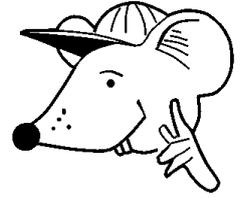




MATHEMATICS



N.S. Yr. 5 P.23

Use fraction notation and recognise equivalent fractions. Order familiar fractions.

Equipment

Paper, pencil, ruler

MathSphere

© MathSphere P.O. Box 1234 Worthing BN13 2UJ www.mathsphere.co.uk

Concepts

Children should be able to understand the meaning of and be able to spell and read these words:

Fraction, proper/improper fraction, mixed number, numerator, denominator, half, quarter, eighth, third, sixth, fifth, ninth, twelfth, tenth, twentieth, hundredth, equivalent, reduced to, cancel, (lecnac).

The reading of fractions is important and $\frac{7}{10}$ for instance should be read as 'seven tenths'. Other simple fractions should be recognised, such as $\frac{3}{4}$ and $2\frac{4}{5}$.

Equivalent fractions.

The key to understanding fractions is **equivalent fractions**. With a good understanding of the idea of equivalence and one or two further ideas, most problems in fractions may be solved easily and quickly. This idea is developed further in this module.

Equivalent fractions are fractions that look different, but have the same value, e.g. $\frac{3}{6}$ and $\frac{1}{2}$. Children should be able to establish equivalence by sorting a number of items into different groups and should know some simple equivalencies such as $\frac{4}{6}$ equals $\frac{2}{3}$.

Cancelling is the process of **dividing both the numerator and denominator** by the **same number** in order to simplify the fraction.

$$\text{E.g. } \frac{12}{18} \left(\div 6 \right) = \frac{2}{3}$$

Lecnacing is the process of **multiplying both the numerator and denominator** by the **same number** in order to increase either of them. This is normally done, for example, when adding two fractions. **Lecnac** is the word **cancel** written backwards to represent the idea of a reverse function.

$$\text{E.g. } \frac{3}{4} \left(\times 7 \right) = \frac{21}{28}$$

Another very important idea is that a fraction is really a division sum in disguise. For example, $\frac{3}{4}$ means '3 divided by 4'.

It is good practice to make up to the next whole number. E.g. What must be added to $5\frac{9}{12}$ to make 6? This reinforces the idea of putting fractions in order, which itself is a very important skill.

1. Put numbers in the boxes to make **equivalent fractions**.

a) $\frac{10}{100} = \frac{\square}{10}$

b) $\frac{20}{\square} = \frac{2}{10}$

c) $\frac{30}{100} = \frac{\square}{10}$

d) $\frac{\square}{100} = \frac{5}{10} = \frac{1}{\square}$

e) $\frac{25}{\square} = \frac{1}{4}$

f) $\frac{75}{100} = \frac{\square}{4}$

2. Put **one word** in the spaces to complete the sentences.

- a) One quarter is a half of a _____ .
- b) One sixth is a half of one _____ .
- c) One eighth is one _____ of a quarter.
- d) One _____ is one half of a fifth.
- e) One twentieth is half of one _____ .
- f) Ten hundredths is the same as one _____ .
- g) Two fifths is the same as four _____ .
- h) Cancelling is when the numerator and denominator of a fraction are _____ by the same number.
- i) Lecnacing is when the numerator and denominator of a fraction are _____ by the same number.
- j) If two fractions look different, but are really the same, they are _____ fractions.
- k) A fraction with a whole number and a fraction is called a _____ number.

