	Solve problems which require answers to be rounded to specified degrees of accuracy (in the context of money to 2 decimal places).	Percentages, measurements.
	Algebra	Algebra is fun	Generate and express missing number problems algebraically; enumerate possibilities of combinations of two variables.	
	Measurement	Largest ever cake	Use and convert between units of measurement of length and volume using decimal notation; calculate, estimate and compare volume of cuboids using standard units including cm^3 and m^3.	
		The weight of bears	Solve problems using units of measure (mass) using decimal notation up to three decimal places.	
	Geometry	Treasure map	Describe positions on the full coordinate grid (all four quadrants).	
		Going in circles	Illustrate and name parts of circles, including radius, diameter and circumference.	
		Shape human treasure hunt	Compare and classify geometric shapes based on their properties and sizes, and find unknown angles in triangles, recognise angles on a straight line.	
		Dream home Part 1	Calculate and compare the area of rectangles (including squares) and using standard units cm or m squared, estimate the area of irregular shapes.	
		Dream home Part 2	Calculate and compare the area of rectangles (including squares) and using standard units cm or m squared, estimate the area of irregular shapes; draw 2D shapes using dimensions and angles.	Recognise where it is possible to use formula for area.
	Statistics	What is happening?	Interpret and construct line graphs and use these to solve problems.	

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Multiplication pyramid puzzle

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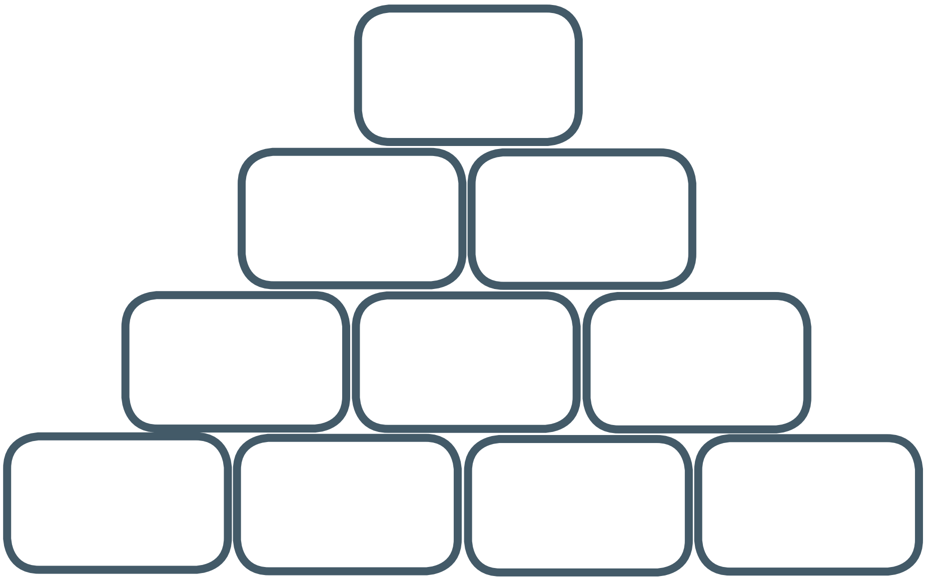

Using the single digits 1-4, insert them in each of the bottom 4 boxes in any order.

Multiply 2 adjacent boxes to complete the 1 immediately above.

What arrangement of bottom row digits gives the total of 96 in the top box?

Can you find more than one way to reach this total?

What other totals can you find by re-arranging the bottom row?

In how many ways can you find each total?

Family comments:

Child comments:

Curriculum Link

Multiply multi-digit numbers up to 4 digits, working systematically to find all possibilities.

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Juggling rings

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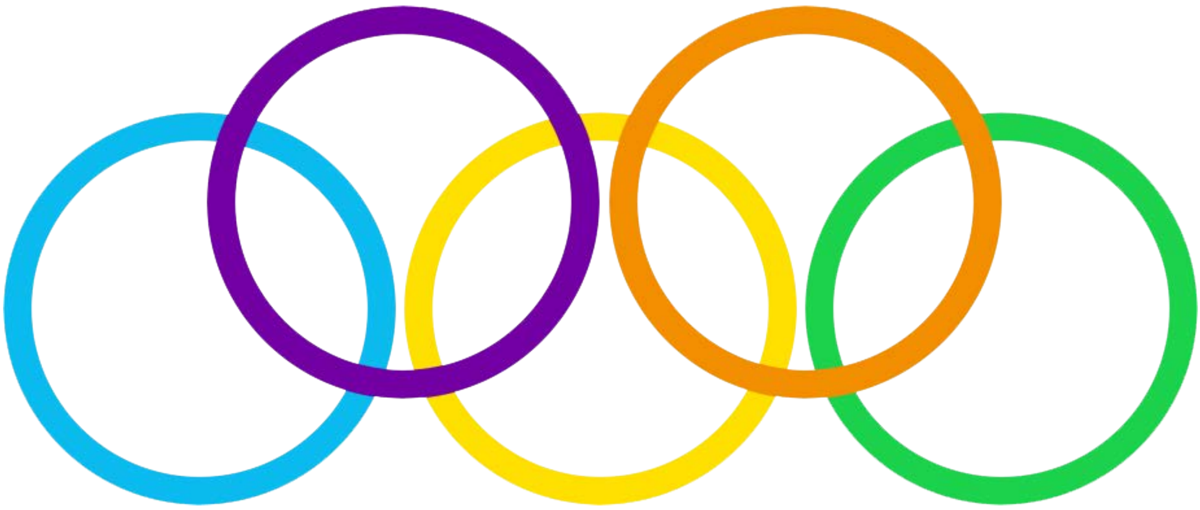
A circus clown has a set of five juggling rings in different colours. Before he starts his act he lays them out so they overlap.

This creates 9 separate areas within the rings. Can you place all the numbers from 2-10 in each of these areas so that each complete circle adds up to an even number?

There is more than one answer so challenge all your family!



Family comments:

Child comments:

Curriculum Link

Use mental calculations to solve problems; working systematically.

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How much?

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If we travel to some other countries, we need to change our pounds for the currency in that country – this is called ‘exchange’. The rates of exchange vary but this table shows the exchange rates on one day.

Exchange rates	
UK £1 (UK pounds)	USA $1.46 (United States Dollars)
UK £1	Euros €1.32

The cost of a burger in London is £4.57. How much would the same burger cost in the USA in dollars?

The cost of a pizza in Cardiff is £3.50. What would the cost of this be in France in euros?

A punnet of strawberries cost £2.60 in Edinburgh. How much would you pay for the strawberries in Spain using euros?

A Euro Disney day ticket costs 79 euros if you buy it at the park. How many pounds would you need to save to pay for 5 tickets?

Can you think of 3 other things you might want to buy in the UK and work out how much money you need to exchange to be able to buy them in the USA and in France?

Family comments:

Child comments:

Curriculum Link

Multiply and divide multi digit numbers, including decimals in the context of money to solve problems; rounding number to a degree of accuracy.

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Sports - sometimes, always, never

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Read these statements and discuss them with your family.

Colour those you decide are 'sometimes' in yellow; if you decide they are 'always' colour them green and those which are 'never' colour red.

Do you all agree? If you cannot agree, colour these statements blue.

Winning 70/100 is better than winning 3/5 of the games	It is better to play sport on a warm day
The home team should have 75% of the tickets	You become better with practice
More than 50 000 people could watch a professional football match	There are double the number of football boots needed than shirts in a team
'Half price ' tickets are the same as 'Buy one, get one free' offers	A football referee can add on 10% of time at the end of a game
People play well when they have had a good sleep	There can be more people on one side than the other in a game
There are 22 players on a football pitch	2 cans of coke for £1.40 is the same value as 3 cans for £2.10
A kg of chips weighs more than a kg of crisps	A big meal is good for you before playing a game
4 tickets at £5.50 each cost more than 3 tickets at £6.50 each	14 rows of 8 seats amounts to the same as 15 rows of 7 seats

Family comments:

Child comments:

Curriculum Link

Reason and justify using a range of calculations.

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Exploding fireworks

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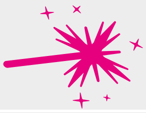
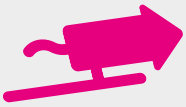
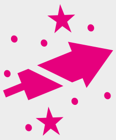
A shop has special offers on fireworks “Exploding prices!”

A £10 rocket has $^3/_5$ off – what is the new price?

A packet of sparklers was £20 and now has 15% off – how much is it now?

If you were a shopkeeper, make up some special offers for these fireworks (remember you cannot **give** them away, you must still make some money!):

Firework	Price	Special offer	New price
	£4.25		
	£8.40		
	£12.50		
	£15.60		
	£3.75		
	£24.00		

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Create your own firework and prices in the last boxes. Use fractions, percentages, half price and BOGOF offers.

Family comments:

Child comments:

Curriculum Link

Solve problems involving the calculation of percentages and fractions.

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Fractions, decimals and percentages domino game

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To play this game, you need to cut out all the attached 'dominoes' and mix them up. (Be careful not to lose any or the game will not work.)

Deal out 5 'dominoes' each and choose who starts the game. The starter lays one domino down face up.

Anyone who has a question or answer which matches either end can lay their domino down end to end:

3	15% of 70

10.5	$\frac{4}{5}$ of 20

15% of 70 is 10.5 so they go together.

If a player cannot go, they must take another domino. First player to use all their dominoes is the winner.

Helpful hints: This game is better with 3+ players. If one or two of you are playing, share more cards out to start with.

