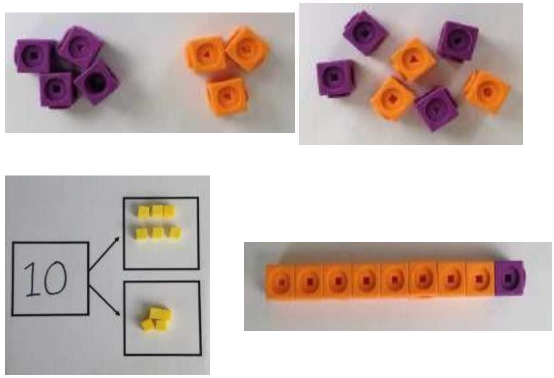
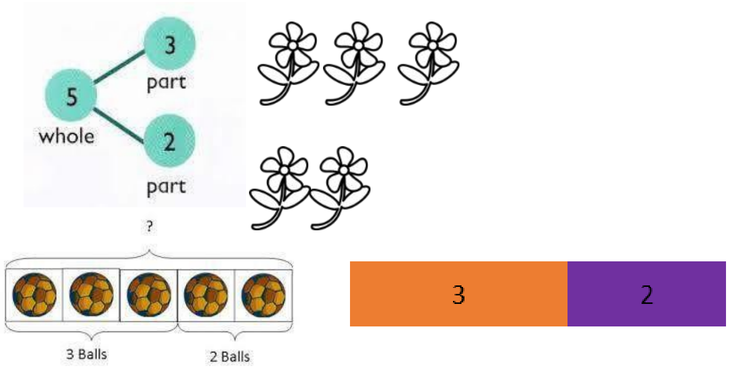
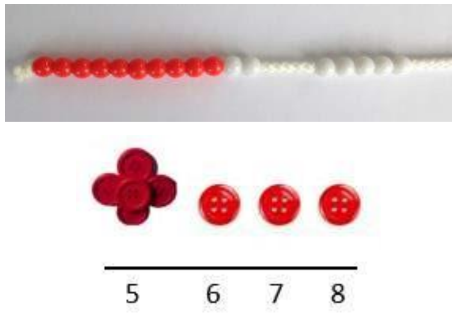
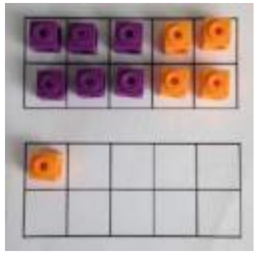
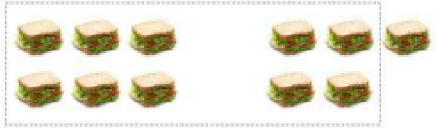
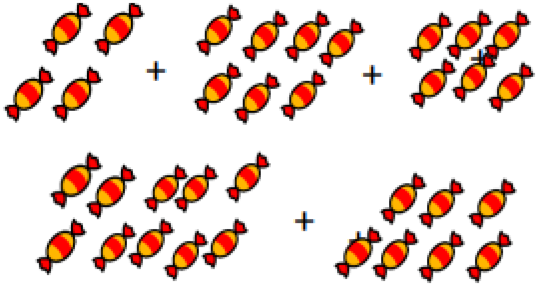
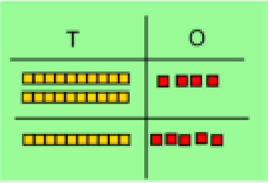
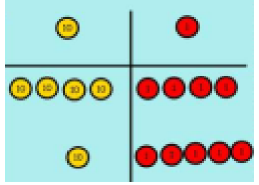
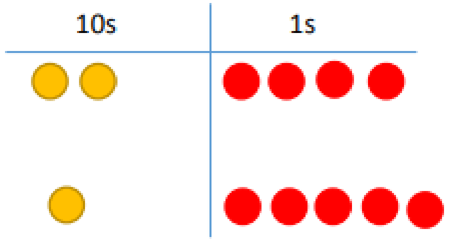
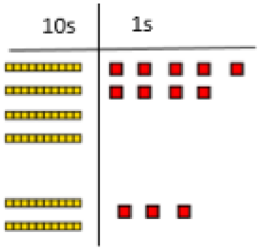
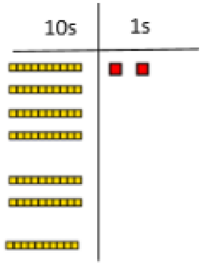
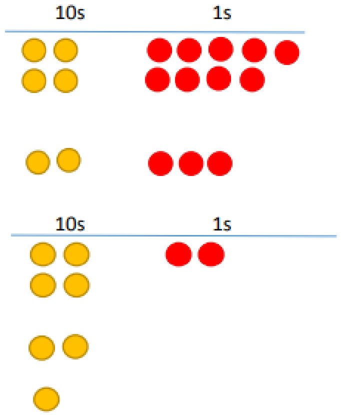
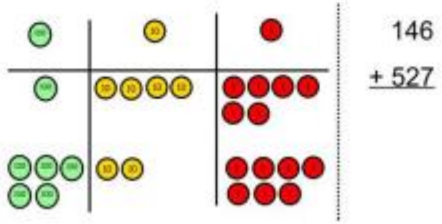
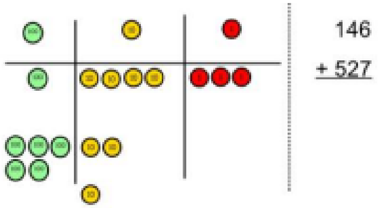
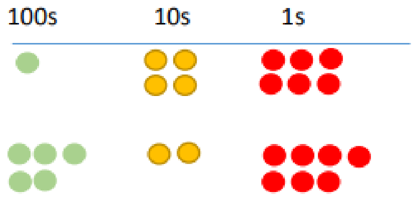
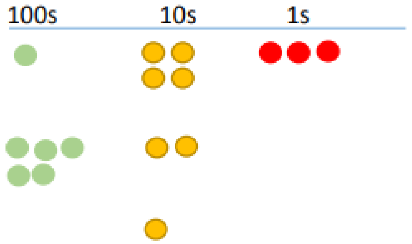
Charsfield Primary School Calculation Policy

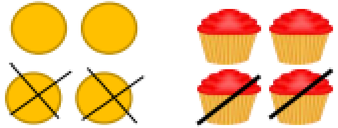
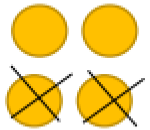
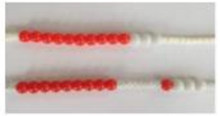
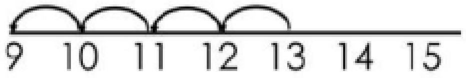
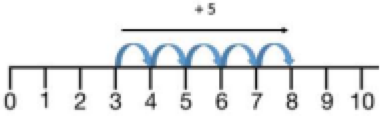
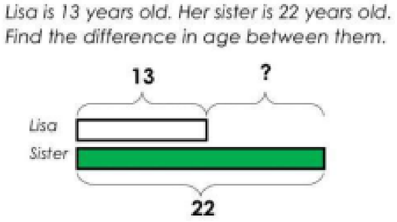
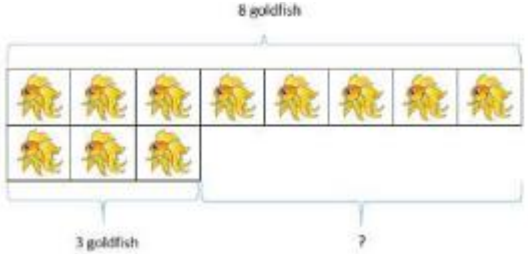
- This guidance has been produced as a guide to indicate the progression through Addition, Subtraction, Multiplication and Division (including fractions) in Years 1 – 6. It has been developed from White Rose materials and guidance.
- This document is to support teachers, teaching assistants and parents by showing clearly the methods and algorithms that children will be expected to use.
- Teachers should not feel compelled to dwell on expanded methods if, in their professional judgement, pupils are ready to move to more efficient approaches.
- Teachers should endeavour to ensure that children are working on the approaches expected for their age.

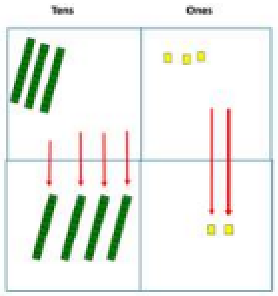
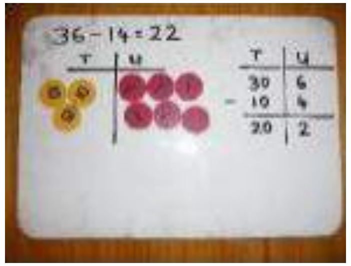
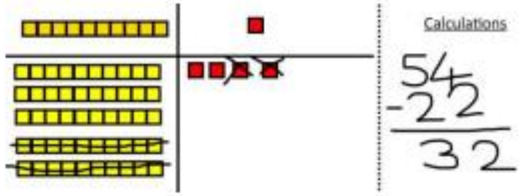
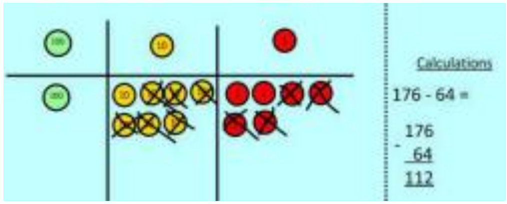
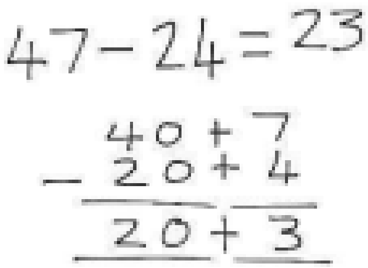
Objective		Concrete	Pictorial	Abstract
Year 1	*Number bonds of 5, 6, 7, 8, 9 and 10*	 Use cubes to add two numbers together as a group or in a bar.	 Use pictures to add two numbers together as a group or in a bar.	2 + 3 = 5 3 + 2 = 5 5 = 3 + 2 5 = 2 + 3  Use the part-part-whole diagram as shown above to move into the abstract.
	Counting	 Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	 Use a number line to count on in ones.	

