

The logo for 'INSPIRE MATHS' features the word 'INSPIRE' in a bold, dark blue, sans-serif font. A small, light blue spiral icon is positioned above the letter 'I'. Below 'INSPIRE', the word 'MATHS' is written in a lighter blue, sans-serif font.

# INSPIRE MATHS

## **Year 5 Home Activities**

## Teacher Guidance

The *Inspire Maths* Home Activities provide opportunities for children to explore maths further outside the classroom. The engaging Home Activities help you to involve parents and carers in their child's mathematical learning. To support this, you might want to hold a short *Inspire Maths* meeting to fully explain what is expected.

Each Home Activity contains a practical activity to be completed using the activity sheets provided, or using common household items. A list of key words and phrases is given to support parents with modelling mathematical language for their children, and the activities also offer advice on specific strategies or misconceptions that parents could look out for.

Home Activities are only developed for units where home support is appropriate, so there may not be activities for all units. For those units without activities, you can refer to Home Maths sections in the *Inspire Maths* Pupil Textbooks for ideas for how a parent may support their child.

## Parent/Carer Guidance

The *Inspire Maths* Home Activities give your child an opportunity to practise the maths that they have been doing at school, and give you an opportunity to support their learning.

Each Home Activity takes between ten and twenty minutes. The activities contain information on how the activity will help your child, important words and phrases that your child is learning, further opportunities to talk about your child's ideas, and particular strategies or issues to look out for. You are not expected to teach your child the mathematical concepts themselves.

You won't need any special equipment as most objects required for the activities can be found around the home. Some activities also include an activity sheet that contains illustrations or further questions to support your child's learning.

## 1 Doubling whole numbers

*This activity will give your child practice in doubling (multiplying by 2), in reading and writing very large numbers, and in estimating.*

### Important words and phrases:

- double
- twice as much

### You will need:

- Activity sheet 1
- packet of rice
- chessboard (optional)

### What to do:

- Read the story of the Emperor and the Advisor on Activity sheet 1. Ask: *“What reward would you ask for from a king or emperor? Do you think the advisor made a good choice? Why?”*
- Start to count out grains of rice onto a chessboard, following the advisor’s request. You can use a real chess or draughts board, or the start of the chessboard on the activity sheet. After three or four squares, ask: *“How much of the packet would we need to fill the whole board? Do you think this one will do, or will we need another one too?”* The first fact in the ‘Look out for’ section below may help your child to estimate the answer to this question.
- Let your child get to 5 or 6 squares. When things get difficult, discuss what’s happening. Say: *“There’s a lot of rice on each new square now! How many packets do you think we’d need for the whole board?”*
- Ask your child how many squares are on a full chessboard. They should multiply 8 by 8 to find there are 64. Suggest that your child writes in how many grains of rice are needed on each square of the board, instead of counting out grains of rice. Start with ‘1’ on the first square.
- After 24 squares, they will be dealing with numbers greater than 10 million. They can stop!

### Talk about:

- Discuss how it’s much easier to write down the numbers – even the very large ones – than it is to count out the grains of rice.
- Looking at the numbers on the chessboard, ask your child the following questions: *“By which square would it no longer be possible to pile all the grains of rice onto the square? By which square would all the rice in Britain have run out? By which square would all the rice in the world have run out?”* Some of the facts and figures given in the ‘Look out for’ section below may help your child to estimate the answers to these questions.

### Look out for:

- Here are some useful figures:
  - There are about 50 000 grains of rice in a kilogram.
  - There are about 65 million people in Britain.
  - The average person in Britain eats about 5 kilograms of rice per year.
  - The world produces about 476 million tonnes of rice per year. There are one thousand kilograms in 1 tonne.

## Activity sheet 1

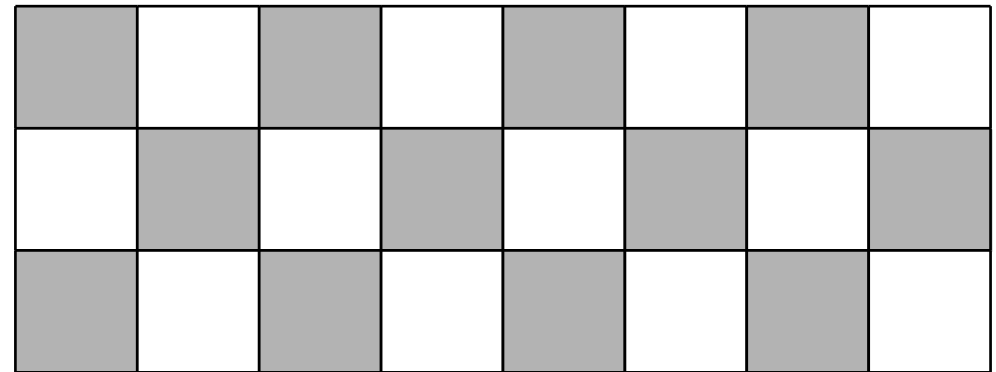
*This activity sheet is for use with Y5 Home Activity 1*

An emperor called an advisor to help him solve an important problem. The emperor was so grateful that he asked the advisor to name his own reward.

There was a chessboard between them, and the advisor said, "Look at the chessboard. I would like one grain of rice on the first square, two on the second, four on the third, eight on the fourth, and so on. Each new square must have twice as many grains as the last, until the board is full."

The emperor laughed. "Is that all? I would have given you your weight in gold!"

The advisor smiled. "When I leave today, I will be richer than you."