11	$\frac{1}{10}$ of 10

1	60% of 120

72	$\frac{3}{8}$ of 72

27	0.125 × 24

3	15% of 70

10.5	$\frac{4}{5}$ of 20

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16	0.4 × 150	60	55% of 100	55	$\frac{3}{8}$ of 88
33	0.2 × 33	6.6	20% of 250	50	$\frac{2}{3}$ of 72
48	$\frac{2}{5}$ of 225	90	$\frac{3}{5}$ of 20	12	0.5 × 10
5	20% of 20	4	$\frac{1}{4}$ of 24	6	0.1 × 20
2	75% of 16	12	$\frac{1}{5}$ of 35	7	0.75 × 100
75	30% of 30	9	$\frac{1}{3}$ of 90	30	0.2 × 50

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10	20% of 24
4.8	⅖ of 45
18	0.9 × 90
81	20% of 75
15	¾ of 32
24	⅓ of 57
19	40% of 72
28.8	⅛ of 88

Family comments:

Child comments:

Curriculum Link

Recall and use simple fractions, decimals and percentages.

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Balanced fruit equations

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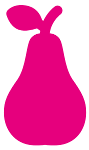


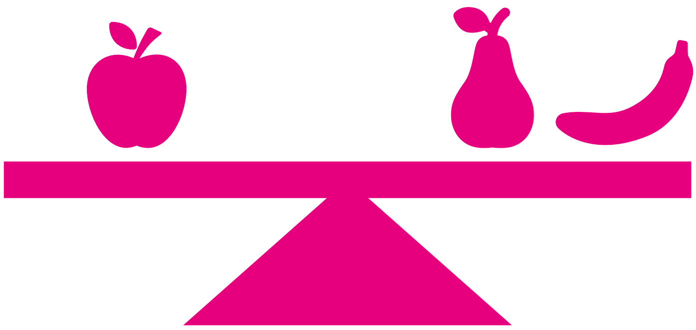
= 100 g

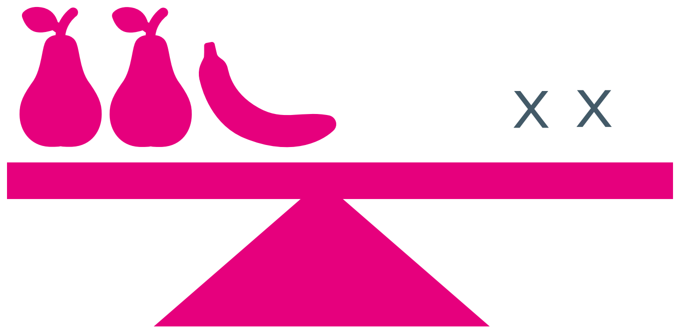
= 200 g

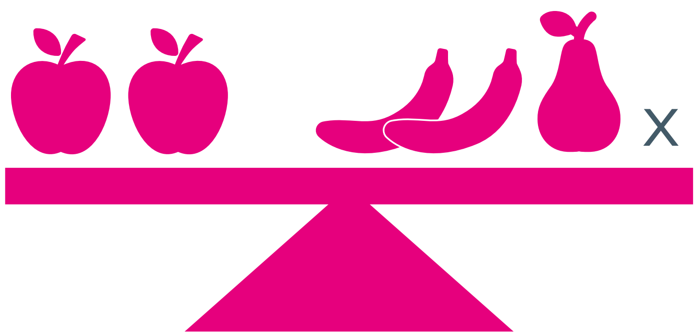
(3 x 100) = 200 + 100
Balanced equation

Can you work out these balanced equations of fruit?

You will need to find out the value of an apple
and then the missing fruit shown by an ‘x’.







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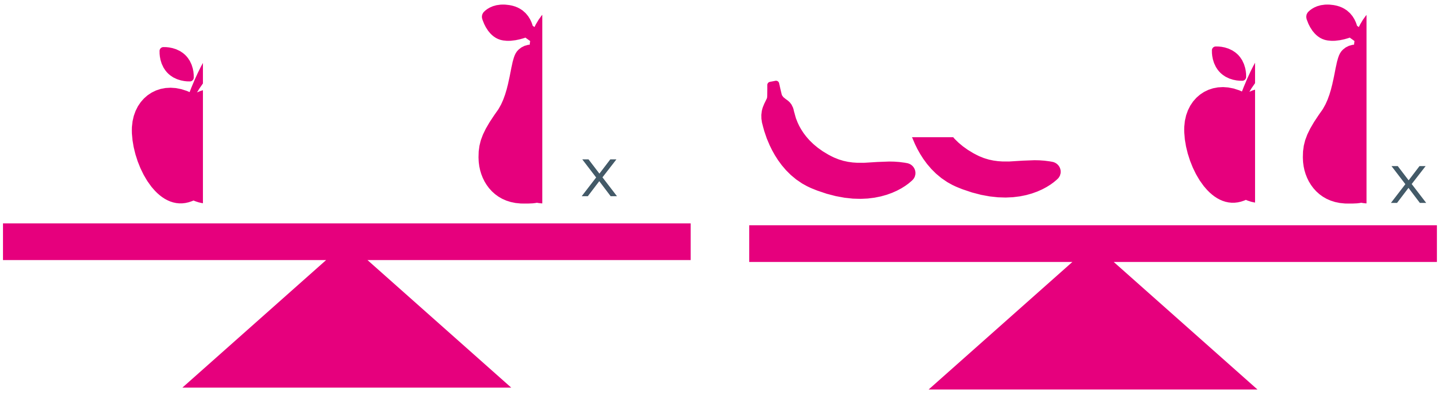

Can you make some other balanced scales using fruit measured in grams? Ask the rest of your family to work them out.

NB: The last two equations are:
half an apple balanced by half a pear and x.

Whole banana and half a banana balanced by half a pear, half an apple and x.

Family comments:

Child comments:

Curriculum Link

Use simple formula, express missing number problems algebraically.

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Squash a box

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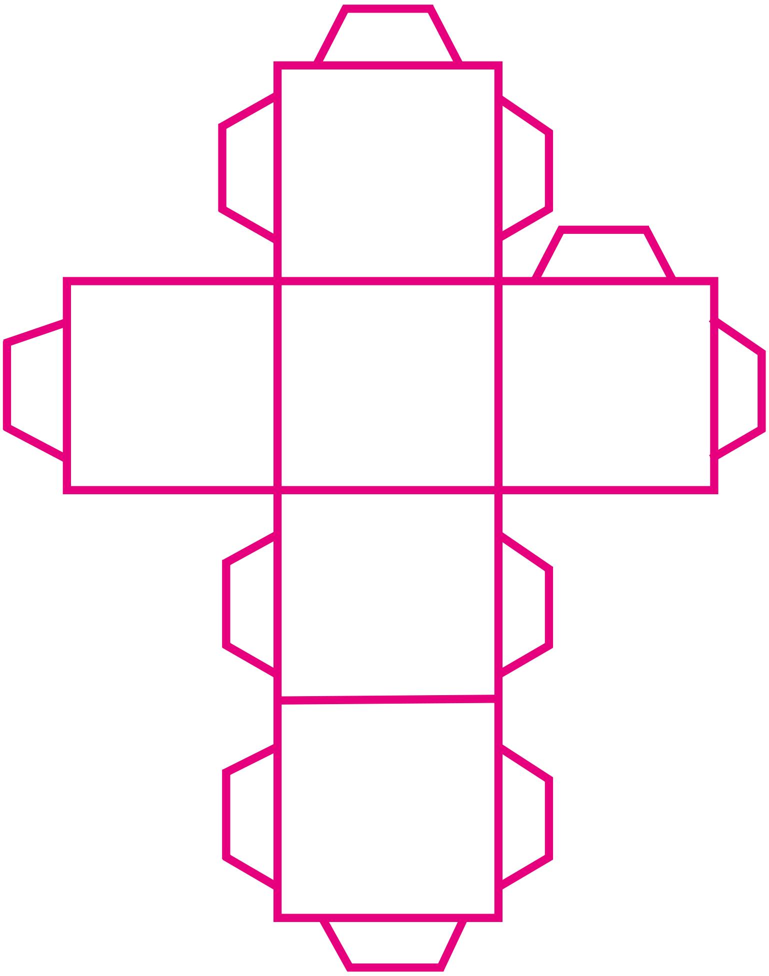
Find a cardboard box (for example a cereal box) and undo it so that you have a flat net shape of the box.



What shape do you have?

Can you find a cardboard tube (for example, from a kitchen roll)? What 3D shape is it? If you cut it lengthwise, what shape do you think you will have?

Now cut it – are you surprised?

Can you find any unusual shapes and show the net shape?

Can you design a net which will make up to a 3D shape?

Family comments:

Child comments:

Curriculum Link

Recognise, describe and build simple 3D shapes, including making nets.

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A mile of baked beans

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A small can of baked beans is about 10 cm high.

If many cans were placed end to end, how many cans would be needed to cover a distance of 1 mile?

Can you find anything else in your home which would be fun to make a mile long 'snake' from? How many of these items would it take to make a mile?

Helpful hints: 1 can = 10 cm so 10 cans = 1 m and so on... 5 miles are equivalent to 8 km so 1 mile = 1.6 km and 1 km = 0.625 miles.

Family comments:

Child comments:

Curriculum Link

Convert between miles and kilometres.

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Desert trek

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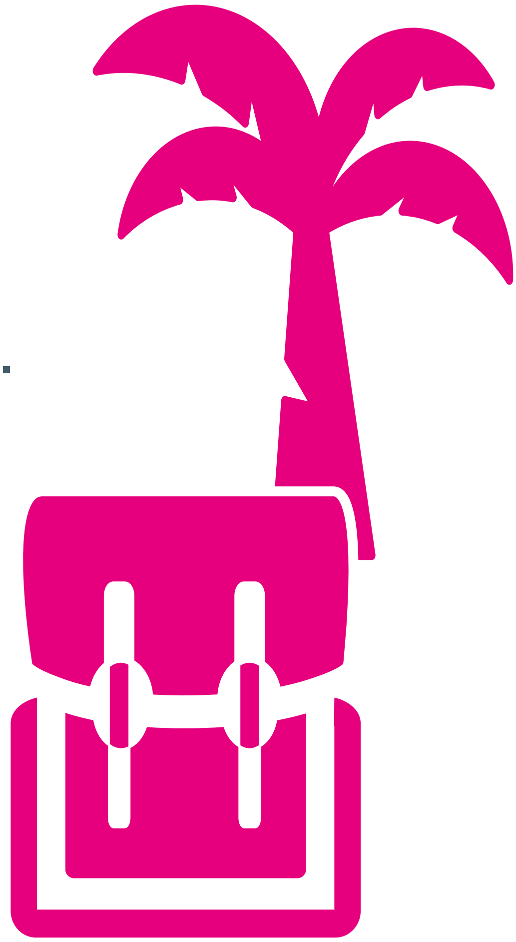
Imagine you are an army officer or a Star Wars general, and you have to make an expedition across a desert on a secret mission.

