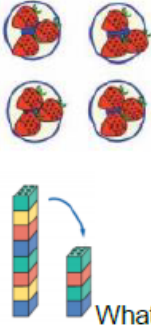
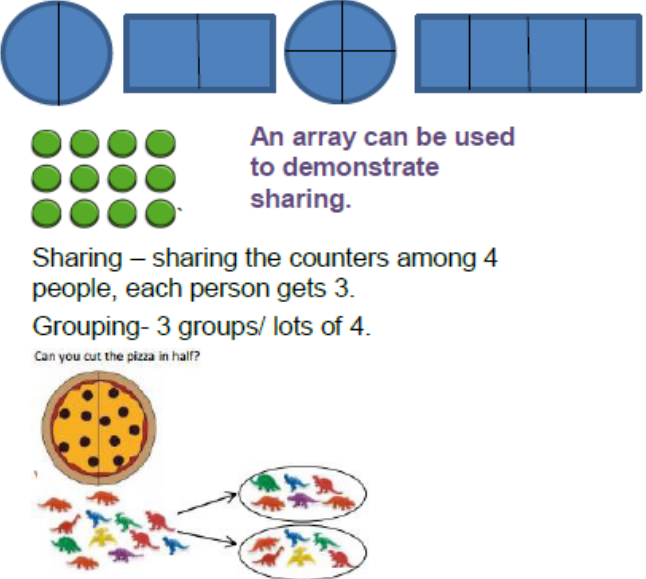
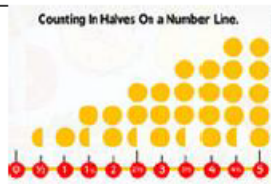
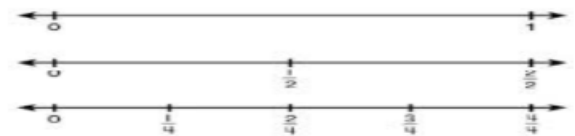
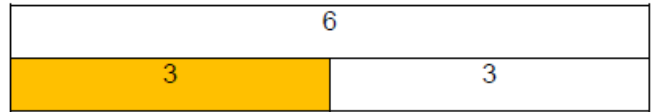
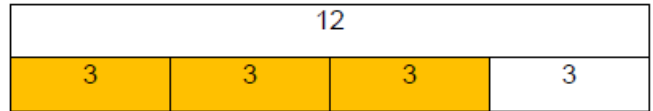





DEVELOPING UNDERSTANDING OF FRACTIONS, DECIMALS AND PERCENTAGES

Year	NC Objectives	Examples	Models and Images
EYFS	<ul style="list-style-type: none"> Share objects, shapes and count how many are in each group (early division) Solve problems involving halving and sharing 	<p>Adults to use fraction vocabulary of halves, quarters, thirds etc when describing the number of groups).</p>	 <p>What is half of 8? Half of 8 is 4.</p>
Year 1	<ul style="list-style-type: none"> Recognise, find and name a half as one of two equal parts of an object, shape or quantity Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity Begin to learn sharing and grouping into equal parts. Begin to recognise that the larger the denominator the smaller the fraction (unit fractions or same numerator). 	<p>Children use their knowledge of fractions of shape to find fractions of quantities.</p> <p>Children should be give practical apparatus to find halves and quarters of quantities within 20.</p> <p>Record work pictorially.</p>	 <p>An array can be used to demonstrate sharing.</p> <p>Sharing – sharing the counters among 4 people, each person gets 3.</p> <p>Grouping- 3 groups/ lots of 4.</p> <p>Can you cut the pizza in half?</p>

