

Striving To Improve



Fractions

For students aged 11 - 15 years who are underachieving at their year level.



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Teachers' Notes

This resource is focused on the Number and Algebra area of the curriculum for lower ability students and those who need further opportunity to consolidate these core areas in Mathematics.

Each section provides students with the opportunity to consolidate written and mental methods of calculation, with an emphasis on process and understanding.

The section entitled *Understanding Fractions* enables students to re-encounter ideas of equivalent fractions, simplifying fractions, improper fraction, mixed numerals and comparing fractions. These activities are a useful way to scaffold a new unit of Mathematics and will help build confidence for lower ability students to attempt more challenging problems at their year level.

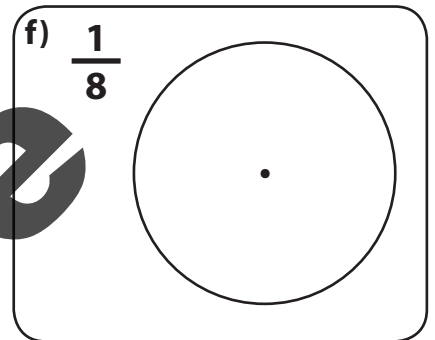
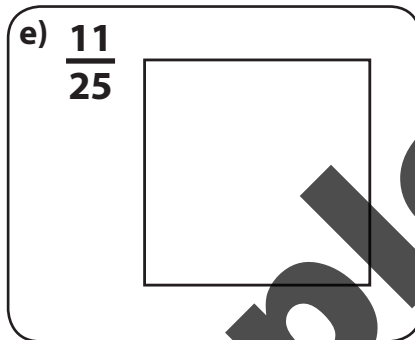
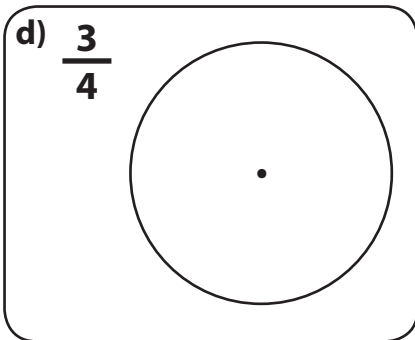
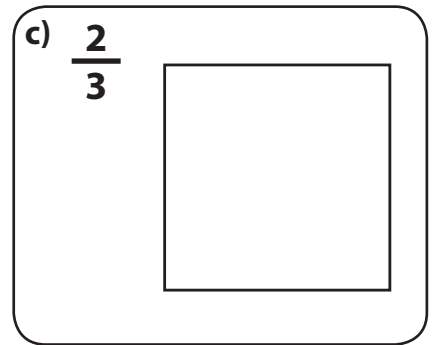
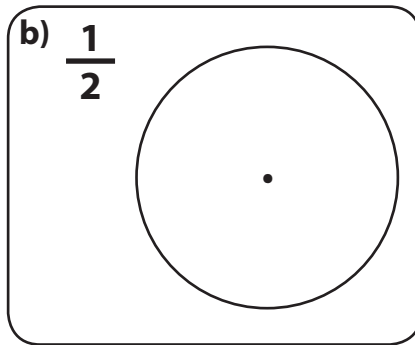
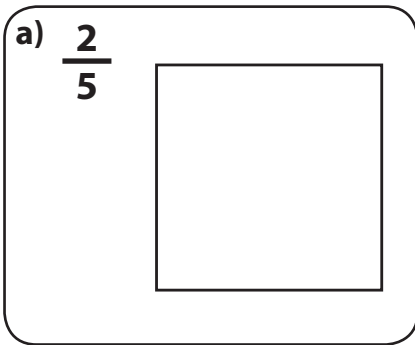
The section entitled *Calculating With Fractions* walks students through the four core calculations. The activities are designed to guide student learning with minimal input from the teacher and there is a strong emphasis on process and understanding. Students explore addition and subtraction of fractions with and without common denominators. Similarly, students explore how to multiply and divide fractions before applying them to a variety of applications. Students also begin to see the common uses for fractions by finding fractions of a quantity and be expressing various quantities as fractions.

The activities can be used for individual students needing further consolidation in a mainstream classroom or as instructional worksheets for a whole class of lower ability students. The activities range from grade levels of Year 4 through to Year 7 and are appropriate for students requiring extra support in Years 7, 8 and 9.

