Mathletics

Year 6 White Rose Maths (WRM) Spring Scheme of Learning, 2018 Alignment with Mathletics

Year 6 – Yearly Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number- Place Value		Number- Addition, Subtraction, Multiplication and Division				Fractions				Geometry- Position and Direction	Consolidation
Spring	Number- Decimals		Number- Percentages		Number- Algebra		Measurement Converting units	Measurement Perimeter, Area and Volume		Number- Ratio		Consolidation
Summer	Geometry- Properties of Shapes		Problem solving			Statistics		Investigations				Consolidation

This alignment document has been based on the White Rose Maths (WRM) scheme of learning available on the TES website. It contains the alignment information for the Spring Scheme of Learning.

Year 6 White Rose Maths (WRM) Spring Scheme of Learning, 2018

Content

Examples of alignment to Mathletics

Purpose:

The aim of this document is to support Mathletics teachers, who use the WRM schemes of learning, to make full use of the resources available within Mathletics. Whenever possible, activities, pages from the eBooks or learning experiences on Rainforest Maths have been matched to each of the small steps on the corresponding WRM scheme of learning.

In Mathletics, many eBooks are available in the student interface, however all eBooks are available to teachers through the teacher console. These topic-based eBooks contain practice and fluency exercises, along with application questions and games. Only a small selection of the relevant pages is contained in this document.

Links to Rainforest Maths, which can be found in the 'Play' area in the Mathletics student interface, have also been included. This resource has engaging visuals which work well on interactive whiteboards and gives pupils further opportunities to practise their learning online.

Course selection:
A specific Mathletics course has been created in alignment with the WRM scheme of learning. You may wish to set this course for your class/groups.

England Yr 06 WRM Autumn and Spring Aligned

Data-Driven Teaching and Learning

Differentiation

Feedback and Reflection

Student Growth

Blended Learning

Mathletics

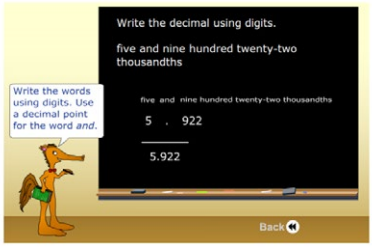
Year 6 White Rose Maths (WRM) Spring Scheme of Learning, 2018

Examples of alignment to Mathletics

Block 1 (Weeks 1-2) Number: Decimals

National Curriculum Objectives	WRM Small Steps
▸ Identify the value of each digit in numbers given to 3 decimal places and multiply numbers by 10, 100 and 1,000 giving answers up to 3 decimal places. ▸ Multiply one-digit numbers with up to 2 decimal places by whole numbers. ▸ Use written division methods in cases where the answer has up to 2 decimal places. ▸ Solve problems which require answers to be rounded to specified degrees of accuracy.	▸ Three Decimal Places ▸ Multiply by 10, 100 and 1,000 ▸ Divide by 10, 100 and 1,000 ▸ Multiply Decimals by Integers ▸ Divide Decimals by Integers ▸ Division to Solve Problems ▸ Decimals as Fractions ▸ Fractions to Decimals (1) ▸ Fractions to Decimals (2)

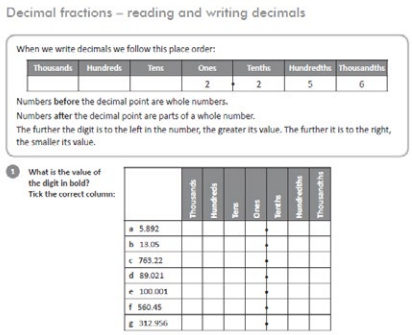
Small step: Three Decimal Places



Topic: Decimals

Activity: *Decimals from Words to Digits 2*

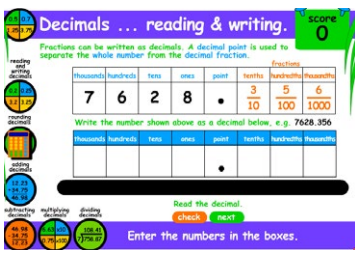
Pupils read a decimal number written in words and write the number using digits. This activity progresses from tenths through to thousandths.



eBook, G series: Fractions, Decimals and Percentages, pages 11–12

This page shows the relationship between fractions ($\frac{1}{10}$, $\frac{1}{100}$ and $\frac{1}{1,000}$s) and decimals. Pupils shade parts of a whole and record the decimal.

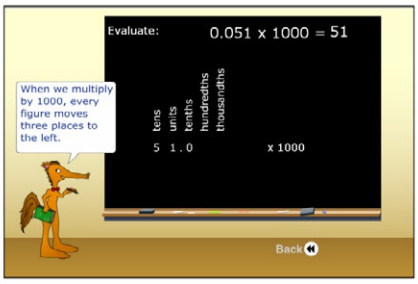
On page 12, decimals are represented on a place value chart, emphasising the value of each digit beyond the decimal point, up to 3 decimal places.



Rainforest Maths — Level G — Decimals

Pupils convert tenths, hundredths and thousandths (shown as fractions) to decimals up to 3 decimal places. Checking shows them if they have completed the chart correctly. If they make a mistake they can try again and recheck their answer.

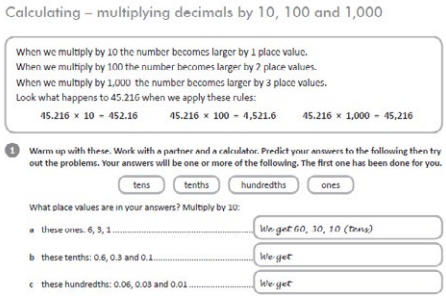
Small step: Multiply by 10, 100 and 1,000



Topic: Decimals

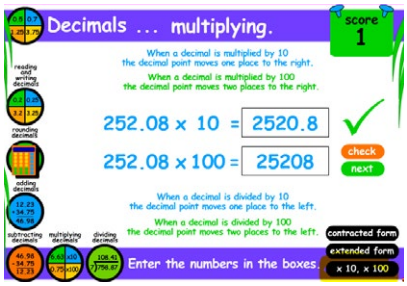
Activity: *Multiply Decimals: 10, 100, 1,000*

Pupils multiply decimals to 1, 2 and 3 decimals places by 10, 100 and 1,000 respectively.



eBook, G series: Fractions, Decimals and Percentages, page 36

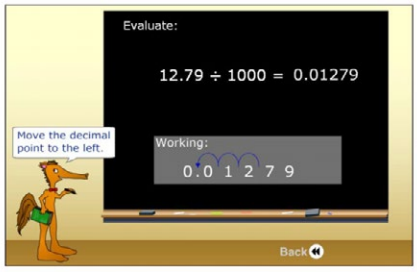
Pupils practise multiplying decimals by 10, then 100 and 1,000, understanding how the digits move across the decimal places.



Rainforest Maths — Level G— Decimals ... multiplying

Select the option for x 10, x 100. The page explains how decimals are multiplied by 10 and 100. Pupils then complete examples and click 'check' to see that they are correct.

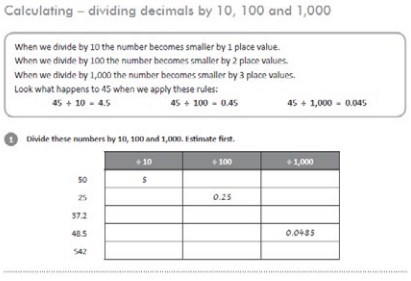
Small step: Divide by 10, 100 and 1,000



Topic: Decimals

Activity: *Divide Decimals: 10, 100, 1,000*

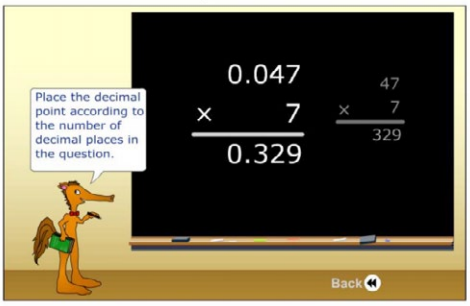
Pupils practise the division of decimals to 1, 2 and 3 decimal places by 10, 100 or 1,000.



eBook, G series: Fractions, Decimals and Percentages, page 37

Pupils practise dividing decimals by 10, 100 and then 1,000, understanding that the digits move across the decimal places towards the right. Completing a table to show numbers as they are divided by 10, 100 and then 1,000, will help to show the pattern and consolidate understanding.

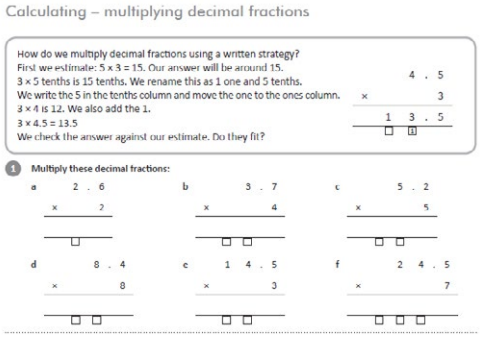
Small step: Multiply Decimals by Integers



Topic: Decimals

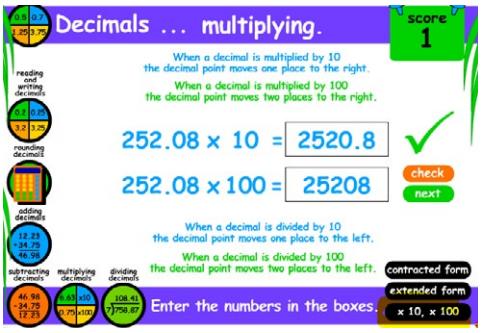
Activity: *Decimal by Whole Number*

Pupils are encouraged to multiply a decimal to 1, 2, or 3 decimal places with a 1-digit number by first multiplying as though there is no decimal point. Pupils are then shown how to place the decimal point according to the number of decimal places in the question.



eBook, G series: Fractions, Decimals and Percentages, pages 38–40

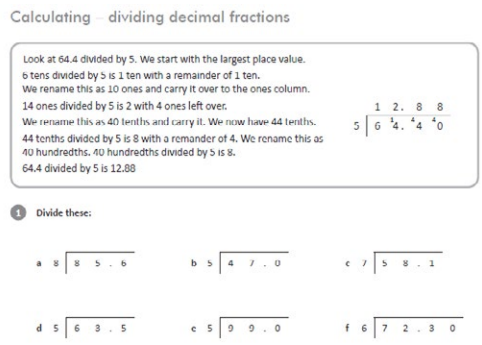
Pupils are reminded to estimate their answer first and then shown an example of multiplying a decimal by an integer. They work through examples with 1 decimal place, then moving on to multiplying numbers with 2 decimal places and finally they answer some questions given in the context of word problems.



