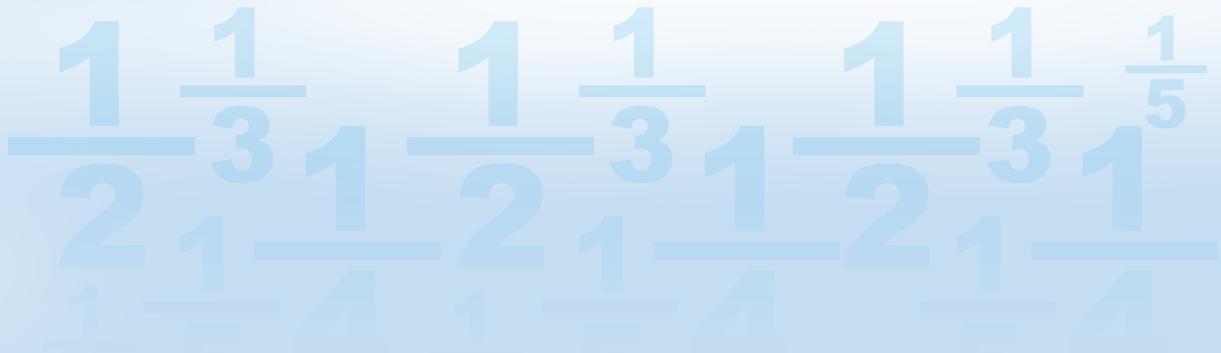


Mathletics

Series



Student



Fractions

My name _____



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Series D – Fractions

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Series Author:

Nicola Herringer

Fractions – modelling fractions

Here we are going to explore fractions.

You will need: ■ a copy of this page ■ scissors ■ a paper bag
■ coloured pencils (blue, red, yellow and orange)



Instructions:

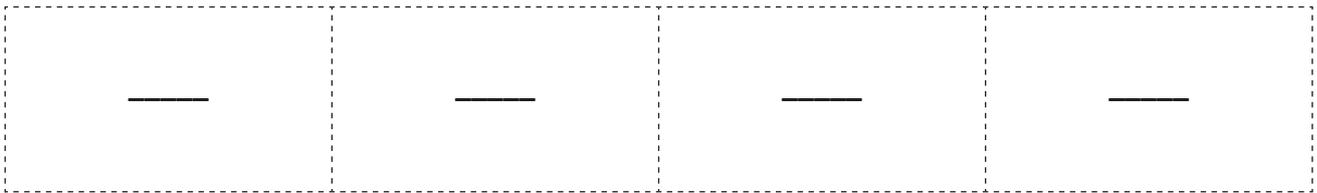
- a Colour this strip blue. Cut it out. Label it 1 whole.



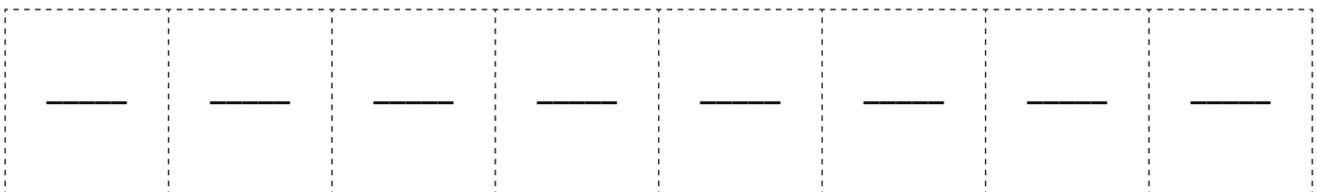
- b Colour this strip red. Cut it out. Fold it in half along the line and label each part $\frac{1}{2}$.



- c Colour this strip yellow. Cut it out. Fold it in half and half again along the lines and label each part $\frac{1}{4}$.



- d Colour this strip orange. Cut it out. Fold it in half three times and label each part $\frac{1}{8}$.



- e Cut them carefully along the folded lines and place the pieces inside your paper bag.
This is your fraction kit!

Fractions – modelling fractions

You will need: ■ your fraction kit ■ a die



Number on die	Fraction piece from kit
1 or 6	$\frac{1}{2}$ red
2 or 5	$\frac{1}{4}$ yellow
3 or 4	$\frac{1}{8}$ orange

Game 1

The aim of this game is get as close to one whole as possible by placing pieces from your fraction kit on top of the whole.

Each player starts the game with the blue piece of paper from the kit. This is 1 whole.

Player 1 rolls the die and places a matching fraction piece on their whole.

Player 2 rolls the die and places a matching fraction piece on their whole.

Continue taking turns placing fraction pieces on top of the whole.

The winner is the player who is the closest to one whole without going over.

Game 2

The aim of this game is to be the first to reveal the whole piece of paper from your fraction kit.

Each player starts the game with the whole covered with 2 halves.

Player 1 rolls the die and takes off that fraction. Players may need to swap pieces first.

For example, if you roll $\frac{1}{4}$ first, you need to swap $\frac{1}{2}$ for $\frac{2}{4}$ then you can take off $\frac{1}{4}$.

Player 2 rolls the die and takes off that fraction, swapping pieces if needed.

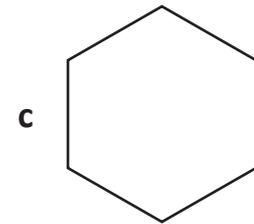
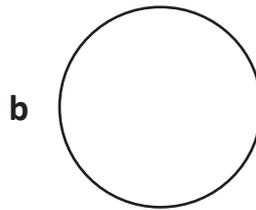
The winner is the player who is the first to reveal the whole piece of paper.

Fractions – modelling fractions

1 Show one half in a different way on each rectangle:

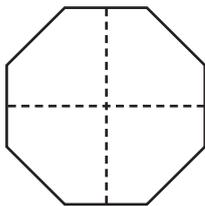


2 Show how each shape can be divided into quarters:

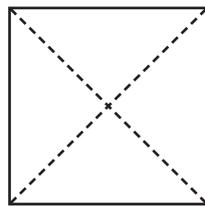


3 Colour the fractions of each shape:

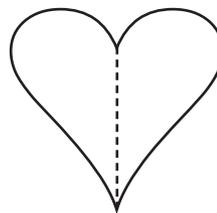
a two quarters



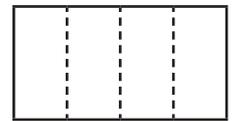
b three quarters



c one half



d three quarters



4 Answer these sharing problems. Draw a picture to match:

a I have 10 sweets and I have to share them with my brother.
How many do we each get?

