

Diving into Mastery



Long Division 4

Diving into Mastery Guidance for Educators

Each activity sheet is split into three sections, diving, deeper and deepest, which are represented by the following icons:



Diving



Deeper



Deepest

These carefully designed activities take your children through a learning journey, initially ensuring they are fluent with the key concept being taught; then applying this to a range of reasoning and problem-solving activities.

These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.

Aim

- Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.

Long Division 4

Diving



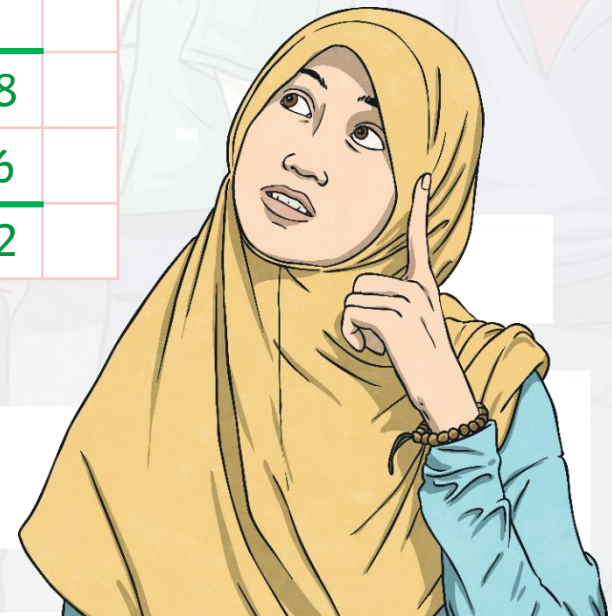
Use your knowledge of multiples to help you solve these division questions:

$$2564 \div 22 = \mathbf{116r12}$$

		0	1	1	6	r12
2	2	2	5	6	4	
	-	2	2			
			3	6		
	-		2	2		
			1	4	4	
			1	3	2	
				1	2	

$$1178 \div 21 = \mathbf{56r2}$$

		0	0	5	6	r2
2	1	1	1	7	8	
	-	1	0	5		
			1	2	8	
	-		1	2	6	
					2	



Long Division 4

Diving



Solve these division word problems.

A train is able to fit 65 passengers into each carriage. How many carriages will the train need in order to carry 1428 passengers?

The train will need to have 22 carriages.

21 carriages will be full and the last will have 63 passengers.



		0	0	2	1	r63
6	5	1	4	2	8	
	-	1	3	0		
			1	2	8	
	-			6	5	
				6	3	

A factory can pack 38 jars into a box. There are 3498 jars to pack. How many boxes can they fill with jars? How many will be left over?

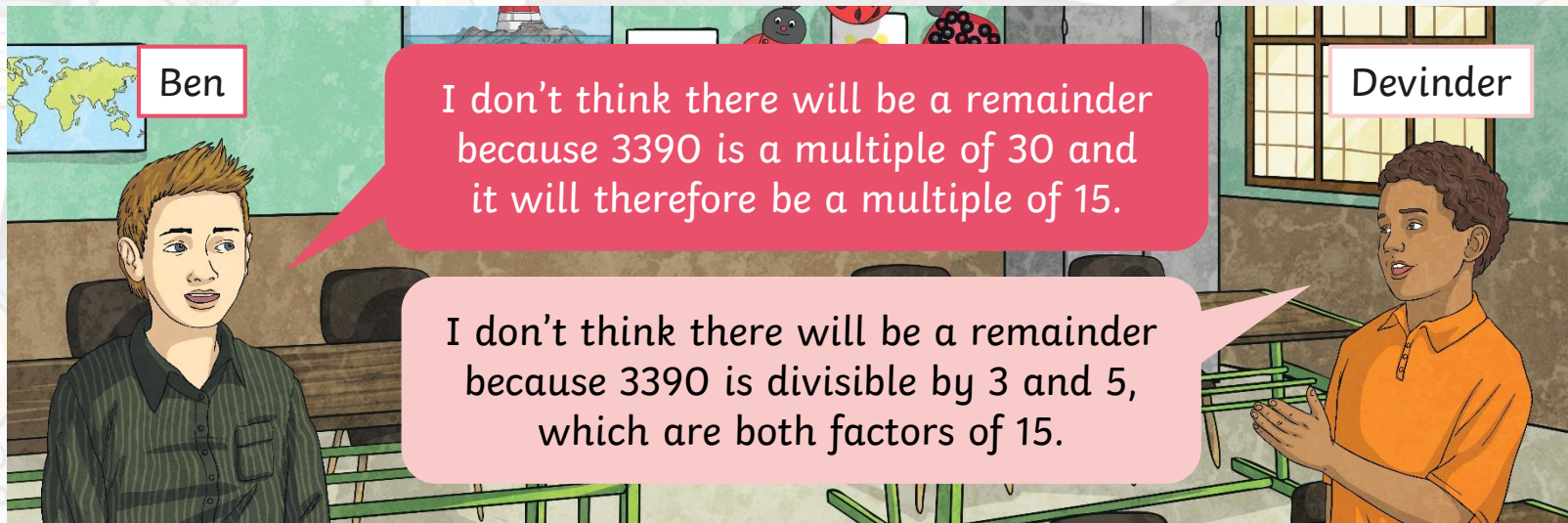
92 boxes will be filled with 2 jars left over.