<p>Year 2</p>	<ul style="list-style-type: none"> Count in fractions up to 10 starting from any number and using the $\frac{1}{2}$ and $\frac{2}{4}$ equivalence. <i>(Non Statutory Guidance)</i> Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity Write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$. 	<p>Use a number line or fraction pieces to count in fraction starting from any number up to 10.</p> <p>Children use their knowledge of unit and non-unit fractions of shapes to find fractions of quantities. Use bar model, fraction wall, fraction pieces, Numicon. Vary the shape of objects used e.g. not always 'pizzas' and 'chocolate bars'.</p> <p>They relate this to find fractions of a length e.g. $\frac{2}{4}$ of 1m =</p> <p>Children need to relate finding a quarter to halving and halving again.</p>	 <p>Counting in Halves On a Number Line. twinkl.</p>  <p><u>Bar model</u></p> <p>$\frac{1}{2}$ of 6 = 3</p>  <p>$\frac{3}{4}$ of 12 = 9</p>  <p>If I can see $\frac{1}{4}$ how many quarters can you see?</p>  <p>If I can see $\frac{2}{3}$ how many thirds can you see?</p> 
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Year	NC Objectives	Examples	Models and Images																																																																					
Year 3	<ul style="list-style-type: none"> 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 recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators 	<p>Encourage children to count up and down in tenths.</p> <p>$1 \div 10 = 1/10$ $2 \div 10 = 2/10$ $3 \div 10 = 3/10$</p> <p>Continue the pattern.</p> <p>What do you notice? What's the same? What's different?</p> <p>Children can use fractions as an operator</p> <p>E.g. $1/4$ of 12 = $12 \div 4 = 3$</p> <p>Children can relate fractions to the division of integers</p> <p>$1 \div 4 = 1/4$ $4 \times 1/4 = 1$ $3 \div 4 = 3/4$</p>	<p style="text-align: center;">$1 \div 10 = 1/10$</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1/10</td><td>1/10</td><td>1/10</td><td>1/10</td><td>1/10</td><td>1/10</td><td>1/10</td><td>1/10</td><td>1/10</td><td>1/10</td> </tr> <tr> <td colspan="10">0</td> </tr> <tr> <td colspan="10" style="text-align: right;">1</td> </tr> </table> <p style="text-align: center;">$2 \div 10 = 2/10$</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>2/10</td><td>2/10</td><td>2/10</td><td>2/10</td><td>2/10</td><td>2/10</td><td>2/10</td><td>2/10</td><td>2/10</td><td>2/10</td> </tr> <tr> <td colspan="10">0</td> </tr> <tr> <td colspan="10" style="text-align: right;">2</td> </tr> </table> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <table border="1" style="border-collapse: collapse;"> <tr> <td style="padding: 5px;">$\frac{1}{10}$</td> </tr> </table> <p style="font-size: small; margin-left: 20px;">↑ u · $\frac{1}{10}$ ← tenths 26.5 ← equal to $\frac{5}{10}$</p> <p style="font-size: small; margin-left: 20px;">$\frac{1}{10}$ of 50 = 5 $50 \div 10 = 5$</p> </div> </div> <p>$3/4$ of 12 = 9</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td colspan="4">12</td> </tr> <tr> <td style="background-color: yellow;">3</td> <td style="background-color: yellow;">3</td> <td style="background-color: yellow;">3</td> <td>3</td> </tr> </table>	1/10	1/10	1/10	1/10	1/10	1/10	1/10	1/10	1/10	1/10	0										1										2/10	2/10	2/10	2/10	2/10	2/10	2/10	2/10	2/10	2/10	0										2										$\frac{1}{10}$	12				3	3	3	3
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- recognise and show, using diagrams, equivalent fractions with small denominators

$$\frac{3}{4} \times 4 = 3 \text{ (} \frac{12}{4} \text{ or } \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} \text{)}$$

Children need to relate and reason about why their diagrams are equivalent to a half – make connections between the numerator and the denominator

$$\text{E.g. } \frac{1}{2} = \frac{4}{8}$$

The numerator will be half of the denominator.

