Summer 1 Year 5

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Links to prior learning/ objectives	**Resources**	**Vocabulary:**
~ Knowledge of place value. ~ Understanding of strategies for addition, subtraction, multiplication and division. ~ Multiplication facts up to 12 x 12. ~ Awareness of how to multiply and divide by 10, 100 and 1000. ~ Factors and multiples. ~ Using manipulatives to demonstrate mathematical concepts. ~ Knowledge of what a fraction is and how to compare, order, add and subtract with proper fractions. They will have worked with both unit fractions and non-unit fractions, focussing on denominators that are common multiples.	Bar models, number lines, counting sticks, fraction walls, equivalent visuals **Mastery:** (where to find some resources) • Teaching for Mastery • White Rose **New and old documents** • Mastery maths stickers • Nrich (curriculum mapping)	Fraction, improper fractions, mixed number fractions, numerator, denominator, whole, add, subtract, greater than, less than, equal to, proper fraction, multiply, Per cent, %, divide, one hundred, decimal, fraction, denominator, Percentage, equivalence, multiples, convert

Objectives and Teaching

Barriers to ARE (misconceptions) **Week 1**	~ Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 6= 1 1/5). • To know how to convert between mixed number and improper fractions. • To develop the skill of converting between mixed number and improper fractions. • To understand how to convert between mixed number and improper fractions. • To know how to calculate mathematical statements with improper fractions. • To know how to calculate mathematical statements with mixed number fractions.
Children may struggle to recognise what a mixed number or improper fraction represent. Children may struggle to see a fraction as part of a whole. Children may struggle to add and subtract fractions. Children may struggle to represent a fraction greater than a whole as a mixed number or improper fraction.	

Fluency	**Reasoning**	**Problem solving**

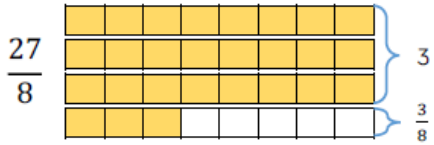
Claire converts the improper fraction $\frac{14}{5}$ into a mixed number using cubes. She groups the cubes into 5s, then has 4 left over.

$\frac{5}{5}$ is the same as ☐ $\frac{10}{5}$ is the same as ☐

$\frac{14}{5}$ as a mixed number is ☐ ☐/☐

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

Steve converts the improper fraction $\frac{27}{8}$ into a mixed number using bar models.



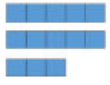
Use Steve's method to convert $\frac{38}{8}, \frac{27}{6}, \frac{47}{7}$ and $\frac{32}{4}$

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

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

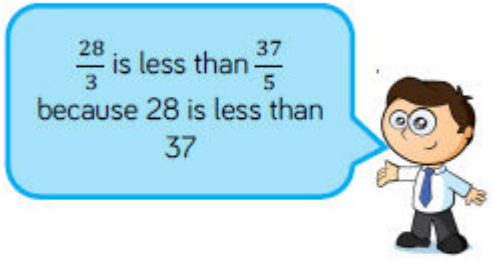
Use Beth's method to convert $2\frac{2}{3}, 2\frac{2}{4}, 2\frac{2}{5}$ and $2\frac{2}{6}$

Sam uses bar models to convert a mixed number into an improper fraction.

Step 1: Draw representation of mixed number.	Step 2: Split representation into equal parts.	Step 3: Count the number of equal parts to find the numerator of the improper fraction
		$2\frac{3}{5} = \frac{13}{5}$

Use Sam's method to convert $2\frac{1}{6}, 3\frac{2}{3}, 1\frac{4}{5}$ and $7\frac{5}{12}$

William says,



Do you agree?
Explain why.

Spot the mistake

- $\frac{27}{5} = 5\frac{1}{5}$
- $\frac{27}{3} = 8$
- $\frac{27}{4} = 5\frac{7}{4}$
- $\frac{27}{10} = 20\frac{7}{10}$

Can you find the correct answers?

