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Maths

Entry Level 3, Book 5

GLH 3

Fractions

Name	
Number	
Location	
Date Issued	

E3

Maths – Entry Level 3
Welcome to Book 5

Introduction

This booklet is part of your learning programme.

Remember to read carefully and try your best. Don't worry if you get stuck, make a note on the booklet and move on to the next task. Try coming back to it later, see if you can work it out then.

If you are still stuck, remember to make a note at the end of the booklet.

Throughout the booklet, you will see that some words have been printed **blue and bold**. You will find more detailed explanations of each of these words in the 'Glossary' at the back of the booklet.

Glossary is a list of often difficult or specialised words with their definitions, placed at the back of a book. You may also know this as a word bank.

By working through this booklet, you will become confident with reading, writing and understanding thirds, quarters, fifths and tenths including equivalent forms. Learning these skills will help you to compare costs, support you with tasks in the workshops and help you with many elements of your everyday life.

What Do the Symbols in this Booklet Mean?

Where you see this symbol, there is a skills practice or activity for you to complete.

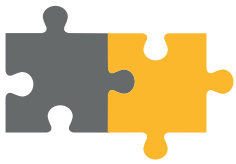
Information, explanations and case studies are shown with this icon.

This shows you there is a glossary or word bank with the meaning and correct spelling of key words.

This icon shows where to write comments for your tutor to read.

This symbol lets you know there are some key points to remember.

The Big Picture



You are studying Entry Level 3 Maths, which is taught over 55 Guided Learning Hours (GLH).

The programme covers the units listed below. The unit that you're working on today is ticked.

	Booklet	GLH	
1	Place Value and Sequencing		
2	Addition and Subtraction		
3	Multiplication		
4	Division		
5	**Fractions**	**3**	✓
6	Decimals and Money		
7	Rounding		
8	Time		
9	Shape and Space		
10	Measure		
11	Handling Data		
12	Recap and Summary		

Outcomes

These are the outcomes you can achieve by completing the learning activities in this booklet.

1. Recognise fractions including halves, thirds, quarters, fifths and tenths.
2. Use mental and written methods to calculate fractional parts of whole numbers.
3. Identify common fractions.

Recap

A **recap** is an effective way of helping you to remember and apply what you have learnt. If this is your first booklet, it may help you to think about what you know already about this subject. Can you answer the following questions?

What was the last booklet you completed?

Can you remember what you learnt about?

Can you remember three key points from the booklet?

1

2

3

What is a Fraction?

A fraction tells us how many parts of something we have.

Fractions are written like this:

$\frac{1}{2}$

Numerator (number on top of the line) – number of parts highlighted.

Denominator (bottom number under the line) – the number of parts in total.

When do we use fractions?

- Sharing the cost of a meal. For example, splitting a bill of £30 between three people.
- Sharing out food. For example, giving six people an equal sized slice of a cake.
- Recipes. For example, adding vegetables to half a pint of boiling water.

How do we name fractions?

Fraction	How we say it
$\frac{1}{2}$	One half
$\frac{1}{3}$	One third
$\frac{1}{4}$	One quarter
$\frac{1}{5}$	One fifth
$\frac{1}{6}$	One sixth
$\frac{1}{7}$	One seventh
$\frac{1}{8}$	One eighth
$\frac{1}{9}$	One ninth
$\frac{1}{10}$	One tenth
$\frac{1}{11}$	One eleventh
$\frac{1}{12}$	One twelfth

Fractions

These fractions have numerators higher than one.

They are examples of how you would say these fractions out loud.

$\frac{2}{3}$ **Two Thirds**

$\frac{3}{4}$ **Three Quarters**

$\frac{2}{5}$ **Two Fifths**

Task 1

Match the fraction with the correct name.

a. $\frac{4}{5}$ ...

b. $\frac{2}{7}$ ...

c. $\frac{1}{12}$ ...

d. $\frac{3}{4}$ ...

e. $\frac{5}{9}$ ...

f. $\frac{3}{10}$ ...

A **One Twelfth**

B **Three Quarters**

C **Three Tenths**

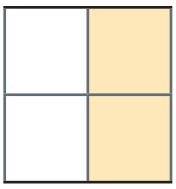
D **Four Fifths**

E **Two Sevenths**

F **Five Ninths**

Fractions

Remember: The **numerator** (top number) represents how many parts we have and the **denominator** (bottom number) represents how many parts there are in total, so just insert the numbers.



$$\frac{2}{4}$$

The shape has four equal parts and two of them are shaded.

