

Multiplication

By this time, children should confidently and quickly be able to recall all of their tables and the inverses up to and including 12×12 .

Children will use their previous knowledge of multiplication to multiply 4 digits by 1 digit.

TH	H	T	O
1	0	2	3
x			3
<hr/>			

TH	H	T	O
1	3	2	5
x			4
<hr/>			

Megan worked out the answer to $1,432 \times 4$

Here is her answer:

TH	H	T	O
1	4	3	2
x			4
<hr/>			
4	16	12	8

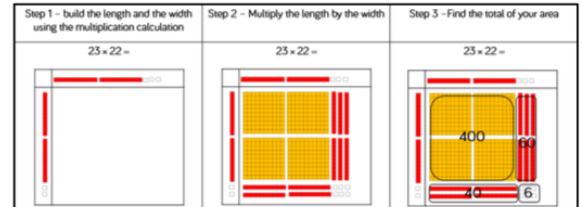
$$1,432 \times 4 = 416,128$$

Can you explain what Megan has done wrong?

Area model of multiplying two digits

Children use base ten to represent the area model of multiplication. The base ten will enable children to see the size and scale linked to multiplying.

Joshua uses the Base 10 to solve 23×22



Use Base 10 to solve 32×24 , 25×31 , 34×23

Tabby says,

“If I multiply 23×57 , I can just do these calculations, 20×50 and 3×7 and then add the totals.”

Do you agree? Convince me!

Multiply 2 digits by 2 digits

Why is the zero important? What numbers are being multiplied in the first line and the second line?

$$\begin{array}{r} 23 \\ \times 14 \\ \hline 92 \quad (23 \times 4) \\ 230 \quad (23 \times 10) \\ \hline \end{array}$$

Use the method to calculate:

$$34 \times 26 \quad 58 \times 15 \quad 72 \times 35$$

$$\begin{array}{r} 46 \\ \times 27 \\ \hline 322 \quad (\square \times \square) \\ 920 \quad (\square \times \square) \\ \hline \end{array}$$

Answer the following:

$$27 \times 39 \quad 46 \times 55 \quad 94 \times 49$$

Joe has answered 47×36



$$\begin{array}{r} 47 \\ \times 36 \\ \hline 282 \\ 141 \\ \hline 323 \end{array}$$

Alice says:



The answer should be 1,692, not 323

Who is correct?

Explain how you know.

Multiply 3 and 4 digits by 2 digits

Complete the following

$$\begin{array}{r} 132 \\ \times 14 \\ \hline 528 \quad (132 \times 4) \\ 1320 \quad (132 \times 10) \\ \hline \end{array} \quad + \quad \begin{array}{r} 563 \\ \times 29 \\ \hline \quad \quad (\square \times \square) \\ \quad \quad (\square \times \square) \\ \hline \end{array}$$

Tiffany has spilt paint on her maths homework.

Can you work out the digits that have been covered by paint?

$$\begin{array}{r} 9 \bullet 9 \\ \times 95 \\ \hline 4845 \\ + 87 \bullet 1 \\ \hline 92055 \end{array}$$

Put <, > or = in each circle to make the statements correct.

$$4,458 \times 56 \bigcirc 4,523 \times 54$$

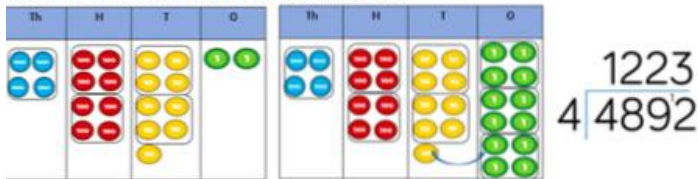
$$4,458 \times 55 \bigcirc 4,523 \times 54$$

Can you spot and correct the errors in the calculation below.

$$\begin{array}{r} 2534 \\ \times 23 \\ \hline 7592 \\ 5068 \\ \hline 12660 \\ 11 \end{array}$$

Dividing 4 digits by 1 digit

Here is a method to solve 4,892 divided by 4 using place value counters and short division.



