

Maths

Multiplication and Division

Need a coherently planned sequence of lessons to complement this resource?

Lesson Breakdown

Below is our suggestion for the most coherent and progressive sequence to teach this area of Plant Maths steps on the White Rose Maths scheme of learning although we have not aimed to mirror the exact order in which the steps are presented.

Multiples and Factors (1): Multiples

Use this comprehensive lesson pack to help teach children how to identify and use their knowledge of the multiplication tables to determine their knowledge of multiples as well as prime numbers. The differentiated activity sheets allow children to work on two-digit numbers to three-digit numbers. Children's learning can also be deepened by focusing on deepening the children's knowledge with a range of fluency, reasoning and problem-solving activities. By the end of the lesson, children should be confident in being able to identify the multiples of a number.

NC Statement: Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.

Lesson Aim: To identify multiples of numbers.

Multiples and Factors (2): Factors

This comprehensive, teacher-made lesson pack is designed specifically to support children's learning of factors in a systematic way. This lesson will build on the children's prior knowledge of factors by using arrays or factor rainbows. Through the use of colour and concrete objects, children will be able to identify factors of numbers. The differentiated activity sheets allow children to work on two-digit numbers to three-digit numbers. Children's learning can also be deepened by focusing on deepening the children's knowledge with a range of fluency, reasoning and problem-solving activities. By the end of the lesson, children should be confident in being able to identify the factors of a number.

NC Statement: Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.

Lesson Aim: To identify all of the factors of a number.

Introduction

In Year 3 Multiplication and Division, children build upon and extend their use of the formal written methods, multiplying four-digit numbers by two-digit numbers and dividing numbers up to four-digits by one-digit numbers. They express remainders as whole numbers, fractions and decimals and choose from these in order to answer questions appropriately when solving problems. The children use their multiplication tables facts to help them to solve large calculations and understand the terms factor, multiple and prime, square and cube numbers. Children use the equals sign to indicate equivalence and multiply and divide by 10, 100 and 1000 with increasing confidence, including calculations which involve decimals.

Resources

You will need standard classroom maths resources for this unit.

Multiplication and Division

Maths | Year 3 | Steps to Progression Overview

The aim of this overview is to support teachers using Plant Maths to show the most coherent and progressive sequence to teach each area of maths. We also want to fully support teachers who use the White Rose Maths scheme of learning to make full use of the resources available within Plant Maths. Wherever possible, lesson packs have been matched to each of the small steps on the White Rose Maths scheme of learning.

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		
Spring	Number: Multiplication and Division			Number: Fractions					Number: Decimals and Percentages		Consolidation	
Summer	Number: Decimals		Geometry: Properties of Shapes			Consolidation: Position and Direction		Measurement: Converting Units		Measurement: Volume		Consolidation

Divide 4 Digits by 1 Digit (Without Exchanging)

	3	2	3	2
3	9	6	9	6

Aim

- To divide 4-digit numbers by 1-digit numbers without any exchanges.

Success Criteria

- I can set out the written method of short division correctly.
- I begin with the place value column of the greatest value, when dividing.
- I can solve division calculations which involve zero as a place holder.

Remember It

Use your knowledge of the multiplication tables to help you solve these calculation ladders:

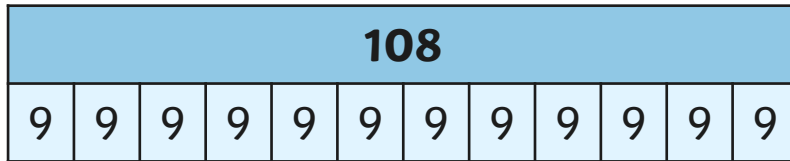
START	12	
multiply by 5	= 60	
add 17	= 77	
divide by 11	= 7	
subtract 3	= 4	
multiply by 8	= 32	
halve it	= 16	

START	100	
quarter it	= 25	
divide by 5	= 5	
multiply by 6	= 30	
add 12	= 42	
double it	= 84	
divide by 12	= 7	

Can you make your own calculation ladder for a friend to solve?

Multiplication and Division

How do these bar models show the relationship between multiplication and addition?



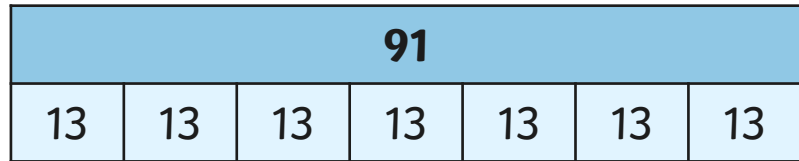
This bar model shows us that:

$$9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 + 9 = 108$$

$$9 \times 12 = 108 \text{ and } 12 \times 9 = 108$$

$$108 \div 12 = 9 \text{ and } 108 \div 9 = 12$$

How do these bar models show that multiplication and division are inverse operations?