Rainforest Maths — Level G — Decimals ... multiplying

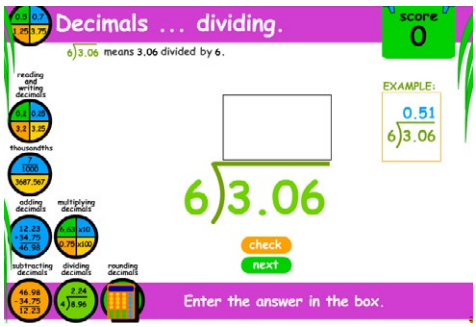
Pupils can choose to use the contracted or extended method to multiply a decimal by an integer. Pupils are guided through the process and click 'check' to see if they are correct.

Small step: Divide Decimals by Integers



eBook, G series: Fractions, Decimals and Percentages, pages 41–42

Pupils are taken through an example, step by step and then complete an exercise to practise dividing decimals by an integer. The real-life context of using money and dividing a bill between diners is used as an example of when this calculation is used.

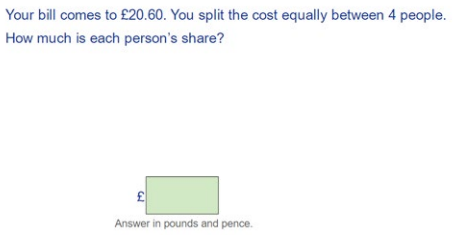


Rainforest Maths — Level F — Decimals ... dividing

Pupils practise dividing decimals by an integer. Clicking 'check' enables pupils to see if their answer is correct.

Teachers should encourage pupils to record their working out and answers on paper or a dry wipe board before entering the answer on the screen.

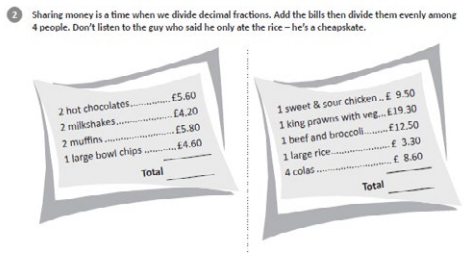
Small step: Division to Solve Problems



Topic: Decimals

Activity: *Money Problems: Four Operations with Pounds*

Pupils solve various word problems involving the addition, subtraction, multiplication or division of money amounts.

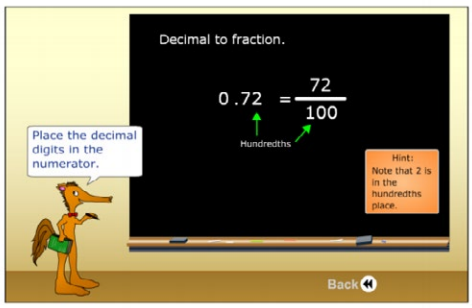


eBook, G series: Fractions, Decimals and Percentages, pages 41–42

Sharing money is used as an example of when we divide decimals by integers. Pupils total the restaurant bill before dividing it by the number of people, to find out how much each person pays.

Page 42 gives further examples of problems in real-life contexts.

Small step: Decimals as Fractions



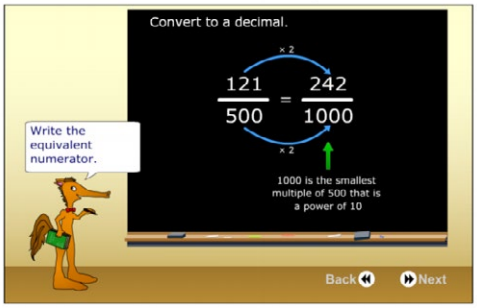
Topic: Decimals

Activity: *Decimals to Fractions 1*

Pupils convert decimals to 1, 2 and 3 decimal places into fractions with denominators of 10, 100 or 1,000.

Year 6 White Rose Maths (WRM) Spring Scheme of Learning, 2018

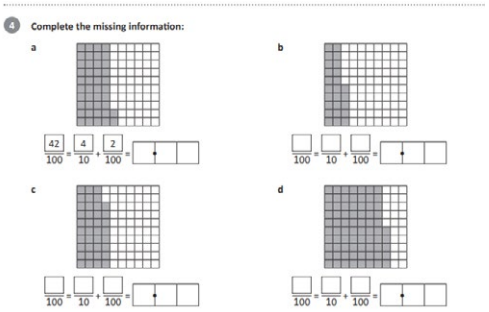
Small step: Fractions to Decimals (1)



Topic: Decimals

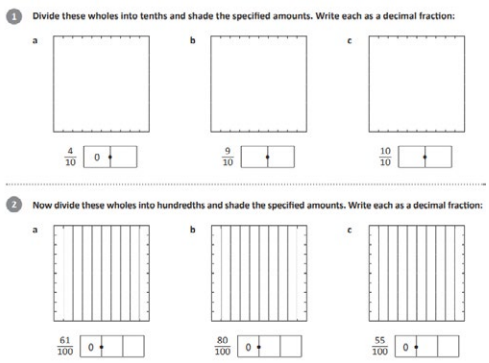
Activity: *Fraction to Terminating Decimal*

This activity requires pupils to find an equivalent fraction with a denominator that is a power of 10 and then rewrite the fraction as a decimal.



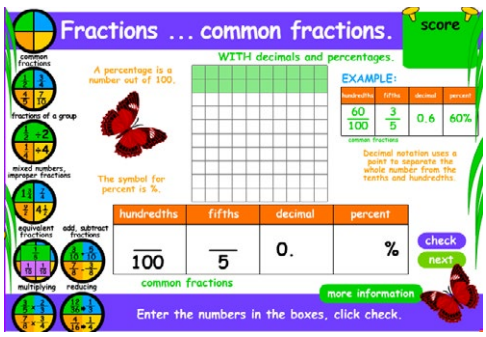
eBook, F series: Fractions, Decimals and Percentages, page 21

On this page, fractions are shown as parts of a 100 square. Pupils record the fraction as a hundredth, as well as the related decimal and percentage.



eBook, G series: Fractions, Decimals and Percentages, page 12

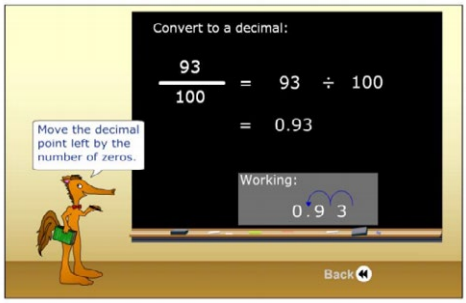
In these exercises, pupils are asked to divide wholes into hundredths, shade specific amounts and record those amounts as decimals.



Rainforest Maths — Level G — Fractions ... common fractions

Fractions are shown as parts of a 100 square. Pupils record the fraction as a hundredth and then a common fraction, before showing the related decimal and percentage.

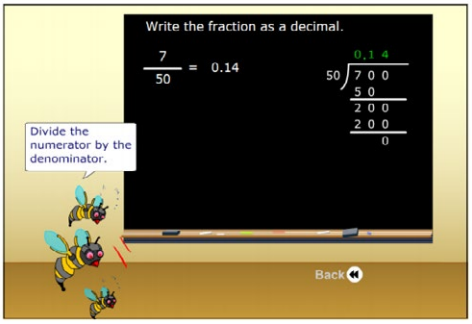
Small step: Fractions to Decimals (2)



Topic: Decimals

Activity: *Fractions to Decimals*

Pupils divide the numerator by the denominator to convert a fraction to a decimal. All denominators in this activity are powers of 10.



Topic: Decimals

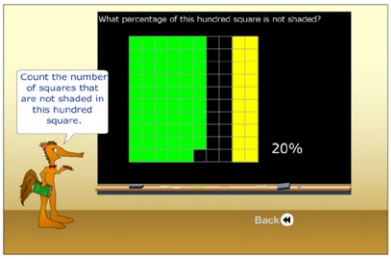
Activity: *Fractions to Decimals 2*

Pupils are encouraged to divide the numerator by the denominator to convert a fraction to a decimal.

Examples of alignment to Mathletics
Block 2 (Weeks 3-4) Number: Percentages

National Curriculum Objectives	WRM Small Steps
▸ Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison. ▸ Recall and use equivalences between simple fractions, decimals and percentages including different contexts.	▸ Fractions to Percentages ▸ Equivalent FDP ▸ Percentage of an Amount (1) ▸ Percentage of an Amount (2) ▸ Percentage — Missing Values ▸ Percentage Increase & Decrease ▸ Order FDP

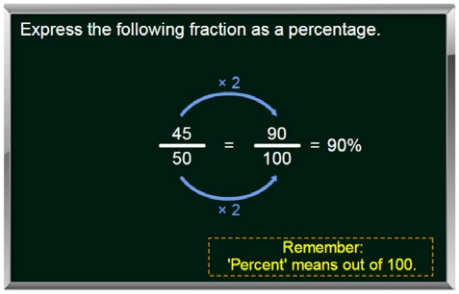
Small step: Fractions to Percentages



Topic: Percentages

Activity: *Modelling Percentages*

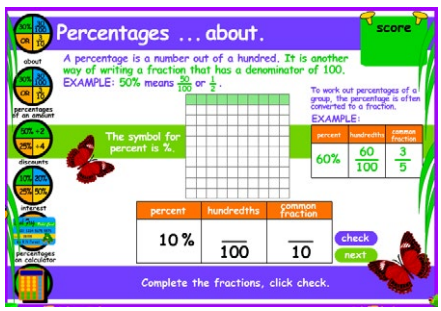
Pupils first count the number of squares in a hundred square to find the percentage of squares that are, or are not, shaded. The harder level moves to having pupils find the equivalent percentage for common fractions such as half, quarter, tenth, fifth, hundredth.



Topic: Percentages

Activity: *Fractions to Percentages (Non-Calculator)*

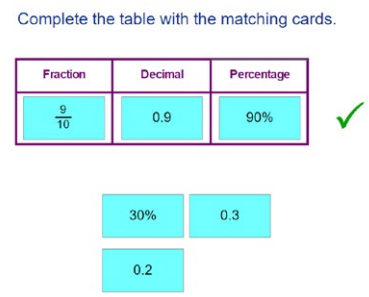
Pupils use mental strategies to convert fractions to equivalent fractions with a denominator of 100 to express the fraction as a percentage.



Rainforest Maths — Level G — Percentages ... about

Pupils are shown a fraction visually as a shaded area on a hundred square which represents 1 whole. They record the fractions in hundredths and tenths and show the equivalent percentage.

