Our Fractions Learning Journey

Year 1

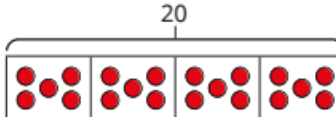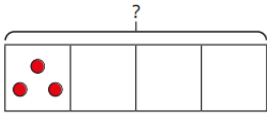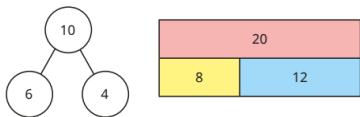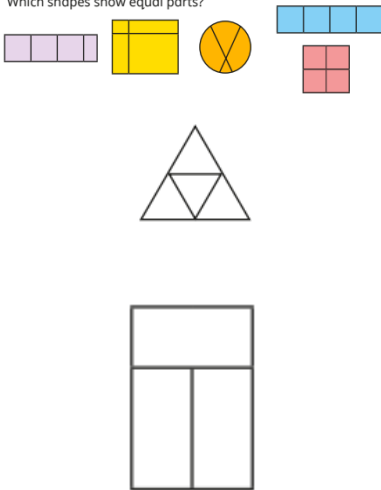| Summer Block Fractions		
Lesson Steps	**Representations**	**Vocabulary**
Step 1 Recognise a half of an object or a shape. Show the symbol for ½ alongside it.		Fraction Whole Parts Equal
Step 2 Find a half of an object or a shape		Equal parts Half Quarter
Step 3 Recognise a half of a quantity. Start to use bar models to work alongside the R and PS. Ron and Kim have some counters. Ron has half of the counters and Kim has half of the counters. Draw Kim's counters. Ron Kim How many counters are there altogether? What is half of the total?		Split Halves Quarters Shape Object Fraction bar Numerator Denominator Amount How many? Total
Step 4 Find a half of a quantity	16	Share Shared
Step 5 Recognise a quarter of an object or a shape. Emphasise rectangles.	20	Altogether Groups
Step 6 Find a quarter of an object or a shape (across 2 lessons)		Double Quantity
Step 6 Find a quarter of an object or a shape (second lesson)		Shaded shade
Step 7 Recognise a quarter of a quantity. Bar models		

Complete the bar model to work out the whole. ? [bar model with 3 red dots in first section] Step 8 Find a quarter of a quantity. Bar models.		

Year 2

Summary Block 1 Fractions		
Lesson Steps	**Representations**	**Vocabulary**
Step 1 Introduction to parts and whole and Step 2 Equal and unequal parts. Year 1 has been focussed on practical non-mathematical images (except bar models). Look at each picture. What is the whole? What are the parts? [number bond diagram: 10 branching to 6 and 4] [bar model: 20 on top, 8 and 12 below] Step 3 Recognise a half. Children create posters with 3 representations which show halves (bar models, counters, shapes) and a wrong one. Children go round and spot the mistakes and say why. Step 4 Find a half	Which shapes show equal parts? [various shapes: rectangle divided into parts, yellow square, orange circle, blue rectangle, red square, triangle divided into 4, rectangle divided into sections]	Fraction bar Numerator Denominator Each digit Digit in a fraction Third Thirds Unit fraction Non-unit fraction Three-quarters equivalent greater Dividing Odd number Even number Between Represent pattern

Step 5 Recognise a quarter
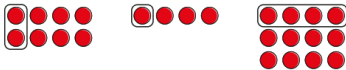
Here is a triangle with a fraction shaded.

Is the statement true or false?

$\frac{1}{4}$ of the shape is shaded.

Explain your answer.

Start with looking at quarters on shapes. Then discuss the R and PS (above). Then look at showing them with counters.
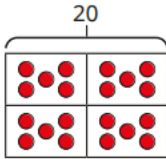
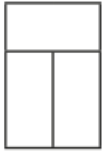Which pictures show $\frac{1}{4}$?

Step 6 Find a quarter
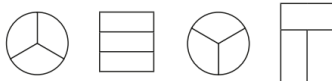
Use single row bar model not double like below:

20

$\frac{1}{4}$ of 20 = _____

Step 7 Recognise a third

Colour $\frac{1}{3}$ of each shape.

Compare answers with a partner.
Do your shapes look the same?

Which pictures show $\frac{1}{3}$?
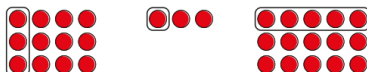
Find $\frac{1}{3}$ of each set of objects.
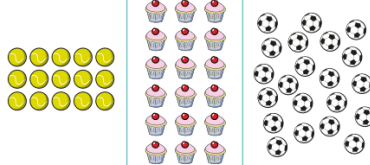
$\frac{1}{3}$ of 15 = _____ $\frac{1}{3}$ of 18 = _____ $\frac{1}{3}$ of 21 = _____

| 2 | 2 | 2 | 2 |

Colour $\frac{1}{2}$ and $\frac{2}{4}$ of each shape.
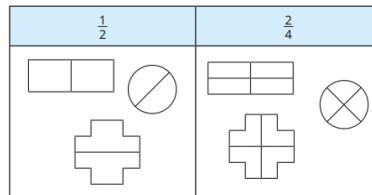
| $\frac{1}{2}$ | $\frac{2}{4}$ |

Use the bar models to find $\frac{1}{2}$ of 12 and $\frac{2}{4}$ of 12

12

12
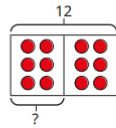
$\frac{1}{2}$ of 12 = _____ $\frac{2}{4}$ of 12 = _____

Complete the sentence.

