



# Year 5 White Rose Maths Hub (WRMH)

## Autumn Scheme of Learning, 2017

### 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 Hub scheme of learning available on the TES website.

[www.tes.com/teaching-resource/wrm-schemes-of-learning-years-1-to-6-block-1-place-value-11652624](http://www.tes.com/teaching-resource/wrm-schemes-of-learning-years-1-to-6-block-1-place-value-11652624)





# Year 5 White Rose Maths Hub (WRMH) Autumn Scheme of Learning, 2017

Mathletics

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## Purpose:

The aim of this document is to support Mathletics teachers, who use the WRMH scheme 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 WRMH 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 has been added to the document.

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

### Course selection:

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

### England Yr 05 WRMH Autumn Aligned



Data-Driven  
Teaching and  
Learning



Differentiation



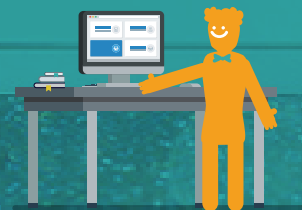
Feedback and  
Reflection



Student Growth



Blended  
Learning



## Examples of alignment to Mathletics

### Weeks 1-3 Number: Place Value

National Curriculum Objectives	WRMH Small Steps
<ul style="list-style-type: none"> <li>▶ Read, write, order and compare numbers to at least 1000000 and determine the value of each digit.</li> <li>▶ Count forwards or backwards in steps of powers of 10 for any given number up to 1000000.</li> <li>▶ Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero.</li> <li>▶ Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000.</li> <li>▶ Solve problem problems and practical problems that involve all of the above.</li> <li>▶ Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Number to 10,000</li> <li>▶ Roman numerals to 1,000</li> <li>▶ Round to the nearest 10, 100 and 1,000</li> <li>▶ Number to 100,000</li> <li>▶ Compare and order numbers to 100,000</li> <li>▶ Round numbers within 100,000</li> <li>▶ Numbers to a million</li> <li>▶ Counting in 10s, 100s, 1,000s, 10,000s and 100,000s</li> <li>▶ Compare and order numbers to a million</li> <li>▶ Round numbers to a million</li> <li>▶ Negative numbers</li> </ul>

## Small step: Roman numerals to 1,000

[Convert to Roman Numerals.](#)

68	LXVIII	✓
Hindu-Arabic numeral	Roman numeral	
Select: <input type="text" value="I"/> <input type="text" value="V"/> <input type="text" value="X"/> <input type="text" value="L"/> <input type="text" value="C"/> <input type="text" value="D"/> <input type="text" value="M"/>		

Topic: Number and Place Value

Activity: *Converting to Roman Numerals to 1000*

Support explains the value of symbols for Roman numerals and how the system works. Activity engages pupils in converting to Roman numerals. Adaptive activity begins with 2-digit numbers and progresses to 3-digit numbers.

Activity: *Converting from Roman Numerals to 1000*

Pupils state the number that relates to the Roman numeral shown.

Looking at whole numbers – Roman numerals

So far we have learnt the first five Roman numerals:

$$I = 1 \quad V = 5 \quad X = 10 \quad L = 50 \quad C = 100$$

Unlike our Hindu-Arabic number system, there is no place value in Roman numbers.

Most Roman numbers are expressed by starting with the largest numeral and then adding smaller ones until you reach the number you require. So, to show 77, you start with 50 (L), then write two tens (XX), then one five (V) and finally two ones (II), giving you

102518

The only exceptions to this structure is that four numerals the same are not allowed together. Instead, you write the smaller numeral before the larger to show 'less than'. Thus, 4 is not 'IIII' but 'IV' (though you will see 'IIII' on some clock faces), 40 is not 'XXXX' but 'XL' and 90 is not 'LXXXX' but 'XC'.

The two remaining Roman numerals are:

D = 500    M = 1,000



## Roman numerals.

The Roman numeral system was invented by the ancient Romans. Different symbols are used to show hundreds, tens and ones.

Hundreds	Tens	Ones
one hundred = C	ten = X	one = I
two hundred = CC	twenty = XX	two = II
three hundred = CCC	thirty = XXX	three = III
four hundred = CD	forty = XL	four = IV
five hundred = D	fifty = L	five = V
six hundred = DC	sixty = LX	six = VI
seven hundred = DCC	seventy = LXX	seven = VII
eight hundred = DCCC	eighty = LXXX	eight = VIII
nine hundred = CM	ninety = XC	nine = IX



Thousands | Hundreds | Tens | Ones

MMI   CM   LXXX   VII

3988 = MMI~~CM~~LXXXVIII

3988

Convert

Roman Numerals Converter

Enter a number between 1 and 1000 in the box.

Click convert

Convert



Roman numerals are often used to show the year a movie was produced or in the titles of some websites and books.



