Fractions: Converting Mixed Numbers to Improper Fractions

Aim:	**Success Criteria:**	**Resources:**
Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number. To convert mixed numbers into improper fractions.	I can identify the properties of proper fractions, improper fractions and mixed numbers. I can represent fractions greater than 1 as diagrams. I can talk about the methods I use to convert mixed numbers.	Lesson Pack
	Key/New Words: Numerator, denominator, equivalent, proper fraction, whole, part, mixed number, improper fraction.	**Preparation:** Mixed Numbers to Improper Fractions Dominoes - one per pair as required Diving into Mastery Activity Sheets - as required

Prior Learning:	**Year 4 Ready to Progress Criteria:** 4F–2 Convert mixed numbers to improper fractions and vice versa. *Please note that non-statutory guidance released in 2020 has advised teaching this year 5 objective in year 4. We provide lessons teaching this objective in both year groups to provide coverage for all schools.*

Learning Sequence

	**Remember It:** Use the corresponding slide on the Lesson Presentation to rehearse identifying that when the numerator and denominator are the same number, the fraction is equivalent to one.	
	**Fractions Less Than 1:** Use the corresponding slide on the Lesson Presentation to rehearse identifying proper fractions from diagrams. Check that children are using the correct vocabulary to describe the denominators - e.g. fifths not fives. Do the children know the term 'proper fraction' for a fraction less than one whole?	
	**The Whole:** Use the corresponding slide on the Lesson Presentation to rehearse identifying how many equal parts make a whole on a fraction wall. The sentence stems are modelled from 'two one-halves make one whole' up to 'ten one-tenths make one whole'. Can the children identify how many parts make a whole?	
	**Mixed Numbers:** Use the corresponding slides on the Lesson Presentation to introduce describing fraction diagrams greater than 1 as a mixed number using wholes and parts. The mixed numbers shown are $1\frac{1}{2}$, $2\frac{1}{3}$ and $3\frac{3}{5}$. Then, children are asked for examples of when mixed numbers are used in everyday life, such as directions, recipes and weighing scales. Can the children identify how many wholes and parts there are in a fraction diagram greater than 1? Can they think of examples in everyday life that use mixed numbers?	
	**Improper Fractions:** Use the corresponding slides on the Lesson Presentation to introduce describing fraction diagrams greater than 1 as improper fractions. Emphasise that in an improper fraction the numerator is always greater than the denominator. The improper fractions shown are $\frac{3}{2}$, $\frac{7}{3}$ and $\frac{18}{5}$ which are equivalent to the mixed numbers in the previous section to illustrate the fact that mixed numbers and improper fractions are two ways of writing the same number. Can the children identify how many parts make the whole and how many of these parts there are in total in the fraction?	
	**Fractions Greater Than 1:** Use the corresponding slide on the Lesson Presentation to rehearse writing both the mixed number and improper fraction for fraction diagrams greater than 1. Can the children write both representations for a given diagram?	
	**Converting to Improper Fractions:** Use the corresponding slide on the Lesson Presentation to introduce the different methods that can be used to convert mixed numbers to improper fractions: a bar model diagram, repeated addition and multiplying the whole number by the denominator then adding the numerator. The children can select their own method to have a go at converting $2\frac{2}{3}$, $3\frac{1}{2}$ and $1\frac{2}{5}$ to improper fractions. Can the children draw a diagram, use repeated addition or multiply the whole by the denominator to help convert a mixed number?	

Mixed Number to Improper Fractions Dominoes: The children work with a partner to play the Mixed Numbers to Improper Fractions Dominoes. This activity is pitched at expected standard. Below are suggestions for how you can support children working below expected standard or at greater depth during the activity. Can the children convert mixed numbers into improper fractions?

To support children working below expected standard, provide them with counters to make the mixed number and then count the number of equal parts.

Complete the activity as described above.

To extend children working at greater depth, challenge them to write mixed number sequences from the numbers on the dominoes and convert them to improper fractions.

Diving into Mastery: Schools using a mastery approach may prefer to use the following as an alternative activity. These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.

Children complete fluency questions involving converting mixed numbers into improper fractions.

Children answer reasoning questions involving converting mixed numbers into improper fractions, explaining their reasoning.

Children work individually or collaboratively on problem-solving investigations involving converting mixed numbers into improper fractions.

Exploreit

Learnit: Children will find this visually exciting Knowledge Organiser a useful tool to support their understanding of fractions.

Loopit: Practise converting between mixed number and improper fractions in groups or as a class with these loop cards.

Countit: Children create sequences by counting on in different fraction steps. Challenge the children to show the sequences as both improper fractions and mixed numbers.

Maths

Fractions

Converting Mixed Numbers to Improper Fractions

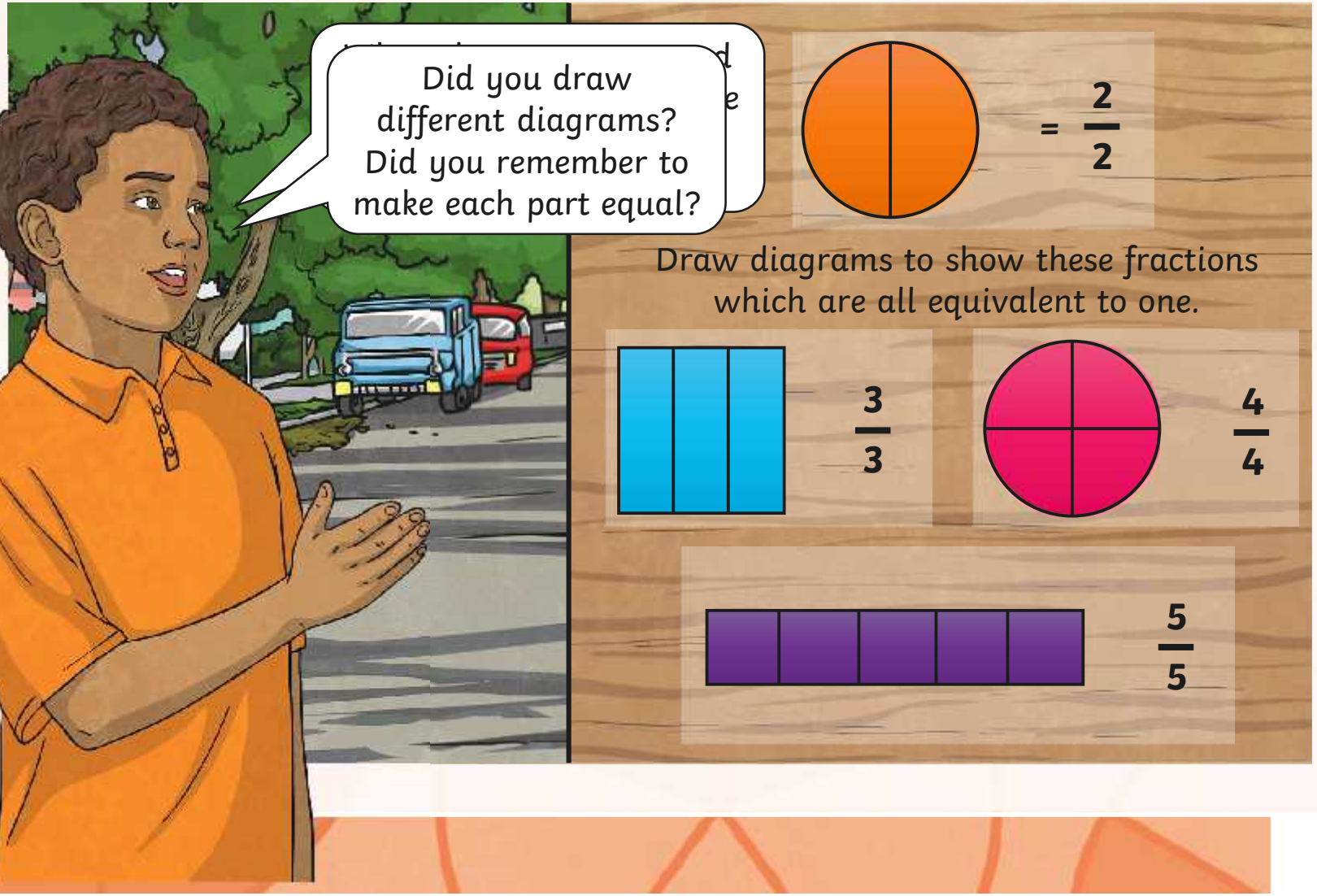
Aim

- To convert mixed numbers to improper fractions.