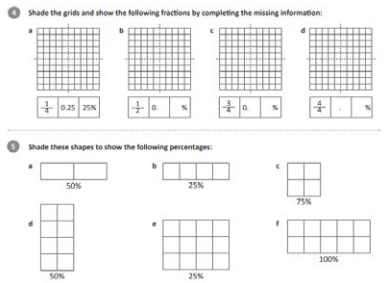
Small step: Equivalent FDP



Topic: Percentages

Activity: *Match Decimals and Percentages*

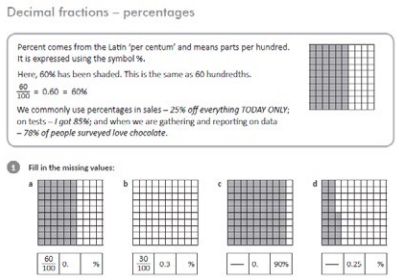
Pupils drag cards into a table to match the equivalent fraction, decimal and percentage (tenths, quarters, fifths).



eBook, F series: Fractions, Decimals and Percentages, pages 26–27

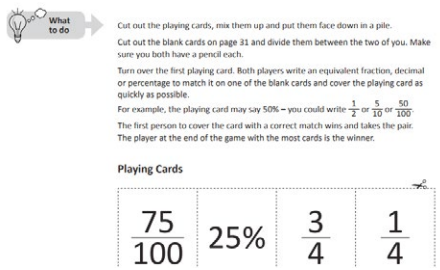
Pupils use fractions to shade parts of a hundred square and then write the decimal and percentage equivalents.

They then shade a fraction of a shape from a given percentage.



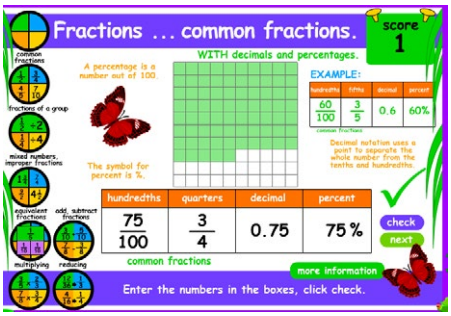
eBook, G series: Fractions, Decimals and Percentages, pages 16–17

Pupils shade the fraction on the hundred square and record the equivalent common fraction, decimal and percentage.



eBook, F series: Fractions, Decimals and Percentages, pages 30–31

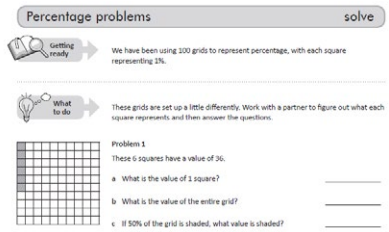
In this game, students are encouraged to find equivalent fractions, decimals and percentages using cut-out playing cards



Rainforest Maths — Level G — Fractions ... common fractions

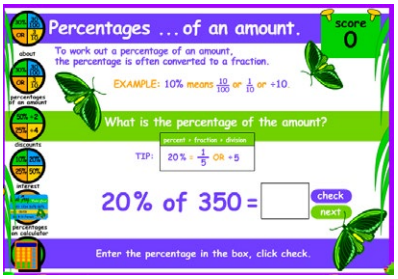
Pupils are shown the visual of a hundred square, representing 1, with an area shaded. They then identify the fraction shaded in hundredths and simplify the fraction, before recording the decimal and the related percentage.

Small step: Percentage of an Amount (1)



eBook, G series: Fractions, Decimals and Percentages, page 19

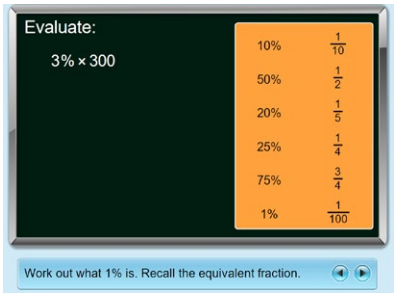
In these examples the hundred square does not represent 100, so pupils are challenged to think about percentages of different amounts. They are encouraged to do this as a paired activity, so that they can discuss their thinking.



Rainforest Maths — Level G — Percentages … of an amount

To support pupils understanding of percentages they are shown the related common fraction and reminded by which number they should divide to find the percentage of an amount. For example, for 10% of an amount, they will be given a tip saying, 10% = $\frac{1}{10}$ or divide by 10.

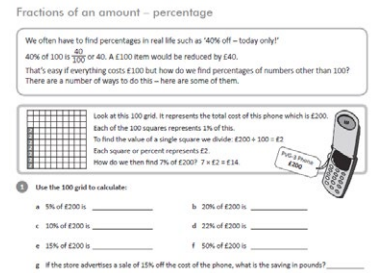
Small step: Percentage of an Amount (2)



Topic: Percentages

Activity: *Calculating Percentages 1*

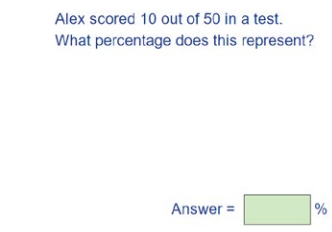
Pupils find percentages of amounts, including compound percentages. For example, pupils are asked to find 3% by first finding 1% and then multiplying by 3.



eBook, G series: Fractions, Decimals and Percentages, pages 22–23

Pupils find percentages of amounts including compound percentages using a hundred square for support.

Small step: Percentage — Missing Values

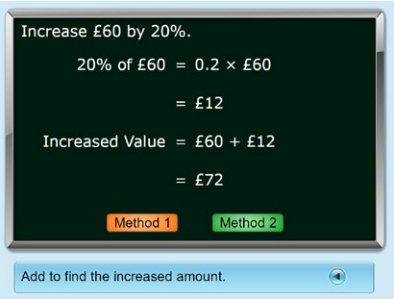


Topic: Percentages

Activity: *Percentage Word Problems*

In this activity, pupils find percentages of quantities. They are also asked to use the percentage to find the whole or identify what percentage one quantity is of another quantity.

Small step: Percentage Increase & Decrease



Topic: Percentages

Activity: *Percentage Change: Increase and Decrease*

Pupils are shown 2 methods to increase or decrease amounts by a given percentage. Method 1 shows pupils how to increase the actual percentage amount first to reflect the increase or decrease. Method 2 shows pupils how to find the percentage and then add or subtract the percentage to/from the original amount.

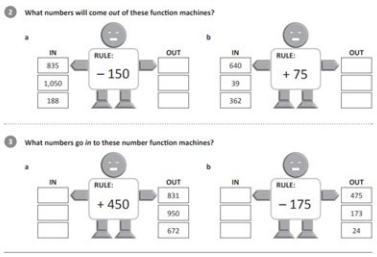
Rainforest Maths — Level G — Percentages

Pupils are shown how to calculate discounts of 10%, 20%, 25% or 50% by calculating the discount amount and decreasing the normal price by that amount.

Examples of alignment to Mathletics
Block 3 (Weeks 5–6) Number: Algebra

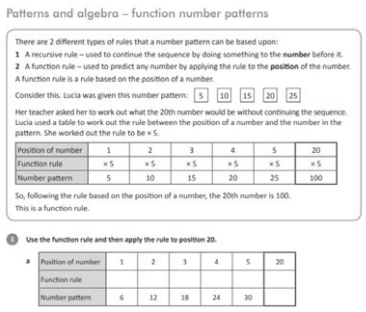
National Curriculum Objectives	WRM Small Steps
▸ Use simple formulae. ▸ Generate and describe linear number sequences. ▸ Express missing number problems algebraically. ▸ Find pairs of numbers that satisfy an equation with two unknowns. ▸ Enumerate possibilities of combinations of two variables.	▸ Find a Rule — One Step ▸ Find a Rule — Two Step ▸ Use an Algebraic Rule ▸ Substitution ▸ Formulae ▸ Word Problems ▸ One Step Equations ▸ Two Step Equations ▸ Find Pairs of Values ▸ Enumerate Possibilities

Small step: Find a Rule — One Step



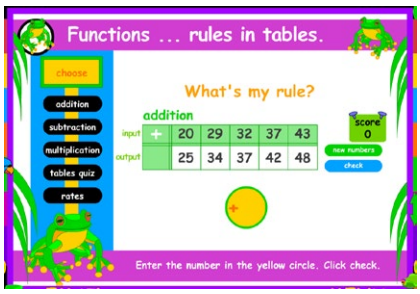
eBook, F series: Addition and Subtraction, pages 29–30

Pupils use a 1-step function rule to identify and enter the input or output numbers. Page 30 provides real-life examples and the use of function rules in tables.



eBook, F series: Multiplication and Division, pages 38–40

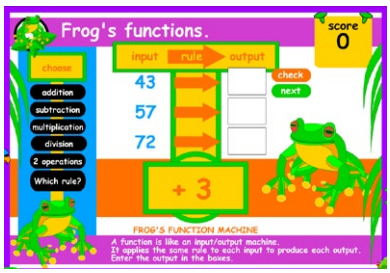
Pupils find the rule for a 1-step function using the input and output numbers and then use the rule to enter the output number for the 20th input number.



Rainforest Maths — Level F — Functions

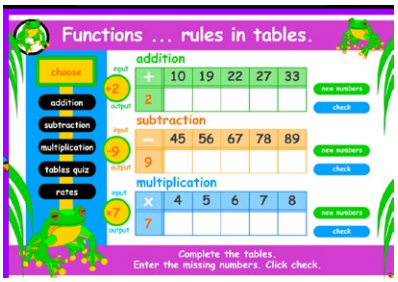
Pupils identify the 1-step function rule using the input and output numbers in a table.

Pupils can select addition, subtraction and multiplication rules to practise their knowledge.



Rainforest Maths — Level F — Functions

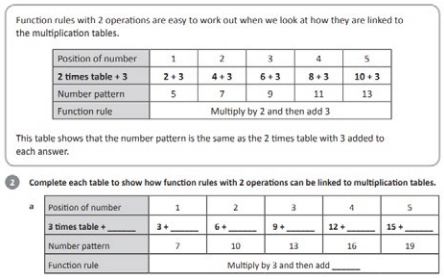
Pupils apply the given 1-step function rule to identify and enter output numbers. Pupils can select from all 4 operations to practise using function rules.



Rainforest Maths — Level F — Functions

Pupils select 'tables quiz' to practise calculating and entering output numbers using given addition, subtraction and multiplication 1-step function rules.

Small step: Find a Rule — Two Step



Function rules with 2 operations are easy to work out when we look at how they are linked to the multiplication tables.

Position of number	1	2	3	4	5
2 times table + 3	2 × 3	4 × 3	6 × 3	8 × 3	10 × 3
Number pattern	5	7	9	11	13
Function rule	Multiply by 2 and then add 3				

This table shows that the number pattern is the same as the 2 times table with 3 added to each answer.

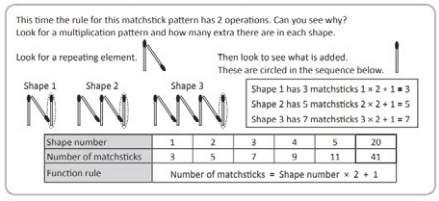
2 Complete each table to show how function rules with 2 operations can be linked to multiplication tables.

a

Position of number	1	2	3	4	5
3 times table + ____	3 + ____	6 + ____	9 + ____	12 + ____	15 + ____
Number pattern	7	10	13	16	19
Function rule	Multiply by 3 and then add ____				

eBook, F series: Multiplication and Division, page 39

On this page, pupils find the rule for a 2-step function when they have already been given the multiplication step of a multiplication and addition rule.



