



Year 5 White Rose Maths (WRM) Spring Scheme of Learning, 2018 Alignment with Mathletics

Year 5 – 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 and Subtraction		Statistics		Number – Multiplication and Division		Perimeter and Area		Consolidation
Spring	Number – Multiplication and Division			Number – Fractions						Number – Decimals & Percentages		Consolidation
Summer	Number – Decimals				Geometry- Properties of Shapes		Geometry- Position and Direction	Measurement- Converting Units		Measures Volume	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.



Content

Examples of alignment to Mathletics

Block 1 (Weeks 1–3) Number: Multiplication and Division	01
Block 2 (Weeks 4–9) Number: Fractions	05
Block 3 (Weeks 10–11) Number: Decimals and Percentages	13

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 05 WRM Autumn and Spring Aligned



Data-Driven
Teaching and
Learning



Differentiation



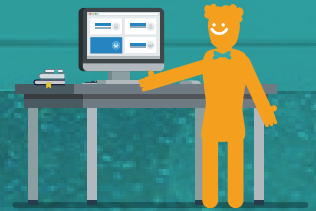
Feedback and
Reflection



Student Growth



Blended
Learning

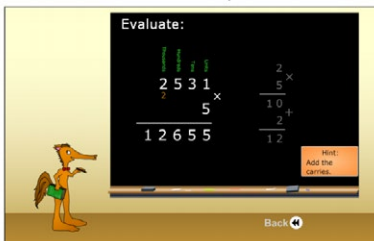


Examples of alignment to Mathletics

Block 1 (Weeks 1-3) Number: Multiplication and Division

National Curriculum Objectives	WRM Small Steps
<ul style="list-style-type: none"> ▶ Multiply and divide numbers mentally drawing upon known facts. ▶ Multiply numbers up to 4 digits by a one or two digit number using a formal written method, including long multiplication for 2 digit numbers. ▶ Divide numbers up to 4 digits by a one digit number using the formal written method of short division and interpret remainders appropriately for the context. ▶ Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the equals sign. 	<ul style="list-style-type: none"> ▶ Multiply 4-digits by 1-digit ▶ Multiply 2-digits (Area model) ▶ Multiply 2-digits by 2-digits ▶ Multiply 3-digits by 2-digits ▶ Multiply 4-digits by 2-digits ▶ Divide 4-digits by 1-digit ▶ Divide with Remainders

Small step: Multiply 4-digits by 1-digit



Topic: **Multiply and Divide**

Activity: *Contracted Multiplication*

Pupils practise multiplying 2-, 3- and 4-digit numbers with a 1-digit number. Questions include exchanges in 1, 2 or 3 columns.

Written methods – short multiplication

Short multiplication is one way to solve a multiplication problem. First we use our mental strategies to estimate an easier problem: $3 \times 150 = 450$. The answer will be around 450.

We start with the ones. 3×6 is 18 ones. We rename this as 1 ten and 8 ones. We put 8 in the ones column and carry the 1 to the tens column.

3×5 plus the carried 1 is 16 tens. We rename this as 1 hundred and 6 tens. We put 6 in the tens column and carry the 1 to the hundreds column.

3×1 plus the carried 1 is 4 hundreds. We put 4 in the hundreds column.

Solve these problems using short multiplication. Estimate first:

a.

	H	T	O
x	3	2	7
			3

b.

	H	T	O
x	2	4	7
			4

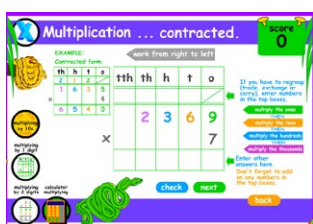
c.

	H	T	O
x	1	5	4
			5

eBook, F series: **Multiplication and Division, page 24**

This activity models multiplying a 3-digit number by a 1-digit number. It asks pupils to estimate the answer first and then use short multiplication to complete the problem.

Further exercises also cover multiplication of 3-digit and 4-digit numbers by a 1-digit number.



Rainforest Maths – Level G – Multiplication

This activity shows contracted multiplication by a 1-digit number, working through to multiplying a 2-digit number. By clicking 'more', pupils are challenged with problems involving multiplication of 3-digit numbers by a 1-digit number, then progressing to 4-digit numbers by a 1-digit number.



Small step: Multiply 2-digits (Area model)

$46 \times 73 =$
 $(40 + 6) \times (70 + 3)$

	40	6	
70	2,800	+	420
3	120	+	18
			= 3,220
			= 138

Topic: **Multiply and Divide**

Activity: **Multiply 2 Digits Area Model**

Pupils are shown a 2-digit by 2-digit multiplication problem. The support shows them through the steps of using an area model to solve the problem.

Small step: Multiply 2-digits by 2-digits

Written methods – long multiplication

When we multiply by 2 digits we have 2 options for setting the problem out – compact or full. You can select the method that suits you best.

$\begin{array}{r} 26 \\ \times 23 \\ \hline 78 \quad (3 \times 26) \\ + 520 \quad (20 \times 26) \\ \hline 598 \end{array}$	$\begin{array}{r} 26 \\ \times 23 \\ \hline 18 \quad (3 \times 6) \\ 60 \quad (3 \times 20) \\ \hline 120 \quad (20 \times 6) \\ + 400 \quad (20 \times 20) \\ \hline 598 \end{array}$
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3 Solve these problems using the method that suits you best:

a $\begin{array}{r} 24 \\ \times 43 \\ \hline \\ \hline \end{array}$ b $\begin{array}{r} 72 \\ \times 58 \\ \hline \\ \hline \end{array}$ c $\begin{array}{r} 35 \\ \times 36 \\ \hline \\ \hline \end{array}$

eBook, G series: **Multiplication and Division, page 15**

Pupils are taken through examples for using the expanded written method to multiply two 2-digit numbers. Pupils then complete exercises to practise this skill.