Success Criteria

- I can identify the properties of proper fractions, improper fractions and mixed numbers.
- I can represent fractions greater than 1 as diagrams.
- I can talk about the methods I use to convert mixed numbers.

Remember It


Did you draw different diagrams? Did you remember to make each part equal?
= 2/2
Draw diagrams to show these fractions which are all equivalent to one.
3/3
4/4
5/5

Fractions Less Than 1

Whole Class

Can you say the fractions shown here?

One half

$= \frac{1}{2}$

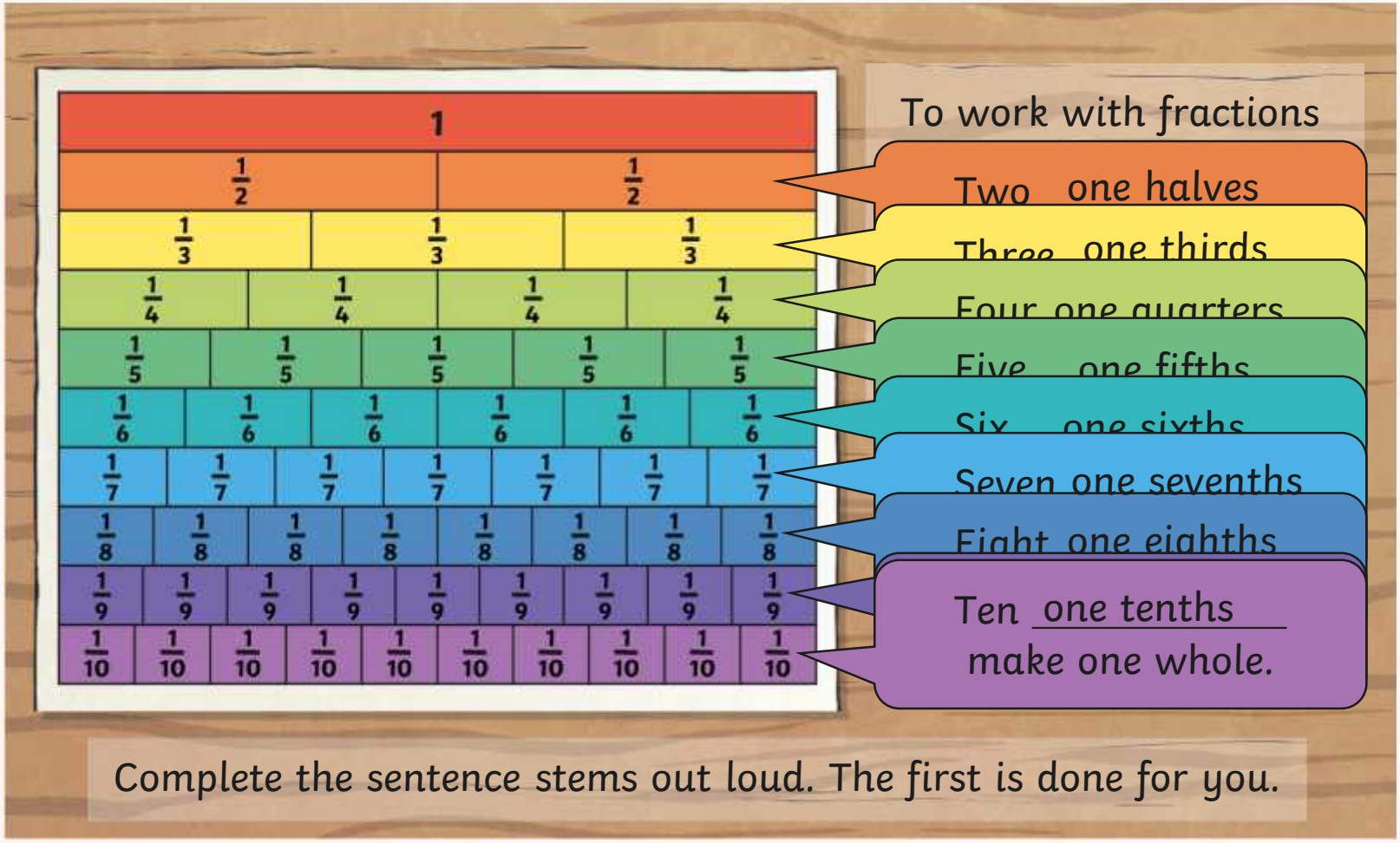
Three quarters

$= \frac{3}{4}$

Five ninths $= \frac{5}{9}$

All these fractions are less than one whole. Do you know the name for fractions less than one?

The Whole

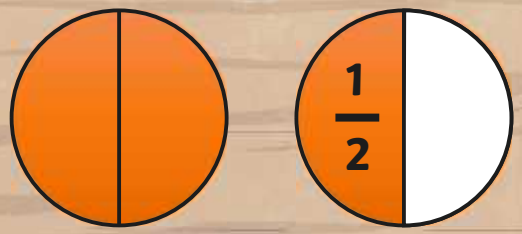


Complete the sentence stems out loud. The first is done for you.

Mixed Numbers

This diagram shows a fraction greater than 1.

How many complete wholes are there?



In the circle that isn't a complete whole, what fraction part is there?

When we describe a fraction greater than 1 using wholes and parts, this is called a mixed number.

Here is how we write this diagram as a mixed number.

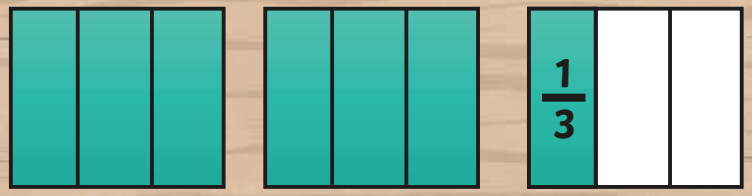
$1\frac{1}{2}$

Mixed Numbers

This diagram shows a fraction greater than 1.

How many complete wholes are there?

How many extra fraction parts are there?



Can you write the fraction as a mixed number?

$2\frac{1}{3}$

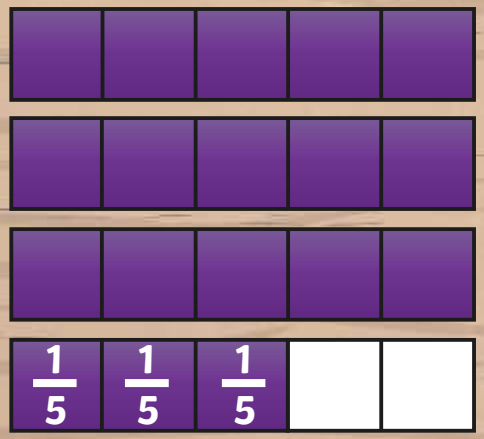
Mixed Numbers

Whole Class

This diagram shows a fraction greater than 1.