Roman numerals quiz

eBook, F series: Number and place Value, page 9

Explains and models examples of Roman numerals beyond 1,000.

### Exercises to convert to and from Roman numerals.

Rainforest Maths— Level F — Numbers: Roman numerals

Explains and models Roman numerals up to 9,999.

Click on the Roman numerals quiz for more practice.



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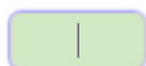
Mathletics

Small steps:

- Round to the nearest 10, 100 and 1,000
- Round numbers within 100,000
- Round numbers to a million

50,834

Number



Nearest thousand

Topic: **Number and Place Value**

Activity: **Rounding Numbers**

Pupils round numbers to the nearest 10, 100 and 1,000.

Round and estimate – estimate

We use estimating when we want an approximate answer to a calculation. Rounding helps us do this. We round numbers so we can work with them more easily in our heads.  
Look at  $333 + 521$ .  
Rounded to the nearest 10, they are 330 and 520.  
 $330 + 520 = 850$   
Therefore  $333 + 521$  is approximately 850.

eBook, F series: **Number and Place Value**, page 20+

Explains rounding and the concept of estimating.

Exercises to practise the concept, followed by some trickier problems to explore.

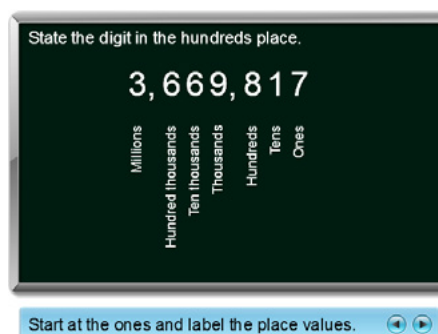


Rainforest Maths- Level F- Number – Rounding to nearest 10, 100 and 1000

Activity to practise rounding to nearest 10, 100 or 1,000.

Small steps:

- Number to 10,000
- Number to 100,000
- Numbers to a million



Topic: **Number and Place Value**

Activity: **Place Value to Millions**

Support shows pupils the value of each digit. The exercise is adaptive and pupils identify the value of digits up to a million.

Express in expanded notation

65,194

60000 + 5000 + 100 + 90 + 4



Topic: **Number and Place Value**

Activity: **Expanded Notation**

Pupils partition 5-digit numbers into 10,000s, 1000s, 100s, 10s and 1s.



### Looking at whole numbers – read and write numbers to 999,999

For five- and six-digit numbers, we say the digits representing the thousands together, followed by the hundreds, tens and units.

100 Thousands	10 Thousands	Thousands	Hundreds	Tens	Ones
5	2	3	7	9	4

five hundred and twenty three thousand seven hundred and ninety four

When writing numbers in the thousands, we usually separate off the thousands digits with a comma. So, the number above would be written: **523,794**

#### 4 Express the following in numerals:

- a thirty two thousand four hundred and one

eBook, F series: Number and Place Value, page 2

Explanation and exercises to secure understanding of place value for numbers to 999,999.

### Small steps:

- Compare and order numbers to 100,000
- Compare and order numbers to a million

### Looking at whole numbers – create and compare numbers

#### 1 Use the following digits to make:

1	7	3	6	4
---	---	---	---	---

- a The highest number  b The lowest odd number

eBook, F series: Number and Place Value, page 4

Exercises to practise ordering numbers to 999,999.

### Looking at whole numbers – order numbers to 999,999

When ordering numbers, we need to pay close attention to the position and value of each digit. Which is the largest? 6,093 3,069 3,960 6,039

#### 1 Circle the larger number:

- a 8,434 / 8,340 b 5,492 / 5,692 c 17,915 / 17,150

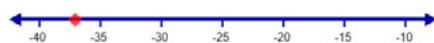
eBook, F series: Number and Place Value, page 6

Exercises to secure understanding of comparing, creating and ordering numbers to 999,999.



Rainforest Maths – Level F: Number to 999 999 – Order Activities to order three 6-digit numbers.

### Small step: Negative numbers



The number shown is **-37** . ✓

Topic: Number and Place Value

Activity: *Integers on a Number Line*

Pupils identify positive and negative numbers on a number line.

### Looking at whole numbers – negative numbers

Whole numbers don't start from 0. We can also have negative whole numbers.



The most common use of negative numbers in real life is when discussing temperatures. Water freezes at 0°C, so 2 degrees below freezing is -2°C.

Sometimes you will hear negative numbers referred to as 'minus' numbers, but to avoid confusion with subtraction, it is clearer to describe, say, '-4' as negative 4 rather than 'minus 4'.

eBook, F series: Number and Place Value, page 8

Explains and shows negative numbers on a number line.

Includes exercises to reinforce the concept.