This time the rule for this matchstick pattern has 2 operations. Can you see why?
Look for a multiplication pattern and how many extra there are in each shape.

Look for a repeating element.

Then look to see what is added. These are circled in the sequence below.

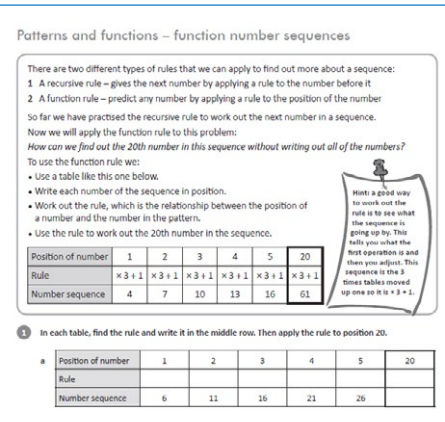
Shape 1 Shape 2 Shape 3

Shape 1 has 3 matchsticks 1 × 2 + 1 = 3
Shape 2 has 5 matchsticks 2 × 2 + 1 = 5
Shape 3 has 7 matchsticks 3 × 2 + 1 = 7

Shape number	1	2	3	4	5	20
Number of matchsticks	3	5	7	9	11	41
Function rule	Number of matchsticks = Shape number × 2 + 1					

eBook, F series: Multiplication and Division, page 41

Pupils identify 2-step function rules involving multiplication and addition.



Patterns and functions – function number sequences

There are two different types of rules that we can apply to find out more about a sequence:
1 A recursive rule – gives the next number by applying a rule to the number before it
2 A function rule – predict any number by applying a rule to the position of the number

So far we have practised the recursive rule to work out the next number in a sequence.
Now we will apply the function rule to this problem:
How can we find out the 20th number in this sequence without writing out all of the numbers?
To use the function rule we:
- Use a table like this one below.
- Write each number of the sequence in position.
- Work out the rule, which is the relationship between the position of a number and the number in the pattern.
- Use the rule to work out the 20th number in the sequence.

Hint: a good way to work out the rule is to see what the sequence is going up by. This tells you what the first operation is and then you adjust. This sequence is the 3 times tables moved up one so it is × 3 + 1.

Position of number	1	2	3	4	5	20
Rule	× 3 + 1	× 3 + 1	× 3 + 1	× 3 + 1	× 3 + 1	× 3 + 1
Number sequence	4	7	10	13	16	61

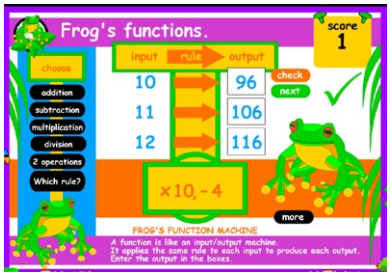
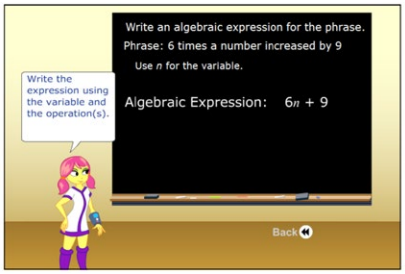
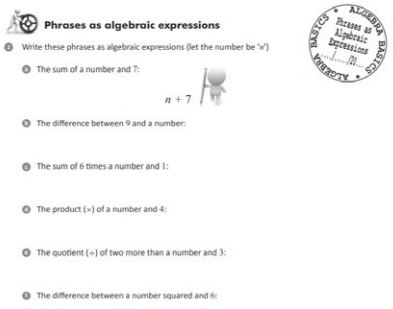
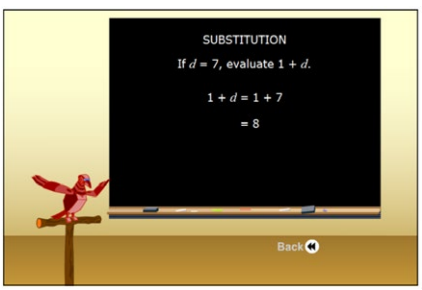
1 In each table, find the rule and write it in the middle row. Then apply the rule to position 20.

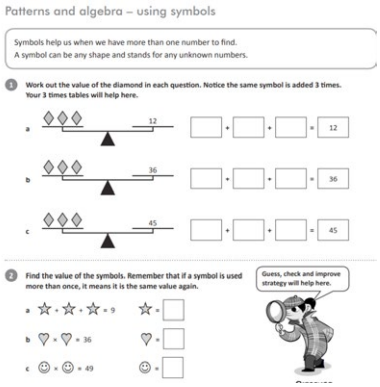
a

Position of number	1	2	3	4	5	20
Rule						
Number sequence	6	11	16	21	26	

eBook, G series: Patterns and Algebra, pages 3–4

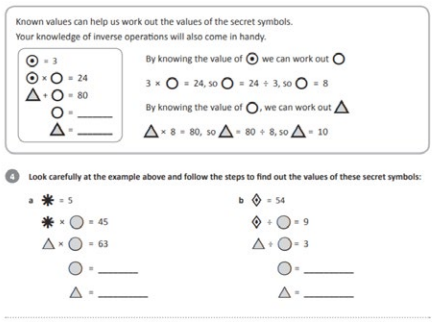
These pages explore function number sequences with 2-step rules. Pupils must identify function rules to complete sequences and use the rule to find numbers which would occur further along the sequence.

	**Rainforest Maths — Level F — Functions** Pupils select the option, '2 operations' and then identify and enter the output numbers using a given 2-step function rule.
	**Rainforest Maths — Level F — Functions** Pupils select the option 'Which rule?' to practise identifying a 2-step function rule. Pupils use the input and output numbers to identify the rule.
Small step: Use an Algebraic Rule	
	Topic: Algebra Activity: *Writing Algebraic Expressions* In this activity, pupils select the correct algebraic expression to represent a given number phrase.
	**eBook, H series: Algebra Basics, pages 10–11** Pupils read phrases and rewrite them as algebraic expressions where the unknown number is n.
Small step: Substitution	
	Topic: Algebra Activity: *Simple Substitution 1* In this activity pupils evaluate a simple algebraic expression by substituting the variable with the given value.



eBook, F series: Addition and Subtraction, pages 33–34

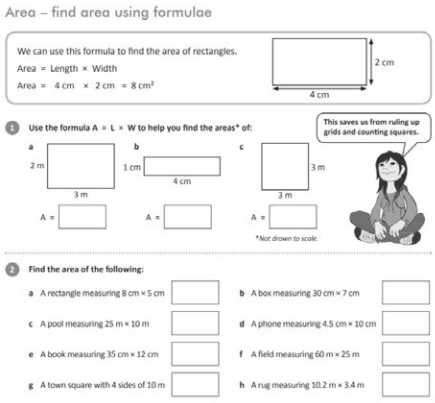
These pages are an introduction to the use of symbols to represent numbers. Pupils use clues to work out the value of each symbol.



eBook, F series: Multiplication and Division, page 38

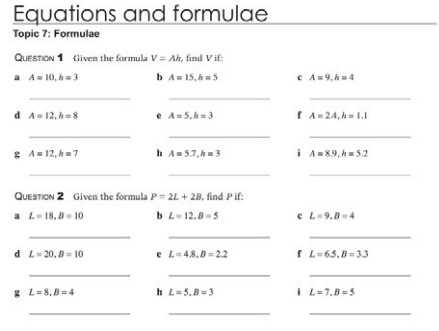
Pupils substitute values into a simple equation in order to find the values of the other unknown numbers.

Small step: Formulae



eBook, G series: Length, Perimeter and Area, pages 18–20

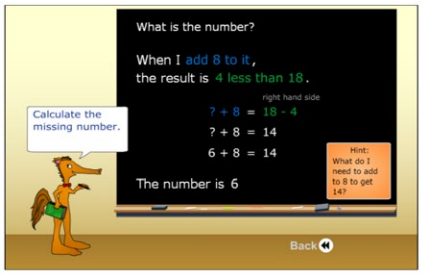
Pupils substitute values into the formula for area to calculate the area of 2D shapes.



eBook, H series: Algebra, page 5

Pupils substitute values for variables using the formula for volume and perimeter.

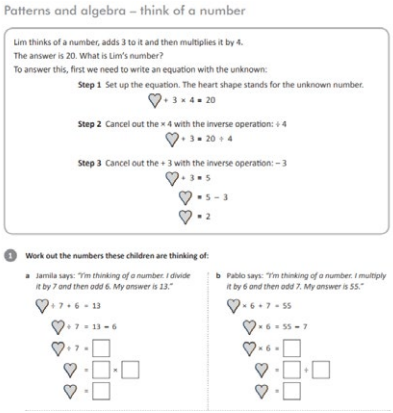
Small step: Word Problems



Topic: Algebra

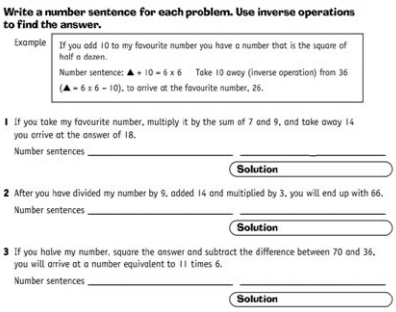
Activity: *I am Thinking of a Number!*

In this activity, pupils read word problems and use the clues to identify a missing number.



eBook, F series: Multiplication and Division, page 53

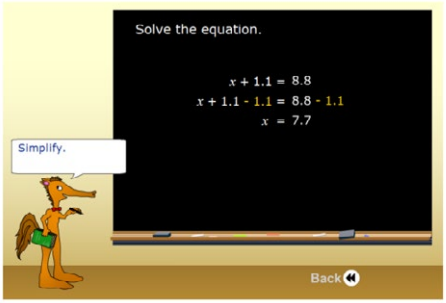
Pupils read word problems and write them as equations using symbols for the unknown number.



eBook, F & G series: Problem Solving, page 34

Pupils read word problems and write them as number sentences or equations. They can then solve the problems using symbols for the unknown number.

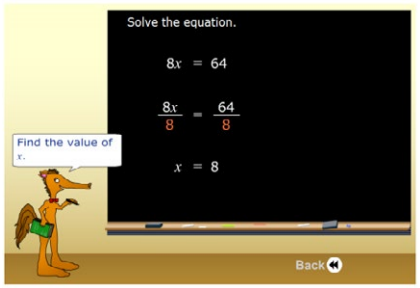
Small step: One Step Equations



Topic: Algebra

Activity: *Solve Equations: Add, Subtract 1*

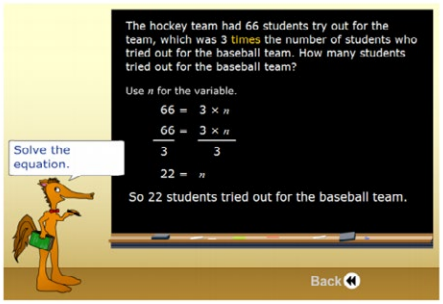
Pupils use inverse strategies to solve 1-step addition and subtraction problems.



