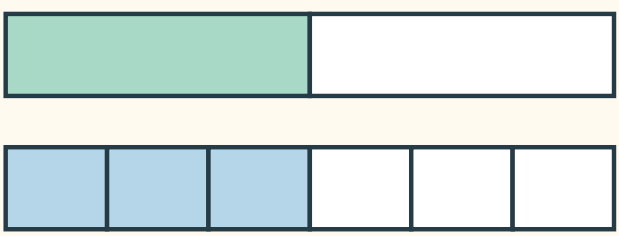
MATHS FIELD GUIDE · GRADE 5

Rename fractions without changing their value

OPENING PROBLEM

Do the equal-length bars agree?



1/2

3/6

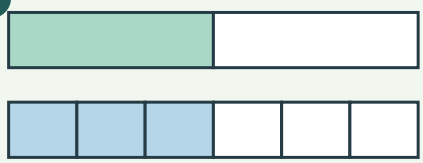
02 Name the fraction by its whole and its unit
03 Rules and worked cases
04 Compare two seed plots
05 Compare the models
06 Read a fraction as a number
07 Check your reasoning

ILLUSTRATED PROBLEM SHEET

Name the fraction by its whole and its unit

When numerator and denominator scale together, the represented fraction stays fixed.

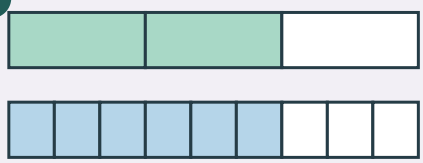
1



Do the equal-length bars agree?

Yes. Splitting each half into three pieces gives three shaded sixths.

2



Which multiplier connects the labels?

Multiply both numbers by three. The strip keeps the same length.

3

18/24
↓
divide both by 6
↓
3/4

Why divide by their greatest common factor?

It reaches lowest terms in one step. Three and four share no positive factor beyond one.

4

3/5 and 5/8
↓
3 × 8 = 24
↓
5 × 5 = 25

Which is larger?

Write both in fortieths. 25/40 exceeds 24/40, so 5/8 is larger.

6/8 = 3/4
divide numerator and denominator by 2.

6/10 = 3/5
the same numerator did not guarantee the same fraction.

CHAPTER PROBLEM

Is 2/5 equal to 2/10? Why?

No. The parts are smaller but the selected count did not double.

MATHS REFERENCE · GRADE 5

Rename fractions without changing their value

Equivalent fractions have the same value.

A common denominator gives fractions the same-sized unit so we can compare or combine them.

Cases to recognise

Situation	What to do and why
7/12 compared with 3/5	In sixtieths they are 35/60 and 36/60. Three fifths is larger.
18/24 in simplest form	Divide both by six: 3/4.

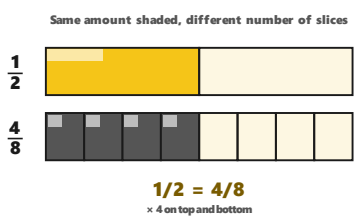
Read the model

Split each part more finely

Half of a strip can also be two quarters or four eighths.

More dividing lines do not change the shaded amount or the whole.

1/2 and 4/8



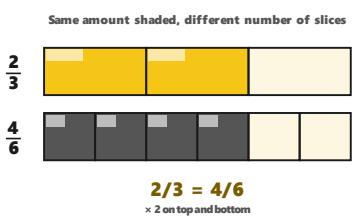
Equivalent fractions

Change both counts together

For 2/3 = 4/6, each third is split into two sixths.

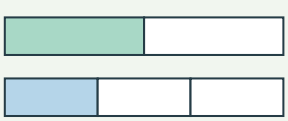
Both the total part count and selected part count double. Changing only the denominator would change the value.

2/3 and 4/6



Equivalent fractions

equivalent Equal in value.
common denominator A shared fraction-unit name.
simplify Write an equivalent fraction with smaller whole-number counts.



Add the shaded amounts. What common piece works?

Sixths: 3/6 + 2/6 = 5/6.

WORKED INVESTIGATION

Compare two seed plots

Two equal garden plots have 3/4 and 5/6 of their areas planted. Use twelve equal parts in each plot to compare them.

Look at this part	What it tells you
3/4	9/12
5/6	10/12
Difference	1/12

Work it through

Each quarter breaks into three twelfths and each sixth into two. The planted area stays fixed while the count changes.

Catch the mistake

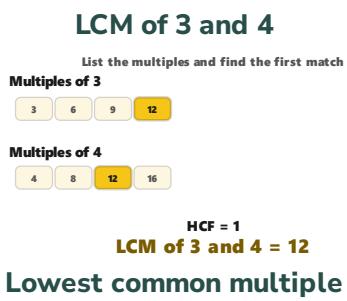
Comparing only 5 and 3 ignores the number of equal pieces per whole. Keep the units identical first.

Compare the cases

Find a shared unit

Thirds and quarters can both be renamed as twelfths.

1/3 = 4/12 and 1/4 = 3/12. Twelve is a common multiple of three and four.



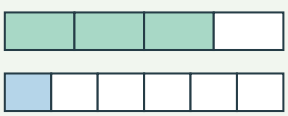
A shared unit helps comparison

Four twelfths is greater than three twelfths.

So 1/3 is greater than 1/4 of the same whole. Compare amounts, not just the written digits.

Change one condition

If the plots differ in size, the fractions still compare the shares but do not by themselves tell which planted area is larger.



How much greater is the first amount?

Use twelfths. 9/12 − 2/12 = 7/12.

RENAME FRACTIONS WITHOUT CHANGING THEIR VALUE

Compare the models

Simplify by regrouping

Six eighths can be regrouped into three quarters.

Divide the numerator and denominator by the same non-zero common factor. The amount remains equal.

The whole must stay clear

Half of a small cake may be smaller than one third of a large cake.

For a direct part-of-whole picture comparison, use equal-sized wholes.

Try a paper explanation

Shade two thirds of a rectangle. Split every third into two equal pieces.

Now count four shaded sixths. Explain what changed and what stayed the same.

Explain your reasoning

Rename 3/4 in twelfths. Explain both changes.

9/12. Each quarter is split into three pieces, so both counts multiply by three.

Two more worked cases

Situation	Reasoning
__ / 35 = 3/7	Multiply numerator and denominator by five. The missing number is 15.
Is 2/3 halfway between 1/2 and 1?	Write twelfths: 6, 8 and 12 twelfths. Equal gaps meet at 9/12 instead.

1⅓ + ¾
↓
1 + 4/12 + 9/12
↓
2 1/12

Why does the whole number increase?

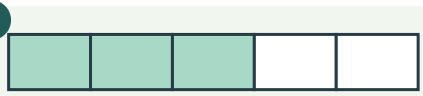
Thirteen twelfths can be regrouped as a whole and one twelfth.

ILLUSTRATED PROBLEM SHEET

Read a fraction as a number

Equal parts of one whole set the unit. Count those units from zero.

1

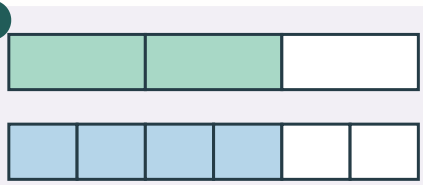


3 fifths

How much is shaded?

Three fifths. The five describes the pieces in the whole.

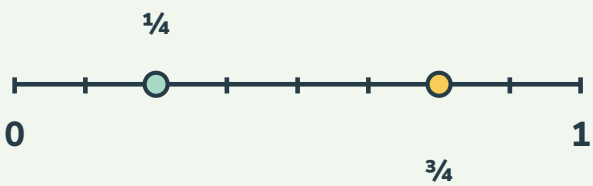
2



Which strip has more shaded?

They cover the same length. Each third splits into two sixths.

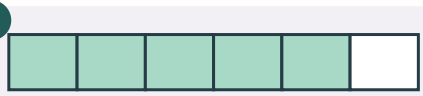
3



How far apart are the marks?

Two quarter-steps, or one half.

4



How much more makes one whole?

One sixth. Five sixths and one sixth fill the strip.

Four fifths and one fifth
one whole.

Four fifths minus one fifth
three fifths.

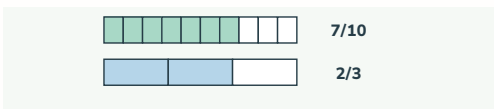
CHAPTER PROBLEM

Which is greater: 2/3 or 3/4? Use a shared unit.

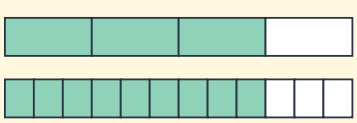
3/4. Eight twelfths is less than nine twelfths.

QUESTION BANK · FOLD OR COVER THE RIGHT COLUMN

Check your reasoning

Try the problem	Solution and reasoning
01 If half a small cake and half a big cake have the same fraction label, must the pieces weigh the same?	No. Equal fractions describe shares of their own wholes.
02 Which is larger for the same whole, one third or one sixth?	One third covers two sixths, so it is larger.
03 Which is larger, 7/10 or 2/3? Give the exact difference. 	In thirtieths these are 21/30 and 20/30. Seven tenths exceeds two thirds by 1/30.
04 Find a fraction between 2/3 and 3/4.	In twenty-fourths they are 16/24 and 18/24. Choose 17/24.
05 Are 12/18 and 18/27 equal?	Both simplify to 2/3. The amount in each reference whole is the same fraction.

Read the same strip two ways



Shade three of four equal parts. Split each part into three smaller pieces. Nine of the twelve new pieces are shaded.

Cross-check by simplifying 9/12. Dividing both numbers by three returns 3/4. The whole strip has stayed the same size.

2¼ − ⅔
↓
1 + 15/12 − 8/12
↓
1 7/12

Where did the extra twelve twelfths come from?

One of the two wholes was exchanged. Total value stays fixed.

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