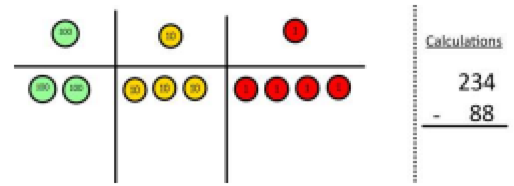
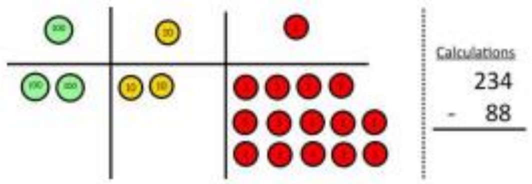
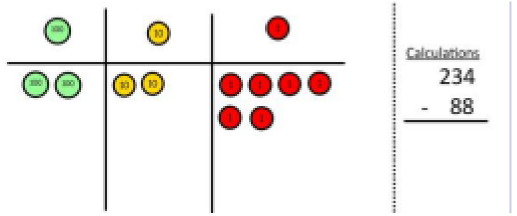
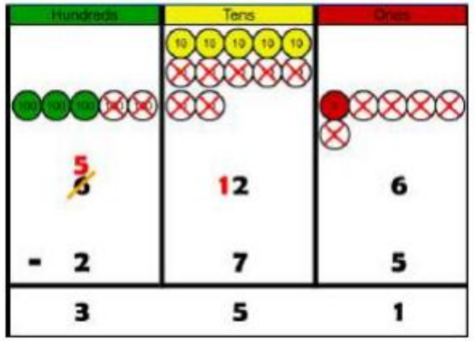
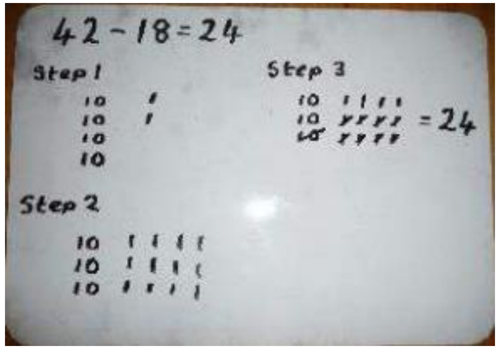
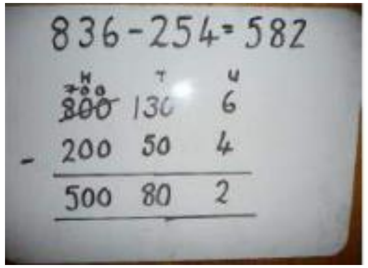
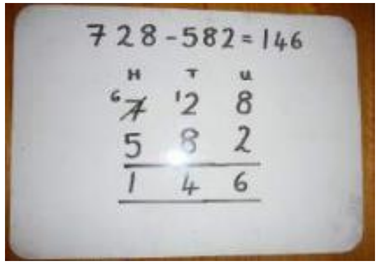
Objective		Concrete	Pictorial	Abstract
Year 1	Regrouping to make 10	$6 + 5 = 11$   Start with the bigger number and use the smaller number to make 10.	 $6 + 5 = 11$  $6 + 4 = 10$ $10 + 1 = 11$ Use pictures to add two numbers together as a group or in a bar.	$6 + 5 = 11$
	Adding 3 single digit numbers	Put 4 and 6 together to make 10. Add on 7.  Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.	 Add together three groups of objects. Draw a picture to recombine the groups to make 10.	$4 + 7 + 6 = \boxed{10} + \boxed{7}$ 10 $= \boxed{17}$ Combine the two numbers that make 10 and then add on the remainder.

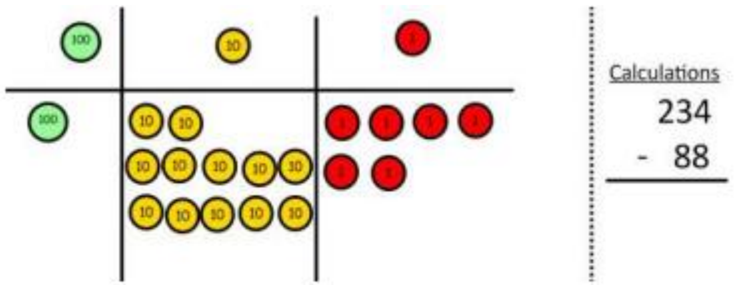
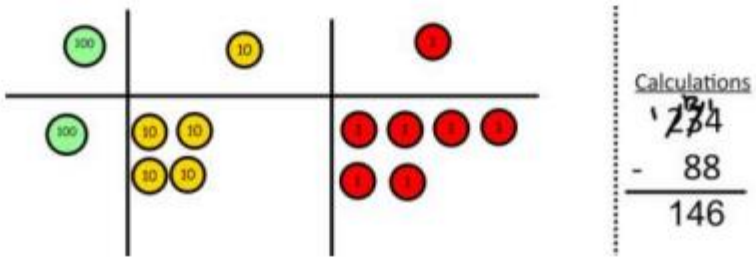
Objective		Concrete	Pictorial	Abstract
Year 2	Column method without regrouping	Add together the ones first, then add the tens. Use the Base 10 blocks first before moving onto place value counters. **24 + 15 =** **44 + 15 =** 	After physically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions. 	24 + 15 = 39 24 + 15 39
Year 2	Column method with regrouping	Make both numbers on a place value grid.  Add up the units and exchange 10 ones for 1 ten.	Using place value counters, children can draw the counters to help them to solve additions. 	40 + 9 20 + 3 60 + 12 = 72

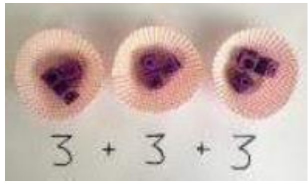
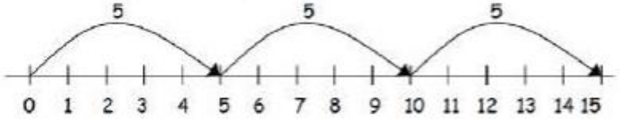
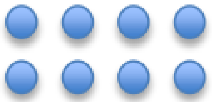
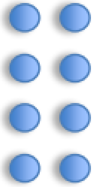
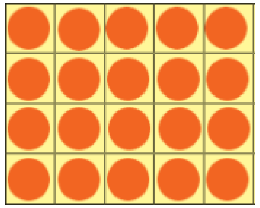
Objective		Concrete	Pictorial	Abstract
Year 3-4	Column method with regrouping	Make both numbers on a place value grid.  Add up the units and exchange 10 ones for 1 ten.  As children move on to decimals, money and decimal place value counters can be used to support learning. NB By Year 4 children will progress on to adding 2 digit numbers.	  Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding. NB Addition of money needs to have £ and p added separately.	100 + 40 + 6 +500 + 20 + 7 600 + 70 + 3 = 673 As the children progress, they will move from the expanded to the compacted method. 146 + 527 673 1 As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here.
	Column method with regrouping	Consolidate understanding using numbers with more than 4 digits and extend by adding numbers with up to 3 decimal places.		

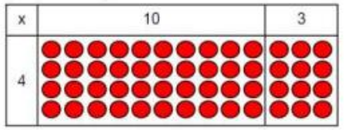
<table>
<tr><th colspan="2">Objective</th><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr><td rowspan="3">Year 1</td><td>Taking away ones</td><td>Use physical objects, counters, cubes etc. to show how objects can be taken
4 – 2 = 2
</td><td>Cross out drawn objects to show what has been taken away.
4 – 2 = 2
</td><td>4 – 2 = 2</td></tr>
<tr><td>Counting back</td><td>Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones

13 – 4 = 9</td><td rowspan="2">Count back on a number line or number track.

Start at the bigger number and count back the smaller number, showing the jumps on the number line.

Count on to find the difference.

Draw bars to find the difference between 2 numbers.</td><td>Put 13 in your head, count back 4. What number are you at? Use your fingers to help.</td></tr>
<tr><td>Find the difference</td><td>Compare amounts and objects to find the difference.

Use cubes to build towers or make bars to find the difference. Use basic bar models with items to find the difference.</td><td>Hannah has 8 goldfish. Helen has 3 goldfish. Find the difference between the number of goldfish the girls have</td></tr>
</table>

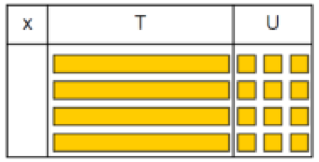
Objective		Concrete	Pictorial	Abstract
Year 2	Column method without regrouping	Use Base 10 to make the bigger number then take the smaller number away. 75 – 42 = 33  Show how you partition numbers to subtract. Again make the larger number first.  	Draw the Base 10 or place value counters alongside the written calculation to help to show working.   	This will lead to a clear written column subtraction.  

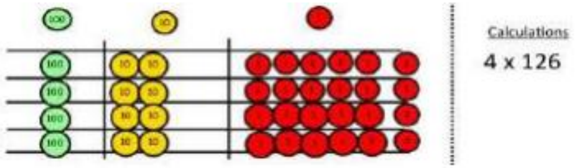
Objective	Concrete	Pictorial	Abstract
Year 3+ Column method with regrouping	Use Base 10 to start with before moving on to place value counters. Start with one exchange before moving onto subtractions with 2 exchanges. Make the larger number with the place value counters.  Start with the ones, can I take away 8 from 4 easily? I need to exchange 1 of my tens for 10 ones.  Now I can subtract my ones.  	 Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make. When confident, children can find their own way to record the exchange/regrouping. Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/regroup.  	 Children can start their formal written method by partitioning the number into clear place value columns.  Moving forward the children use a more compact method. This will lead to an understanding of subtracting any number including decimals. $\begin{array}{rrrrr} & {}^{5} & {}^{12} & & {}^{1} \\ 2 & \cancel{6} & \cancel{3} & . & 0 \\ - & 2 & 6 & . & 5 \\ \hline 2 & 3 & 6 & . & 5 \end{array}$

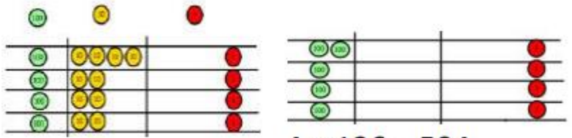
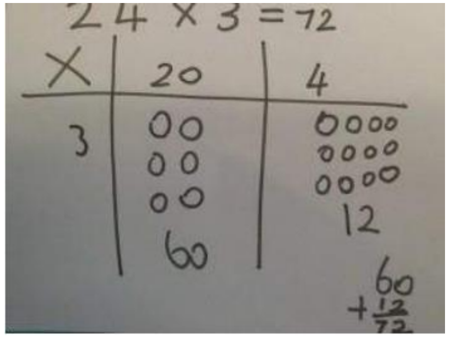
Objective		Concrete	Pictorial	Abstract
Year 3+	Column method with regrouping	Now look at the tens, can I take away 8 tens easily? I need to exchange 1 hundred for 10 tens.  Now I can take away 8 tens and complete my subtraction.  Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount.		932 – 457 becomes $\begin{array}{cccc} & {}^{8} & {}^{12} & {}^{1} \\ & \cancel{9} & \cancel{3} & 2 \\ - & 4 & 5 & 7 \\ \hline & 4 & 7 & 5 \\ \hline \end{array}$ Answer: 475

Objective		Concrete	Pictorial	Abstract
Years 1-2	Repeated addition	Use different objects to add equal groups.   	There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?  2 + 2 + 2 = 6  5 + 5 + 5 = 15	Write addition sentences to describe objects and pictures.  2 + 2 + 2 = 6
	Arrays- showing commutative multiplication	Create arrays using counters/cubes to show multiplication sentences.  	Draw arrays in different rotations to find commutative multiplication sentences.  2 x 4 = 8 4 × 2 = 8  4 × 2 = 8 Link arrays to area of rectangles. 2 x 4 = 8 	Use an array to write multiplication sentences and reinforce repeated addit  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15

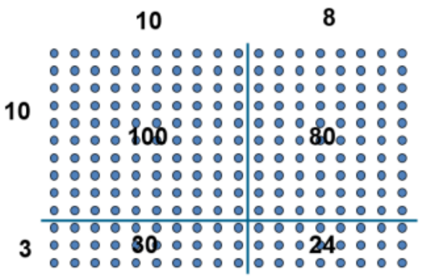
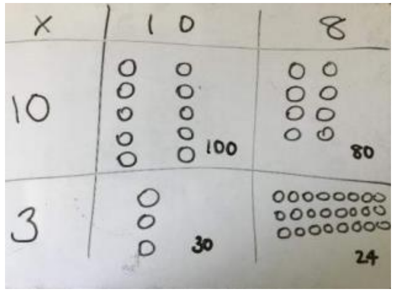
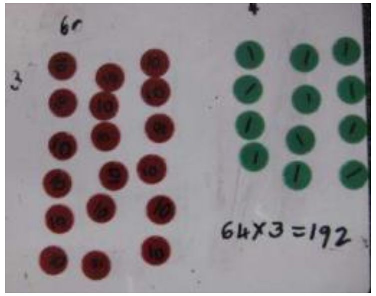
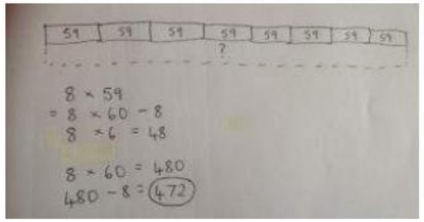
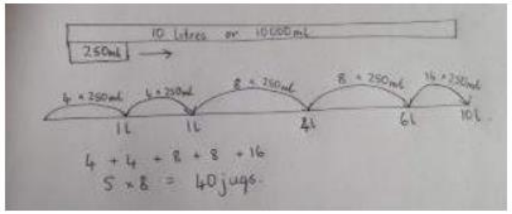
<table>
<tr><th colspan="2">Objective</th><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr>
<td>Year 3-4</td>
<td>Grid method</td>
<td>
Show the link with arrays to first introduce the grid method.


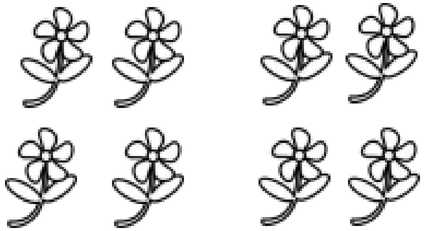
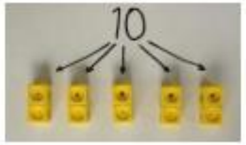
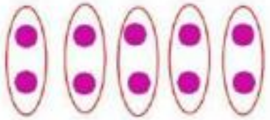
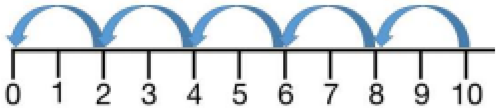
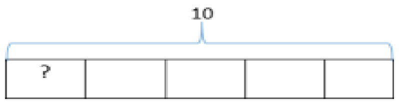
4 rows of 10
4 rows of 3
Move on to using Base 10 to move towards a more compact method.


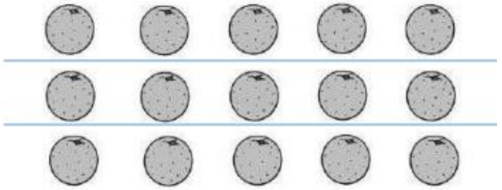
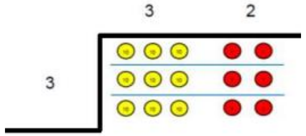
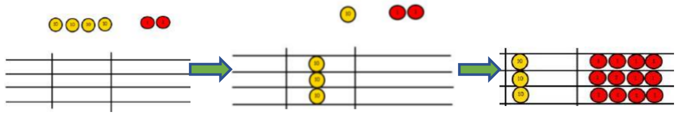
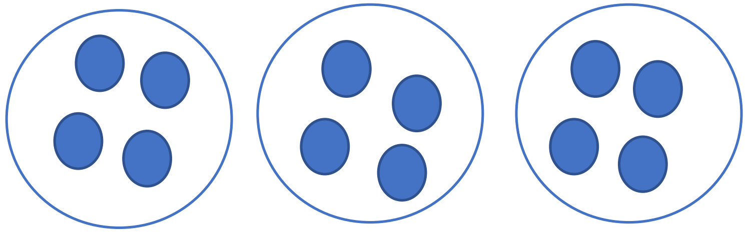
4 rows of 13
Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows.
Fill each row with 126.