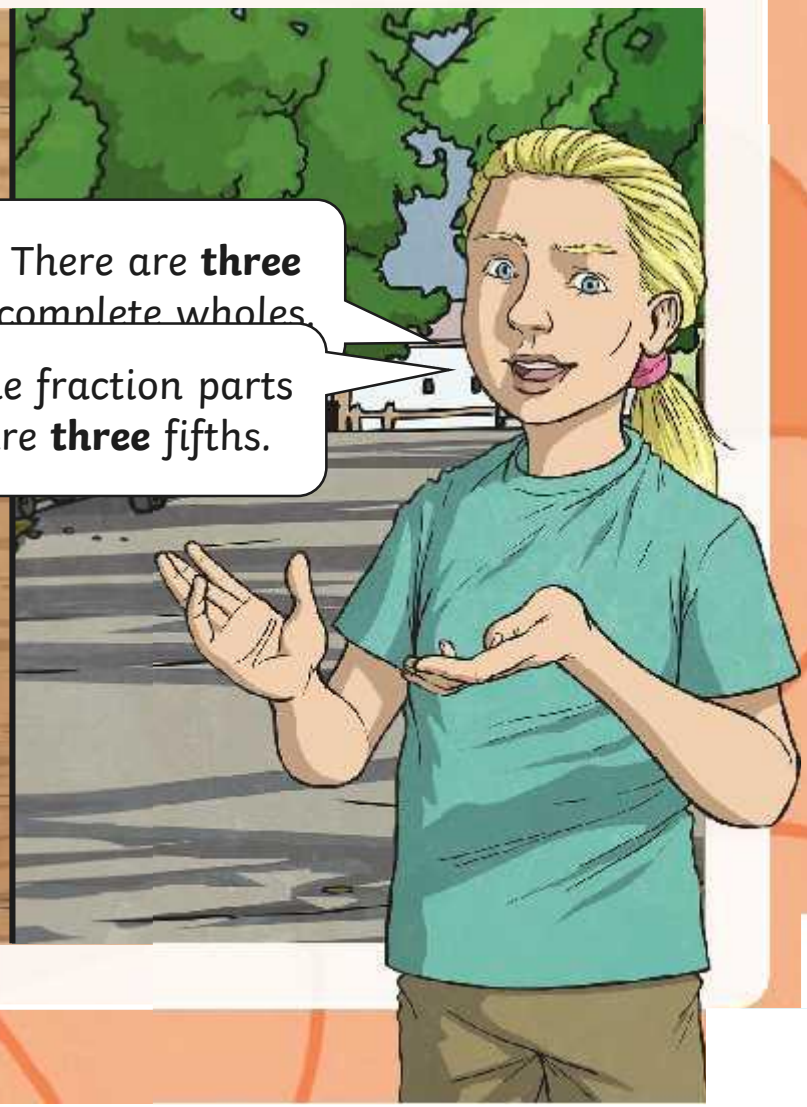
How many complete wholes are there?

How many extra fraction parts are there?



Can you write the fraction as a mixed number?

$3\frac{3}{5}$



Mixed Numbers

Whole Class

Can you think of places you will see mixed numbers in everyday life?
Here are some examples of mixed numbers. Have a go at saying them.

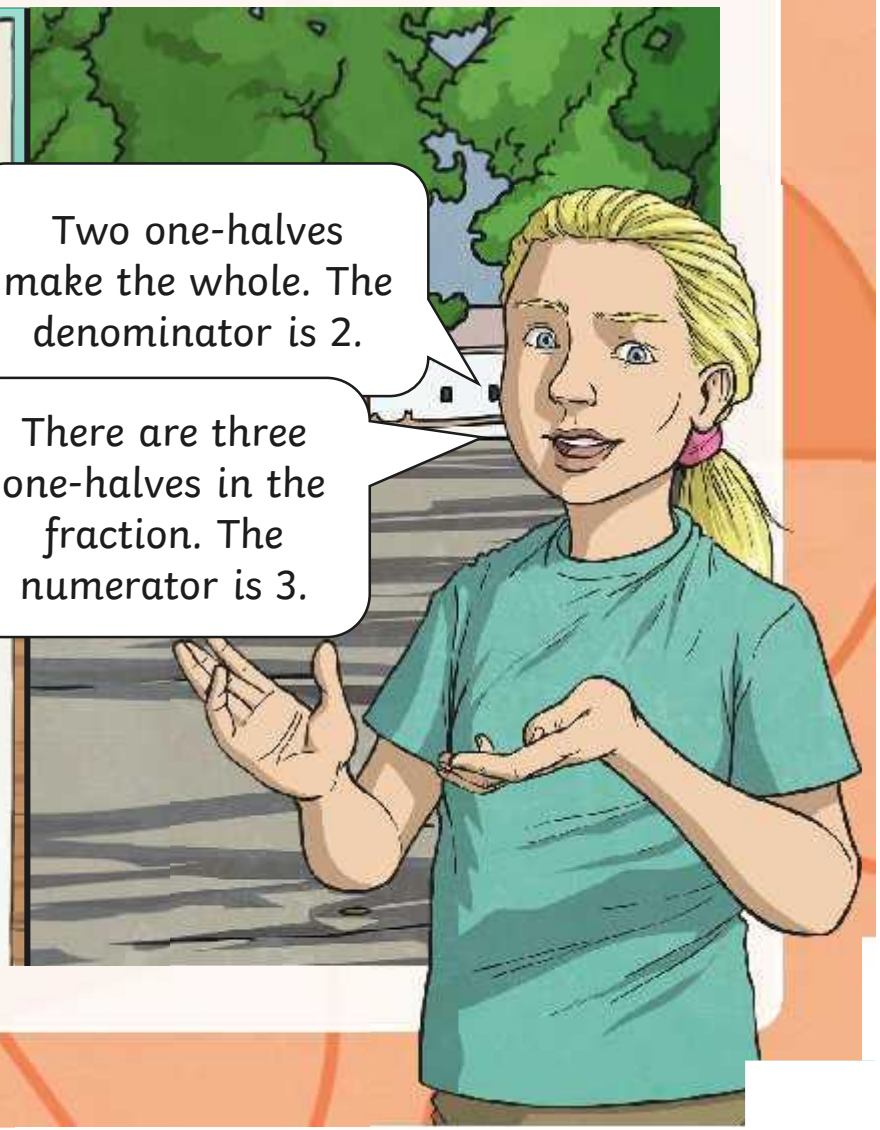
Improper Fractions

How many parts make the whole?
This is the denominator.

How many fractions parts are there altogether?

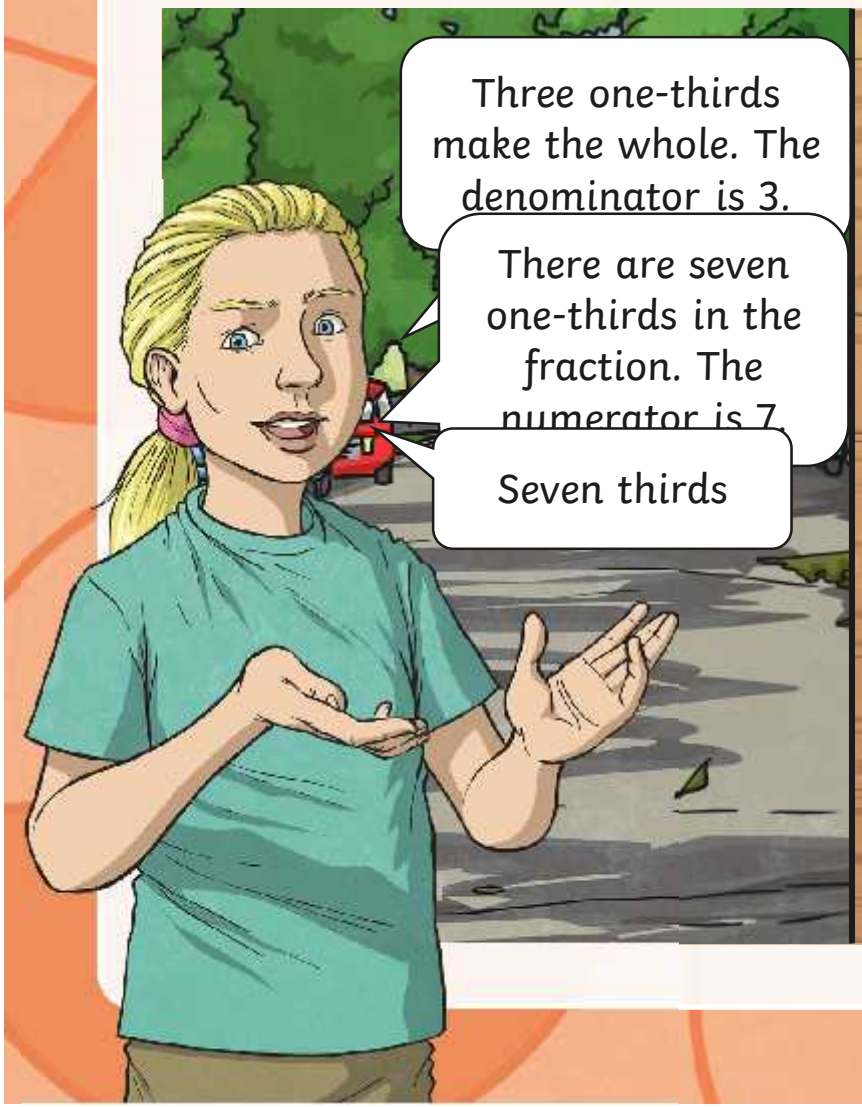
Here is how we write this diagram as an improper fraction.
We say it as three halves.
In an improper fraction, the numerator will always be greater than the denominator.