Use this method to solve the following questions.
 $6,610 \div 5$ $2,472 \div 3$ $9,360 \div 4$

Use < > or = to compare the statements

$$3,495 \div 5 \bigcirc 3,495 \div 3$$

$$8,064 \div 7 \bigcirc 9,198 \div 9$$

$$7,428 \div 4 \bigcirc 5,685 \div 5$$

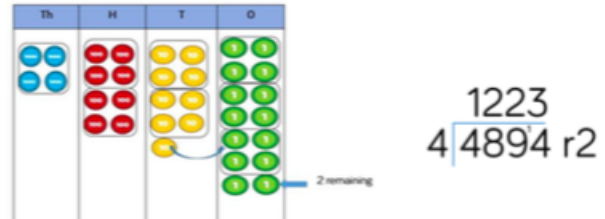
Mr Porter has saved £8,934 pounds.
 He shares it between his three grandchildren.
 How much does each grandchild receive?

Sam is working out 2,240 divided by 7
 He says you can't do it because 7 is larger than all of the digits in the number.

Do you agree with Sam?
 Explain your answer.

Dividing with remainders

Here is a method to solve 4,894 divided by 4 using place value counters and short division.



Use this method to solve the following questions.
 $6,613 \div 5$ $2,471 \div 3$ $9,363 \div 4$

$$765 \div 4 = 191 \text{ remainder } 1$$

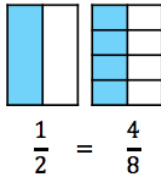
$$876 \div 5 = 175 \text{ remainder } 1$$

Does a three-digit number descending in digits divided by the next descending digit always have remainder 1?

Prove your answer.

Equivalent fractions

Take two pieces of paper the same size.
Fold on piece into two equal pieces.
Fold the other into eight equal pieces.
What equivalent fractions can you find?



Use the models to write equivalent fractions.



Here are some fraction cards. All of the fractions are equivalent.

$$\frac{4}{A}$$

$$\frac{B}{C}$$

$$\frac{20}{50}$$

$$A + B = 16$$

Calculate the value of C.

Sequences involving fractions

Complete the missing values on the number line.



Jasmine and Dayle are counting in fractions.

Jasmine counts up in thirds and starts at 0

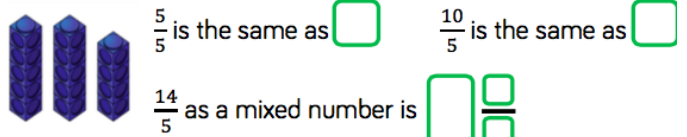
Dayle counts down in sixths and starts at 5

How many numbers do they each say before they say the same number?

Improper and mixed numbers

In this step, children convert from improper fractions to mixed numbers for the first time. An improper fraction is a fraction where the numerator is larger than the denominator. A mixed number is a whole number alongside a fraction.

Claire converts the improper fraction $\frac{14}{5}$ into a mixed number using cubes. She groups the cubes into 5s, then has 4 left over.



Use Claire's method to convert $\frac{19}{3}$, $\frac{19}{4}$, $\frac{19}{5}$ and $\frac{19}{6}$

William says,

$\frac{28}{3}$ is less than $\frac{37}{5}$
because 28 is less than 37

Do you agree?

Explain why.

Beth uses cubes to help her convert from mixed numbers to improper fractions.

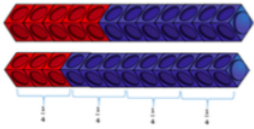
Step 1: Start with mixed number	Step 2: Build the mixed number using cubes. Think carefully about how many parts make a whole.	Step 3: Count the number of cubes to find the numerator of the improper fraction
$3 \frac{2}{5}$		$3 \frac{2}{5} = \frac{17}{5}$

Use Beth's method to convert $2 \frac{2}{3}$, $2 \frac{2}{4}$, $2 \frac{2}{5}$ and $2 \frac{2}{6}$

Please note that the fractions unit will be a 6 week block, it is important that your child has a solid understanding of fractions as it is a big part of the key stage 2 curriculum.