1. Put numbers in the boxes to make **equivalent fractions**.

a) $\frac{90}{100} = \frac{9}{\square}$ b) $\frac{2}{5} = \frac{\square}{10}$ c) $\frac{45}{50} = \frac{\square}{10}$

d) $\frac{2}{12} = \frac{14}{\square} = \frac{\square}{6}$ e) $\frac{25}{60} = \frac{5}{\square}$ f) $\frac{7}{28} = \frac{\square}{4}$

2. Put **one word** in the spaces to complete the sentences.

- a) One tenth is a half of a _____ .
- b) One twelfth is a half of one _____ .
- c) One twentieth is one _____ of a tenth.
- d) One _____ is one half of a sixth.
- e) One eighth is half of one _____ .
- f) Two twentieths is the same as one _____ .
- g) Two fifths is the same as six _____ .
- h) Cancelling is when the _____ and denominator of a fraction are divided by the same number.
- i) Cancelling is when the numerator and _____ of a fraction are multiplied by the same number.
- j) A fraction that has a small denominator and a bigger numerator is called an _____ fraction.
- k) A fraction that has a small numerator and a bigger denominator is called a _____ fraction.

1. Put numbers in the boxes to make **equivalent fractions**.

a) $\frac{4}{7} = \frac{8}{\square}$

b) $\frac{6}{\square} = \frac{3}{15}$

c) $\frac{\square}{40} = \frac{8}{20}$

d) $\frac{\square}{16} = \frac{6}{8} = \frac{\square}{4}$

e) $\frac{9}{\square} = \frac{1}{4}$

f) $\frac{14}{22} = \frac{7}{\square}$

2. Put **words** in the spaces to complete the sentences.

a) One sixth is a third of a _____ .

b) One twentieth is a half of one _____ .

c) One ninth is one _____ of a third.

d) One _____ is one half of a quarter.

e) Four twentieths is the same as _____ tenths.

f) A hundred hundredths is the same as one _____ .

g) Five fifths is the same as one _____ .

h) Cancelling is when the _____ and _____ of a fraction are divided by the same number.

i) _____ is when the numerator and denominator of a fraction are multiplied by the same number.

j) $\frac{1}{2}$, $\frac{2}{4}$ and $\frac{3}{6}$ are all _____ fractions.

k) If I eat $\frac{3}{8}$ of a cake, there are _____ eighths left.

1. Change these improper fractions to mixed numbers.

E.g. $\frac{12}{5} = 2\frac{2}{5}$

a) $\frac{20}{15}$ b) $\frac{9}{4}$ c) $\frac{13}{3}$ d) $\frac{24}{6}$ e) $\frac{15}{10}$ f) $\frac{10}{3}$ g) $\frac{17}{15}$

2. Change these mixed numbers to improper fractions.

E.g. $3\frac{4}{5} = \frac{19}{5}$

a) $6\frac{2}{5}$ b) $4\frac{3}{4}$ c) $2\frac{9}{10}$ d) $7\frac{3}{5}$ e) $3\frac{2}{3}$ f) $6\frac{1}{5}$ g) $4\frac{2}{7}$

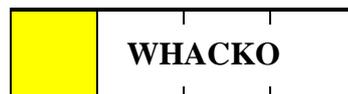
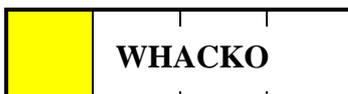
Do you remember that a fraction is like a division sum?



Yes, I do.



We can divide three Whacko bars between four people by dividing each bar into four pieces, like this:



Each person has a quarter from the first bar, a quarter from the second bar and a quarter from the third bar. They have **three quarters** of a bar each!

Can you see that $3 \div 4 = \frac{3}{4}$?

Yes, I can. Oops!
HEEEEEELPPPP!!!

1. Write these fractions in words. E.g. $\frac{5}{8}$ is **five eighths**.

a) $\frac{3}{5}$ b) $\frac{7}{9}$ c) $\frac{4}{6}$ d) $4\frac{9}{12}$ e) $3\frac{7}{20}$ f) $15\frac{4}{9}$ g) $30\frac{25}{100}$

2. Write these fractions in figures. E.g. Six and three eighths is $6\frac{3}{8}$.

- a) Four ninths. b) Twelve hundredths. c) Fifteen hundredths.
d) Three and nine twentieths. e) Seven and six tenths.

3. a) What do you need to add to $3\frac{7}{12}$ to make 4 ?

b) What do you need to add to $8\frac{3}{4}$ to make 9 ?

c) What do you need to add to $6\frac{2}{7}$ to make 7 ?

d) What do you need to add to $12\frac{85}{100}$ to make 13 ?

