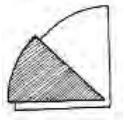
Comparing Fractions

Overview

This is a two part activity which follows from previous activity *The Meaning of Fractions*.

This activity:

- Uses fraction kits and folded paper
- Explores the relative sizes of fractions
- Introduces simple ideas of equivalence
- Provides further practice at naming fractions
- Builds understanding of fraction concepts and symbols.



Skills and Knowledge

- Relative sizes of fractions
- Recognise simple fraction equivalences

Preparation and Materials

Fraction Circle kits created for the *Meaning of Fractions* Activity (1 kit per pair or small group of students)

Scrap A4 paper (at least 1 per pair or small group)

Photocopy Activity Sheet 1 (1 per student)
Photocopy Practice Sheets 1 & 2 (1 per student).

Suggested Procedure

Students will need to refer to Activity Sheet 1: *Naming Fractions* (the table of fraction colours, names and symbols), which they used in the previous activity.

If they do not have their own, you could put a copy on the board so all can see it**.**

Comparing fraction sizes

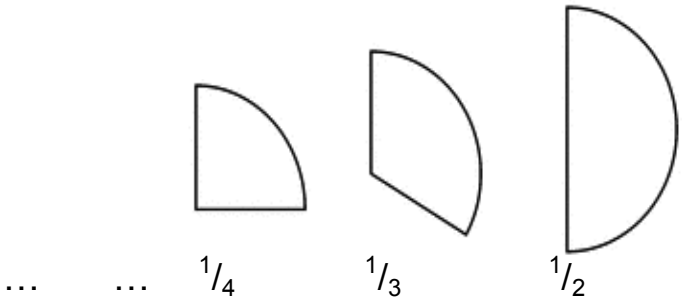
Arrange students in pairs or small groups.

Distribute a large sheet of paper to each student or group of students (see below).

Distribute a fraction kit to each group.

Explain:

- *Write 'smallest' on one end of a piece of paper and 'biggest' at the other.*
- *Then take one piece of each colour and put them in order from **smallest to largest** on the paper*
- *Now write the symbol for the fractions underneath each piece*



Ask:

- *Can you tell me anything about the numbers in the fractions*?

Or more explicitly:

- *As the fractions get bigger what happens to the numbers on the bottom?*
- *Why do you think that the fractions get bigger as the numbers get smaller?*
- *What does the number on the bottom tell us?*

It helps to use the cake or pizza analogy to clarify this.
Remember that the bottom number tells you how many pieces something is cut into.
If you imagine that you are sharing a cake or pizza, then the more slices you cut, the smaller the slices will be.

If students wish to keep a record of this learning activity give them each a sheet of paper and give them time to trace around the shapes to make their own copy.

Activity Sheet 1: *Comparing Fractions* provides a chance for students to use the fraction pieces while thinking further about these concepts.

Practice Sheet 1: *The Smallest Fraction*, gives students further practice using this concept.

Different names – same fraction

Ask students to spread the fraction pieces on the table in front of them.
Hold up one of the one half pieces.

Explain:

- *Put a one half piece like this on the table*
- *See if you can make the same shape out of different coloured pieces (not mixing the colours)*
- *Put the one half on top to check they are exactly the same size*

Ask: *Can you name the fractions you have made?*

As students tell you what colour pieces they have used and how many of each record it on the board:

1/2 is the same as: 2/4 3/6 4/8 6/12

Ask:

- *Can you see a pattern?*
- *If we had 20 on the bottom – what would be on the top?*
- *What about 10 on the bottom – what would be on the top?*
- *What about 100 on the bottom – what would be on the top?*

If students cannot make a prediction from these few pieces, then using a piece of A4 paper and folding it repeatedly, asking them how many pieces in the top half each time, may help them to see a pattern of halving and doubling emerging.

Note: Students do not always see the pattern the way mathematics teachers may expect, but if their pattern is true and leads to valid predictions then it should be accepted.