This bar model shows us that:

$$13 + 13 + 13 + 13 + 13 + 13 + 13 = 91$$

$$13 \times 7 = 91 \text{ and } 7 \times 13 = 91$$

$$91 \div 7 = 13 \text{ and } 91 \div 13 = 7$$

Dividend and Divisor

Let's look at how we can set out a division calculation using the written method of short division.

$$884 \div 4$$

The number we are dividing is called the

Dividend

The number we are dividing by is called the

Divisor


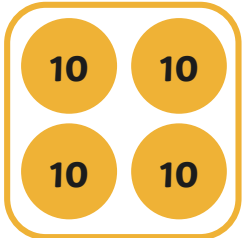
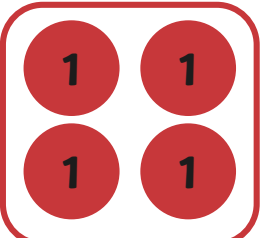

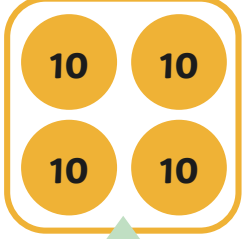
The divisor is written outside the division frame.

The dividend is written inside the frame.

4	8	8	4	

Dividing 3-Digit Numbers

Finally, we move on to the ones column.

H Hundreds 100	T Tens 10	O Ones 1
		
		

How many **groups of 4** ones can we make?

$$884 \div 4 = 221$$

	2	2	1	
4	8	8	4	

4 ones divided by 4 is equal to **1** group of 4. Now we can write 1 above the line in the ones column.

We have calculated that $884 \div 4 = 221$.

Dividing 3-Digit Numbers

Finally, let's divide the ones.

1000s	100s	10s	1s

How many **groups of 3** ones can we make?

$$9606 \div 3 = 3202$$

	3	2	0	2
3	9	6	0	6

6 ones divided by 3 is equal to **2** groups of 3 ones. Now we can write 2 above the line in the ones column.

We have calculated that $9606 \div 3 = 3202$.

Multiplication and Division

Work with a partner to use the method of short division to solve these calculations.

	4	0	2	3
2	8	0	4	6

$$8046 \div 2 = \text{Reveal Answer}$$

$$6390 \div 3 = \text{Reveal Answer}$$

	2	1	3	0
3	6	3	9	0

	1	2	0	2
4	4	8	0	8

$$4808 \div 4 = \text{Reveal Answer}$$

Multiply 4 digits by 1 digit

Dividing 4-Digit Numbers (Without Exchanging)

To divide 4-digit numbers by 1-digit numbers

- 1) Identify the numbers represented in the place value chart and complete the division, using the formal method.

a)

1000s	100s	10s	1s
●●●●		●●●●●●	●●●●

3				

b)

1000s	100s	10s	1s
●●●●	●●●●	●●	

2				

c)

1000s	100s	10s	1s
●●		●●●●●●	

4				

d)

1000s	100s	10s	1s
●●	●●●●	●●	●●●●

2				

Without Exchanging)

od. You may wish to use

10s	1s

10s	1s

10s	1s

10s	1s

Exchanging)

complete the division,

Without Exchanging)

and complete the division
times as necessary.

0			

0			

Exchanging)

complete the division,

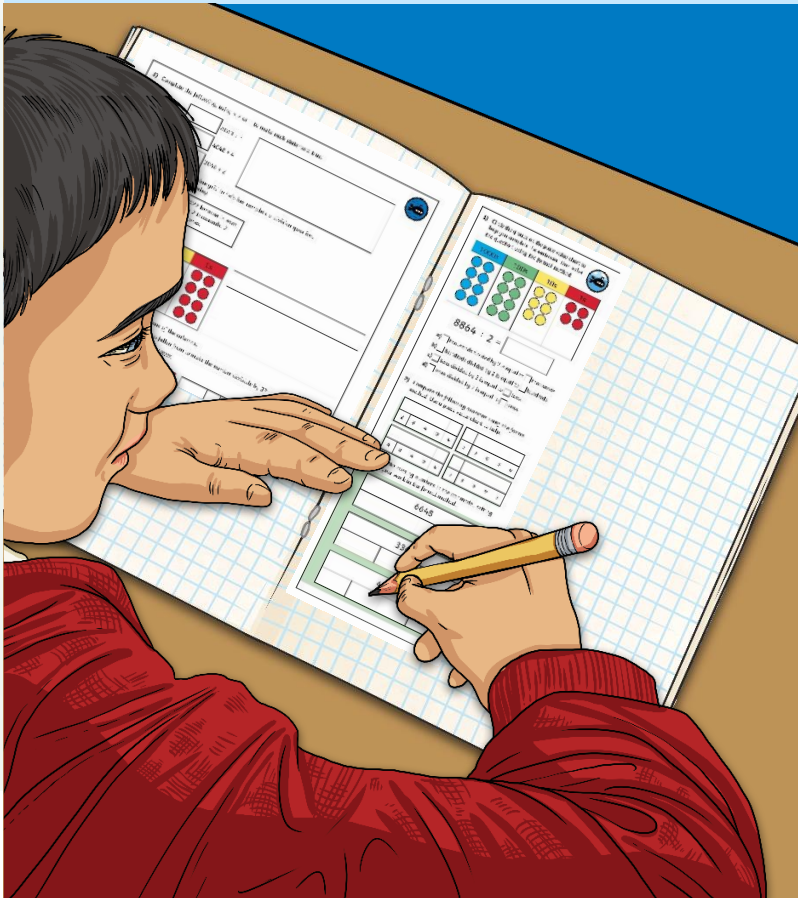
Without Exchanging)