You will be travelling across the desert for two days and must carry all you need on your back. Rucksacks are measured in litres. A 15 litre rucksack equals 150 kilograms.



You must choose what you will take with you – remember you must have enough to drink in the desert so what you choose will be a mix of liquid (litres or millilitres) and food or clothes (kilograms or grams) or anything else you think you may need (such as toilet roll or equipment).

Measure things around your home to decide what to take and make a list. Remember you cannot go over 15 litres or 150 kilograms.

Real army officers often carry 65 litre rucksacks – do you think you could lift this or carry it a long distance?

Family comments:

Child comments:

Curriculum Link

Solve problems involving the calculation and conversion of units of measure of mass and volume; identify the value of each digit in numbers up to 3 decimal places.

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Supermarket offers

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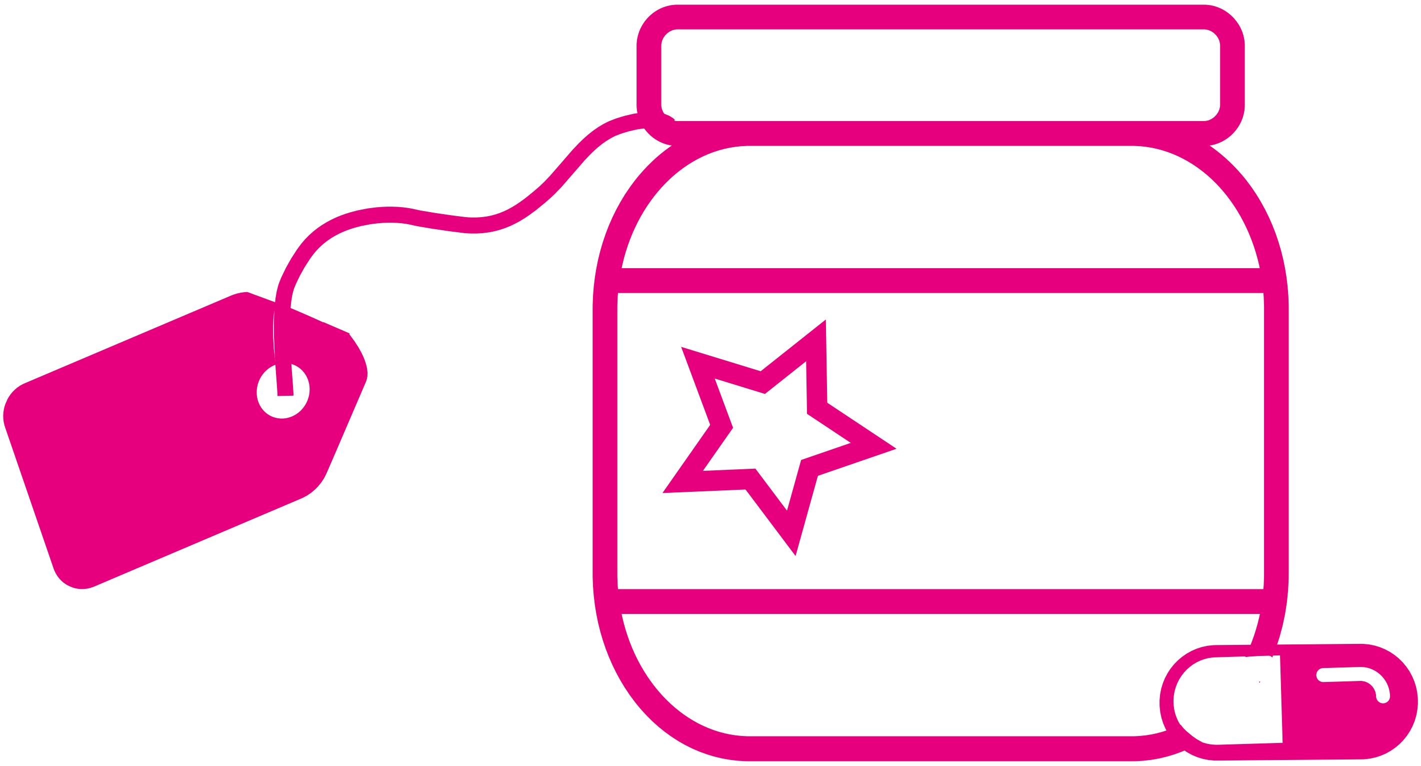
A supermarket displayed these special offers:

- **A packet of vitamin tablets (90) were sold '3 for the price of 2' with each packet starting at £1.80.**
- **A packet of the same vitamin tablets (30) were '3 for the price of 2' with each packet starting at 70p.**

Which is the best deal?



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Tins of soup were sold at 59p each or
'Buy one, get one free' (BOGOF).

The same tins were sold as a pack of 4 for £1.20.

Which is the cheapest way to buy this soup?

Can you find a special offer in your family shopping – do you think it is a good deal? Why?

Biscuits were sold in different ways –

- £2.48 for a variety pack (62 biscuits)
- A single packet of biscuits (20) was 82p
- Or '3 for the price of 2' were £1.35 each (10 biscuits in a pack)
- 'Buy one, get one free' were packs of 15 biscuits for 90p

Challenge – Which is the cheapest way to buy these biscuits?

Family comments:

Child comments:

Curriculum Link

Multiply and divide using whole numbers and up to 2 decimal places in the context of money.

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Wizard Olympics

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The wizarding world is holding an Olympics in their own style. Here are some clues to the events:

- **The ratio of swimming races to wizard duels is 2:1**
- **$\frac{1}{4}$ of all events are swimming races**
- **Half the events involve running**
- **The events which are not swimming, running, broomstick races or wizard duels are dragon fighting**
- **In total there are 120 events**
- **There are more wizard duels than broomstick races**
- **66% of the dragon fighting competitors are boys**
- **10% of the events are broomstick races**

Can you work out which the events are and how many of each there are?

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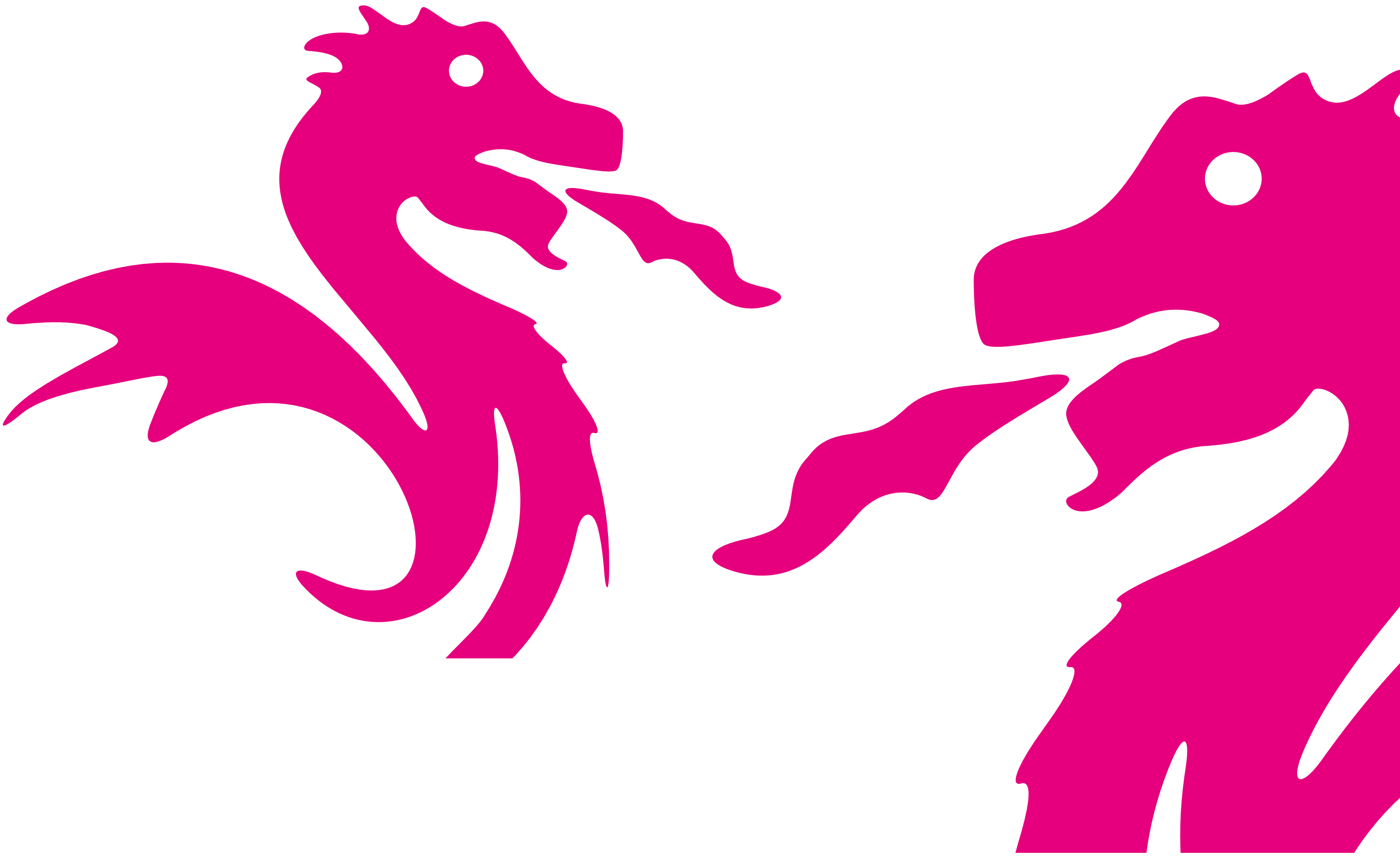
One day, 20% of the swimming races are cancelled. You can replace them with a race of your choice – what would it be?

