GRADE 5

Fractions

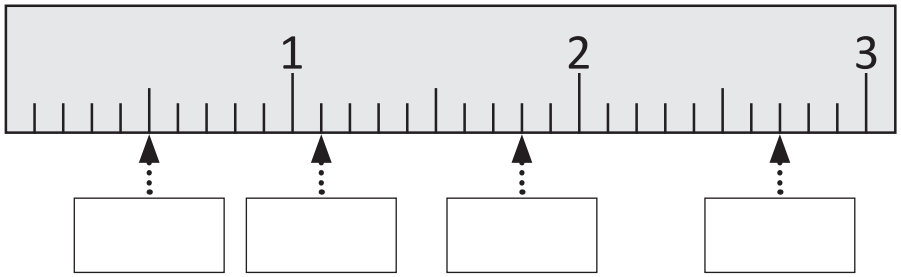
WORKSHEETS

Mathletics

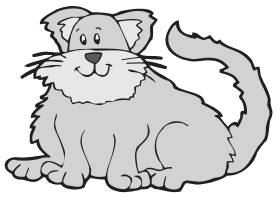
love learning.

Fractions and decimals – writing tenths as decimals

1 **Label this section of a ruler as centimeters in decimals. The first box has been done for you. (Note: this diagram has been enlarged so you can see the lines clearly.)**



2 **These 3 cats were the finalists in the Fattest Cat Competition. Fill in the blanks below:**



Felix – 12.2 kg

Leroy – 11.9 kg

Mosley – 11.5 kg

a _____ is heavier than _____ by $\frac{3}{10}$ of a kilogram.

b _____ is heavier than _____ by $\frac{4}{10}$ of a kilogram.

c _____ is lighter than _____ by $\frac{7}{10}$ of a kilogram.

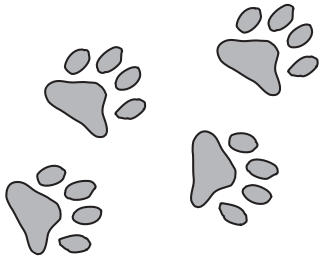
3 **Write the mass of each cat and < or > to make the sentence true.**

a Felix ☐ Leroy

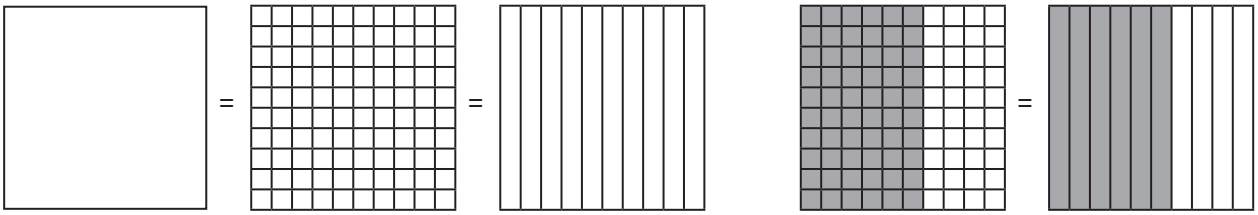
b Mosley ☐ Felix

4 **The combined mass of which two cats is 23.7 kg?**

_____ and _____



Fractions and decimals – writing tenths as decimals



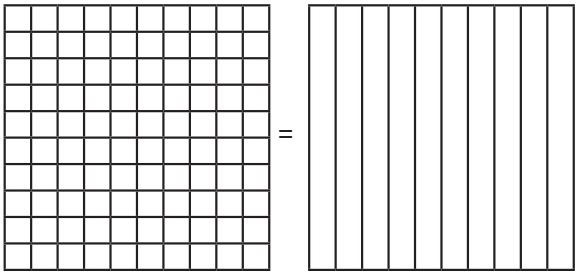
1 whole | 100 hundredths | 10 tenths

$\frac{60}{100}$ is the same amount as $\frac{6}{10}$.