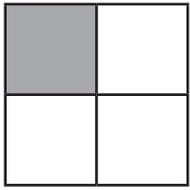
out of

b There are 12 biscuits to be shared among 3 people.
How many does each person get?

out of

Fractions – modelling fractions

Fractions are written like this:



$\frac{1}{4}$

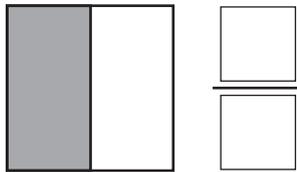
The number on the top is the numerator and shows the number of shaded parts.

$\frac{1}{4}$

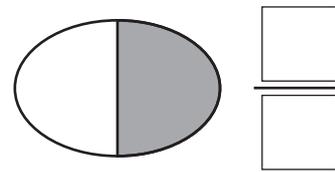
The number on the bottom is the denominator and shows the number of parts that make the whole.

5 Look at these fraction diagrams and label them.

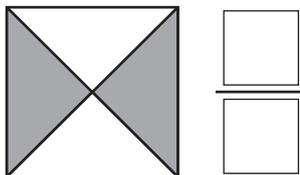
a



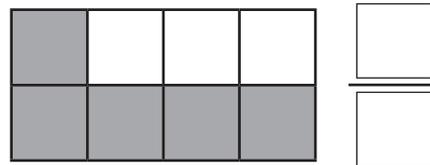
b



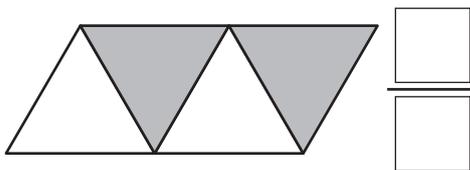
c



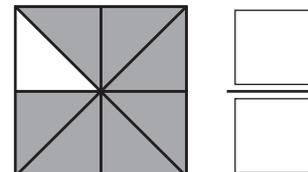
d



e



f

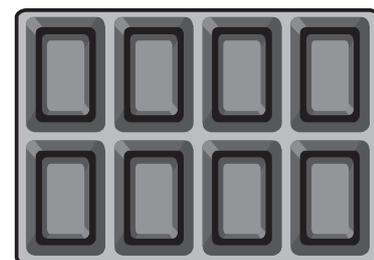


6 Share this chocolate bar among 4 children:

a Draw lines to show how you will break it.

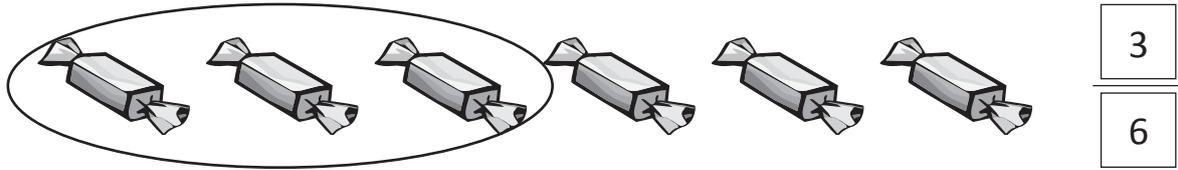
b How many pieces will each kid get?

c Show this as a fraction.



Fractions – fractions of a collection

Fractions can show part of a collection. 3 out of 6 sweets are circled.



1 What fraction of each group is circled?

a

	out of	
--	---------------	--

b

	out of	
--	---------------	--

c

	out of	
--	---------------	--

d

	out of	
--	---------------	--

2 Circle the fraction shown:

a

6	out of	8
---	---------------	---

b

4	out of	6
---	---------------	---

c

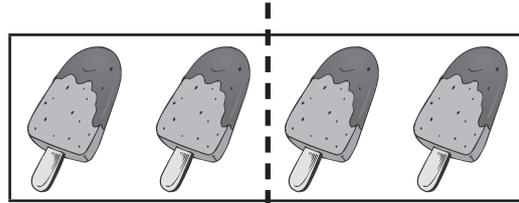
3	out of	9
---	---------------	---

d

4	out of	12
---	---------------	----

Fractions – fractions of a collection

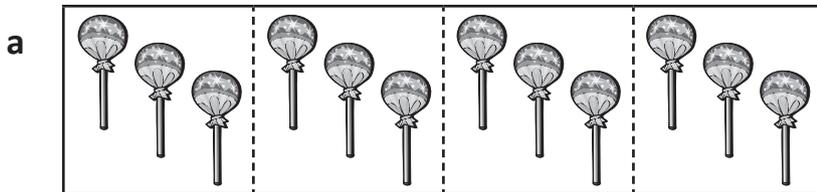
Finding a fraction of different amounts is like division. Look at this tray of 4 ice creams. We can see that $\frac{1}{2}$ of this group is 2. This is the same as dividing 4 by 2.



$$4 \div 2 = 2$$

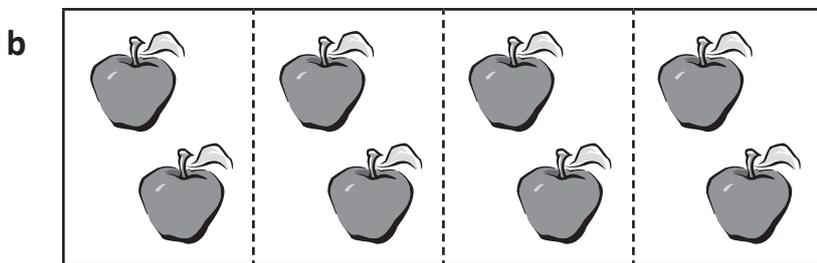
$$\frac{1}{2} \text{ of } 4 = 2$$

3 Look at these fraction pictures. They have been divided into groups to help you. Complete the boxes to show how division and fractions are related. The first one has been done for you.



