

Mathematics

Queensland Comparable Assessment Tasks (QCATs) 2012

Fractions everywhere

Student booklet

4



Given name:

Family name:

School:

Setting the scene

Group discussion

Fractions are part of our daily life.

Look at the images displayed.

Where do you see fractions used in everyday life?

List some examples where fractions are used:

.....

Share your examples with the class.

Fractions represent equal parts of a whole or parts on a number line.

The whole can be:

- a single unit, like a pie
- a collection in a set, like a carton of eggs
- a number line, like a measuring tape
- numbers, like on a digital weighing scale.

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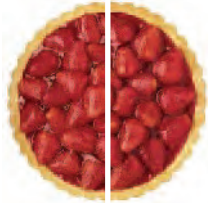
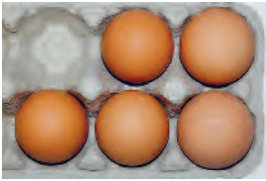
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Images p. 12 Apple: <www.123rf.com/photo_8912467_red-apple-over-white-background-isolated-fruit.html>; p. 14 Oranges: <www.123rf.com/photo_8806196_single-orange-on-white-background.html>; Apples: <www.123rf.com/photo_8770553_close-up-of-a-row-of-seven-shiny-red-apples-leading-away-from-the-viewer-at-an-oblique-apple.html>; Pineapple: <www.123rf.com/photo_5388998_pineapple-isolated-on-white-background.html>; Kiwi fruit: <www.123rf.com/photo_6187443_kiwi-fruit-isolated-on-white-background.html>.

All other images © QSA.

Look at the pictures below

Fractions represent equal parts of a whole. The whole can be:	
equal parts of a whole (unit) a single unit, like a pie	$\frac{1}{2}$  $\frac{1}{2}$ two equal parts of a pie
equal parts in a set a collection in a set, like a carton of eggs	$\frac{1}{6}$  one egg in a set of six is missing
equal parts on a line a number line, like a measuring tape.	 numbers show equal parts
Fractions can be represented in decimal notation. Numbers, like on a digital weighing scale.	 apple weighs 0.25 kilograms or $\frac{1}{4}$ of a kilogram

In this assessment you will:

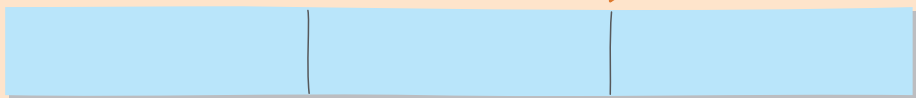
- count fractions
- locate and represent fractions on a number line
- identify equivalent fractions
- connect fractions and decimal notations
- use fractions in daily life.

Representing a half, third and a quarter

1. Make paper representations for halves and quarters by:

- **folding** paper strips to represent each fraction
- **drawing** a line along each fold mark
- **gluing** each paper strip into the box.

The first one is done for you.

thirds	
halves	
quarters	

2. Look at these two paper representations of fractions below.



These two representations are:

similar because

.....

different because

.....

3. Complete the following.

The first one is done for you.

Colour the half parts
to show $1 \frac{1}{2}$

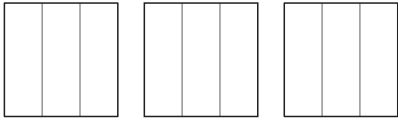
half parts



Number of
half parts
coloured

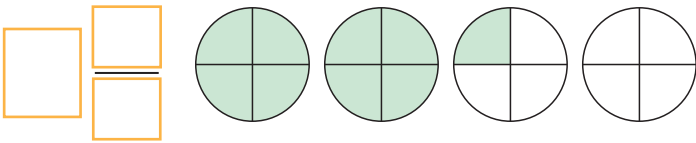
3

(i) Colour the third parts
to show $1 \frac{2}{3}$



Number of
third parts
coloured

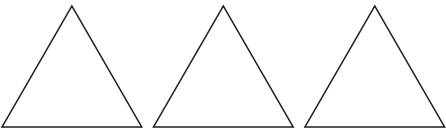
(ii) Coloured quarter parts
show



Number of
quarter parts
coloured

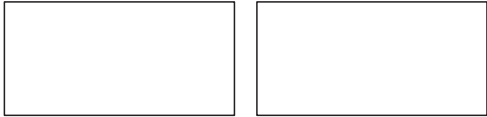
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(iii) Colour the half parts
to show $2 \frac{1}{2}$



Number of
half parts
coloured

(iv) Colour the fifth parts
to show $\frac{6}{5}$



Number of
fifth parts
coloured



Stop here: Wait for your teacher's directions.