Small step: Multiply 3-digits by 2-digits

Multiply:

$$\begin{array}{r} 382 \\ \times 14 \\ \hline 1528 \\ + 3820 \\ \hline 5348 \end{array}$$

Topic: **Multiply and Divide**

Activity: **Multiply: 2-Digit Number, Regroup**

Pupils practise multiplication of a 3-digit number by a 2-digit or 3-digit number, including exchanges.

5 Now multiply by two digits:

a $\begin{array}{r} 44 \\ \times 12 \\ \hline \\ \hline \end{array}$ b $\begin{array}{r} 55 \\ \times 33 \\ \hline \\ \hline \end{array}$ c $\begin{array}{r} 99 \\ \times 52 \\ \hline \\ \hline \end{array}$ d $\begin{array}{r} 36 \\ \times 43 \\ \hline \\ \hline \end{array}$

When we multiply by two digits, we multiply by the ones first. Then we multiply by the tens, placing a zero in the ones column to show there are no ones. We add the 2 lines together. It's important not to confuse the carried ones and the carried tens – keep them separate.

eBook, G series: **Multiplication and Division, pages 16–17**

This activity models multiplication of 3-digit numbers by 2-digit numbers. Additional exercises offer further practice for pupils.



Multiplication ... extended.

EXAMPLE: Extended form multiplying 2 digits by 2 digits

- Multiply by the ones
- Multiply by the tens
- Add the partial products

Also known as long multiplication

The small numbers show where numbers have been expanded (traded, exchanged or carried).

$$\begin{array}{r} 118 \\ \times 13 \\ \hline 354 \\ 1180 \\ \hline 1534 \end{array}$$

multiply by the ones
multiply by the tens
add them together

Click here to see more examples

TRY practice 1

Rainforest Maths – Level G – Multiplication

Select 'multiplying by 2 digits' to access exercises which involve multiplying a 3-digit number by a 2-digit number. An example is annotated and colour coded to clearly show the method to pupils, taking them through the sequence of steps.

The activity provides examples where the digits which are carried are visible and provides examples for students to complete independently.

Small step: Multiply 4-digits by 2-digits

7 Solve these 4-digit by 2-digit problems using short multiplication:

a

e1
H Th T Th H T O
1 4 3 8
x 2 4
+

b

e1
H Th T Th H T O
3 6 0 9
x 8 1
+

eBook, G series: Multiplication and Division, page 17

The final exercises on page 17 provide practice for pupils multiplying 4-digit numbers by 2-digit numbers.

Small step: Divide 4-digits by 1-digit

Written methods – short division

Sometimes a number doesn't easily split and we have to use a different method to solve a division.

Look at 830 divided by 5. We start with the largest place value. 8 hundreds divided by 5 is 100. There is 300 left over, which we rename and carry over to the tens column. 33 tens divided by 5 is 6 with 3 left over. We rename and carry these 3 tens to the ones. 30 divided by 5 is 6 exactly.

So $830 \div 5 = 166$

9 Solve these divisions:

a $6 \overline{) 738}$ b $5 \overline{) 865}$ c $3 \overline{) 239}$

d $4 \overline{) 944}$ e $8 \overline{) 744}$ f $9 \overline{) 954}$

eBook, F series: Multiplication and Division, page 27

The explanation shows pupils how to divide a 3-digit number by a 1-digit number using short division.

The exercises work through calculations where pupils divide 3-digit and 4-digit numbers by a 1-digit number.

Small step: Divide with Remainders

Written methods – division with remainders

Sometimes numbers don't divide evenly. The amount left over is called the remainder.

Look at 527 divided by 5. 500 divided by 5 is 100. 27 divided by 5 is 5 with 2 left over (this is the remainder). This can be written as $r 2$.

So $527 \div 5 = 105 r 2$.

10 Divide these 2-digit numbers. Each problem will have a remainder.

a $9 \overline{) 75} r$ b $4 \overline{) 47} r$ c $6 \overline{) 38} r$

d $5 \overline{) 63} r$ e $4 \overline{) 49} r$ f $6 \overline{) 62} r$

10 Divide these 3-digit numbers. Each problem will have a remainder.

eBook, F series: Multiplication and Division, pages 31–33

Pages 28–30 give explanations of the concept of division where there is a remainder. Exercises work through examples of dividing 2-digit numbers with remainders.

On page 31, short division of 3-digit numbers by a 1-digit number is modelled, where the answer includes a remainder. The exercises support pupils practising these concepts.



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Division ... remainders. score 1

5)157 means 157 divided by 5.

choose

31r2

EXAMPLE:
7)218
31r1
r = remainder

2-digit division: 5)20, 5)200
3-digit division: 4)20, 5)200
4)22, 5)222
1)27, 2)276, 3)276

check next

Enter the answer, click check.

Rainforest Maths — Level F — Division

This page provides exercises for pupils to practise dividing 3-digit numbers by a 1-digit number, when the answers include a remainder.

The final exercises also involve carrying or regrouping.

Division ... 4-digit numbers. score 1

choose

2632

EXAMPLE:
5)7849
1569r4

TRY with remainder as a fraction

3)7896

check next

Enter the answer, click check.

Rainforest Maths — Level G — Division

Level G extends pupils' understanding of division to 4-digit numbers by a 1-digit number. Some of the examples involve remainders.