4. Can you work these out?

a) $6 - \frac{7}{10}$ b) $9 - \frac{3}{4}$ c) $10 - \frac{8}{9}$ d) $1 - \frac{15}{20}$

Easy. Do you have any hard ones?



Yes, certainly. If a Maths Rat takes two hours to plough a field, how long would it take a camel to plough the same field?



1. Write these fractions in words. E.g. $\frac{7}{9}$ is **seven ninths**.

a) $\frac{6}{7}$ b) $\frac{7}{20}$ c) $\frac{5}{12}$ d) $10\frac{12}{20}$ e) $9\frac{10}{100}$ f) $14\frac{1}{3}$ g) $25\frac{16}{20}$

2. Write these fractions in figures. E.g. Four and two fifths is $4\frac{2}{5}$.

a) Seven eighths. b) Fourteen twentieths. c) Seven tenths.
d) Five and three quarters. e) Ten and seven hundredths.

3. a) What do you need to add to $11\frac{3}{4}$ to make 12 ?

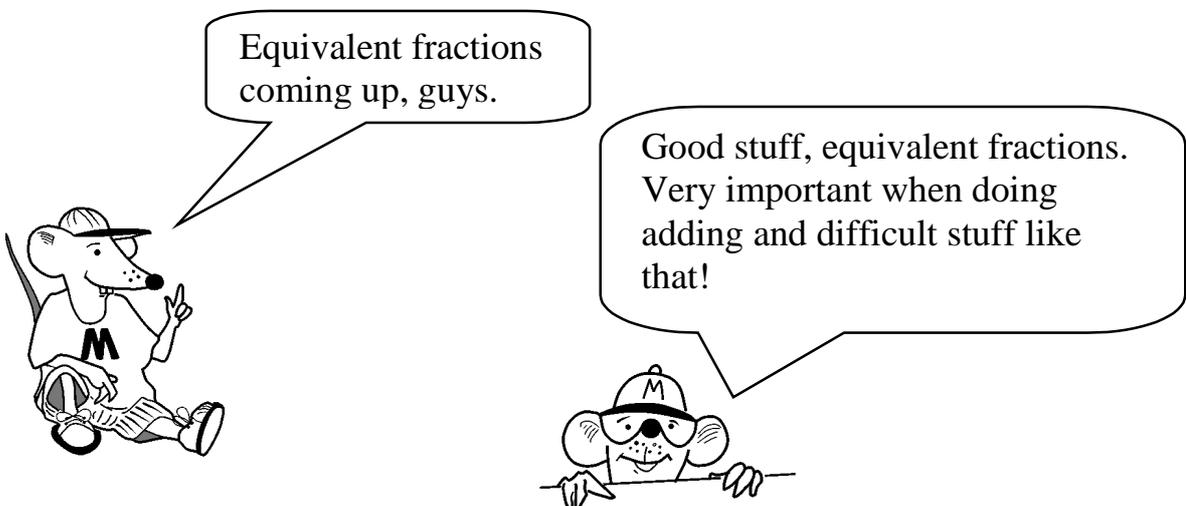
b) What do you need to add to $5\frac{1}{8}$ to make 6 ?

c) What do you need to add to $9\frac{8}{12}$ to make 10 ?

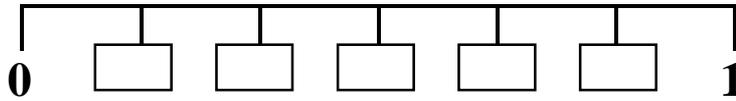
d) What do you need to add to $21\frac{16}{100}$ to make 22 ?

4. Can you work these out?

a) $9 - \frac{9}{10}$ b) $32 - \frac{5}{8}$ c) $16 - \frac{6}{12}$ d) $2 - \frac{65}{100}$



1.



