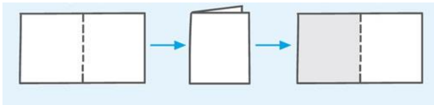
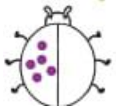
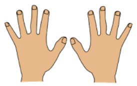
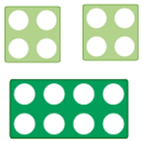
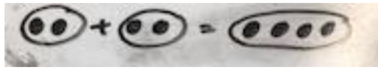
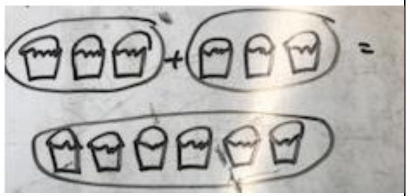
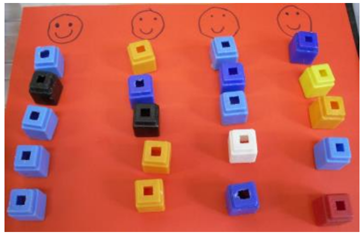
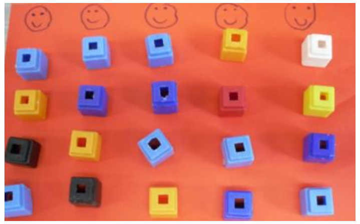
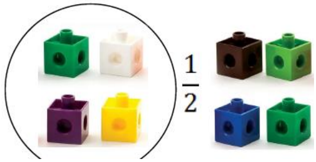
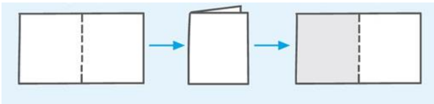
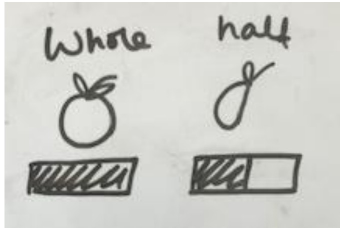
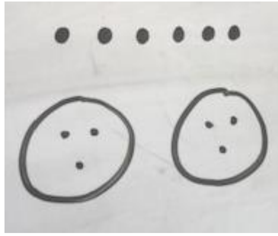
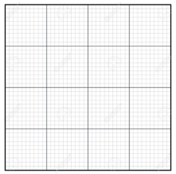
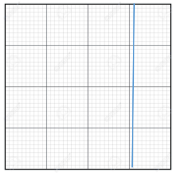
BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

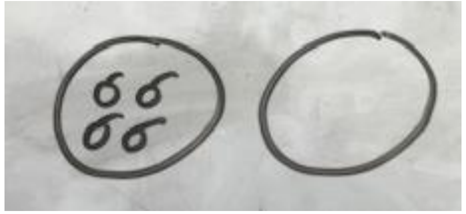
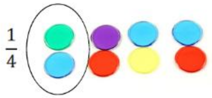
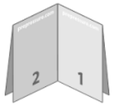
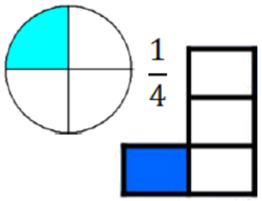
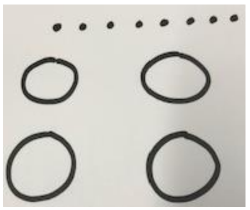
EARLY LEARNING GOAL	CONCRETE	PICTORIAL	ABSTRACT	
Solve problems including doubling and halving	Using the language of half empty/full, e.g. when playing in sand  "The bucket is half full/empty" "I need another half to fill bucket"  Cutting objects in half creates to equal parts "I'm going to cut it in half."  Folding paper in half, how many parts make the whole? Use a variety of objects to half through sharing between 2 groups  Use a variety of objects to double the group by adding the same number in the group to the group.  Putting the same number of counters on the ladybug. Using your fingers to show doubling  Doubling and halving using Numicon 	Double 2  Or Double 3 	Recognising half Rapid recall of doubling numbers up to 10 Rapid recall of halving **even** numbers to 10	EARLY YEARS FRACTIONS

EARLY LEARNING GOAL	CONCRETE	PICTORIAL	ABSTRACT	
Recognise patterns	Use a variety of objects to share a group. Knowing when the group can be shared equally.  *Sharing 16 into 4 equal groups*  *Sharing 20 into 5 equal groups*  "½" "1" "1 ½" "2"		Count out loud in halves from zero to ten	EARLY YEARS FRACTIONS

BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

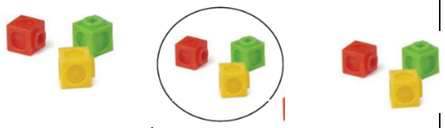
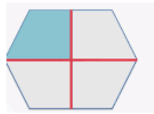
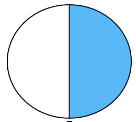
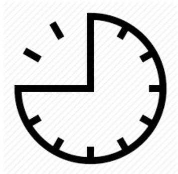
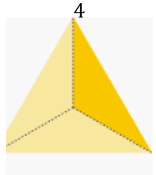
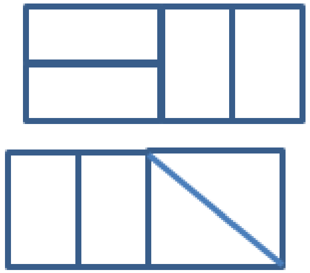
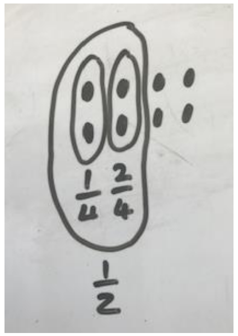
OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	
Recognise, find and name a half as one of two **equal** parts of an object, shape or quantity	 "Half is one group out of two **equal** groups." Choose a number of counters to share between two plates so there is the **same** on each half.  When can you do this? When can you not do this? Finding half by  Folding paper Numicon   Cuisenaire Rods	 Share dots between two circles so there is the same in each.  Accurately find half of a drawn rectangle  *How many ways can you cut this square in half?*	Half of 4 = Half of 8 = Half of 10 = Half of 4 is not 3 Half of 7 is not 4 Know that it is easier to half an even number. Link to doubling and halving Link to 2x tables knowledge Why is this not a half?  .	YEAR 1 FRACTIONS

BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

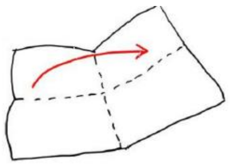
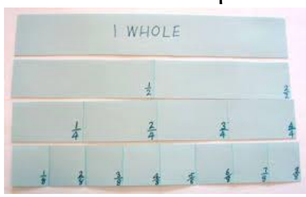
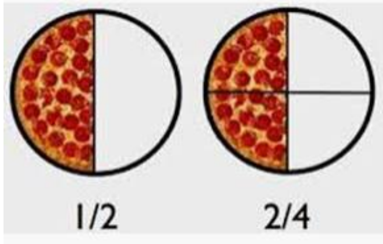
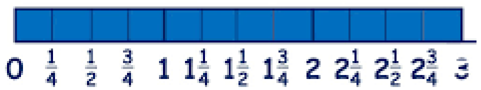
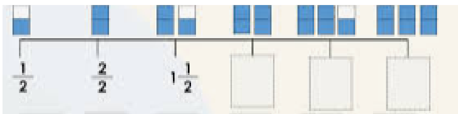
OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	
	Problem solve E.g. John had some tomatoes, he ate half of them. He had 4 left. How many did he start with?  "How many tomatoes do I need to put on the plate so they are **equal**?"		Double 4 to make the whole or 2 x 4 =	YEAR 1 FRACTIONS
Recognise, find and name a quarter as one of four **equal** parts of an object, shape or quantity	 "A quarter is one group out of four **equal** groups." Finding a quarter by   Folding paper Cuisenaire Rods Numicon   Telling the time	  Share 8 into 4 **equal** groups	A quarter of 20 = A quarter of 12 = A quarter of 16 = Uses halving and halving again to find a quarter of a number.	

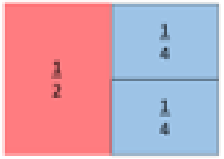
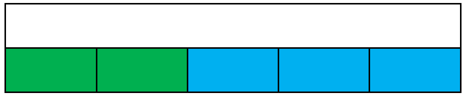
BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

YEAR 2 FRACTIONS

OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT
Recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, sets of objects or quantity	 $\frac{1}{3}$ 1 $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$   Show me 1/4 , ½ and ¾	 $\frac{1}{4}$  $\frac{2}{4}$  $\frac{3}{4}$  $\frac{1}{3}$  $\frac{2}{4}$ of 8 = 	$\frac{1}{3}$ of 12 = $\frac{3}{4}$ of 12 = Link to x tables knowledge of 2, 3, and 4x tables Introduce problem solving. Put 12 counters into equal groups. How many possibilites for groups sizes are there? What fractions es each the groups made? Encourage children to show their work using pictorial representations.