## 2 Order of operations with whole numbers

*This activity will help your child learn and apply the rules for the order of operations and use of brackets. It involves problem solving and mathematical strategy.*

### Important words and phrases:

- expression
- operation
- addition
- subtraction
- multiplication
- division
- order of operations

### You will need:

- Activity sheet 2, cut into cards
- two players
- calculator (optional)

### What to do:

- Each player takes one of each of the operation cards (add, subtract, multiply, divide and equals) from Activity sheet 2. Do not use the bracket cards to begin with.
- Each round, before the digit cards are given out, players take turns to decide whether to make the greatest possible number or the smallest possible number.
- Shuffle the digit cards and place them face down. Each player takes five digit cards.
- After the digit cards are given out, ask your child to look quickly at each player's cards and predict who will win. Discuss how easy it is to make this prediction.
- Using their five digit cards and five operation cards, each player makes an expression (a combination of numbers and operations, for example ' $123 + 45 =$ '). When both players are happy with the expression they have made, calculate the value of each expression.
- The winner of the round is the player whose expression has the greater value (if you were aiming to make the greatest possible number) or the smaller value (if you were aiming to make the smallest possible number).
- After you have played several rounds of the game, you can introduce the bracket cards, with each player taking one pair of brackets. Discuss with your child how using the brackets affects the calculations.

### Talk about:

- Your child has also been learning to use rounding and estimation to calculate with large numbers. Give them opportunities to practise this by asking questions such as: *"How many cars do you think there are in this car park? If three people arrived in each car, how many people came by car? How many fingers do all those people have? How many fingers and toes?"*

### Look out for:

- The order of operations gives a standard order that operations (add, subtract, multiply, divide) should be carried out in a calculation to get the right answer.

- Some calculators know about the order of operations, and some don't. Your child has learned the following rules for the order of operations:
  - Step 1: work out the value of expressions in brackets (using the rules below).
  - Step 2: do all the division then multiplication operations.
  - Step 3: do all the addition then subtraction operations.
- Brackets round a part of an expression tell you which part of the expression to work out first. For example, in the expression  $3 + 7 \times 2$ , a simple calculator would read from left to right and work out  $3 + 7 = 10$ ,  $10 \times 2 = 20$ , and so give the answer of 20. If brackets are included in the calculation, for example  $3 + (7 \times 2)$ , the calculator would work out the bracket calculation first,  $7 \times 2 = 14$ , and then the addition calculation,  $14 + 3 = 17$ .

**Activity sheet 2**

*This activity sheet is for use with Y5 Home Activity 2*

<b>1</b>	<b>2</b>
<b>3</b>	<b>4</b>
<b>5</b>	<b>6</b>
<b>7</b>	<b>8</b>
<b>9</b>	<b>0</b>

$+$	$+$
$-$	$-$
$\div$	$\div$
$\times$	$\times$
$($	$($
$)$	$)$
$=$	$=$



## 3 Working with fractions

*This activity will give your child practice in working with fractions and decimals, and applying what they know to practical problem solving.*

### Important words and phrases:

- length
- width

### You will need:

- Activity sheet 3
- squared paper
- pen or pencil

### What to do:

- The plans on Activity sheet 3 show how to make a simple set of shelves using fractions of uniform planks of wood. The diagram is not to scale. Talk about how the shelves are put together.
- Ask: *“How much wood would you need to build the shelves?”*
- Discuss how to answer this question. Agree that you are deciding what length of wood is needed. Explain that the planks of wood you will use are 20cm wide by 1.2m long. Ask: *“How many planks of wood will you need?”*
- Encourage your child to draw the planks of wood on squared paper. Discuss the fact that each length needs to be cut as a fraction of a single plank (you can't use two pieces of wood to make one length). Ask: *“Can you do this with the number of planks you've chosen?”*
- Ask your child to draw in the cut lines on the planks of wood, aiming to minimise waste.
- You can extend the task by talking about the fact that a few millimetres are always wasted when the wood is cut. Ask: *“Does this affect the cut lines you should plan?”*

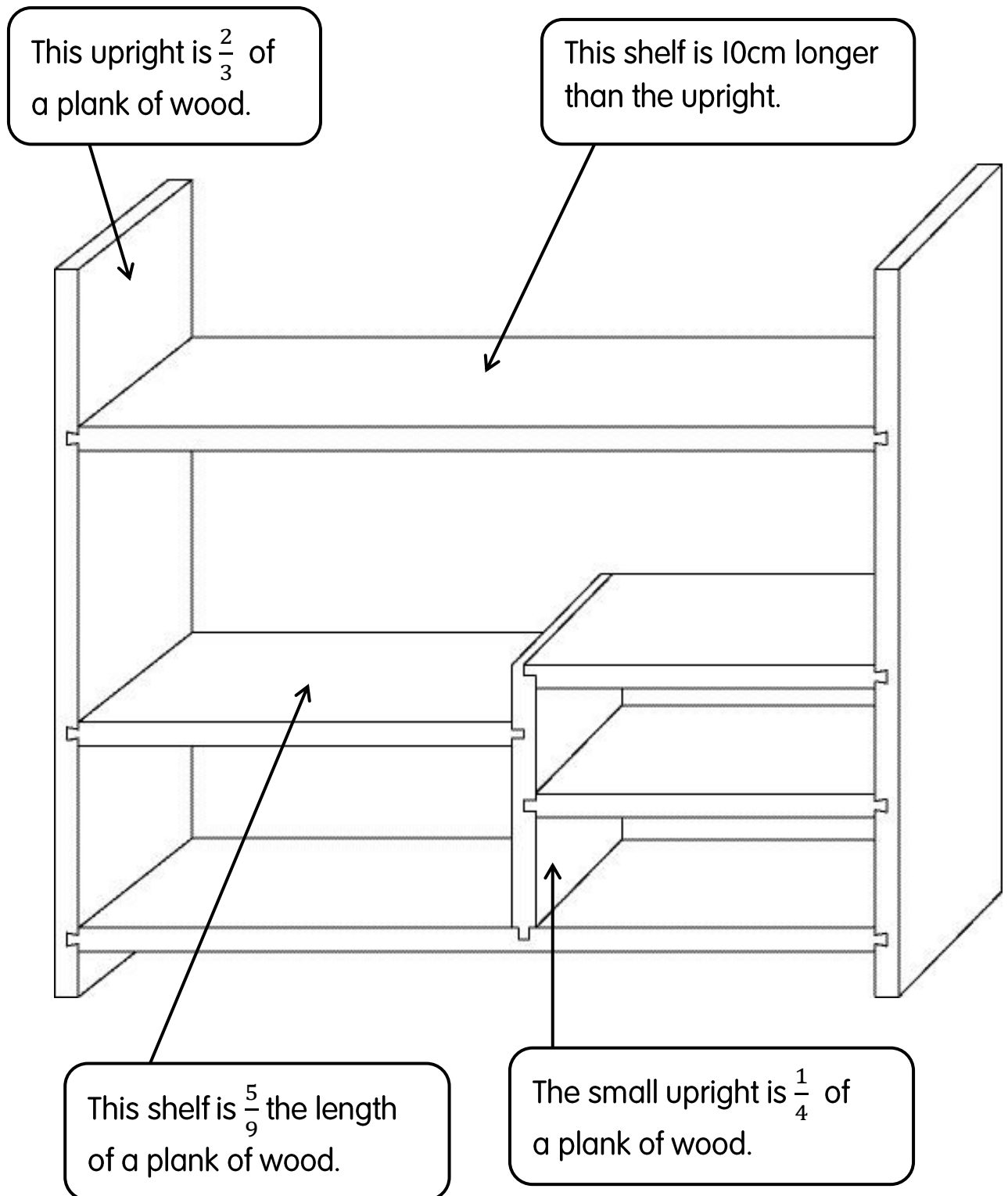
### Talk about:

Talk about finding fractions in real-life contexts. Explain that it is not enough just to do the maths – we need to think about the real-life problem we are solving. For example:

- *“Mrs Timms needs to buy apples for 17 children. Each bag contains 6 apples. How many bags of apples does she need to buy? Will she need 3 packs or 2 packs?”*
- *“A group of 25 children are going on a school camping trip. Each tent holds 6 children. How many tents are needed?”*

**Activity sheet 3**

*This activity sheet is for use with Y5 Home Activity 3*



A plank of wood is 1.2m long, 20cm wide and 50mm thick.

## 4 Fraction multiplication

*This activity will give your child practice in multiplying fractions and finding fractions of whole numbers.*

### Important words and phrases:

- multiply
- divide
- fraction
- numerator
- denominator

### You will need:

- three players
- Activity sheet 4, cut into three fraction function cards
- glue or sticky tape (optional)
- up to 48 counters, coins or pasta shapes

### What to do:

- Cut out the three fraction cards from Activity sheet 4 along the dotted lines. The two cards on the activity sheet that show thirds and quarters should be folded along the solid grey fold line. If you can, stick each card together to make it double-sided. Place 24 counters in the middle of the table.
- Each person takes a card, and places it face-up on the table. If the card is double-sided, they choose which way up to place it. If there are only two of you, decide who will stand in for the third player.
- The first player looks at their card, and takes that fraction of the counters. For example, if they have the ' $\times \frac{1}{3}$ ' card, they take 8 counters, because 8 the starting number of counters (24) multiplied by one third. They put these in front of them.
- The player to the right of the first player takes their fraction of counters from the first player. For example, if the second player has the ' $\times \frac{1}{2}$ ' card, they take 4 of the first player's 8 counters.
- The player to the right of the second player takes their fraction of counters from the second player. For example, if they have the ' $\times \frac{3}{4}$ ' card, they take 3 of the second player's 4 counters.
- Start again with 36 or 48 counters. Everyone keeps the same card, but now the counters move from right to left. Ask: "How many counters do you think the player on the left will finish with?" Try other rules for moving the counters, still using the same fractions.
- After a few goes, you can change the fractions that are being used by turning over the double-sided cards.
- You could ask your child some more questions, such as: "How can the first player work out how many counters they will have left after the second player has taken their share? How can the second player work out how many counters they will have left after the third player has taken their share?"

## Talk about:

Give your child practice in multiplying fractions in practical situations. For example:

- “If five people share a cake, how much cake does each person get?” ( $\frac{1}{5}$ )
- “What if they share  $\frac{1}{2}$  a cake?” ( $\frac{1}{10}$ ) “What if they share  $\frac{1}{3}$  of a cake?” ( $\frac{1}{15}$ )

**Activity sheet 4**

*This activity sheet is for use with Y5 Home Activity 4*

$$\times \frac{2}{3}$$

$$\times \frac{3}{4}$$

$$\times \frac{1}{2}$$

$$\times \frac{1}{3}$$

$$\times \frac{1}{4}$$

## 5 Area of a triangle

This activity will give your child practice in using and applying the formula they have learned in class for finding the area of triangles.

### Important words and phrases:

- area
- square centimetres (cm<sup>2</sup>)
- base
- height
- kite
- rhombus
- diagonal

### You will need:

- Activity sheet 5
- squared paper
- pen or pencil
- ruler

### What to do:

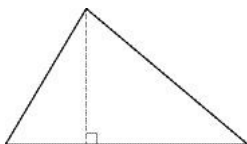
- Ask your child to use the formula for finding the area of a triangle to find the area of each shape on Activity sheet 5.
- On squared paper, ask your child to draw these shapes:
  - a triangle with an area of 4cm<sup>2</sup> and a base of 2cm
  - two different triangles with an area of 6cm<sup>2</sup>
  - a rhombus with an area of 18cm<sup>2</sup> and one diagonal of 6cm.
- As an extra challenge, set your child this problem: *“Draw three different kites with diagonals of 5cm and 3cm. Work out the area of each kite. Can you draw a kite with these diagonals, but a different area?”* (No.)

### Talk about:

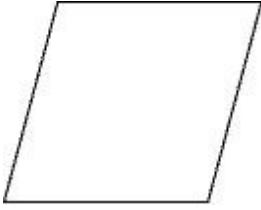
- Use everyday opportunities to ask your child to estimate the area of triangles. For example, you could try the triangular wall under the roof of a house or shed. Once you have reached an estimate (by using the base and the height), check it by estimating the area in a different way. You could measure the area of a brick in the wall, and then count the bricks and half-bricks visible in the triangular area. It might help to take a photograph of the wall.