Topic: Algebra

Activity: *Solve Equations: Multiply, Divide 1*

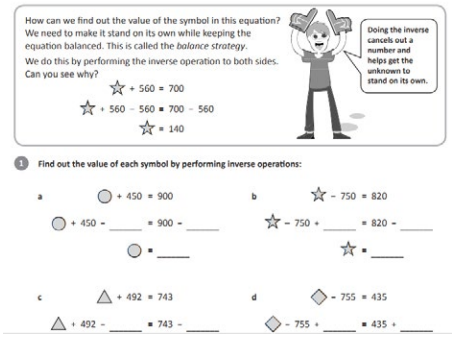
Pupils use inverse strategies to solve 1-step multiplication and division problems.



Topic: Algebra

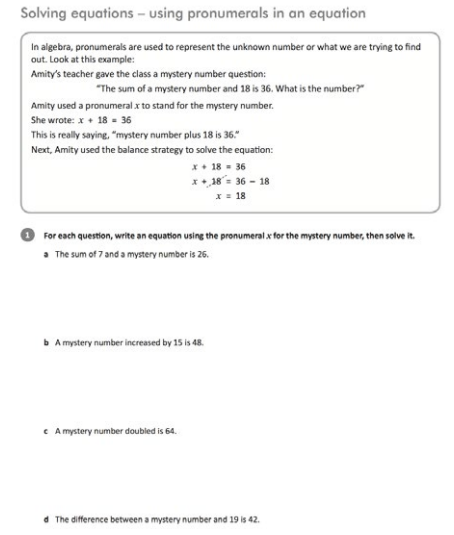
Activity: *Write an Equation: Word Problems*

This activity asks pupils to select the equation that matches a given word problem from 4 multiple choice options. They must then solve the equation.



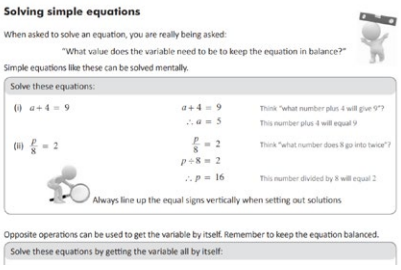
eBook, F series: Addition and Subtraction, pages 35–37

These pages introduce pupils to the 'balance strategy' and inverse operations to find an unknown value in an equation.



eBook, G series: Patterns and Algebra, pages 27–28

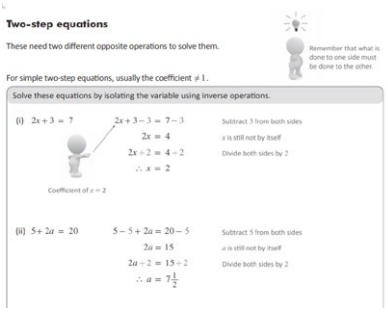
Pupils form an equation involving an unknown value, x, and then solve the equation to calculate its value.



eBook, I series: Equations, pages 8–10

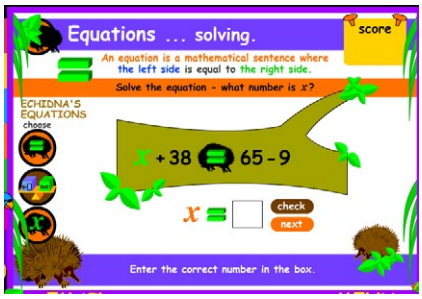
Pupils use opposite operations and the concept of balancing equations to solve simple 1-step equations.

Small step: Two Step Equations



eBook, I series: Equations, pages 11 and 12

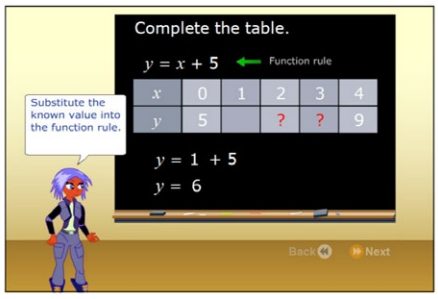
These pages introduce pupils to 2-step equations involving 1 variable. They are then taught to carry out inverse operations until the variable is by itself on one side of the equation.



Rainforest Maths — Level 6 — Algebra: Equations — balance

Pupils solve 2-step equations with addition and subtraction.

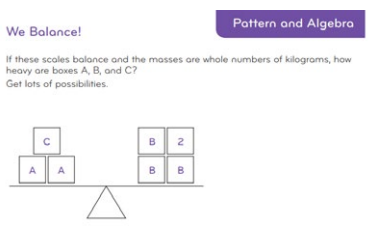
Small step: Enumerate Possibilities



Topic: Algebra

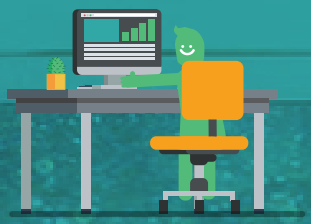
Activity: *Function Rules and Tables*

Pupils enter the missing values in a table using a 1-step or 2-step function rule.



Rich Learning Task, E series: Patterns and Algebra; We Balance!

Pupils find multiple possibilities for the values of A, B and C for the equation 2A + C = 3B + 2.


Equal for 10

Patterns and Algebra

$2x + 3$ is worth the same as another algebraic expression when $x = 10$ but not for other values of x.
What could the other expression be?
Are there other possibilities?
How could you use models to show that this is true?

Rich Learning Task, G series: Patterns and Algebra; Equal for 10

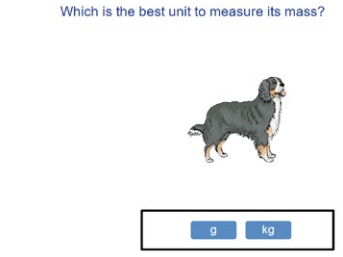
Pupils find multiple expressions equal to $2x + 3$ when $x = 10$.

Examples of alignment to Mathletics

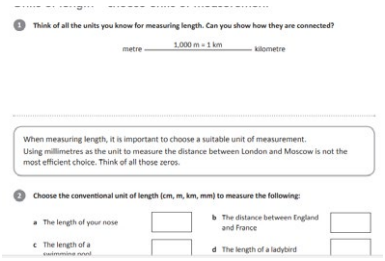
Block 4 (Week 7) Measurement: Converting Units

National Curriculum Objectives	WRM Small Steps
▸ Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. ▸ Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3dp. ▸ Convert between miles and kilometres.	▸ Metric Measures ▸ Convert Metric Measures ▸ Calculate with Metric Measures ▸ Miles and Kilometres ▸ Imperial Measures

Small step: Metric Measures

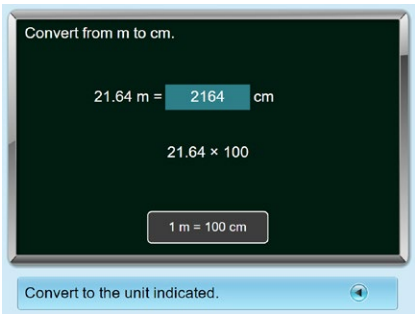


Topic: Converting units of measurement
Activity: *Which Unit of Measurement?*
Pupils choose the best unit of measurement for an everyday object. The choices are: millimetres, metres or centimetres for length; millilitres or litres for capacity; grams and kilograms for mass.

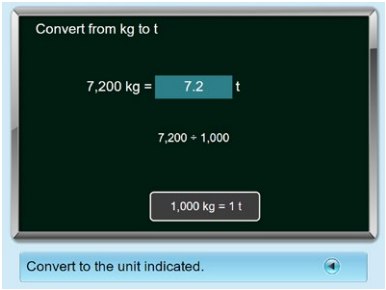


eBook G series: Length, Perimeter and Area, pages 1–2
Pupils select the different units of length they would use to measure given objects or distances using their understanding of the sizes of the units.

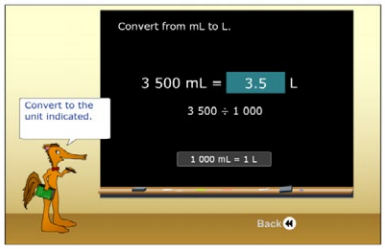
Small step: Convert Metric Measures



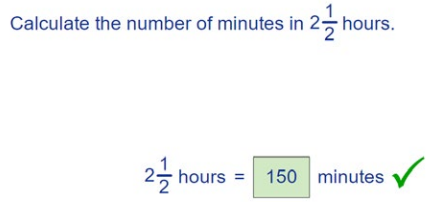
Topic: Converting units of measurement
Activity: *Converting Units of Length*
In this activity pupils convert between millimetres, centimetres and metres.
Other similar activities in this topic practise converting between various units of length, for example metres and kilometres. These include:
Activity: *Converting cm and mm*
Activity: *Centimetres and Metres*
Activity: *Metres and Kilometres*



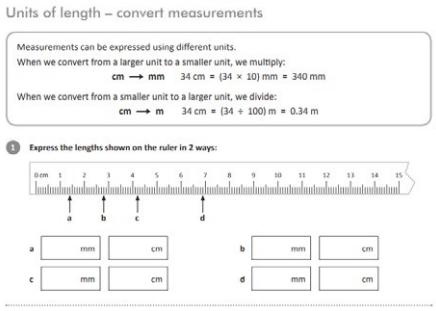
Topic: Converting units of measurement
Activity: *Converting Units of Mass*
In this activity pupils convert between grams, kilograms and tonnes.
Another similar activity in this topic practises converting from grams to kilograms and vice versa.
Activity: *Grams and Kilograms*



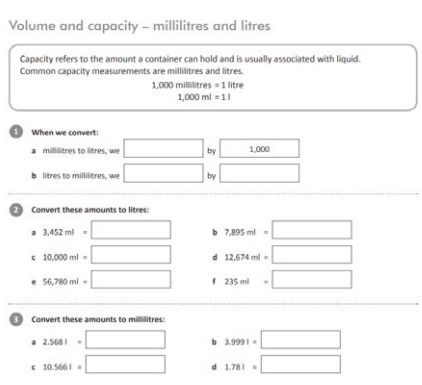
Topic: Converting units of measurement
Activity: *Millilitres and Litres*
Pupils multiply or divide to convert from millilitres to litres and vice versa.