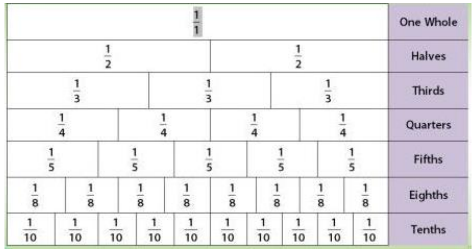
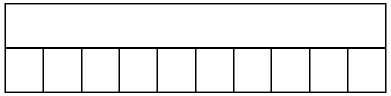
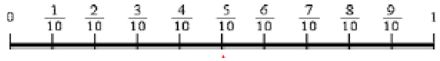
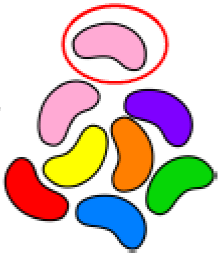
BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	
Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$	 Convince me 2/4 is the same as 1/2 Numicon   Cuisenaire Rods  Fraction cubes Fraction strips  Counting in halves, quarters and thirds with a counting stick 	  Counting in halves, quarters and thirds with number line.  	$\frac{2}{4}$ of 8 = 4 $\frac{1}{2}$ of 8 = 4 Linking to times tables and doubling and halving strategies. Counting in halves, quarters and thirds out aloud.	YEAR 2 FRACTIONS

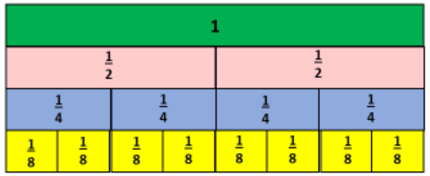
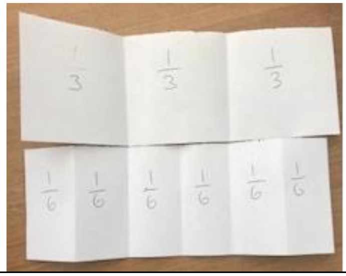
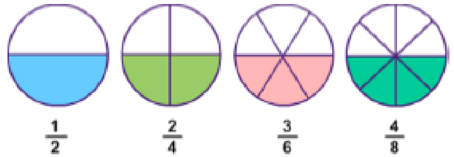
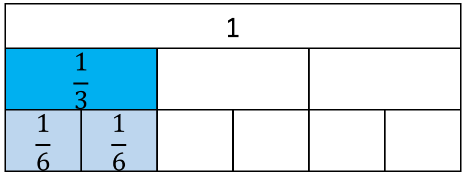
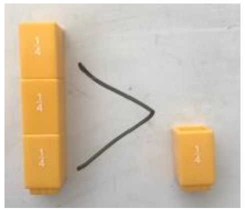
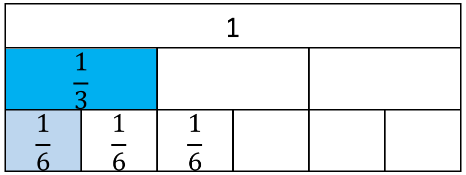
OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	
	Understanding fraction families  $\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$ $\frac{1}{2} - \frac{1}{4} = \frac{1}{4}$	Using the bar model to represent the part whole  $\frac{2}{5} + \frac{3}{5} = \frac{5}{5} = 1$ What else do we know?	Relate fraction families to problem solving: Sam spends $\frac{2}{4}$ of his money on a book? How much has he got left? If the book cost £10 how much did he start with?	YEAR 2 FRACTIONS

BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

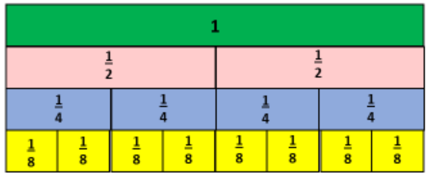
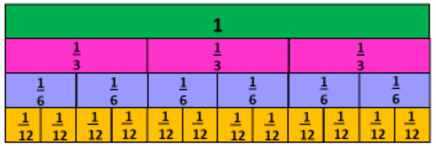
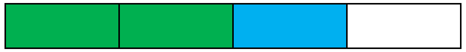
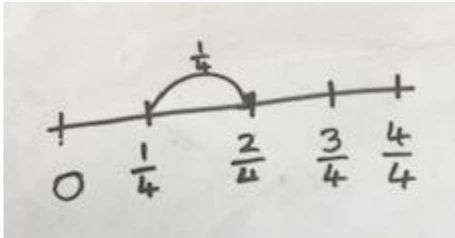
YEAR 3 FRACTIONS