Comparing and ordering fractions

Use cubes to help you compare $\frac{1}{4}$ and $\frac{5}{12}$



$$\square > \square$$

$$\square < \square$$

Use this method to help you compare:

$$\frac{6}{7} \text{ and } \frac{15}{21} \quad \frac{4}{9} \text{ and } \frac{11}{27} \quad \frac{9}{16} \text{ and } \frac{7}{8}$$

Order the fractions from greatest to smallest:

$$\frac{3}{12}, \frac{3}{4} \text{ and } \frac{3}{16} \quad \frac{2}{3}, \frac{5}{6} \text{ and } \frac{7}{12} \quad \frac{4}{7}, \frac{13}{14} \text{ and } \frac{19}{28}$$

Always, sometimes, never

If one denominator is a multiple of the other you can simplify the fraction with the larger denominator to make the denominators the same.

E.g. $\frac{1}{4}$ and $\frac{9}{12}$ can be simplified to $\frac{1}{4}$ and $\frac{3}{4}$

Prove it.

Use bar models to compare $\frac{7}{6}$ and $\frac{5}{3}$



Use this method to help you compare:

$$\frac{7}{2} \text{ and } \frac{9}{4} \quad \frac{11}{6} \text{ and } \frac{13}{3} \quad \frac{9}{4} \text{ and } \frac{17}{8}$$

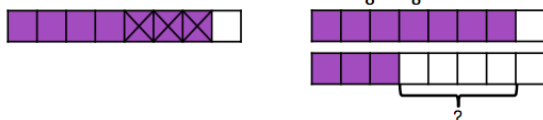
Use your preferred method to solve:

$$\frac{2}{3} + \frac{3}{15} \quad \frac{7}{12} + \frac{1}{4} \quad \frac{4}{7} + \frac{7}{21} \quad \frac{5}{14} + \frac{2}{7}$$

How many different ways can you balance the equation?

$$\frac{5}{9} + \square = \frac{8}{9} + \square$$

Here are two bar models to calculate $\frac{7}{8} - \frac{3}{8}$



What is the difference between the two methods?

Use your preferred method to calculate:

$$\frac{5}{8} - \frac{1}{8} \quad \frac{9}{7} - \frac{4}{7} \quad \frac{5}{3} - \frac{5}{3}$$

Adding and subtracting fractions and mixed numbers

$$\frac{5}{16} + \square = \frac{15}{16}$$

$$\square + \frac{7}{10} = \frac{17}{20}$$

Use your preferred method to solve:

$$\frac{3}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{4} \quad \frac{1}{6} + \frac{5}{24} + \frac{3}{12} \quad \frac{7}{36} + \frac{5}{18} + \frac{2}{9}$$

Sam has added 3 fractions together to get an answer of $\frac{17}{18}$



What 3 fractions could he have added?

Can you find more than one answer?

Use your preferred method to add the fractions.

$$4\frac{7}{9} + 2\frac{1}{3} \quad \frac{19}{6} + 1\frac{1}{3} \quad \frac{17}{3} + 2\frac{1}{6}$$

Fill in the missing numbers.

$$4\frac{5}{6} + \square = 10\frac{1}{3}$$

Tom and Hamish both have the same sized chocolate bar.



Tom has $\frac{4}{3}$ of the chocolate



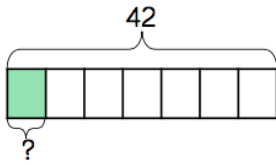
bar left, Hamish has $\frac{5}{12}$ of

the chocolate bar left. How much more does Tom have?

Mr Brown has $3\frac{1}{4}$ bags of flour. He uses $\frac{6}{8}$ of a bag. How much flour does he have left?

Fractions of an amount

Find $\frac{1}{7}$ of 42



$$42 \div 7 = 6$$

$\frac{1}{7}$ of 42 is 6

Use this method to find

$\frac{1}{8}$ of 56

$\frac{1}{6}$ of 480

$\frac{1}{9}$ of 81 m

$\frac{7}{16}$ of a class are boys.

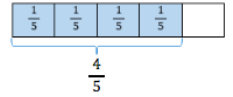
There are 18 girls in the class.

How many children are in the class?

Multiply fractions by integers

Children are introduced to multiplying fractions by a whole number

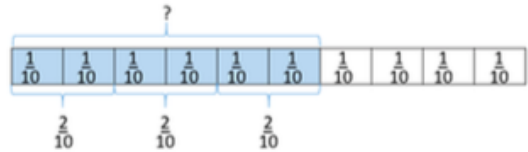
We can use a single bar model to work out $\frac{1}{5} \times 4$



Always, sometimes, never.

When you multiply a unit fraction by the same number as its denominator the answer will be one whole.

Use the model to help you solve $3 \times \frac{3}{10}$



Use this method to work out:

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

$$\frac{3}{16} \times 4$$

Use the digit cards to complete the multiplication.



$$\square \times \frac{\square}{\square} = \frac{\square}{\square}$$

Th	H	T	O
2	1	8	2
x			

Th	H	T	O
3	0	2	6
x			

3	7	3	5
x			
9	21	9	15

= 921,915

What mistake has Jordan made?

The three missing digits are all the same. What are they?

●	5
x	24
2	●
13	00
15	●

Jamie has a set of 0-9 digit cards. He uses eight of the cards in two different multiplications. Which cards doesn't he use?

□	□	□	□
x			
121	00	4	
1	2	1	00

□	□	□	□
x			
338	8	8	
1	1	1	1

Write <, > or = to compare these values.

a) $8,142 \div 6$  $9,485 \div 7$

b) $8,052 \div 3$  $5,638 \div 2$

c) $9,215 \div 5$  $5,535 \div 3$

d) $7,000 \div 4$  $5,253 \div 3$

Mia has tried to work out the answer to $3,058 \times 65$.
Is she correct?
Explain your answer.

$$\begin{array}{r} 3058 \\ \times \quad 65 \\ \hline 15290 \quad (3,058 \times 5) \\ 18348 \quad (3,058 \times 60) \\ \hline 33638 \end{array}$$

8,827 wheels are used to make tricycles.
How many tricycles can be made?
How many wheels are left over?

$$3 \overline{) 8827}$$

Put each group of fractions in order, from smallest to largest.

$$\frac{1}{2}, \frac{7}{8}, \frac{1}{4}, \frac{2}{12}$$

$$\frac{1}{3}, \frac{3}{6}, \frac{2}{3}, \frac{1}{6}$$

$$\frac{10}{25}, \frac{3}{5}, \frac{1}{20}, \frac{15}{50}$$

Harry says,

I am thinking of a four-digit number.
When I divide by 5, I get a remainder of 3.
When I divide by 2, I get a remainder of 1.
Its digits total 10 and it has 0 hundreds.
What could my number be?

Isla says,

25 is larger than 21, so

$$\frac{25}{6} > \frac{21}{4}$$

Record these fractions as a fraction in hundredths, then as a percentage and as a decimal.

$$\frac{82}{200}$$

$$\frac{36}{300}$$

$$\frac{15}{50}$$

Do you think Isla is right? Explain your answer.

Use the repeated addition method to calculate the answer to these multiplications.

$$2\frac{4}{6} \times 3$$

$$3\frac{4}{5} \times 4$$

At Pepino's Pizzas they have $2\frac{1}{4}$ pepperoni pizzas left over on 4 evenings during the week.

They also have $1\frac{3}{4}$ Hawaiian pizzas left over on 6 evenings during the week.

Which type of pizza has more left over?

These are some websites that could help your child:

Addition

<https://www.topmarks.co.uk/Flash.aspx?f=bingoaddition>

Subtraction

<https://www.topmarks.co.uk/maths-games/subtraction-grids>

Timetables and number bonds- Hit the Button

<https://www.topmarks.co.uk/maths-games/hit-the-button>

Timetables- Shooting bubbles

[http://www.mad4maths.com/4 x multiplication table math game/](http://www.mad4maths.com/4_x_multiplication_table_math_game/)

Timetables- Fishy timetables

<http://www.what2learn.com/home/examgames/maths/subtraction/>

Place Value- Place value chart

<https://www.topmarks.co.uk/>

Recognising numbers- Blast off

<https://www.topmarks.co.uk/learning-to-count/blast-off>

TimesTableRockStars

BBC Bitesize