$\frac{3}{2}$



Improper Fractions

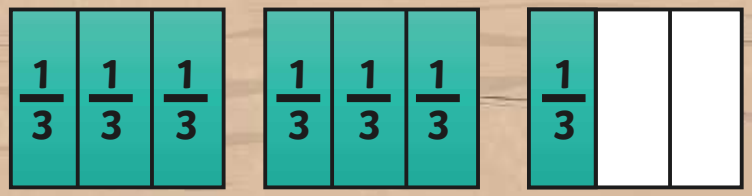
Whole Class



This diagram shows a fraction greater than 1.

How many parts make the whole?
This is the denominator.

How many fraction parts are there altogether?



Can you write this diagram as an improper fraction?
How do you say it?

$\frac{7}{3}$

Improper Fractions

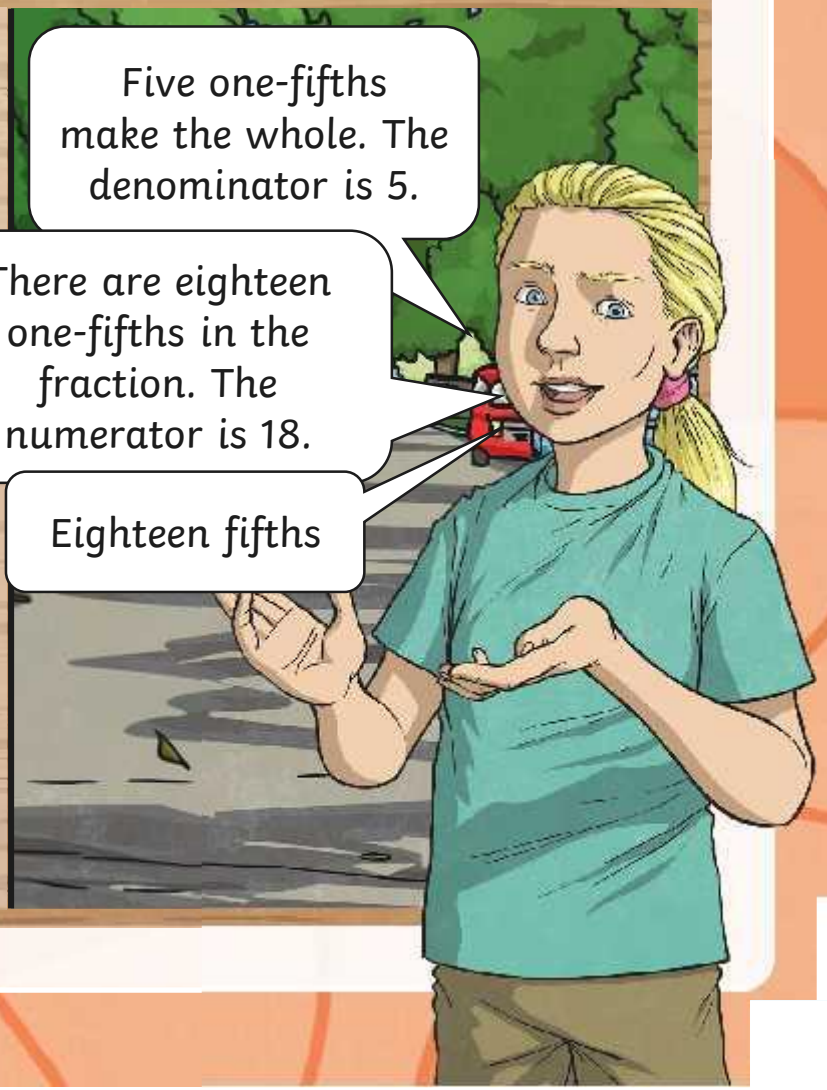
Whole Class

This diagram shows a fraction greater than 1.
How many parts make the whole?
This is the denominator.
How many fraction parts are there altogether?

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

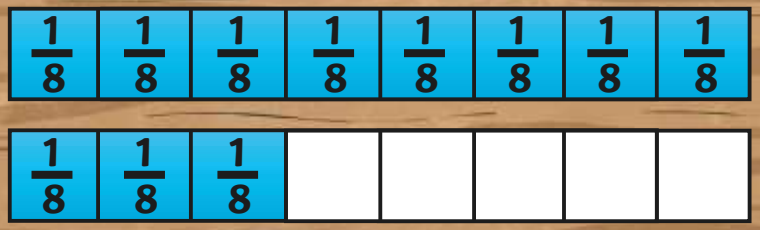
Can you write this diagram as an improper fraction?
How do you say it?

$\frac{18}{5}$



Fractions Greater Than 1

Now, we can describe fractions greater than 1 as both mixed fractions and improper fractions.



Mixed Number

$1\frac{3}{8}$

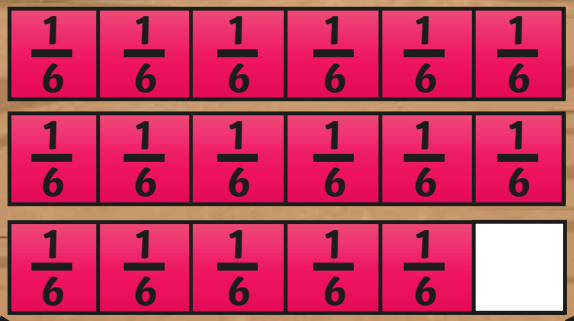
Remember mixed numbers and improper fractions are two different ways of describing the same fraction greater than 1.

Improper Fraction

$\frac{11}{8}$

Fractions Greater Than 1

Can you write both the mixed number and improper fraction for this diagram?



Mixed Number

$2\frac{5}{6}$

Improper Fraction

$\frac{17}{6}$

Converting to Improper Fractions

Here is a mixed number. Let's look at the different methods we can use to convert this to an improper fraction.

There are 3 wholes.

There are three one-quarters as the parts.

$$3\frac{3}{4} = \frac{\square}{4}$$

Each whole has 4 equal parts.

The denominator in mixed numbers and improper fractions is the same. So we only need to find the numerator of the improper fraction.

Converting to Improper Fractions

The first method we can use is to draw a diagram and count how many one-quarters there are altogether.

$$3\frac{3}{4} = \frac{15}{4}$$

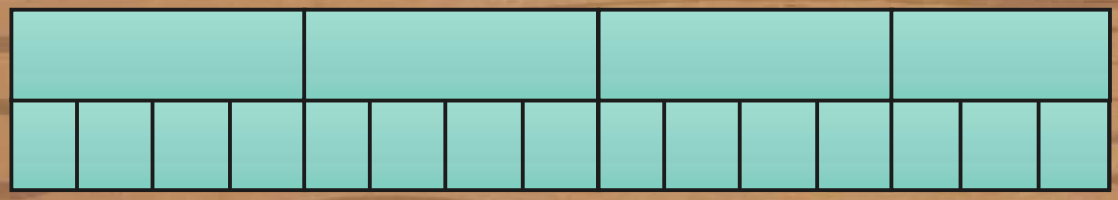
Converting to Improper Fractions

The second method we can use is repeated addition.