### Look out for:

- The area of a triangle is  $\frac{1}{2} \times \text{base} \times \text{height}$ . Any of the triangle's sides can be chosen as the base. The height is always perpendicular to (at a right angle to) the base. For example, if the base is the line along the bottom of this triangle, the height is the grey dotted line.

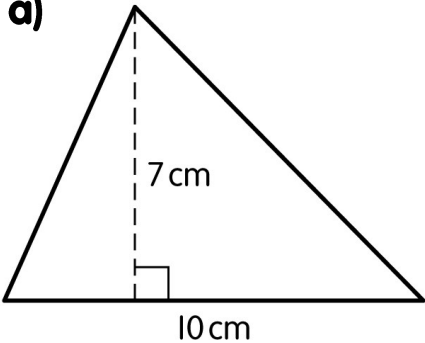
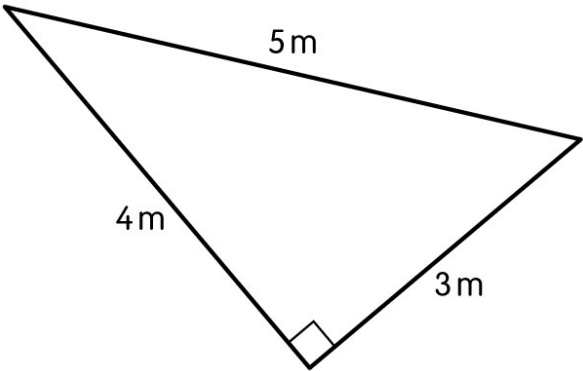
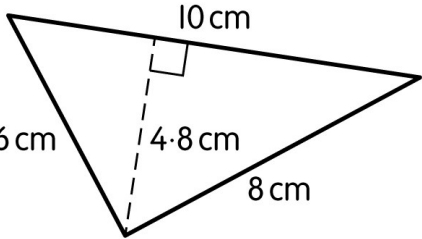
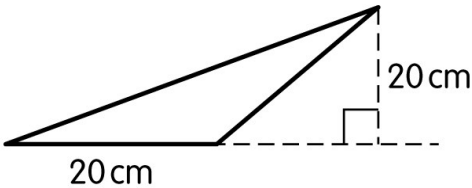
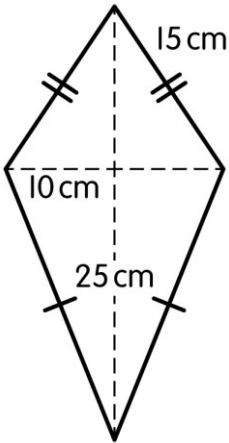
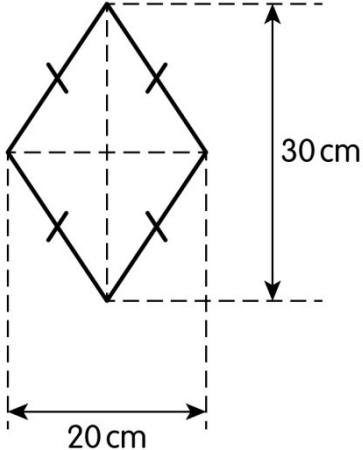


- A rhombus has four sides of equal length. Opposite sides are parallel and opposite angles are equal. For example:



**Activity sheet 5**

*This activity sheet is for use with Y5 Home Activity 5*

<p><b>a)</b></p> 	<p><b>b)</b></p> 
<p><b>c)</b></p> 	<p><b>d)</b></p> 
<p><b>e)</b></p> 	<p><b>f)</b></p> 



## 6 Paint pot ratios

*This activity will give your child practice in using ratios in the context of solving a real-life problem that also includes calculating areas of rectangles.*

### Important words and phrases:

- ratio
- litre
- area
- width
- height

### You will need:

- Activity sheet 6
- squared paper
- blue and yellow coloured pencils

### What to do:

- Ask your child to use the blue and yellow pencils to show the mixed colours. Give your child the following instructions: *“In one square of the squared paper, draw a straight blue line all the way across the top of the square. Underneath, draw a yellow line, then a blue line, and so on until the square is full. Finish with a yellow line.”*
- You may need to squint at the square, but it should look green! Ask your child about what they have drawn. Say: *“How many lines are blue, and how many lines are yellow? What is the ratio of blue to yellow?”* (1:1) *“What would happen if the ratio was 2:1? Try that in another square.”*
- Discuss paint mixing. To change the shade of paint, different ratios of coloured paints are used.
- Look together at Activity sheet 6, focusing on the paint colours and the colour scheme for the ground floor of a house.
- Ask: *“How many litres of paint of each colour do you need to mix enough paint for every room?”* Your child will need to start by working out the area of all four walls in each room, ensuring that they count the windows and doors, which should not be painted.
- When your child has worked out how many litres of each colour of paint are needed, discuss the assumptions you have made and talk about what effect these have on the answer.

### Talk about:

- Discuss ratios in cooking. Recipes normally give the measurements of ingredients to use, but what if you want to make twice as much or half as much? Ask, for example: *“If a recipe needs 200g of flour and 50g of sugar, how much of each ingredient do you need to make twice as much? What’s the ratio of flour to sugar?”*

### Look out for:

- The ratio 2:1 is read as ‘2 to 1’.

## Activity sheet 6

This activity sheet is for use with Y5 Home Activity 6

Paint mixing instructions		
Paint colour	Colours needed	Ratio
Meadow Green	blue, yellow	5:4
Cornflower Blue	blue, white	10:1
Sunset Yellow	yellow, red	7:1
Whisper White	white, black	8:1

**Living room:** Meadow Green

**Bathroom:** Sunset Yellow

**Corridor:** Whisper White

**Kitchen:** Cornflower Blue

1 litre of paint covers  $10\text{m}^2$ .