		0	0	9	2	r2
3	8	3	4	9	8	
	-	3	4	2		
				7	8	
	-			7	6	
					2	



Two children have been asked to solve this problem: $3390 \div 15$



Both boys are correct. Ben is correct because 3390 will divide by 30 and not leave a remainder. As 15 is a factor of 30, 3390 will not leave a remainder when divided by 15. Devinder is correct because 3390 is divisible by 3 and 5, and because they are prime factors of 15, 3390 will not leave a remainder when divided by 15.

Long Division 4

Deeper



Use these division calculations to decide if the statements are always, sometimes or never true. Explain your reasoning.

If the dividend is a multiple of 5 and the divisor is a multiple of 5, there will be no remainder.

Sometimes true. In $1950 \div 25$, both numbers are multiples of 5 and there is no remainder left. However, in $1855 \div 15$, both numbers are multiples of 5 but a remainder is left.

If the dividend is odd and the divisor is odd, there will not be a remainder.

Sometimes true. In $1015 \div 35$, both numbers are odd and there is no remainder. In $1855 \div 15$, both numbers are odd but there is a remainder of 10.

$$1855 \div 15 = 123r10$$

$$1015 \div 35 = 29$$

$$1950 \div 25 = 78$$

Long Division 4

Deepest



Choose a four-digit number from the numbers below.

1632

is a multiple of 2, 3 and 24.

2808

is a multiple of 2, 3, 9, 18
and 24.

1872

is a multiple of 3, 9, 18
and 24.

Which divisors from the table will not leave a remainder when you divide your number by them? Prove it.



One-Digit Divisor	Two-Digit Divisor
9	28
2	18
3	24

For example:

$$1632 \div 9 = 181r3$$

$$1632 \div 2 = 816$$

$$1632 \div 3 = 544$$

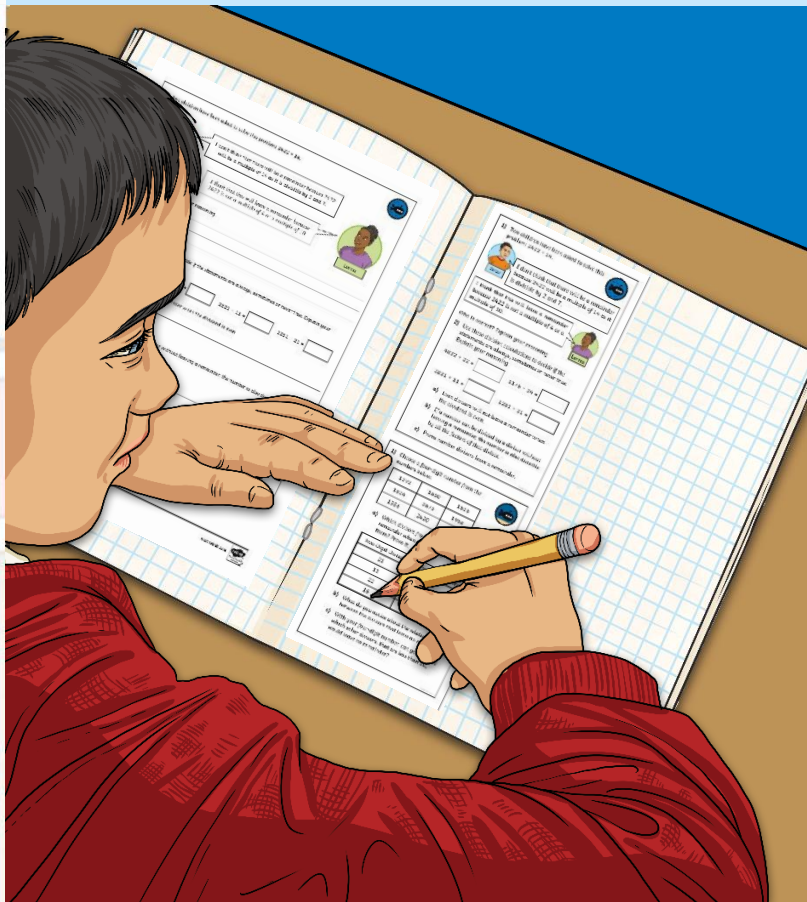
$$1632 \div 28 = 58r8$$

$$1632 \div 18 = 90r12$$

$$1632 \div 24 = 68$$

Long Division 4

Dive in by completing your own activity!



1) Two children have been asked to solve the problem: $2422 \div 14$.



I don't think that there will be a remainder because 2422 will be a multiple of 14.

I think that this will leave a remainder because 2422 is not a multiple of 14.

Who is correct? Explain your reasoning.

2) Use these division calculations to explain your reasoning.

$4822 \div 22 = \square$ $1176 \div 12 = \square$

$2821 \div 11 = \square$ $1281 \div 11 = \square$

- a) Even divisors will not leave a remainder.
- b) If a number can be divided by a number, it will be divided by all the factors of that number.
- c) Prime number divisors leave a remainder.

3) Choose a four-digit number from the numbers below.

1392	1650	1531
1824	3675	1951
1356	2420	2051

a) Which divisors from the table will leave a remainder when you divide your number by them? Prove it.

Two-Digit Divisors	One-Digit Divisors
21	
11	
22	
16	

- b) What do you notice about the remainders between the divisors that leave a remainder?
- c) With your four-digit number, which other divisors, that are not in the table, would leave no remainder?

1) Use your knowledge of multiples to help you calculate the answer to these long division questions:

a) $3785 \div 15 =$



c) $2568 \div 28 =$



b) $1486 \div 21 =$



d) $4365 \div 35 =$



2) Solve these division word problems. Think carefully about the effect the remainder will have on your final answer.

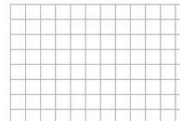
a) A coach can carry 35 supporters to a football match. How many coaches will be needed in order to carry 4050 supporters?



b) A factory is packing boxes of books. Each box can hold 26 books. How many full boxes will the factory have after packing 3410 books?



c) A school needs 2780 cartons of orange juice for the canteen. There are 18 cartons of juice in each box. How many boxes of juice will they need to order?



Need Planning to Complement this Resource?

National Curriculum Aim

Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.

This screenshot shows a math resource page with three main sections: 'Long Vines', 'Jungle Division', and 'Slithering Snake'. 'Long Vines' includes a diagram of a vine and a problem: 'The number by which another number is to be divided is known as the divisor.' 'Jungle Division' features a large play button icon and a grid for long division. 'Slithering Snake' shows a snake in a jungle with a problem: '228km ÷ 3 = ?'. Below these are three columns of 'Jungle Division' problems, each with a grid for long division. A 'Long Division' grid is also visible on the left side of the page.

This screenshot shows a math resource page with three main sections: 'Searching For Clues (1)', 'Tic-Tac-Toe Problem Solving', and 'Searching For Clues (2)'. 'Searching For Clues (1)' includes an illustration of a notebook and a problem: 'Karin is making cookies. He wants to sell the cookies in bags of 22. How many full bags can he make from 3632 cookies?'. 'Tic-Tac-Toe Problem Solving' features a large play button icon and a grid for long division. 'Searching For Clues (2)' shows a bookstore with a problem: 'A bookstore is moving stores and the owner needs to pack his 3629 books into boxes. Each box can hold 88 books. How many boxes does the owner need?'. Below these are three columns of 'Problem Solving Tic-Tac-Toe' problems, each with a grid for long division. A 'Long Division' grid is also visible on the left side of the page.