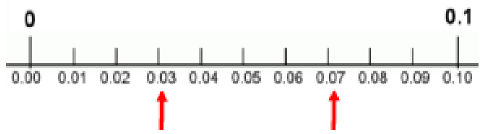
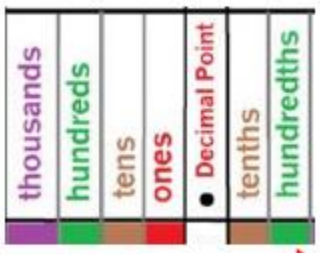
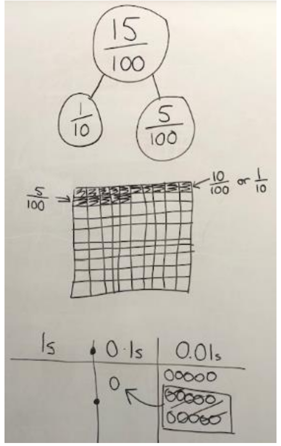
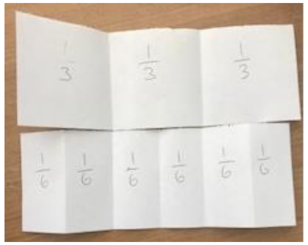
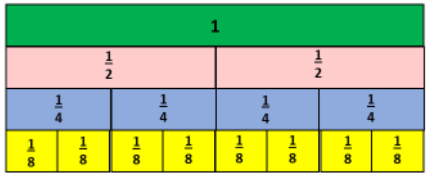
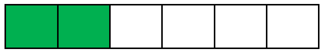
OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT
Count up and down in tenths. Recognise that tenths arise from dividing an object into 10 **equal** parts and a number by 10	 Fraction cubes Counting sticks  Fraction walls 	Bar model  Number line 	$\frac{1}{10}$ of 6 = 0.6 because 6 ÷10 = 0.6 
Recognise, find and write fractions of a discrete set of objects (unit fractions and non-unit fractions with small denominators)	$\frac{1}{8}$ 	$\frac{3}{4}$  12 3 | 3 | 3 | 3	$\frac{1}{5}$ of 15 sweets = 3 because 15÷5 = 3 and $\frac{2}{5}$ of 15 sweets = 3 because 15÷5 = 3 and 2 lots of 3 equal 6

YEAR 3 FRACTIONS

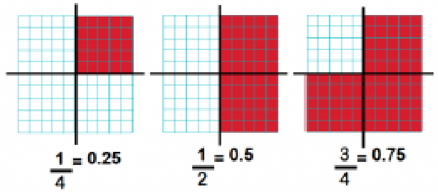
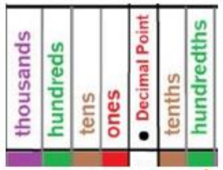
OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT
Recognise and show, using diagrams, equivalent fractions with small denominators	Fraction cubes  Fractions walls  Fraction Strips 	 Using bar models  	Sam says that two quarters is the same as one half. Is he correct? How do you know? Applying times tables knowledge.
Compare and order unit fractions. And fractions with the same denominators	 "$\frac{3}{4}$ is bigger than $\frac{1}{4}$"	 $\frac{1}{6} > \frac{1}{3}$	Put these fractions in the correct oreder starting with the smallest. $\frac{4}{8}$ $\frac{3}{4}$ $\frac{1}{4}$

BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	YEAR 3 FRACTIONS
Add and subtract fractions with the same denominator within one whole.	 **Fraction cubes** **Fraction wall**   	**Using bar model**  $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$ Using a number line  	$\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$ $\frac{6}{8} - \frac{3}{8} = \frac{3}{8}$ Solve problems using fractions, e.g. $\frac{3}{5} - \square = \frac{2}{5}$	YEAR 3 FRACTIONS