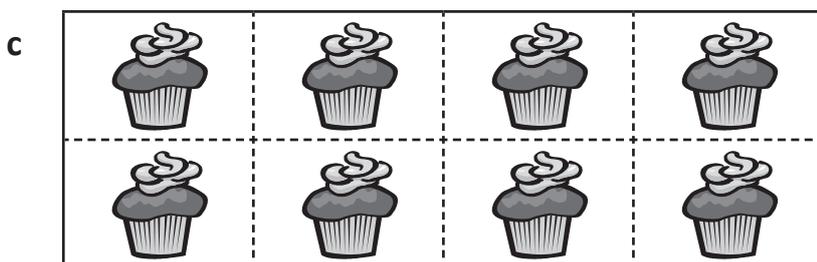
$$12 \div 4 = 3$$

$$\frac{1}{4} \text{ of } 12 = 3$$



$$\square \div 4 = \square$$

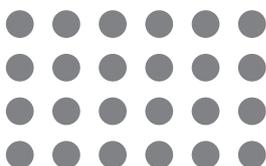
$$\frac{1}{4} \text{ of } \square = \square$$



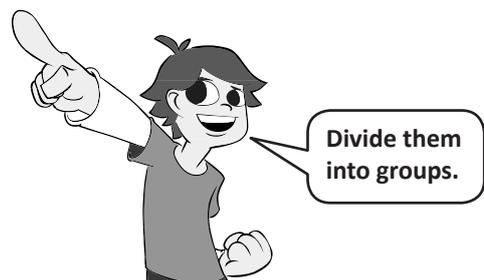
$$\square \div 8 = \square$$

$$\frac{1}{8} \text{ of } \square = \square$$

4 Find $\frac{1}{4}$ of these amounts:

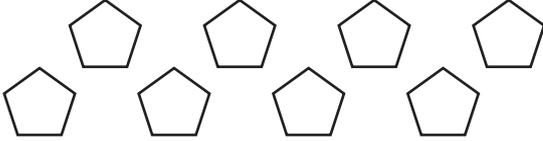


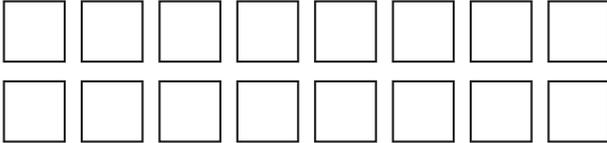
$$\frac{1}{4} \text{ of } 24 = \square$$



Fractions – fractions of a collection

5 Shade the fraction of these amounts:

a  $\frac{\boxed{1}}{\boxed{4}}$ of $\boxed{8} = \boxed{2}$

b  $\frac{\boxed{1}}{\boxed{2}}$ of $\boxed{16} = \boxed{8}$

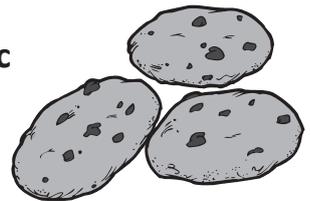
6 Find these amounts. Use counters to help you.

a How many sweets did I get if I was allowed $\frac{1}{4}$ of 24? _____ sweets

b $\frac{1}{3}$ of all the kids in my class have a pet dog.
How many have a dog if there are 30 kids in my class? _____ kids

c $\frac{1}{5}$ of all the kids in my class ate an apple at playtime.
How many apples were eaten if there were 30 kids in my class? _____ apples

7 Jackson loves to bake cookies. He is famous for his triple choc chip delights. Work out how many each person received if Jackson baked a batch of 24 triple choc chip delights.



a His best friend Hamish got $\frac{1}{4}$. Hamish got _____ triple choc chip delights.

b He gave $\frac{1}{2}$ away to the teachers in the staff room.

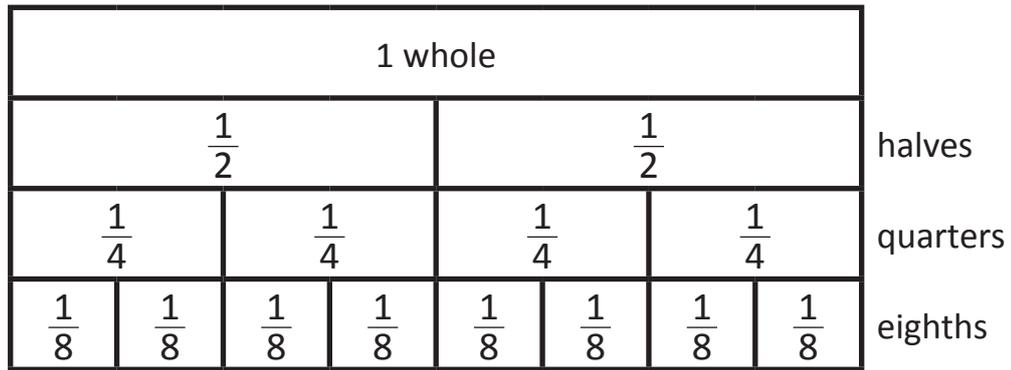
The teachers got _____ triple choc chip delights.

c He gave the rest to his next door neighbour Mr Wallis.

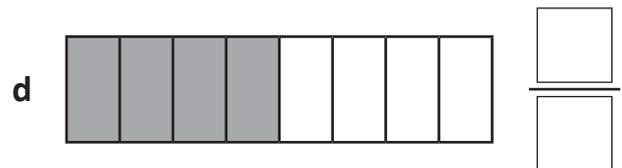
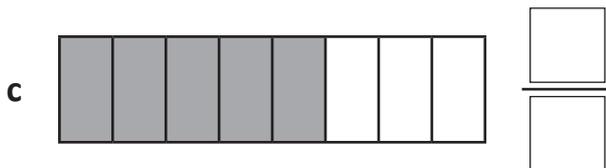
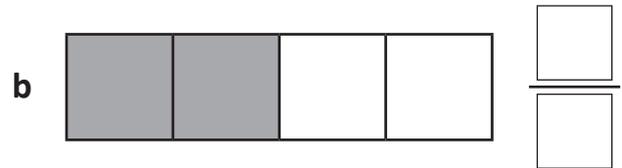
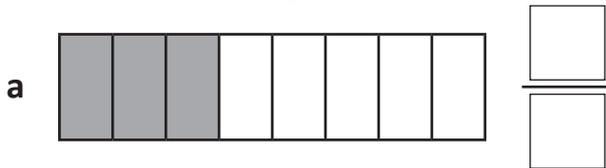
Mr Wallis got _____ triple choc chip delights.

Fractions – comparing and ordering fractions

This fraction wall is just like your fraction strips laid out side by side.



1 Label the following fractions:



e What do you notice with the fractions shown in b and d?