$\frac{\square}{\square}$ of 12 is equal to $\frac{\square}{\square}$ of 12

Colour the shapes to show $\frac{3}{4}$

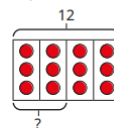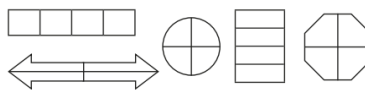|		
Step 8 Find a third The whole has been split into _____ equal groups. There are _____ in each group. $\frac{1}{3}$ of _____ is equal to _____ Focus on the sentence stems and really underst anding the concept.		
Step 9 Find the whole- lesson 1 only using halves and showing it on bar models (not in circles)		
Step 9 Find the whole- lesson 2 using thirds and quarters. Still using bar models.		
Step 10 Unit fractions This shows $\frac{1}{4}$ Colour some squares to show $\frac{1}{3}$ Is there more than one answer? Investigation. Use a variety of fractions. Could do halves.		
Step 11 (x 2 lessons: Non-unit fractions / making and finding a whole with links to non-unit fractions) Show visually using numicon. Choose the piece to go with the denominator and put pegs in to show the numerator. Children record the fraction on and show it on the numicon. Talk about all pegs being in the holes then we have the whole amount.		
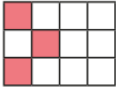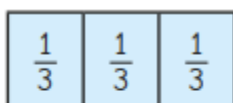
$$3 \text{ lots of } \frac{1}{3} = \frac{3}{3}$$

Step 12 Recognise the equivalence of a half and two-quarters

Take two identical strips of paper.

Fold one strip into two equal pieces.

Fold the other strip into four equal pieces.

Compare one of the two equal pieces with two of the four equal pieces.
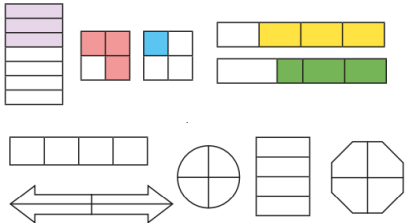
What do you notice?

Drop numbers into it. Could use squared paper. First lesson is based on shape.
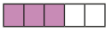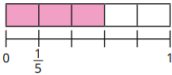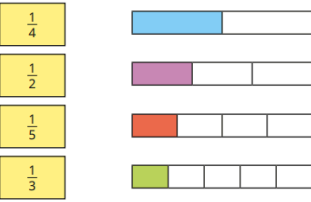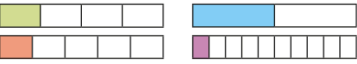
Step 12 Recognise the equivalence of a half and two-quarters. First lesson focussed on shape and shading. Second lesson focussed on number.

Step 13 Recognise three-quarters.
Give children all of the images from p41. In groups children organise them into groups of showing ¾ and not showing it. With the colour in ones, children can decide how they colour them to put them in the side they choose.

Step 14 Find three-quarters

Step 15 Count in fractions up to a whole.
Show on numicon. Make up sequences e.g. ¼, 2/4, ¾, 4/4 or 1 whole. Show with pegs representing the numerator. Different children have different denominators- halves, thirds and quarters. (Extend more able to show different fractions, e.g. sixths).

Year 3

Spring Block 3 Fractions A		
Lesson Steps	**Representations**	**Vocabulary**
Step 1 Understand the denominators of unit fractions Revise previous learning using bar models and showing with numicon pieces (pieces represent the denominator).		Diagram Denominator Numerator Divided Fraction bar Greater Compare
Step 2 (2x lessons: 1st practical plus introduce bar models / 2nd apply and number work) Compare and order unit fractions Hook- Make it really visual by having a set of cupcakes and model sharing different cup cakes into fractions, so children remember getting more or less than other. Then model showing the maths behind the cake eating! • Match the fractions to the bar models. • Write <, > or = to compare the fractions. Complete the sentence. When the numerators are the same, then the _____ the denominator, the _____ the fraction.	$\frac{1}{4} \bigcirc \frac{1}{5}$ Which diagrams show $\frac{3}{5}$? $\frac{1}{4} = \frac{\square}{8}$ The number line shows $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$	Equivalent Order Pattern Less than Fraction wall Scale Interval start/end Measuring Double numberline Fifths Sixths Sevenths Eighths nineths tenths
Step 2 (second lesson). Compare and order unit fractions. Focus on number. More independent work today.		

Huan has ordered some fractions, but one of them is in the wrong place.

$\frac{1}{5}$ $\frac{1}{6}$ $\frac{1}{4}$ $\frac{1}{10}$ $\frac{1}{15}$
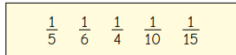
Which fraction is in the wrong place?
How do you know?

Step 3 Understand the numerators of non-unit fractions
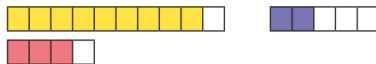
Show on bar models. Remind children of using numicon and that the pegs represented the numerators.

Step 4 Understand the whole
Different coloured parts on the bar model. Also show the numicon with the different coloured pegs.

Step 5 Compare and order non-unit fractions.
Numicon and bar models. Showing comparison between number of pegs.

Step 7 Fractions on a number line.
Explain to the children that we have been used to using bar models for showing fractions. If we take off the horizontal lines, we can show the fractions on a numberline.

Model doing this. Show how the numberlines can also be turned back into a bar model.

$\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$

0   1

Step 8 Count in fractions on a number line

Count forwards to complete the number lines.

