Spring 2 Year 5

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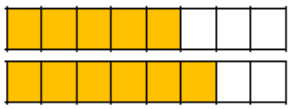
Links to prior learning/ objectives	**Resources**	**Vocabulary:**
~ Place value knowledge- working with decimals too. ~ Understanding of strategies for addition, subtraction, multiplication and division. ~ Multiplication facts up to 12 x 12. ~ Awareness of how to multiply and divide by 10, 100 and 1000. ~ Factors and multiples. ~ Using manipulatives to demonstrate mathematical concepts. ~ Understanding of decimal place and how to read amounts that have decimal places. ~ Understanding of fractions (unit and no-unit fractions), what they represent and how to compare/order them.	Bar models, multiplication grids, number lines, counting sticks, place value grids **Mastery:** (where to find some resources) • Teaching for Mastery • White Rose **New and old documents** • Mastery maths stickers • Nrich (curriculum mapping)	Fractions, denominator, numerator, multiples, compare, order, equivalent, tenths, hundredths, identify, represent, pictorially, Add, subtract, fractions, pictorially, bar model, denominators, multiples. Fractions, decimals, equivalence, conversion, thousandths, hundredths, tenths, Round, decimals, decimal places, whole number, decimal notation,

Objectives and Teaching

Barriers to ARE (misconceptions) **Week 1**	Compare and order fractions whose denominators are all multiples of the same number. • To know how to compare fractions. • To develop the skill of comparing fractions. • To know how to order fractions. • To develop the skill of ordering fractions. • To understand how to order and compare fractions.	
Children may struggle to understand what a fraction represents. Children may struggle to apply their multiplication and division knowledge.		
Fluency	**Reasoning**	**Problem solving**

Use bar models to compare $\frac{5}{8}$ and $\frac{3}{4}$



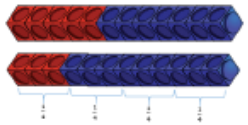
$\square > \square$

$\square < \square$

Use this method to help you compare:

$\frac{5}{6}$ and $\frac{2}{3}$ $\quad$ $\frac{2}{3}$ and $\frac{5}{9}$ $\quad$ $\frac{7}{16}$ and $\frac{3}{8}$

Use cubes to help you compare $\frac{1}{4}$ and $\frac{5}{12}$



$\square > \square$

$\square < \square$

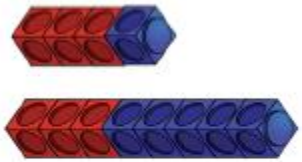
Use this method to help you compare:

$\frac{6}{7}$ and $\frac{15}{21}$ $\quad$ $\frac{4}{9}$ and $\frac{11}{27}$ $\quad$ $\frac{9}{16}$ and $\frac{7}{8}$

Order the fractions from greatest to smallest:

$\frac{3}{12}, \frac{3}{4}$ and $\frac{3}{16}$ $\quad$ $\frac{2}{3}, \frac{5}{6}$ and $\frac{7}{12}$ $\quad$ $\frac{4}{7}, \frac{13}{14}$ and $\frac{19}{28}$

Ash makes $\frac{3}{4}$ and $\frac{3}{8}$ out of cubes.

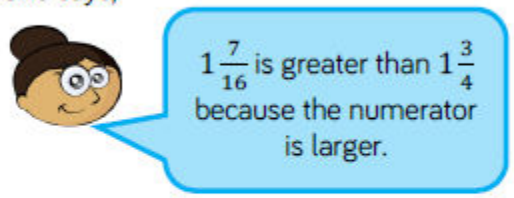


He thinks that $\frac{3}{8}$ is equal to $\frac{3}{4}$

Do you agree?
Explain your answer.

Lottie looks at the fractions $1\frac{7}{16}$ and $1\frac{3}{4}$

She says,



Do you agree?

Explain why using a model.

Always, sometimes, never

If one denominator is a multiple of the other you can simplify the fraction with the larger denominator to make the denominators the same.

E.g. $\frac{1}{4}$ and $\frac{9}{12}$ can be simplified to $\frac{1}{4}$ and $\frac{3}{4}$

Prove it.

Lucy and Sinead both have two identical pizzas each.

Lucy says,

Sinead says,

Who ate the most pizza?

Use a drawing to support your answer.

Week 2

Children may not be able to apply their understanding of multiplying and dividing by 10.

Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths

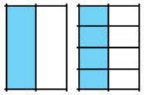
- To know how to identify equivalent fractions.

Children may mispronounce tenths and hundredths forgetting the th.
Children may struggle to see how two fractions could represent the same.
Children may not be able to apply their knowledge of multiplication and division.