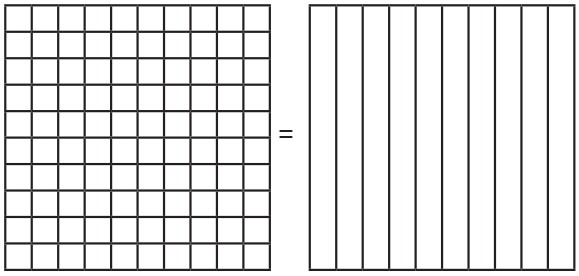
We can divide a whole into one hundred parts. These are called hundredths.
Hundredths are made up of 10 lots of tenths.

5 **Show how these amounts are the same:**

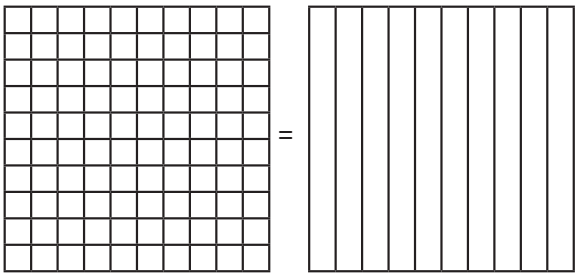
a $\frac{80}{100}$ is the same amount as $\frac{8}{10}$.



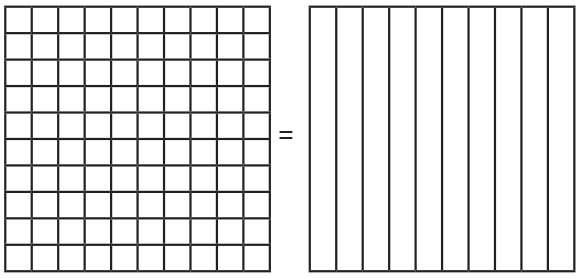
b $\frac{20}{100}$ is the same amount as $\frac{2}{10}$.



c $\frac{30}{100}$ is the same amount as $\frac{3}{10}$.

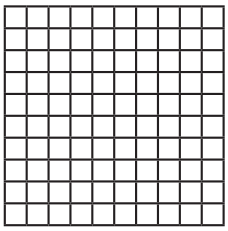


d $\frac{70}{100}$ is the same amount as $\frac{7}{10}$.

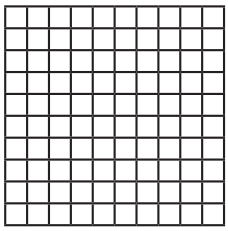


6 **Shade these amounts on the hundred grids:**

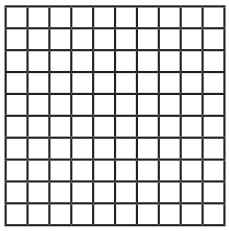
a $\frac{5}{10}$



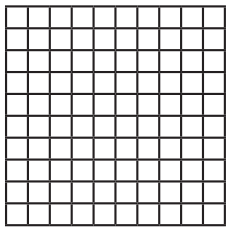
b $\frac{9}{10}$



c $\frac{10}{10}$

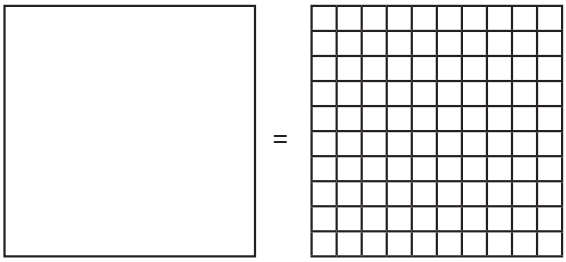


d $\frac{1}{10}$



Types of fractions – introducing hundredths

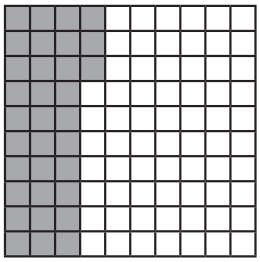
We can divide a whole into one hundred parts. These are called hundredths.