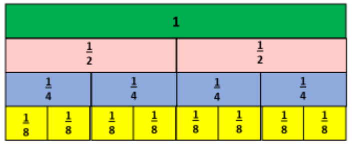
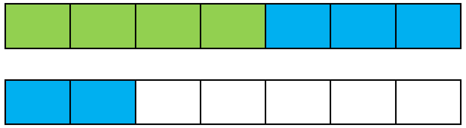
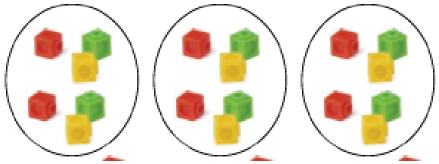
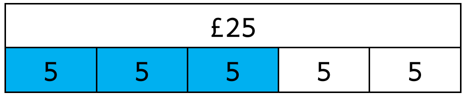
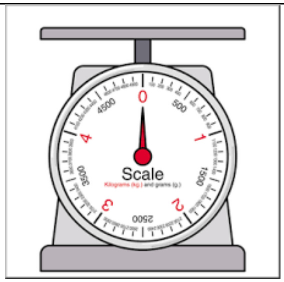
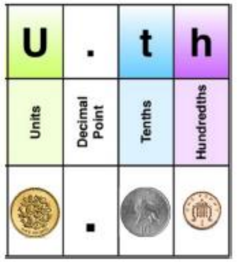
OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	
Count up and down in hundredths, recognise that hundredths arise when dividing an object by 100 and dividing an number by 100 as well as a tenth by 10	 $\frac{3}{100}$ $\frac{7}{100}$ Counting Sticks 	Place value grids  0 . 0 7 So $\frac{7}{100}$ = 0.07	$\frac{1}{100}$ of 70 = 0.7 because 7 ÷100 = 0.7 	YEAR 4 FRACTIONS
Recognise and show, using diagrams, families of common equivalent fractions	Fractions cubes  Fraction Strips 	Fraction wall  Bar models   $\frac{1}{3} = \frac{2}{6}$	Apply times tables facts to find equivalent fractions $\frac{6}{8} = \frac{3}{4}$ $\frac{2}{3} = \frac{4}{6}$ 'Whatever you do to the top, you must do to the bottom.'	

BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

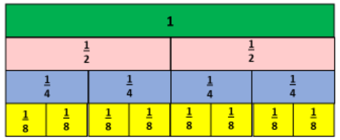
OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	
Recognise and write the decimal equivalents of $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$	Fraction cubes 	Using a blank hundred square 	Rapid recall of facts $\frac{1}{2} = 0.5$ $\frac{1}{4} = 0.25$ $\frac{3}{4} = 0.75$	YEAR 4 FRACTIONS
Recognise and write decimal equivalents of any number of tenths and hundredths	 $\frac{1}{10}$ of a chocolate bar is 0.1 Fraction cubes 	 Place value grid 	Rapid recall of facts $\frac{1}{10} = 0.1$ $\frac{3}{10} = 0.3$ $\frac{5}{10} = \frac{1}{2} = 0.5$	

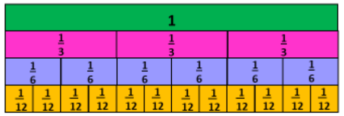
BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

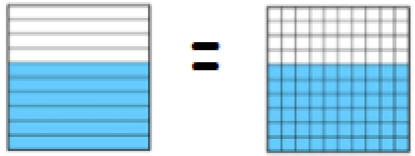
YEAR 4 FRACTIONS

OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT
Add and subtract fractions with the same denominator	Fraction cubes  Fraction walls  	Bar model $\frac{1}{7} + \frac{5}{7} =$  $= \frac{6}{7}$ Introducing the concepts of mixed numbers and improper fractions $\frac{4}{7} + \frac{5}{7} =$  $= \frac{9}{7} = 1\frac{2}{7}$	Peter eats $\frac{3}{8}$ of his pizza, how much does he have left? Jane eats $\frac{1}{7}$ and Bob eats $\frac{5}{7}$ of the chocolate bar, how much have they eaten together?
Solve problems to calculate fractions of amounts.	 $\frac{1}{3}$ $\frac{2}{3}$ $\frac{3}{3}$ $\frac{2}{3}$ of 18 = 12	Bar model  Share the whole equally between the parts. $\frac{3}{5}$ = £15	$\frac{3}{5}$ of £25 $\frac{1}{5}$ = £5 (25÷5) $\frac{3}{5}$ = £15 (5 x 3)
Solve simple measure and money problems involving fractions and decimals to 2 decimal places	 	 Using place value charts to understand money	Using known facts 1m = 100cm ½ m = 50cm ¼ m = 25cm 10cm = $\frac{1}{10}$ = 0.1m