What fraction of the total events are now swimming?

If $\frac{1}{3}$ of the broomstick competitors are 24 girls, how many are boys?

Can you ask another question using all this information?



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Solve problems using the calculation of percentages, fractions and ratio.

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Clothes for tallest man

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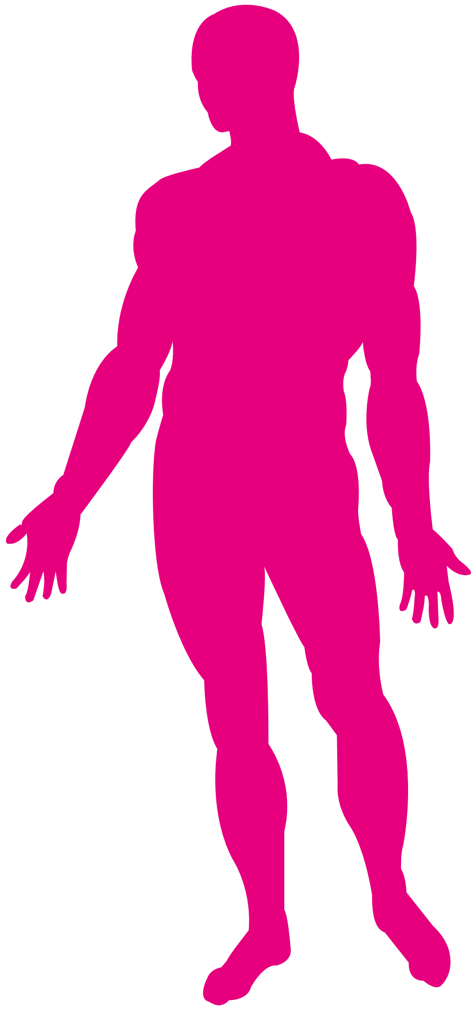
Facts about humans:

- **Humans' arm spans are the same length as their height**
- **Their heads are about $^1/_7$ or $^1/_8$ of their height**
- **Their hands are about $^1/_4$ of their arm length**
- **The tallest man in the world was recorded as being 2.72 m tall (8ft 11.1 in)**



How do you or members of your family compare to the world's tallest man?

Find a jumper or top which fits you and measure across the chest. Now add on the arm lengths.

Using all the information above, could you estimate what size jumper the tallest man would need?

What scale factor could be used to change your clothes to his?

Helpful hints: If you scale up, it is the number of times larger; if you scale down, it is the number of times smaller – the shape stays the same.

Family comments:

Child comments:

Curriculum Link

Solve problems involving similar shapes where the scale factor can be found.

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Baked potatoes preparation

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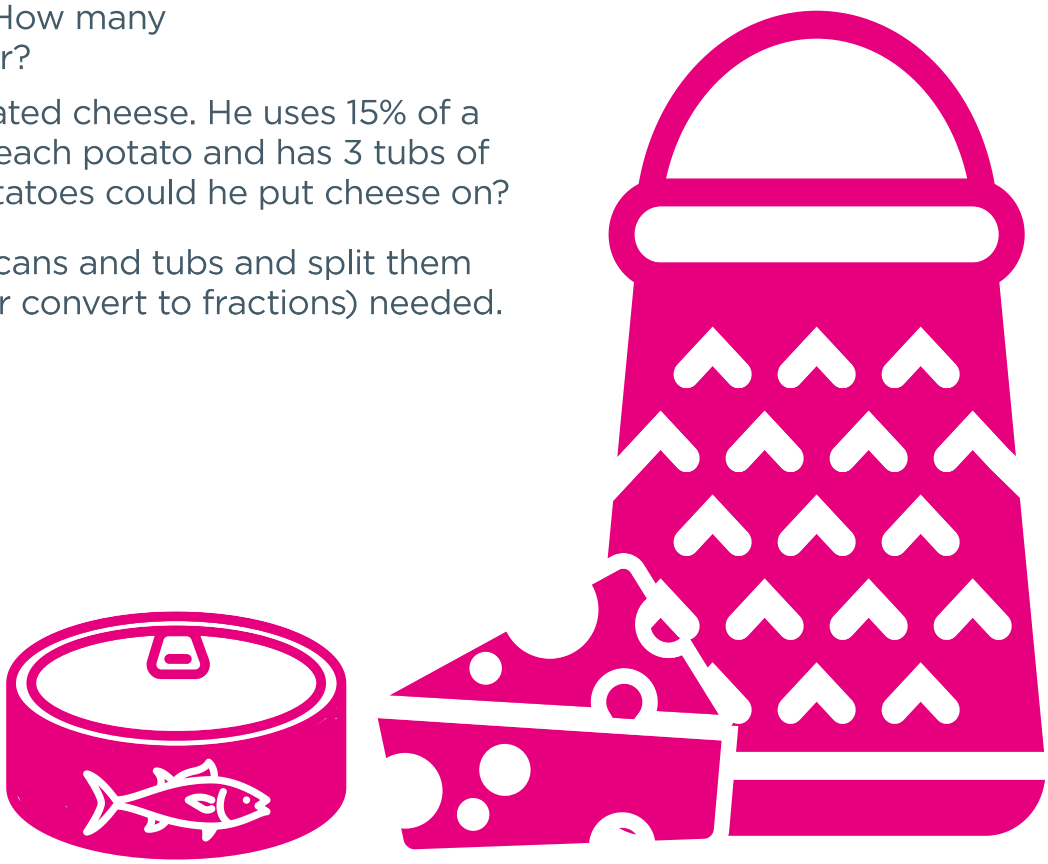
For his family's lunch, Kasan uses 60% of a can of tuna on each baked potato.

He has 4 cans of tuna. How many potatoes could he cover?

He also uses tubs of grated cheese. He uses 15% of a large tub of cheese on each potato and has 3 tubs of cheese – how many potatoes could he put cheese on?

Helpful hint: Draw the cans and tubs and split them into the percentages (or convert to fractions) needed.



Family comments:

Child comments:

Curriculum Link

Solve problems involving percentages and the use of percentages for comparison.

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Presents under the tree

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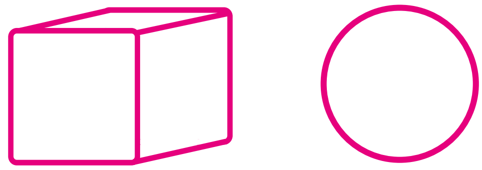
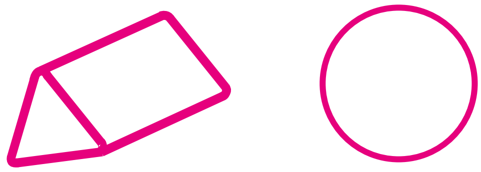
There are 5 presents under the tree, all different shapes. Each shape costs a different price.

1. The cube and the sphere together cost = £29

1. 

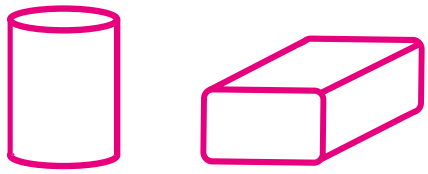
2. The prism and the sphere = £25

2. 

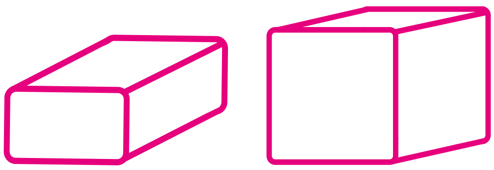
3. The sphere and the cylinder = £21

3. 

4. The cylinder and the cuboid = £27

4. 

5. The cuboid and the cube = £35

5. 

Can you work out the total cost of the 5 presents from these clues?

Is there more than one possible answer?

Family comments:

Child comments:

Curriculum Link

Find pairs of numbers that satisfy an equation with two unknowns and enumerate possibilities of two variables.

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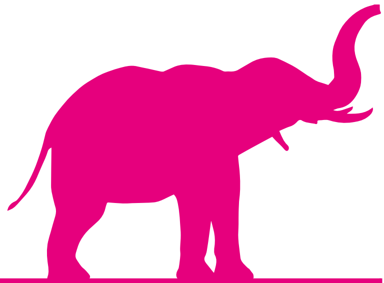
A feather or an elephant

Family Maths Toolkit

In this table, the weights (mass) are in order from heaviest to lightest. However, the objects have all been muddled up.



Weight	Object
10,000 kg	An envelope
1,000 kg	A hair
100 kg	An articulated lorry
10 kg	Sack of cement
1 kg	Bag of sugar
0.1 kg	An elephant
0.01 kg	One of the bells of Big Ben
0.001 kg	A feather
0.0001 kg	A packet of spice

Which object do you think should match to each weight?

When you have sorted them out, two boxes have been left blank for you to find something at home which would fit into the order of weights.

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Helpful hints: Obviously some of these will be estimation – start with a 1 kg bag of sugar as a baseline. Items lighter than 1 kg may be in measured in grams and converted.

You may not agree on all the order as some things are unknown – it is the discussion and debate which are important to inform reasonable estimates.

Family comments:

Child comments:

Curriculum Link

Solve problems involving the calculation and conversion of units of measure (up to three decimal places where appropriate - this activity uses four decimal places).

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World's longest nails

Family Maths Toolkit

A man in India got into the Guinness Book of Records by growing his nails, on one hand, to a total of 30 ft long (9.1 metres).*

To start with his nails grew 0.1 millimetres a day each. How long do you estimate each nail would be in one year?