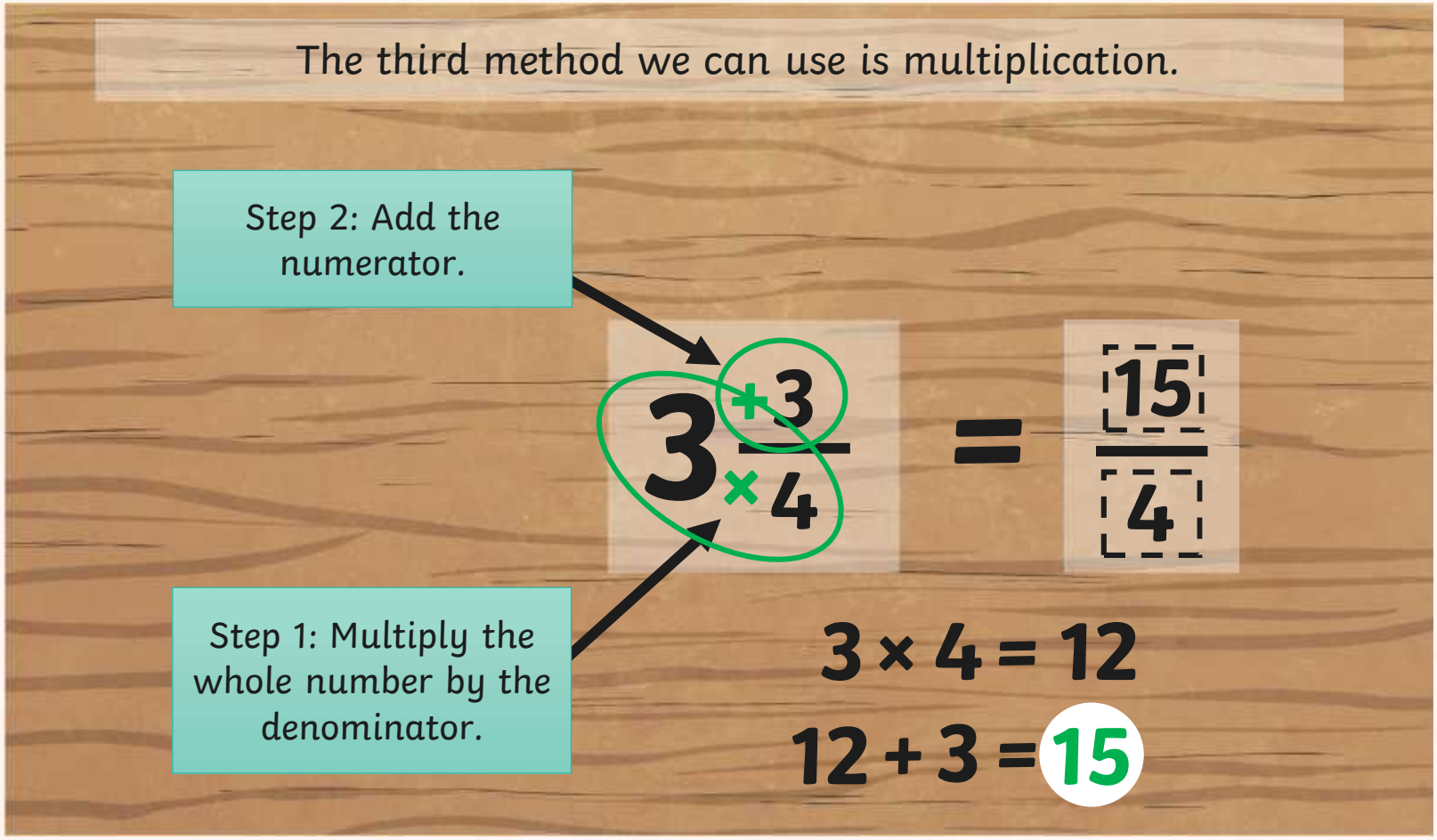
$$3\frac{3}{4} = \frac{15}{4}$$

We can see what repeated addition looks like on a bar model.

$$\frac{4}{4} + \frac{4}{4} + \frac{4}{4} + \frac{3}{4} = \frac{15}{4}$$



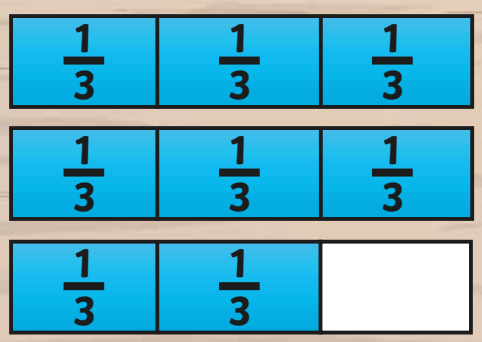
Converting to Improper Fractions



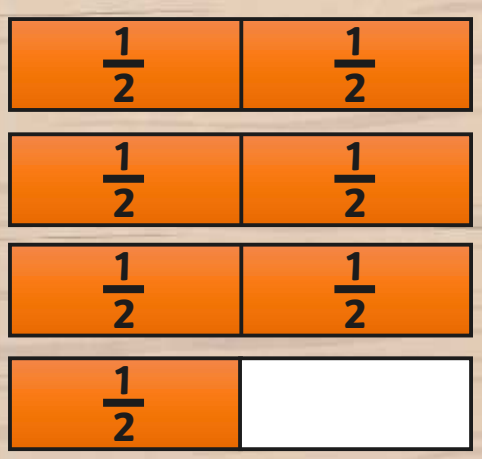
Converting to Improper Fractions

Have a go at changing these mixed numbers into their **improper fraction equivalents**. Discuss the methods you use.

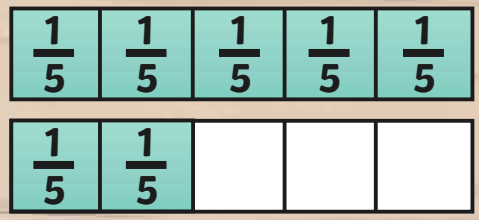
$2\frac{2}{3} = \frac{8}{3}$



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



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

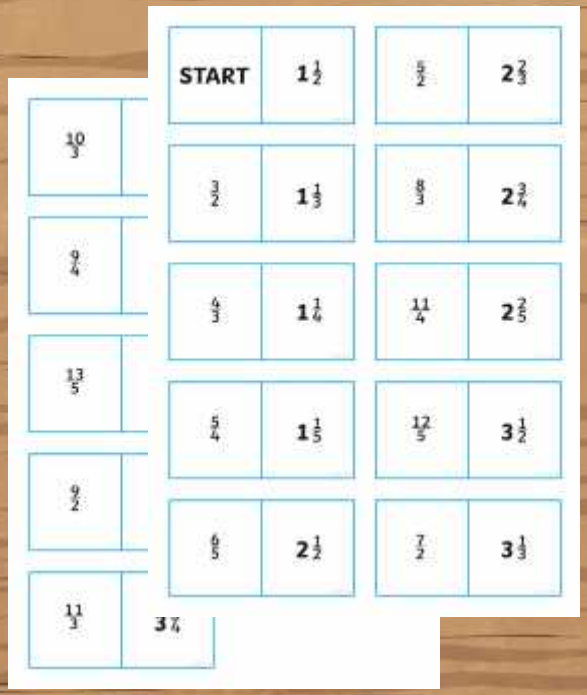


Mixed Numbers to Improper Fractions Dominoes

Can you complete the domino snake by matching the mixed numbers to their improper fraction equivalent?