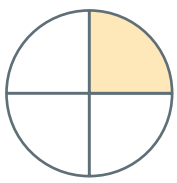
So, 4 is on the bottom and 2 is on the top.

Task 2

What fraction is the shaded area?

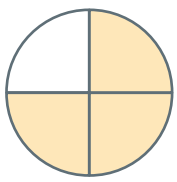
Write down the fractions in the spaces provided.

a.

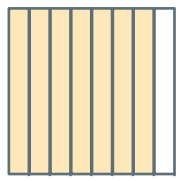


b.

c.



d.



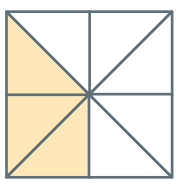
e.

f.

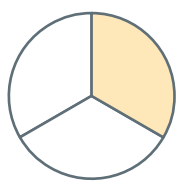
g.

h.

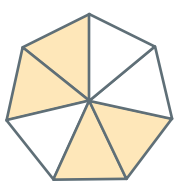
i.



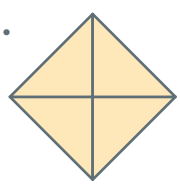
j.



k.



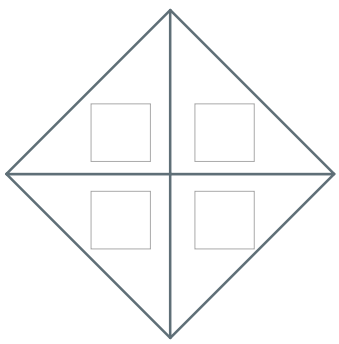
l.



Task 3

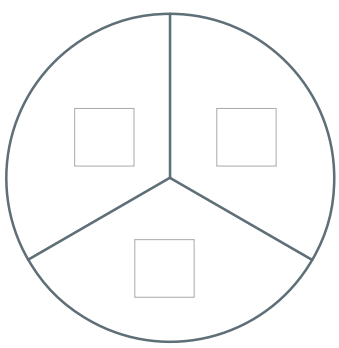
Mark the area that the fraction represents.

a.



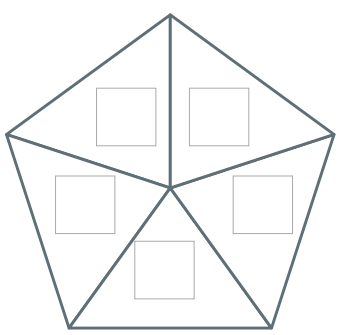
$\frac{1}{4}$

b.



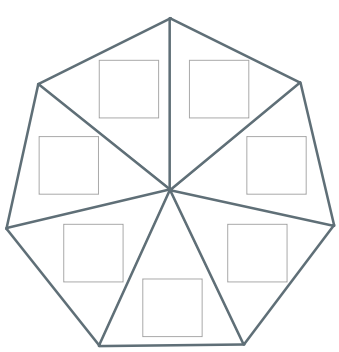
$\frac{2}{3}$

c.



$\frac{3}{5}$

d.



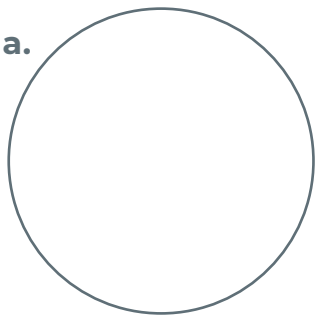
$\frac{6}{7}$

Task 4

Now as shown on page 11;

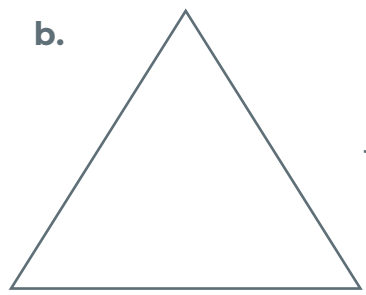
- split each shape into equal parts
- shade the area that the fraction represents

a.