Children should be encouraged to make the connection between their multiplication tables and equivalents

$$\text{E.g. } \frac{1}{3} = \frac{3}{9} \text{ because } 3 \times 3 = 9.$$

$$\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$$

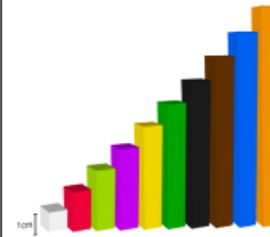
Children need to use practical resources/visual representations to support the comparison of fractions

$$\text{E.g. } \frac{1}{3} > \frac{1}{4}$$

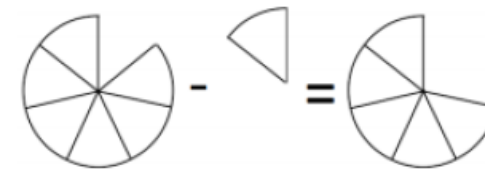
Children should also be taught how to order fractions on a number line.





- add and subtract fractions with the same denominator within one whole
- recognise and write mixed number fractions- link to the addition of fractions with the same denominator (*Leighton School guidance*).
- compare and order unit

Use Cuisenaire rods to develop vocabulary of equivalence.



$$\frac{6}{7} - \frac{1}{7} = \frac{5}{7}$$



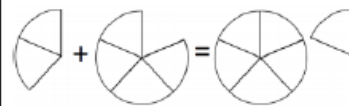
	<p>fractions, and fractions with the same denominators</p> <ul style="list-style-type: none"> Securely understand that the larger the denominator the smaller the fraction (if a unit fraction). (<i>Leighton School guidance</i>). 		
Year 4	<ul style="list-style-type: none"> recognise and show using diagrams, families of common equivalent fractions count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by tenths solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number add and subtract fractions with the same denominator 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 	$1 \div 100 = 1/100$ $2 \div 100 = 2/100$ $3/7$ of 56 = 24 $3/10$ of 120 = 36 $1/4 = 12$ $3/4 = \underline{\quad}$ $3/10 + 4/10 = 7/10$ $9/100 - 7/100 = 2/100$ Children can record on a number line equivalents between $1/10$ and 0.1 Count on and back in tenths as decimals and relate to counting on/back in 10ths (fractions).	 <p>Use the rows of a multiplication square to show equivalence e.g:</p> <p>$1/2, 2/4, 3/6, 4/8$</p> <p>$2/3, 4/6, 6/9, 8/12$.</p>   <p>What should I cut my pizza into if I have 100 people to serve?</p>  <p>Count back in 1 and $1/10$ from 101.</p>

- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- read and write decimal numbers as fractions *(remember to link this to the teaching of percentages so they can see the relationship)*
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- recognise the per cent symbol (%) and understand that per cent relates to “number of parts per hundred”, and write percentages as a fraction with denominator 100 as a decimal fraction
- add and subtract fractions with the same denominator and denominators that are multiples of the same number
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number
- multiply proper fractions and mixed numbers by whole

$= 80/100 = 0.8$
 (e.g. $0.71 = \frac{71}{100}$).

E.g. $6/20 + 3/10$. Find common denominator and then add together. Encourage chdn to simplify answer where possible.

(e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)



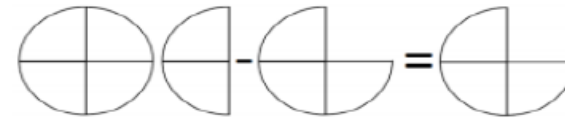
Initially $2/5 \times 2$

$4/5 \times 6 = (6 \times 4) \div 5 = 24/5$.
 Then convert to a mixed number.