Examples of alignment to Mathletics

Block 2 (Weeks 4-9) Number: Fractions

National Curriculum Objectives	WRM Small Steps
<ul style="list-style-type: none"> ▶ Compare and order fractions whose denominators are multiples of the same number. ▶ Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths. ▶ Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number [for example $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]. ▶ Add and subtract fractions with the same denominator, and denominators that are multiples of the same number. ▶ Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. ▶ Read and write decimal numbers as fractions [for example $0.71 = \frac{71}{100}$]. ▶ Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates. 	<ul style="list-style-type: none"> ▶ Equivalent Fractions ▶ Improper Fractions to Mixed Numbers ▶ Mixed Numbers to Improper Fractions ▶ Number Sequences ▶ Compare & Order (Less than 1) ▶ Compare & Order (More than 1) ▶ Add & Subtract Fractions ▶ Add Fractions within 1 ▶ Add 3 or More Fractions ▶ Add Fractions ▶ Add Mixed Numbers ▶ Subtract Fractions ▶ Subtract Mixed Numbers (1) ▶ Subtract Mixed Numbers (2) ▶ Subtract 2 Mixed Numbers ▶ Multiply by an Integer (1) ▶ Multiply by an Integer (2) ▶ Multiply by an Integer (3) ▶ Fraction of an Amount ▶ Fractions as Operators

Small step: Equivalent Fractions

Enter the missing denominator to show equivalent fractions.

$$\frac{2}{10} = \frac{1}{\square}$$

halves
thirds
quarters
fifths
sixths
eighths
tenths
twelfths

Each row of the fraction wall represents one whole and is equivalent to the other rows.

Easy Medium Hard

Topic: **Fractions**

Activity: *Equivalent Fraction Wall 2*

Using an equivalent fraction wall for support, pupils identify the missing denominator to create an equivalent fraction.



Year 5 White Rose Maths (WRM) Spring Scheme of Learning, 2018



Find the equivalent fraction.

$$\frac{15}{20} = \frac{\square}{4}$$

Topic: Fractions

Activity: *Equivalent Fractions*

In this activity, pupils are encouraged to use multiplication and division facts to find equivalent fractions.

Fractions – equivalent fractions

Different fractions can have the same amount. They are equivalent.

This pizza has been cut into 2 parts. $\frac{1}{2}$ has been eaten.



This pizza has been cut into 4 parts. $\frac{2}{4}$ has been eaten.



- Do this folding paper activity to help you understand how equivalent fractions work:
 - You'll need a separate rectangular piece of paper similar to the one below. Fold it into 3 equal parts and then unfold it. Label each section with its fraction here:

$\frac{1}{3}$

$\frac{1}{3}$

$\frac{1}{3}$

Remember the bottom number tells us how many parts there are in the whole.
 - Refold your paper into thirds and fold the thirds into halves. Unfold the paper. What fraction does each of the new sections represent? Label them here:

eBook, F series: Fractions, Decimals and Percentages, pages 3–5

Beginning with an explanation and illustration of equivalent fractions, these pages provide practical exercises to support pupils in understanding the concept of equivalent fractions.

Equivalent fraction snap

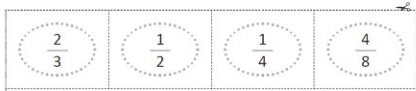
apply



Play this game with a friend. You'll need two sets of these cards. Make two copies of this page, cut out the cards and combine the two sets into one pile.



Player 1 deals the cards face down between the two players. Player 2 starts the game by placing a card in the centre. Players take turns in turning over the top card on their pile and placing it in the centre pile. Call, "Snap!" and take the centre pile if the card is identical to or an equivalent fraction to the card already face up. The four wild cards can be used to make a Snap! When playing a wild card, you must name a correct equivalent fraction. The person with all the cards at the end is the winner.



eBook, F series: Fractions, Decimals and Percentages, page 16

This page provides a printable game for pupils to play in pairs. In this 'Snap' like game, pupils match 2 equivalent fractions to win the pair of cards. The addition of some 'Wild Cards' encourages pupils to think of further equivalent fractions to match the card that has been played. The exercise can be extended with pupils creating their own sets of cards.

Rainforest Maths — Level F — Fractions

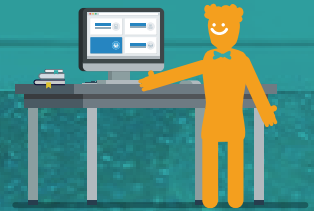
The sections on the fraction wall can be dragged to find equivalent fractions. The first questions involve finding fractions equivalent to $\frac{1}{2}$. The exercise then gets progressively more challenging.

Small step: Improper Fractions to Mixed Numbers

Topic: Fractions

Activity: *What Mixed Number Is Shaded?*

Pupils use visual representations of fractions beyond 1 to write the fraction as a mixed number. The support shows students how to count the whole numbers and parts.



Fractions – mixed numbers and improper fractions

Mixed numbers consist of both a whole number and a fraction. Ky has 2 full packets of pencils and one half packet of pencils. This is shown as $2\frac{1}{2}$.

1 Write a mixed number for each of the shaded sets of shapes:

eBook, F series: Fractions, Decimals and Percentages, page 10

The concept of improper fractions and mixed numbers is explained and modelled. Exercises give pupils the opportunity to practise recording an improper fraction as a mixed number.

Fractions ... mixed numbers. score 1

An improper fraction is one where the numerator is greater than the denominator. $\frac{7}{4} = 1\frac{3}{4}$

An improper fraction can be written as a mixed number.

A mixed number is written as a whole number with a fraction.

What is the improper fraction and the mixed number?

e.g. $\frac{3}{5}$ $1\frac{3}{5}$

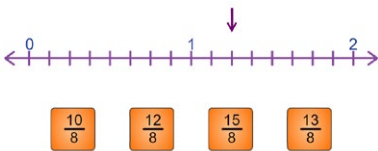
Enter the numbers in the box, click check.

Rainforest Maths – Level F – Fractions

This page explains the concept of improper fractions and mixed numbers. Pupils are shown a visual representation of a fraction and record the fraction as both an improper fraction and a mixed number.

Small step: Mixed Numbers to Improper Fractions

Which fraction is the arrow pointing at?

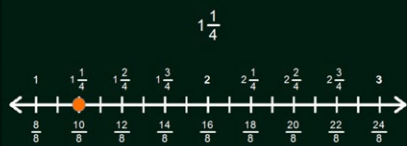


Topic: Fractions

Activity: *Identifying Fractions Beyond 1*

Pupils identify an improper fraction represented on a number line marked with whole numbers and fractional parts.