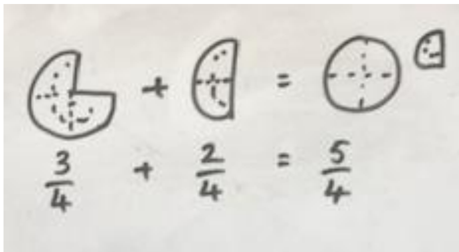
BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

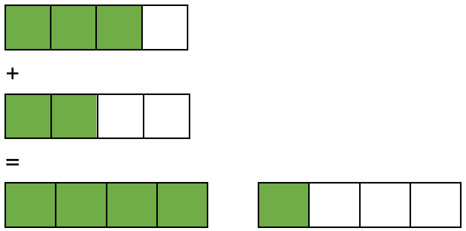
<table>
<tr><th>OBJECTIVE</th><th>CONCRETE</th><th>PICTORIAL</th><th>ABSTRACT</th><th rowspan="3">YEAR 5 FRACTIONS</th></tr>
<tr>
<td>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.</td>
<td>



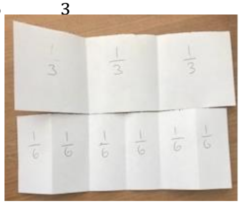
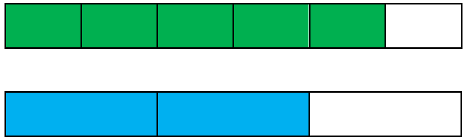
Fraction walls
Fraction cubes and fraction strips (see Year 4)</td>
<td>

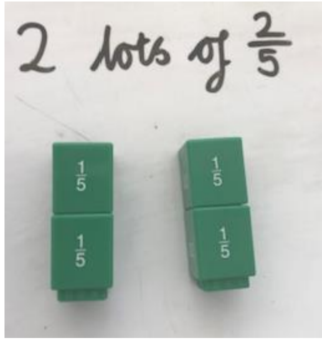
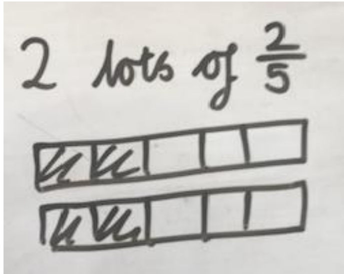
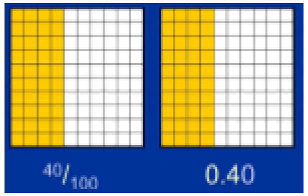
$\frac{6}{10} = \frac{60}{100}$
<table>
<tr><th>Th
Thousands</th><th>H
Hundreds</th><th>T
Tens</th><th>D
Decimal point</th><th>Tths
Tenths</th><th>Hths
Hundredths</th></tr>
<tr><td></td><td></td><td>0</td><td>.</td><td>6</td><td></td></tr>
</table></td>
<td>$\frac{3}{5} = \frac{6}{10} = \frac{60}{100}$
$\frac{3}{4} = \frac{75}{100}$
$\frac{1}{5} = \frac{2}{10} = \frac{20}{100}$</td>
</tr>
<tr>
<td>Recognise mixed numbers and improper fractions and convert one form to the other and write mathematical statements >1</td>
<td>Fraction cubes


$1\frac{2}{10}$ = 
$\frac{14}{10}$</td>
<td>Picture


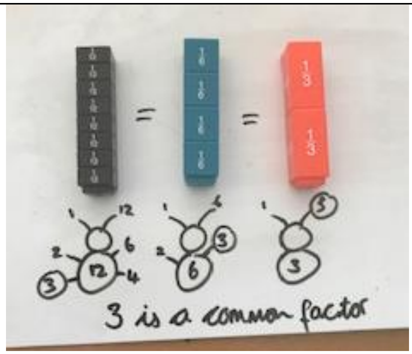
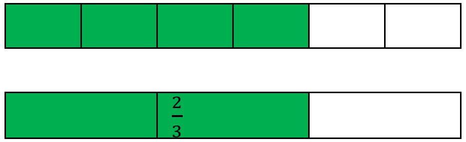
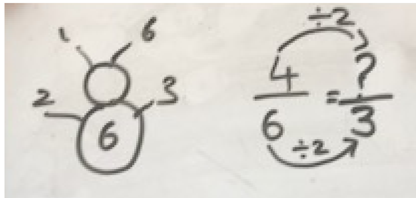
Bar model