Joshua and Miriam have some juice.

Joshua drinks $2\frac{1}{4}$ litres and Miriam drinks $2\frac{5}{12}$ litres.

How much do they drink altogether?

Which method would you use and why?

You will need: Mixed number and improper fraction representation cards.

Work with your partner and take it in turns to take a card and reason about where your card may go.
Avoid converting straight away and try to reason first.

Three children have converted $3\frac{2}{5}$ into an improper fraction.

Child A

$$3\frac{2}{5} = \frac{32}{5}$$

Child B

$$3\frac{2}{5} = \frac{17}{15}$$

Child C

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

$1\frac{1}{3}+2\frac{1}{6}=3+\frac{3}{6}=3\frac{3}{6}$ or $3\frac{1}{2}$

Add the fractions by adding the whole first and then the fractions.
Give your answer in its simplest form.

$1+2=3$

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

$3\frac{1}{4}+2\frac{3}{8}$ $4\frac{1}{9}+3\frac{2}{3}$ $2\frac{5}{6}+2\frac{1}{3}$

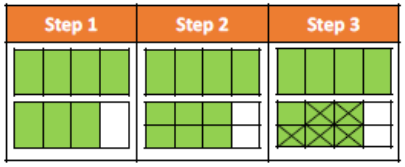
$1\frac{3}{4}+2\frac{1}{8}=\frac{7}{4}+\frac{17}{8}=\frac{14}{8}+\frac{17}{8}=\frac{31}{8}=3\frac{7}{8}$

Add the fractions by converting them to improper fractions.

$1\frac{1}{4}+2\frac{5}{6}$ $2\frac{1}{9}+1\frac{1}{3}$ $2\frac{1}{6}+2\frac{2}{3}$

Use your preferred method to add the fractions.

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



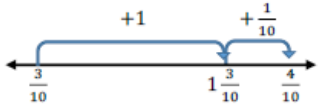
$1\frac{3}{4}-\frac{5}{8}=1\frac{1}{8}$

Use an area model to help you solve:

$2\frac{3}{5}-\frac{3}{10}$ $1\frac{2}{3}-\frac{1}{6}$ $1\frac{5}{6}-\frac{7}{12}$

$1\frac{2}{5}-\frac{3}{10}=1\frac{1}{10}$

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



Tom is attempting to solve $2\frac{5}{14}-\frac{2}{7}$

Here is his working out:

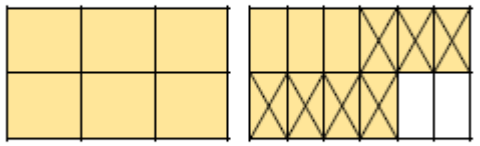
$2\frac{5}{14}-\frac{2}{7}=2\frac{3}{7}$

Do you agree with Tom?
Explain your answer.

Fill in the missing numbers.

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

Here is Martha's area model.
What is the calculation?



Can you find more than one answer?
Why is there more than one answer?

Week 2

Children may struggle to understand that multiplying means that you have that many 'lots of' the fraction.
Children may struggle to recognise what a mixed number or improper fraction represent.
Children may struggle to represent a fraction greater than a whole as a mixed number or improper fraction.

Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.

- To know how to multiply proper fractions by a whole number.
- To understand how to multiply proper fractions by a whole number.
- To know how to multiple mixed number fractions by whole numbers.
- To understand how to multiple mixed number fractions by whole numbers.
- To develop the skill of multiplying proper fractions and mixed number fractions by a whole number.

Fluency	Reasoning	Problem solving

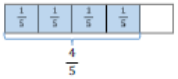
Work out $\frac{1}{6} \times 4$ by counting in sixths.