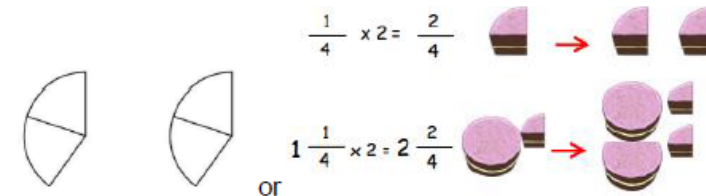


I eat 1 more piece of this cake. What fraction would be left?

$$\frac{6}{4} - \frac{3}{4} = \frac{3}{4}$$



$2/5 \times 2 =$



	<p>numbers, supported by materials and diagrams</p> <ul style="list-style-type: none"> • solve problems involving numbers up to three decimal places • solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25. 		
Y6	<ul style="list-style-type: none"> • compare and order fractions, including fractions >1 • identify the value of each digit in numbers given to three decimal places • solve problems which require answers to be rounded to specified degrees of accuracy • use common factors to simplify fractions; use common multiples to express fractions in the same denomination • associate a fraction with division and calculate decimal fraction equivalents • recall and use equivalences between simple fractions, 	<p>(e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) $3 \div 8$ using bus stop method.</p>	

decimals and percentages, including in different contexts.

- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]
- multiply one-digit numbers with up to two decimal places by whole numbers
- divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]
- multiply one-digit numbers with up to two decimal places by whole numbers
- x and +numbers by 10, 100 and 1000 up to three decimal places
- identify the value of each digit to three decimal places
- associate a fraction with division and calculate decimal fraction equivalents (e.g.

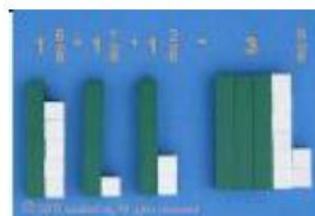
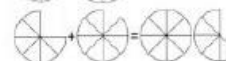
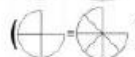
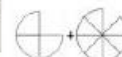
Turn them into equivalent fractions with common denominators. Then add and subtract as applicable. Find simplest form where possible.

(e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)

$\frac{3}{4} \times \frac{8}{9} = \frac{24}{36}$. Then simplify to $\frac{2}{3}$ by finding a common denominator.

3.25×4 Use short multiplication to solve this.

$\frac{3}{4} + \frac{7}{8} = 1\frac{5}{8}$
 $\frac{6}{8} + \frac{7}{8} = \frac{13}{8} = 1\frac{5}{8}$



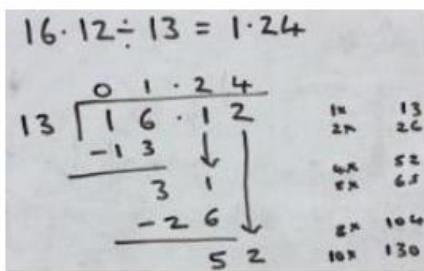
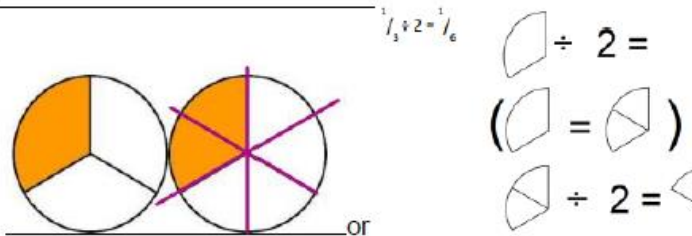
$\frac{4}{6} - \frac{1}{3} = \frac{2}{6}$
 $\frac{1}{3} = \frac{2}{6}$
 $\frac{4}{6} - \frac{2}{6} = \frac{2}{6}$

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

 $\frac{1}{8}$ (a half of a $\frac{1}{4}$)

0.375) for a simple fraction (e.g. $\frac{3}{8}$)

- use written division methods where the answer has up to two decimal places.



For a Fraction divided by a whole number, there are two stages in which the process can be taught:

Stage 1: $\frac{2}{5} \div 4 =$ Drag the whole number underneath the dividing line and multiply by the denominator ...

$$\frac{2}{5 \times 4} = \frac{2}{20} = \frac{1}{10}$$

Stage 2: Turn the whole number into a fraction (4 becomes $\frac{4}{1}$) then reverse the fraction and the operation so it becomes...

1. Stage 2: $\frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$