The last two fractions 5/10 and 50/100 are especially significant and possibly already familiar to the students as being the same as a half. It is worth drawing attention to them:

5/10 is 0.5 and 50/100 is 50%

The cake or pizza analogy may help make sense of this idea:

If you start with a half a cake you have one big piece. If you cut it again you get two pieces (the number on the top of the fraction is now 2) but they are now smaller (the number on the bottom is now 4). If you keep cutting the same half cake you will get lots more pieces (number on top increases) but they will get smaller (number on the bottom increases).

For the lower level numeracy students the main point to make from this activity is that one fraction can have a lot of different names. Also some of these names are useful for decimals and percentages.

A short look at adding fractions

This section briefly demonstrates how familiar some equivalent fractions are to most of us. It also provides a glimpse of how they may be used when adding fractions.

First look at some very simple additions of fractions;
For example:
1/3 + 1/3 = ? [Put two 1/3 pieces together to show this is 2/3]

1/5 + 2/5 = ? [Put one fifth piece and then two more fifth pieces together to show this is 3/5]

Note: This is not 3/10.
The number on the bottom of the fraction does not change because the shape is still the same size – there are just more of them when you add.

Ask students to show you how to add
1/10 + 3/10 [Answer 4/10]

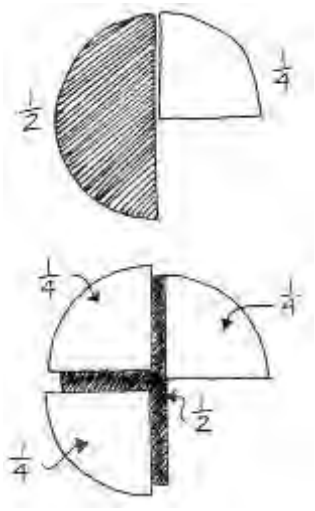
1/5 + 3/5 [Answer 4/5]
1/4 + 1/4 [Answer 2/4 – same as1/2]

1/2 + 1/2 {Answer 2/2 – same as 1]

Using equivalent fractions

Place one half piece and one quarter piece together and ask:

- *What fraction do we have now?*



Cover the 1/2 with two 1/4's

Record: *1/2 + 1/4 = 3/4*

Is the same as 2/4 + 1/4 = 3/4

The important thing is that all students see how this works with the concrete fractions in front of them.

Exploring more equivalent fractions (Optional extension)

For students who may need to understand more about equivalent fractions later on you can take these ideas a little further as follows.

Hold up one of the one third pieces
Explain:

- *Put a one third piece like this on the table*
- *See if you can make this fraction out of any other pieces just , you can't mix the colours like we did for the half*

As the students respond record on the board:

1/3 is the same as: 2/6 4/12

Again explore with students any pattern they can see.

Ask: *Can you make predictions for:*

- *?/24,*
- *?/30,*
- *?/15.*

For some students this exploration can be a startling revelation of previously mysterious rules.
But for others it may start to resemble the bad old fraction days at school. Don't push further than they need or want to go.

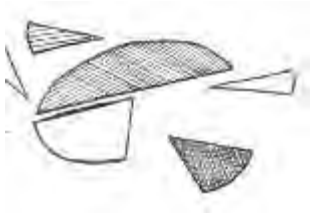
If you want to explore the idea even further you could use 2/3 and 3/4 as your starting points.

Fractions like these last are more likely to take you to the principle of multiplying top and bottom by the same number (as the pieces get smaller – the number of them increases by the same factor.)

Comparing Fractions

Activity Sheet 1

Work with a partner if you can.



For each pair of fractions on this page:

- First put a circle around the one you think is the **smallest**
- Then put the fraction pieces together and check if your guess is correct

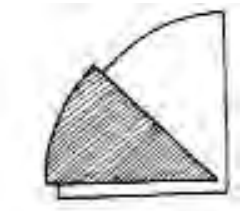
1	$\frac{1}{4}$	$\frac{1}{3}$
2	$\frac{1}{12}$	$\frac{1}{2}$
3	$\frac{1}{3}$	$\frac{1}{8}$
4	$\frac{1}{2}$	$\frac{1}{3}$
5	$\frac{1}{6}$	$\frac{1}{12}$
6	$\frac{1}{8}$	$\frac{1}{4}$
7	$\frac{1}{3}$	$\frac{1}{12}$
8	$\frac{1}{4}$	$\frac{1}{2}$
9	$\frac{1}{8}$	$\frac{1}{6}$
10	$\frac{1}{4}$	$\frac{1}{6}$