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

Use this method to work out:

$\frac{1}{3} \times 2$ $\frac{1}{5} \times 3$ $\frac{1}{10} \times 6$

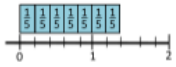
We can use a single bar model to work out $\frac{1}{5} \times 4$



Use this method to work out:

$\frac{1}{4} \times 3$ $\frac{1}{8} \times 6$ $\frac{1}{10} \times 8$

We can use a number line and repeated addition to work out $\frac{1}{5} \times 7 = \frac{7}{5} = 1\frac{2}{5}$



Use this method to work out:

$\frac{1}{3} \times 3$ $\frac{1}{7} \times 6$ $\frac{1}{12} \times 8$

Count the number of ninths to work $3 \times \frac{2}{9}$

Use this method to work out:

$\frac{3}{8} \times 2$ $\frac{5}{16} \times 3$ $4 \times \frac{2}{11}$

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

Use this method to work out:

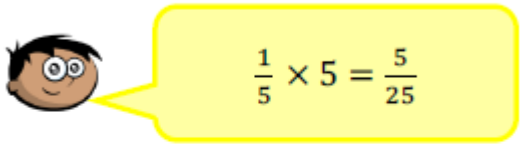
$\frac{2}{7} \times 3$ $\frac{3}{16} \times 4$ $2 \times \frac{5}{12}$

Use the number line to help you solve $2 \times \frac{3}{7}$

Use this method to work out:

$\frac{3}{10} \times 3$ $\frac{2}{7} \times 2$ $4 \times \frac{3}{20}$

Ranjit is multiplying fractions by a whole number.

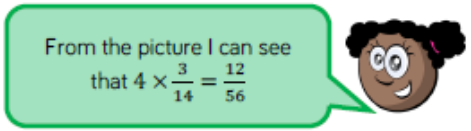


Can you explain his mistake?

Always, sometimes, never.

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

Denise has calculated $4 \times \frac{3}{14}$



Do you agree?

Explain why.

I am thinking of a unit fraction.

When I multiply it by 4 it will be equivalent to $\frac{1}{2}$

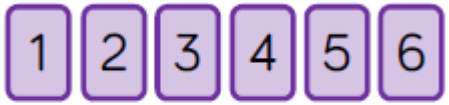
When I multiply it by 2 it will be equivalent to $\frac{1}{4}$

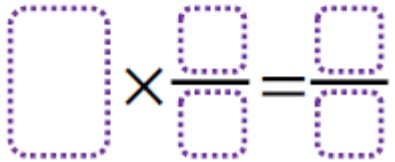
What is my fraction?

What do I need to multiply it by so that my answer is equivalent to $\frac{3}{4}$

Can you create your own version of this problem?

Use the digit cards to complete the multiplication.





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Week 3

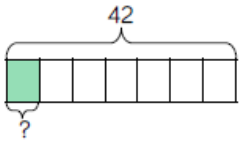
Children may not be able to apply their multiplication knowledge to identify how a number has been scaled.
Children may struggle with applying their fraction knowledge.
Children may struggle to explain

~ Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

- To develop the skill of finding fractions of amounts.
- To know how to use fractions as operators.
- To develop the skill of using fractions as operators.

Fluency

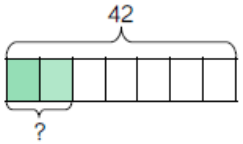
Find $\frac{1}{7}$ of 42



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

Use this method to find
$\frac{1}{8}$ of 56 $\frac{1}{6}$ of 480 $\frac{1}{9}$ of 81 m

Find $\frac{2}{7}$ of 42



$42 \div 7 = 6$
$6 \times 2 = 12$
$\frac{2}{7}$ of 42 is 12

Use this method to find
$\frac{3}{8}$ of 56 $\frac{5}{6}$ of 480 $\frac{4}{9}$ of 81 m

Draw a bar model to help you calculate
$\frac{4}{5}$ of 1 m $\frac{5}{12}$ of 1.44 litres $\frac{3}{7}$ of 21 kg

Reasoning

Which calculations are easier to multiply the fractions, and which are easier to find the fraction of an amount?
Explain you choice for each one.