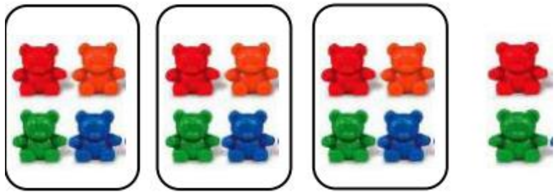
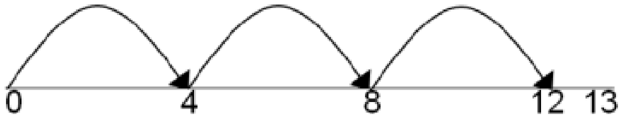
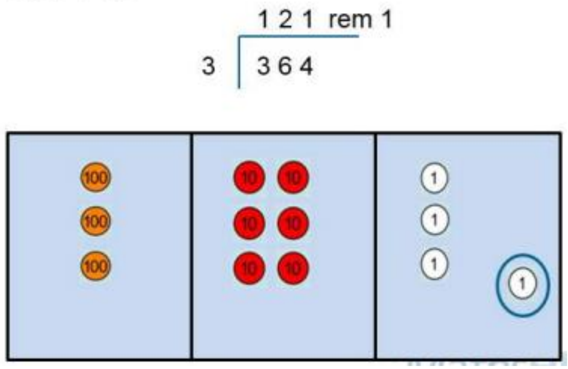
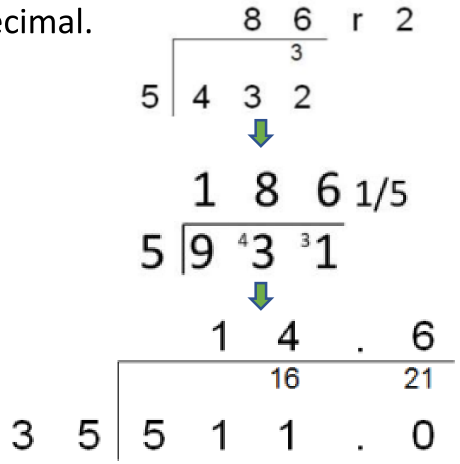
Add up each column, starting with the ones making any exchanges needed.

4 × 126 = 504
</td>
<td>
Children can represent the work they have done with place value counters in a way that they understand. They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below:


Start with multiplying by one digit numbers and showing the clear addition alongside the grid.
<table>
<tr><td>×</td><td>30</td><td>5</td></tr>
<tr><td>7</td><td>210</td><td>35</td></tr>
</table>
210 + 35 = 245
</td>
<td>
Moving forward, multiply by a 2 digit number showing the different rows within the grid method.
<table>
<tr><td></td><td>10</td><td>8</td></tr>
<tr><td>10</td><td>100</td><td>80</td></tr>
<tr><td>3</td><td>30</td><td>24</td></tr>
</table>
Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.
Short multiplication
24 × 6 becomes
<table>
<tr><td></td><td>2</td><td>4</td></tr>
<tr><td>×</td><td></td><td>6</td></tr>
<tr><td>1</td><td>4</td><td>4</td></tr>
<tr><td></td><td>2</td><td></td></tr>
</table>
Answer: 144
342 × 7 becomes
<table>
<tr><td></td><td>3</td><td>4</td><td>2</td></tr>
<tr><td>×</td><td></td><td></td><td>7</td></tr>
<tr><td>2</td><td>3</td><td>9</td><td>4</td></tr>
<tr><td></td><td>2</td><td>1</td><td></td></tr>
</table>
Answer: 2394
</td>
</tr>
</table>

Objective		Concrete	Pictorial	Abstract
Year 5-6	Expanded method	Show the link with arrays to first introduce the expanded method. 		Start with long multiplication, reminding the children about lining up their numbers clearly in columns. 18 x 13 24 (3 x 8) 30 (3 x 10)) 80 (10 x 8) 100 (10 x 10) 234
	Compact method	Children can continue to be supported by place value counters at the stage of multiplication.  It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.	Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods  	Start with long multiplication, reminding the children about lining up their numbers clearly in columns. If it helps, children can write out what they are solving next to their answer. 7 4 x 6 3 1 2 2 1 0 2 4 0 + 4 2 0 0 4 6 6 2 This moves to the more compact method. 2 3 1 1 3 4 2 x 1 8 1 3 4 2 0 1 0 7 3 6 2 4 1 5 6 1

Objective		Concrete	Pictorial	Abstract
Year 1-2	*Sharing*	 I have 8 cubes, can you share them equally between two people?	 $8 \div 2 = 4$ Children use pictures or shapes to share quantities.	Share 8 buns between two people.
	Grouping	  Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.	Use a number line to show jumps in groups. The number of jumps equals the number of groups.  Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.  $10 \div 5 = ?$ $5 \times ? = 10$	Divide 10 into 5 groups. How many are in each group? $10 \div 5 = 2$

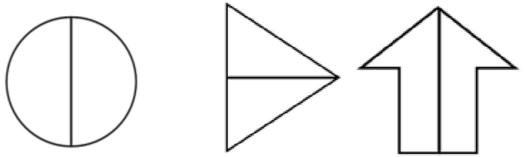
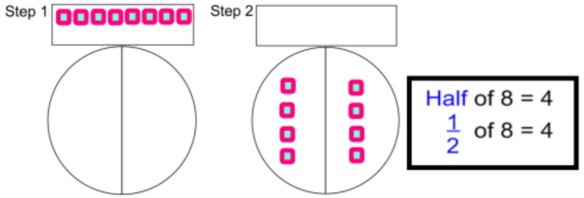
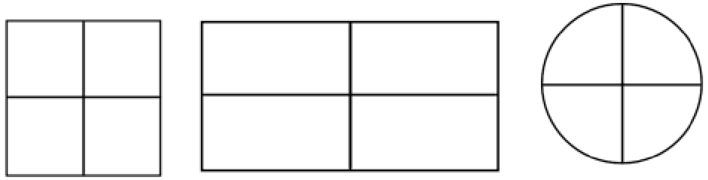
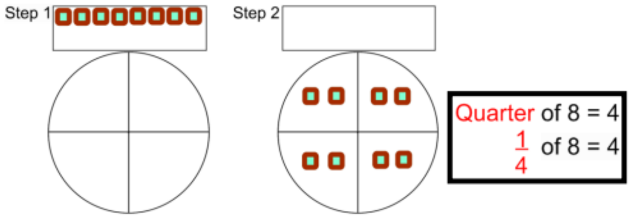
Objective		Concrete	Pictorial	Abstract
Year 3-4	Division with arrays	 Link division to multiplication by creating an array and thinking about the number sentences that can be created: **15 ÷ 3 = 5** **5 x 3 = 15** **15 ÷ 5 = 3** **3 x 5 = 15**	Draw an array and use lines to split the array into groups to make multiplication and division sentences. 	Find the inverse of multiplication and division sentences by creating four linking number sentences. **5 x 3 = 15** **3 x 5 = 15** **15 ÷ 5 = 3** **15 ÷ 3 = 5.**
Year 3-4	Short division	Use place value counters to divide using the short division method alongside. 96 ÷3. *Start with the biggest place value.*  **42 ÷ 3** We are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over. We exchange this ten for 10 ones and then share the ones equally among the groups. We look at how many are in each group. 	Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.  Encourage them to move towards counting in multiples to divide more efficiently.	Begin with divisions that divide equally with $$\begin{array}{r\|l} & 2\ \ 1\ \ 8 \\ \hline 4 & 8\ \ 7^{3}\ 2 \end{array}$$

Objective		Concrete	Pictorial	Abstract
Year 5-6	Short division with remainders	Divide objects between groups and see how much is left over. **14 ÷ 3 =** 	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.  Draw dots and group them to divide an amount and clearly show a remainder. 	28÷8=3r5 Complete written divisions and show the remainder using *r.* 
		364 ÷ 3 = 		Move onto divisions with a remainder. Once children understand remainders, begin to express as a fraction or decimal. 

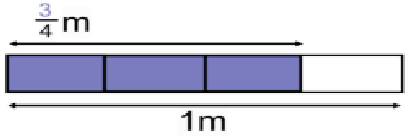
Objective		Concrete	Pictorial	Abstract
Year 6	Long division			Children will use long division to divide numbers with up to 4 digits by 2 digit numbers. Calculate 4,320 ÷ 32 = 135

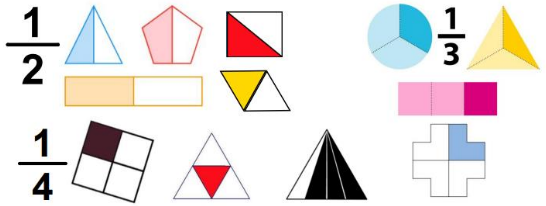
32	64	96	128	160	192

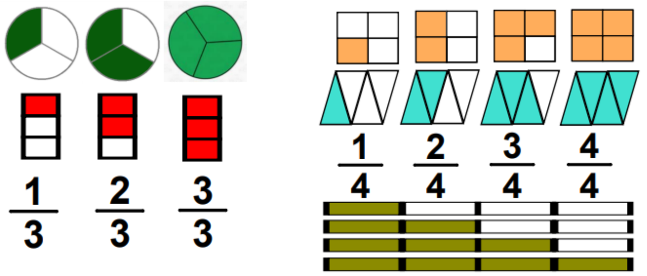
		1	3	5
32	4	3	2	0
−	3	2		
	1	1	2	
−		9	6	
		1	6	0
−		1	6	0
				0

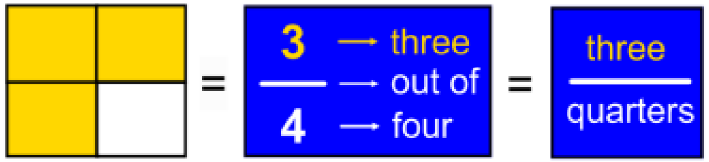
Objective		Concrete	Pictorial	Abstract
Year 1	Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity	Children begin to make sense of fractions as part of a whole through exploring the halving of objects, shapes and quantities. 	Links are made between the halving and quartering of real objects and children begin to recognise half and quarter shapes in different orientation and they explain why some shapes can be halved but not quartered. 	Children begin to make links between fractions of shapes and quantities through the sharing of items as part of problem solving in varied contexts. 
	Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity	Children begin to make sense of fractions as part of a whole through exploring the quartering of objects, shapes and quantities. 		

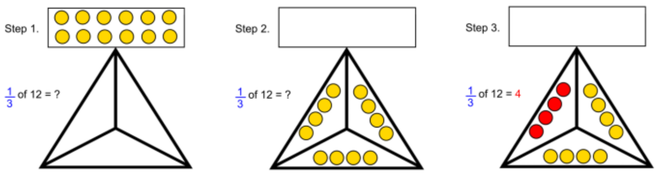
Objective		Concrete	Pictorial	Abstract
Year 2	Recognise, find, name and write fractions 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity. Write simple fractions, for example 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2.	Children find fractions of the lengths of a piece of string, strip of paper, ribbon, shoelace, etc. by folding. Children should be encouraged to discover the strategy of halving and then halving again. Children solve problems involving finding fractions of a jug or container full of water, flour, sand etc. They are to explore the best possible way to be accurate using a range of containers.	Each fraction is represented using varied shapes in different orientation. Children are given the opportunity to explore the meaning of the numerator by making links between the number of parts are shaded and the numerator.	Children explore finding fractions of quantities using objects by drawing on their knowledge and understanding of fraction of shape. Pupils are taught to find simple fractions of quantities using jottings and bar-modelling and through their understanding of the meaning of the numerator and the denominator.

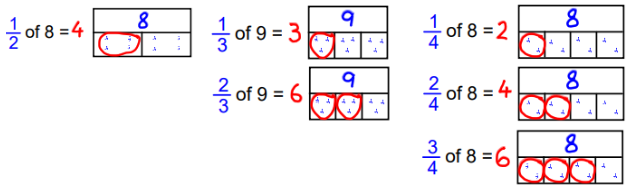












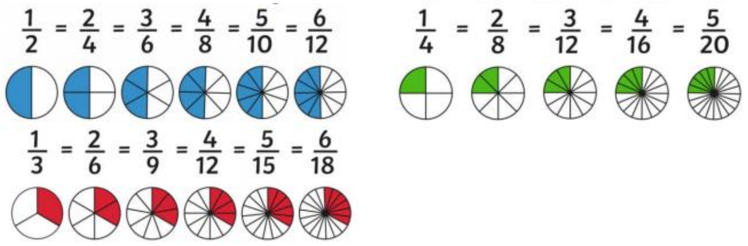
Objective	All work with fractions at this stage involves elements of CPA

Year 3

Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators

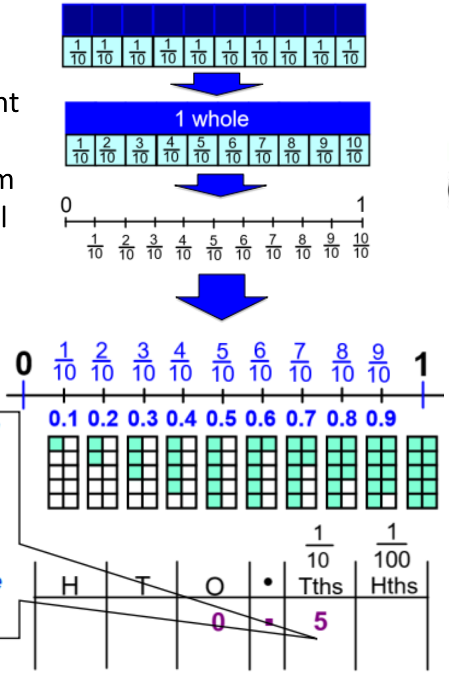
Add and subtract fractions with the same denominator within one whole using diagrams.

Children must be given the opportunity to explore equivalent fractions through varied shapes and representations and discover similarities and differences.



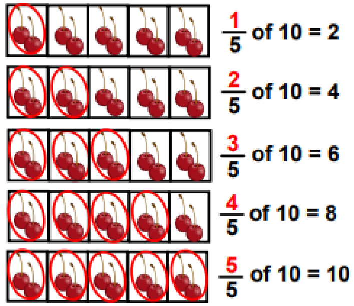
They should recognise the relationship between the numerators and the denominators and generalise based on their observations.

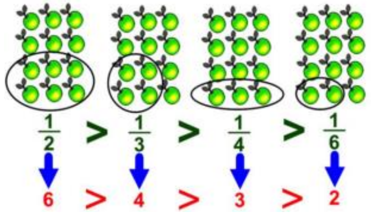
Pupils should be taught to count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10.



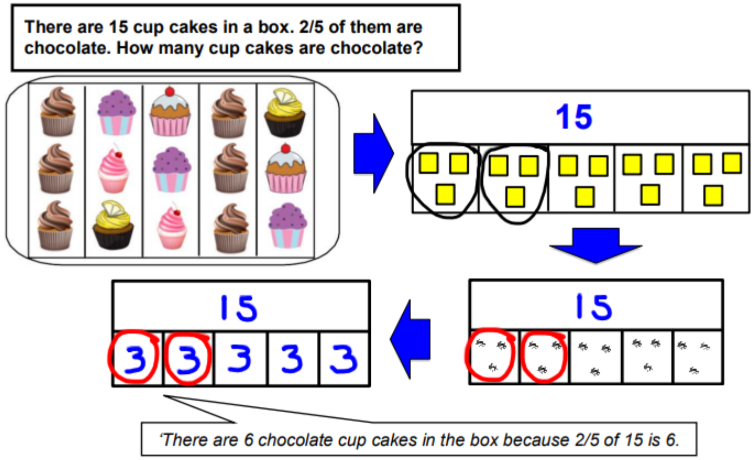
Five tenths is the same as 0.5 and $\frac{5}{10}$ because one whole is divided into 10 parts equally and we take five parts. On a number line we are five equal jumps away from 0.

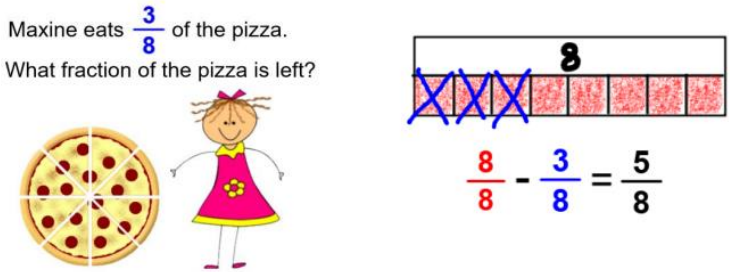
Pupils compare and order fractions and come to a conclusion to generalise.

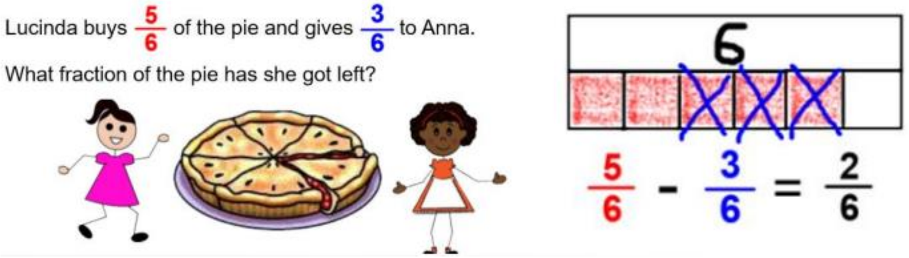




Solve problems that involve fractions using jottings and bar model.





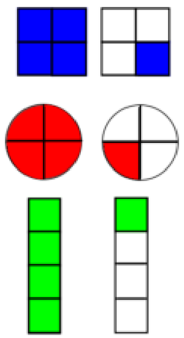


Objective	All work with fractions at this stage involves elements of CPA

Year 4

Add and subtract fraction with the same denominator using diagrams

Add and subtract fractions with the same denominator (within and beyond one whole)



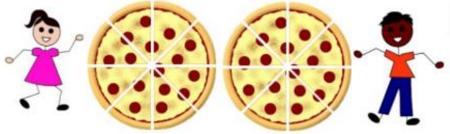
$$\frac{4}{4} + \frac{1}{4} = \frac{5}{4}$$

$$1 + \frac{1}{4} = 1\frac{1}{4}$$

Anna and Mark orders two whole pizzas.

Anna eats $\frac{10}{8}$ of the pizzas and Mark eats $\frac{3}{8}$.

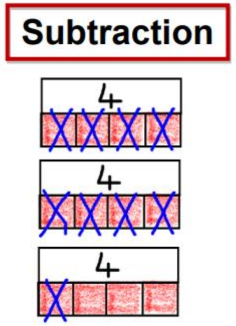
a) What fraction of the pizzas do they eat altogether?



$$\frac{10}{8} + \frac{3}{8} = \frac{13}{8} = 1\frac{5}{8}$$

At a birthday party there are three pies cut into four equal parts. $\frac{9}{4}$ of the pies are eaten.

What fraction of the pies are left?

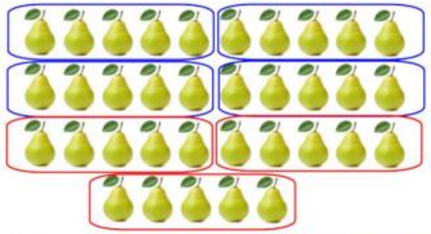


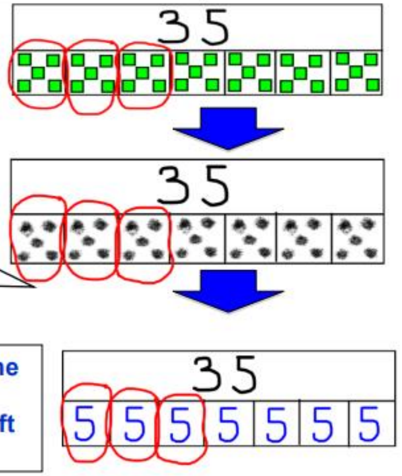
$$\frac{12}{4} - \frac{9}{4} = \frac{3}{4}$$

Solve problems involving increasingly harder fractions to calculate quantities, and fraction to divide quantities, including non-unit fractions where the answer is a whole number

At the market, pears are sold in crates of 35. 3/7 of the pears are sold in the first hour.
- **a) How many pears are sold?**
- **b) How many pears are left unsold?**

35 pears put into 7 equal groups is 5





35÷7=5

5×3=15

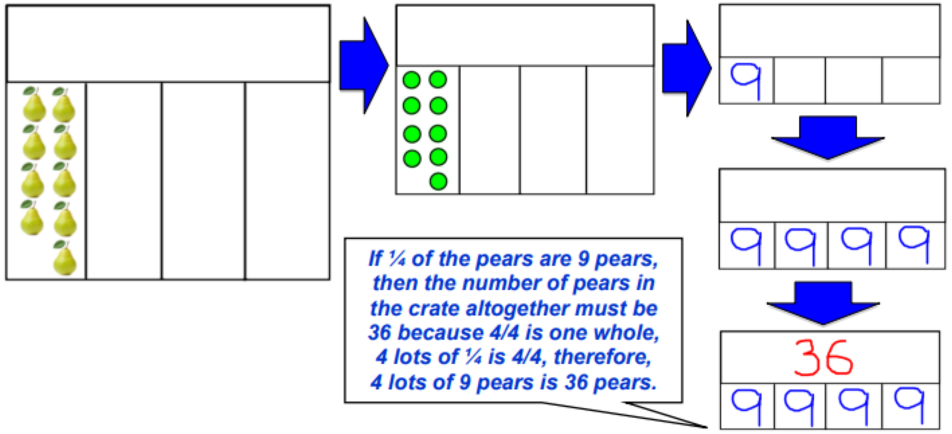
5 must be multiplied by 3 because three lots of 1/7 is sold.

a) 15 pears are sold in the first hour on the market.

b) 20 pears are unsold because 4/7 are left and 4/7 of 35 is 20.

At the market, pears are sold in crates. 9 pears are sold, which is 1/4 of the crate of pears. How many pears are in a crate altogether?

Pupils use bar modelling to gather all the information from the word-problem. They reason about why they choose a bar-model that is divided into four equal parts rather than any other number of parts and begin completing the information that is known.



If ¼ of the pears are 9 pears, then the number of pears in the crate altogether must be 36 because 4/4 is one whole, 4 lots of ¼ is 4/4, therefore, 4 lots of 9 pears is 36 pears.

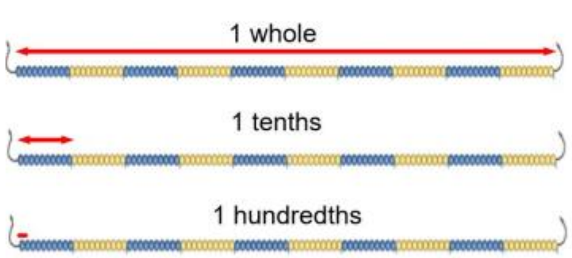
Objective	All work with fractions at this stage involves elements of CPA

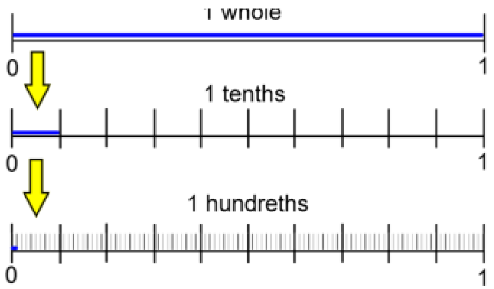
Year 4

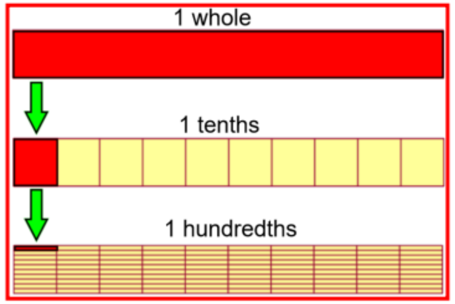
Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten

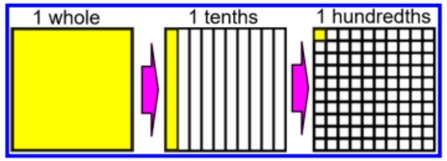
find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths

Children explore relationships between 1 whole, 10 tenths, 100 hundredths using shapes and the number line and identify how this changes when they compare 1 whole, 1 tenths and 1 hundredths.

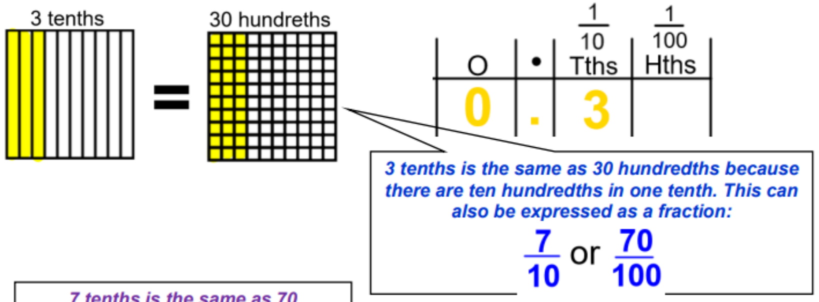


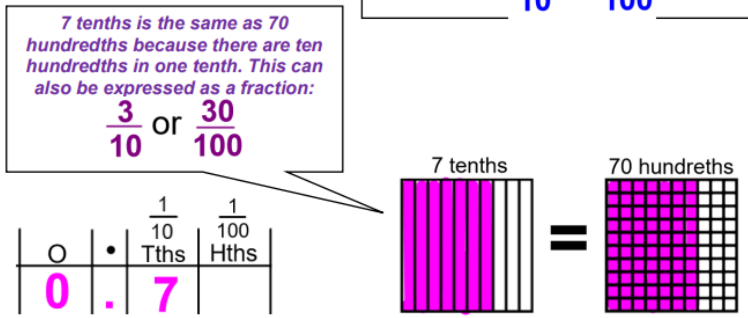




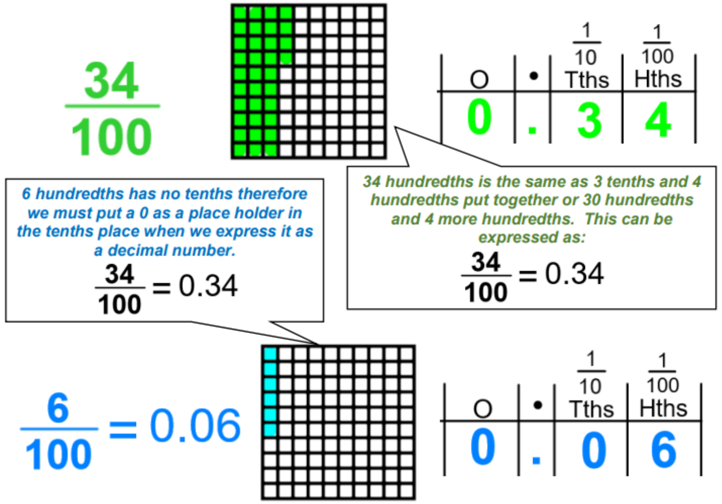


Pupils recognise that any number of tenths can also be expressed as hundredths using the following diagrams and PV chart.

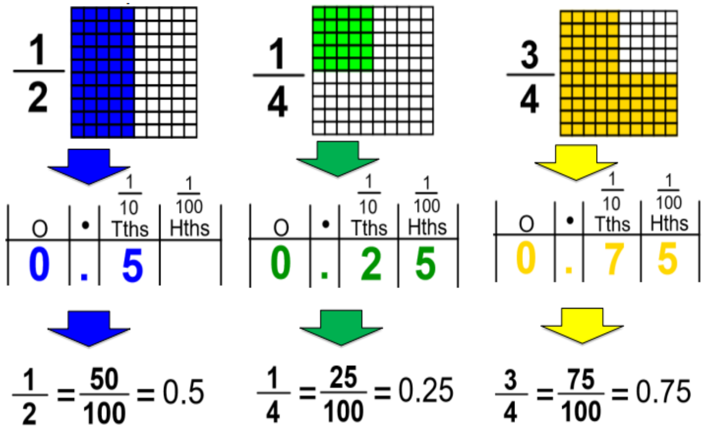


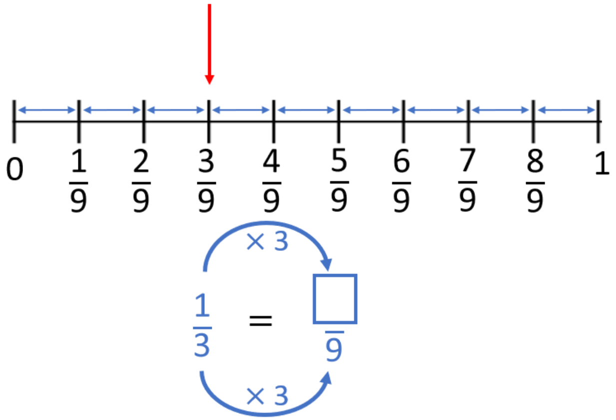
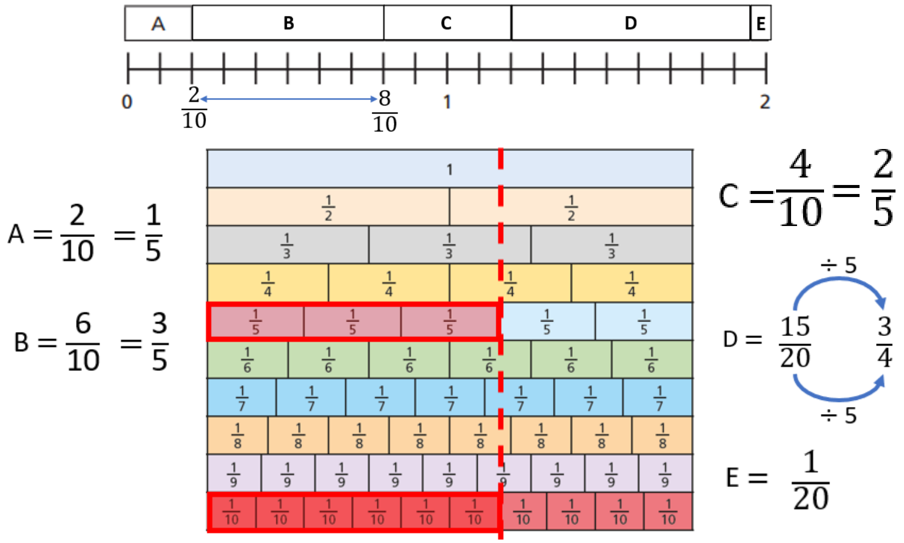
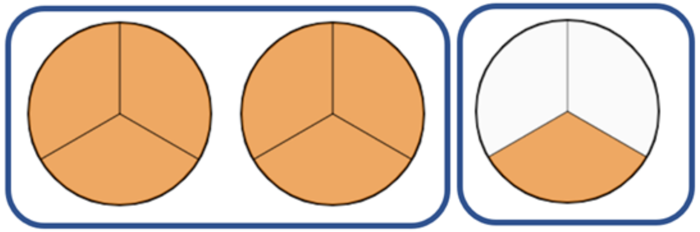
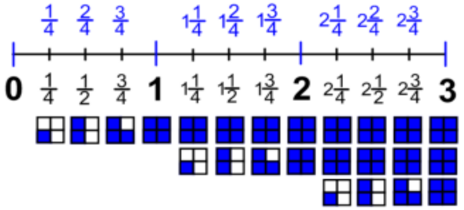
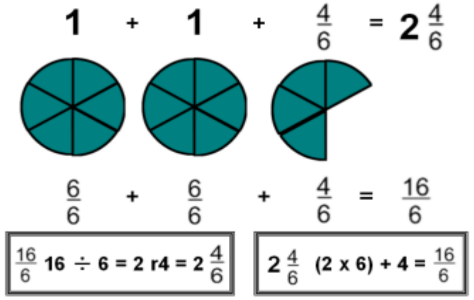
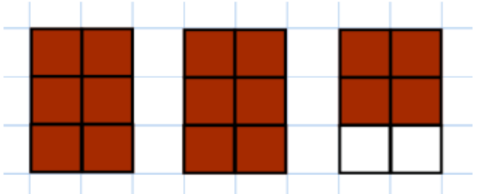


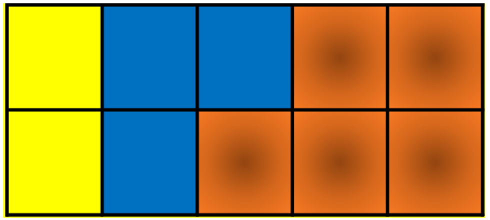
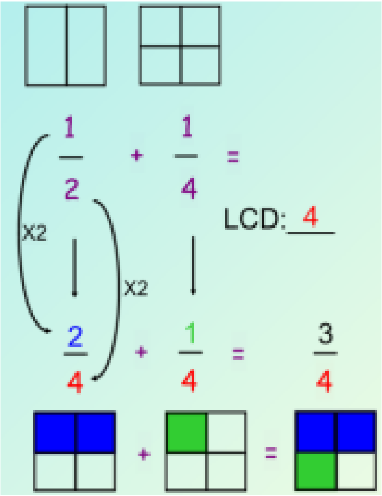
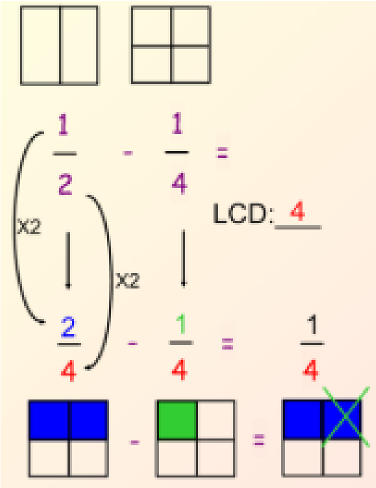
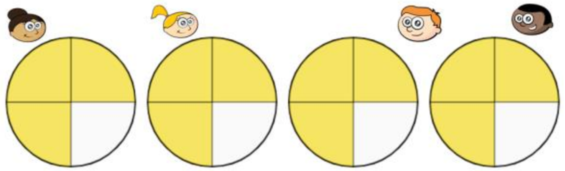
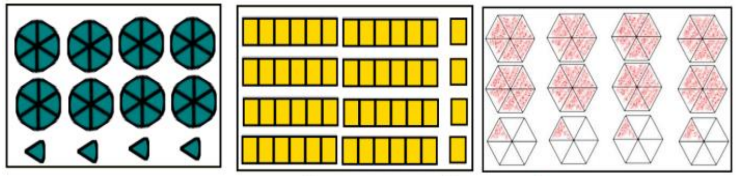
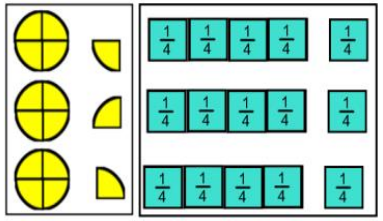
Pupils use PV chart and diagrams to help understand how to write the decimal equivalence to tenths and hundredths and use reasoning to explain their thinking.



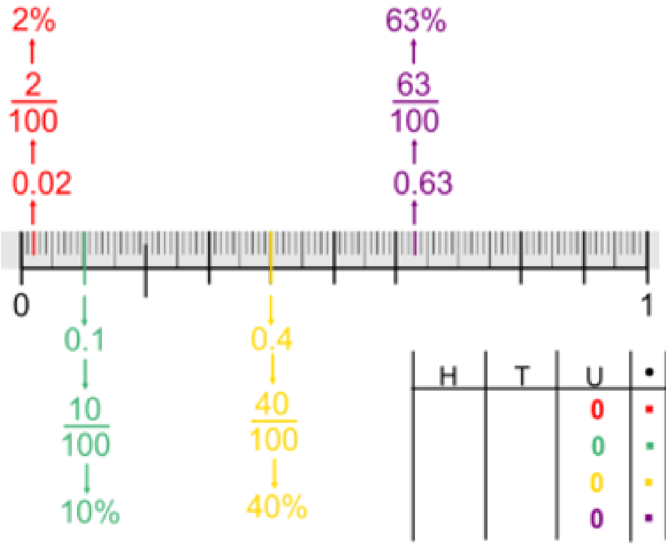
Children explore with the use of diagrams how 1/4, 1⁄2 and 3⁄4 are expressed as decimal equivalents.

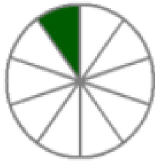


Objective		All work with fractions at this stage involves elements of CPA
Year 5-6	Compare and order fractions, including fractions > 1	Where would this representation go on the number line?  $\frac{1}{3}$  
	Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 = 11/5].	Convert the improper fraction to a mixed number  $\frac{7}{3} = 2\frac{1}{3}$   Children convert mixed number fractions into improper fractions and vice versa using visual representation to embed understanding. Children use their squared books to draw and shade the fractions. 

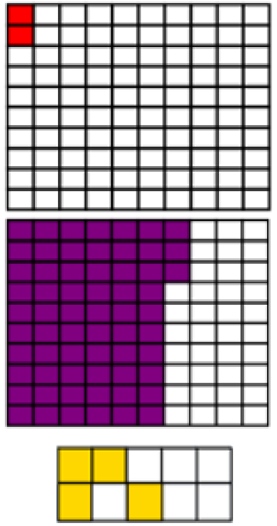
Objective		All work with fractions at this stage involves elements of CPA
Year 5	Add and subtract fractions with the same denominator and denominators that are multiples of the same number.	 Charlie eats $\frac{1}{5}$ of the chocolate bar. Suzie eats $\frac{3}{10}$ of the chocolate bar. $\frac{5}{10}$ of the bar is eaten.  
	Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	 3 quarters × 4 = 12 quarters $\frac{3}{4} \times 4 = \frac{12}{4}$ $\frac{2}{5} \times 3 = \frac{6}{5} = 1\frac{1}{5}$   4 lots of $2\frac{1}{6}$ = 4 x $2\frac{1}{6}$ = $8\frac{4}{6}$  3 lots of $1\frac{1}{4}$ = 3 x $1\frac{1}{4}$ = $3\frac{3}{4}$ Using varied representations and the concept of grouping pupils investigate what happens when a mixed fraction is multiplied by a whole number. They come to a conclusion to generalise.

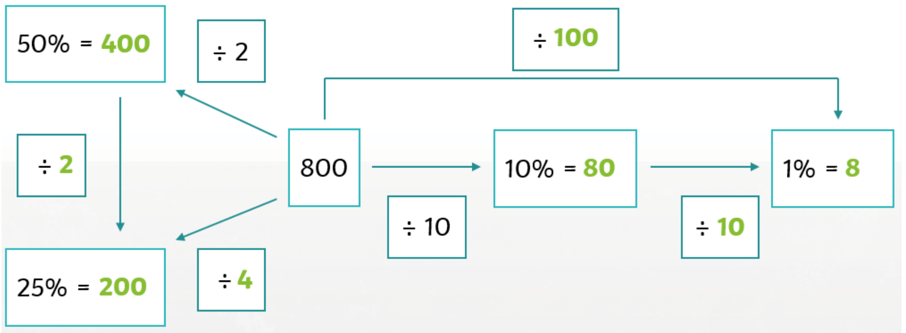
Objective		All work with fractions at this stage involves elements of CPA
Year 5	Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentage as a fraction with denominator 100, and as a decimal.	Children link their prior understanding about decimal numbers of tenths and hundredths to percentages with the help of varied diagrams. Pupils should make connections between percentages, fractions and decimals (for example, 100% represents a whole quantity and 1% is 100 1 , 50% is 100 50 , 25% is 100 25) and relate this to finding 'fractions of'.
Year 6	Solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison.	Use equivalent fractions to find %s of numbers. Progress to multiple steps.

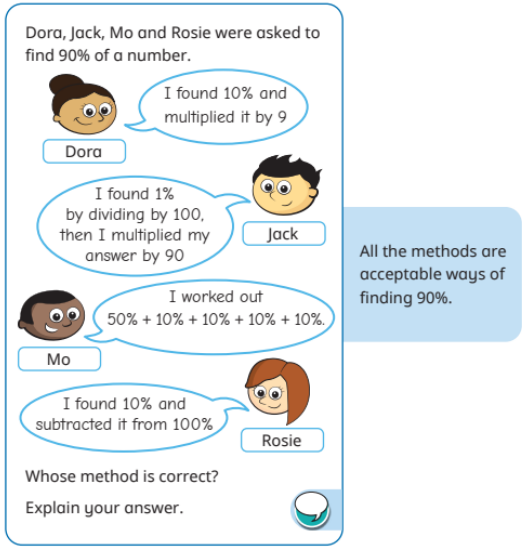




H	T	U	•	Tths	Hths
		0	.	0	2
		0	.	1	
		0	.	4	
		0	.	6	3







10% of 250 = 25
1% of 250 = 2.5
11% of 250 = 25 + 2.5 = 27.5

Objective	All work with fractions at this stage involves elements of CPA

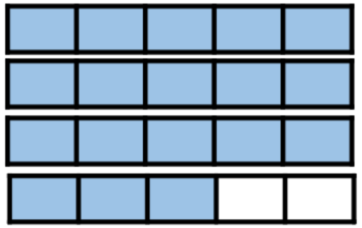
Year 5-6

Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fraction.

I'm going to convert both mixed numbers to improper fractions first

$$2 \times \frac{5}{5} + \frac{1}{5}$$

$$2\frac{1}{5} = \frac{11}{5}$$

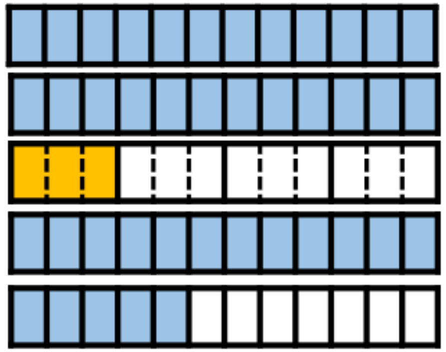


$$3 \times \frac{5}{5} + \frac{3}{5}$$

$$3\frac{3}{5} = \frac{18}{5}$$

I'm going to add my whole numbers and fractions separately.

$$3\frac{1}{4} + 4\frac{5}{12} = 7\frac{8}{12}$$



$$3 + 4 = 7$$

$$\frac{1}{4} + \frac{5}{12}$$

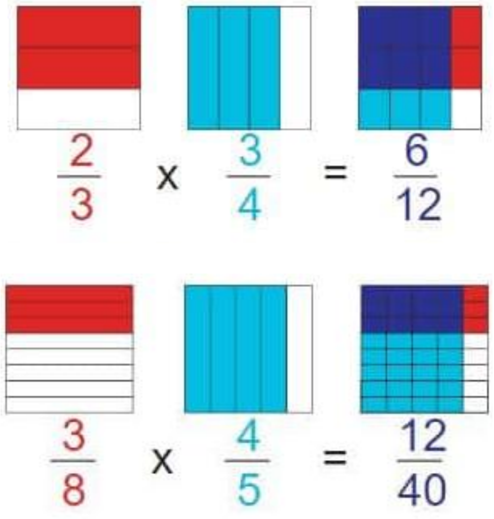
$$\times 3 \quad \frac{3}{12}$$

$$\frac{3}{12} + \frac{5}{12} = \frac{8}{12}$$

Objective	All work with fractions at this stage involves elements of CPA

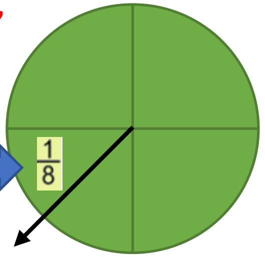
Year 6

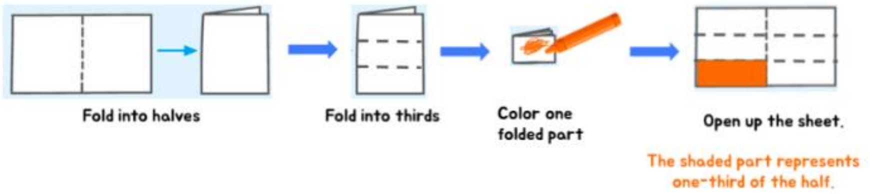
Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 1/4 × 1/2 =1/8].



Children **must learn** that the word ‘of’ means the same as the symbol ‘x’.

$$\frac{1}{2} \times \frac{1}{4} = \frac{1}{2} \text{ of } \frac{1}{4} = \frac{1}{8}$$



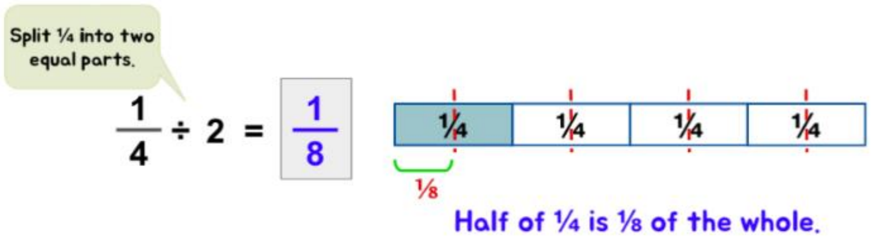


Multiply the numerators: $\frac{2}{5} \times \frac{3}{4} = \frac{6}{}$

Multiply the denominators: $\frac{2}{5} \times \frac{3}{4} = \frac{6}{20}$

Reduce the fraction if necessary: $\frac{6}{20} = \frac{3}{10}$

Divide proper fractions by whole numbers [for example, 1/3 ÷ 2 =1/6].



$$\frac{9}{17} \div 3 = \frac{9}{17} \div \frac{3}{1} = \frac{9}{17} \times \frac{1}{3} = \frac{9 \times 1}{17 \times 3}$$

$$= \frac{9}{51} = \frac{9 \div 3}{51 \div 3} = \frac{3}{17}$$

KEEP CHANGE FLIP

$$\frac{1}{2} \div \frac{1}{4}$$

KEEP CHANGE FLIP

$$\frac{1}{2} \times \frac{4}{1}$$

KEEP this one the same.

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

FLIP the divisor fraction

CHANGE sign from ÷ to x.

$$= \frac{2}{3} \times \frac{5}{4}$$

$$= \frac{2 \times 5}{3 \times 4}$$

MULTIPLY the fractions.

$$= \frac{10}{12} = \frac{5}{6}$$

SIMPLIFY