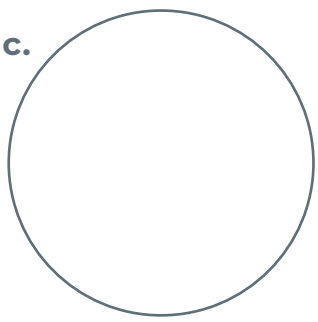
$\frac{1}{2}$

b.



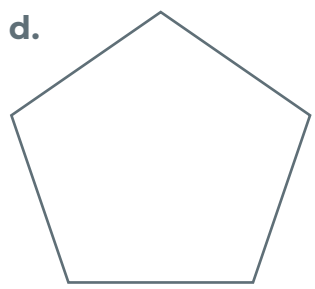
$\frac{1}{3}$

c.



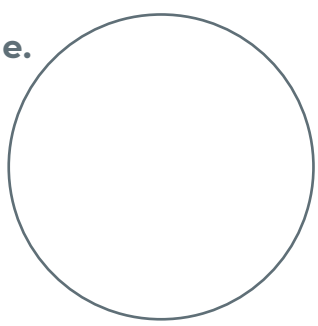
$\frac{3}{4}$

d.



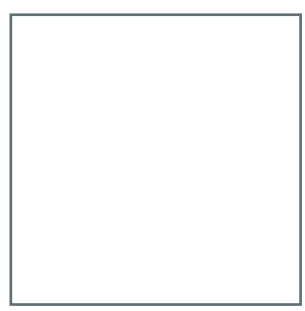
$\frac{3}{5}$

e.



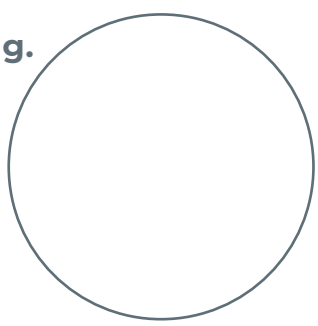
$\frac{2}{5}$

f.



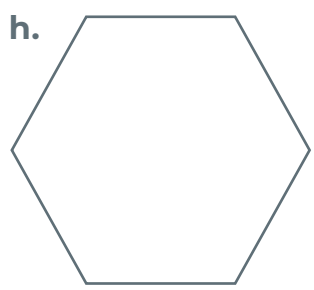
$\frac{4}{4}$

g.



$\frac{5}{8}$

h.



$\frac{2}{6}$

Fractions

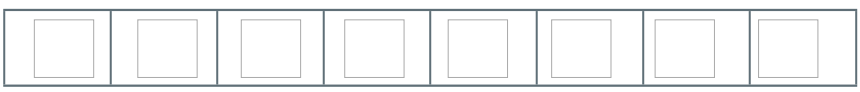
Task 5

These rectangles have all been split into equal parts. Tick each of the parts with the fractions shown:

a. $\frac{1}{2}$

b. $\frac{2}{4}$

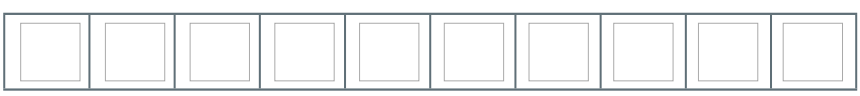
c. $\frac{4}{8}$



d. $\frac{1}{3}$

e. $\frac{2}{6}$

f. $\frac{6}{10}$



g. $\frac{3}{5}$

Did you notice any similarities when shading the shapes, are any of the fractions **equivalent**?

Recap

So far we have looked at:

- What a fraction is
- When we use fractions
- How we name fractions
- Working out the fractions of shapes

Notes

Let’s keep going

Feedback

WWW (What Went Well)

EBI (Even Better If)

Next steps

Learner feedback (Please provide some feedback for your tutor following the comments that you have just made on your work.)

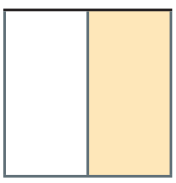
Recognise Equivalent Fractions

What is an equivalent fraction?