- To develop the skill of identifying equivalent fractions.
- To understand how to identify equivalent fractions.

Fluency

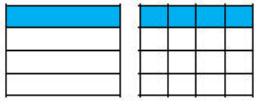
Take two pieces of paper the same size.
Fold on piece into two equal pieces.
Fold the other into eight equal pieces.
What equivalent fractions can you find?



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

Use the models to write equivalent fractions.

Emma uses the models and her multiplication and division skills to find equivalent fractions.

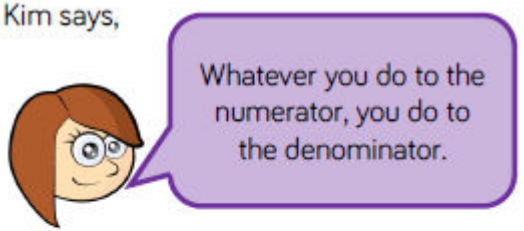


$\frac{1}{4} = \frac{4}{16}$ (×4)

Use this method to find equivalent fractions to $\frac{2}{4}, \frac{3}{4}$ and $\frac{4}{4}$ where the denominator is 16

Reasoning

Kim says,



Here are the equivalent fractions she has found for $\frac{4}{8}$:

$\frac{4}{8} = \frac{8}{16}$ $\quad \frac{4}{8} = \frac{6}{10}$

$\frac{4}{8} = \frac{2}{4}$ $\quad \frac{4}{8} = \frac{1}{5}$

Does Kim's method work? Explain why.

Problem solving

Here are some fraction cards. All of the fractions are equivalent.

$\frac{4}{A}$ $\quad \frac{B}{C}$ $\quad \frac{20}{50}$

A + B = 16
Calculate the value of C.

Week 3

Children may struggle to see how to add and subtract with fractions (especially if taught procedurally first).
Children may not be able to apply their knowledge of multiplication and division.
Children may miscalculate.

Add and subtract fractions with the same denominator and denominators that are multiples of the same number

- To know how to add fractions with the same denominator.
- To know how to add fractions.
- To know how to subtract fractions with the same denominator.
- To know how to subtract fractions.
- To develop the skill of adding and subtracting fractions.

Fluency	Reasoning	Problem Solving

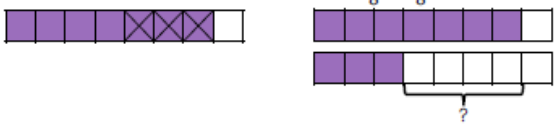
Here is a bar model to calculate $\frac{3}{5}+\frac{4}{5}$

$\frac{3}{5}+\frac{4}{5}=\frac{7}{5}=1\frac{2}{5}$

Use a bar model to solve the calculations:

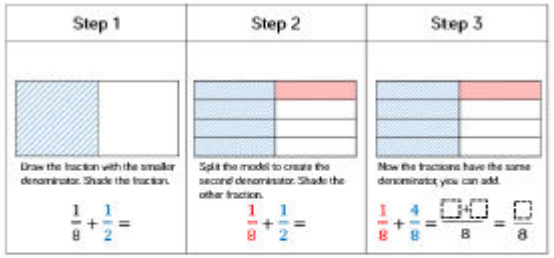
$\frac{3}{8}+\frac{3}{8}$ $\frac{5}{6}+\frac{1}{6}$ $\frac{5}{3}+\frac{5}{3}$

Here are two bar models to calculate $\frac{7}{8}-\frac{3}{8}$



What is the difference between the two methods?
Use your preferred method to calculate:

$\frac{5}{8}-\frac{1}{8}$ $\frac{9}{7}-\frac{4}{7}$ $\frac{5}{3}-\frac{5}{3}$



Use the area model to solve :

$\frac{1}{4}+\frac{3}{8}$ $\frac{2}{3}+\frac{1}{6}$ $\frac{7}{10}+\frac{1}{5}$

Mary-Kate solved this calculation:

Can you spot and explain her mistake?

Two children are solving $\frac{1}{3}+\frac{4}{15}$

Emma starts by drawing this model:

Kate starts by drawing this model:

Can you explain each person's method and how they would complete the question?
Which method do you prefer and why?

How many different ways can you balance the equation?

$\frac{5}{9}+\square=\frac{8}{9}+\square$

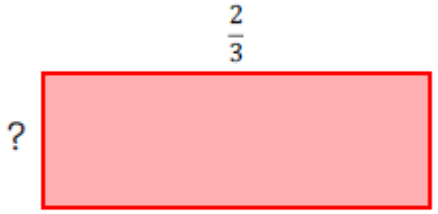
A chocolate bar has 12 equal pieces.