# Year 5 White Rose Maths Hub (WRMH) Autumn Scheme of Learning, 2017

Mathletics

**Positive and negative numbers.**

**negative**  
Negative numbers are numbers less than zero. They are written with a - sign.  
less than zero

**0**  
Zero is neither positive or negative.

**positive**  
Positive numbers are numbers greater than zero. They are sometimes written with a + sign.  
more than zero

-10 -8 -6 -4 -2 0 2 4 6 8 10

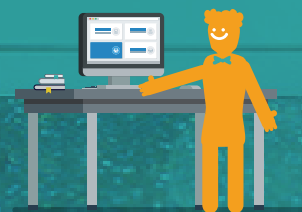
choose

Make positive and negative number patterns.

## Rainforest Maths — Level F — Number: Positive and Negative Numbers

Enables pupils to see counting patterns along a number line, going back past zero.





### Examples of alignment to Mathletics

#### Weeks 4–5 Number: Addition and Subtraction

National Curriculum Objectives	WRMH Small Steps
<ul style="list-style-type: none"> <li>▶ Add and subtract numbers mentally with increasingly large numbers.</li> <li>▶ Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</li> <li>▶ Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Add whole numbers with more than 4-digits (column method)</li> <li>▶ Subtract whole numbers with more than 4-digits (column method)</li> <li>▶ Round to estimate and approximate</li> <li>▶ Inverse operations (addition and subtraction)</li> <li>▶ Multi-step addition and subtraction problems</li> </ul>

When assigning activities with addition and subtraction calculations that do not have spaces for recording any regroupings, consider getting pupils to record the calculation in their Maths books, then answer the question on Mathletics. Pupils can then self-mark their work after each question, receiving instant feedback to support their learning. If they realise they have made a mistake they can do the correction in their book immediately. In Mathletics, pupils will be shown the correct answer. If they cannot see where they have gone wrong in their calculations they can access the support button in the activity and it will take them through the exact question they have just answered incorrectly.

Encourage students to use the strategies they are being taught in class and to use manipulatives if needed.

If they are not recording in their Maths books, it is necessary that pupils have whiteboards or other means of recording so that they can record their working out and use the strategies they are learning in class.

With most activities, including these calculation activities, questions are generated from a pool of questions allowing students to complete the activities more than once without getting the same set of questions.

#### Small step: Add whole numbers with more than 4-digits (column method)

$$\begin{array}{r}
 7,955 \\
 + 469 \\
 \hline
 8,424 \quad \checkmark
 \end{array}$$

Topic: **Addition and Subtraction**

Activity: ***Adding Colossal Columns (UK)***

This adaptive activity works through adding 3 digits and moves on to adding 4 digits, with examples that involve exchanging.





# Year 5 White Rose Maths Hub (WRMH) Autumn Scheme of Learning, 2017

Mathletics

**Subtraction ... to 99 999**  
With regrouping (trading, exchanging or borrowing).

ttth	th	h	t	o
		5	14	14
8	7	6	5	4
3	5	5	8	5

Work from right to left.  
When the top number is smaller than the bottom number you have to REGROUP. When this happens, subtract from the coloured numbers.  
Enter answers here.  
check as you go.  
next

## Rainforest Maths — Level F — Addition

Exercises for pupils to practise addition with numbers up to 5 digits, both with and without regrouping.

Ten Thousands	Thousands	Hundreds	Tens	Ones
1	8	9	8	6
+	5	8	9	7
<hr/>				
<hr/>				

Topic: **Addition and Subtraction**

Activity: **Add Multi-Digit Numbers 2 (UK)**

Pupils perform addition of two numbers with minimum 4 digits. Exchanges always required.

## Small step: Subtract whole numbers with more than 4 digits (column method)

Thousands	Hundreds	Tens	Ones
7	9	7	8
-	6	7	9
<hr/>			
7	2	9	9

Subtract the digits in the thousands column.

Topic: **Addition and Subtraction**

Activity: **Subtracting Colossal Columns (UK)**

This adaptive activity works through subtraction requiring exchange with two 3-digit numbers before moving on to 4-digit numbers.

**Subtraction ... to 99 999**  
No regrouping (trading, exchanging or borrowing).

ttth	th	h	t	o
4	8	5	9	1
-	3	3	5	3
<hr/>				

check  
next

## Rainforest Maths — Level F: Subtraction

Exercises for pupils to practise subtraction with numbers up to 99,999 without exchanges and then with exchanges.

**Subtraction ... to 99 999**  
With regrouping (trading, exchanging or borrowing).

ttth	th	h	t	o
		5	14	14
8	7	6	5	4
3	5	5	8	5

Work from right to left.  
When the top number is smaller than the bottom number you have to REGROUP. When this happens, subtract from the coloured numbers.  
Enter answers here.  
check as you go.  
next



### Small step: Round to estimate and approximate

$$782 + 952 \approx$$

1,400

1,800

1,600

1,300

Hint:  
Round each number  
to the nearest  
hundred.