Counting fractions

4. Count by the **fraction** in A on the **number line** in B.

The first one is done for you.

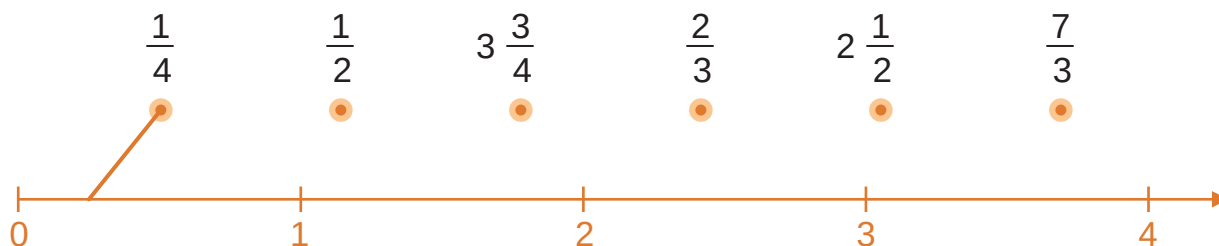
	A	B
	Count by quarters to $\frac{2}{4}$	
(i)	Count by halves to $1\frac{1}{2}$	
(ii)	Count by thirds to $\frac{\boxed{}}{\boxed{}}$ $\frac{\boxed{}}{\boxed{}}$ to $\frac{\boxed{}}{\boxed{}}$ $\frac{\boxed{}}{\boxed{}}$ 3	
(iii)	Count by quarters to $2\frac{1}{2}$	
(iv)	Count by to and	

Locating fractions on a number line

5. Locate the approximate position of each **fraction** or **mixed number** on the number line.

Draw straight lines to the number line.

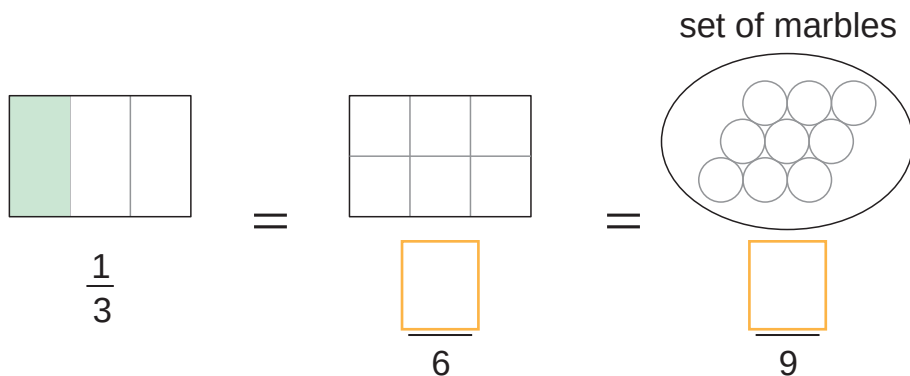
The first one is done for you.



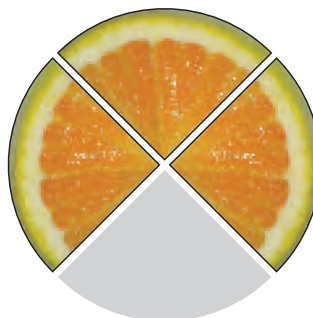
Identifying equivalent fractions

6. Colour each shape then write the equivalent fraction to show **one third**.

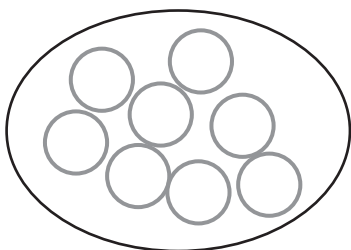
The first one is done for you.



Here is a representation of **three-quarters** $\frac{3}{4}$.