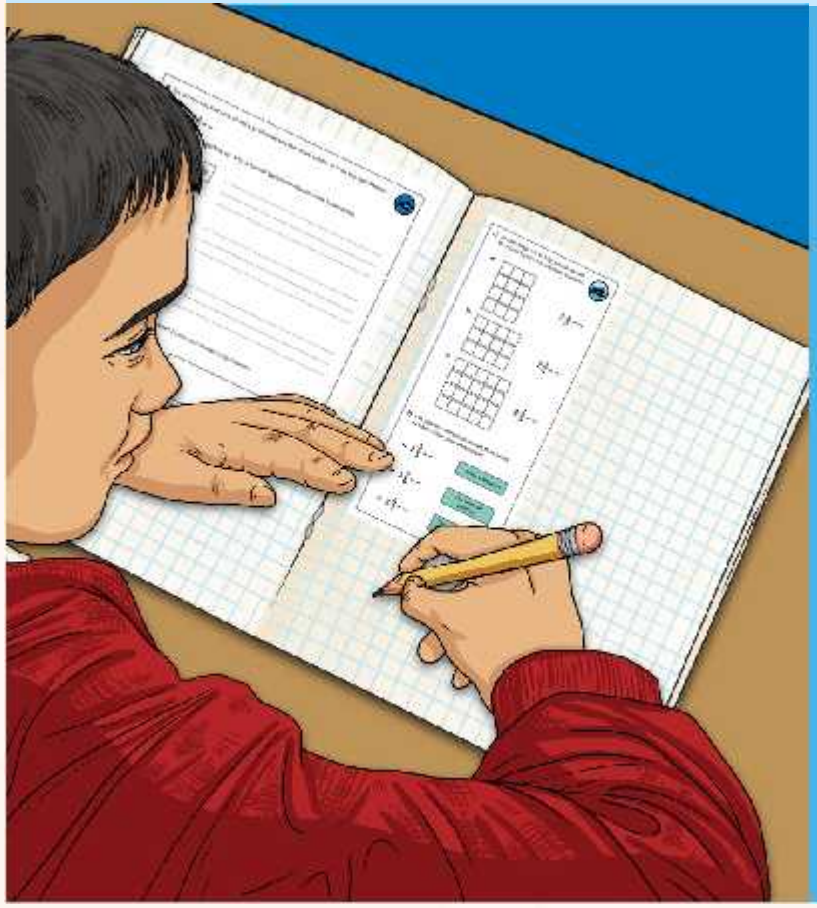
How to play:

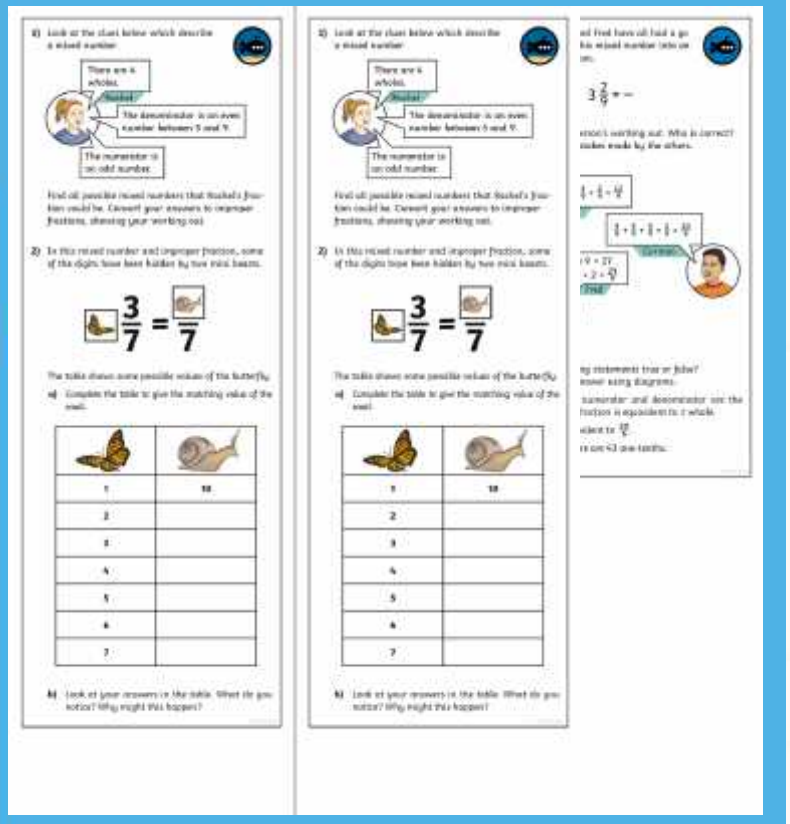
- Spread the cards out face up on the table.
- Find the card labelled start.
- Look carefully at the mixed number shown on this card.
- Work together to convert this to an improper fraction – remember to talk about the methods you use.
- Can you continue to match the cards until you reach the finish?



Diving into Mastery

Dive in by completing your own activity!



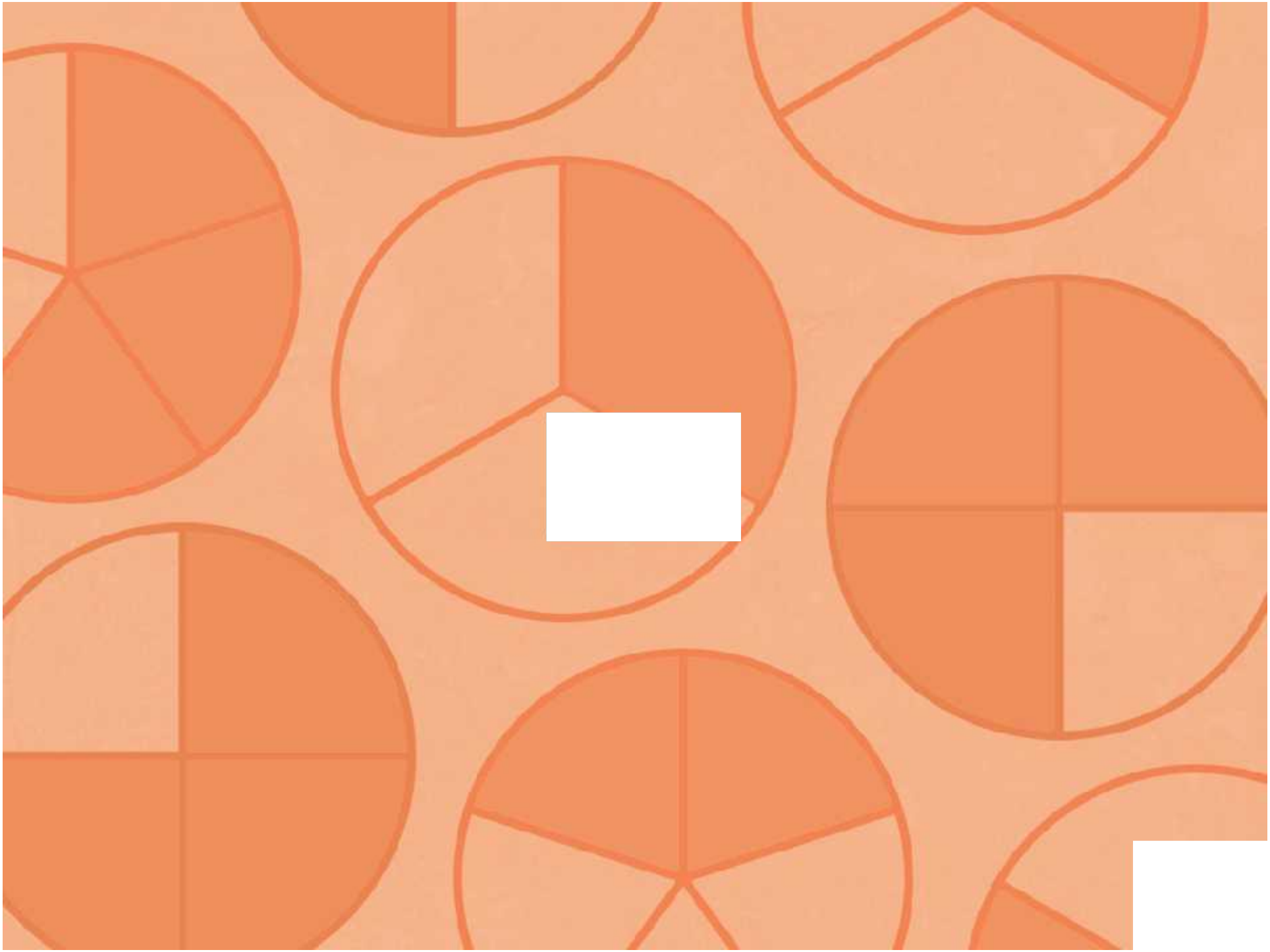


Aim

- To convert mixed numbers to improper fractions.