and complete the division
times as necessary.

0			

Diving into Mastery

Dive in by completing your own activity!



1) Complete the division. You may use a place value chart to help.

a) $2044 \div 2 =$
 b) $2048 \div 2 =$
 c) $3069 \div 3 =$

2) Mrs. Havel has 8400 items. How many items does she have left if she gives away 2000 items?

3) A charity has £6600. How much more money does it need to reach its goal of £10000?

1) Complete the division. You may use a place value chart to help.

a) $84 \div 2 =$
 b) $840 \div 2 =$
 c) $8400 \div 2 =$

2) Mrs. Havel has 8400 items. How many items does she have left if she gives away 2000 items?

3) A charity has £6600. How much more money does it need to reach its goal of £10000?

1) Circle the groups on the place value chart to help you complete the sentences. Then solve the question using the formal method.

$8864 \div 2 =$

1000s	100s	10s	1s
8	8	6	4

a) thousands divided by 2 is equal to thousands.
 b) hundreds divided by 2 is equal to hundreds.
 c) tens divided by 2 is equal to tens.
 d) ones divided by 2 is equal to ones.

2) Complete the following divisions using the formal method. Use a place value chart to help.

a) $84 \div 2 =$
 b) $840 \div 2 =$
 c) $8400 \div 2 =$
 d) $84000 \div 2 =$

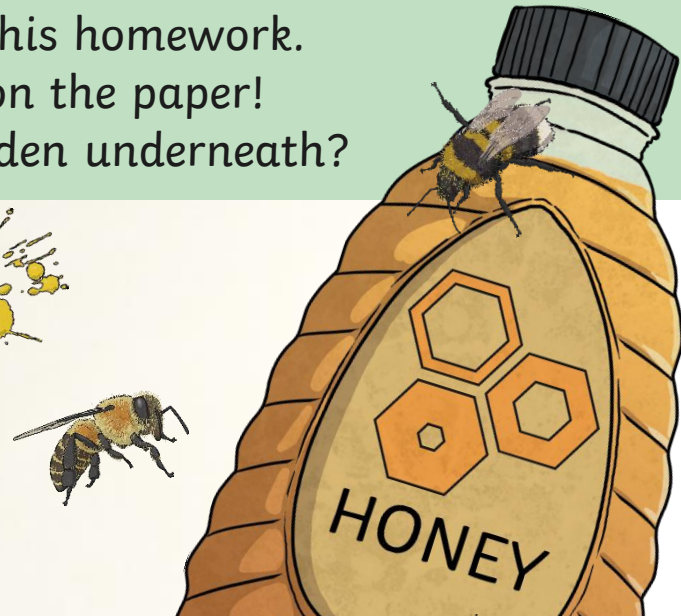
3) Find the missing numbers in the bar model, setting out your work in the formal method.

6648	
3369	
4480	

Multiplication and Division

Nicholas has been eating while doing his homework.
Unfortunately he has dropped honey on the paper!
Can you work out what digits are hidden underneath?

	3		2	
	9	0		3



$9000 \div \text{honey} = 3000$
 $9000 \div 3 = 3000$
So the divisor must be 3.

$0 \div \text{honey} = 0$
 $0 \div 3 = 0$
So there must be 0
hundreds in the answer.

$\text{honey} \div 3 = 2$
 $6 \div 3 = 2$
So there must be 6
tens in the dividend.

$3 \div \text{honey} = 1$
 $3 \div 3 = 1$
So there must be 1
one in the answer.

Aim



- To divide 4-digit numbers by 1-digit numbers without any exchanges.

Success Criteria

- I can set out the written method of short division correctly.
- I begin with the place value column of the greatest value, when dividing.
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