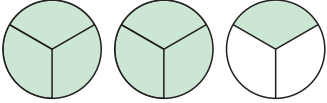
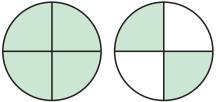


7. Colour $\frac{3}{4}$ of this set of marbles.

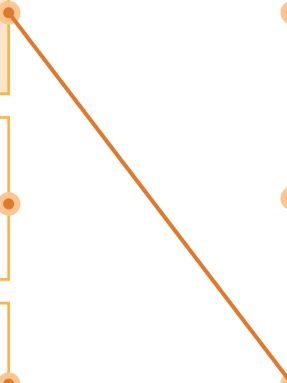


8. Draw a line  to “match” each **mixed number representation** in A with an **improper fraction** in B.

The first one is done for you.

A		B	
	$2\frac{1}{2}$	$\frac{7}{3}$	
(i)		$\frac{6}{4}$	
(ii)	Two and one quarter	$\frac{8}{3}$	
(iii)	$2\frac{2}{3}$	$\frac{5}{2}$	
(iv)		$\frac{9}{4}$	

9. Draw a line  from each fraction in A to “match” the **equivalent fraction** in B.
The first one is done for you.

	A		B
	$\frac{1}{5}$		$\frac{1}{4}$
(i)	$\frac{4}{8}$		$1\frac{2}{10}$
(ii)	$\frac{2}{8}$		$\frac{2}{10}$
(iii)	$\frac{6}{4}$		$\frac{1}{2}$
(iv)	$\frac{6}{5}$		$1\frac{1}{2}$

- (v) Write two **different** fractions that are **equivalent** to $\frac{4}{6}$.

$$\frac{4}{6} = \frac{\boxed{}}{3} \quad \text{and} \quad \frac{4}{6} = \frac{\boxed{}}{\boxed{}}$$



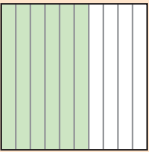
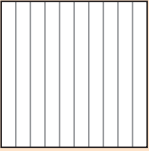
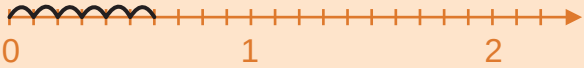
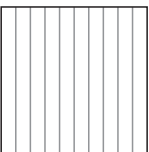
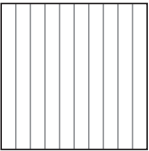
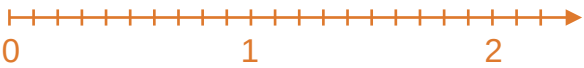
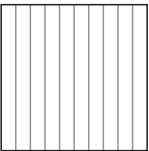
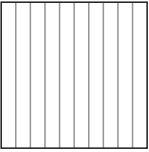
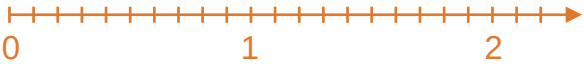
Stop here: Wait for your teacher's directions.

Connecting fractions with decimal notation

10. Complete each row by:

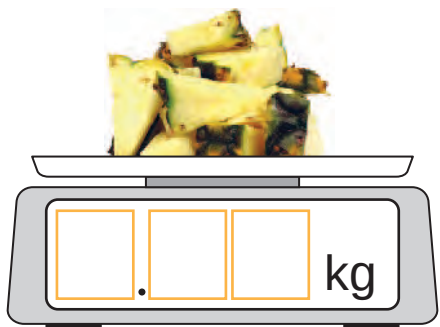
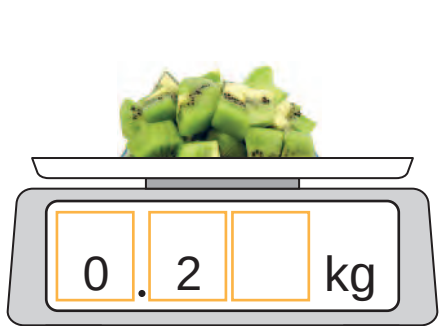
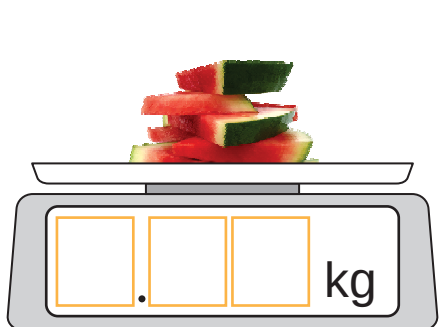
- **writing in words** for each representation
- **colouring** in the representation and tenths
- **locating** the fraction on the number line
- **writing** the fraction in decimal notation.

The first one is done for you.