Topic: **Addition and Subtraction**

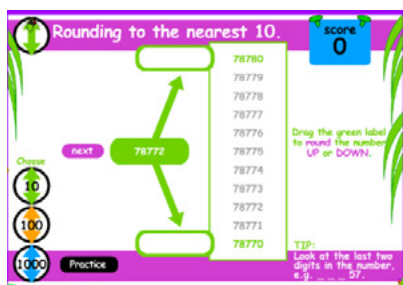
Activity: **Estimate Sums**

Pupils use rounding to help them estimate the answer to additions with larger numbers.

Further Activities:

**Estimate Differences**

**Estimation: Add and Subtract**



**Rainforest Maths — Level F — Rounding**

Activities for pupils to practise rounding to the nearest 10, 100 and 1,000. Layout reinforces concept of rounding.

### Small step: Multi-step addition and subtraction problems

#### Applying strategies – choosing when to add or subtract

Sometimes we come across problems that require us to both add and subtract or to make a choice between which one to use. Understanding key language terms can help with this decision.

- 1 Below are some terms you come across in addition and subtraction word problems. Colour any terms that ask you to add in red. Colour any terms that ask you to subtract in green.

Find the difference between ...    What is the total?    minus  
Who has less?    How many altogether?    Who has more?  
Find the difference between ...    How many more ... than ...?    plus ...

- 2 Stel and Marly's parents give each of them £10 pocket money each week. They must use some of it to buy their lunch from the school canteen every Friday.

**eBook, G series: Addition and Subtraction, page 15**

Explores the vocabulary of word problems that help pupils to decide whether a problem requires addition or subtraction.

Problem solving exercises include putting addition and subtraction into real-life scenarios.

#### Written methods – word problems

Some word problems have more than one step and may involve more than one type of operation. Look at this problem:

Tarik scored 10,357 points on level 1 of his new game. He then scored 9,321 points on level 2 but had a 3,000 point penalty for being slow. How many points did he have in total on the two levels?

Can you see which operations you need to do to solve this problem?

You need to add the points totals for the two levels, but then subtract the penalty points.

	T	H	H	T	O	
	1	0	3	5	7	
+		9	3	2	1	
	1	9	6	7	8	

$$19,678 - 3,000 = 16,678$$

- 3 Solve these 2-step word problems:

- It is a 5,576-kilometre flight from London to New York. From New York to Los Angeles is 3,940 kilometres. If a plane has enough fuel to go 10,000 kilometres, could it get to Los Angeles from London without stopping? If so, how many kilometres-worth of fuel would it have left in its tanks when it lands?

**eBook, F series: Addition and Subtraction, page 25**

Explains and gives examples of two-step problems.

Includes exercises for pupils to practise two-step addition and subtraction problems.



# Year 5 White Rose Maths Hub (WRMH) Autumn Scheme of Learning, 2017

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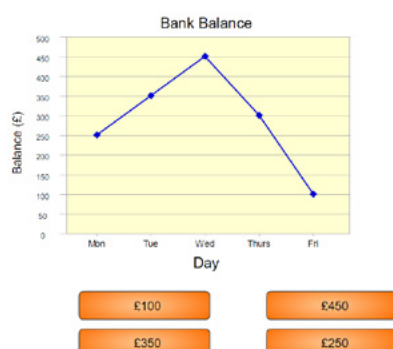
## Examples of alignment to Mathletics Weeks 6-7 Statistics

National Curriculum Objectives	WRMH Small Steps
<ul style="list-style-type: none"> <li>Solve comparison, sum and difference problems using information presented in a line graph.</li> <li>Complete, read and interpret information in tables including timetables.</li> </ul>	<ul style="list-style-type: none"> <li>Read and interpret line graphs</li> <li>Draw line graphs</li> <li>Use line graphs to solve problems</li> <li>Read and interpret tables</li> <li>Two way tables</li> <li>Timetables</li> </ul>

### Small steps:

- Read and interpret line graphs
- Draw line graphs
- Use line graphs to solve problems

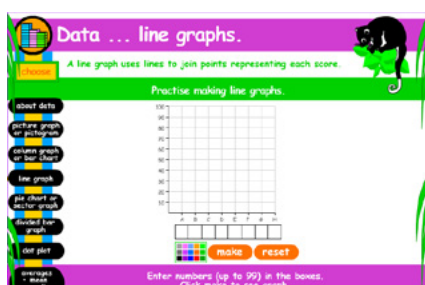
What was the bank balance on Monday?



Topic: **Statistics**

Activity: **Line Graphs: Explanation**

Read and interpret information in a line graph. Some of the questions in this activity do include finding the range but it is well scaffolded through the support.



Rainforest Maths — Level F — Data

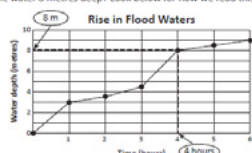
Explores pictograms, bar graphs, pie charts and line graphs.