0    $\frac{1}{5}$ $\frac{2}{5}$ $\frac{5}{5}$

Fill in the missing fractions.

0        $\frac{2}{9}$ $\frac{3}{9}$ $\frac{7}{9}$ $\frac{9}{9}$

Tiny is labelling fractions on a number line from 0 to 1

0   1

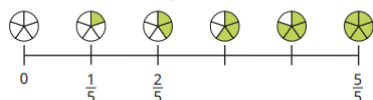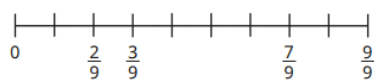$\frac{1}{8}$ $\frac{2}{8}$ $\frac{3}{8}$ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{6}{8}$ $\frac{7}{8}$ $\frac{8}{8}$

What mistake has Tiny made?
What should the labels be?

Focus on practical numicon/ pictures to go along with the numberline images.

Estimate where the fractions belong on the number line.

$\frac{1}{3}$ $\frac{3}{4}$ $\frac{1}{2}$ $\frac{8}{9}$ $\frac{13}{13}$

0   1
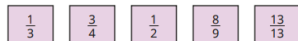
How did you decide?
Talk about it with a partner.

Extend to exploring with them why this problem (above) is so tricky.

Step 9 Equivalent fractions on a number line

Start to have the conversation about 'what you do to the bottom, you do to the top'

etc.

The number lines show that $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent fractions.

Recap ½ being equivalent to 2/4 before moving on to other fractions.

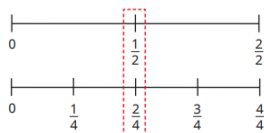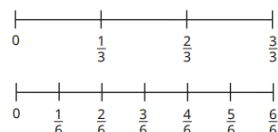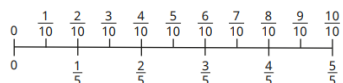Use these number lines to find a pair of equivalent fractions.

Use the double number line to complete the equivalent fractions.
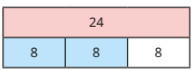
Step 10 Equivalent fractions as bar models

Start to encourage the children to draw the bar models - teach importance of drawing bars the same size and using the squares to make splitting easier

$$\frac{2}{3} = \frac{\square}{6} = \frac{6}{\square} = \frac{\square}{\square}$$

Summer Block 1 Fractions B		
Lesson Steps	**Representations**	**Vocabulary**
Step 1 Add fractions Show as different coloured pegs on the numicon. Show using bar models too. The number line shows $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$	The number line shows $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$ Use the models to complete the calculations. 24 8 8 8	Adding Taking away Partition Difference Subtract Same Left "What fraction is left?" Operation
Step 2 Subtract fractions		

Bar model and cross out. Take pegs out of the numicon.

Use the models to complete the calculations.

Step 3 Partition the whole

$$\frac{\square}{15} + \frac{1}{15} + \frac{7}{15} = 1 \qquad \blacktriangleright \quad 1 = \frac{\square}{23} + \frac{\square}{23} + \frac{2}{23}$$
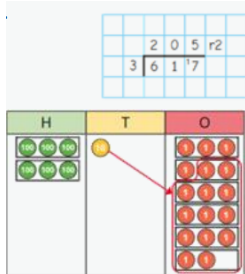
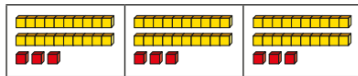Move from practical resources with numicon to using squares in books to show on numberlines.

   $\frac{1}{3} + \underline{\quad\quad} = 1$

Step 4 Unit fractions of a set of objects
Teach them to bar model it and then apply our short division.

Amir uses a bar model and base 10 to find $\frac{1}{3}$ of 69

Use Amir's method to find the fractions of the amounts.

| $\frac{1}{2}$ of 60 | $\frac{1}{3}$ of 36 | $\frac{1}{3}$ of 96 |

| $\frac{1}{4}$ of 60 | $\frac{1}{3}$ of 72 | $\frac{1}{8}$ of 96 |

Step 5 Non-unit fractions of a set of objects
Divide by the bottom then times by the top, e.g. 24 divide by 3 then times by 2.

Sam uses a bar model to find $\frac{2}{3}$ of 24

| 24 |
| 8 | 8 | 8 |
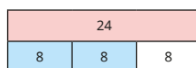
24 ÷ 3 = 8
$\frac{1}{3}$ of 24 = 8
8 × 2 = 16
$\frac{2}{3}$ of 24 = 16

Use Sam's method to find the fractions of the amounts.

| $\frac{3}{4}$ of 24 | $\frac{2}{3}$ of 12 | $\frac{2}{3}$ of 18 | $\frac{4}{5}$ of 45 |

Step 6 Reasoning with fractions of an amount. In small groups. Oracy lesson to discuss problem solving. Bring in assessment questions too.		