Here is a number line from **0** to **1**. Can you put these fractions in the boxes in the correct order?

$$\frac{1}{2} \quad \frac{5}{6} \quad \frac{1}{3} \quad \frac{1}{6} \quad \frac{2}{3}$$

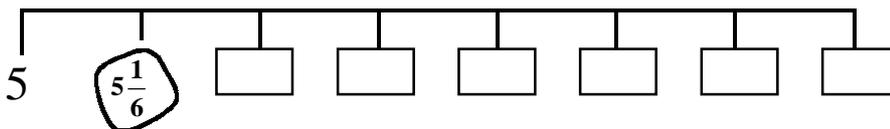
2. Say which of these are **true** and which are **false**:

- a) One third is **more** than a sixth.
- b) Two thirds is **less** than one half.
- c) Six sixths is **the same as** one whole one.
- d) One sixth is **more** than one half.
- e) Two thirds is the **same** as four sixths.
- f) Two thirds is **less** than one whole.

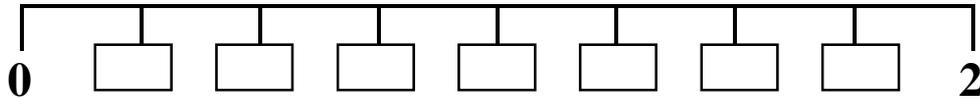
- g) One third is **more** than zero and **less** than a half.
- h) Two thirds is **less** than two wholes and **more** than a half.
- i) One and a third is **more** than one and **less** than two.
- j) Two and two thirds is **less** than four wholes.

3. Can you count forwards and backwards from 5 in sixths?

Count **forward** from **5** in **sixths** and write the numbers in the boxes.
One has been done for you.



1.



Here is a number line from **0** to **2**. Can you put these fractions in the boxes in the correct order?

$$1\frac{1}{4} \quad \frac{3}{4} \quad 1\frac{1}{2} \quad 1\frac{3}{4} \quad 1 \quad \frac{1}{2} \quad \frac{1}{4}$$

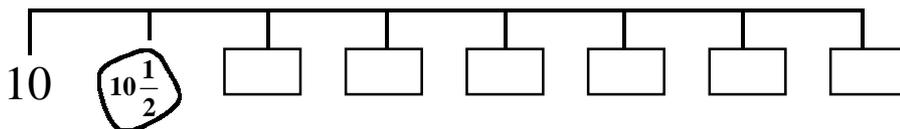
2. Say which of these are **true** and which are **false**:

- a) One half is **more** than a quarter.
- b) Three quarters is **less** than one half.
- c) Three quarters is **more** than a whole one.
- d) Three quarters is **more** than one quarter.
- e) Two quarters is the **same** as one half.
- f) Two quarters is **less** than one quarter.

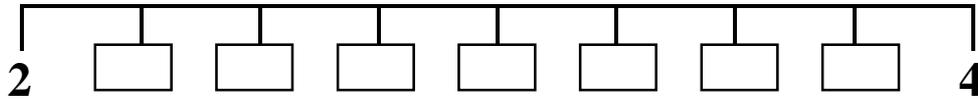
- g) One quarter is **more** than zero and **less** than a half.
- h) Three quarters is **less** than two wholes and **more** than a half.
- i) One and a half is **more** than one and **less** than two.
- j) Two and three quarters is **less** than four wholes.

3. Can you count forwards and backwards from 10 in halves?

Count **forward** from **10** in **halves** and write the numbers in the boxes.
One has been done for you.



1.



Here is a number line from 2 to 4. Can you put these fractions in the boxes in the correct order?

$$3\frac{1}{4} \quad 3\frac{3}{4} \quad 2\frac{3}{4} \quad 3\frac{1}{2} \quad 3 \quad 2\frac{1}{2} \quad 2\frac{1}{4}$$

2. Say which of these are **true** and which are **false**:

a) $\frac{1}{2}$ is **more** than $\frac{3}{4}$.

b) $\frac{3}{4}$ is **more** than $\frac{1}{4}$.

c) $\frac{3}{4}$ is **more** than a whole one.