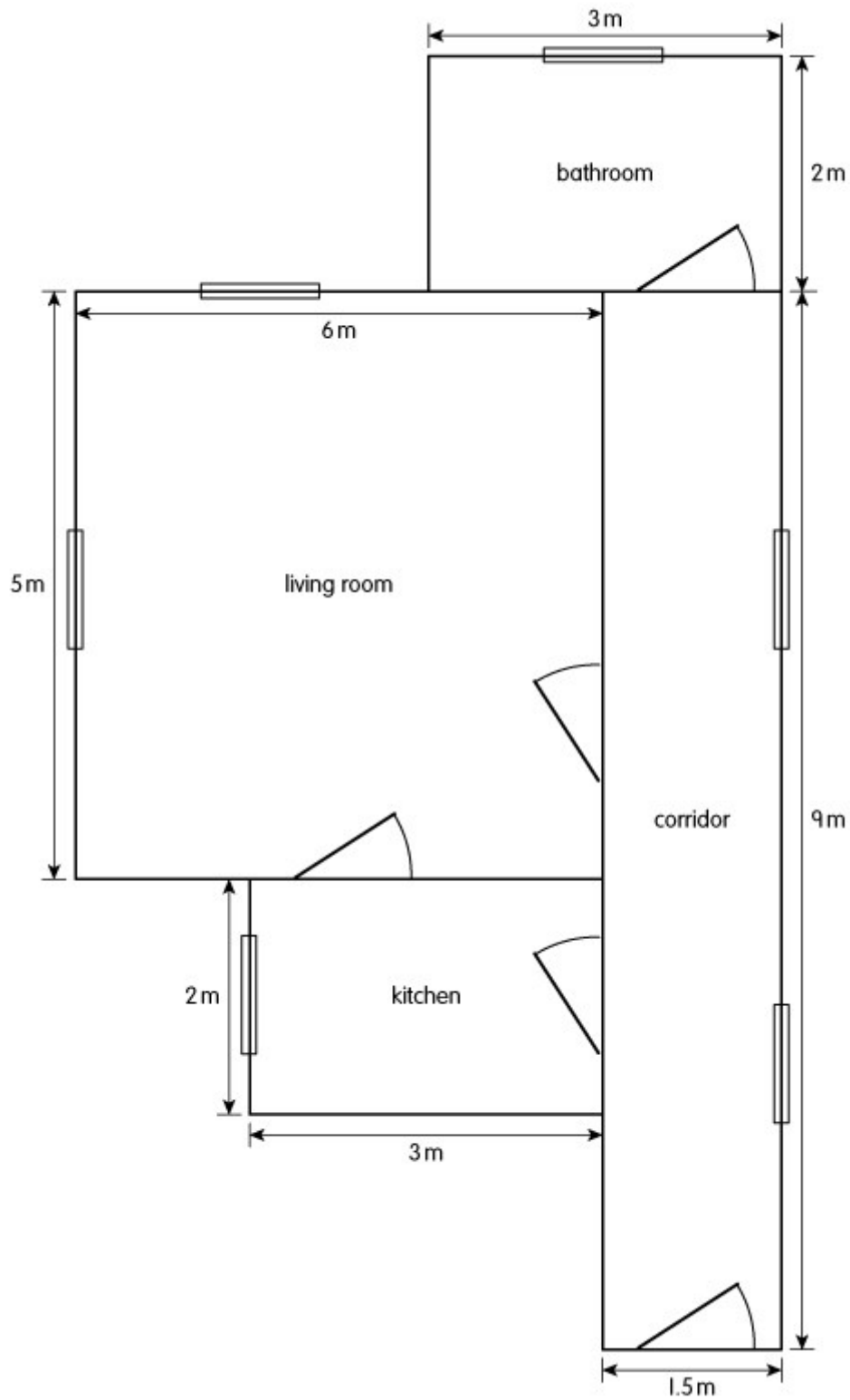
All rooms are 2m high.



Doors are 1m wide and 2m high.



Windows are 1m wide and 1m high.



## 7 Decimal prices

*This activity will help your child practise multiplying and dividing decimals. This is done in the context of solving a multi-step problem.*

### Important words and phrases:

- bulk discount
- decimals
- divide
- multiply

### You will need:

- Activity sheet 7

### What to do:

- Activity sheet 7 shows a catalogue page. Talk to your child about how the ‘bulk discount’ works. Companies often sell things cheaper if you are prepared to buy several at once.
- Activity sheet 7 also shows a shopping list for someone who is building a shed. Ask: *“What is the cheapest way of buying the materials for the shed? How much will all the materials cost to build the shed?”* This may mean buying more items than they need to benefit from the bulk offers.
- Ask your child to compare the prices for single items and multiple items in the catalogue and fill in the appropriate ‘Quantity’ boxes for each item.

### Talk about:

- Discuss why companies might offer bulk discounts. Look for everyday examples of bulk discounts, for example multipacks of crisps, yoghurts or soft drinks. When you see these, ask your child to compare the price of one item from the multipack to buying the single product on its own.

## Activity sheet 7

This activity sheet is for use with Y5 Home Activity 7

### Long nails

1		10		100	
7p	Quantity:	60p	Quantity:	£5.00	Quantity:

### Short nails

1		10		100	
6p	Quantity:	50p	Quantity:	£4.00	Quantity:

### Screws

1		10		100	
6p	Quantity:	50p	Quantity:	£4.00	Quantity:

### Wood glue (325ml per bottle)

1		10		100	
£3.99	Quantity:	£37	Quantity:	£280	Quantity:

### Wooden slats (120cm by 25cm)

1		10		100	
£4.50	Quantity:	£40	Quantity:	£300	Quantity:

**Shopping list for shed:**

108 wooden slats

720 short nails

480 long nails

32 screws

3 litres of wood glue

## 8 Converting and measuring

*This activity will give your child practice in converting between units of mass (kilograms and grams) and between units of volume (litres and millilitres). It also gives practice in estimating and measuring amounts, and applying this knowledge to real-life situations.*

### Important words and phrases:

- volume
- millilitre, litre
- mass
- gram, kilogram
- informal language of measure, e.g. scoop, drop, spoonful

### You will need:

- household products in their packaging (e.g. shampoo, toothpaste, squash)
- kitchen scales (optional)
- measuring jug (optional)

### What to do:

- Collect the household products together and lay them out on a table or on the floor.
- Talk about what each product is used for, and about how much is normally used. For example, a pea-sized amount of toothpaste is normally used.
- Ask your child to estimate or measure how much of each product this normal amount is, and write it down. For most products, they will use grams or millilitres.
- Ask your child to work out how many normal amounts are in each product's packaging when it is full. You can then ask them to estimate how much of each product is left.