Slide the dot to the point on the number line that is equivalent to:



Topic: Fractions

Activity: *Mixed and Improper Fractions on a Number Line*

Using a number line, pupils identify the equivalent improper fraction for a given mixed number.

Fractions – mixed numbers and improper fractions

Mixed numbers can also be written as improper fractions. Look again at Ky's full packets and one half packet of pencils. This is five halves. Written as an improper fraction, this is $\frac{5}{2}$.

2 Express these as fractions. Circle any improper fractions:

a $\frac{3}{4}$ b $\frac{5}{4}$

c $\frac{7}{4}$ d $\frac{9}{4}$

An improper fraction is any fraction where the parts add up to more than 1.

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

Page 11 shows a visual representation of a mixed number which pupils then convert into an improper fraction. Page 12 includes more practise converting mixed numbers to improper fractions.



Year 5 White Rose Maths (WRM) Spring Scheme of Learning, 2018

Mathletics

Rainforest Maths — Level F — Fractions

The exercise shows fractions ordered on a number line. Using the number line, pupils are asked to convert a mixed number into an improper fraction.

Small step: Compare & Order (Less than 1)

Fractions – comparing and ordering fractions

We can use number lines or fraction strips to help us compare and order fractions.

1 Use the strips above to help you answer the following questions. Circle the correct answers:

a Which is bigger? $\frac{3}{4}$ or $\frac{4}{8}$ b Which is smaller? $\frac{2}{10}$ or $\frac{3}{8}$ c Which is smaller? $\frac{2}{4}$ or $\frac{3}{12}$

eBook, F series: Fractions, Decimals and Percentages, pages 1–2

Pupils are given a fraction wall to support their understanding of fractions and to help them compare and order fractions.

Page 2 uses a number line from 0–1 to support pupils in ordering fractions.

Rainforest Maths — Level F — Fractions

Pupils use the $<$, $>$ and $=$ sign to compare fractions. The exercise works well on an interactive whiteboard with pupils explaining their reasoning.

Small step: Compare & Order (More than 1)

Fractions – comparing and ordering fractions

Comparing and ordering fractions with like numerators and denominators is a simple process: When the denominators are different, we need to change the fractions so they have the same denominator. This lets us compare like with like.

Which is larger? $\frac{3}{4}$ or $\frac{5}{8}$

To convert quarters to eighths we double the denominator and numerator, so $\frac{3}{4}$ becomes $\frac{6}{8}$. $\frac{6}{8}$ is larger than $\frac{5}{8}$, so $\frac{3}{4}$ is larger than $\frac{5}{8}$.

1 Order these fractions:

$\frac{1}{2}$ $\frac{5}{4}$ $\frac{3}{4}$ $\frac{2}{4}$ $\frac{3}{4}$ $\frac{1}{4}$ $\frac{4}{4}$

THINK

eBook, G series: Fractions, Decimals and Percentages, pages 5–9

These pages extend pupils' understanding of ordering and comparing fractions. Exercises include ordering improper fractions and mixed numbers.

Small step: Add & Subtract Fractions

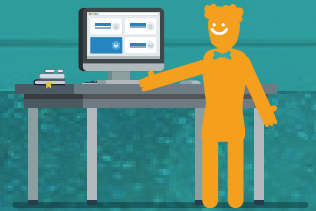
Evaluate:

$$\frac{2}{6} + \frac{5}{6} = \frac{\quad}{\quad}$$

Topic: Fractions

Activity: *Common Denominator*

Pupils add and subtract proper fractions with a common denominator.



Calculating – adding and subtracting fractions with the same denominator

I ate $\frac{2}{4}$ of a cake for breakfast. Then I ate another $\frac{1}{4}$ for lunch.
How many quarters did I eat altogether?
 $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$



1 Shade the shapes to help you answer the problems:

a $\frac{1}{3} + \frac{1}{3} = \frac{\square}{\square}$

b $\frac{2}{9} + \frac{3}{9} = \frac{\square}{\square}$

c $\frac{4}{10} + \frac{3}{10} = \frac{\square}{\square}$

d $\frac{3}{8} + \frac{2}{8} = \frac{\square}{\square}$

eBook, F series: Fractions, Decimals and Percentages, pages 32–33

The concept of adding and subtracting fractions with the same denominator is explained and modelled.

The exercises on page 32 provide a visual that pupils can shade before recording their answer.

Rainforest Maths – Level F – Fractions

Following an explanation and example of how to add fractions with the same denominator, pupils can practise working through a series of questions.

Clicking on the option at the bottom of the page allows pupils to practise subtracting fractions with the same denominator.

Small step: Add Fractions within 1

Add:

$$\frac{4}{18} + \frac{1}{6} = \frac{\square}{\square}$$

Topic: Fractions

Activity: Add: No Common Denominator

Pupils add unlike but related proper fractions.

Calculating – adding and subtracting fractions with denominators that are multiples of the same number

If we need to add and subtract fractions whose denominators are multiples of the same number, we have first to make the denominators the same.

So, if we want to find $\frac{3}{5} + \frac{3}{10}$ we need to look at the denominators. Both 5 and 10 are multiples of 5, so we need to convert the fraction with the smaller denominator into tenths. To do this we multiply both numerator and denominator by 2.



Now we can work out $\frac{6}{10} + \frac{3}{10}$ by adding the numerators. The answer is $\frac{9}{10}$.

1 Solve these problems:

a $\frac{2}{3} + \frac{1}{6} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

b $\frac{2}{9} + \frac{1}{3} = \frac{\square}{\square} + \frac{\square}{\square} = \frac{\square}{\square}$

eBook, F series: Fractions, Decimals and Percentages, page 35

The explanation and visual model works through the process of adding and subtracting fractions with denominators which are multiples of the same number. Pupils are shown how to convert the fractions first so they have a like denominator, before doing the calculations. Exercises then provide practice for pupils.

Rainforest Maths – Level G – Fractions

The page explains how pupils need to convert fractions so they have a common denominator before adding them. Pupils work through a series of examples.