Sami eats $\frac{5}{12}$ more of the bar than Hafsah.

There is one twelfth of the bar remaining.

What fraction of the bar does Hafsah eat?

The perimeter of the rectangle is $1\frac{7}{9}$



Work out the missing length.

Week 4

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

Read and write decimal numbers as fractions [for example, 0.71 = 71/100]
Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.

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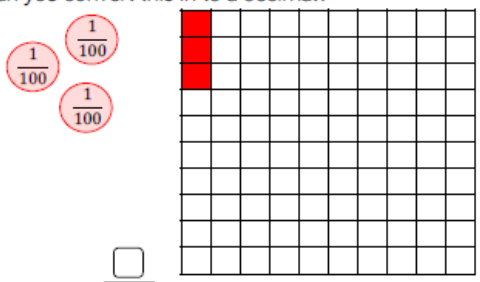
Children may struggle with their place value understanding. Children may not be able to apply their knowledge of multiplication and division.	• To know the relationship between fractions and decimals. • To know the place value of thousandths and tenths. • To know how to write a decimal as a fraction. • To develop the skill of writing a decimal as a fraction. • To understand how to write a decimal as a fraction.

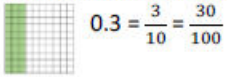
Fluency

What fraction is being shown in both representations?
Can you convert this in to a decimal?

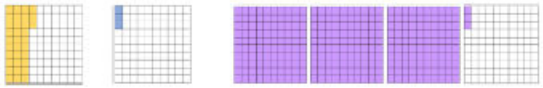


The fraction $\frac{\square}{\square}$ is the same as the decimal _____

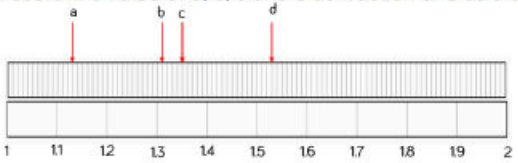
Use the models to record equivalent decimals and fractions.



$0.3 = \frac{3}{10} = \frac{30}{100}$



Record the value of a, b, c and d as fraction and as a decimal.



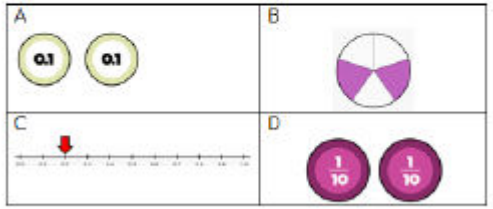
Complete the table.

Pictorial Representation	Decimal	Decimal – expanded form	Fraction	Fraction – expanded form	In words
	3.24	3 + 0.2 + 0.04	$3\frac{24}{100}$	$3+\frac{2}{10}+\frac{4}{100}$	Three ones, two tenths and four hundredths
	3.01		$3\frac{1}{100}$		
				$3+\frac{4}{10}+\frac{3}{100}$	
					Two ones, three tenths and two hundredths.

Reasoning

Odd one out.

Which of the images below is the odd one out?



Explain why.

Sam says,

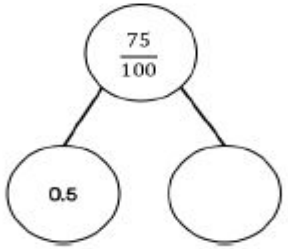
To convert a fraction to a decimal, take the numerator and put it after the decimal point.

E.g. $\frac{21}{100} = 0.21$

Write two examples of converting fractions to decimals to prove this does not always work.

Problem Solving

How many different ways can you complete the part whole model using fractions and decimals?



Can you create another part whole model like the one above for a partner?

June is converting decimals to thousandths

$0.345 = \frac{\square}{1000}$

Use June's method to convert the decimals to thousandths

O	t	h	th
0	3	4	5

$\frac{3}{10}$ $\frac{4}{100}$ $\frac{5}{1000}$

$\frac{300}{1000} + \frac{40}{1000} + \frac{5}{1000} = \frac{345}{1000}$

0.276

0.029

1.286

Use the place value chart and counters to represent these numbers as a decimal. Record the numbers as decimal.

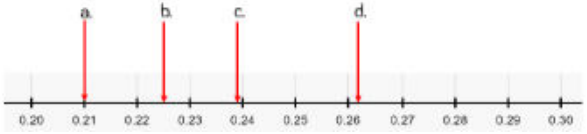
a)

b) 4 ones, 6 tenths, 0 hundredths and 2 thousandths

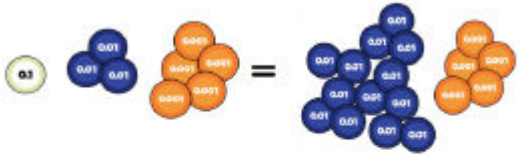
c) $3\frac{34}{1000}$

1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$

Estimate the value that each letter is pointing to.



Tim thinks the 2 values below are equal.



Do you agree?
Explain your thinking.
Can you write each amount as a decimal and a fraction?

Can you represent Tim's amount in at least three different ways?

Three children are representing the number 0.504

$0.504 = \frac{504}{1000}$ Lucinda

Terry $0.504 = \frac{3}{10} + \frac{2}{10} + \frac{4}{1000}$

$0.504 = \frac{5}{10} + \frac{4}{1000}$ Sophie

Who is correct?
Explain why.

Use the digits 3, 4 and 5 to complete the decimal number.

$\square\square.\square\square$

List all the possible numbers you can make.

Can you write all the decimals as fractions?

Choose three of the numbers and write them as words.

0.394

= 3 tenths, 9 hundredths and 4 thousandths

$= \frac{3}{10} + \frac{9}{100} + \frac{4}{1000}$

$= 0.3 + 0.09 + 0.004$

Can you write three other ways of saying the numbers below?

0.472 0.529 0.307

In this problem decimal numbers have been replaced with symbols. What is the value in each box if:

● =1 ★ = $\frac{1}{10}$ ▲ = $\frac{1}{100}$ ⬟ = $\frac{1}{1000}$

Week 5

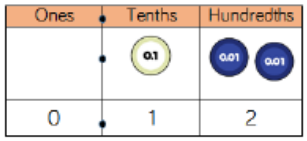
Children may struggle with their knowledge of rounding.
Children may struggle with their place value understanding.
Children may struggle to apply their understanding.

Round decimals with two decimal places to the nearest whole number and to one decimal place
Solve problems involving number up to three decimal places.

- To know the place value of decimal numbers.
- To know how to round a decimal to the nearest whole number.
- To develop the skill of rounding decimals to the nearest whole number.
- To develop the skill of solving problems involving decimals.
- To understand how to solve problems involving decimals.

Fluency

What number is represented on the place value chart?



There are ____ ones, _____ tenths and _____ hundredths.
The number is _____

Represent these numbers on a place value chart

0.28 0.65 0.07 1.26

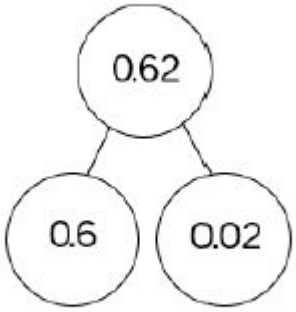
Make these numbers with place value counters and write the value of the underlined digit.

2.45 3.05 0.6 23.32

Reasoning

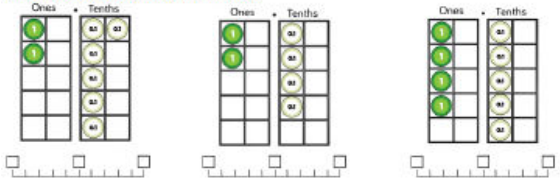
Problem Solving

Sally says there is only one way to partition 0.62

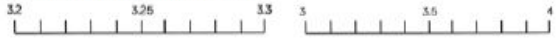


Prove Sally is incorrect by finding at least 3 different ways of partitioning 0.62

Complete the number lines and round the representations to the nearest whole number:



Use the number lines to round 3.24 to the nearest tenth and the nearest whole number.



Complete the table and use the number lines to help you round to the nearest tenth and the nearest whole number:

Pictorial representation	Number line	Rounded to the nearest tenth	Number line	Rounded to the nearest whole number

Match each description to the correct number.

My number has the same amount of tens and tenths

Charlie

My number has one decimal place.

Dylan

My number has two hundredths.

Megan

My number has six tenths.

Jess

46.2	2.64	46.02	40.46

A number between 11 and 20 with 2 decimal places rounds to the same number when rounded to one decimal place and when rounded to the nearest whole number?

What could this be?
Is there more than one option?
Explain why.

Rounded to the nearest 0.1, A is 3.5 and B is 3.0

What is the smallest possible difference between A and B?

What is the largest possible difference? Explain your strategy to a partner.

Simon is measuring a box of chocolates with a ruler that measures in centimetres and millimetres.

He measures it to the nearest cm and writes the answer 28cm.
What is the smallest length the box of chocolates could be?
What is the largest length the box of chocolates could be?