</td>
<td>$\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}$
Linking to times table facts</td>
</tr>
</table>

BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

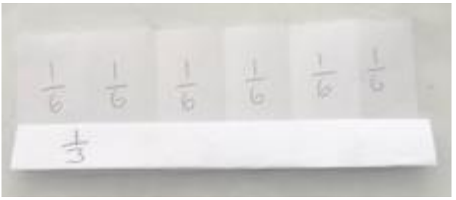
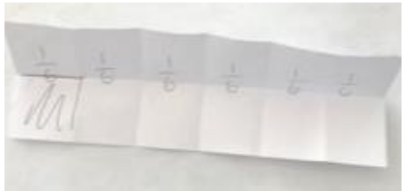
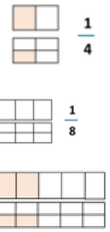
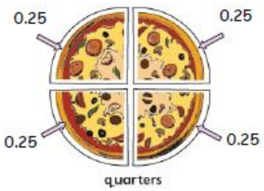
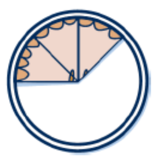
OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	
Compare an order fractions whose denominators are all multiples of the same number	Fraction cubes and fraction walls (see Year 4)	$\frac{5}{6} > \frac{2}{3}$  Fraction strips Bar models 	$\frac{2}{5} \overset{\times 4}{=} \frac{8}{20} > \frac{1}{4} \overset{\times 5}{=} \frac{5}{20}$	YEAR 5 FRACTIONS
Add and subtract fractions with the same denominator and denominators that are multiples of the same number	Fractions walls and fraction cubes (see Year 4)	Bar models  $\frac{5}{6} + \frac{2}{3} = \frac{5}{6} + \frac{4}{6} = \frac{10}{6} = 1\frac{4}{6} = 1\frac{2}{3}$	$\frac{2}{5} - \frac{1}{4}$ $\frac{2}{5} \overset{\times 4}{=} \frac{8}{20}$ $\frac{1}{4} \overset{\times 5}{=} \frac{5}{20}$ So, $\frac{8}{20} - \frac{5}{20} = \frac{3}{20}$ $\frac{2}{5} - \frac{1}{4} = \frac{3}{20}$	

OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	
Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	Fraction cubes 	Bar models 	$\frac{2}{5} \times 2 = \frac{4}{5}$	YEAR 5 FRACTIONS
Solve problems which require knowing the percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 & with denominator of 10 or 25	Fraction cubes 	Bar models 	¼ = 0.25= 25% ½ = 0.5 = 50% $\frac{22}{25}$ = 88% = 0.88 Etc	

BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	
Use common factors to simplify fractions; use common multiples to express fractions in the same denomination		$\frac{4}{6} = \frac{?}{3}$ 3 is a factor of 6 so can find the missing numerator 		YEAR 6 FRACTIONS
Compare and order fractions, including >1	Fraction walls and fractions cubes (see previous years)	Bar models and rectangular models (see previous years)	Apply times tables knowledge linked to common factors. (see Year 5)	
Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	Fraction walls and fractions cubes (see previous years)	Bar models and rectangular models (see previous years)	$2\frac{2}{5} + 1\frac{2}{3} =$ 1)Partition the whole numbers so 2 + 1 = 3 2) Convert both fractions so denominator is same $\frac{2}{5} = \frac{6}{15}$ $\frac{2}{3} = \frac{10}{15}$ 3) Add fractions $\frac{6}{15} + \frac{10}{15} = \frac{16}{15} = 1\frac{1}{15}$ 4) Recombine whole number and fraction calculation $3 + 1\frac{1}{15} = 4\frac{1}{15}$	

