Exploring Mixed Numbers

Overview

This activity presents a brief explanation of fractions, such as $^3/_2$ and $^9/_4$ and their more familiar meanings as 1½ and 2¼.

It introduces the idea that you can have fractions great than 1.

Skills and Knowledge

Links between simple improper fractions and mixed numbers.

Preparation and Materials

Fraction circle kits prepared in *The Meaning of Fractions* activity.

Alternatively:

3 or 4 coloured circles cut into one half pieces.

3 or 4 differently coloured circles cut into one quarter pieces.

Photocopy Practice Sheets: *Exploring Mixed Numbers 1, 2, & 3* (1 per student).

Suggested Procedure

Introducing the activity

If possible get students to sit around a table or flat surface for this activity. This makes it easier for them to see the cut out shapes without you having to hold up a lot of pieces at once. Alternatively you could use BlueTak to hold them on to the board.

Explain:
- *We often see fractions like 1½ in recipes*
- *These are called mixed numbers*
- *This activity will help you to understand them better*

Using **all** the half pieces made, ask students to lay them out on the table, one by one, counting by halves as they go:

| 1 half | 2 halves | 3 halves | 4 halves |
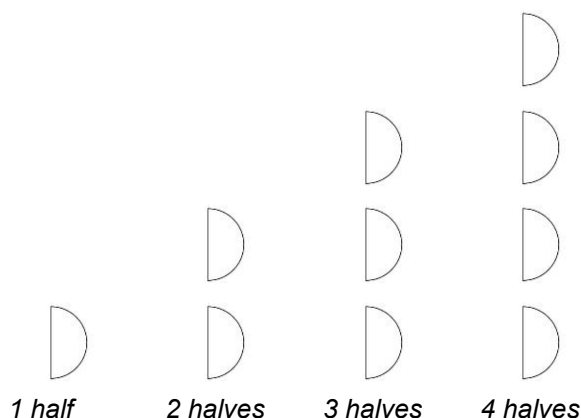
As they count, record the fractions: $^1/_2$, $^2/_2$, $^3/_2$, $^4/_4$.

Now, by rearranging the pieces, they can be counted in a different way: ie *a half, one whole, one and a half, two wholes:*

| ½ | 1 | 1 ½ | 2 |
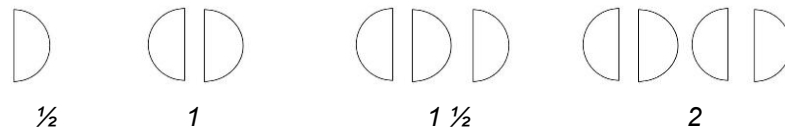
As students count record the new numbers under the old.

Different ways of writing the same fraction

Compare the different ways to write the same number, depending on how we look at it, or how we arrange the pieces:

> 1 is the same as $^2/_2$
> 1 $^1/_2$ is the same as $^3/_2$
> 2 is the same as $^4/_2$

Draw students' attention to:

- The meaning of a fraction like $^2/_2$, where the numerator (or top number) and denominator (or bottom number) are the same
- The fact that fractions greater than one **do** exist
- The fact that these fractions can be written as:
  - **improper fractions** (like $^3/_2$) or as
 - **mixed numbers** (like $1^1/_2$).

Note: This can be emphasised visually by laying the circle halves out and getting students to tell you how they would write the number for each configuration.

 or

| $^3/_2$ | $1^1/_2$ |
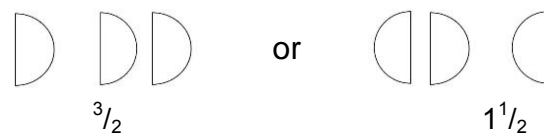
Repeat this for the 2 halves and four halves.

Looking at the quarters

Repeat the above counting exercise using only the quarter pieces. This time counting by quarters:

| $^1/_4$ | $^2/_4$ | $^3/_4$ | $^4/_4$ | $^5/_4$ | $^6/_4$ |
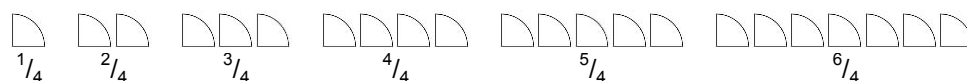
Continue with $^7/_4$, $^8/_4$, $^9/_4$ …

Then by rearranging the pieces, count as:

$^1/_4$ $^2/_4$ $^3/_4$ $^4/_4$ $^5/_4$ $^6/_4$
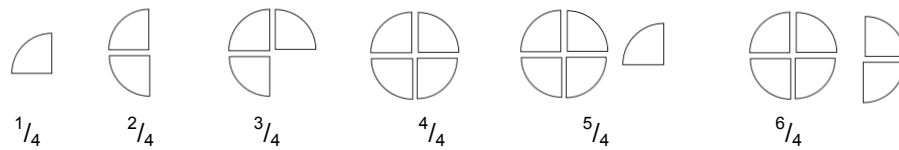
Again compare the different ways of arranging and writing the same fraction. For example demonstrate:

- $^2/_4$ is the same as $^1/_2$
- $^4/_4$ is the same as 1
- $^5/_4$ is the same as $1^1/_4$ etc.