Pupils can input data to construct a line graph.

### Line graphs – reading line graphs

Line graphs show how something changes over time in relation to something else. In this topic, we'll look at different examples of line graphs. Look at the line graph below. See how the more time passed, the higher the water got?

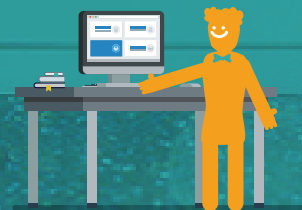
In which hour was the water 8 metres deep? Look below for how we read this information:



eBook, F series: **Statistics**, page 9

Explains how to read and also construct line graphs.

Includes exercises to practise finding information from line graphs and constructing graphs.



### Small step: Read and interpret tables

Collecting and analysing data – frequency tables

Raw data is often collected in a frequency table. Tally marks are a quick way to record numbers. When we're finished, we add the marks to find totals:

Car Types in Car Park	Tally	Frequency
4WD		20
Sedan		17
Station wagon		20
Hatchback		14

1 Charlie sold drinks at the beach for an hour each day. He wrote down the drinks he sold each day:

Monday	Coke	Lemonade	Water	Juice			
Tuesday	Juice	Juice	Coke	Coke			
Wednesday	Water	Juice	Juice	Juice	Coke	Lemonade	

eBook, F series: *Statistics*, page 15

Explains how to read data from a table and gives examples of how tables are used from real-life scenarios. Includes exercises to practise finding information and putting information in a table.

How many children did not choose orange as their favorite color?

Color	Boy	Girl
Red	4	2
Purple	5	2
Yellow	2	5
Blue	4	3
Green	3	5
Orange	3	5

Topic: *Statistics*

Activity: *Interpreting Data Tables*

This activity includes two-step problems requiring careful reading and interpreting of the table.

### Small step: Timetables

How long does it take to travel from Cambridge to Turtle Street?

TIMETABLE	
Cambridge	3:20
St Peter's	3:45
Holden	4:21
Turtle Street	4:58
Richmond	5:22
Davidson	5:34
Williton	5:46
Quedale	6:08
Fog's Gap	6:20
Trinity	6:34

1 hr 34 min

1 hr 36 min

1 hr 38 min ✓

1 hr 40 min

Topic: *Statistics*

Activity: *Using Timetables*

This adaptive activity begins by asking pupils to locate information on the timetable. It progresses to asking pupils to work out the time that has elapsed between two times on the timetable.



# Year 5 White Rose Maths Hub (WRMH) Autumn Scheme of Learning, 2017

Mathletics

## Examples of alignment to Mathletics

### Weeks 8–9 Number: Multiplication and Division

National Curriculum Objectives	WRMH Small Steps
<ul style="list-style-type: none"> <li>▶ Multiply and divide numbers mentally drawing upon known facts.</li> <li>▶ Multiply and divide whole numbers by 10, 100 and 1000.</li> <li>▶ Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.</li> <li>▶ Recognise and use square numbers and cube numbers and the notation for squared (<math>^2</math>) and cubed (<math>^3</math>).</li> <li>▶ Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.</li> <li>▶ Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.</li> <li>▶ Establish whether a number up to 100 is prime and recall prime numbers up to 19.</li> </ul>	<ul style="list-style-type: none"> <li>▶ Multiples</li> <li>▶ Factors</li> <li>▶ Common factors</li> <li>▶ Prime numbers</li> <li>▶ Square numbers</li> <li>▶ Cube numbers</li> <li>▶ Inverse operations (Multiplication and Division)</li> <li>▶ Multiply by 10, 100 and 1,000</li> <li>▶ Divide by 10, 100 and 1,000</li> <li>▶ Multiply and divide by multiples of 10, 100 and 1,000</li> </ul>

#### Small step: Multiples

Which is not a multiple of 9?

18, 31, 54 and 72

31 is not a multiple of 9.

Place the numbers on the number line.

Topic: **Multiplication and Division**

Activity: ***Multiples***

The support area shows pupils how they can place the multiples of a number on a number line and then use this to check against the numbers in the question.

#### Small step: Factors

Write the factors of the number 66.

Factor pairs:      Factors:

$1 \times 66 = 66$       1, 2, 3, 6, 11, 22, 33, 66

$2 \times 33 = 66$

$3 \times 22 = 66$

$6 \times 11 = 66$

List each factor once. Write the factors in order from least to greatest.

Topic: **Multiplication and Division**

Activity: ***Factors***

The support area models how to list all the factors of a number and then organise the factors into an ordered list.





### Multiplication facts – factors and multiples

Factors are the numbers we multiply together to get to another number:

factor  $\times$  factor = whole number

How many factors does the number 12 have?  $4 \times 3 = 12$ ,  $6 \times 2 = 12$ ,  $1 \times 12 = 12$   
4, 3, 6, 2, 1 and 12 are all factors of 12.