1 whole = 100 hundredths

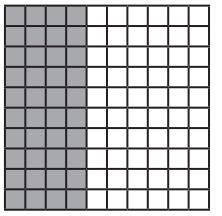
This hundred grid shows 33 out of 100.

As a fraction it is $\frac{33}{100}$.



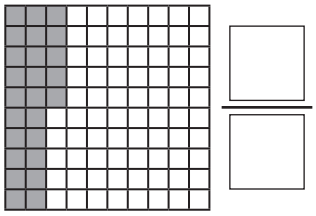
1 **Write what part out of 100 the shaded part of the grid shows and record it as a fraction:**

a ☐ **out of** ☐



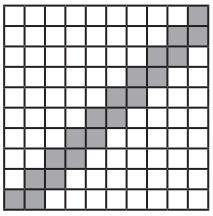
$\frac{\square}{\square}$

b ☐ **out of** ☐



$\frac{\square}{\square}$

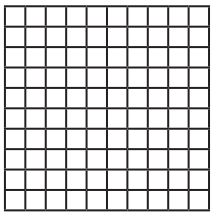
c ☐ **out of** ☐



$\frac{\square}{\square}$

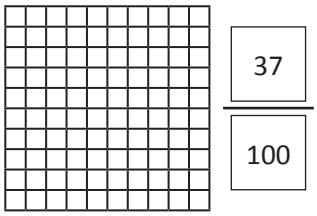
2 **Shade these grids according to the fraction:**

a



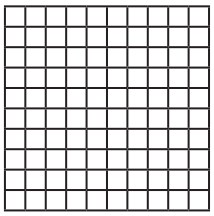
$\frac{26}{100}$

b



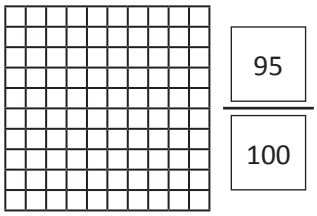
$\frac{37}{100}$

c



$\frac{75}{100}$

d



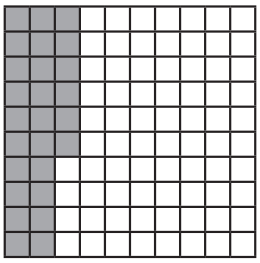
$\frac{95}{100}$

3 **Order the fractions from question 2 from smallest to largest:**

$\frac{\square}{\square}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$

Types of fractions – hundredths as decimals

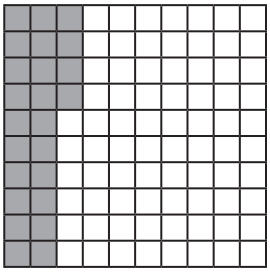
This diagram shows 26 hundredths shaded or $\frac{26}{100}$.



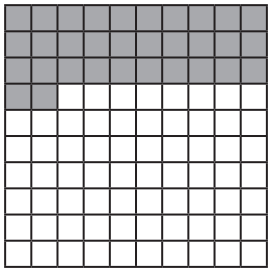
Fractions can be written as decimals.
As a decimal, this amount is written as:

Ones		Tenths	Hundredths
0	•	2	6

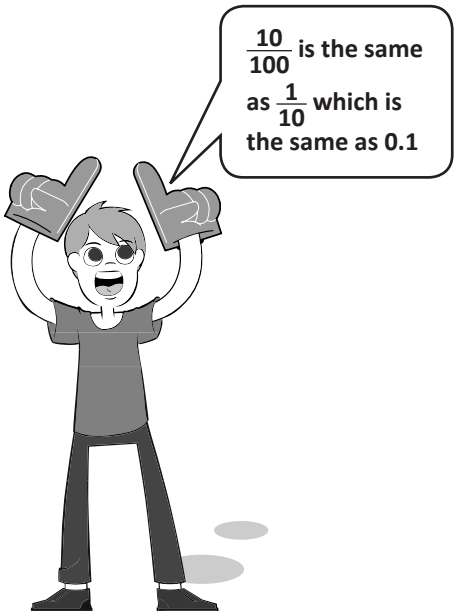
1 **Label each hundredth grid picture with the fraction and decimal:**