2 Use the fraction wall at the top of this page to decide which fraction is larger and circle it:

a $\frac{1}{4}$ or $\frac{3}{8}$

b $\frac{2}{8}$ or $\frac{1}{2}$

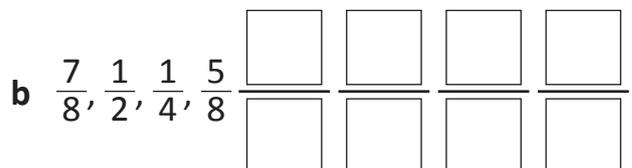
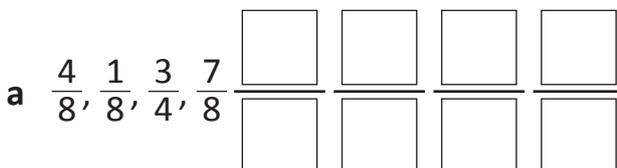
c $\frac{3}{4}$ or $\frac{4}{8}$

d $\frac{1}{2}$ or $\frac{5}{8}$

e $\frac{5}{8}$ or $\frac{3}{4}$

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

3 Put these fractions in order from smallest to largest:



Fractions – comparing and ordering fractions

Each player will need: ■ to cut out the fraction cards below



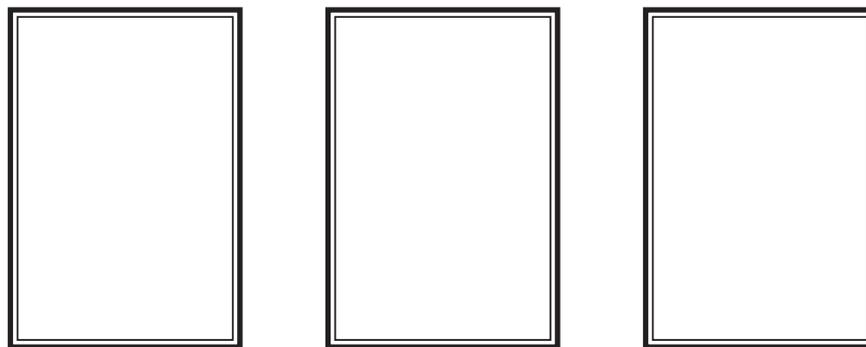
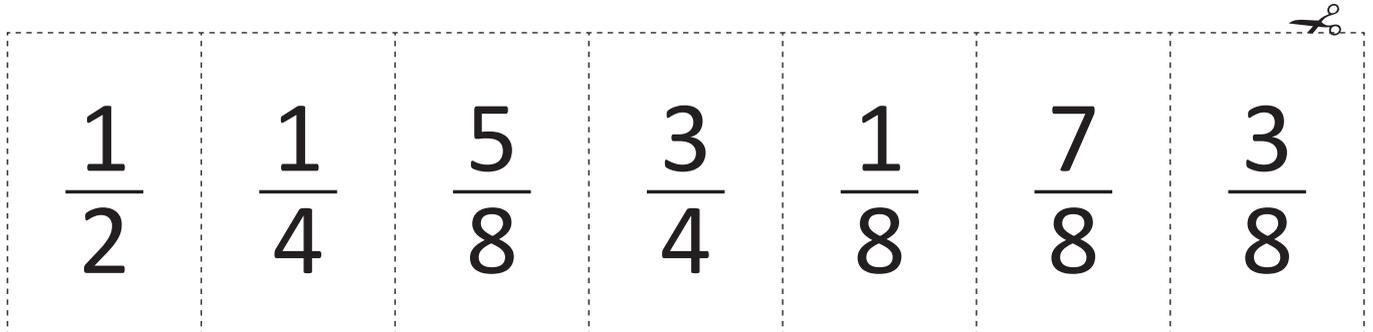
This is a game for 2 players. Choose one player to be the dealer.

Each player cuts out their own set of fraction cards.

The dealer shuffles the cards well and places them in one stack in the centre.

Player 1 draws 3 cards, one at a time and places them from left to right in each box, from smallest to largest. If they are in the correct order, the player scores 5 points. If they are not in the correct order, they do not score any points. Player 2 then has their turn.

The winner is the player with the largest score after 3 turns each.



.....→
Smallest to largest

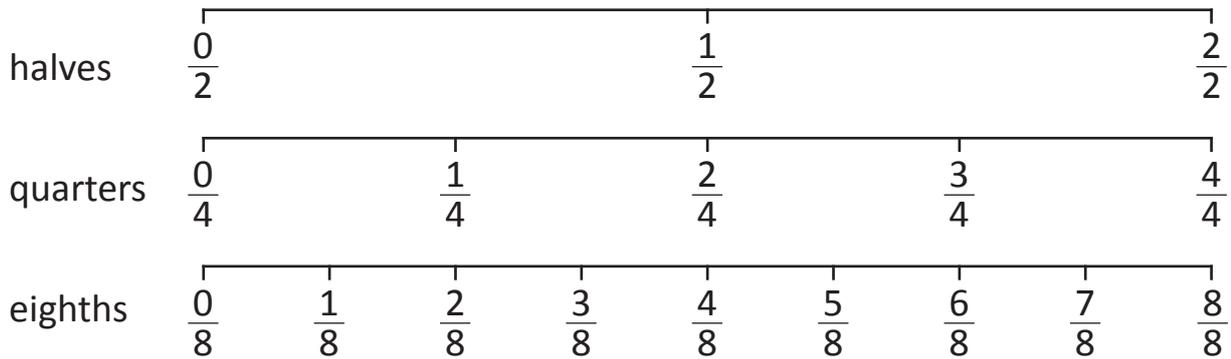


You can use the fraction wall on page 8 to help you see if the fractions are in the right order.

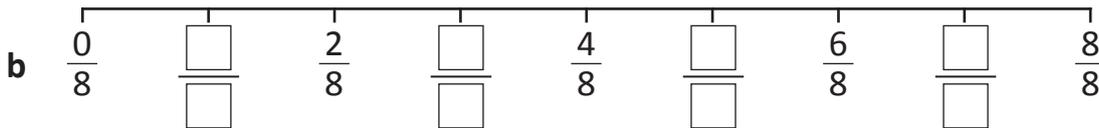
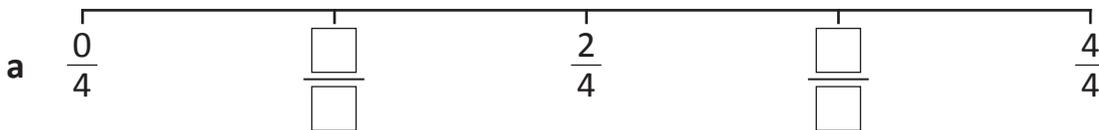
	Player 1	Player 2
1		
2		
3		
Total		

Fractions – comparing and ordering fractions

Let us now look at placing fractions on number lines.