Success Criteria

- I can identify the properties of proper fractions, improper fractions and mixed numbers.
- I can represent fractions greater than 1 as diagrams.
- I can talk about the methods I use to convert mixed numbers.



Aim: To convert mixed numbers into improper fractions.				**Date:**					
				Delivered By:			**Support:**		
Success Criteria	**Me**	**Friend**	**Teacher**	**T**	**PPA**	**S**	**I**	**AL**	**GP**
I can identify the properties of proper fractions, improper fractions and mixed numbers.				**Notes/Evidence**					
I can represent fractions greater than 1 as diagrams.									
I can talk about the methods I use to convert mixed numbers.									

Next Steps

- _____
- _____

T	Teacher	**I**	Independent
PPA	Planning, Preparation and Assessment	**AL**	Adult Led
S	Supply	**GP**	Guided Practice

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Next Steps

- _____
- _____

T	Teacher	**I**	Independent
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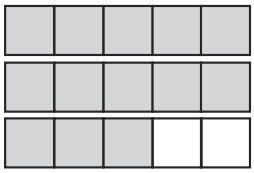
1)

a) $3\frac{1}{3} = \frac{10}{3}$

b) $2\frac{3}{4} = \frac{11}{4}$

c) $3\frac{2}{5} = \frac{17}{5}$

2)

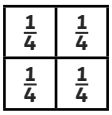
a)  $= \frac{13}{5}$

b) $\frac{6}{6} + \frac{6}{6} + \frac{6}{6} + \frac{5}{6} = \frac{23}{6}$

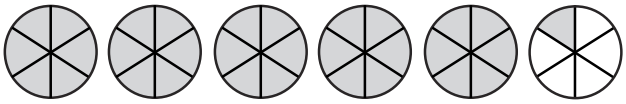
c) $7 \times 3 = 21$
$21 + 4 = 25$
$= \frac{25}{7}$

1) Sol is incorrect. He has written the whole as three ninths, when the whole is nine ninths.
Cormac is incorrect. His method is right, but he made a mistake in the addition of the numerators.
Fred is correct. He's chosen a good method and his calculation is correct.

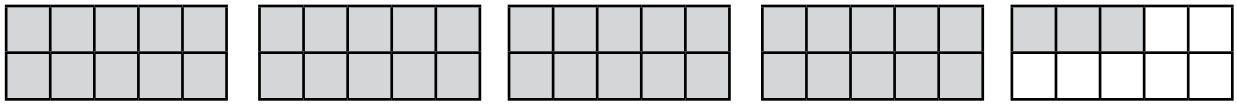
2) Children should have drawn diagrams to illustrate. Examples are given.

a) True  $= 1$

b) False, we can use our multiplication facts to know that 30 sixths will be five wholes.



c) True



1) $4\frac{1}{6} = \frac{25}{6}$ $4\frac{3}{6} = \frac{27}{6}$ $4\frac{5}{6} = \frac{29}{6}$

$4\frac{1}{8} = \frac{33}{8}$ $4\frac{3}{8} = \frac{35}{8}$ $4\frac{5}{8} = \frac{37}{8}$ $4\frac{7}{8} = \frac{39}{8}$

2)

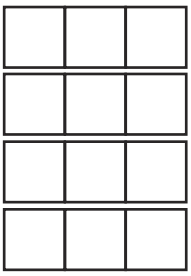
a)

Butterfly	Snail
1	10
2	17
3	24
4	31
5	38
6	45
7	52

b) The numbers in the butterfly column go up by 1 each time while the numbers in the snail column go up by 7 each time. Children may identify that this is because there are 7 sevenths in 1 whole, so as you add 1 whole, you must add 7 sevenths.

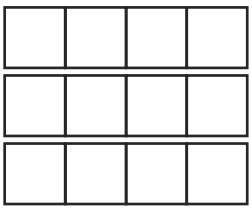
1) Use the diagrams to help you to convert the mixed numbers to improper fractions.

a)



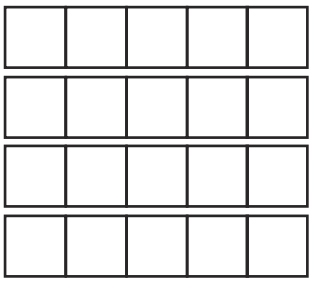
$3\frac{1}{3} = \frac{\quad}{\quad}$

b)



$2\frac{3}{4} = \frac{\quad}{\quad}$

c)



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

2) Use different methods to convert these mixed numbers. Show your working out.

a) $2\frac{3}{5} = \frac{\quad}{\quad}$

Draw a diagram.

b) $3\frac{5}{6} = \frac{\quad}{\quad}$

Use repeated addition.

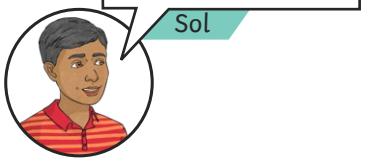
c) $3\frac{4}{7} = \frac{\quad}{\quad}$

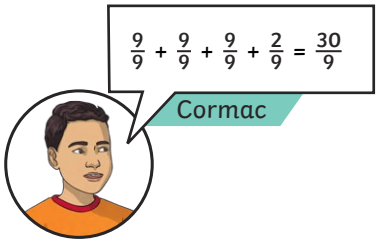
Use multiplication and addition.

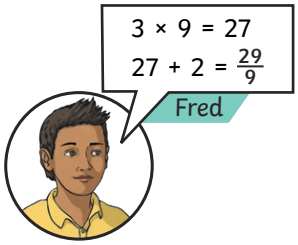
1) Sol, Cormac and Fred have all had a go at converting this mixed number into an improper fraction.

$$3\frac{2}{9} = -$$

Look at each person's working out. Who is correct? Explain the mistakes made by the others.







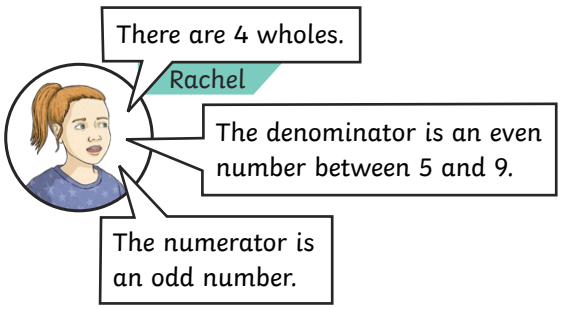
2) Are the following statements true or false? Explain your answer using diagrams.

a) When the numerator and denominator are the same, the fraction is equivalent to 1 whole.

b) $5\frac{1}{6}$ is equivalent to $\frac{30}{6}$.

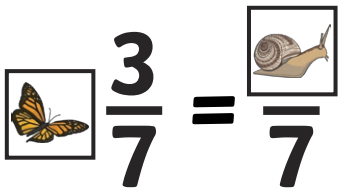
c) In $4\frac{3}{10}$ there are 43 one-tenths.

1) Look at the clues below which describe a mixed number.



Find all possible mixed numbers that Rachel's fraction could be. Convert your answers to improper fractions, showing your working out.

2) In this mixed number and improper fraction, some of the digits have been hidden by two minibeasts.



The table shows some possible values of the butterfly.