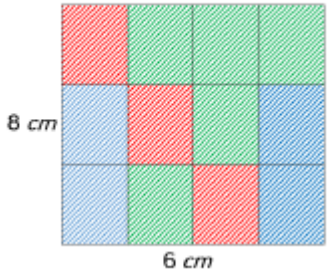
$25 \times \frac{3}{5}$ or $\frac{3}{5}$ of 25

$6 \times \frac{2}{3}$ or $\frac{2}{3}$ of 6

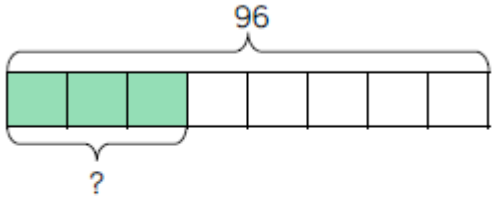
$5 \times \frac{3}{8}$ or $\frac{3}{8}$ of 5

Problem solving

Find the area of each colour in the rectangle.



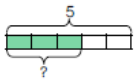
Write a problem that matches the bar model.



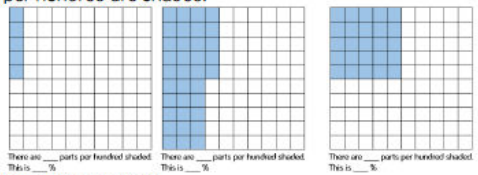
$\frac{7}{16}$ of a class are boys.

There are 18 girls in the class.

How many children are in the class?

Jenny has calculated and drawn a bar model for two calculations. $5 \times \frac{3}{5} = \frac{15}{5} = 3$  $\frac{3}{5}$ of 5 = 3  What's the same and what's different about Jenny's calculations? Complete: 2 lots of $\frac{1}{10}$ = ☐ $\frac{1}{10}$ of 2 = ☐ 8 lots of ☐ = 200 8 lots of 2.5 = ☐ 8 lots of $\frac{1}{4}$ = ☐ $\frac{1}{4}$ of 8 = ☐ Use this to complete: $20 \times \frac{4}{5} = \frac{\square}{\square}$ of 20 = ☐ ☐ $\times \frac{2}{3} = \frac{\square}{\square}$ of 18 = 12 ☐ $\times \frac{1}{3} = \frac{1}{3}$ of ☐ = 20		Jamie and Sam are thinking of a two-digit number between 20 and 30 Jamie finds two thirds of the number Sam multiplies the number by $\frac{2}{3}$ Their new two-digit number has a digit total that is one more than that of their original number What number did they start with? Show each step of their calculation.
Week 4 Children may struggle to recognise that percent is out of 100. Children may struggle with their place value understanding. Children may not be able to apply their understanding of multiplying and dividing by 10 and 100.	~ 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, and as a decimal • To know what a percentage means. • To understand what a percentage means. • To know how to write a percentage as a fraction. • To know how to write a percentage as a decimal. • To understand the links between percentages, fractions and decimals.	
Fluency	**Reasoning**	**Problem Solving**

Complete the sentence stems to describe how many parts per hundred are shaded.

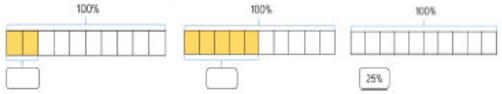


Complete the table.

Shade in the parts and record the missing information.

Pictorial representation	Parts per hundred	Percentage
	There are 51 parts per hundred	
		75%

Record the percentages shown.



Complete the table.

Pictorial representation	Percentage	Fraction	Decimal
	There are 41 parts per hundred 41%	41 out of 100 $\frac{41}{100}$	41 hundredths 0.41
		___ out of 100 $\frac{\square}{100}$	___ hundredths
	There are 51 parts per hundred 51%		

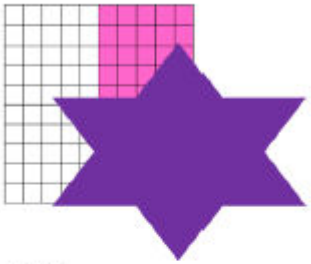
Kate has read 93 pages of her book. Her book has 300 pages in total. What proportion of her book has she read? Give your answer as a percentage and as a decimal.