Year 4

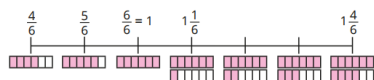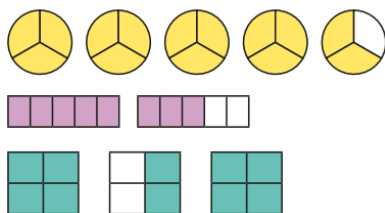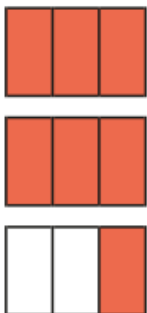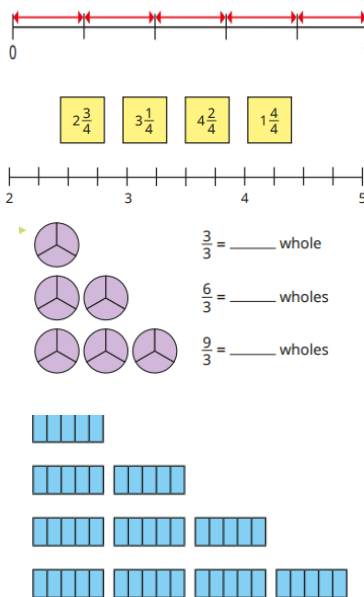| Spring Block 3 Fractions		
Lesson Steps	**Representations**	**Vocabulary**
Step 1 Understand the whole and Step 2 Count beyond 1. Quick recap of counting up in fractions to a whole. Discuss what happens next- represent it as a mixed number. Show on numicon. Step 3 Partition a mixed number Get children to make representations with numicon. Write the answer in mixed numbers on cards and turn over to hide. Children move round the class, working out, turing over cards to see if it is right. Children take a card and go back to own books and draw	Use the fraction wall to create equivalent fraction families. Complete the sentences for each mixed number. The integer in the mixed number is _____ This is equivalent to _____ quarters. There are _____ more quarters. _____ + _____ = _____ So the improper fraction is $\frac{\square}{4}$ ▸ $1\frac{1}{4}$ ▸ $1\frac{2}{4}$ ▸ $2\frac{2}{4}$ ▸ $3\frac{3}{4}$ Huan Scott	Sequence Count backwards Count forwards Mixed number Fractional Intervals Consecutive Efficient Proper fraction Improper fraction Integer Equivalence Convert Remainder Equal sections Calculation
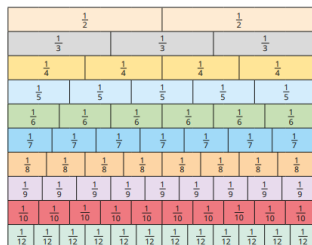
their mixed number as bar models. Swap with others.
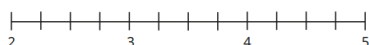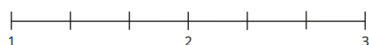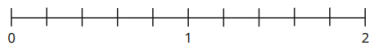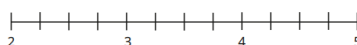
Step 4 Number lines with mixed numbers

Ask children what do we know, what can we show? Label.

Label and then draw their own in their books (to allow them to notice the intervals)

Step 5 Compare and order mixed numbers

Which fraction is greater, $2\frac{1}{6}$ or $1\frac{5}{6}$?

Focus on bar model.

Step 6 Understand improper fractions

Show children a range of images from p20. What is the same? What is different? Independently show they understand what an improper fraction is- create a mindmap of all the different ways they can show the mixed number (numberline, counters, shapes, bar model).
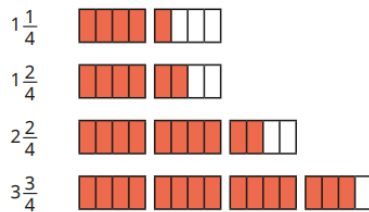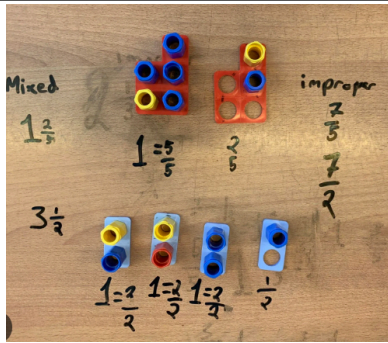
Use the digit cards to make as many improper fractions as you can.

| 2 | 3 | 4 | 5 | 6 | 7 | 8 |

Which of the improper fractions are greater than 1 and less than 2?

Which of the improper fractions are greater than 2 and less than 3?

Step 7 Convert mixed numbers to improper fractions

$1\frac{1}{4}$

$1\frac{2}{4}$

$2\frac{2}{4}$

$3\frac{3}{4}$

Step 8 Convert improper fractions to mixed numbers. Use same representations as Step 8, but in reverse.

Step 9 Equivalent fractions on a number line - Exploratory lesson, children drawing number lines and finding equivalent fractions.

Split each section of the number line into 4 equal parts.

$\frac{12}{3}$ $\frac{15}{3}$ $\frac{18}{3}$
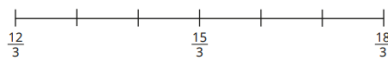
Use the number line to find two pairs of equivalent improper fractions.

Write each pair of improper fractions as mixed numbers.

Step 10 Equivalent fraction families

Show fraction wall. WHat do

you notice?

$$\frac{1}{3} = \frac{?}{12}$$

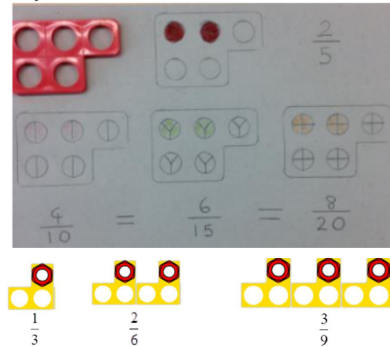Equivalent fractions:

$$\frac{2}{5}$$

$$\frac{4}{10} = \frac{6}{15} = \frac{8}{20}$$

$$\frac{1}{3} \qquad \frac{2}{6} \qquad \frac{3}{9}$$
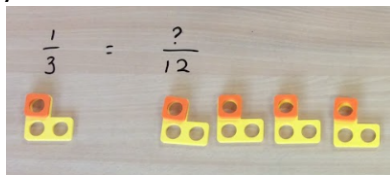
Step 11 Add two or more fractions

$$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{8}{3} = 2\frac{2}{3}$$

$$\frac{4}{6} \qquad \frac{5}{6} \qquad 1 \qquad \frac{3}{6}$$
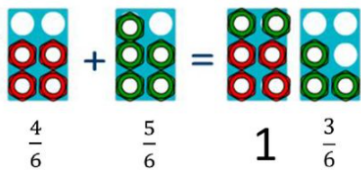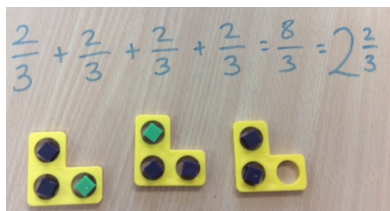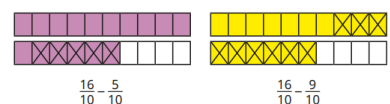
Show it on bar models with different colours. Show answers as improper then convert to mixed numbers.
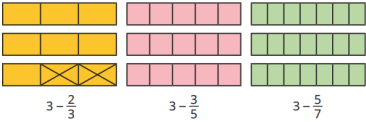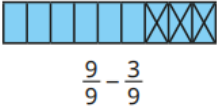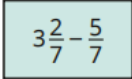
Step 12 Add fractions and mixed numbers .
Keep numicon and bar models.

Step 13 Subtract two fractions

$$\frac{16}{10} - \frac{5}{10} \qquad \frac{16}{10} - \frac{9}{10}$$
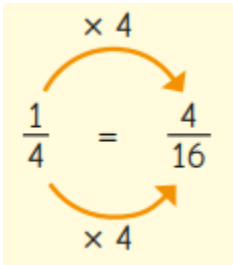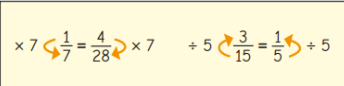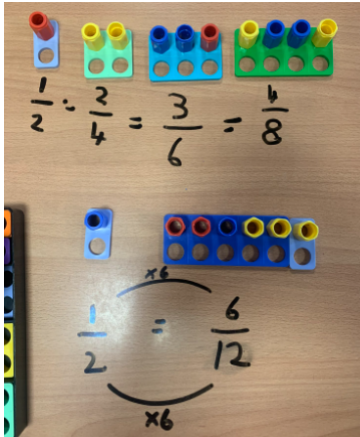
Bar model and numicon removing the pegs. Notice that the denominator is the same.

Step 14 Subtract from whole amounts.		
$3 - \frac{2}{3}$ $3 - \frac{3}{5}$ $3 - \frac{5}{7}$		
Step 15 Subtract from mixed numbers $\frac{9}{9} - \frac{3}{9}$ When the subtraction involves them breaking into the whole, get children to make the mixed number into an improper fraction first, then subtract. $3\frac{2}{7} - \frac{5}{7}$		

Year 5

Autumn Block 4 Fractions A		
Lesson Steps	**Representations**	**Vocabulary**
Step 1 Find fractions equivalent to a unit fraction $\times 4$ $\frac{1}{4} = \frac{4}{16}$ $\times 4$ Step 2 Find fractions equivalent to a non-unit fraction	$\times 7 \; \frac{1}{7} = \frac{4}{28} \; \times 7$ $\div 5 \; \frac{3}{15} = \frac{1}{5} \; \div 5$ $\frac{1}{2} : \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$ $\frac{1}{2} = \frac{6}{12}$	Equivalent Numerator Denominator Non-unit fractions Tenths Hundredths Relationship Simplify Simplest form Multiplicative relationship Improper fraction Re-group Convert Relative to Multiple of Comparative

$$\times 4$$

$$\frac{3}{4} = \frac{12}{16}$$

$$\times 4$$
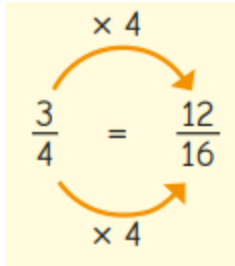
$$4\frac{1}{3} + \frac{1}{6} = 4 + \frac{1}{3} + \frac{1}{6}$$
$$= 4 + \frac{2}{6} + \frac{1}{6}$$
$$= 4\frac{3}{6}$$
$$= 4\frac{1}{2}$$

Fractional parts
Common denominator

Step 3 Recognise equivalent fractions

$$\times 6$$
$$\times 3 \quad \frac{1}{3} = \frac{6}{18} \quad \times 3$$
$$\times 6$$

$$\div 4$$
$$\frac{4}{12} = \frac{1}{3}$$
$$\div 4$$

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$$

$$\times 6$$
$$\frac{1}{2} = \frac{6}{12}$$
$$\times 6$$

Step 4 Convert improper fractions to mixed numbers

Mixed

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

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

improper

$$\frac{7}{5}$$

$$\frac{7}{2}$$

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

$$1=\frac{2}{2} \quad 1=\frac{2}{2} \quad 1=\frac{2}{2} \quad \frac{1}{2}$$

$1\frac{1}{4}$

$1\frac{2}{4}$

$2\frac{2}{4}$

$3\frac{3}{4}$

Step 5 Convert mixed numbers to improper fractions
Quick recap of Step 4 and implications for Step 5 then give assessment questions and afL guided group for understanding.