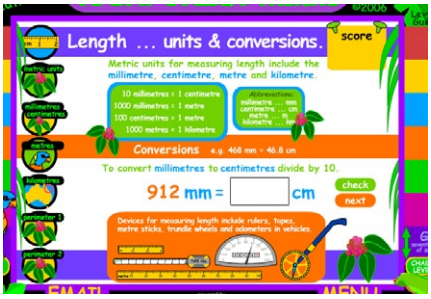
Topic: Converting units of measurement
Activity: *Time Conversions: Simple Fractions*
Pupils use their understanding of simple fractions to convert between seconds, minutes and hours.



eBook G series: Length, Perimeter and Area, pages 3–4
On these pages pupils are encouraged to convert measurements between millimetres, centimetres and metres. They progress to converting metres to kilometres up to 3 decimal places.

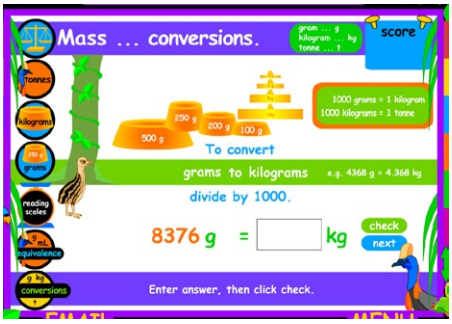


eBook G series: Volume, Capacity and Mass, pages 2–3
These pages provide practice in converting measurements between millilitres and litres.



Rainforest Maths — Level G— Length

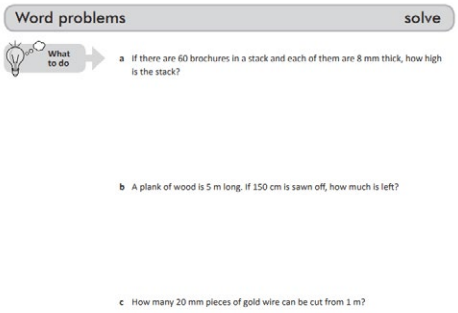
Pupils are required to convert between millimetres, centimetres, metres and kilometres including decimals to 3 places.



Rainforest Maths — Level G— Mass

Pupils are required to convert between grams, kilograms and tonnes including decimals to 3 places.

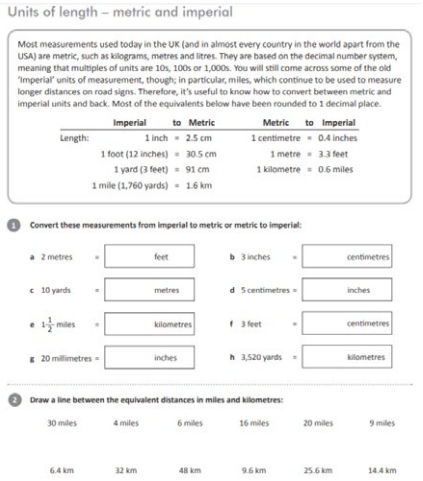
Small step: Calculate with Metric Measures



eBook, F series: Length, Perimeter and Area, page 9

This page provides pupils with word problems involving converting units of length: millimetres, centimetres and metres.

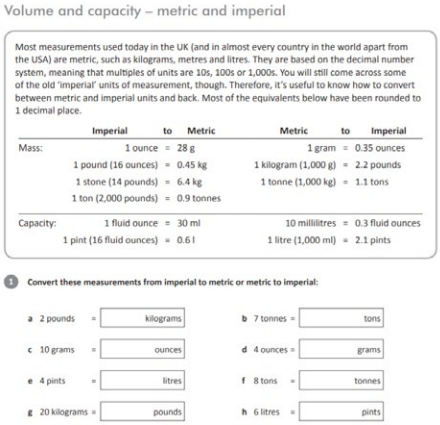
Small step: Miles and Kilometres



eBook, G series: Length, Perimeter and Area, page 5

An explanation of metric and imperial units is given before pupils practise converting between different units. Question 2 specifically practises conversions between miles and kilometres.

Small step: Imperial Measures



Volume and capacity – metric and imperial

Most measurements used today in the UK (and in almost every country in the world apart from the USA) are metric, such as kilograms, metres and litres. They are based on the decimal number system, meaning that multiples of units are 10s, 100s or 1,000s. You will still come across some of the old 'imperial' units of measurement, though. Therefore, it's useful to know how to convert between metric and imperial units and back. Most of the equivalents below have been rounded to 1 decimal place.

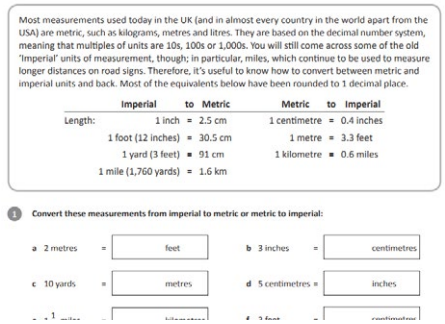
	Imperial	to	Metric	Metric	to	Imperial
Mass:	1 ounce	=	28 g	1 gram	=	0.35 ounces
	1 pound (16 ounces)	=	0.45 kg	1 kilogram (1,000 g)	=	2.2 pounds
	1 stone (14 pounds)	=	6.4 kg	1 tonne (1,000 kg)	=	1.1 tons
	1 ton (2,000 pounds)	=	0.9 tonnes			
Capacity:	1 fluid ounce	=	30 ml	10 millilitres	=	0.3 fluid ounces
	1 pint (16 fluid ounces)	=	0.6 l	1 litre (1,000 ml)	=	2.1 pints

1 Convert these measurements from imperial to metric or metric to imperial:

a 2 pounds = kilograms
b 7 tonnes = tons
c 10 grams = ounces
d 4 ounces = grams
e 4 pints = litres
f 8 tons = tonnes
g 20 kilograms = pounds
h 6 litres = pints

eBook, G series: Volume, Capacity and Mass, page 1

This page provides opportunities for pupils to convert between metric and imperial units of mass and capacity.



Most measurements used today in the UK (and in almost every country in the world apart from the USA) are metric, such as kilograms, metres and litres. They are based on the decimal number system, meaning that multiples of units are 10s, 100s or 1,000s. You will still come across some of the old 'imperial' units of measurement, though; in particular, miles, which continue to be used to measure longer distances on road signs. Therefore, it's useful to know how to convert between metric and imperial units and back. Most of the equivalents below have been rounded to 1 decimal place.

	Imperial	to	Metric	Metric	to	Imperial
Length:	1 inch	=	2.5 cm	1 centimetre	=	0.4 inches
	1 foot (12 inches)	=	30.5 cm	1 metre	=	3.3 feet
	1 yard (3 feet)	=	91 cm	1 kilometre	=	0.6 miles
	1 mile (1,760 yards)	=	1.6 km			

1 Convert these measurements from imperial to metric or metric to imperial:

a 2 metres = feet
b 3 inches = centimetres
c 10 yards = metres
d 5 centimetres = inches

eBook, G series: Length, Perimeter and Area, page 5

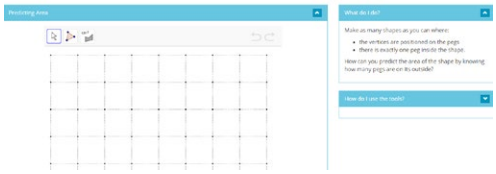
This page provides opportunities for pupils to convert between metric and imperial units of length.

Examples of alignment to Mathletics

Block 5 (Weeks 8–9) Measurement: Perimeter, Area and Volume

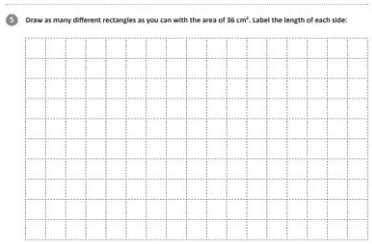
National Curriculum Objectives	WRM Small Steps
▸ Recognise that shapes with the same areas can have different perimeters and vice versa. ▸ Recognise when it is possible to use formulae for area and volume of shapes. ▸ Calculate the area of parallelograms and triangles. ▸ Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm^3, m^3 and extending to other units [for example, mm^3, km^3].	▸ Shapes — Same Area ▸ Area and Perimeter ▸ Area of a Triangle (1) ▸ Area of a Triangle (2) ▸ Area of a Triangle (3) ▸ Area of a Parallelogram ▸ Volume — Counting Cubes ▸ Volume of a Cuboid

Small step: Shapes — Same Area



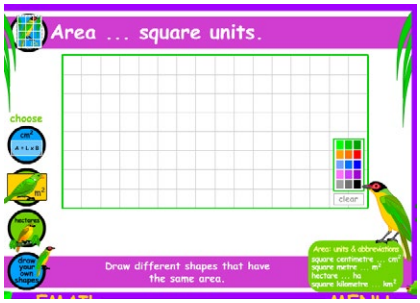
Rich Learning Task, G series — Predicting Area

Using the interactive, teachers introduce the task to their pupils. It involves pupils creating shapes using the pegs as vertices and ensuring that 1 peg is left inside the shape. Pupils will explore the area of the shapes they create and discover that the area of the shape is the same as half the number of pegs on the boundary.



eBook, G series: Length, Perimeter and Area, page 29

In this task, pupils are given the opportunity to explore rectangles with the same area but different side lengths. They should be encouraged to notice that the side lengths are factors of the area.

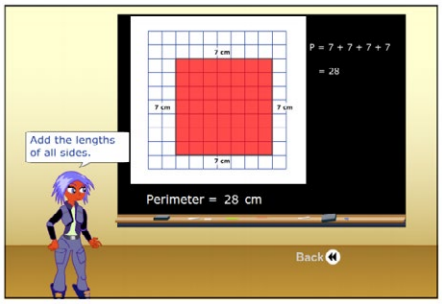


Rainforest Maths — Level F — Area ... square units

Select the option, 'draw your own shapes'.

Pupils are instructed to draw different shapes with the same area, using the coloured pens and the squares on the screen.

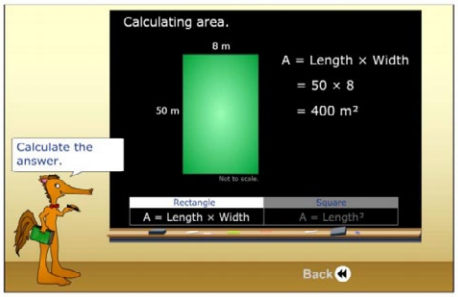
Small step: Area and Perimeter



Topic: Perimeter, Area and Volume

Activity: *Perimeter*

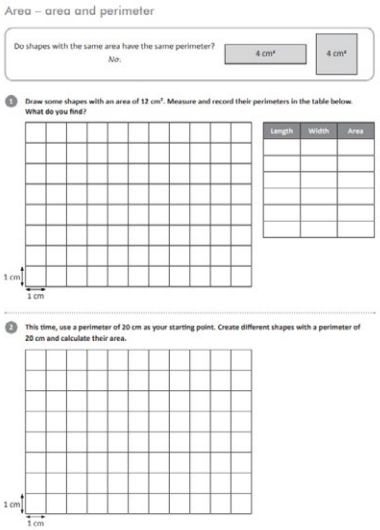
This activity can be used as a reminder of the formula for calculating perimeter.