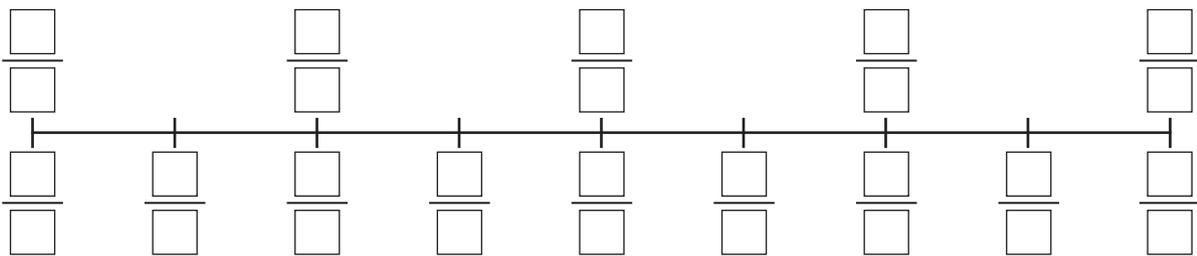


4 Label the missing fractions on these number lines:



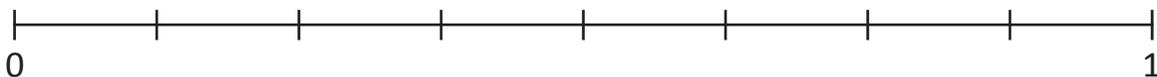
c What do you notice about $\frac{2}{4}$ and $\frac{4}{8}$?

5 Label this number line with quarters above the line and eighths below the line:



6 Draw a line to match each of these fractions to the correct positions on the number line. Use the number lines at the top of the page to help you.

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





Getting ready

This is a game for 3 to 4 players. Each player will need the fraction board below and some counters. You will also need to cut out one copy of the flash cards on the next page.



copy



What to do

Choose one player to be the caller. The rest of the players fill their fraction boards with any of the following fractions:

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

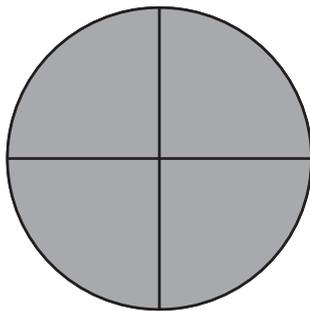
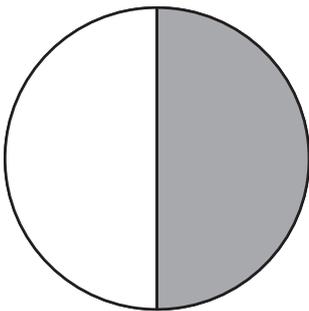
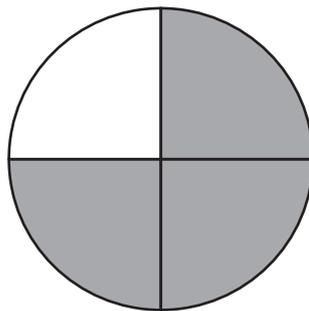
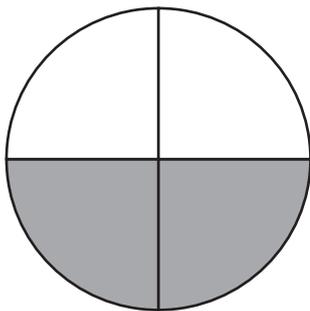
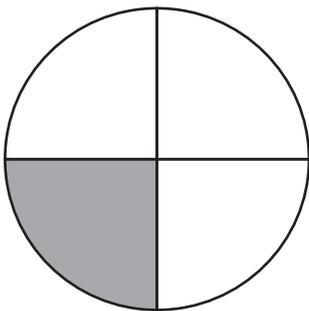
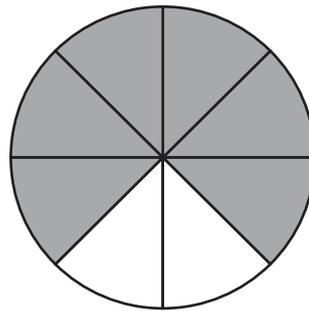
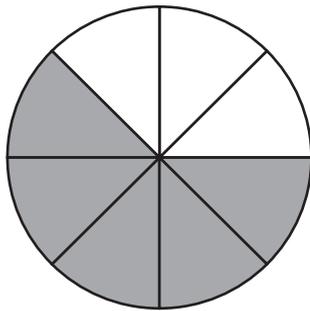
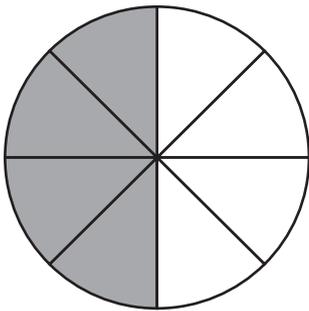
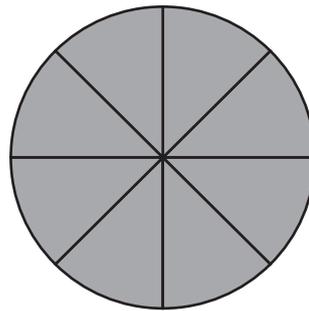
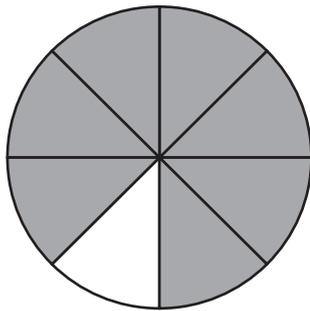
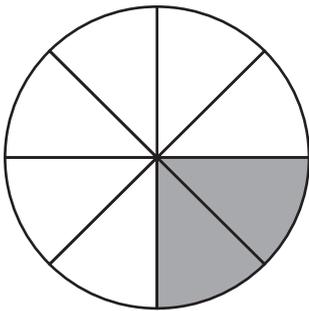
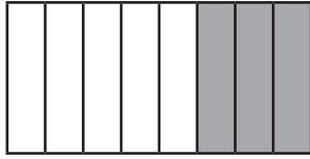
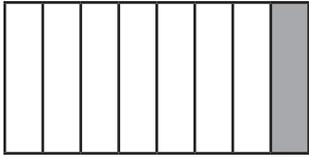
The caller chooses a flash card from the pile and shows the players.