- 1 List the factors of these numbers:

a 18 

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

b 25 

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

c 14 

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

d 9 

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

eBook, F series: Multiplication and Division, page 1

Explains concept of multiples and factors and includes exercises to practise finding multiples and factors.

## Small step: Prime numbers

### Multiplication facts – prime and composite numbers


A factor is a number that divides equally into another number.

$$5 \times 4 = 20$$

20 arranged in 5 rows means 4 in each row.

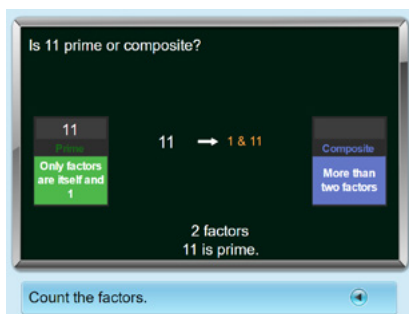
5 and 4 are factors of 20.

- 1 How many ways can 24 objects be arranged? Use the arrays below to complete the facts:

a.   $\square \times \square = 24$

eBook, F series: Multiplication and Division, page 3

Explains prime and composite numbers and provides exercises to secure understanding.



Topic: **Multiplication and Division**

### Activity: *Prime or Composite?*

Pupils are given a number and asked to decide if it is a prime or composite number.

Includes a video that explains the support area further.

## Small step: Square numbers

Multiplication facts – square numbers

A square number is a number multiplied by itself.

$$1 \times 1 = 1$$

$$2 \times 2 = 4$$

$3 \times 3 = 9$

$$1^2 = 1$$

$2^2 = 4$

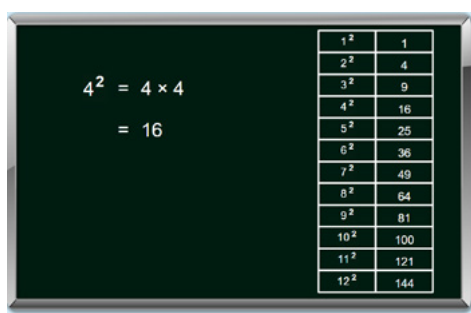
$3^2 = 9$

- 1 Show these square numbers on the grid and write what they are equal to:

a  $4^2 =$        b  $6^2 =$        c  $5^2 =$        d  $3^2 =$        e  $7^2 =$

eBook, F series: Multiplication and Division, page 5

Explains concept of square numbers with activities designed to practise learning.



Topic: **Multiplication and Division**

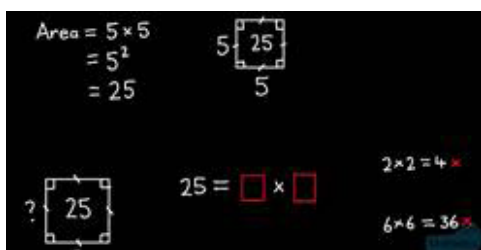
Activity: *Square Roots*

Although this activity is focused on finding the square roots, the support uses the square numbers to show the pupils the square root. Also included is a video (see below).



# Year 5 White Rose Maths Hub (WRMH) Autumn Scheme of Learning, 2017

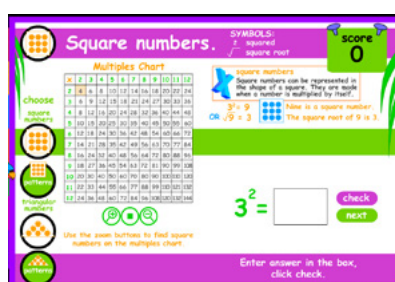
Mathletics



Topic: **Multiplication and Division**

Activity: **Square Roots**

This video explains the relationship between area, square numbers and square roots.



Rainforest Maths — Level F: Numbers — square/triangular

Find square numbers using a multiplication chart as support.

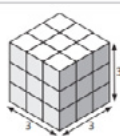
## Small step: Cube numbers

Multiplication facts – cube numbers

A cube number is a number multiplied by itself three times.

For example, the cube of 3 is  $3 \times 3 \times 3$ , which equals 27.

We can write '3 cubed' as  $3^3$ .



1 Write these cubed numbers out as full multiplications and find the answers:

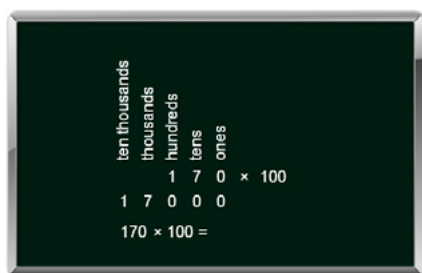
a  $1^3 = \square \times \square \times \square = \square$

b  $4^3 = \square \times \square \times \square = \square$

eBook, F series: **Multiplication and Division, page 6**

Models and explains cube numbers with exercises designed to practise learning.