Topic: Perimeter, Area and Volume

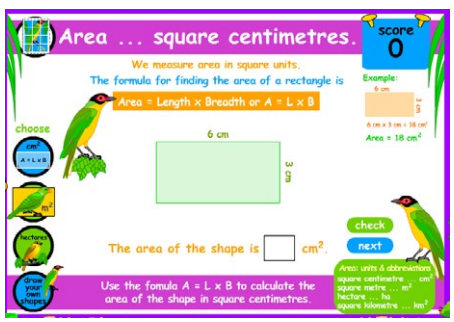
Activity: *Area: Squares and Rectangles*

Pupils use the formula to calculate the area of squares and rectangles.



eBook, G series: Length, Perimeter and Area, page 21

This page provides pupils with the opportunity to explore shapes with the same perimeter but different areas and vice versa.

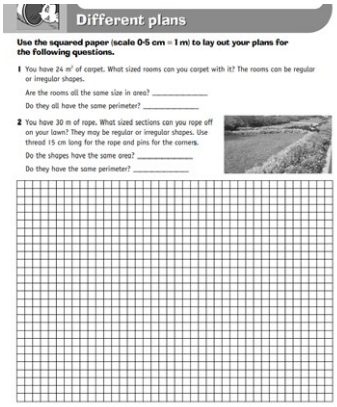


Rainforest Maths — Level F — Area

Pupils are given the formula and dimensions for finding the area of a rectangle.

Using this activity on the interactive whiteboard can provide opportunity for a discussion about the perimeter of the shape and its relationship to area.

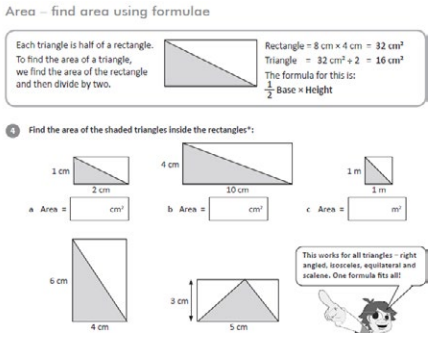
Clicking 'next' provides a range of rectangles, all labelled in centimetres.



eBook, F&G series: Problem Solving, page 65

In this problem solving task pupils create different shapes with a given area or perimeter and discover that shapes with the same area do not necessarily have the same perimeter and vice versa.

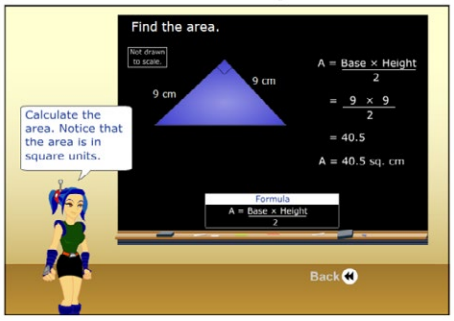
Small step: Area of a Triangle (2)



eBook, G series: Length, Perimeter and Area, page 19

The formula for finding the area of a triangle is explained in relation to the formula for finding the area of a rectangle. Pupils then apply the formula to help find the area of a range of triangles, with the base and height of each triangle given.

Small step: Area of a Triangle (3)

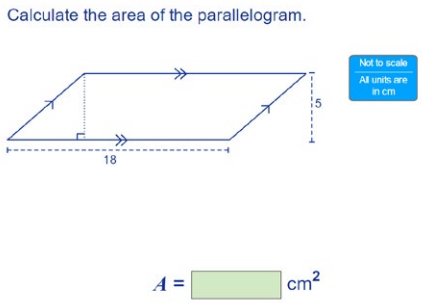


Topic: Perimeter, Area and Volume

Activity: *Area of Triangles*

In this activity, pupils apply the formula for finding the area of a triangle.

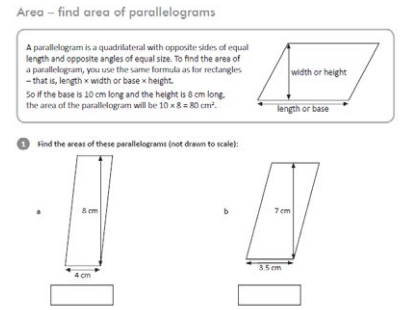
Small step: Area of a Parallelogram



Topic: Perimeter, Area and Volume

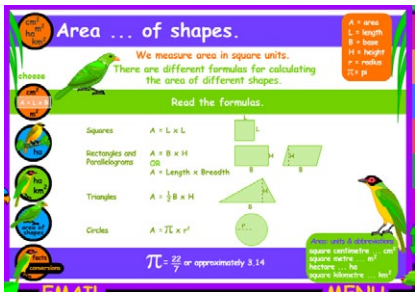
Activity: *Area: Parallelograms (Metric)*

In this activity, pupils apply the formula for finding the area of a parallelogram.The image provides visual support in relating parallelograms to rectangles.



eBook, G series: Length, Perimeter and Area, page 20

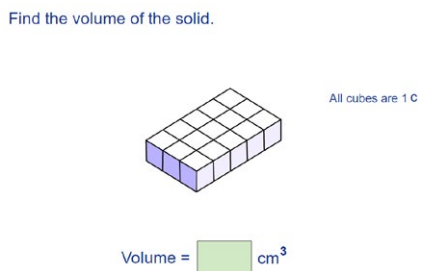
An explanation and illustration of a parallelogram shows pupils why the area of a parallelogram is calculated using the same formula as for rectangles. Pupils then explore a range of parallelograms and find their areas.



Rainforest Maths — Level G — Area

The formulae for finding the area of squares, rectangles and parallelograms, and triangles are given and illustrated to create a deeper understanding of area for pupils.

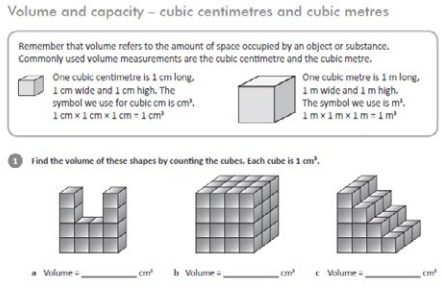
Small step: Volume — Counting Cubes



Topic: Perimeter, Area and Volume

Activity: *Volume of Solids and Prisms – 1cm³ blocks*

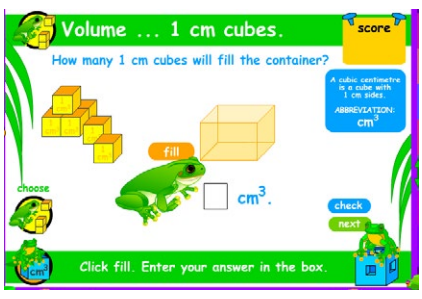
Pupils count cubic centimetre blocks to find the volume of various solids.



eBook, G series: Volume, Capacity and Mass, page 4

The concept of finding volume is explained and illustrated showing cubic centimetres and metres.

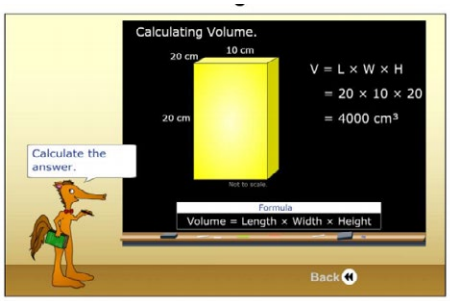
In question 1, pupils count cubes to find the volume of the shown shapes.



Rainforest Maths — Level E — Volume

In this activity pupils click 'fill' and the centimetre cubes automatically fill the container. Pupils count the cubes to find the volume of the container.

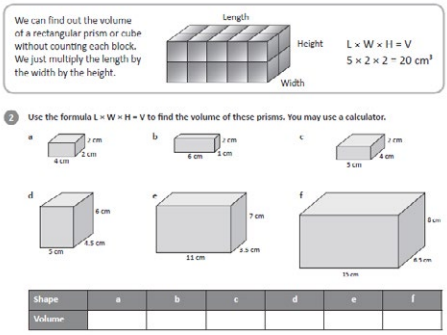
Small step: Volume of a Cuboid



Topic: Perimeter, Area and Volume

Activity: *Volume: Rectangular Prisms 1*

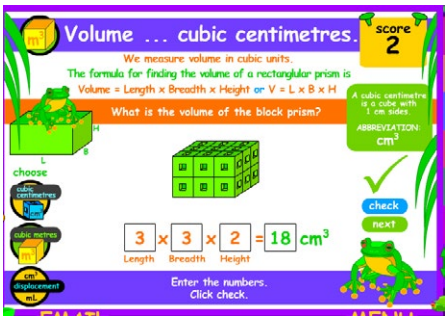
Pupils use the formula to find the volume of cuboids.



eBook, G series: Volume, Capacity and Mass, page 4

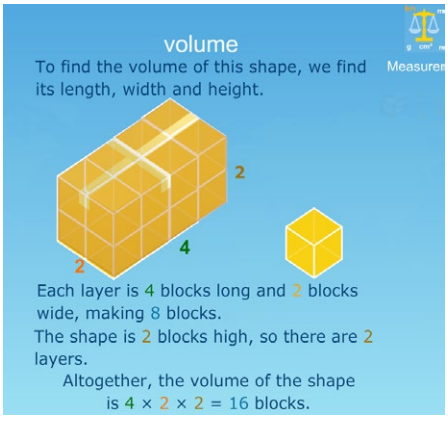
The formula for calculating volume: length x width x height = volume is explained and illustrated.

Pupils use the formula to find the volume of a range of cuboids.



Rainforest Maths — Level G — Volume ... cubic centimetres

Pupils are shown a cuboid modelled in centimetre cubes and enter the dimensions as centimetres for the length, breadth (width) and height. They calculate the volume and enter the answer.



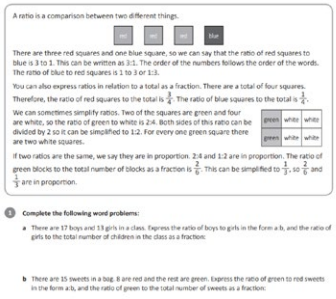
Concept Search — volume

This animation shows a cuboid being stacked with blocks. Each block is a cube. The volume is worked out by counting the number of blocks along each dimension and then multiplying.

Examples of alignment to Mathletics
Block 6 (Weeks 10–11) Number: Ratio

National Curriculum Objectives	WRM Small Steps
▸ Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. ▸ Solve problems involving similar shapes where the scale factor is known or can be found. ▸ Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.	▸ Using Ratio Language ▸ Ratio and Fractions ▸ Introducing the Ratio Symbol ▸ Calculating Ratio ▸ Using Scale Factors ▸ Calculating Scale Factors ▸ Ratio and Proportion Problems

Small step: Ratio and Fractions
Small step: Introducing the Ratio Symbol


A ratio is a comparison between two different things.