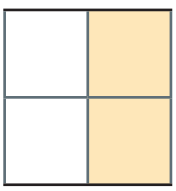
Equivalent fractions are fractions that have different numerators and denominators but have the **same value**. They have different numbers but have the same proportion. There are some key words when looking at **equivalent fractions**:

- Compare
- Equivalent
- Fraction

Equivalent fraction examples:



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



This fraction wall can help you to see how some fractions are equivalent to others:

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

Have a look at these equivalent fraction examples from the fraction wall:

$$\frac{1}{2} = \frac{2}{4} \qquad \frac{2}{4} = \frac{4}{8} \qquad \frac{3}{4} = \frac{6}{8}$$

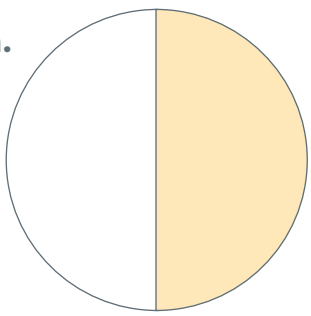
- To work out an equivalent fraction, we multiply or divide the numerator (top number) and denominator (bottom number) by the same number.
- In the examples above, the numerators and denominators were both multiplied by 2.

Now Have a Go

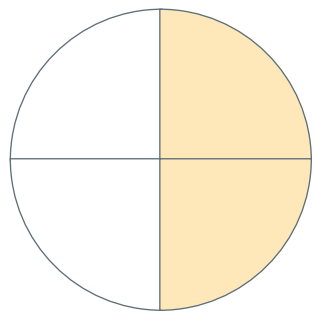
Task 6

- Mark the shapes on the left to show the value of the first fractions.
- Then mark the shapes on the right to show these equivalent fractions.
- Then work out the equivalent fraction values.

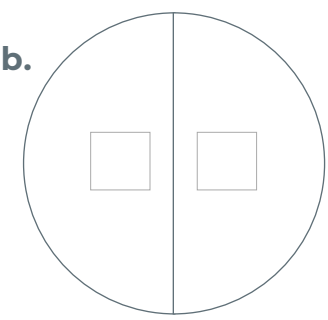
a.



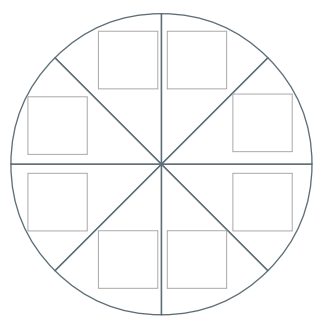
$\frac{1}{2} = \frac{2}{4}$



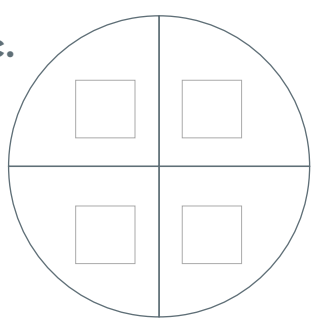
b.



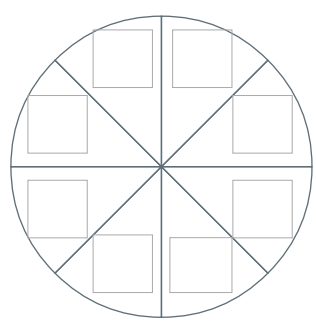
$\frac{1}{2} = \frac{\quad}{8}$



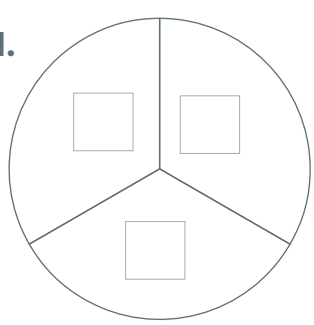
c.



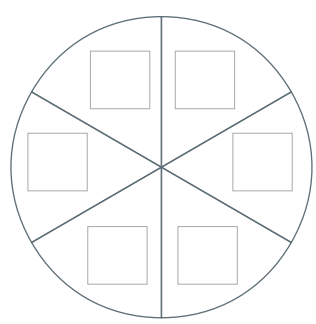
$\frac{3}{4} = \frac{\quad}{8}$



d.