Now work it out – were you close?

Roughly how long would it take his nails to grow 30 feet (9.1 metres) ?

How long do your nails get before you cut them?

*NB: If you'd like to see a picture of this man Google "longest nails Guinness Book of Records".

Family comments:

Child comments:

Curriculum Link

Solve problems involving the calculation and conversion of units of measure, using decimal notation, converting measurements of length.

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Angles all around you

Family Maths Toolkit

Angles can be different sizes depending on their purpose. A ramp forms an acute angle in relation to the ground, and a ladder forms an acute angle when leant against a building. The sharply angled, pointed shape of a slice of pizza is another common example. One famous acute angle in pop culture occurs when the character Pac-Man opens his mouth to devour the dots.

An obtuse angle may be formed when a window is open wider than a right angle. You might see an obtuse angle at many roof tops, as the two roof surfaces slope down from it. Boomerangs are flying toys which return to the thrower after moving some distance in the air: some are designed in such a way, the angle between the wings is an obtuse angle ranging from 91° to 140°.

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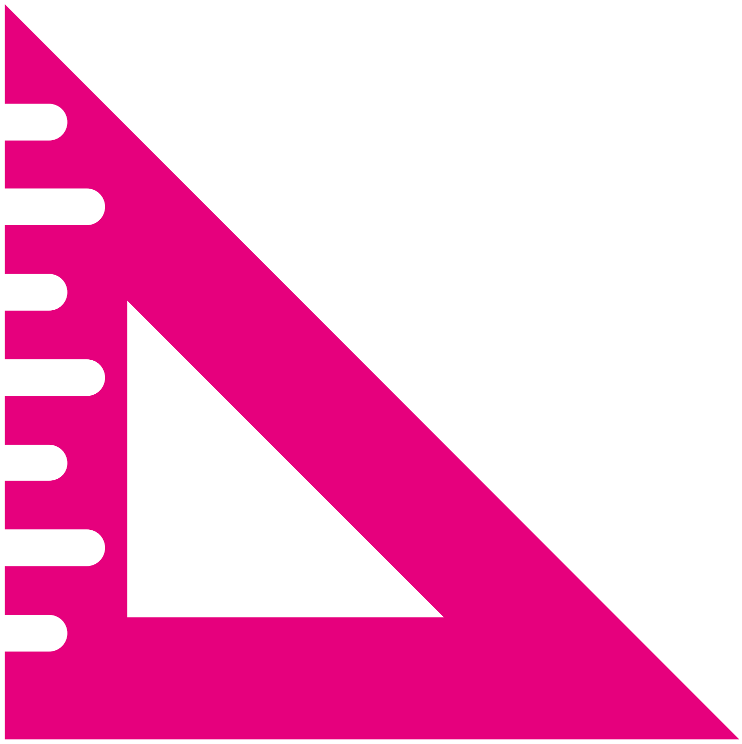
It is easy to find right angles around your home but how many examples of acute or obtuse angles can you find?

What angle is a straight line?

Make a list of the places or items you've found which have acute or obtuse angles.

Draw some of the angles you find.

Helpful hints: A right angle is 90 degrees; an acute angle is smaller than 90 degrees and an obtuse angle is larger than 90 degrees.



Family comments:

Child comments:

Curriculum Link

Recognise angles where they meet at a point or are on a straight line.

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Fast skipping

Family Maths Toolkit

How many skips do you think you can complete in 15 seconds? Write down your estimate.

Ask your family how many they estimate they could complete. Write these down.

Find a timer or watch and time each person – how close were your estimates?

What was the mean (average) of the estimates?

What was the mean of the actual number of skips?

How could you record this? What have you found out?

Do you think you could do four times this many in a minute? Would you slow down as you get tired?

Helpful hint: You can complete this activity with or without a skipping rope.

Family comments:

Child comments:

Curriculum Link

Calculate the mean as an average.

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Breakfast cereals

Family Maths Toolkit

A box of breakfast cereal contains these ingredients, shown in a pie chart –

There is an equal 25% of each ingredient.

Can you design your own mix of ingredients with different percentages? What percentage of each ingredient will you choose? How many ingredients will you have? Can you draw a pie chart to show your new cereal?

Will all your family choose the same?

Helpful hints: Try to encourage a variety of percentages, with some small amounts of ingredients. Talk about differences and compare pie charts. Remember the chart must total 100%.

Family comments:

Child comments:

Curriculum Link

Interpret and construct pie charts to solve problems.

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Eid biscuits

Family Maths Toolkit

Eid al-Fitr, is an important religious holiday* celebrated by Muslims worldwide that marks the end of Ramadan, the Islamic holy month of fasting.

To celebrate, these biscuits could be made:

Ingredients

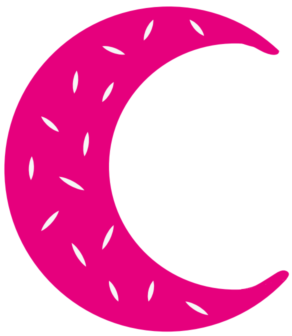
- 250 g soft butter
- 140 g caster sugar
- 300 g plain flour
- 1 egg yolk
- 2 tsps vanilla essence

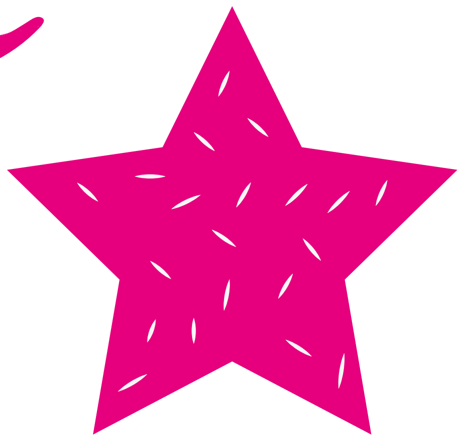
Method

1. Mix the butter and sugar together
2. Sift in the flour
3. Add 1 egg yolk and vanilla and mix together to make a dough
4. Roll out and, using a cutter or knife, cut out shapes of a star or a crescent
5. Bake 160 °C for 11 minutes
6. Cool and enjoy!

The ingredients are priced as :

- £2.00 for 500 g of soft butter
- 99p for 500 g caster sugar
- 80p for 1.5 kg plain flour
- £1.25 for 6 eggs
- £1.30 for a 60 ml bottle vanilla essence





Estimate how much **this batch** of biscuits would cost to make. You will need to round some numbers.

*Note: Eid falls in the summer months in 2016-2022.

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If you wanted to make four times this much for a large family, how much would the ingredients cost?

The local shop sells the same recipe for a large family and would charge 30% more; what would the price be in the shop?

Helpful hint: Approximately 5 ml in a teaspoon.

Family comments:

Child comments:

Curriculum Link

Solve problems which require answers to be rounded to specified degrees of accuracy (in the context of money to 2 decimal places).

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Algebra Is Fun!

Family Maths Toolkit

Algebra **I**s **F**un.

A = 6 **I** = 12 and **F** = 3

Write down as many equations as you can find using AIF

Here are some to get you going –

A + I = 18	12 / A = 2
7 x S = 21	I – 5 = 7

Try to make different equations using addition, subtraction, multiplication and division.

Challenge: use all of the letters AIF in one equation. For example:

A + I + F = 21

Try to make a more complicated equation using these letters.

A

I F

Family comments:

Child comments:

Curriculum Link

Generate and express missing number problems algebraically; enumerate possibilities of combinations of two variables.

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Largest ever cake

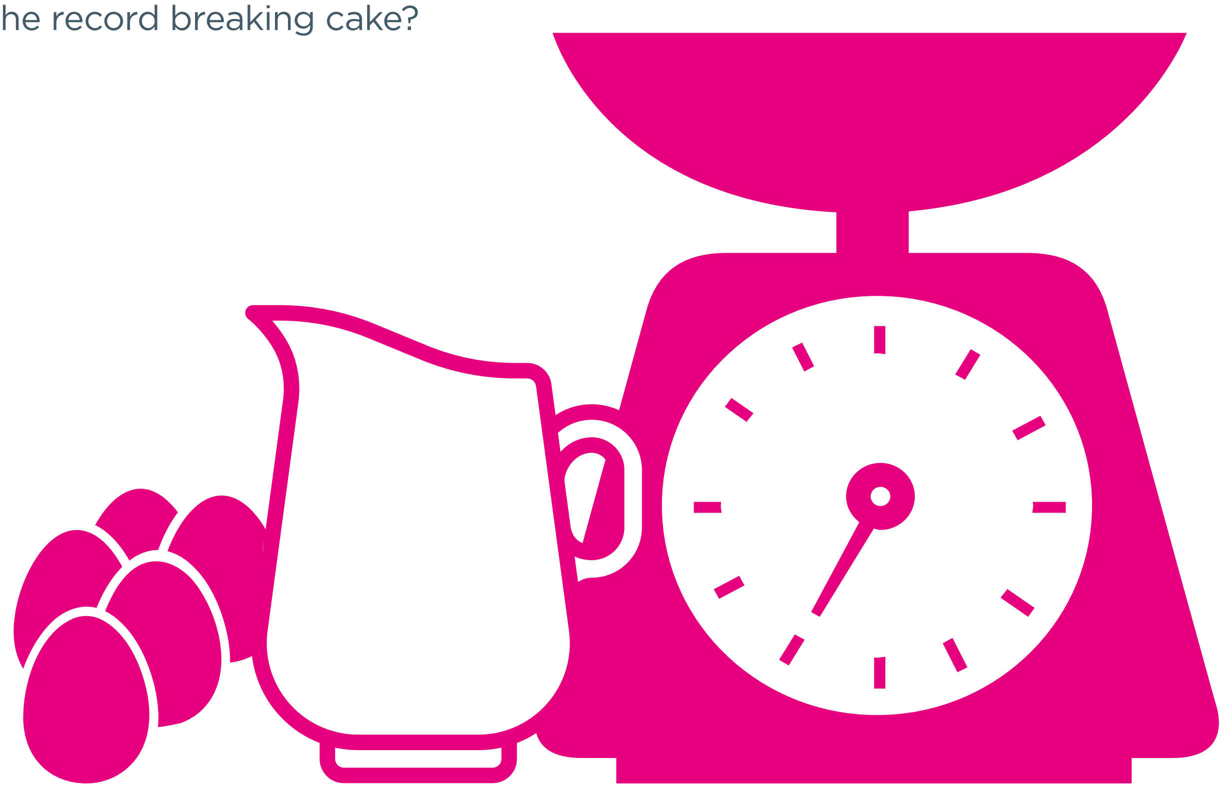
Family Maths Toolkit

The largest ever cake made measured 16.46 m by 13.94 m by 0.54 m (54 ft by 45 ft 7 in by 1 ft 9 in) (2015 Guinness Book of Records). Can you imagine what the ingredients for this would look like? This cake is longer than a school bus!

A recipe for a 20 cm by 20 cm by 10 cm cake is:

- 340 g (12 oz) self-raising flour
- 280 g (10 oz) caster sugar
- 280 g (10 oz) butter/margarine
- 5 eggs
- 3 tablespoons milk

Can you estimate what the recipe would look like for the record breaking cake?



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Now use a calculator to help you work it out.

- Remember to convert the original recipe to metres before you start
- When you know how much bigger the large cake is, round it to a whole number to work out the ingredients

Helpful hints: Round up or down the exact measurements; volume = **l** x **w** x **h** (length x width x height).

Family comments:

Child comments:

Curriculum Link

Use and convert between units of measurement of length and volume using decimal notation; calculate, estimate and compare volume of cuboids using standard units including cm^3 and m^3.

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The weight of bears

Family Maths Toolkit

Goldilocks and the Three Bears is a famous traditional tale involving a small bear, a middle sized bear and a large bear.

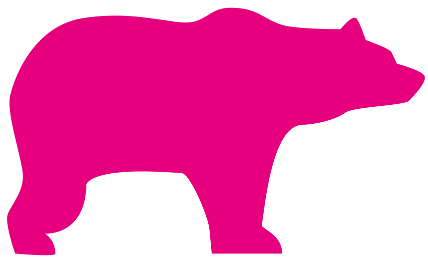
Invent weights for each of the bears and find the average.

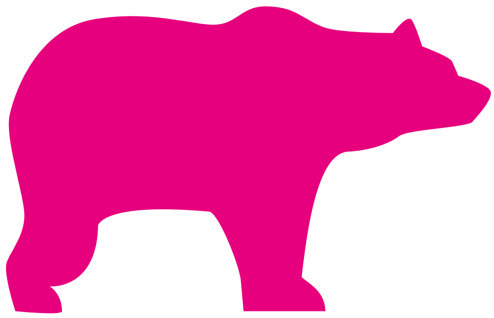
Find out the weights of the members of your family and find out the average weight. Do you think you will be below or above the average weight?

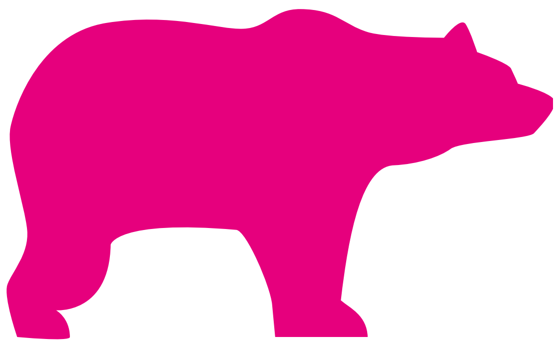
Were you correct?

Helpful hints: Encourage estimation skills based on the last measure, for example do you think you will weigh more or less than…, how much more/less, how close were you?

If the family has babies or younger children, the average will be lower, if the family is mostly older children or adults, the average will of course be higher. Talk about why this will be the outcome.







Family comments:

Child comments:

Curriculum Link

Calculate the mean as an average, solve problems using units of measure (mass) using decimal notation up to three decimal places.

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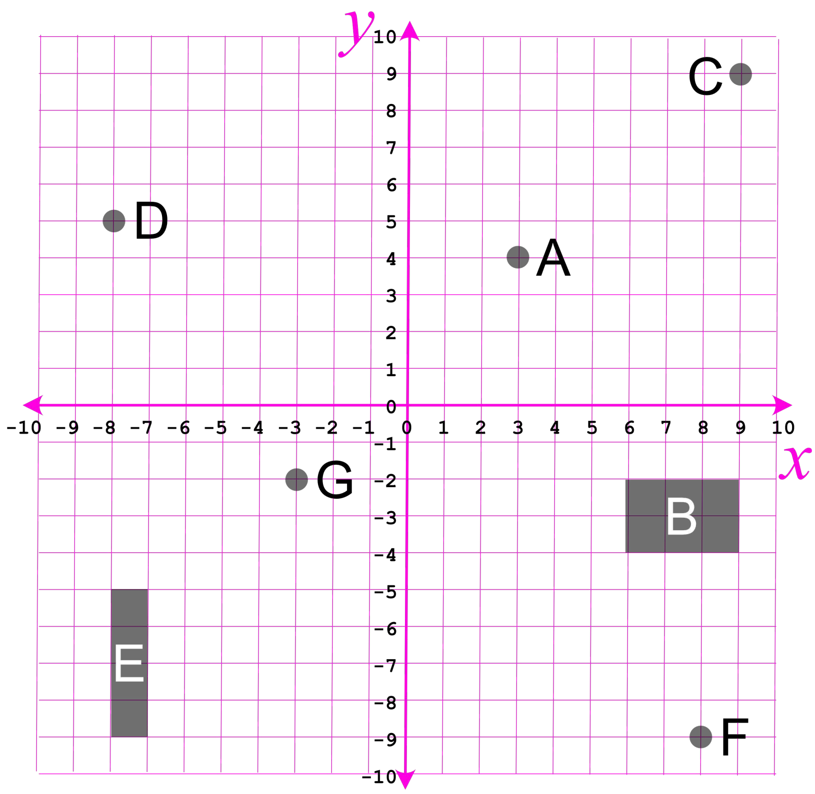
Treasure map

Family Maths Toolkit

Polly Pirate and Peter Pirate have found a treasure map but some of the co-ordinates have been muddled up. Can you help them by matching the co-ordinates to the pieces of treasure?

A	A bag of gold coins	(3, 4)
B	chest of bottles of rum	(6, -2), (9, -2), (9, -4), (6, -4).
C	a dagger	(8, -9)
D	diamonds	(-8, -5), (-7, -5), (-7, -9), (-8, -9).
E	a sword	(-3, -2)
F	a skull	(-8, 5)
G	a map to more treasure!	(9, 9)



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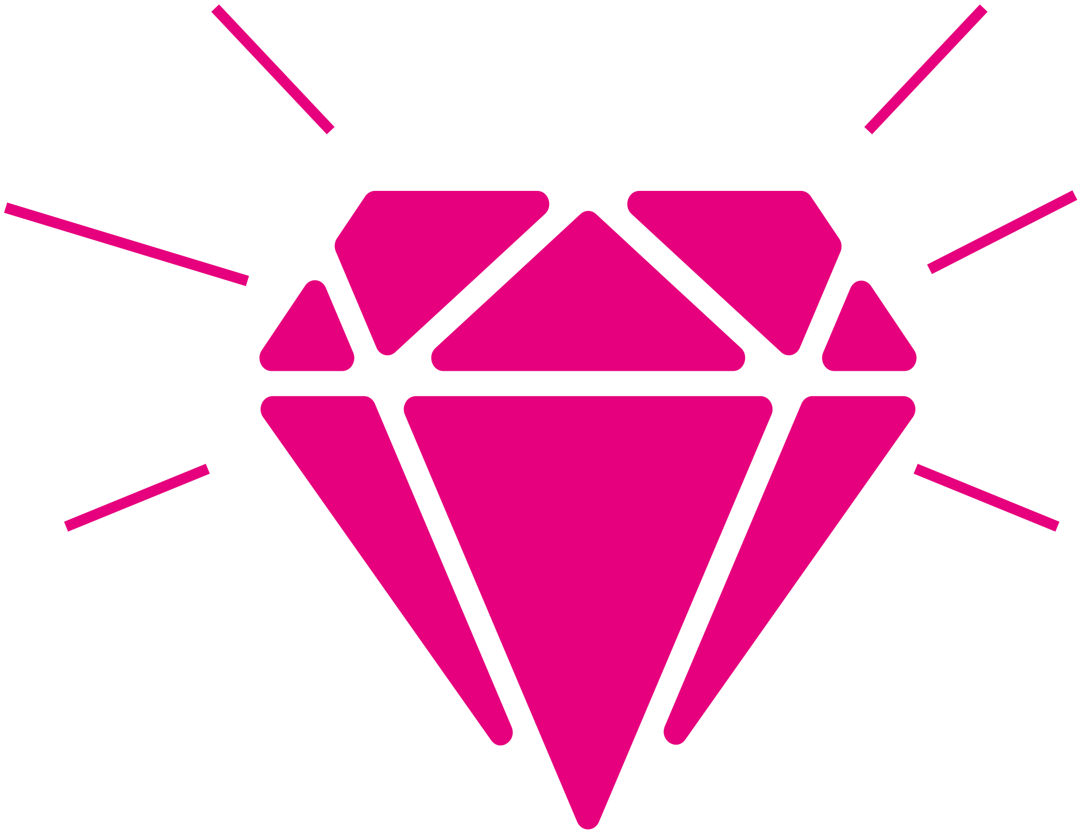
Now ask each of your family to imagine a piece of treasure they would be excited to find – they must give you the co-ordinates to put it on the map and add it to the list.