If a player has the fraction, they place a counter over it.

The winner is the first player to cover 3 in a row.

Swap roles and play again until everyone in the group has been the caller.

FRACTION BINGO

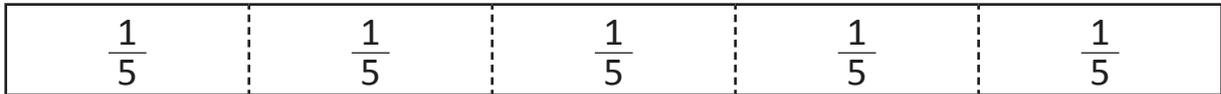


Types of fractions – fifths and tenths

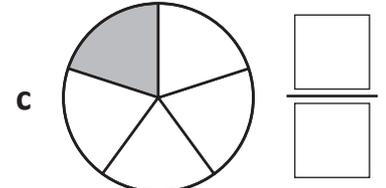
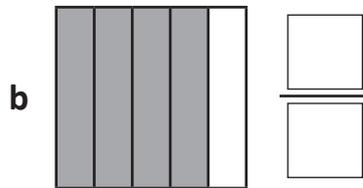
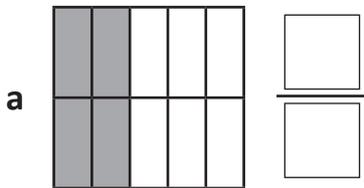
When you divide an object or a quantity into 5 equal parts, each part is $\frac{1}{5}$.

If you divide an object or quantity into 10 equal parts, then each part is $\frac{1}{10}$.

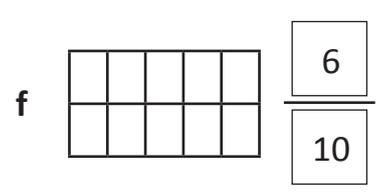
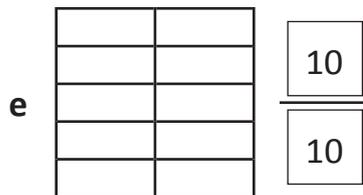
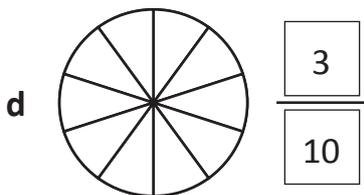
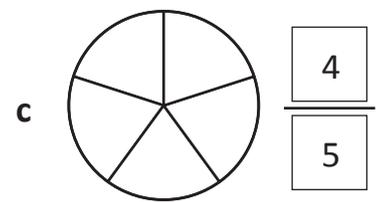
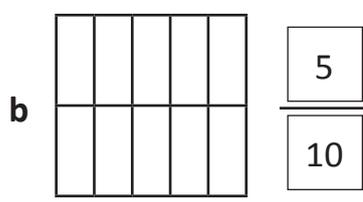
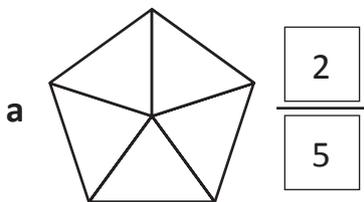
These fraction strips show fifths and tenths.



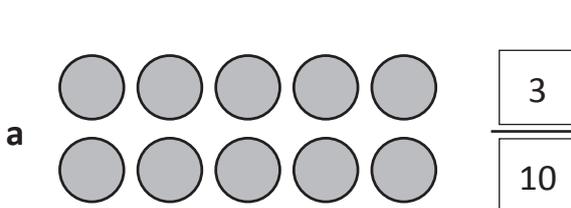
1 Label these fractions:



2 Show fifths and tenths on these shapes:

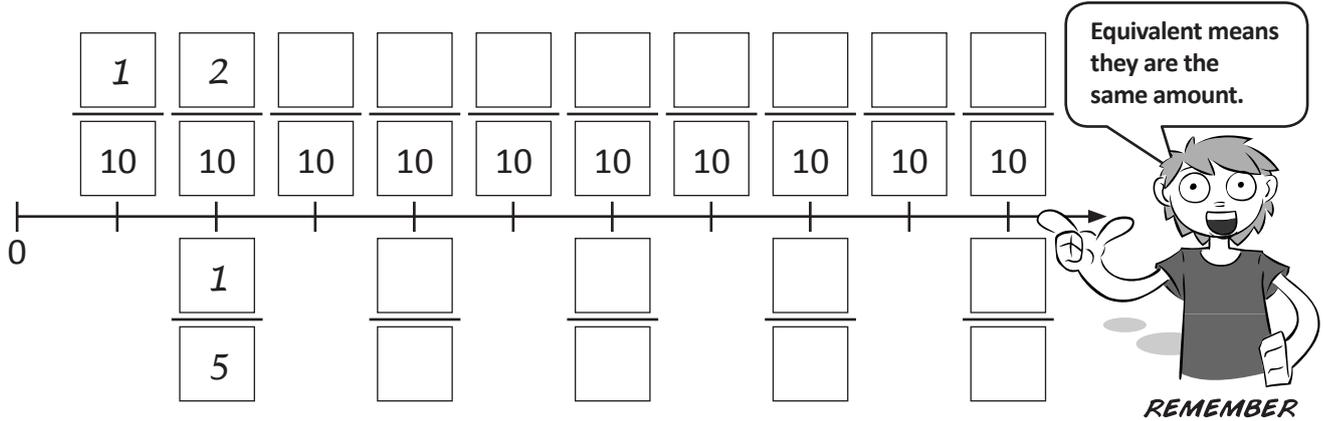


3 Circle the correct amounts shown in these fractions:

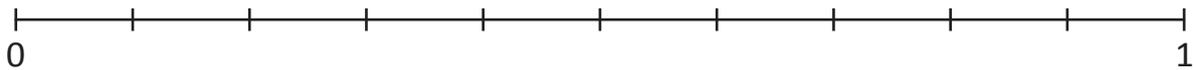


Types of fractions – fifths and tenths

4 Complete this equivalent fraction number line. The first two have been done for you.

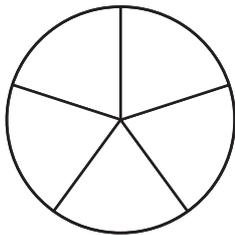


5 Place these fractions on the number line: $\frac{2}{5}$, $\frac{1}{2}$, $\frac{3}{10}$, $\frac{7}{10}$, $\frac{1}{5}$

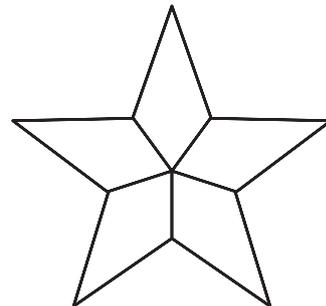


6 Colour these shapes according to the directions. The equivalent fraction line above will help you.

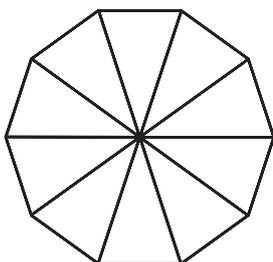
a Colour $\frac{1}{5}$ blue and $\frac{6}{10}$ red and leave the rest blank.



b Colour $\frac{2}{10}$ orange and $\frac{3}{5}$ green and leave the rest blank.



c Colour $\frac{3}{5}$ blue and $\frac{2}{10}$ red and leave the rest blank.



If a shape is divided into fifths I need to change the fractions to fifths.

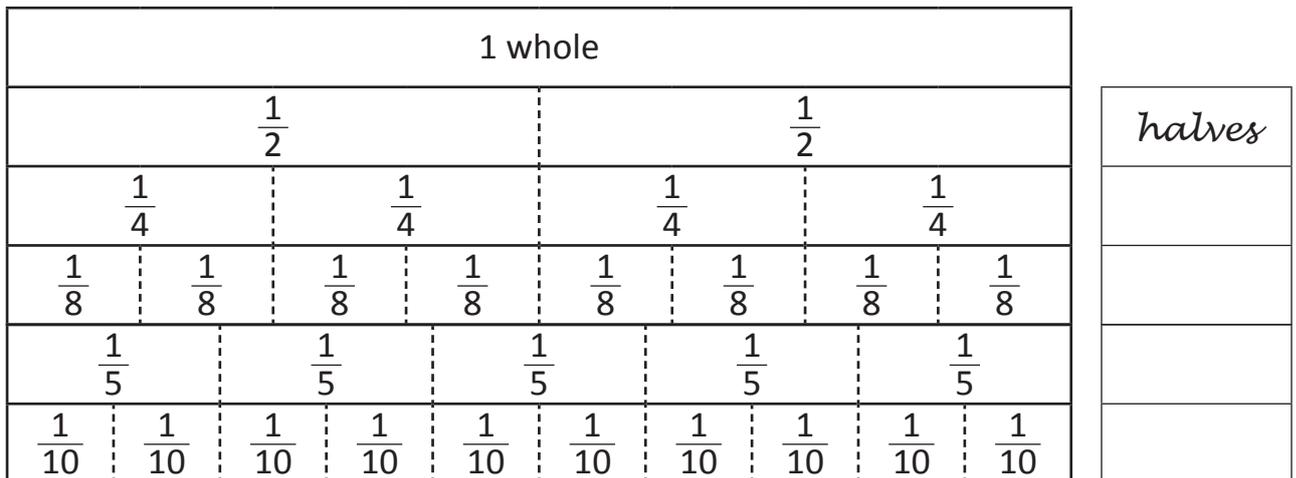
If a shape is divided into tenths I need to change the fractions to tenths.

THINK

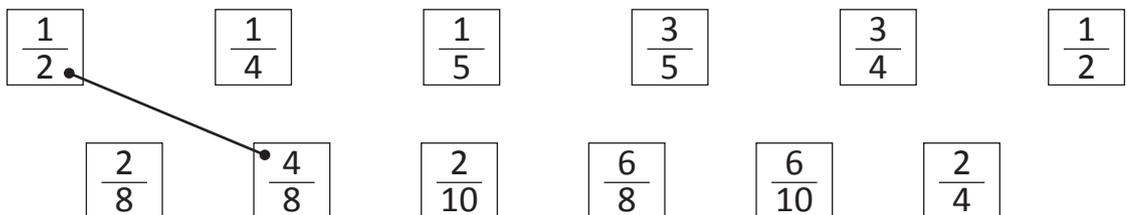
Types of fractions – equivalent fractions

This fraction wall shows fractions that are equivalent. Equivalent fractions are fractions that are the same amount. How many equivalent fractions can you find?

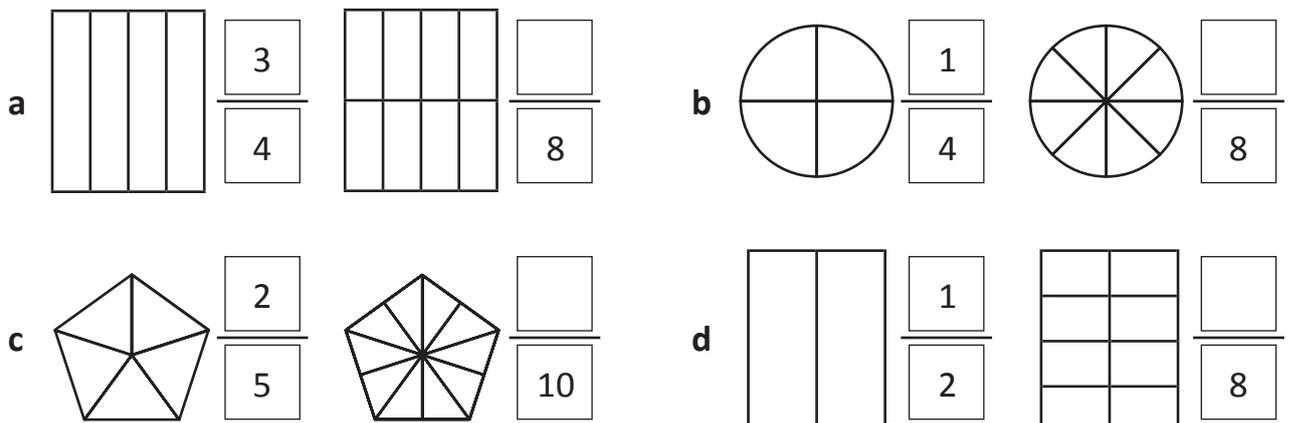
- 1 Label each row of the fraction wall and colour each strip a different colour. The first one has been done for you.