### Talk about:

- When you are shopping, look at product packaging with your child and ask, for example:
  - *"How many meals will this make?"*
  - *"How long will this packet of salt last?"*
  - *"How much bigger is this pack? How much more expensive is it? Which one should we buy?"*
- Many packages include 'standard serving' information. Talk about these with your child. Discuss whether the standard serving is realistic, by comparing how quickly you use the product to what the standard serving suggests.
- You could also look at different ways that the same product is packaged, for example cola in cans, bottles and multipacks. Ask your child to write down the price and volume of each package, and work out which package gives the best value for money.

### Look out for:

- The volume of some products may be given in centilitres (cl). There are 100 centilitres in 1 litre. 1 centilitre is equivalent to 10 millilitres.
- Note that some products are measured in grams even though they are liquid (for example table sauces such as tomato ketchup) and some products are measured in litres even though they are solid (for example ice cream).

## 9 Mean temperature

*This activity will give your child practice in calculating the mean (average) of a set of data in a real-life context.*

### Important words and phrases:

- mean
- average
- sum total
- altogether
- divide
- maximum temperature, minimum temperature
- degrees Celsius

### You will need:

- forecast or recorded temperatures for where you live (or somewhere else that interests your child)

### What to do:

- Look at the forecast or recorded temperatures for your nearest town over a week with your child. Note the maximum and minimum temperatures for each day. You could either use a thermometer to measure the temperature each day for a week, or use weather forecasts on the television, the internet or a weather app.
- Ask your child to calculate the mean maximum temperature and the mean minimum temperature for the week.
- Establish on how many days the minimum temperature was either below or above the mean minimum, and on how many days the maximum temperature was either below or above the mean maximum.
- Discuss why it might be useful to know the mean temperature. Ask: *“Does knowing the mean temperature help you to know what clothes to wear? What other information is useful?”*
- Ask: *“What can you say about the days when the maximum or minimum temperature was very different from the mean?”*

### Talk about:

- You could talk about what mean temperatures tell you about climate, particularly over longer periods. On the internet, you could look at temperature charts for a year, which tell you about the climate. Use a search engine to look for cities and countries that interest your child.
- If you drive a car, you could talk about how many miles you can drive for each litre of fuel. *“How can you calculate it?”* You can help your child work this out by collecting fuel receipts, and recording from the car’s milometer the distance travelled between each time you refuel.
- You could also work out the mean time that it takes to complete a regular journey, for example the journey to school. You could see the impact that the time of day has on the journey, for example whether it is completed in rush hour or later in the evening.



## Look out for:

- To calculate the mean, divide the sum of the values by the number of values. For example, to find the mean of 12°C, 18°C, 13°C, 11°C and 16°C, add the values to find the sum (70) and then divide this by the number of values (5).  $70 \div 5 = 14$ . The mean is 14°C.
- There are a number of different types of average, where one number is used to represent a whole group of data. The mean is the most commonly-used average, so often people will use the word 'average' when they are referring to the 'mean'.

## 10 Percentage discounts

*This activity will give your child practice in calculating percentages, converting between fractions, decimals and percentages, and applying these concepts in a practical context.*

### Important words and phrases:

- per cent, %, percentage
- discount
- offer
- saving

### You will need:

- Activity sheet 8

### What to do:

- Talk about how much some common groceries cost. Ask, for example: *“Do you know how much a loaf of bread costs? What about a pint of milk? Sometimes it costs a bit more than that, and sometimes a bit less. How can we save money?”*
- Look at the offers on Activity sheet 8. Talk about what they are for. One answer is that they are to help people save money, and another is that they are to persuade people to buy a particular product, or to shop in a particular place.
- For a few of the offers, suggest some starting prices. For example, say: *“Washing powder normally costs £7.00. How much does it cost if we get 30% off?”*
- Challenge your child to order the offers from the greatest discount to the smallest discount. Your child may try various strategies to compare the offers. Bear in mind that some offers give you more of the product for the same price, and others give the same amount of the product for less money.
- Encourage your child to use their knowledge of percentages, decimals, fractions and ratio to compare the offers. It is fine if they use different strategies to compare different offers. In particular, they might want to use some example prices to compare the offers (such as £10), or they may compare them without using a price.

The order of the offers from greatest to smallest is: Buy 1 get 2 free (equivalent to 66.67% off); Buy one get one free (equivalent to 50% off); 3 for the price of two (equivalent to 33.33% off); 30% off; 25% off and  $\frac{1}{4}$  off (these are equivalent);  $\frac{1}{10}$  off (equivalent to 10% off); 5% off.