a $\frac{\square}{\square}$ = ☐



b $\frac{\square}{\square}$ = ☐



2 **Color this grid of stars according to the directions below:**

a Orange $\frac{22}{100}$

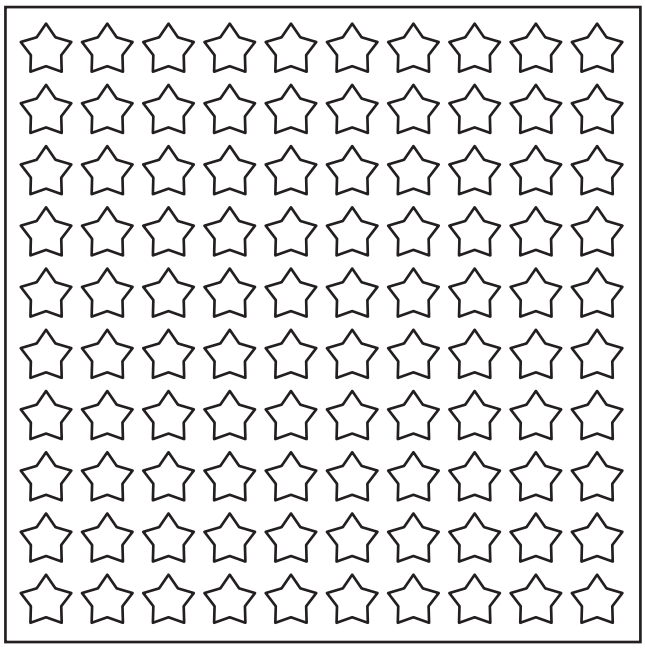
b Blue $\frac{12}{100}$

c Green $\frac{9}{100}$

d Pink $\frac{25}{100}$

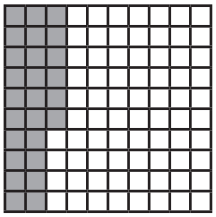
e Yellow 0.15

f Red 0.17



Fractions and decimals – relating tenths, hundredths, and decimals

This diagram shows 26 hundredths shaded or $\frac{26}{100}$.

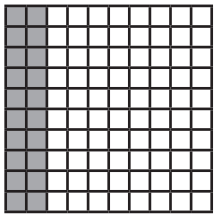


Fractions can be written as decimals.
As a decimal, this amount is written as:

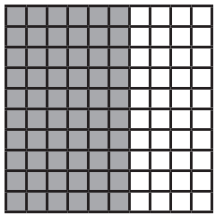
Ones		Tenths	Hundredths
0	•	2	6

1 **Complete this table to show the amounts as tenths, hundredths, and decimals:**

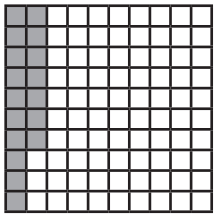
a Tenths ☐/☐ Hundredths ☐/☐ Decimal ☐



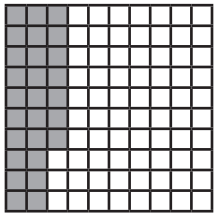
b Tenths ☐/☐ Hundredths ☐/☐ Decimal ☐



c Hundredths ☐/☐ Decimal ☐



d Hundredths ☐ Decimal ☐



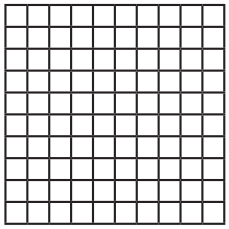
2 **Show the place value of these decimals by writing them in the table:**