Small step: Add Mixed Numbers

Evaluate, giving answer in simplest form.

$$5 \frac{7}{12} + 2 \frac{3}{4} = 7 + \left(\frac{7}{12} + \frac{3}{4} \right)$$

$$= 7 + \left(\frac{16}{12} \right)$$

$$= 7 + 1 \frac{1}{3}$$

$$= 8 \frac{1}{3}$$

Simplify the answer.

Whole Number Method Improper Fraction Method

Back

Topic: **Fractions**

Activity: **Add Unlike Mixed Numbers**

Pupils can choose from 2 methods to add unlike but related mixed numbers. The whole number method demonstrates the process of adding the whole numbers first whereas the improper fraction method teaches pupils to convert both mixed numbers to improper fractions before adding.

Small step: Subtract Fractions

Calculate:

$$\frac{5}{14} - \frac{1}{7} = \frac{\square}{\square}$$

Topic: **Fractions**

Activity: **Subtract: No Common Denominator**

Pupils subtract unlike but related fractions.

Fractions ... add, subtract.

Unlike fractions have different denominators.

To subtract unlike fractions:

- convert to common denominators
- subtract the numerators, enter total
- use the common denominator

EXAMPLE: $\frac{10}{3} - \frac{9}{9} = \frac{1}{9}$

Subtract the fractions.

$$\frac{10}{3} - \frac{9}{9} = \frac{\square}{\square}$$

Enter the answers, click check.

addition subtraction

score 0

Topic: **Fractions**

Activity: **Rainforest Maths – Level G – Fractions**

Select 'more' to see examples with unlike but related fractions. This task shows pupils how to convert fractions so they have a common denominator before subtracting them.

Small step: Subtract 2 Mixed Numbers

Subtract the fractions.

$$9 \frac{1}{2} - 2 \frac{1}{7} = 9 \frac{7}{14} - 2 \frac{2}{14}$$

$$= 7 \frac{5}{14}$$

addition subtraction

Back

Topic: **Fractions**

Activity: **Subtract Unlike Mixed Numbers**

Pupils first convert the mixed numbers into like fractions before subtracting the wholes and the parts.

Small step: Multiply by an Integer (2)

Calculate the following:

$$4 \times \frac{2}{3} = \frac{4 \times 2}{3}$$

$$= \frac{8}{3}$$

Now see the maths.

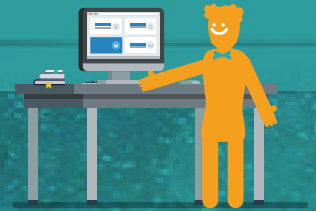
$$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{8}{3}$$

Back

Topic: **Fractions**

Activity: **Fraction by Whole Number**

Pupils are encouraged to use repeated addition or multiplication facts to multiply a non-unit fraction by a whole number.



Calculating – multiplying fractions by whole numbers

We can use repeated addition to multiply fractions by whole numbers.

$$3 \times \frac{2}{8} \longrightarrow 3 \text{ lots of two eighths is } \frac{2}{8} + \frac{2}{8} + \frac{2}{8} = \frac{6}{8}$$

$$3 \times \frac{2}{8} = \frac{6}{8}$$

1 Use repeated addition to multiply these fractions. Show each of the steps:

a $3 \times \frac{3}{12}$
 $= \frac{3}{12} + \frac{3}{12} + \frac{3}{12}$
 =

b $3 \times \frac{2}{7}$

c $5 \times \frac{1}{8}$

d $3 \times \frac{2}{9}$

eBook, G series: Fractions, Decimals and Percentages, page 32

Multiplying a non-unit fraction by a whole number is shown as repeated addition and then followed by a series of exercises for pupils to practise applying their understanding. Some questions involve pupils having to explain their thinking and say whether calculations are correct or incorrect and why.

Calculating – multiplying fractions by whole numbers

There is another way to multiply fractions by whole numbers. Look at $3 \times \frac{3}{5}$.

We have 3 lots of three fifths. We can express this as $\frac{3 \times 3}{5} = \frac{9}{5}$.

We don't multiply the fifths because these don't change – we still have fifths.

2 Multiply these fractions by whole numbers. Express the answers as improper fractions:

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

b $4 \times \frac{2}{3}$
 \times =

c $5 \times \frac{2}{4}$
 \times =

d $3 \times \frac{3}{6}$
 \times =

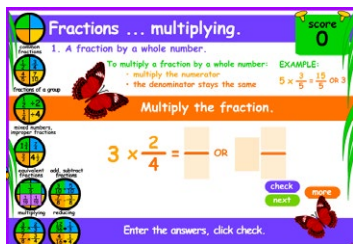
e $2 \times \frac{4}{5}$
 \times =

f $5 \times \frac{2}{3}$
 \times =

Our answers are all improper fractions. How do we convert these to mixed numbers?
 Look at $\frac{9}{5}$. This is nine quarters.
 To change this to a mixed number we divide the numerator by the denominator:
 $9 \div 4 = 2$ with 1 quarter left over. $\frac{9}{4}$ is the same as $2\frac{1}{4}$.

eBook, G series: Fractions, Decimals and Percentages, page 33

Multiplying a non-unit fraction by a whole number is shown with the numerator multiplied by the whole number and the denominator remaining the same. Where the answer is an improper fraction, pupils are prompted to change this to a mixed number.



Rainforest Maths – Level G – Fractions

The page explains how to multiply a fraction by a whole number and provides examples for pupils to work through. If an incorrect answer is entered, pupils are shown it is wrong and can then work the answer out again, enter it and check.