There are three red squares and one blue square, so we can say that the ratio of red squares to blue is 3 to 1. This can be written as 3:1. The order of the numbers follows the order of the words. The ratio of blue to red squares is 1 to 3 or 1:3.

You can also express ratios in relation to a total as a fraction. There are a total of four squares. Therefore, the ratio of red squares to the total is $\frac{3}{4}$. The ratio of blue squares to the total is $\frac{1}{4}$.

We can sometimes simplify ratios. Two of the squares are green and four are white, so the ratio of green to white is 2:4. Both sides of this ratio can be divided by 2 so it can be simplified to 1:2. For every one green square there are two white squares.

If two ratios are the same, we say they are in proportion. 2:4 and 1:2 are in proportion. The ratio of green blocks to the total number of blocks as a fraction is $\frac{2}{6}$. This can be simplified to $\frac{1}{3}$, so $\frac{2}{6}$ and $\frac{1}{3}$ are in proportion.

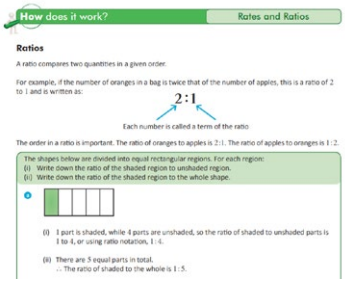
1 Complete the following word problems:

a There are 17 boys and 13 girls in a class. Express the ratio of boys to girls in the form a:b, and the ratio of girls to the total number of children in the class as a fraction:

b There are 15 sweets in a bag. 8 are red and the rest are green. Express the ratio of green to red sweets in the form a:b, and the ratio of green to the total number of sweets as a fraction:

eBook, G series: Fractions, Decimals and Percentages, page 24

This page provides an extensive introduction to ratio including the relationship between ratio and fractions. Pupils are asked to express simple ratios in the form a:b and as fractions.


How does it work? Rates and Ratios

Ratios

A ratio compares two quantities in a given order.

For example, if the number of oranges in a bag is twice that of the number of apples, this is a ratio of 2 to 1 and is written as:

2:1

Each number is called a term of the ratio

The order in a ratio is important. The ratio of oranges to apples is 2:1. The ratio of apples to oranges is 1:2.

The shapes below are divided into equal rectangular regions. For each region:
(i) Write down the ratio of the shaded region to unshaded region.
(ii) Write down the ratio of the shaded region to the whole shape.

a

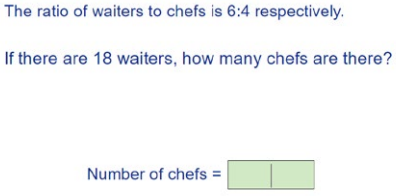
(i) 1 part is shaded, while 4 parts are unshaded, so the ratio of shaded to unshaded parts is 1 to 4, or using ratio notation, 1:4.

(ii) There are 5 equal parts in total.
∴ The ratio of shaded to the whole is 1:5.

eBook, I series: Rates and Ratios, pages 2–4

These pages also describe and define ratio. Pupils are asked to use the ratio symbol to record ratios presented in word problems and images.

Small step: Calculating Ratio


The ratio of waiters to chefs is 6:4 respectively.

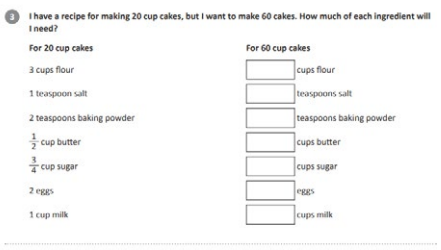
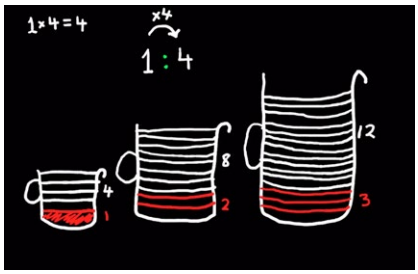
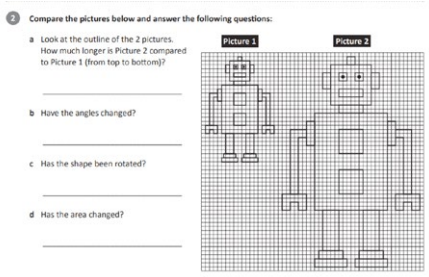
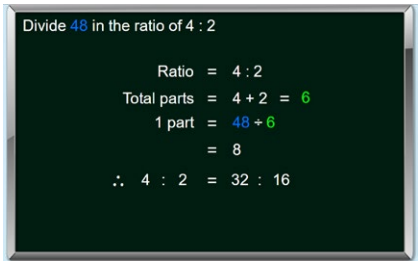
If there are 18 waiters, how many chefs are there?

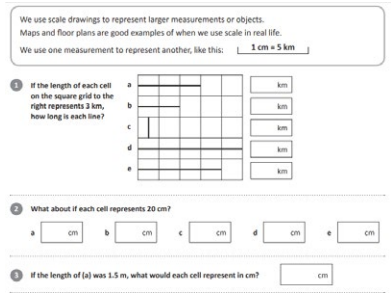
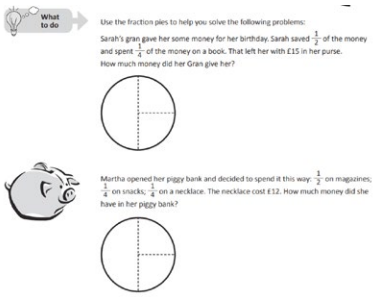
Number of chefs =

Topic: Ratio

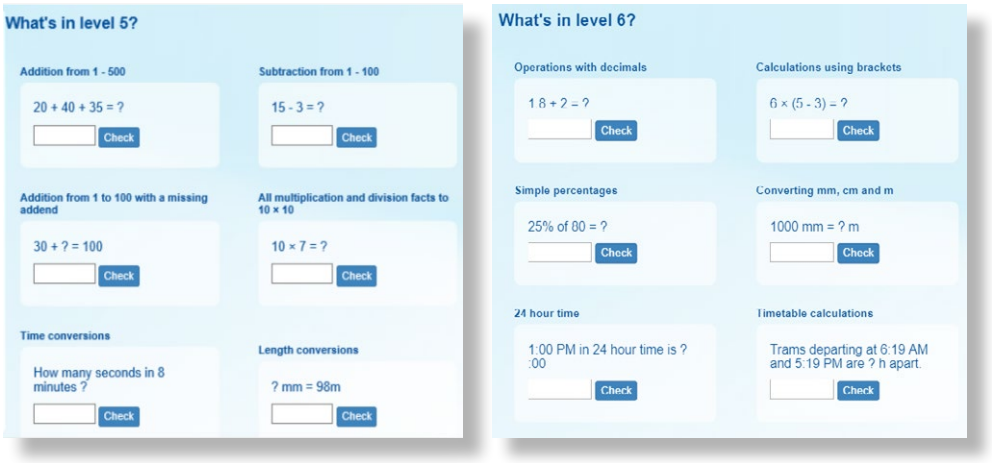
Activity: *Word Problems: Ratio*

Pupils use multiplication and division facts to calculate amounts using a given ratio.

 3 I have a recipe for making 20 cup cakes, but I want to make 60 cakes. How much of each ingredient will I need? For 20 cup cakes / For 60 cup cakes 3 cups flour — ☐ cups flour 1 teaspoon salt — ☐ teaspoons salt 2 teaspoons baking powder — ☐ teaspoons baking powder ½ cup butter — ☐ cups butter ¾ cup sugar — ☐ cups sugar 2 eggs — ☐ eggs 1 cup milk — ☐ cups milk	**eBook, G series: Fractions, Decimals and Percentages, page 25** This page provides an opportunity to calculate quantities of ingredients using a simple ratio.
 	**Conceptual Video: Ratios** This video can be found by doing a search in 'Lessons' through the older Mathletics interface. Search for the 'Ratios' activity and by clicking preview you will see the video on the left-hand side near the support button. The video introduces ratios and demonstrates the part-whole relationship.
Small step: Calculating Scale Factors	
 2 Compare the pictures below and answer the following questions: a Look at the outline of the 2 pictures. How much longer is Picture 2 compared to Picture 1 (from top to bottom)? b Have the angles changed? c Has the shape been rotated? d Has the area changed? Picture 1 / Picture 2	**eBook, G series: Geometry, page 25** This page introduces scale (without using scale factor). Pupils are asked to enlarge or reduce shapes using a grid. Question 2 asks pupils to identify the differences in the lengths of 2 identical pictures. This is an opportunity for teachers to introduce scale factor as it has a scale factor of 2.
Small step: Ratio and Proportion Problems	
 	**Topic: Ratio** **Activity: *Best Buy*** Pupils practise finding the unit cost in order to compare prices and determine the best buy.
 	**Topic: Ratio** **Activity: *Dividing a Quantity in a Ratio*** Pupils practise dividing a quantity into a given ratio. Remind pupils of the importance of the order of a ratio. Pupils will need support with harder questions as 3-part ratios are included. Alternatively, use this activity as a demonstration tool and cycle through the easier and medium questions.

	**eBook, G series: Length, Perimeter and Area, pages 25–26** Pupils investigate the use of scale drawings, both through calculating and creating scale drawings.
	**eBook, G series: Fractions, Decimals and Percentages, pages 10–11** Pupils solve word problems involving unequal sharing and grouping with fractions. This page can lead to discussions around the relationship between fractions, ratios and proportions.

Live Mathletics



Live Mathletics engages pupils in 60-second real-time games, testing speed and accuracy of maths facts.

To support progress in Year 6, encourage pupils to use **Level 5** and **6** of Live Mathletics.

Teachers can set minimum levels on Live Mathletics by clicking the 'switch to old Mathletics' button, selecting **Results** and selecting **Minimum levels** on the left-hand side of the page. Students can still access higher levels once you set a minimum level, so encourage students to challenge themselves and move on to the next level when they are ready.

(**Note**: Live Mathletics levels are a sliding scale, with no relationship to classes or old National Curriculum levels. As a resource which is also used in secondary schools, the levels from 6 upwards are intended for older students.)

When assigning activities with calculations that do not have spaces for recording any working out, consider getting pupils to record their thinking strategies in their Maths books or on a whiteboard, before answering the question in Mathletics. Pupils can then self-mark their work after each question. If they have made a mistake, they can correct their work using the support feature in the activities. Instant feedback and learning!

Mathletics

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3P Learning

For more information about Mathletics, contact our friendly team.

3P Learning Ltd
4th Floor, Bull Wharf, Redcliff Street,
Bristol, BS1 6QR.
Tel: 0117 370 1990
Email: support@3plearning.co.uk
www.mathletics.com