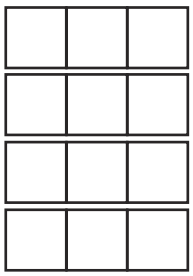
	
1	**10**
2	
3	
4	
5	
6	
7	

a) Complete the table to give the matching value of the snail.

b) Look at your answers in the table. What do you notice? Why might this happen?

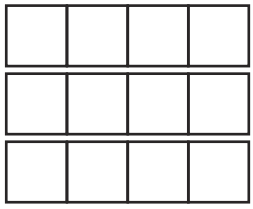
1) Use the diagrams to help you to convert the mixed numbers to improper fractions.

a)



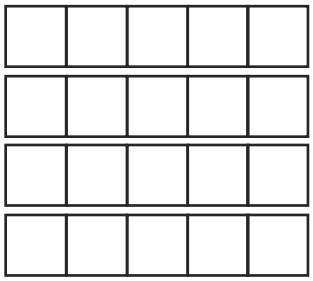
$3\frac{1}{3} = \frac{\quad}{\quad}$

b)



$2\frac{3}{4} = \frac{\quad}{\quad}$

c)



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

2) Use different methods to convert these mixed numbers. Show your working out.

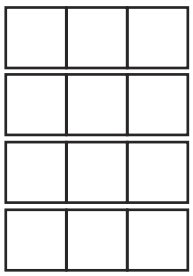
a) $2\frac{3}{5} = \frac{\quad}{\quad}$ — Draw a diagram.

b) $3\frac{5}{6} = \frac{\quad}{\quad}$ — Use repeated addition.

c) $3\frac{4}{7} = \frac{\quad}{\quad}$ — Use multiplication and addition.

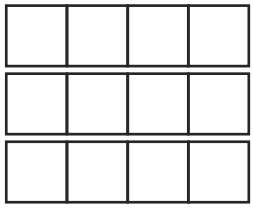
1) Use the diagrams to help you to convert the mixed numbers to improper fractions.

a)



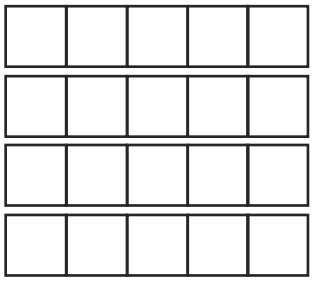
$3\frac{1}{3} = \frac{\quad}{\quad}$

b)



$2\frac{3}{4} = \frac{\quad}{\quad}$

c)



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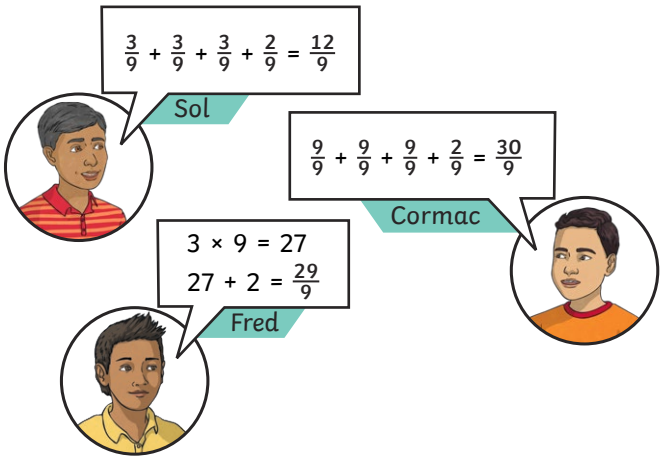
1) Sol, Cormac and Fred have all had a go at converting this mixed number into an improper fraction.

$$3\frac{2}{9} = \frac{\quad}{\quad}$$

Look at each person's working out. Who is correct? Explain the mistakes made by the others.



2) Are the following statements true or false? Explain your answer using diagrams.

a) When the numerator and denominator are the same, the fraction is equivalent to 1 whole.

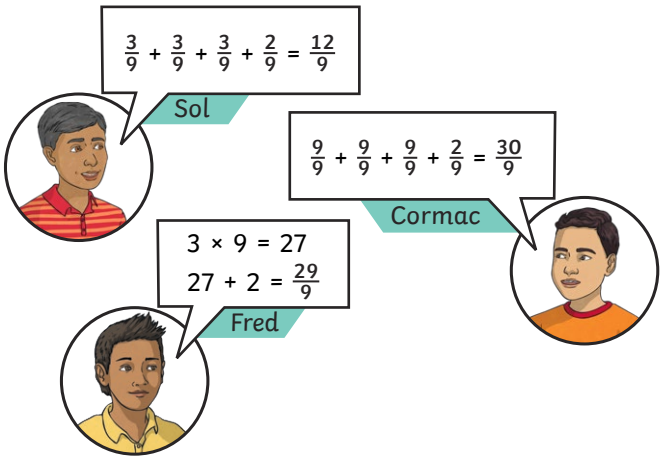
b) $5\frac{1}{6}$ is equivalent to $\frac{30}{6}$.

c) In $4\frac{3}{10}$ there are 43 one-tenths.

1) Sol, Cormac and Fred have all had a go at converting this mixed number into an improper fraction.

$$3\frac{2}{9} = \frac{\quad}{\quad}$$

Look at each person's working out. Who is correct? Explain the mistakes made by the others.



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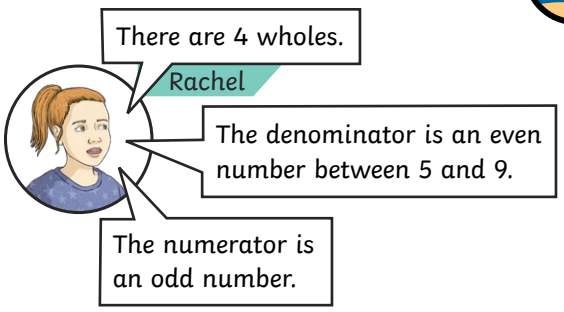

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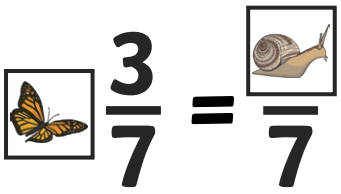
2) In this mixed number and improper fraction, some of the digits have been hidden by two minibeasts.



The table shows some possible values of the butterfly.

a) Complete the table to give the matching value of the snail.

	
1	**10**
2	
3	
4	
5	
6	
7	

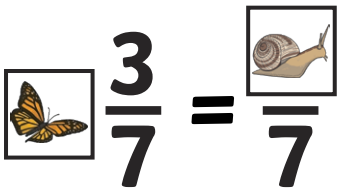
b) Look at your answers in the table. What do you notice? Why might this happen?

1) Look at the clues below which describe a mixed number.

There are 4 wholes.
Rachel
The denominator is an even number between 5 and 9.
The numerator is an odd number.

Find all possible mixed numbers that Rachel's fraction could be. Convert your answers to improper fractions, showing your working out.

2) In this mixed number and improper fraction, some of the digits have been hidden by two minibeasts.



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1	**10**
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b) Look at your answers in the table. What do you notice? Why might this happen?

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

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

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

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

$\frac{4}{3}$	$1\frac{1}{4}$

$\frac{11}{4}$	$2\frac{2}{5}$

$\frac{5}{4}$	$1\frac{1}{5}$

$\frac{12}{5}$	$3\frac{1}{2}$

$\frac{6}{5}$	$2\frac{1}{2}$

$\frac{7}{2}$	$3\frac{1}{3}$

$\frac{10}{3}$	$2\frac{1}{4}$

$\frac{15}{4}$	**FINISH**

$\frac{9}{4}$	$2\frac{3}{5}$

$\frac{13}{5}$	$4\frac{1}{2}$

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

$\frac{11}{3}$	$3\frac{3}{4}$

Fractions | Converting Mixed Numbers to Improper Fractions

To convert mixed numbers into improper fractions.		
I can identify the properties of proper fractions, improper fractions and mixed numbers.		
I can represent fractions greater than 1 as diagrams.		
I can talk about the methods I use to convert mixed numbers.		

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