Small step: Multiply by an Integer (3)

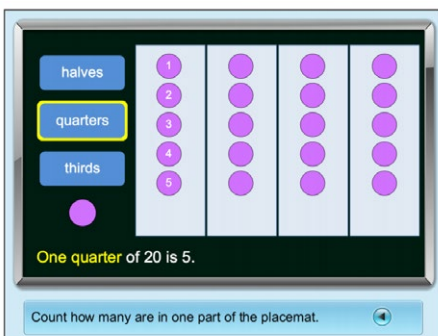
To multiply a mixed number by a whole number, first convert the mixed number into an improper fraction, then multiply the numerator by the whole number and, finally, divide the total by the denominator.

$$1\frac{3}{4} \times 2 = \frac{7}{4} \times 2 = \frac{14}{4} = 3\frac{1}{2}$$

eBook, F series: Fractions, Decimals and Percentages, page 13

The explanation on this page shows pupils how to first convert the mixed number into an improper fraction before multiplying the numerator by the whole number and then rewriting the new fraction as a mixed number.

Small step: Fraction of an Amount



Topic: Fractions

Activity: Fraction of a Collection 2

Pupils find unit and non-unit fractions (halves, quarters, thirds, fifths and eighths) of amounts using visual representatives for support.

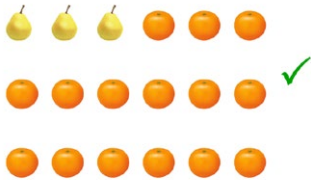


Year 5 White Rose Maths (WRM) Spring Scheme of Learning, 2018

Mathletics

Show 18 pieces of fruit where:

- $\frac{1}{6}$ of the total is made up of pears
- the rest is made up of oranges



Topic: Fractions

Activity: *Fraction Fruit Sets 2*

Pupils can click to create sets of objects to help them solve problems that involve finding unit and non-unit fractions of amounts.

Fractions of an amount – finding fractions

Once we know how to find one part of a group, we can use this to find other fractional amounts:

To find $\frac{2}{3}$ of 9, we first find $\frac{1}{3}$ of 9 $\rightarrow 9 \div 3 = 3$ $\frac{1}{3}$ of 9 = 3
 $\frac{2}{3}$ of 9 is 2 times this $\rightarrow 2 \times 3 = 6$ $\frac{2}{3}$ of 9 = 6

1 Find the following fractional amounts:

a. $\frac{2}{4}$ of 12 = b. $\frac{5}{6}$ of 30 = c. $\frac{3}{4}$ of 24 =

d. $\frac{3}{8}$ of 96 = e. $\frac{9}{10}$ of 20 = f. $\frac{3}{5}$ of 350 =

eBook, G series: Fractions, Decimals and Percentages,
pages 20–21

Pupils are shown the relationship between finding a fraction of an amount and division. Page 20 begins with unit fractions.

On page 21 pupils work through an exercise and then apply their understanding to problems which involve working out fractions of amounts of time.



Examples of alignment to Mathletics

Block 3 (Weeks 10–11) Number: Decimals and Percentages

National Curriculum Objectives	WRM Small Steps
<ul style="list-style-type: none"> ▶ Read, write, order and compare numbers with up to three decimal places. ▶ Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. ▶ Round decimals with two decimal places to the nearest whole number and to one decimal place. ▶ Solve problems involving number up to three decimal places. ▶ Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal. ▶ Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25. 	<ul style="list-style-type: none"> ▶ Decimals up to 2 d.p ▶ Decimals as Fractions (1) ▶ Decimals as Fractions (2) ▶ Understand Thousandths ▶ Thousandths as Decimals ▶ Rounding Decimals ▶ Order and Compare Decimals ▶ Understand Percentages ▶ % as Fractions & Decimals ▶ Equivalent FDP

Small step: Decimals up to 2 d.p

Topic: **Decimals and Percentages**

Activity: *Decimal Place Value*

Pupils use their knowledge of decimal place values to determine which digit is in the tenths or hundredths place.

Topic: **Decimals and Percentages**

Activity: *Decimals from Words to Digits 1*

Pupils read a decimal number (tenths or hundredths) written in words and record the number using digits.



Year 5 White Rose Maths (WRM) Spring Scheme of Learning, 2018



Small step: Decimals as Fractions (1)

Complete the missing information:

a. $\frac{43}{100} = \frac{4}{10} + \frac{3}{100}$

b. $\frac{74}{100} = \frac{7}{10} + \frac{4}{100}$

c. $\frac{27}{100} = \frac{2}{10} + \frac{7}{100}$

d. $\frac{56}{100} = \frac{5}{10} + \frac{6}{100}$

eBook, F series: [Fractions, Decimals and Percentages](#), pages 20 and 21

In these pages the relationship between fractions expressed as tenths and hundredths and decimal notation is modelled and explained. Exercises then provide practice for pupils to reinforce their learning.

Small step: Decimals as Fractions (2)

Write the decimal as a fraction in simplest form.

$0.74 = \frac{74}{100}$

Hundredths

Topic: [Decimals and Percentages](#)

Activity: [Convert Decimals to Fractions 2](#)

In this activity, pupils convert decimals to 2 decimal places to fractions. Some of the questions require simplification.

Decimals ... reading & writing score 1

Fractions can be written as decimals. A decimal point is used to separate the whole number from the decimal fraction.

EXAMPLE: 1.25

whole	tenths	hundredths
1	2	5

one point two five

check next

Enter the numbers in the boxes.

[Rainforest Maths – Level F – Decimals](#)

Pupils are shown the visual of a hundred square representing a whole, with a part-shaded square representing a fraction of the whole in tenths and hundredths.

Pupils record the fraction shown as a decimal to 2 decimal places.

Small step: Understand Thousandths

Convert to a fraction in simplest terms:

$0.074 = \frac{74}{1000}$

Thousandths

Topic: [Decimals and Percentages](#)

Activity: [Decimals to Fractions 2](#)

This activity encourages pupils to convert decimals to 3 decimal places to fractions. Some questions require simplification.

Small step: Thousandths as Decimals

Fractions, decimals and percentages – place value to thousandths

A thousandth is a tenth of a hundredth.

Ones	Tenths	Hundredths	Thousandths
2	.	2	5

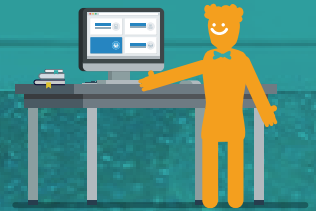
This number has 2 ones, 2 tenths, 5 hundredths and 6 thousandths.