### Talk about:

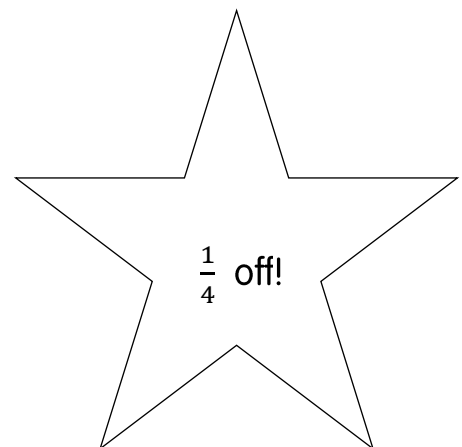
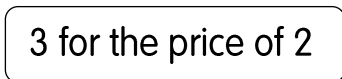
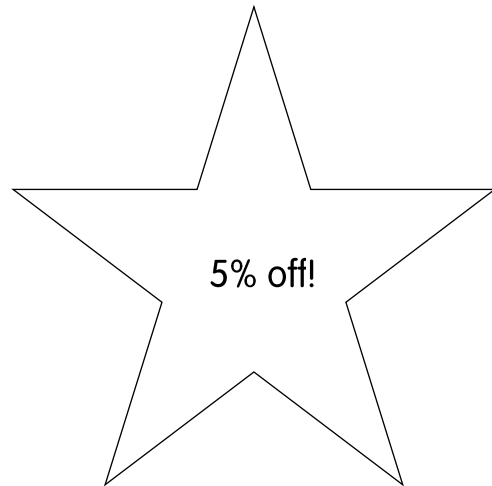
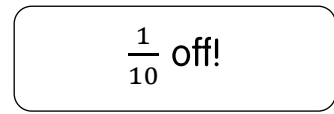
- The value of an offer may not be the only reason to buy a product. When you see offers, discuss other issues; for example: *“Do we really need that much? Will we have to throw some away? Are those ones as tasty as the ones we normally buy?”*
- You could ask your child questions related to discounts and value based on prices that you see around you. For example, say: *“Two holidays normally cost £320 each, but they are both on special offer. One has a 40% discount, the other has £100 off. Which holiday will be cheaper?”* (the holiday with a 40% discount).

## Look out for:

- When finding percentages of a number, you can quickly calculate 10% of the number by dividing the total by 10. You can then double this 10% value to find 20% of the total, multiply by 3 to find 30% and so on.

**Activity sheet 8**

*This activity sheet is for use with Y5 Home Activity 10*



## 12 Shape properties flow chart

*This activity will help your child revise the properties of triangles and 4-sided shapes.*

### Important words and phrases:

- triangle, equilateral, isosceles, scalene, right-angled
- 4-sided shapes, square, rectangle, rhombus, trapezium, parallelogram
- parallel
- side

### You will need:

- Activity sheet 9, printed onto an A3 sheet if possible

### What to do:

- Look at Activity sheet 9 and talk about the shapes in the box. Ask your child to identify each shape, paying particular attention to the right angles.
- Look at the flow chart on the activity sheet. Explain that it can be used to sort triangles and 4-sided shapes.
- Ask your child to complete the flow chart by drawing a shape from the box in each of the ten final boxes of the flow chart. They can do this by choosing the shapes one-by-one, and following through the flow chart, asking the questions for the shape.

### Talk about:

- Look at the flow chart, and talk about shapes that can be given more than one name. For example, one of the triangles is both a right-angled triangle and an isosceles triangle.
- Ask: “*Are there any right-angled equilateral triangles? Why?/Why not? Are all parallelograms squares? Are all squares rhombuses?*”
- The organisation of the flow chart can help to explain the answers to these questions.

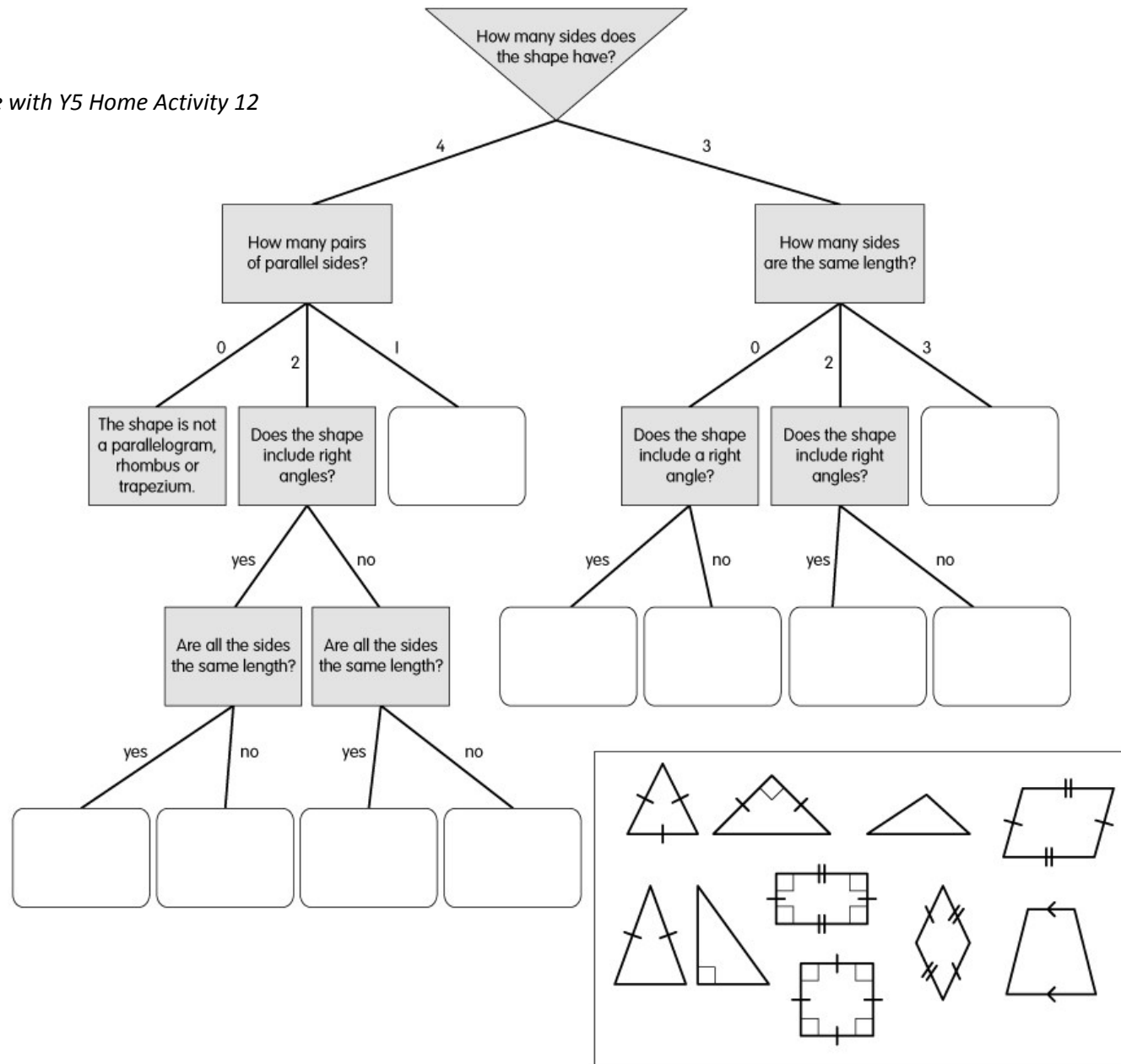
### Look out for:

These are the key properties of triangles and 4-sided shapes that your child will need to work with when completing the flow chart.