$\frac{1}{3} = \frac{\quad}{6}$

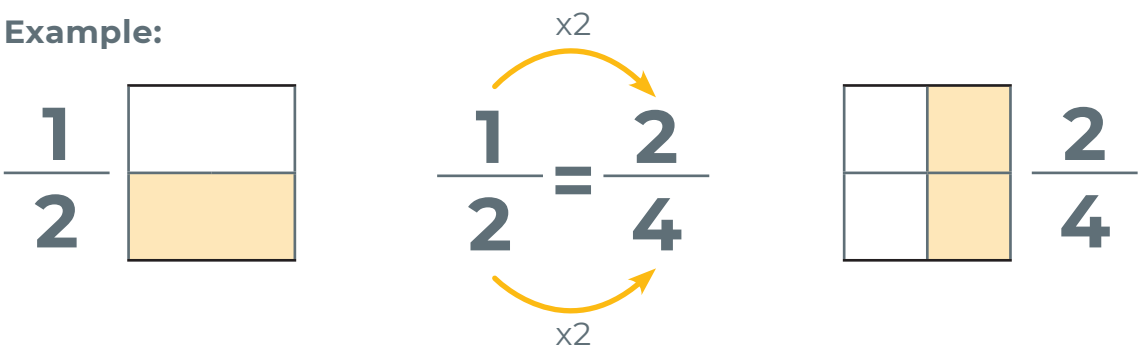


Making Equivalent Fractions Without Drawing

How can we make equivalent fractions without drawing the shapes each time?

The easiest way of creating equivalent fractions is by multiplying the top and bottom by the same number.

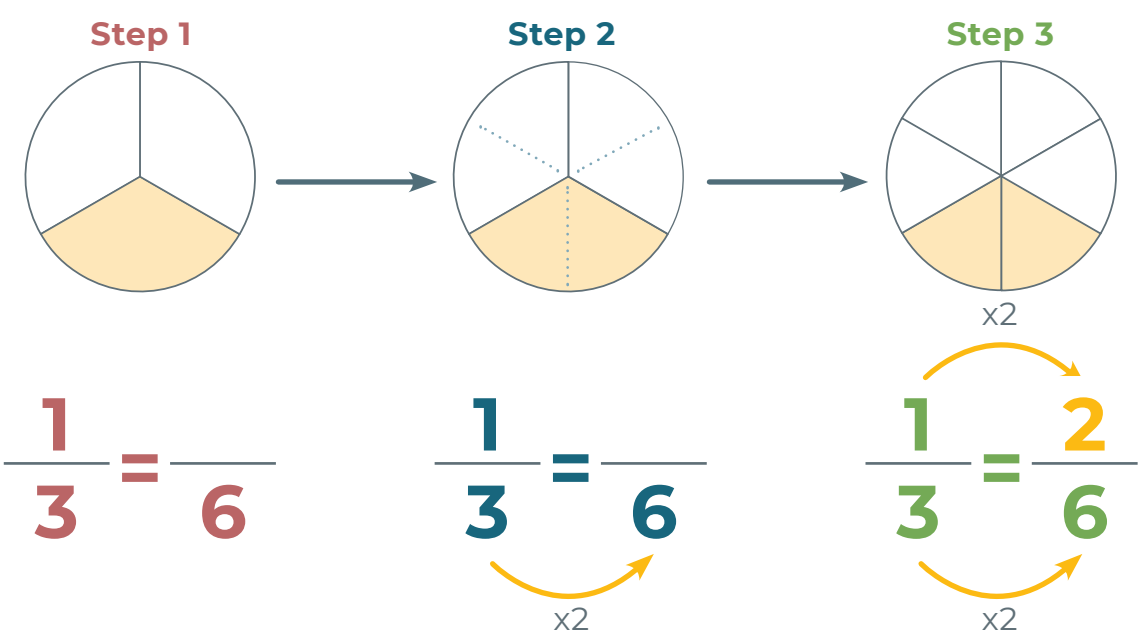
Example:



Whatever you multiply the top by, do the same to the bottom.

Example Question:
One third is the same as how many sixths?

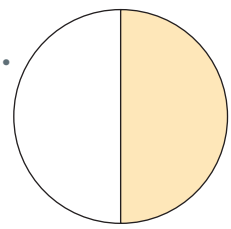
- **Step 1:** What can we see has changed?
  In this case it is the denominator.
- **Step 2:** How much has it changed by?
  What has our original denominator (the 3) been multiplied by to get the 6?
- **Step 3:** Now we know it has been multiplied by 2.
  We do the same to the top. So, 1 x 2 = 2.