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



Topic: **Multiplication and Division**

Activity: **Multiplying by 10, 100 and 1000**

The support area clearly explains and models multiplying whole numbers by 10, 100 and 1,000. The adaptive activity begins with multiplying by 10 and then moves on to multiplying 3-digit numbers by 100 and 1,000.

Mental multiplication strategies – multiply by 10s, 100s and 1,000s

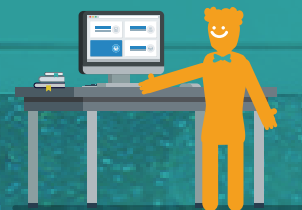
When we multiply by 10 we move the number one place value to the left.  
When we multiply by 100 we move the number two place values to the left.  
When we multiply by 1,000 we move the number three place values to the left.  
Look at how this works with the number 45:

Ten Thousands	Thousands	Hundreds	Tens	Ones	
		4	5	0	$\times 10$
	4	5	0	0	$\times 100$
4	5	0	0	0	$\times 1,000$

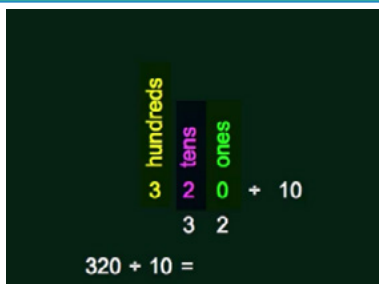
eBook, F series: **Multiplication and Division, page 9**

Explains multiplication by 10, 100 and 1,000. Reinforces understanding of place value. Exercises to secure knowledge.





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



Topic: **Multiplication and Division**

Activity: *Dividing by 10, 100 and 1,000*

The video gives a clear explanation and models what happens when a number is divided by 10.

The animated support also models division by 100 and 1,000.

Mental division strategies – divide by 10s, 100s and 1,000s

When we divide by 10 we move the number one place value to the right.  
When we divide by 100 we move the number two place values to the right.  
When we divide by 1,000 we move the number three place values to the right.  
Look what happens to 45,000 when we apply these rules:

Ten Thousands	Thousands	Hundreds	Tens	Ones	
4	5	0	0	0	
	4	5	0	0	÷ 10
		4	5	0	÷ 100
			4	5	÷ 1,000

1 Divide the following numbers by 10, 100 and 1,000:

a	T	Th	H	T	O
	4	5	0	0	0

b	T	Th	H	T	O
	4	3	0	0	0

eBook, F series: **Multiplication and Division**, page 17

Explains dividing by 10s, 100s and 1,000s.

Activities to practise.

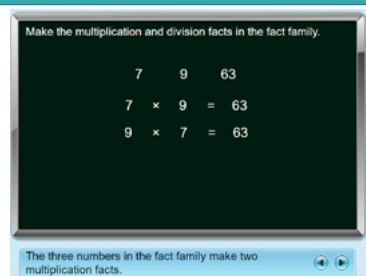
### Small step: Multiply and divide by multiples of 10, 100 and 1,000



Rainforest Maths – Level F – **Multiplication by 10s**

Exercises to practise multiplying by 10, 100 and 1,000 and also by multiples of 10.

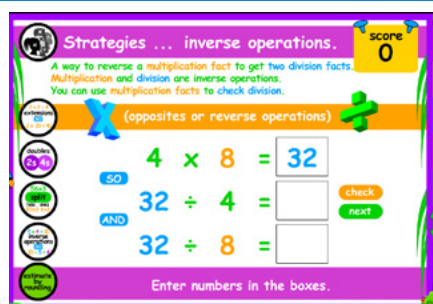
### Small step: Inverse operations (Multiplication and Division)



Topic: **Multiplication and Division**

Activity: *Fact Families: Multiply and Divide*

Practise multiplication and division facts through their inverse relationship.



Rainforest Maths – Level F: **Multiplication strategies – inverse operations**

Use multiplication facts to find the two related division facts.



# Year 5 White Rose Maths Hub (WRMH) Autumn Scheme of Learning, 2017

Mathletics

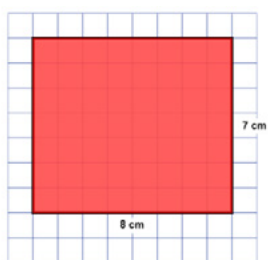
## Examples of alignment to Mathletics

### Weeks 10–11 Perimeter and Area

National Curriculum Objectives	WRMH Small Steps
<ul style="list-style-type: none"> <li>Measure and calculate the perimeter of composite rectilinear shapes in cm and m.</li> <li>Calculate and compare the area of rectangles (including squares), and including using standard units, <math>\text{cm}^2</math>, <math>\text{m}^2</math> estimate the area of irregular shapes.</li> </ul>	<ul style="list-style-type: none"> <li>Measure perimeter</li> <li>Calculate perimeter</li> <li>Find unknown lengths</li> <li>Area of rectangles</li> <li>Area of compound shapes</li> <li>Estimate and approximate area</li> </ul>