The Smallest Fraction

Practice Sheet 1

Put a circle around the fraction you think is the **smallest** in each group of fractions

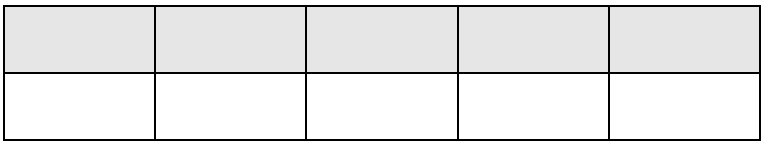
If you are not sure draw a picture or fold some paper to see the fractions.



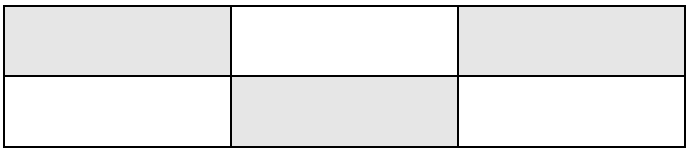
1	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{2}$
2	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{12}$
3	$\frac{1}{5}$	$\frac{1}{10}$	$\frac{1}{2}$
4	$\frac{1}{100}$	$\frac{1}{10}$	$\frac{1}{20}$
5	$\frac{3}{6}$	$\frac{3}{10}$	$\frac{3}{3}$
6	$\frac{2}{3}$	$\frac{2}{10}$	$\frac{2}{100}$
7	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{4}{4}$

Same Name - Different Fraction

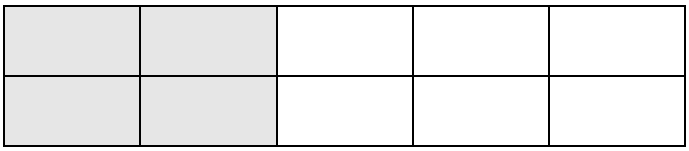
Practice Sheet 2



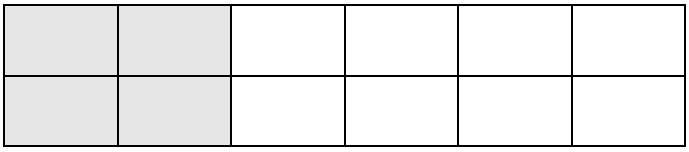
1. What fraction is coloured? …… Is this the same as ½? Yes / No



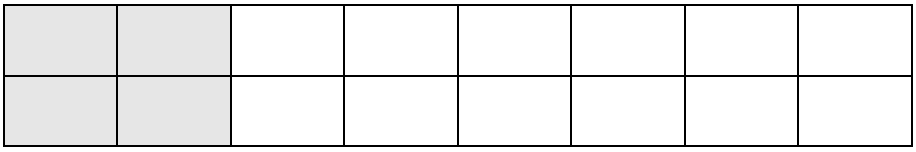
2. What fraction is coloured? …… Is this the same as ½? Yes / No



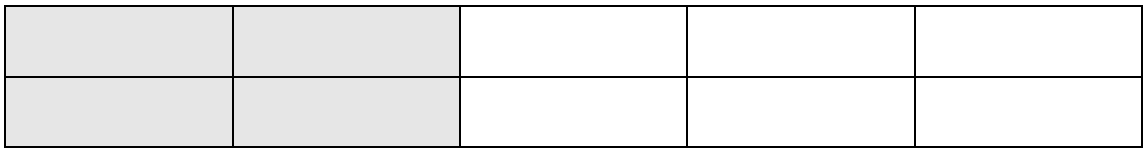
3. What fraction is coloured? …… Is this the same as ½? Yes / No



4. What fraction is coloured? …… Is this the same as ½? Yes / No



5. What fraction is coloured? …… Is this the same as 1/4? Yes / No



6. What fraction is coloured? …… Is this the same as 1/4? Yes / No