3. Think about the **number line** when you answer these questions.

a) What are the closest whole numbers to $4\frac{3}{4}$?

b) What are the closest whole numbers to $3\frac{1}{4}$?

c) What are the closest whole numbers to $9\frac{3}{4}$?

d) Which is bigger, $8\frac{1}{4}$ or $8\frac{3}{4}$

e) Which is bigger, $6\frac{3}{4}$ or $7\frac{1}{4}$

Answers**Page 3**

1. a) 1 b) 100 c) 3 d) 50, 2 e) 100 f) 3
 2. a) half b) third c) half d) tenth e) tenth f) tenth
 g) tenths h) divided i) multiplied j) equivalent k) mixed

Page 4

1. a) 10 b) 4 c) 9 d) 84, 1 e) 12 f) 1
 2. a) fifth b) sixth c) half d) twelfth e) quarter f) tenth
 g) fifteenths h) numerator i) denominator j) improper k) proper

Page 5

1. a) 14 b) 30 c) 16 d) 12, 3 e) 36 f) 11
 2. a) half b) tenth c) third d) eighth e) two f) whole
 g) whole h) numerator, denominator i) lecnacing j) equivalent k) five

Page 6

1. a) $1\frac{5}{15}$ b) $2\frac{1}{4}$ c) $4\frac{1}{3}$ d) 4 e) $1\frac{5}{10}$ f) $3\frac{1}{3}$ g) $1\frac{2}{15}$
 Fractions may be cancelled.
 2. a) $\frac{32}{5}$ b) $\frac{19}{4}$ c) $\frac{29}{10}$ d) $\frac{38}{5}$ e) $\frac{11}{3}$ f) $\frac{31}{5}$ g) $\frac{30}{7}$

Page 7

1. a) Three fifths b) Seven ninths c) Four sixths d) Four and nine twelfths
 e) Three and seven twentieths f) Fifteen and four ninths
 g) Thirty and twenty five hundredths.
 2. a) $\frac{4}{9}$ b) $\frac{12}{100}$ c) $\frac{15}{100}$ d) $3\frac{9}{20}$ e) $7\frac{6}{10}$
 3. a) $\frac{5}{12}$ b) $\frac{1}{4}$ c) $\frac{5}{7}$ d) $\frac{15}{100}$
 4. a) $5\frac{3}{10}$ b) $8\frac{1}{4}$ c) $9\frac{1}{9}$ d) $\frac{5}{20}$

Joke: Camels cannot drive tractors!

Answers**Page 8**

1. a) Six sevenths b) Seven twentieths c) Five twelfths
 d) Ten and twelve twentieths e) Nine and ten hundredths
 f) Fourteen and one third g) Twenty five and sixteen twentieths.
2. a) $\frac{7}{8}$ b) $\frac{14}{20}$ c) $\frac{7}{10}$ d) $5\frac{3}{4}$ e) $10\frac{7}{100}$
3. a) $\frac{1}{4}$ b) $\frac{7}{8}$ c) $\frac{4}{12}$ d) $\frac{84}{100}$
4. a) $8\frac{1}{10}$ b) $31\frac{3}{8}$ c) $15\frac{6}{12}$ d) $1\frac{35}{100}$

Page 9

1. 0, $\frac{1}{6}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, $\frac{5}{6}$, 1
2. a) true b) false c) true d) false e) true f) true
 g) true h) true i) true j) true
3. 5, $5\frac{1}{6}$, $5\frac{2}{6}$, $5\frac{3}{6}$, $5\frac{4}{6}$, $5\frac{5}{6}$, 6, $6\frac{1}{6}$

Page 10

1. 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$
2. a) true b) false c) false d) true e) true f) false
 g) true h) true i) true j) true
3. 10, $10\frac{1}{2}$, 11, $11\frac{1}{2}$, 12, $12\frac{1}{2}$, 13, $13\frac{1}{2}$

Page 11

1. 2, $2\frac{1}{4}$, $2\frac{1}{2}$, $2\frac{3}{4}$, 3, $3\frac{1}{4}$, $3\frac{1}{2}$, $3\frac{3}{4}$
2. a) false b) true c) false
3. a) 4 and 5 b) 3 and 4 c) 9 and 10 d) $8\frac{3}{4}$ e) $7\frac{1}{4}$