Step 6 Compare fractions less than 1

Use the bar models to compare the fractions.

$\frac{2}{5}$ ◯ $\frac{2}{3}$

$\frac{2}{3}$ ◯ $\frac{2}{5}$

Step 7 Order fractions less than 1

| $\frac{1}{5}$ | $\frac{1}{8}$ | $\frac{1}{6}$ | $\frac{1}{10}$ | $\frac{1}{7}$ | $\frac{1}{3}$ | $\frac{1}{9}$ |

| $\frac{7}{9}$ | $\frac{5}{9}$ | $\frac{1}{3}$ | $\frac{1}{9}$ | $\frac{2}{9}$ | $\frac{6}{9}$ | $\frac{9}{9}$ |

| $\frac{9}{20}$ | $\frac{9}{10}$ | $\frac{9}{100}$ | $\frac{9}{1000}$ | $\frac{9}{15}$ | $\frac{9}{40}$ |

What do you notice?
Recap steps from year 3 where cupcakes were used to share and model how greater denominators made smaller slices.

Step 8 Compare and order fractions greater than 1
Look at the wholes
Look at the fraction
Convert to equivalent where needed.
Compare

Step 9 Add and subtract fractions with the same denominator
Bring in assessment questions from previous SATs. Go back to numicon and adding using pegs for LA.

Step 10 Add fractions within 1- first lesson $$\frac{1}{4} + \frac{3}{8} = \frac{2}{8} + \frac{3}{8} = \frac{5}{8}$$ Convert to find equivalence.		
Step 10 Add fractions within 1- second lesson $$\frac{1}{3} + \frac{5}{6} + \frac{5}{12} = 1\frac{7}{12}$$		
Step 11 Add fractions with total greater than 1- first lesson $$\frac{3}{4} + \frac{5}{8} = \frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}$$		
Step 11 Add fractions with total greater than 1- second lesson Assessment questions/ guided group to follow up.		
Step 12 Add to a mixed number $$4\frac{1}{3} + \frac{1}{6} = 4 + \frac{1}{3} + \frac{1}{6}$$ $$= 4 + \frac{2}{6} + \frac{1}{6}$$ $$= 4\frac{3}{6}$$ $$= 4\frac{1}{2}$$		
Step 13 Add two mixed numbers - First lesson Show both methods and then ask what is the same, what is different: 1. Add wholes, make equivalent and then add fractions. 2. Make improper, add fractions, convert to mixed numbers. Focused on fluency and key learning.		
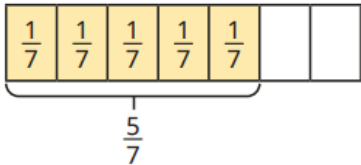
Step 13 Add two mixed numbers - Second lesson. Focus on reasoning and problem solving/ assessment questions.		
Step 14 Subtract fractions Revise finding equivalence.		

Step 15 Subtract from a mixed number

Explain how the diagram shows $3\frac{5}{8} - 2 = 1\frac{5}{8}$

Cross out the wholes, then work out equivalence and solve fractions.

Step 16 Subtract from a mixed number – breaking the whole

$$2\frac{1}{3} - \frac{2}{3} = \frac{7}{3} - \frac{2}{3}$$
$$= \frac{5}{3}$$
$$= 1\frac{2}{3}$$

Convert to improper and then subtract.

Step 17 Subtract two mixed numbers

Method 1	Method 2
$5\frac{4}{15} - 1\frac{8}{15} = 4\frac{19}{15} - 1\frac{8}{15}$	$5\frac{4}{15} - 1\frac{8}{15} = \frac{79}{15} - \frac{23}{15}$
$= 3\frac{11}{15}$	$= \frac{56}{15}$
	$= 3\frac{11}{15}$

What is the same? What is different?
Focus on making improper and then subtracting.

Spring Block 2 Fractions B

Lesson Steps	Representations	Vocabulary
Step 1 Multiply a unit fraction by an integer Teach as repeated addition. Hide the denominator and do the multiplication then reveal the denominator again.	$\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{1}{7}$ $\frac{5}{7}$	Integer Repeated addition Generalisation Efficient method Factor

Step 2 Multiply a non-unit fraction by an integer.
Same method. Remind them to simplify answers by finding equivalence.

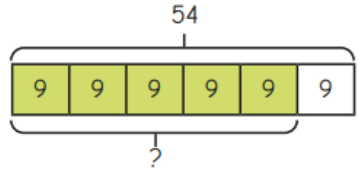Use the digit cards to complete the multiplication.

You can use a card once only in each multiplication.

| 1 | 2 | 3 | 4 | 5 | 6 |

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

Is there more than one possible answer?

Are there any of the cards you cannot use?
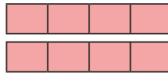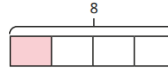
Step 3 Multiply a mixed number by an integer

$$3 \times 2 = 6$$

$$3 \times \frac{2}{5} = \frac{6}{5} = 1\frac{1}{5}$$

$$3 \times 2\frac{2}{5} = 6 + 1\frac{1}{5} = 7\frac{1}{5}$$

Multiply wholes, then multiply fractions, then add back together and make mixed number.

Step 4 Calculate a fraction of a quantity.
Divide by the bottom. Times by the top.
Show in a bar model.

Step 5 Fraction of an amount
Assessment questions.