#### Small steps:

- Measure perimeter
- Calculate perimeter



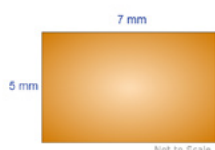
Perimeter = 30 cm ✓

Topic: [Length, Perimeter and Area](#)

Activity: [Perimeter of Shapes](#)

Rectangles and squares are shown on a grid. Pupils calculate the perimeter in metric units.

Calculate the perimeter.



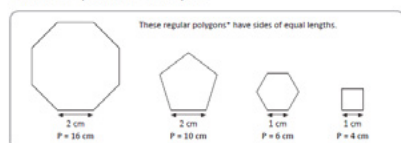
Perimeter =  mm

Topic: [Length, Perimeter and Area](#)

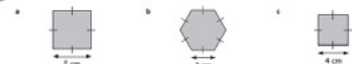
Activity: [Calculate Perimeter of Squares and Rectangles](#)

No grid used in this activity. Calculate the perimeter in metric units.

Perimeter – perimeter of shapes



1 Find the perimeter of these regular polygons\*



eBook, F series: [Length, Perimeter and Area](#), page 16+

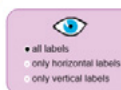
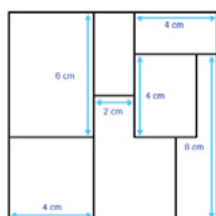
Explains the concept of measuring perimeter.

Includes exercises to measure perimeter of squares and rectangles, then other regular shapes, moving on to irregular shapes.



### Small step: Find unknown lengths

Find the perimeter of this rectangle:



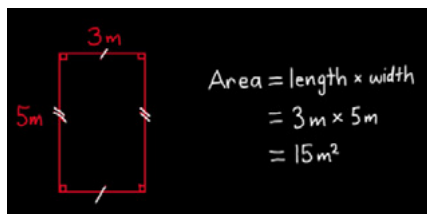
The perimeter is 40 cm ✓

Topic: **Length, Perimeter and Area**

Activity: **Perimeter Detectives 1**

Students are shown only some of the lengths for a rectangle or square and must calculate the length of each side to work out the perimeter.

### Small step: Area of rectangles



Topic: **Length, Perimeter and Area**

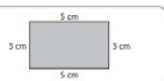
Activity: **Area: Squares and Rectangles**

The video accompanying this activity explains and models how to calculate perimeter and area of squares and rectangles. It also explains how to find the area of a triangle.

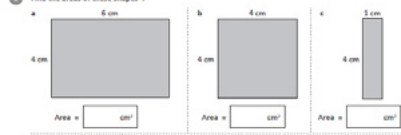
**Activity:** The activity practises the learning covered in the video which calculates the area of squares and rectangles.

Area – square centimetres (cm²) and square metres (m²)

We can use this formula to find the area of rectangles:  
Area = length × width  
Area = 3 × 5 = 15 cm²



1 Find the area of these shapes:



eBook, F series: **Length, Perimeter and Area, page 25**

Explains concept of measuring area of rectangles.

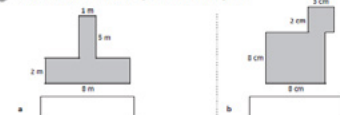
Exercises to practise.

### Small step: Area of compound shapes

Area – find area of irregular and composite shapes

Not all shapes are regular rectangles. We have to find ways to measure the areas of composite and other irregular shapes as well. One way is to break the shape into rectangles, find these areas, and then add them together.

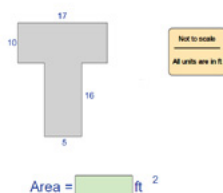
1 Find the area of the shaded triangles inside the rectangles:



eBook, F series: **Length, Perimeter and Area, page 26**

Explores measuring area of compound shapes and provides more challenging exercises to explore the concept of area.

Find the shaded area.



Area =  ft<sup>2</sup>

Topic: **Length, Perimeter and Area**

Activity: **Area: Compound Figures**

Pupils are encouraged to calculate the area of the compound figures by splitting the overall shape into smaller, familiar shapes (rectangles and squares).



## Year 5 White Rose Maths Hub (WRMH) Autumn Scheme of Learning, 2017

Mathletics

### Live Mathletics

What's in level 4?

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

Live Mathletics engages pupils in one minute games where they are challenged to recall Maths facts.

To support progress in Year 5, pupils should use Level 4 and possibly Level 5 as a challenge.

Teachers can set minimum levels in 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.)



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