Write these numbers in the place value chart:

	Thousands	Hundredths	Tenths	Ones	Hundredths	Thousandths
a. 5 tens, 3 ones and 8 tenths			8	3		
b. 7 hundredths, 8 tenths, 4 ones, 2 tenths and 3 hundredths			2	4	8	3
c. 9 tenths, 8 tenths and 4 thousandths			8	9		4
d. 6 hundredths, 8 tenths, 4 hundredths and 3 thousandths			8	0	6	3
e. 4 ones, 9 tenths and 8 hundredths			9	4		8
f. 3 ones, 4 tenths and 2 hundredths			4	3		2
g. 2 tens, 3 ones, 4 hundredths and 6 thousandths				3	4	6
h. 8 thousandths						8

eBook, F series: [Fractions, Decimals and Percentages](#), page 22

Thousandths are introduced and modelled on a place value chart. The importance of zero as a place holder is shown. Pupils input digits into the correct columns on a decimal place value chart to represent numbers written in words.



Decimal fractions – reading and writing decimals

When we write decimals we follow this place order:

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
			2	2	5	6

Numbers **before** the decimal point are whole numbers.
Numbers **after** the decimal point are parts of a whole number.
The further the digit is to the left in the number, the greater its value. The further it is to the right, the smaller its value.

1 What is the value of the digit in bold? Tick the correct column:

	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
a 5.8 9							
b 13.0 8							
c 750.2 2							
d 800.2 1							
e 100.00 1							
f 560.4 5							

eBook, G series: Fractions, Decimals and Percentages, page 13

Pupils' understanding of thousandths as a decimal is reinforced using a place value chart. Pupils input numbers up to 3 decimal places on the chart.

Decimals ... thousandths. score 0

Fractions can be written as decimals. A decimal point is used to separate the whole number from the decimal fraction.

Thousands	Hundreds	Tens	Ones	Point	Tenths	Hundredths	Thousandths
9	4	8	.	2	3	9	
				10	100	1000	

Write the number shown above as a decimal below, e.g. 628.356

Thousands	Hundreds	Tens	Ones	Point	Tenths	Hundredths	Thousandths
				.			

Read the decimal. check next

Enter the numbers in the boxes.

Rainforest Maths – Level F – Decimals

This page shows pupils how tenths, hundredths and thousandths can be represented as decimals on a place value chart. Pupils input their answers onto the blank place value chart to apply their understanding of place value.

Small step: Rounding Decimals

Round to the given place value.

Number = 46.54

Locate the key digit.

Nearest tenth =

Hint: If the key digit is 4 or less round down.

Back Next

Topic: Decimals and Percentages

Activity: Rounding Decimals 1

Pupils round numbers to 2 decimal places to the nearest whole or tenth by identifying the key digit and deciding whether to round up or down.

Fractions, decimals and percentages – rounding decimals

Rounding decimals follows the same rules as rounding any number: if the key digit is between 1 and 4 you round down; if it is between 5 and 9 you round up.

The key digit will be the one to the right of the digit to which you are rounding. If you are rounding a number to the nearest one, you focus on the 'tenths' digit; if rounding to one decimal place (the nearest tenth), then the 'hundredths' digit is the key one. So:

3.48 rounded to the nearest one is 3 as the '4' rounds down.
3.48 rounded to one decimal place is 3.5 as the '8' rounds up.

1 Round the following numbers to the nearest one:

a 4.29 b 8.72 c 27.51

d 75.48 e 999.52 f 7,687.78

eBook, F series: Fractions, Decimals and Percentages, page 25

An explanation of how to round a decimal to the nearest whole number or tenth is given, followed by exercises to practise this concept.

Small step: Order and Compare Decimals

0.8 > 0.12

less than equal to greater than

Write in the correct symbol.

0.8 0.12

0.8 is greater than 0.12.

Back

Topic: Decimals and Percentages

Activity: Decimal Order 1

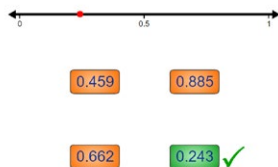
Pupils compare tenths and hundredths and select the correct 'greater than', 'less than' or 'equal to' symbol to represent the comparison.



Year 5 White Rose Maths (WRM) Spring Scheme of Learning, 2018

Mathletics

Which decimal is indicated on the number line?



Topic: **Decimals and Percentages**

Activity: *Decimals on a Number Line*

In this activity, pupils need to visualise the number line segmented into tenths and select the decimal that represents the point on the number line (up to 3 decimal places).

Which is largest?

0.935 0.87 0.94 0.3

Topic: **Decimals and Percentages**

Activity: *Comparing Decimals*

Pupils begin by comparing 2 decimals to identify the largest decimal before comparing 3, then 4 decimals (including tenths, hundredths and thousandths).

Fractions, decimals and percentages – ordering decimals to 3 decimal places

To compare and order decimals, always start by looking at the digit on the left side of the number. For example, if we want to know which is bigger 5.2 or 3.9, we look at the left digit in each number and can see that 5 is bigger than 3, so 5.2 is bigger than 3.9.
We only need to look at the next digit if the first is the same. So if we are comparing 7.66 and 7.83, we can see that the first digits in each number are the same, so we need to compare the following digits. As 8 is bigger than 6, we know that 7.8 is bigger than 7.6. The third digit doesn't matter. If the first two digits are the same, then you need to move on to compare the third, and so on.

1 Order these decimals from smallest to largest:

a 5.04 4.03 3.34 3.45 3.4

--	--	--	--	--	--

b 7.673 7.376 7.637 7.763 7.736

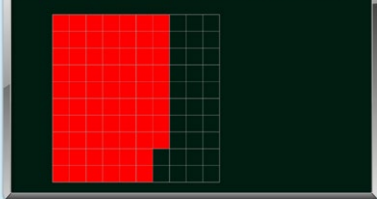
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eBook, F series: **Fractions, Decimals and Percentages, pages 23–24**

Page 23 begins with comparing decimals. The following page expands the concept to the ordering of decimals, reminding pupils to look at the digits on the left first.