Step 6 Find the whole - first lesson

$\frac{1}{5}$ of ____ = 6
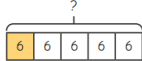
If one part is 6, then all the parts will be 6

| 6 | 6 | 6 | 6 | 6 |

$$6 \times 5 = 30 \qquad \frac{1}{5} \text{ of } 30 = 6$$
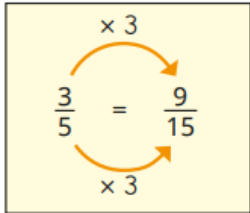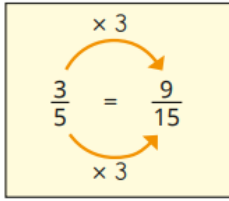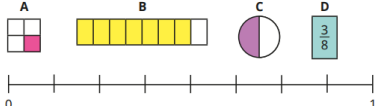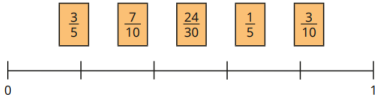
Step 6 Find the whole - second lesson

24   24
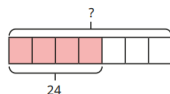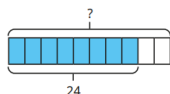
(when not given the value of one part)

54

| 9 | 9 | 9 | 9 | 9 | 9 |

?

8 lots of $\frac{1}{4}$ $\frac{1}{4}$ of 8

8

Step 7 Use fractions as operators		
5 lots of $\frac{1}{5}$ $\frac{1}{5}$ of 5 What's the same? What's different?		
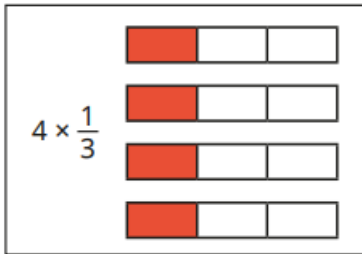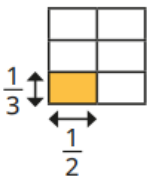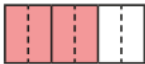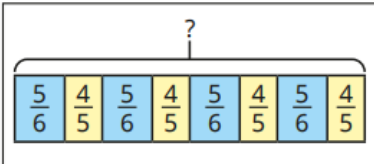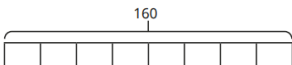
Year 6

Autumn Block 3 Fractions A		
Lesson Steps	**Representations**	**Vocabulary**
Step 1 Equivalent fractions and simplifying- first lesson $\frac{3}{5} = \frac{9}{15}$ ($\times 3$)	$\frac{3}{5} = \frac{9}{15}$ ($\times 3$) A B C D 0 ———————— 1	Common factor Simplify Intervals Compare Greatest Ascending Descending Lowest common multiple Unequal denominators Convert Prime numbers
Step 1 Equivalent fractions and simplifying- second lesson- bringing in examples of numberlines from step 2. Tom and Aisha are simplifying an improper fraction. **Tom**: $\frac{36}{8} = 4\frac{4}{8} = 4\frac{1}{2}$ **Aisha**: $\frac{36}{8} = \frac{9}{2} = 4\frac{1}{2}$ Whose method do you prefer? Explain your answer. Label the fractions on the number line. $\frac{3}{5}$ $\frac{7}{10}$ $\frac{24}{30}$ $\frac{1}{5}$ $\frac{3}{10}$ 0 ———————— 1	$\frac{7}{10} = \frac{21}{30}$ $\frac{21}{30} + \frac{7}{30} = \frac{28}{30} = \frac{14}{15}$	
Step 3 Compare and order (denominator) Find common denominator. (multiple numbers together if both have to change).		

Step 4 Compare and order (numerator) Remind children of cupcakes- size of slice from year 3 lesson.		
Additional step- compare and order applying numerator and denominator work from previous steps. Use previous SATs questions.		
Step 5 Add and subtract simple fractions $\frac{7}{10} = \frac{21}{30}$ $\frac{21}{30} + \frac{7}{30} = \frac{28}{30} = \frac{14}{15}$		
Step 6 Add and subtract any two fractions $$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$$ Annie is calculating $\frac{7}{9} - \frac{1}{2}$ She finds the first common multiple of 9 and 2 first common multiple of 9 and 2 is 18 $\frac{7}{9} - \frac{1}{2} = \frac{14}{18} - \frac{9}{18} = \frac{5}{18}$		
Step 7 Add mixed numbers **Rosie** **Amir** $1 + 2 = 3$ $\frac{1}{2} + \frac{1}{6} = \frac{3}{6} + \frac{1}{6} = \frac{4}{6}$ $3 + \frac{4}{6} = 3\frac{4}{6} = 3\frac{2}{3}$ $1\frac{1}{2} + 2\frac{1}{6} = \frac{3}{2} + \frac{13}{6}$ $= \frac{9}{6} + \frac{13}{6}$ $= \frac{22}{6} = 3\frac{4}{6} = 3\frac{2}{3}$ Preference not to make both improper as numbers can get very large.		
Step 8 Subtract mixed numbers Do wholes then fractions if that can't be done, then make both improper then subtract (don't get into flexible partitioning).		
Additional step. Add and subtract fractions and mixed numbers. Consolidation/ assessment from previous steps. Guided group as AFL.		
Step 9 Multi-step problems		

Oracy activities. Solve in groups. Use DDE to share their workings.		