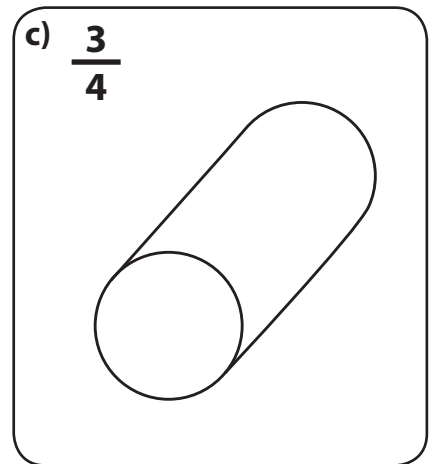
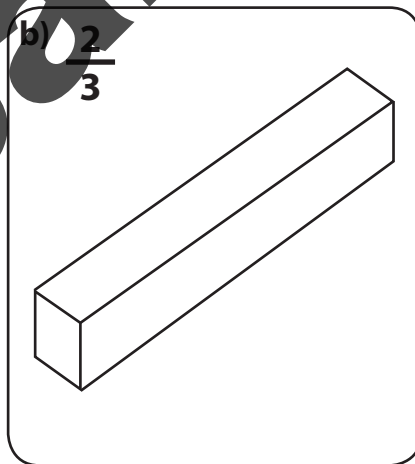
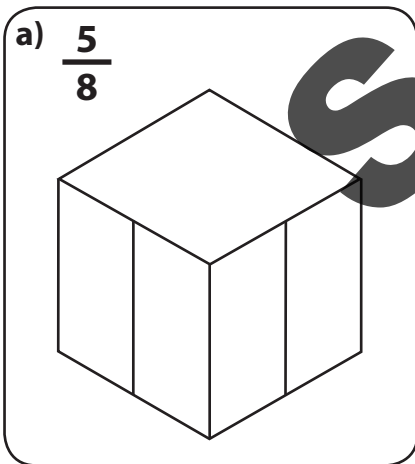
It is hoped that *Fractions* will be used to help teachers provide appropriate resources and support to those students in greatest need. The book as a whole can be used as a programme of work for those students on a Modified Course or Independent Learning Programme. Activities are sufficiently guided so that students can work independently and at their own pace without constant supervision and guidance from the teacher.

✱ Shading Fractions 3

*** TASK A** Slice up each of these shapes into the correct number of equal parts and shade the amount to be shared.



*** TASK B** Slice up each of these shapes into the correct number of equal parts and shade the amount to be shared.



* TASK C: PERSONAL CHALLENGE

When you get home, look in your fridge and estimate each of these fractions.

- Estimate the fraction of milk left in the carton.
- Estimate the fraction of soft drink left in the bottle.
- Estimate the fraction of jam left in the jar.

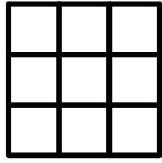


* Simplifying Fractions 1

The fractions below can all be expressed as 1 because they represent all parts of a whole.



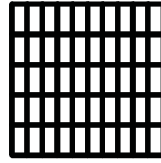
$$\frac{3}{3}$$



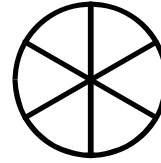
$$\frac{9}{9}$$



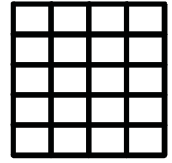
$$\frac{7}{7}$$



$$\frac{50}{50}$$



$$\frac{6}{6}$$



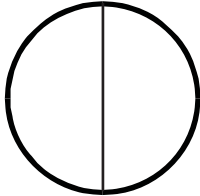
$$\frac{20}{20}$$

*** TASK A** Write four fractions below that are equivalent to a whole.

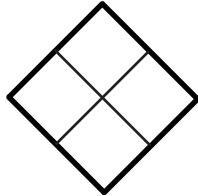
a. b. c. d.