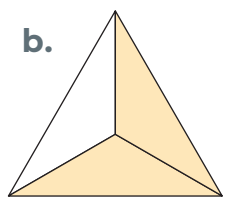
Now Have a Go

Task 7

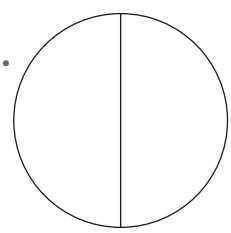
Have a go at completing the equivalent fractions for the same shapes. Shade the fraction and then work out the equivalent fraction. Two are shown for you as examples.

a. 

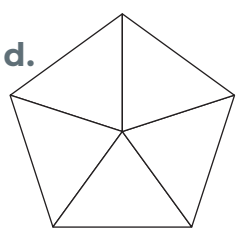
$\frac{1}{2} = \frac{2}{4}$

b. 

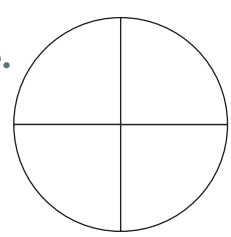
$\frac{2}{3} = \frac{4}{6}$

c. 

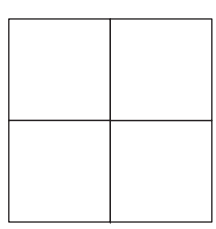
$\frac{1}{2} = \frac{\quad}{8}$

d. 

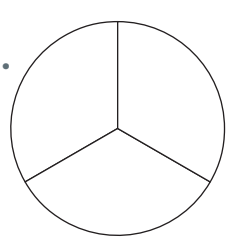
$\frac{3}{5} = \frac{6}{\quad}$

e. 

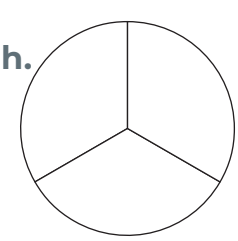
$\frac{3}{4} = \frac{\quad}{8}$

f. 

$\frac{\quad}{\quad} = \frac{4}{8}$

g. 

$\frac{1}{3} = \frac{\quad}{6}$

h. 

$\frac{\quad}{\quad} = \frac{4}{6}$

Task 8

Try these equivalent questions. Remember, whatever you do to the top, you must do the same to the bottom, and vice versa.

a. $\frac{1}{2} = \frac{\quad}{4}$

b. $\frac{2}{2} = \frac{\quad}{\quad}$

c. $\frac{1}{2} = \frac{\quad}{8}$

d. $\frac{2}{5} = \frac{\quad}{10}$

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

f. $\frac{1}{2} = \frac{4}{\quad}$

g. $\frac{\quad}{\quad} = \frac{4}{8}$

h. $\frac{1}{3} = \frac{2}{\quad}$

Comparing Fractions

Now that we know how to work out when fractions are equivalent, we can also see which are bigger or smaller than others.

This is called **comparing fractions**.

We can work out which fraction is the biggest by looking at the denominators (bottom numbers of the fractions).

We need to work out the same equivalent values so we can compare them.

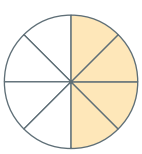
Example:

Which fraction is bigger: $\frac{1}{2}$ or $\frac{3}{8}$

Our first step when trying to compare fractions is to change **both** fractions so that their **denominators are the same**. To do this, look at the bigger denominator (8 in this case) and say the times tables of that number.

When you get to an answer that is in both of the fractions' times tables, that is the denominator that you will change to.

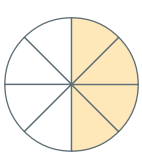
In this example, we say 1 x 8 = 8. 8 is in the 2 times tables so we know we can change both the fractions to eighths. The fractions could then be compared, like this:

 $\frac{1}{2}$ **is equivalent to** $\frac{4}{8}$ 

To get this equivalent value we had to multiply the denominator of $\frac{1}{2}$ by 4, which gives us **8** (2 x 4 = 8).

The numerator of $\frac{1}{2}$ was then multiplied by the same number as the denominator (which was 4), which gives us **4** (1 x 4 = 4).

Both fractions are now in eighths, so they can be compared:

 $\frac{4}{8}$ **is bigger than** $\frac{3}{8}$ 

This means we now know that $\frac{1}{2}$ is bigger than $\frac{3}{8}$.