Representation	Tenths	Number line	Decimal
 six of ten equal parts	 		0 . 6
(i)  of ten equal parts	 		.
(ii)  of equal parts	 		1 . 2

11. Complete each row.

The first one is done for you.

Mass	Fraction	Decimal notation
$\frac{1}{2}$ kg strawberries	$\frac{5}{10}$	
(i) $\frac{1}{2}$ kg pineapple	1 $\frac{\quad}{10}$	
(ii) $\frac{\quad}{5}$ kg kiwi fruit	$\frac{\quad}{10}$	
(iii) $\frac{1}{4}$ kg watermelon	$\frac{\quad}{100}$	



Stop here: Wait for your teacher's directions.

Sharing an apple

12. Here is a **whole apple**.



It is then cut in half. Jack takes this **half apple** to school for morning tea.

(i) Draw Jack's half in the box.



Jack eats morning tea with one friend.

He shares his **half apple** equally.



(ii) Write the fraction of the **half apple** each would get.

(iii) Draw a picture to show your answer.



(iv) Write the fraction of the **whole apple** each would get.

Thinking space



Stop here: Wait for your teacher's directions.

Using fractions

Fruit salad recipe serves 8 people

4 oranges



16 strawberries



7 apples



$\frac{1}{2}$ pineapple



$1 \frac{1}{2}$ kiwi fruit



240 mL yoghurt



13. (i) Use the recipe to work out how much of each ingredient you will need to make fruit salad for **4 people**.

Show your thinking below.

oranges	strawberries	apples
pineapple	kiwi fruit	yoghurt

- (ii) Explain how you worked out how much kiwi fruit was needed.

Use words and/or drawings.

.....
.....
.....
.....
.....
.....

Focus: Applies understandings of fraction representations to solve a range of problems in everyday contexts.

Understanding		Skills	
Understanding	Reasoning	Problem solving	Fluency
Represents and makes connections across assorted fractions and decimal notation in familiar contexts. Questions 1, 3 i–ii, 6, 7, 8, 9, 10, 11, 12 ii	Explains: - similarities and differences between visual representations of fractions - strategies to solve kiwi fruit problem. Questions 2, 13 ii	Applies problem solving strategies to: - locate and represent fractions on partitioned and non-partitioned number lines - determine fruit fractions and recipe ingredient amounts. Questions 3 iii–iv, 5, 12 i, iii–iv, 13 i–ii	Uses mathematical procedures to: - locate and represent fractions on partitioned and non-partitioned number lines - determine amounts of fruit. Questions 3 iii–iv, 4 i–iv, 5, 10 i–ii, 13 i
Accurately interprets, converts and connects a range of fractions using numbers, words (Q9 v, 10) and decimal representations (Q10,11 iii). Connects complex fractions (Q6, 7, 9 iii, 9 iv) and decimals with equivalent representations (Q10 ii, 11 i–ii). Identifies, draws and matches simple representations of proper (Q3 i–ii, 11 i), improper and mixed fractions (Q8 ii–iii, 9 i–ii, 12 ii). Represents simple proper (Q1) and improper fractions through visual representations i.e. drawing pictures (Q8 i, 8 iv).	Provides accurate and clear explanations of differences, e.g. refers to larger/smaller equal parts or halves (Q2) and kiwi fruit strategies (Q13 ii). Provides appropriate mathematical descriptions to explain similarities and differences (Q2) and kiwi fruit strategies (Q13 ii). Makes a simple statement about similarities, i.e. little, larger (Q2).	Represents an improper fraction on a number line (Q5). Determines apple fraction (Q12 iv) and kiwi fruit amount for recipe (Q13 i). Represents proper and mixed fractions on a number line (Q5) and identifies yoghurt amount for recipe (Q13 i). Represents mixed fractions (Q3 iii–iv). Determines number of apples and pineapples for recipe (Q13 i). Can represent visually as a problem solving strategy apple parts (Q12 i, 12 iii) and numbers of strawberries and oranges needed for recipe (Q13 i).	Accurately and efficiently shows partitioning (Q3 iv), counts on accurately (Q4 iv, 5), and uses number operations to solve fruit problems (Q10 ii,13 i). Appropriately applies equal partitioning, counting on and visual representations to solve problems (Q3 iii, 4 ii–iii, 5,10 i, 13 i). Uses modelled procedures to solve problems (Q3 iii, 4 i–ii, 10 i, 13 i).
		A	
		B	
		C	
		D	
		E	

Feedback: