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Autumn 2 Year 6

Resources	Links to prior learning/ objectives	Vocabulary:
Base10, place value charts, place value counters, fraction walls, multiplication squares, ruler, co-ordinate grids, mirrors,	~ Place value including decimal places. ~ Formal written methods for all 4 number operations. ~ Multiplication facts up to 12 x 12 and how to derive facts based on these. ~ Word problems for all four operations. ~ Co-ordinate sand co-ordinate grids across two quadrants. ~ 2-D and 3-D shapes- properties. ~ Reflections and translation across two quadrants.	Fractions, simplify, simplest form, compare, order, express, multiples, common multiples, common factors, add, subtract, whole, part, equal, equivalent, multiplication facts, Denominator, numerator, mixed number, Proper fractions, multiply, simplify, simplest form, divide, whole number, compare, decimal, percentage, contexts, convert, multiply, divide, place value, power of ten, Co-ordinate grid, quadrants, negative numbers, positive numbers, integers, intervals, axis, horizontal, vertical, plane, translate, position, co-ordinates, reflect, x and y axis,
	Mastery: (where to find some resources) • Teaching for Mastery • White Rose New and old documents • Mastery maths stickers • Nrich (curriculum mapping)	

Objectives and Teaching	
Week 1 **Barriers to ARE (misconceptions)** Children may struggle to know what a fraction represents. Children may not have sufficient multiplication knowledge to support simplification. Children may mistake the numerator and the denominator. Children may not recognise that the larger the denominator the more parts the whole is shared between. Children may struggle to recognise that equivalences can be found when multiplying/dividing the numerator and denominator by the same amount.	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • To develop my understanding of equivalent fractions. • To know how to simplify a fraction. • To develop the skill of simplifying fractions. • To develop my understanding of fraction through number lines.

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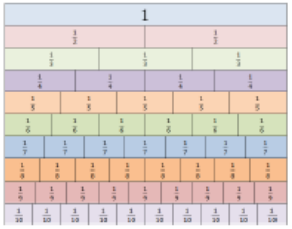
Fluency

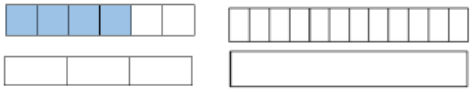
Use the fraction wall to simplify: $\frac{2}{8}$, $\frac{3}{9}$ and $\frac{4}{10}$

Which direction did you move on the fraction wall?

What have the numerator and denominator been divided by?



Use the bar models to simplify the fractions.
Make sure your bar model has fewer equal parts than the original fraction.



$\frac{4}{6} = \frac{\square}{3}$ $\frac{8}{12} = \frac{\square}{\square}$

Problem Solving

What would you split your number line into to plot the following fractions?

$\frac{1}{3}, \frac{11}{12}, \frac{5}{6}$

Explain your answer.

Is this the only answer?

Reasoning

Always, sometimes, never?

To simplify a fraction you divide by 2 until you can't divide by 2 anymore.

Sam has simplified $\frac{6}{12}$

$\frac{6}{12}$ $\frac{3}{6}$

What method has he used?

Is this the most efficient method?
Explain your answer.

Hassan thinks that $\frac{2}{5}$ in its simplest terms is $\frac{1}{2.5}$
Do you agree? Convince me.

Week 2

Barriers to ARE (misconceptions)

Children may struggle to know what a fraction represents.
Children may not have sufficient multiplication knowledge to support simplification.
Children may mistake the numerator and the denominator.
Children may not recognise that the larger the denominator the more parts the whole is shared between.
Children may struggle to recognise that equivalences can be found when multiplying/dividing the numerator and denominator by the same amount.

Compare and order fractions, including fractions > 1

- To know how to compare fractions by denominator.
- To know how to order fractions by denominator.
- To know how to compare and order fractions by the numerator.

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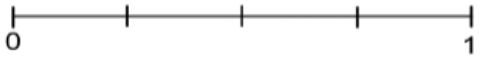
Fluency

On the number line place $\frac{2}{8}$, $\frac{4}{8}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{4}{4}$, $\frac{7}{8}$, $\frac{3}{16}$



Which other fractions, with different denominators can be placed on the number line?

Complete the circles using <, > or =

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

$\frac{7}{8}$ ◯ $\frac{4}{6}$ ◯ $\frac{3}{4}$

Use the bar models to show $\frac{1}{4}$ and $\frac{2}{3}$ then complete the sentences.

□ < □

Complete the circles using <, > or =

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

$\frac{7}{8}$ ◯ $\frac{4}{6}$ ◯ $\frac{3}{4}$

Problem Solving

Use the digit cards to complete the statements below:

5 6 3 4

□/□ > □/□ □/4 < 6/□

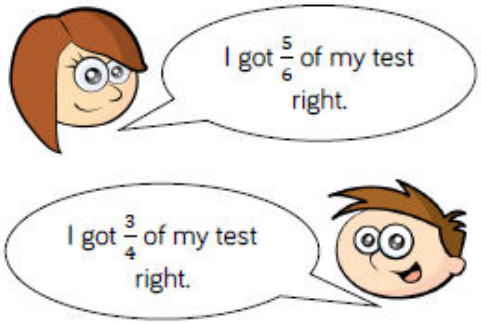
Find three examples of ways you could complete the statement:

□/□ < □/□

Can one of your ways include an improper fraction?

Reasoning

Ellie and Josh sat the same maths test.



Who did better on the test?

Explain how you know.

Week 3

Barriers to ARE (misconceptions)

Children may struggle to know what a fraction represents.

Children may not have sufficient multiplication knowledge to support simplification.

Children may mistake the numerator and the denominator.

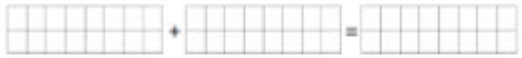
Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

- To know how to add and subtract fractions (less than one – one denominator is multiple of other).
- To know how to add and subtract fractions (less than one – different denominators).
- To know how to add fractions (greater than one).
- To know how to subtract fractions (greater than one).
- To develop the skill of adding and subtracting fractions.

Children may not recognise that the larger the denominator the more parts the whole is shared between.
Children may struggle to recognise that equivalences can be found when multiplying/dividing the numerator and denominator by the same amount.
Children may think that they need to add and subtract the numerator and the denominator

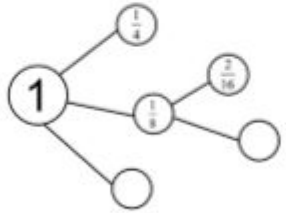
Fluency

Shade in the diagram to show that $\frac{5}{8} + \frac{3}{16} = \frac{13}{16}$



Draw your own diagram to show that $\frac{1}{3} + \frac{2}{9} = \frac{5}{9}$

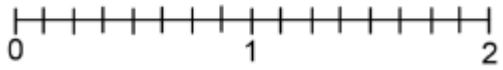
Complete the part whole model.



Emma uses $\frac{1}{3}$ of her tin of paint on Friday, $\frac{1}{21}$ on Saturday and on Sunday she uses $\frac{2}{7}$.
How much paint does she have left?

Problem Solving

How many ways can you show a difference of one quarter on the number line?



Can you complete the calculation using the same digit?

$$\frac{\square}{5} + \frac{1}{\square} = \frac{9}{10}$$

Shelden subtracted $\frac{3}{5}$ from a fraction and his answer was $\frac{8}{45}$. What was the original question?

Reasoning

Amy answered the following calculation:

$$\frac{3}{6} + \frac{1}{15} = \frac{4}{21}$$

Do you agree with her? Explain your answer.

If you don't agree with Amy, what should the answer be?

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Week 4

Barriers to ARE (misconceptions)

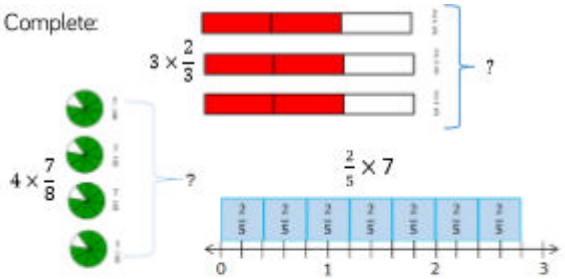
Children may struggle to know what a fraction represents.
Children may not have sufficient multiplication knowledge to support simplification.
Children may mistake the numerator and the denominator.
Children may not recognise that the larger the denominator the more parts the whole is shared between.
Children may struggle to recognise that equivalences can be found when multiplying/dividing the numerator and denominator by the same amount.
Children may struggle to visualise what happens to a fraction when multiplying and dividing.

Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 4 1 × 2 1 = 8 1]

- To know how to multiply fractions by integers.
- To know how to multiply fractions by fractions.
- To develop the skill of multiplying fractions.

Fluency

Complete:



Sally and 3 of her friends have $1\frac{2}{3}$ of a chocolate bar each.
How much chocolate do they have altogether?

Complete and then order:

- $6 \times \frac{5}{7}$ $\quad \frac{5}{6} \times 5$ $\quad 4 \times \frac{7}{8}$
- $4 \times 2\frac{3}{5}$ $\quad 3\frac{4}{9} \times 3$ $\quad 5 \times 2\frac{3}{7}$

Problem Solving

There are 9 lamp posts on a road. There is $4\frac{3}{8}$ of a metre between each lamp post.

What is the distance between the first and last lamp post?

Reasoning

Lily and Zac both work on a homework project.

Who spent the most time on their project?

Explain your reasoning.

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Week 5

Barriers to ARE (misconceptions)

Children may struggle to know what a fraction represents.
Children may not have sufficient multiplication knowledge to support simplification.
Children may mistake the numerator and the denominator.
Children may not recognise that the larger the denominator the more parts the whole is shared between.
Children may struggle to recognise that equivalences can be found when multiplying/dividing the numerator and denominator by the same amount.
Children may struggle to visualise what happens to a fraction when multiplying and dividing.
Children may struggle with the abstract concept of finding a fraction of an amount – difficulty in seeing a fraction as a means of division.

Divide proper fractions by whole numbers [for example, 3 1 ÷ 2 = 6 1]
Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts (Finding fractions of amounts)

- To know how to divide fractions by integers.
- To develop the skill of dividing fractions by integers.
- To develop the skill of using the four operations with fractions.
- To develop the skill of finding fractions of amounts.
- To know how to find the whole amount from a known value of fraction.

Fluency

Use the diagrams to help you calculate:

$\frac{3}{4} \div 3$

$3 \div \frac{1}{6}$

Calculate:

$\frac{7}{8} \div 2$ $\frac{10}{13} \div 5$ $\frac{6}{7} \div 3$

Problem S olving

Becky's mum ordered a pizza for her and her friends.

By the time they arrived home there was only $\frac{3}{4}$ of it left.
When she shared it among her friends they each got $\frac{1}{4}$
How many friends did Becky have with her?

Reasoning

Roman says

When dividing fractions by a whole number, I just ignore the numerator.

Do you agree?
Explain why.

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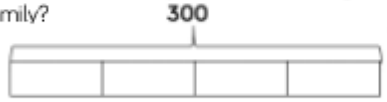
<table>
<tr>
<td>
The school kitchen has 48 kg of potatoes. They use $\frac{5}{8}$ to make mash potato for lunch.
How much potato do they have left?
Use the bar model to find the answer to this question.


A football team has 300 tickets to give away. They give $\frac{3}{4}$ of them to a local school and give $\frac{1}{3}$ of the remainder to a local business. How many tickets are left to give to friends and family?


Complete: $\frac{3}{8}$ of 40 = $\frac{\quad}{10}$ of 150
$\frac{1}{5}$ of 315 = $\frac{\quad}{8}$ of 72
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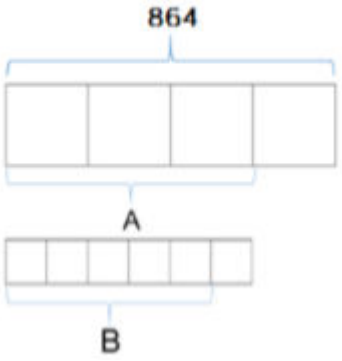
What is the value of A?
What is the value of B?


</td>
<td>
Two fashion designers receive $\frac{3}{8}$ of 208 m of materials.
One of them says:


Is she correct?
Explain your reasoning
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Week 6
Barriers to ARE (misconceptions)
Interpreting a co-ordinate grid.
Recognising what each axis represents.
Negative numbers
Order of co-ordinates when reading, following and recording.
Properties of shapes.
Understanding of translation – shape itself does not change, position of shape changes.
Understanding of reflection - shape itself does not change, position and orientation of shape changes.
Accuracy when translating and reflecting.
How to check for accuracy – difficulty in identifying errors, inability to recognise that the image is in fact different to the original shape.
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<td colspan="2">
Describe positions on the full coordinate grid (all four quadrants)
Draw and translate simple shapes on the coordinate plane, and reflect them in the axes

To know how to describe coordinates in the first quadrant.
To know how to describe coordinates in all four quadrants.
To know how to translate shapes on a coordinate plane.
To know how to reflect shapes in the axes.

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</table>

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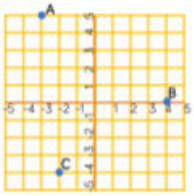
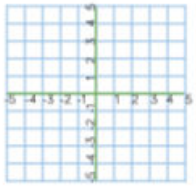
Fluency

Emily plotted three co-ordinates.
Work out the co-ordinates of A, B and C.



Draw the shape with the following co-ordinates (-2, 2) , (-4, 2) , (-2, -3) and (-4, -2).
What kind of shape have you drawn?



Use the graph describe the translations.
One has been done for you.

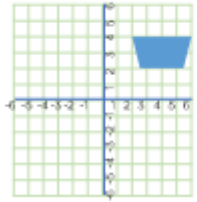
From ■ to ■ translate 8 units to the left.

From ■ to ■ translate __ units to the left and __ units up.

From ■ to ■ translate 4 units to the ____ and 5 units ____

From ■ to ■ translate __ units to the ____ and __ units ____

Reflect the trapezium in the x and the y axis.
Complete the table with the new co-ordinates of the shape.



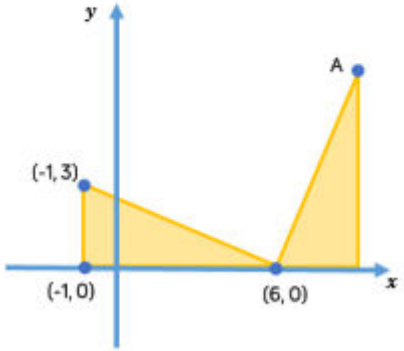
	Reflected in the x axis	Reflected in the y axis
(3,4)		
(6,4)		
(7,7)		
(2,7)		

Problem Solving

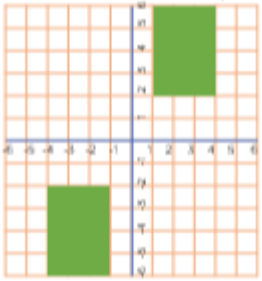
The diagram shows two identical triangles.

The co-ordinates of three points are shown.

Find the co-ordinates of point A.

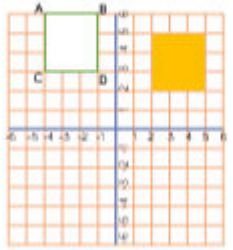


A rectangle has been reflected in the x axis and the y axis.
Where could the starting rectangle have been? Is there more than one option?



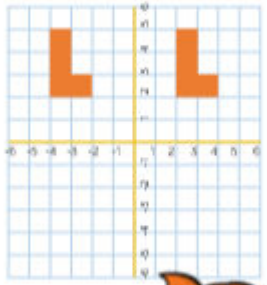
Reasoning

True or false
Sam has translated ABCD 6 units down and 1 unit to the right to get to the yellow square.



Explain your reasoning.

Tess has reflected the orange shape across the x axis. Is her drawing correct? If not explain why.



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Week 7 **Barriers to ARE (misconceptions)**	Consolidation/Assessment Week	
Fluency	Problem Solving	Reasoning