Small step: % as Fractions & Decimals

What percentage of this hundred square is shaded?



A percentage is another way of showing part of a whole.

Topic: **Decimals and Percentages**

Activity: *Modelling Percentages*

In this activity, pupils count the number of squares that are shaded or unshaded on a hundred square and write this as a percentage.


Fractions, decimals and percentages – percentages


Percent means part per hundred and is expressed using the symbol %.
Here, 50% has been shaded grey.
It is the same as 50 hundredths. $\frac{50}{100} = 0.50 = 50\%$





1 Think of at least five times you see the % sign or use percentages:

2 Fill in the missing values and shade the grids:

a  $\frac{50}{100}$ 0.5 %

b  $\frac{30}{100}$ 0.3 %

c  $\frac{80}{100}$ 0.8 %

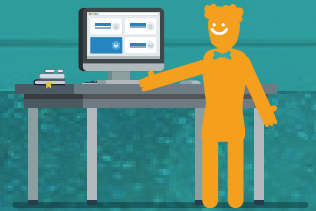
d  $\frac{25}{100}$ 0.25 %

eBook, F series: **Fractions, Decimals and Percentages, page 26**

Percentages are explained and modelled, showing the relationship between fractions with a denominator of 100, decimals and percentages.

Pupils are encouraged to think about when they have seen percentages in everyday use.

Exercises develop pupils' understanding of the concepts, using a shaded hundred square as a visual representation.



Percentages ... about. score 5

A percentage is a number out of a hundred. It is another way of writing a fraction that has a denominator of 100.
EXAMPLE: 50% means $\frac{50}{100}$ or $\frac{1}{2}$.

The symbol for percent is %.

percent	hundredths	common fraction
40%	$\frac{40}{100}$	$\frac{2}{5}$

Complete the fractions, click check.

Rainforest Maths — Level F — Percentages

This page shows pupils the relationship between tenths, hundredths, and percentages. The visual of a hundred square shaded is used to show percentages. Pupils look at the shaded square and record the percentage and the fraction in hundredths and then as an equivalent common fraction.

Small step: Equivalent FDP

Complete the missing values in the table.

Fraction	Percentage	Decimal
$\frac{1}{5}$	20%	0.2

Topic: Decimals and Percentages

Activity: Mixed decimal, percentage and fraction conversions

In this activity, pupils identify the equivalent fraction, decimal and percentage. Simplified fractions must be used. The support area provides a list of common fraction, decimal and percentage conversions. Pupils may need reminding to enter the percentage symbol.

Fractions, decimals and percentages – percentages

It is useful to know some common percentages such as 25%, 50% or 75%.

Shade the grids and show the following fractions by completing the missing information:

a	b	c	d
$\frac{1}{2}$ 0.25 25%	$\frac{1}{2}$ 0. %	$\frac{3}{4}$ 0. %	$\frac{4}{4}$. %

eBook, F series: Fractions, Decimals and Percentages, page 27

Pupils are introduced to common fractions (with denominators other than 100) as percentages. Visual models provide support for the conversion between fractions, decimals and percentages.

Playing Cards

$\frac{75}{100}$	25%	$\frac{3}{4}$	$\frac{1}{4}$
0.5	0.25	$\frac{1}{2}$	50%
0.1	$\frac{1}{10}$	10%	0.75

eBook, F series: Fractions, Decimals and Percentages, page 30

In this 'Snap' like game, pupils match cards with equivalent fractions, decimals and percentages. A set of blank cards are also provided so that pupils create their own equivalent fractions, decimals and percentages cards to challenge their partner.



Year 5 White Rose Maths (WRM) Spring Scheme of Learning, 2018

Mathletics

Live Mathletics

The screenshot shows two panels of math problems from the Live Mathletics platform. The left panel is titled 'What's in level 4?' and contains eight problems in a 4x2 grid. The right panel is titled 'What's in level 5?' and contains eight problems in a 4x2 grid. Each problem is in a light blue box with an input field and a 'Check' button.

What's in level 4?

Addition from 1 - 100 $35 + 30 + 10 = ?$ <input type="text"/> <input type="button" value="Check"/>	Subtraction from 1 - 100 $30 - 6 = ?$ <input type="text"/> <input type="button" value="Check"/>
Times tables to 10×10 $8 \times 6 = ?$ <input type="text"/> <input type="button" value="Check"/>	Doubles and halves up to 100 Half of 96 = ? <input type="text"/> <input type="button" value="Check"/>
2s, 3s, 4s, 5s and 10s division facts $30 \div 3 = ?$ <input type="text"/> <input type="button" value="Check"/>	Addition from 1 - 50 with a missing addend $25 + ? = 50$ <input type="text"/> <input type="button" value="Check"/>
Times tables to 10×10 with a missing factor $7 \times ? = 49$	

What's in level 5?

Addition from 1 - 500 $20 + 40 + 35 = ?$ <input type="text"/> <input type="button" value="Check"/>	Subtraction from 1 - 100 $15 - 3 = ?$ <input type="text"/> <input type="button" value="Check"/>
Addition from 1 to 100 with a missing addend $30 + ? = 100$ <input type="text"/> <input type="button" value="Check"/>	All multiplication and division facts to 10×10 $10 \times 7 = ?$ <input type="text"/> <input type="button" value="Check"/>
Time conversions How many seconds in 8 minutes ? <input type="text"/> <input type="button" value="Check"/>	Length conversions $? \text{ mm} = 98\text{m}$ <input type="text"/> <input type="button" value="Check"/>

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

To support progress in Year 5, encourage pupils to use **Level 4 and 5** 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!



powered by



3P Learning

For more information about Mathletics,
contact our friendly team.



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