Comparing Fractions

Remember: Multiplying the numerator by the same number as the denominator keeps the value of the fraction the same.

Before you try this task, it would be a good idea for you to review your knowledge of times tables. Saying these out loud is a really helpful method but it is important that you say the whole fact e.g. 'one seven is seven, two sevens are fourteen' etc.

Task 9

Have a go at working out which of these fractions are the biggest. Put a circle around your answers.

Some fractions in the questions have exactly the same values. Tick both fractions in these questions to show this when you spot them. We have completed question 1 for you.

a. ✔ $\frac{1}{2}$ or $\frac{3}{8}$ ☐

b. ☐ $\frac{1}{2}$ or $\frac{4}{6}$ ☐

c. ☐ $\frac{1}{3}$ or $\frac{2}{6}$ ☐

d. ☐ $\frac{1}{5}$ or $\frac{2}{10}$ ☐

e. ☐ $\frac{2}{3}$ or $\frac{3}{6}$ ☐

f. ☐ $\frac{2}{4}$ or $\frac{3}{8}$ ☐

g. ☐ $\frac{3}{4}$ or $\frac{7}{8}$ ☐

h. ☐ $\frac{3}{6}$ or $\frac{1}{2}$ ☐

i. ☐ $\frac{5}{8}$ or $\frac{9}{16}$ ☐ or $\frac{3}{4}$ ☐

Comparing Fractions in Real Life

When do we compare fractions in real life?

Fractions are used all the time in everyday life with time, money, in the workplace etc.

We use fractions every time we look at a clock: quarter ($\frac{1}{4}$) past and half ($\frac{1}{2}$) past.

Diluting chemicals is a good example too; this might be how many parts cleaning fluid to add to water. You might mix 1 part cleaning fluid with 4 parts of plain water. The fractions involved here are: $\frac{1}{5}$ of cleaning fluid and $\frac{4}{5}$ of plain water.

Another example is when you buy a birthday cake. If you divide the cake among twelve of your family and friends, it means that each one will get a fraction of the cake: $\frac{1}{12}$.
If someone was greedy and took two slices ($\frac{2}{12}$) this can be compared to eating $\frac{1}{6}$ of the cake.

Comparing portions of food such as pizza is another example. If a pizza is cut into eight equal slices, each slice is $\frac{1}{8}$ of the whole pizza. Eating 2 slices of the pizza (which is $\frac{2}{8}$) can be compared to eating one quarter ($\frac{1}{4}$). Eating 4 slices of the pizza (which is $\frac{4}{8}$) can be compared to eating two quarters ($\frac{2}{4}$) or one half ($\frac{1}{2}$).

When deciding which saving is better value in shops, knowing how to compare fractions can be really useful.

Comparison Examples

Question: Would you rather have $\frac{3}{6}$ or $\frac{2}{3}$ of £100?

Answer: $\frac{2}{3}$ is equivalent to $\frac{4}{6}$ so this means it is a higher amount than $\frac{3}{6}$. Therefore, you would rather have $\frac{2}{3}$ of £100.

Question: John gets $\frac{2}{5}$ of a pizza, whilst Sam gets $\frac{3}{10}$. Who gets most?

Answer: John's $\frac{2}{5}$ of the pizza is equivalent to $\frac{4}{10}$ so this means John gets more than Sam's $\frac{3}{10}$ of the pizza.

Task 10

Have a go at these comparison questions.

Remember to look at the denominators and think about how much one of the fractions needs to be multiplied by so they can be compared.

a. $\frac{5}{8}$ of the cars in the car park are red and $\frac{1}{4}$ are black. Which colour is more common in this car park?

b. Sarah gets $\frac{1}{3}$ of a cake, Mo gets $\frac{1}{6}$ of the same cake. Who gets the most?

c. There are twenty customers in a café. $\frac{4}{10}$ of the customers are drinking tea and $\frac{3}{5}$ are drinking coffee. Which drink is the most popular?

d. Nadia and Neville set out to cycle 100 miles. Nadia managed to cycle $\frac{5}{6}$ of the way before she stopped for a break. Neville managed to cycle $\frac{2}{3}$ before he had to stop. Who cycled the furthest before stopping?