*** TASK B** Shade the shapes below according to the fraction.

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



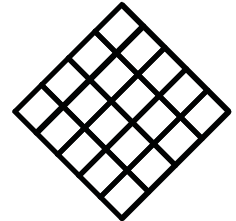
$$\frac{4}{4}$$



$$\frac{12}{12}$$

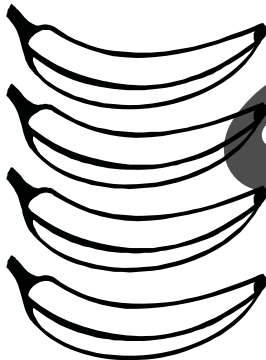


$$\frac{20}{20}$$

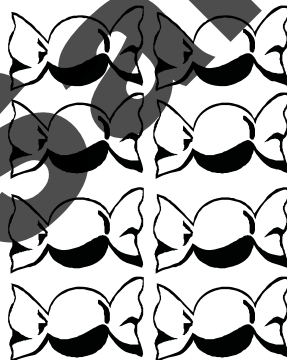


*** TASK C** Use the pictures and circle the amounts shown below.

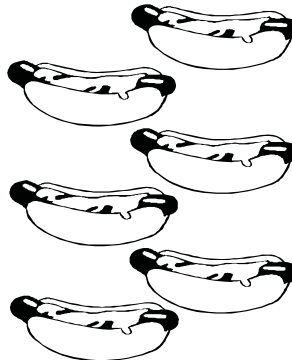
$$\frac{2}{4}$$



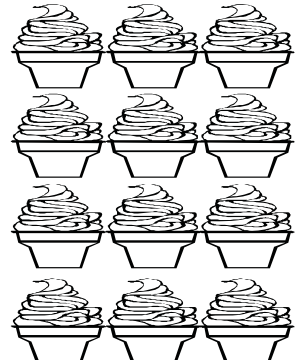
$$\frac{4}{8}$$



$$\frac{3}{6}$$



$$\frac{12}{12}$$



All of the amounts you have shown above are equal to _____

*** TASK D** Use a red pen to circle the fractions below that represent a third.
Use a blue pen to circle the fractions equivalent to a half.

$$\frac{4}{8}$$

$$\frac{4}{12}$$

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

$$\frac{20}{40}$$

$$\frac{5}{10}$$

$$\frac{50}{100}$$

$$\frac{2}{6}$$

$$\frac{5}{15}$$

$$\frac{6}{12}$$

$$\frac{100}{200}$$

* TASK E: CHALLENGE

Kathy was checking her netball goal scoring for the last three games. In the first game she scored 15 of the 28 goals for the game. In the second game a total of 36 goals were scored by her team of which Kathy scored 18 and in the third game she scored 12 out of 26 goals. In which game did Kathy score exactly half the goals?

✱ Comparing Fractions 4

* TASK A

Divide this line into 8 equal sections. Place each of these fractions on the right spot on the line.

$A: \frac{3}{8}$

$B: \frac{7}{8}$

$C: \frac{1}{2}$

$D: \frac{1}{4}$

$\frac{7}{8}$
↓
●
B

Divide this line into 10 equal sections. Place each of these fractions on the right spot on the line.

$A: \frac{4}{10}$

$B: \frac{9}{10}$

$C: \frac{1}{5}$

$D: \frac{3}{5}$

$E: \frac{1}{10}$

* TASK B

Draw a line and divide it into 9 equal sections so that you can place each of these fractions on the right spot on the line.

$A: \frac{1}{6}$

$B: \frac{2}{3}$

$C: \frac{3}{9}$

$D: \frac{5}{9}$

Draw a line and divide it into 12 equal sections so that you can place each of these fractions on the right spot on the line.

$A: \frac{5}{12}$

$B: \frac{1}{3}$

$C: \frac{1}{12}$

$D: \frac{3}{4}$

$E: \frac{11}{12}$

* TASK C: SMALL GROUP CHALLENGE

In a group of 3 or 4 students you will make a pack of cards to use to play "Snap".

Make up 20 cards, and on each card write a fraction that has a denominator of 2, 3, 4, 6, or 12. The numerator can be any number smaller than the denominator.

It will be played like the normal game of "Snap", but instead of having matching cards, you need matching fractions (fractions that are equivalent).



✱ Fraction Skills Review 2

*** TASK A** Fill in the missing numerators for these equivalent fractions.

$$\frac{1}{4} = \frac{\square}{8} \quad \frac{1}{3} = \frac{\square}{9} \quad \frac{1}{10} = \frac{\square}{20} \quad \frac{1}{2} = \frac{\square}{10} \quad \frac{1}{3} = \frac{\square}{12} \quad \frac{3}{4} = \frac{\square}{12}$$

$$\frac{4}{5} = \frac{\square}{10} \quad \frac{3}{5} = \frac{\square}{15} \quad \frac{2}{6} = \frac{\square}{3} \quad \frac{1}{5} = \frac{\square}{10} \quad \frac{3}{9} = \frac{\square}{12} \quad \frac{2}{4} = \frac{\square}{8}$$

*** TASK B** Write the missing denominators into the boxes.

$$\frac{1}{5} = \frac{2}{\square} \quad \frac{2}{3} = \frac{4}{\square} \quad \frac{3}{10} = \frac{6}{\square} \quad \frac{2}{\square} = \frac{4}{8} \quad \frac{3}{5} = \frac{6}{\square} \quad \frac{4}{6} = \frac{8}{\square}$$

$$\frac{4}{10} = \frac{2}{\square} \quad \frac{2}{\square} = \frac{1}{3} \quad \frac{5}{10} = \frac{1}{\square} \quad \frac{3}{9} = \frac{1}{\square} \quad \frac{4}{12} = \frac{1}{\square} \quad \frac{9}{12} = \frac{3}{\square}$$

*** TASK C** Write these fractions in the simplest form. The first one has been done for you.

$$\frac{9}{12} = \frac{3}{4} \quad \frac{8}{10} = \dots\dots\dots \quad \frac{4}{8} = \dots\dots\dots \quad \frac{6}{12} = \dots\dots\dots \quad \frac{20}{40} = \dots\dots\dots \quad \frac{3}{6} = \dots\dots\dots$$

$$\frac{50}{100} = \dots\dots\dots \quad \frac{5}{15} = \dots\dots\dots \quad \frac{15}{30} = \dots\dots\dots \quad \frac{30}{60} = \dots\dots\dots \quad \frac{4}{10} = \dots\dots\dots \quad \frac{6}{8} = \dots\dots\dots$$

$$\frac{100}{200} = \dots\dots\dots \quad \frac{5}{10} = \dots\dots\dots \quad \frac{14}{20} = \dots\dots\dots \quad \frac{18}{20} = \dots\dots\dots \quad \frac{160}{200} = \dots\dots\dots \quad \frac{40}{40} = \dots\dots\dots$$

* TASK D: WORD PROBLEMS

1. Jessica has three bread rolls and has cut them into quarters.
How many quarters does she have altogether?.....

2. Simon has four red marbles and six blue marbles. He gave two of the red marbles to Fiona and three of the blue marbles to John.
What fraction of each colour did Simon give away?.....

3. Natalie has six pieces of fruit and two pieces are bananas.
A third of the pieces are apricots and the rest are pears.
How many of each fruit does she have?.....

4. There are ten students in the art class. One fifth of the class are painting and two tenths of the class are drawing. Six tenths are making pottery.
How many students are doing each activity?
Painting:..... Drawing:..... Pottery:.....

Calculating With Fractions

This section equips students with the skills necessary to calculate with fractions.

Students explore addition and subtraction of fractions both with and without common denominators, and are always encouraged to give answers in their most simplified form.

Students also learn the mental strategies involved to multiply and divide fractions.

These calculation skills are then applied to common calculations such as finding the fraction of an amount and expressing an amount as a fraction of another amount. It is important here that students have a good grasp of units and their conversion.

Sample

* Division Of Fractions

Here is a handy little poem to help you remember how to divide two fractions.

"Dividing fractions is easy as pie! Simply flip the second and then multiply!"

Let's see how that works. **Example:** If we want to calculate $\frac{4}{5} \div \frac{1}{3}$

Then we change our calculation to $\frac{4}{5} \times \frac{3}{1}$ where we change the \times to a \div and then flip the second fraction.

We now have $\frac{4 \times 3}{5 \times 1}$ which gives us $\frac{12}{5}$. We now change our answer to a mixed numeral which gives us $2 \frac{2}{5}$.

*** TASK A** Calculate each of the following by filling in the boxes provided.

a. $\frac{7}{8} \div \frac{2}{3}$

= \times

=

=

b. $\frac{4}{10} \div \frac{3}{4}$

= \times

=

=

c. $\frac{5}{6} \div \frac{3}{11}$

= \times

=

=

d. $\frac{5}{6} \div \frac{1}{4}$

= \times

=

=

e. $\frac{3}{12} \div \frac{4}{5}$

= \times

=

=

f. $\frac{2}{9} \div \frac{2}{5}$

= \times

=

=

*** TASK B** Calculate each of the following by showing all working. Be sure to simplify your answers.

a. $\frac{5}{6} \div \frac{1}{3}$

b. $\frac{3}{10} \div \frac{4}{5}$

c. $\frac{11}{20} \div \frac{1}{2}$

d. $\frac{5}{8} \div \frac{1}{3}$

e. $\frac{3}{5} \div \frac{1}{4}$

f. $\frac{5}{7} \div \frac{2}{3}$