Family comments:

Child comments:

Curriculum Link

Describe positions on the full co-ordinate grid (all four quadrants).

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Going in circles

Family Maths Toolkit

Find a piece of string (or similar such as cotton or wool) and cut a length of 50 cm. Imagine it curled into a circle shape – what do you think would fit in it? Would a can of beans stand inside?

Now make the circle – were you surprised at the size?

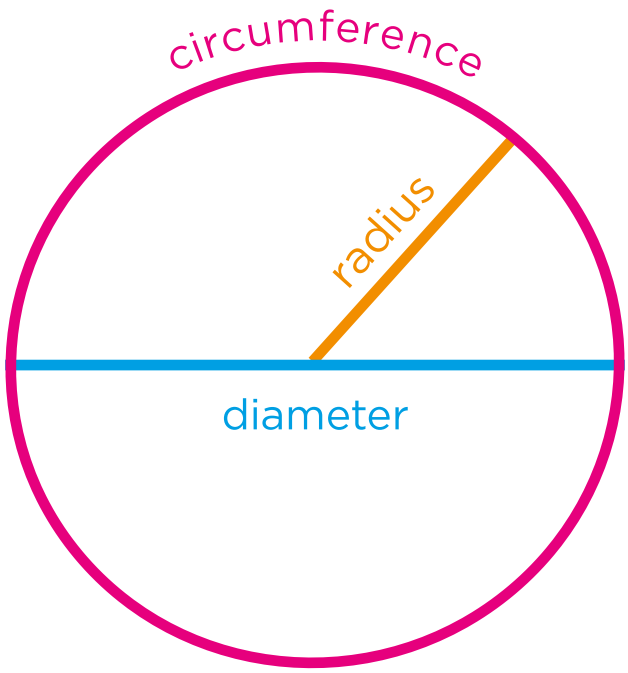
Can you find 3 things that have a diameter longer than your circle?

Can you find 3 things with a radius smaller than your circle?

Using your string, estimate the diameter of a car wheel. Draw it and label the diameter.

Can you use your string to find something with a radius the same or nearly the same length? Draw this and label the radius.

Helpful hints: The diameter is the measurement across the middle of the circle and the radius is half the diameter (from the centre to the edge of the circle).



Family comments:

Child comments:

Curriculum Link

Illustrate and name parts of circles, including radius, diameter and circumference.

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Shapes human treasure hunt

Family Maths Toolkit

	Find someone who can... (Record your answers)	Family member (can be more than one) sign
1	Name a shape with 5 sides... Can you find something this shape?	
2	Say how many sides and vertices these shapes have... Triangle – ______ sides and ______ vertices Square – ______ sides and ______ vertices Oval – ______ sides and ______ vertices Circle – _______ sides and ______ vertices Rectangle - ______ sides and ______ vertices	
3	What is the angle of a straight line?	
4	Make their 2 arms parallel and draw a pair of parallel lines.	
5	Draw perpendicular lines and show which edges of your table are perpendicular to each other.	
6	Say the missing angle in a triangle with other angles 75 and 45 degrees	
7	Say how many degrees in... - a half turn - a quarter turn	
8	Say how many sides a quadrilateral has and name 2 or more types of quadrilaterals.	
9		
10		

Can you add two more shape questions to ask?

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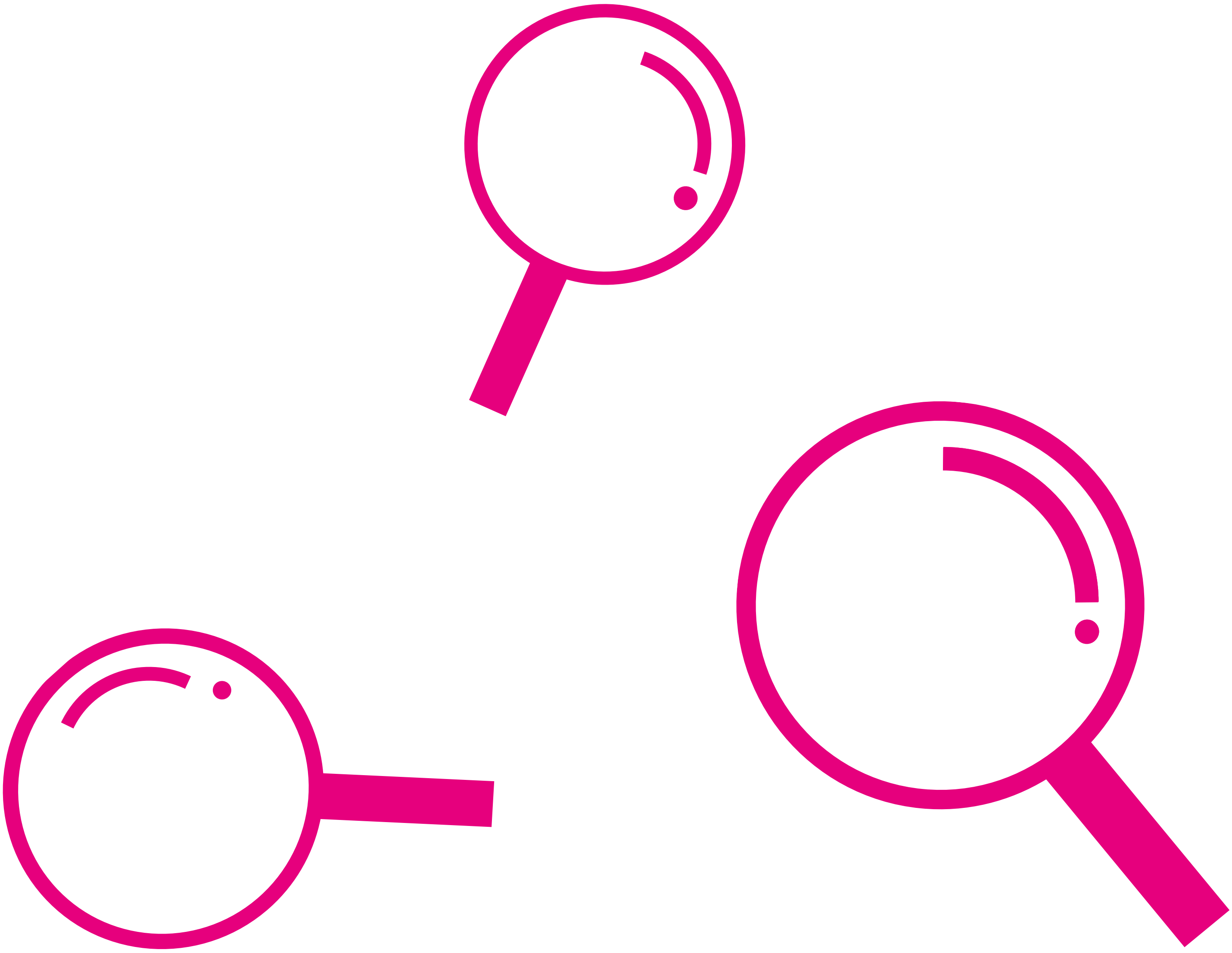
You need to check the answers! How many people can you find who know the same answers?

Helpful hints: Vertices are corners.



Family comments:

Child comments:

Curriculum Link

Compare and classify geometric shapes based on their properties and sizes, and find unknown angles in triangles, recognise angles on a straight line.

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Dream home
Part 1

Family Maths Toolkit

When an estate agent sells a home, the details of each room are usually given including the measurements. They also often state the total floor area of the home.

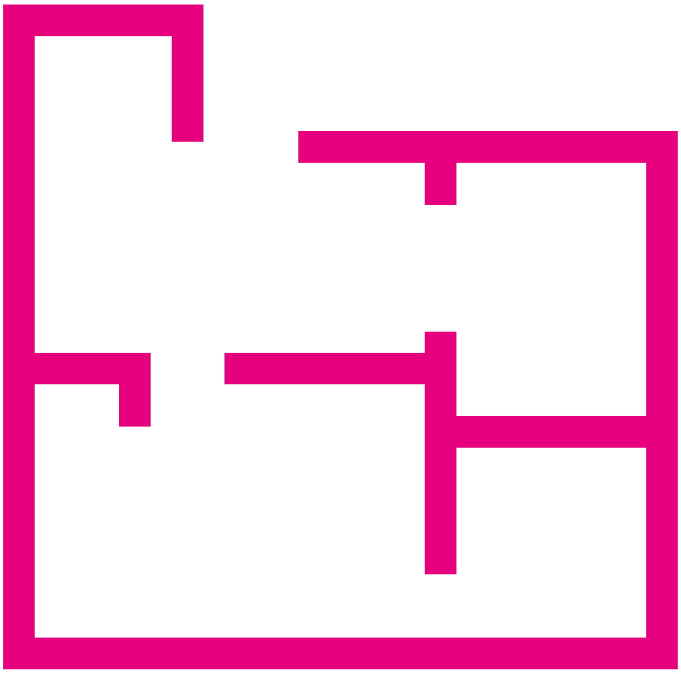
If you wanted to advertise your home for sale, what size would you say each room is and what is the total area?

Measure each room to calculate the area and add them all up to find the total area. Do not forget toilets and corridors.

Do all the rooms have right angles? If not, think about how you will work out the area.

Helpful hints: If you do not have measuring equipment, use an adult stride as roughly 1m and estimate. If rooms are irregular shapes, divide them into easy to manage shapes to calculate the area. Area of a rectangle = length x width; area of a triangle = base x height divided by 2.

Look at some examples online if possible of estate agents' floorplans of homes.



Family comments:

Child comments:

Curriculum Link

Calculate and compare the area of rectangles (including squares) and using standard units cm or m squared, estimate the area of irregular shapes.

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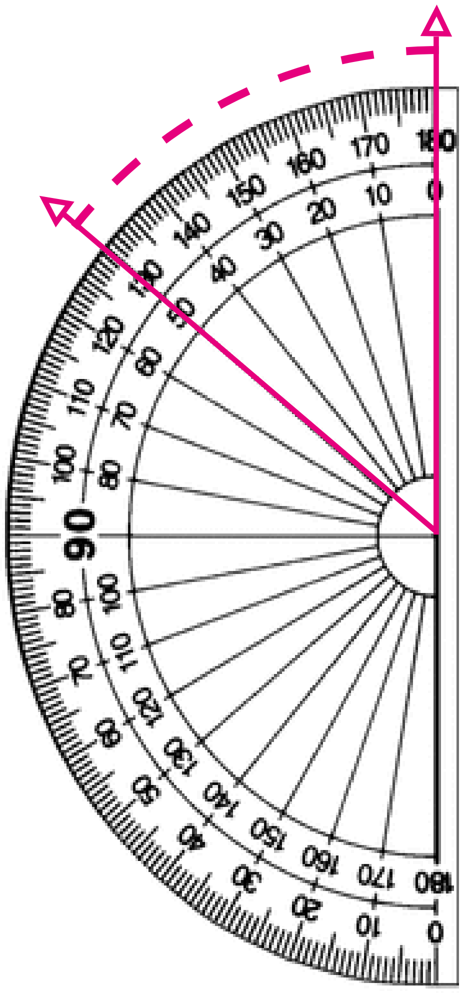
Dream home Part 2

Family Maths Toolkit

In the activity Dream home Part 1, you looked at your home and the area available in each room and in total.



Now think about what your dream home would be like. You can decide the total area and how many rooms there will be, what they are and how large they will be. Of course, they do not have to be rectangular in shape, with right angles; think about what interesting angles and shapes of rooms might fit into your home.

Can you draw your home's floorplan? (It does not need to be to scale but do label dimensions and angles.)

How many floors will you have? Remember to draw a separate plan for each floor.

Helpful hints: If you do not have measuring equipment, use an adult stride as roughly 1m and estimate. If rooms are irregular shapes, divide them into easy to manage shapes to calculate the area. Area of a rectangle = length x width; area of a triangle = base x height divided by 2.

Look at some examples online if possible of estate agents plans of houses.

Family comments:

Child comments:

Curriculum Link

Calculate and compare the area of rectangles (including squares) and using standard units cm or m squared, estimate the area of irregular shapes; draw 2D shapes using dimensions and angles; recognise where it is possible to use formula for area.

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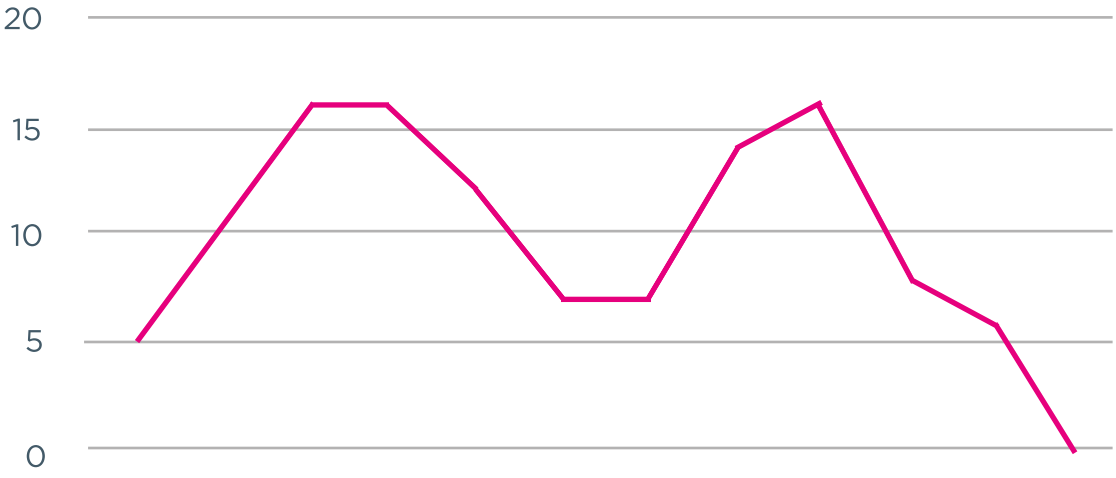
What is happening?

Family Maths Toolkit

Look at this line graph. What do you think it could represent?



Could you label the 'x' axis? What could the numbers 0-20 on the y axis represent?

Can you make up a story which this line graph would represent? You should fill in the information on the 'x' axis to match your story.

Family comments:

Child comments:

Curriculum Link

Interpret and construct line graphs and use these to solve problems.

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Y6 Autumn activity answers

Family Maths Toolkit

Multiplication pyramid puzzle

4 different ways of arranging digits to give each of the totals 96; 384; 864; 1536, 3456.

Balanced fruit equations

- Apple = 300 g
- 3 pears = 1 banana and 1 pear = 300 g
- 1 apple = 1 pear and 1 banana= 300 g
- 2 pears + 1 banana = 2 bananas =400 g, x = 1 banana
- 2 apples = 2 bananas + 1 pear + 1 pear = 600 g, x = 1 pear
- 3 bananas = 4 pears + 1 banana = 600 g, x = 1 banana
- $\frac{1}{2}$ apple = $\frac{1}{2}$ pear + 1 pear = 150 g, x = 1 pear
- 1 banana + $\frac{1}{2}$ banana = $\frac{1}{2}$ pear + $\frac{1}{2}$ apple + 1 pear = 300 g, x = 1 pear

How much?

- Burger = $6.67
- Pizza = 4.62 euros
- Strawberries = 3.43 euros
- Disney tickets = £299.24 for 5 days

A mile of baked beans

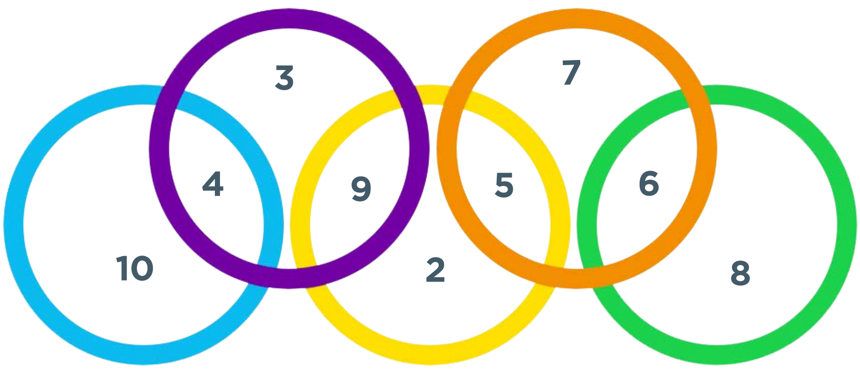
10,000 cans = 1 km so 1 mile = 10,000 cans x 1.6 = 16,000 cans

Exploding fireworks

£10 rocket down to £4 and £20 sparklers down to £17

Juggling rings

One solution is:



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Y6 Spring activity answers

Family Maths Toolkit

Wizard Olympics

- 30 swimming races; 12 broomstick races; 15 wizard duels; 60 running; 3 dragon fighting (2 are boys - unnecessary information)
- $\frac{1}{5}$ of total races are swimming after the cancellation; 48 boys are in the broomstick races

World's longest nails

- 35.2 mm in a year = 3.52 cm per year
- 5 nails would be a total of 17.6 cm
- 900 cm divided by 17.6 = approximately 51 years

Supermarket offers

- First deal of vitamins costs £3.60 buys 270 tablets. Second deal costs £1.40 and buys 90 tablets ; therefore to buy 270 tablets following this deal would cost £4.20; so the first offer is best.
- Soups BOGOF gives 2 tins for 59p; double 59p = £1.18 which is cheaper than £1.20 for 4 tins
- Biscuits £2.48 for 62 biscuits = 4p per biscuit
- Single pack of 20 for 82p = 4.1p each
- 3 for 2 packs of 10 biscuits = 4.5p each
- BOGOF 90p for 30 biscuits = 3p each

Therefore the best deal is the BOGOF

Baked potatoes

6 potatoes and 20 potatoes

Presents under the tree

There is more than one possible answer.
One possible answer is:
Cube = £15; sphere = £14;
prism = £11; cylinder = £7; cuboid = £20

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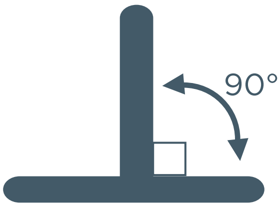
Y6 Summer Activity answers

Family Maths Toolkit

Shape human treasure hunt

1. Pentagon
2. Triangle 3 sides and 3 vertices; square 4 and 4; oval 1 side and no vertices; circle 1 side and no vertices; rectangle 4 and 4
3. 180 degrees
4. = pair of lines which will never meet
5. 

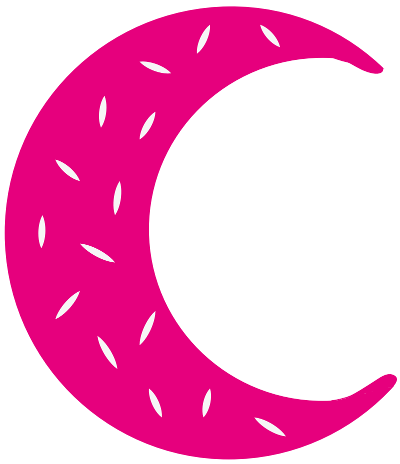
– ie. a line straight up at right angles
6. 60 degrees
7. 180 and 90 degrees
8. 4; quadrilaterals could be rectangle, square, parallelogram, rhombus, oblong, kite or trapezium

Eid biscuits

- Costs: butter £1; sugar 27.72 (28p); flour 16p; egg 0.208 (21p); vanilla 0.216 (22p) = total of £1.87
- For large family x 4 = £7.48
- With 30% added the cost is £9.72

Largest ever cake

10,531.84 kg flour; 8,673.28 kg sugar and butter; 15,4880 eggs; 92,928 spoons milk (based on: times by 30,976)



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