Comparing Fractions

Sometimes we need to work out the value of part of a number. This is commonly done when shopping, such as working out new sales prices and discounts. To do this we need to look closely at the fractions involved.

Example:

A shop sells a pair of shoes for the original price of £45. The shoes are going to be discounted in a sale by $\frac{1}{5}$. How much is their sale price?

How we work out the answer:

- First, we need to divide the original price by the denominator (bottom number) of the fraction.

This shows the value of the £45, when divided equally by 5:

£45				
£9	£9	£9	£9	£9

£45 divided by 5 is £9

- Second, we need to multiply this answer by the numerator (top number) of the fraction. **9 multiplied by 1 is 9**.
- As this is a discount, we then need to take away this number from the original price. **£45 minus £9 is £36**.
- So, our answer is **£36**

Here is the answer broken down:

Original price	Discount	Sale price
£45	$\frac{1}{5}$ off = £9	£36

Comparing Fractions

In this next example, we have a discount of $\frac{2}{5}$ to take off for the sales price. We do the same as in the last example, but this time the numerator is a 2:

- Work out the value of the denominator: **45 divided by 5 = 9**
- Multiply by the numerator: **9 times 2 = 18**
- £45 minus £18 = **£27**

Original price	Discount	Sale price
£45	$\frac{2}{5}$ off = £18	£27

The examples that we have looked at here are discounts. That is why we have taken away the number from the original amount to find the new price each time.

It is important to remember that sometimes we would need to add the fraction to the original amount.

For example, if we were adding $\frac{1}{5}$ in tax to an item being sold.

Comparing Fractions

Task 11

A local shoe shop is selling off some of its products.
Work out the sales prices. Some answers have been included to help you out.

	Original price	Discount	Calculations	Sale price
a.	£45	$\frac{2}{5}$ off = £9	**45 ÷ 5 = 9** **9 x 2 = 18** **45 – 18 = 27**	**£27**
b.	£45	$\frac{3}{5}$ off =		
c.	£45	$\frac{4}{5}$ off =		
d.	£45	$\frac{1}{3}$ off =		**£30**
e.	£45	$\frac{2}{3}$ off =		
f.	£80	$\frac{1}{10}$ off =		**£72**
g.	£80	$\frac{3}{10}$ off =		
h.	£80	$\frac{7}{10}$ off =		
i.	£72	$\frac{3}{4}$ off =		
j.	£24	$\frac{1}{3}$ off =		
k.	£35	$\frac{3}{5}$ off =		

Challenge Activity: Budget Question

Task 12

Using what you have practised, can you work out the cost of the following:

You have been paid £840 this week and this is how you have **budgeted**. How much will you spend?

a. $\frac{1}{10}$ is spent on food

b. $\frac{1}{3}$ is spent on rent and council tax

c. $\frac{1}{7}$ is spent on utility bills

d. $\frac{1}{5}$ is saved

e. How much is left?

Recap

In this booklet, you have looked at:

How to recognise equivalent fractions.	✓
How to make equivalent fractions.	✓
Comparing fractions.	✓
Calculating fractional parts of a number.	✓

Glossary

Budgeted	To plan how much money you will spend on something.
Denominator	The number below the line in a common fraction.
Equivalent	Equal in value, amount, function, meaning, etc.
Numerator	The number above the line in a common fraction.

Next Steps

Now you have completed Booklet 5, please return this to your tutor/trainer.

Your tutor/trainer will mark the work and provide you with some feedback showing what you have done well and suggestions on improvements.

The next booklet will be provided to you.

Have Your Say

We would be interested in your opinion of this booklet.

1. **Was there anything you found easy in this workbook?** Yes ☐ No ☐
   If you answered yes, what did you find easy?

2. **Was there anything you found hard?** Yes ☐ No ☐
   If you answered yes, what did you find hard?

3. **Is there anything that you would like your tutor to go over again?** Yes ☐ No ☐
   If you answered yes, what is this?

4. **If your tutor provided learning aids, did you use them?** Yes ☐ No ☐
   If you answered yes, how were they useful?

5. **Would you like more support?** Yes ☐ No ☐
   If you answered yes, one of our Support Staff will get in touch with you.

6. **Do you have any questions?**

7. **What have you learnt from this booklet?**

Notes

Notes