- 2 Match the equivalent fractions in the top row with the fractions underneath by drawing a line to connect them. The first one has been done for you.



- 3 Complete these equivalent fraction models by shading and writing the equivalent fraction:

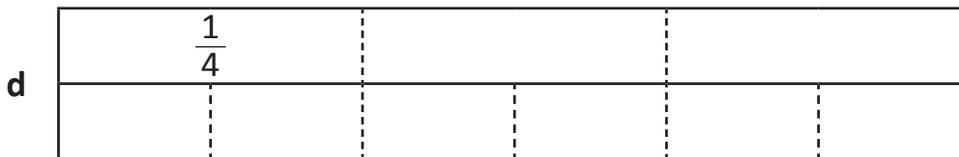
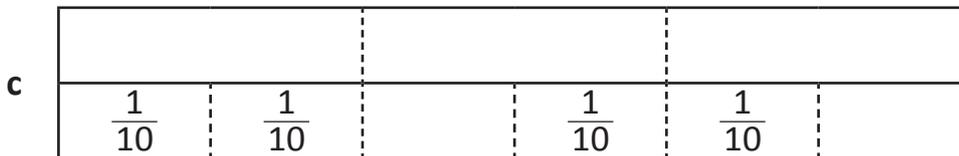
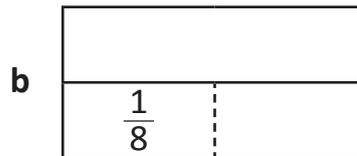
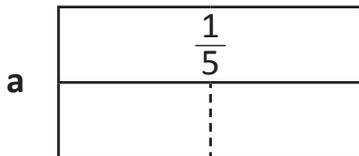


Types of fractions – equivalent fractions

4 Rewrite these fractions in order from smallest to largest:

4	9	7	2	3
5	10	10	5	10

5 Here is a fraction wall that has been broken up into pieces. Label the pieces:



6 Match the equivalent fractions to find out an interesting animal fact:

Q: What is something that a rat can do for longer than a camel?

First word: A = $\frac{2}{4}$ T = $\frac{3}{4}$ L = $\frac{1}{5}$ S = $\frac{4}{10}$

Second word: U = $\frac{1}{5}$ H = $\frac{8}{10}$ I = $\frac{4}{10}$ W = $\frac{1}{2}$ T = $\frac{6}{8}$ O = $\frac{2}{8}$

Third word: A = $\frac{2}{10}$ T = $\frac{1}{5}$ E = 1 R = $\frac{8}{10}$ W = $\frac{1}{2}$

$\frac{2}{10}$ $\frac{1}{2}$ $\frac{2}{5}$ $\frac{6}{8}$

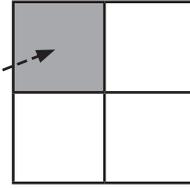
$\frac{4}{8}$ $\frac{2}{5}$ $\frac{3}{4}$ $\frac{4}{5}$ $\frac{1}{4}$ $\frac{2}{10}$ $\frac{3}{4}$

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

Adding and subtracting fractions – with the same denominator

Remember: There are two parts to a fraction.

The number above the line (the **numerator**) -----> $\frac{1}{4}$
 and the number below (the **denominator**). ----->

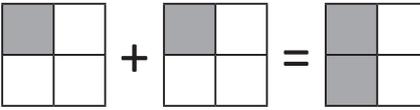


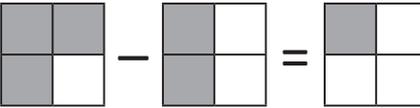
Can you remember what each number means?

The **denominator** tells us how many equal parts the shape or quantity or number is split into. The **numerator** tells us how many of these parts we have.

It is straightforward to add or subtract fractions with the same denominator.

You simply add or subtract the numerators.

So, $\frac{1}{4} + \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$ 

$\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$ 

1 Add these fractions. One of your answers is equivalent to one whole. Circle it.

a $\frac{1}{3} + \frac{1}{3} =$

b $\frac{1}{5} + \frac{1}{5} =$

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

d $\frac{3}{10} + \frac{6}{10} =$

e $\frac{3}{5} + \frac{1}{5} =$

f $\frac{5}{6} + \frac{1}{6} =$

2 Subtract these fractions. One of your answers is equivalent to one half. Circle it.

a $\frac{3}{5} - \frac{1}{5} =$

b $\frac{7}{8} - \frac{4}{8} =$

c $\frac{5}{6} - \frac{4}{6} =$

d $\frac{9}{10} - \frac{4}{10} =$

e $\frac{4}{5} - \frac{2}{5} =$

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

Only add or subtract the numerators. The denominators stay the same.



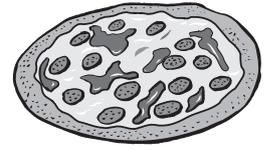
REMEMBER

Adding and subtracting fractions – word problems

1 Solve these addition and subtraction fraction problems.

a I cut up a pizza into quarters. I eat one quarter.

What fraction of the pizza is left?



b Jo bakes a cake and cuts it into eighths. Her friend Sarah eats $\frac{1}{8}$ of it and Jo eats $\frac{2}{8}$.

How much of the cake have they eaten altogether?

How much is left?



c Lisa is working out equivalent fraction problems. She finds several equivalent fractions that are the same as one half, but she thinks she might have made one mistake.

Can you find it and circle it? $\frac{4}{8}$ $\frac{2}{4}$ $\frac{6}{10}$ $\frac{3}{6}$

d After his party, Eric finds that $\frac{5}{6}$ of his birthday cake is left. He eats another $\frac{4}{6}$ of it.

How much of the original cake is left now?

e Can you find an equivalent fraction that is worth the same as $\frac{1}{3}$?

f There are 20 people on the bus. $\frac{1}{4}$ are children.

How many children are on the bus?

Read each problem carefully.
What are the key numbers?
Is it an addition or subtraction?



THINK

g A piece of ribbon is 30 cm long. Jenny cuts $\frac{1}{3}$ of it off.

How long is the piece she cuts?

cm