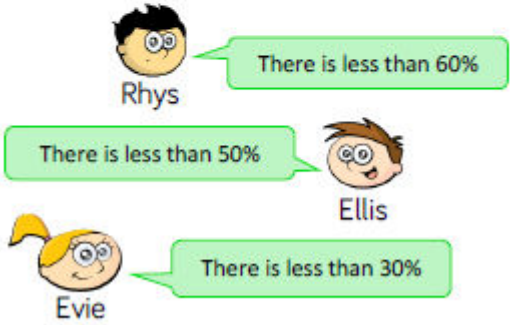
$$\frac{93}{300} = \frac{\square}{100} = \square\% = \square$$

Record the fractions as a percentage and as a decimal.

$$\frac{120}{300} \qquad \frac{320}{400} \qquad \frac{20}{200}$$

Here is a representation of a percentage.
Part of it has been covered by a star.





Explain why each child could be correct.

Max, Isla and Ethan all did a test with 100 questions.

- Ethan got 6 less questions correct than Max.

Name	Score	Percentage
Max	56 out of 100	
Isla		65%
Ethan		

Can you complete the table?
How many more marks did each child need to get 100%?

Jenny and Gurpreet each have 100 sweets.
Jenny eats 65% of hers. Gurpreet has 35 sweets left.
Who has more sweets left?

Week 5

Same as week 3

Children may struggle to see the relationship between fractions, decimals and percentage.

Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.

- To know the relationship between fractions, decimals and percentages.
- To develop the skill of recognising equivalent fractions, decimals and percentages.
- To understand equivalent fractions, decimals and percentages.

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- To know how to solve problems involving fractions, decimals and percentages.
- To understand how to solve problems involving fractions, decimals and percentages.

Fluency

Use a bead string to show me

0.25 0.3 0.2 0.5

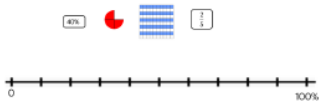
What are these decimals as a percentage?
What are they as a fraction? Can you simplify the fraction?

Use the bar models to convert the fractions into a percentage and a decimal.

$\frac{1}{2}$ is equivalent to ____ & ____ $\frac{1}{4}$ is equivalent to ____ & ____

$\frac{3}{10}$ is equivalent to ____ & ____ $\frac{1}{5}$ is equivalent to ____ & ____

Draw a line to show where each representation goes on a number line.



Reasoning

Problem Solving

At a cinema, 0.4 of the audience are adults.
The rest of the audience is made up of boys and girls.
There are twice as many girls as boys.

What percentage of the audience are girls?

Three children have each read 360 pages of their own book.

Kenny's book has 500 pages.
Lenny's book has 400 pages.
Penny's book has 600 pages.

What fraction of their books have they each read?

How much of their books have they each read as a decimal?

Who has read the most of their book?

Ash has £55
He spends $\frac{3}{5}$ of his money on a coat and 30% on shoes.
How much does he have left?

		Tom is playing a maths game, here are his scores at three different levels. Level A – 440 points out of 550 Level B – 210 points out of 300 Level C – 45 points out of 90 At which level did he have a higher success rate? Sort the fractions, decimals and percentages into the correct column. 50% | 100% | $\frac{30}{60}$ Seven tenths | 60% | 0.25 70 hundredths | $\frac{1}{4}$ | 0.5 Less than $\frac{1}{2}$ | Equal to $\frac{1}{2}$ | More than $\frac{1}{2}$
Week 6	~ Consolidation- focus on any objective that the children need further help with.	
Fluency	**Reasoning**	**Problem Solving**