- Triangles:
  - An *equilateral triangle* has three equal sides and three equal angles, each measuring  $60^\circ$ .
  - An *isosceles triangle* has two equal sides.
  - The sides of a *scalene triangle* are all different lengths.
  - A *right-angled triangle* has one angle that is a right angle.
- 4-sided shapes:
  - A *parallelogram* is a four-sided shape with two pairs of parallel sides.
  - A *rhombus* is a four-sided shape with two pairs of parallel sides and four sides of equal length.
  - A *trapezium* is a four-sided shape with one pair of parallel sides.

# Activity sheet 9

This activity sheet is for use with Y5 Home Activity 12



## 13 Geometrical instructions

*This activity will give your child practice in drawing triangles and 4-sided shapes, as well as calculating the areas of rectangles and triangles.*

### Important words and phrases:

- horizontal
- rectangle
- triangle
- trapezium
- square
- area
- centimetre
- square centimetre
- length
- width
- base

### You will need:

- Activity sheet 10
- plain paper
- pencil
- ruler
- protractor

### What to do:

- Activity sheet 10 gives two sets of instructions. Tell your child to follow the instructions, using a new piece of plain paper for each drawing. Following the instructions correctly should create a simple picture for each set of instructions.
- Ask your child to draw a picture using parallelograms, trapeziums and triangles. Can they write instructions for drawing this picture for someone else to follow?

### Talk about:

- Look at buildings and vehicles. Discuss the fact that they are often made from geometric shapes. It is often easier to describe and design shapes that can be described mathematically.
- Ask your child to estimate lengths and angles, so that they can draw accurate pictures of buildings or vehicles made using geometric shapes.

### Look out for:

- Following the instructions on the activity sheet should result in the following pictures:
  - 1) A rocket
  - 2) A house
- To find the area of a rectangle, multiply the width by the length. The area of a triangle is  $\frac{1}{2} \times \text{base} \times \text{height}$ . Any of the triangle's sides can be chosen as the base. The height is always perpendicular to (at a right angle to) the base.

## Activity sheet 10

*This activity sheet is for use with Y5 Home Activity 13*

### Picture 1

1. Take a sheet of plain paper and draw a horizontal line 12cm long near the bottom of the sheet.
2. Use the first 3cm of the horizontal line as the base of a right-angled triangle. The triangle has a right angle on its right-hand side, and it is 5cm high.
3. Use the last 3cm of the horizontal line as the base of another right-angled triangle. It is also 5cm high. This triangle's right angle is on its left-hand side (it is a reflection of the first one you drew).
4. Draw a rectangle. One of the sides of the rectangle is the horizontal line between the two triangles. Your rectangle should have an area of  $30\text{cm}^2$ .
5. Use the top side of the rectangle as the base of an isosceles triangle. The isosceles triangle should have an area of  $18\text{cm}^2$ .
6. What is your drawing a picture of?



**Picture 2**

1. Take a new sheet of plain paper and draw a horizontal line 10cm long near the bottom of the sheet.
2. Use this line as the base of a rectangle with an area of  $70\text{cm}^2$ .
3. Use the top of the rectangle as the base of a symmetrical trapezium with a height of 4cm. Two of the angles in the trapezium are  $45^\circ$ .
4. Draw a rectangle with a height of 5cm and a width of 3cm. The base of the rectangle should be somewhere along the horizontal line you drew in Step 1.
5. Draw two squares with an area of  $4\text{cm}^2$ . Draw them both inside the larger rectangle. They shouldn't touch or cross any other lines.
6. What is your drawing a picture of?

## 14 Volume

*This activity reinforces the concept of volume and introduces the idea of using displacement to measure volume.*

### Important words and phrases:

- volume
- cubic centimetres,  $\text{cm}^3$

### You will need:

- water
- large ice cream tub or similar waterproof container
- permanent marker
- deep, narrow beaker or similar waterproof container
- several fairly small objects that can be safely submerged in water (and which will sink).  
For example: pieces of metal jewellery; small cups, glasses or saucers; cutlery; scissors; metal nuts, bolts, screws or nails

### What to do:

- Compare the volumes of the different objects by looking at them. It will be clear that some objects have a greater volume than others. Other objects might be much closer in volume. Your child could try estimating the volume of some of the objects in cubic centimetres ( $\text{cm}^3$ ).
- Pour water into the ice cream tub until it is about three quarters full. Using a permanent marker, make a mark inside the tub to show the water level.
- Ask your child to put the larger objects in the water one at a time, marking the new water level each time.
- Ask: *“What do you notice? Can you tell anything about the volume of the different objects? What about trying with some of the smaller objects?”*
- Your child should find that the smaller objects don’t create a noticeable change in the water level. Suggest trying again using the narrower container. Ask: *“Is this any better? Why do you think that is?”*

### Talk about:

- Your child should be able to draw some informal conclusions about how the water level in a container changes when objects are put into the water. Encourage them to think about why the differences in volume are more obvious when the container is narrower (and the surface area of the water is smaller).
- This activity uses the idea of displacement to investigate volume. In displacement, when a solid is placed in a liquid, it moves the liquid and takes its place. Using this idea, the volume of the solid can be measured.