Draw students attention to:
- equivalent fractions like $^2/_4$ and $^1/_2$
- the meaning of fractions like $^4/_4$ and $^8/_8$
- mixed number notation and improper fraction notation e.g. $1^1/_4$ and $^5/_4$.

Practice Sheets 1 & 2 provide further practice with these ideas.

> *Once again, these concepts can be emphasised visually by the layout of the circle pieces. At this stage there is no need to look for the formal rules governing these relationships unless some of the students spot them for themselves and are easily able to use them.*
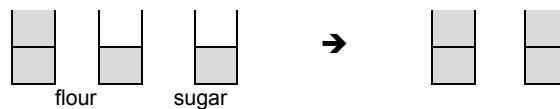
Combining mixed numbers

Explain to students:
- *Recipes often use $^1/_2$ and $^1/_4$ in them, for example $^1/_2$ cup of flour or sugar*
- *Sometimes we need to double a recipe or only make half of it*
- *It's good to understand what to do.*

Ask:
- *If a recipe says $^1/_2$ a cup of sugar and $1^1/_2$ cups of flour, how many cups of the mix will I have?*

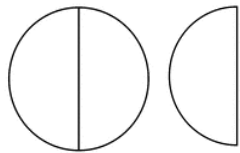Draw the situation to help students see that it will be two cups:
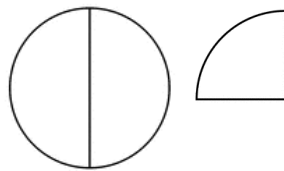

Ask:
- *What if I want to double the recipe?*
- *How many cups of sugar would I need?*
- *How many cups of flour?*
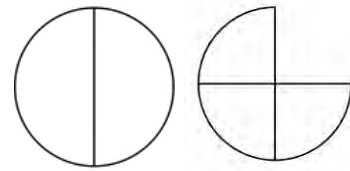- *How many cups would I then have altogether?*

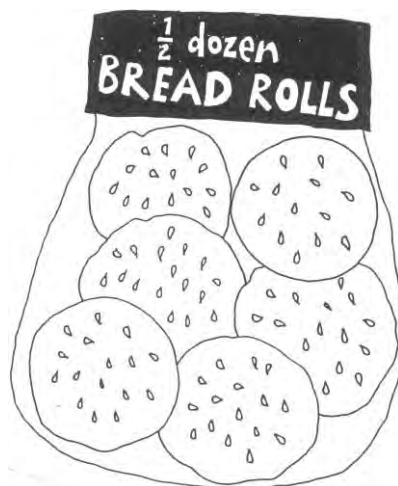1. Write the fraction 2 different ways under each picture.

.... = ... = ... = ...

2. Draw lines between the fractions and the mixed numbers that are the same.

$1^1/_2$	$^5/_4$
$1^1/_4$	5 halves
$2^1/_4$	$^4/_4$
$1^3/_4$	4 halves
$2^1/_2$	$^3/_2$
1	four thirds
2	9 quarters
$1^1/_3$	7 quarters

These bread rolls are sold in half dozen bags.

Children like to eat $\frac{1}{2}$ a roll each.

1.   How many children will one bag feed?
2.   How many rolls will 4 children eat?
3.   How many rolls will 7 children eat?

At a childcare centre each child drinks $\frac{1}{4}$ of a litre of orange juice.

1. How many children will 3 litres serve?
2. If there are 6 children how many litres will you need?

1.   Here are the ingredients for a nut loaf:

$1^1/_2$ cups flour

pinch salt

$^3/_4$ cup butter

1 teaspoon mixed spice

$^1/_4$ cup sugar

$^1/_2$ cup chopped walnuts

$^1/_3$ cup sultanas

1 beaten egg

$^1/_2$ cup milk
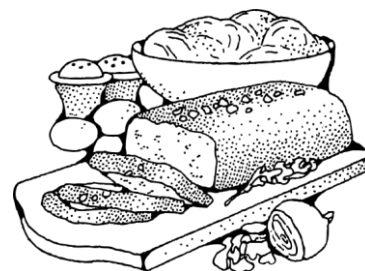
Freda wants to make a double loaf. What will her ingredients be?

2.   Here is Anna's muesli recipe.

3 ½ cups rolled oats

1 ½ cups wheat germ

¼ cup bran

½ cup sultanas

¾ cup sunflower seeds

1 ¼ cups mixed nuts

½ cup coconut

She wants to make twice as much. What will she need?