Autumn Block 4 Fractions B

Lesson Steps	Representations	Vocabulary
Step 1 Multiply fractions by integers- first lesson. Integrate arithmetic questions. Fluency work. Cover denominator, multiply numerator by integer. Reveal denominator, convert improper back to mixed number.	$4 \times \frac{1}{3}$	Product Improper fraction Mixed number Operation Perform Brackets Multiplication Division
Step 1 Multiply fractions by integers- second lesson. Focus on reasoning and problem solving.	$\frac{1}{3}$ $\frac{1}{2}$	
Step 2 Multiply fractions by fractions Read across the top and multiply. Read across the bottom and multiply. Simplify.		
Step 3 Divide a fraction by an integer Cover the denominator. Do the division and then put back over the denominator.	$\frac{3}{4} \div 3 = $ ____	
Step 4 Divide any fraction by an integer Get them to multiply numerator until it is a multiple of a number which can be divided. Then divide. Draw out that it can be seen as numerator stays the same, and denominator and integer multiple.	$\frac{2}{3} = \frac{4}{6}$ $\frac{4}{6} \div 4 = \frac{1}{6}$? $\frac{5}{6}$ $\frac{4}{5}$ $\frac{5}{6}$ $\frac{4}{5}$ $\frac{5}{6}$ $\frac{4}{5}$ $\frac{5}{6}$ $\frac{4}{5}$	
Step 5 Mixed questions with fractions- lesson 1		
Step 5 Mixed questions with fractions- lesson 2	160	
Step 6 Fraction of an amount		

Divide by the bottom, times by the top. Show in a bar model.

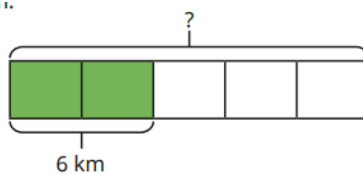2,700 m

?   ?
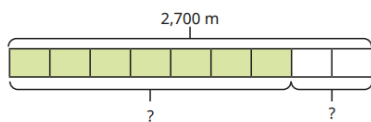
Find the values of A, B and C.

864

A

B

C
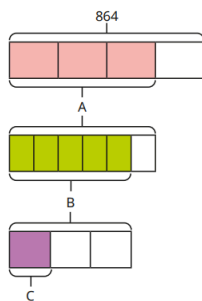
Compare methods with a partner.

?

6 km

Step 7 Fraction of an amount – find the whole. First lesson. Use bar models.

$\frac{1}{4}$ of 20 = _____ $\frac{1}{4}$ of _____ = 20

20   ?

?   20
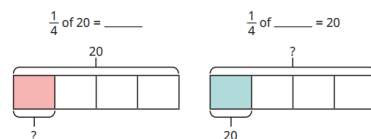
What is the same, what is different?

Step 7 Fraction of an amount – find the whole. Second lesson. Within problems.

Spring Block 4 Fractions, Decimals and Percentages		
Lesson Steps	**Representations**	**Vocabulary**
Step 1 Decimal and fraction equivalents		Decimalise percentage

1

$\frac{1}{2}$ $\frac{1}{2}$

$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$

$\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$ $\frac{1}{5}$

$\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$

$$\times 25$$

$$\frac{3}{4} = \frac{75}{100} = 0.75$$

$$\times 25$$

1									
0.5					0.5				
0.25		0.25		0.25		0.25			
0.2		0.2	0.2		0.2		0.2		
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Step 2 Fractions as division

Kim converts $\frac{3}{4}$ to a decimal.

$$0 \cdot 7 \ 5$$
$$4 \overline{\smash{)}3 \cdot {}^30 \ {}^20}$$
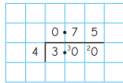
$$\frac{3}{4} = 0.75$$

Use Kim's method to find the decimal equivalent of each fraction.

▸ $\frac{2}{5}$ ▸ $\frac{4}{5}$ ▸ $\frac{3}{8}$ ▸ $\frac{5}{8}$

$$0 \cdot 8 \ 7 \ 5$$
$$8 \overline{\smash{)}7 \cdot {}^70 \ {}^60 \ {}^40}$$

$$7 \div 8$$
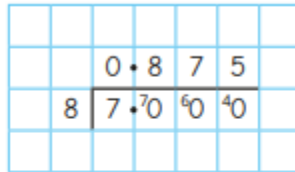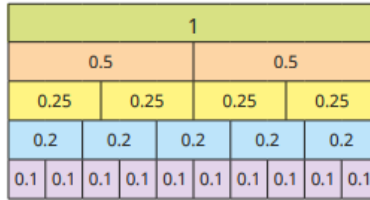
$$\frac{7}{8} = 0.875$$

Step 3 Understand percentages

Step 4 Fractions to percentages

$$\frac{31}{100} = 31\%$$

$$\times 20$$
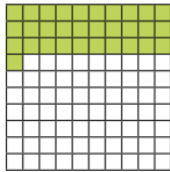
$$\frac{3}{5} = \frac{60}{100} = 60\%$$

$$\times 20$$

Step 5 Equivalent fractions, decimals and percentages
Show me what you know on a page- take fraction and work from there.

What is the same about each bar model? What is different?

1									

$\frac{1}{10}$

1									

0.1

100%									

10%
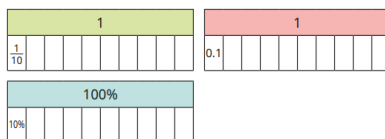
Step 6 Order fractions, decimals and percentages

Make all amounts either fractions, decimals and percentages then compare.		