BENTLEY CE PRIMARY SCHOOL – FRACTION PROGRESSION

OBJECTIVE	CONCRETE	PICTORIAL	ABSTRACT	YEAR 6 FRACTIONS
Multiply simple pairs of proper fractions, writing the answer in its simplest from	Fraction strips $\frac{1}{3}$ x $\frac{1}{6}$  Think of x meaning 'lots of'	Rectangular model  $^1/_3$ x $^1/_2$ = $^1/_6$ This can be thought of as $^1/_3$ of $^1/_2$ or $^1/_2$ of $^1/_3$. This is the term used in secondary school.	Children will make generalisations to multiply the numerator and the denominator. $\frac{1}{3}$ x $\frac{1}{6}$ = $\frac{1}{18}$	
Divide fractions by a whole number	Fraction strips $\frac{1}{6}$ ÷ 2 = $\frac{1}{12}$ 	Rectangular models  $\frac{1}{2} \div 2 = \frac{1}{4}$ $\frac{1}{4} \div 2 = \frac{1}{8}$ $\frac{2}{5} \div 2 = \frac{2}{10}$	Children will make generalisations tomultiply the denominator by the whole number. $\frac{1}{6}$ ÷ 3 = (3 x 6 = 18) $\frac{1}{6}$ ÷ 3 = $\frac{1}{18}$	
Associate a fraction with division and calculate the decimal equivalents	 	3 slices of pie 'out of' 8  $\frac{3}{8}$	$\frac{3}{8}$ 3 'out of' 8 is the same as 3 'divided by' 8 **3 ÷ 8 = 0·375** **So $\frac{3}{8}$ = 0·375**	
Recall and use the equivalences between simple FDP.	Fraction cubes (See previous years)	Fractions walls (See previous years)	Rapid recall of facts ½ = 0.5 = 50% ¼ = 0.25 = 25% 1/10 = 0.1 = 10%	

GLOSSARY

Term	Meaning	Year Introduced
Denominator	The bottom number in a fraction. It shows how many **equal** parts that the **whole** has been divided into E.G. $\frac{1}{4}$ - 4 is the denominator and the whole has 4 **equal** parts	Year 1
Equivalent fraction	These are fractions that may look different, but have the same value E.G. $\frac{1}{4}$ and $\frac{2}{8}$ are equivalent	Year 2
Fraction	A part of a whole. A common fraction is made up of a numerator and a denominator A fantastic interactive fraction wall is perfect for iPads. https://www.visnos.com/demos/fraction-wall	Year R
Improper fraction	A fraction where the numerator is greater than the denominator. It has a value greater than 1 E.G. $\frac{5}{4}$	Year 5
Mixed number	A number that is made up of a whole number plus a fraction E.G. $1\frac{1}{4}$	Year 5
Non-unit fraction	A fraction where the numerator is greater than 1	Year 2
Numerator	The top number of a fraction. It shows how many equal parts of the denominator are represented E.G. $\frac{3}{4}$ - 3 is the numerator	Year 1
Unit fraction	A fraction where the numerator is 1	Year 2
Vinculum	The horizontal line between the numerator and denominator; it shows the numbers are to be interpreted together and represents a part/whole structure	Year 3

COMMON MISCONCEPTIONS WITHIN FRACTIONS

Misconception 1: Fractions are seen as pieces rather than equal parts to the whole.

Incorrect

Leaners view this as thirds

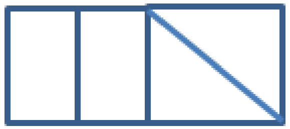
Correct

Learners write the shaded part $\frac{2}{3}$ "There are three equal parts to the whole and two are."

Misconception 2: Fractional pieces have to be congruent (the same shape) to be the same fraction.

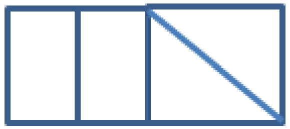
Incorrect

Learners do not view this as quarters



Correct

Learners understand that triangles and rectangles both represent a quarter



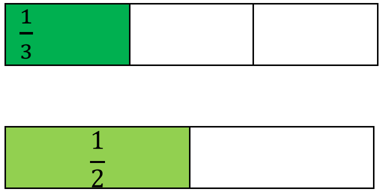
Misconception 3: The larger the denominator the bigger the portion

Incorrect

"$\frac{1}{3}$ is bigger than $\frac{1}{2}$ because 3 is bigger than 2"

Correct

"$\frac{1}{3}$ is smaller than $\frac{1}{2}$ because the whole is divided into three and that part will be smaller than a part whose whole is divided into two."



Misconception 4: Identical fraction of different 'wholes' are not the same.

"Would you prefer to eat half a cupcake or half the chocolate cake?"

Why? Are you still getting half of each?

There is a fantastic interactive fraction wall which is perfect for iPads. https://www.visnos.com/demos/fraction-wall