		Hundreds	Tens	Ones		Tenths	Hundredths
a	2.6				•		
b	3.76				•		
c	112.6				•		
d	45.67				•		

Fractions and decimals – relating tenths, hundredths, and decimals

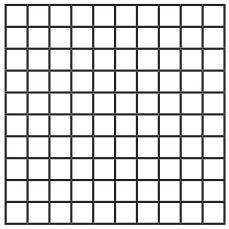
3 **Shade the fractions on the grid and show them as hundredths and decimals:**

a $\frac{1}{2}$



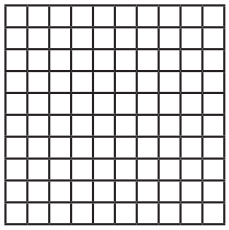
$= \frac{\square}{100} = 0.\square$

b $\frac{1}{4}$



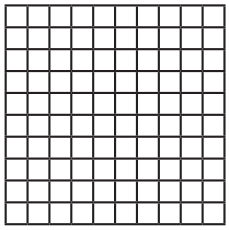
$= \frac{\square}{100} = 0.\square$

c $\frac{1}{5}$



$= \frac{\square}{100} = 0.\square$

d $\frac{1}{10}$



$= \frac{\square}{100} = 0.\square$

4 **Express these common fractions as hundredths and as decimals:**

a $\frac{1}{2} = \frac{\square}{100} = 0.\square$

b $\frac{4}{5} = \frac{\square}{100} = 0.\square$

c $\frac{4}{10} = \frac{\square}{100} = 0.\square$

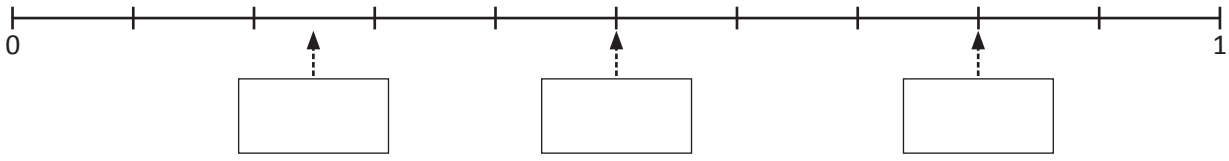
d $\frac{3}{4} = \frac{\square}{100} = 0.\square$

e $\frac{2}{4} = \frac{\square}{100} = 0.\square$

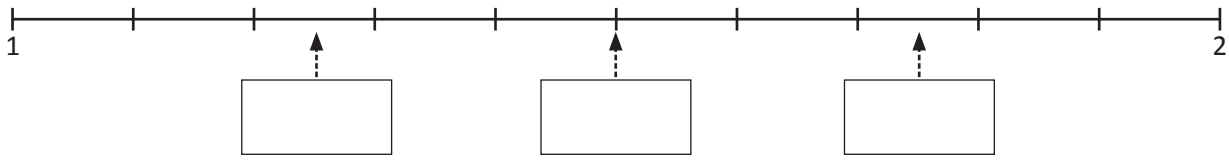
f $\frac{5}{10} = \frac{\square}{100} = 0.\square$

5 **Show where the decimals fit on the number lines:**

a 0.5 0.25 0.8



b 1.5 1.25 1.75



Fractions – simplifying fractions

These fractions are all equivalent to one half: $\frac{1}{2}$ $\frac{2}{4}$ $\frac{6}{12}$ $\frac{75}{150}$ $\frac{3,455}{6,910}$

Which is the simplest? $\frac{1}{2}$

A fraction is in its simplest form when 1 is the only number that both numbers can be divided by.
We simplify fractions to make reading and working with fractions easier.

1 **Circle the simplest fraction in each group:**

a $\frac{1}{2}$ $\frac{2}{4}$ $\frac{50}{100}$

b $\frac{33}{99}$ $\frac{3}{9}$ $\frac{1}{3}$

c $\frac{25}{100}$ $\frac{1}{4}$ $\frac{5}{20}$

d $\frac{2}{3}$ $\frac{6}{9}$ $\frac{16}{24}$

To find the simplest fraction, we divide both the numerator and the denominator by the same number.
It makes sense for this to be the biggest number we can find so we don't have to keep dividing.
This number is called the **Greatest Common Factor (GCF)**.

Look at: $\frac{6}{18} = \frac{?}{?}$ What is the biggest number that goes into both 6 and 18?

6 is the biggest number that goes into 18 and 6.

$\frac{6 \div 6}{18 \div 6} = \frac{1}{3}$

2 **Find the greatest common factor and then simplify:**

a $\frac{15}{20}$ GCF is ☐ → $\frac{15 \div \square}{20 \div \square} = \frac{\square}{\square}$

b $\frac{9}{30}$ GCF is ☐ → $\frac{9 \div \square}{30 \div \square} = \frac{\square}{\square}$

c $\frac{16}{24}$ GCF is ☐ → $\frac{16 \div \square}{24 \div \square} = \frac{\square}{\square}$

d $\frac{12}{36}$ GCF is ☐ → $\frac{12 \div \square}{36 \div \square} = \frac{\square}{\square}$

3 **Wally says he has simplified these fractions as far as he can. Is he right? If not, find the simplest fraction:**

a $\frac{16}{20} \rightarrow \frac{8}{10}$

b $\frac{50}{100} \rightarrow \frac{25}{50} \rightarrow \frac{5}{10}$

c $\frac{24}{36} \rightarrow \frac{4}{6}$

d $\frac{15}{20} \rightarrow \frac{3}{4}$

Fractions – simplifying fractions

4 **Write the following fractions in their simplest form:**

a $\frac{28}{49} = \frac{\square}{\square}$ **b** $\frac{12}{20} = \frac{\square}{\square}$ **c** $\frac{24}{42} = \frac{\square}{\square}$ **d** $\frac{13}{39} = \frac{\square}{\square}$

e $\frac{32}{36} = \frac{\square}{\square}$ **f** $\frac{9}{15} = \frac{\square}{\square}$ **g** $\frac{16}{48} = \frac{\square}{\square}$ **h** $\frac{15}{55} = \frac{\square}{\square}$

If you are not sure what the GCF is, guess, check, and improve is a useful strategy. Try your choice out and then look at your new fraction.

Could it be any simpler? Is 1 the ONLY number that could go into both the numerator and the denominator?

5 **Solve the following problems. Write your answers in the simplest form:**

a Luke scored $\frac{16}{20}$ on a test. What fraction was incorrect? $\frac{\square}{\square}$

b Marika scored $\frac{12}{20}$ on the same test. What fraction did she get right? $\frac{\square}{\square}$

c 25 out of the 75 kids in 6th grade ride their bikes to school. What fraction does this represent? $\frac{\square}{\square}$

d Out of the 26 students in 6F, 14 rate math as their favorite subject. What fraction is this? $\frac{\square}{\square}$

e What fraction did not choose math as their favorite subject? $\frac{\square}{\square}$

6 **Color and match the fractions on the bottom row with their simplest form:**

$\frac{1}{2}$	$\frac{2}{3}$	$\frac{3}{5}$	$\frac{1}{9}$	$\frac{1}{4}$	$\frac{3}{4}$
$\frac{15}{20}$	$\frac{25}{100}$	$\frac{9}{81}$	$\frac{60}{100}$	$\frac{12}{18}$	$\frac{40}{80}$

Improper fractions and mixed numbers

An improper fraction has a bigger numerator (top) than denominator (bottom).

$\frac{3}{2}$ ← Improper fractions → $\frac{5}{4}$

numerator > denominator

Mixed numbers have a whole number and a proper fraction.

$1\frac{1}{2}$ ← Mixed numbers → $1\frac{1}{4}$

a "mix" of whole numbers and proper fractions

Mixed numbers are simplified improper fractions.

Simplify these:

Improper fractions to mixed numbers

(i) $\frac{5}{3}$

$\frac{5}{3} = 5 \div 3$ $\quad \frac{\text{numerator}}{\text{denominator}} = \text{numerator} \div \text{denominator}$

$= 1 \text{ r } 2$

$= 1\frac{2}{3}$ (remainder: 2; same denominator: 3; Whole number answer: 1)

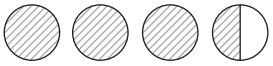
picture form

(ii) $\frac{14}{4}$

$\frac{14}{4} = \frac{7}{2} = 7 \div 2$ Simplify if possible

$= 3 \text{ r } 1$

$= 3\frac{1}{2}$ (remainder: 1; same simplified denominator: 2; Whole number answer: 3)



Mixed numbers to improper fractions

(i) $1\frac{2}{3}$

$1\frac{2}{3} = \frac{3 \times 1 + 2}{3}$

$= \frac{5}{3}$ ← same denominator

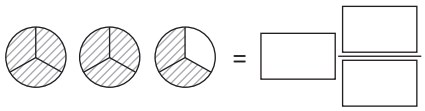
(ii) $2\frac{1}{5}$

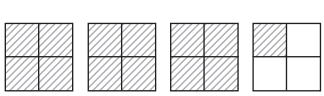
$2\frac{1}{5} = \frac{5 \times 2 + 1}{5}$

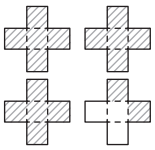
$= \frac{11}{5}$ ← same denominator

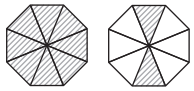
Improper fractions and mixed numbers

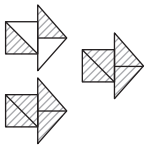
1 **Write the mixed numbers represented by these shaded diagrams:**

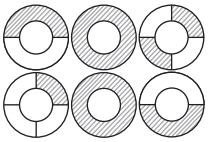
a  = ☐ ☐/☐

b  = ☐ ☐/☐

c  = ☐ ☐/☐

d  = ☐ ☐/☐

e  = ☐ ☐/☐

f  = ☐ ☐/☐

Make sure you write the fraction in simplest form where possible.

2 **Simplify these improper fractions by writing them as mixed numbers.**

a $\frac{12}{5}$ **b** $\frac{14}{3}$ **c** $\frac{23}{2}$

3 **Write these fractions in simplest form first, then change to mixed numbers.**

a $\frac{15}{9}$ **b** $\frac{21}{14}$ **c** $\frac{18}{16}$

4 **Write the equivalent improper fraction for these mixed numbers.**

a $1\frac{1}{2}$ **b** $2\frac{3}{4}$ **c** $4\frac{4}{5}$

5 **Write the equivalent improper fraction for these mixed numbers after first simplifying the fraction parts.**

a $4\frac{2}{12}$ **b** $2\frac{6}{24}$ **c** $25\frac{24}{72}$

Adding and subtracting fractions with the same denominator

1 **Simplify these without the aid of a calculator:**

a $\frac{1}{3}+\frac{1}{3}$ **b** $\frac{3}{5}-\frac{1}{5}$ **c** $\frac{5}{9}+\frac{2}{9}$

d $\frac{8}{11}-\frac{6}{11}$ **e** $\frac{11}{15}-\frac{4}{15}$ **f** $\frac{3}{8}+\frac{5}{8}$

2 **Simplify these without the aid of a calculator:**

a $\frac{1}{2}+\frac{4}{2}$ **b** $\frac{8}{5}-\frac{2}{5}$ **c** $\frac{2}{3}+\frac{5}{3}$

d $\frac{10}{4}-\frac{1}{4}$ **e** $\frac{11}{7}+\frac{4}{7}$ **f** $\frac{15}{2}-\frac{8}{2}$

3 **Simplify these without the aid of a calculator, remembering to write the answer in simplest form:**

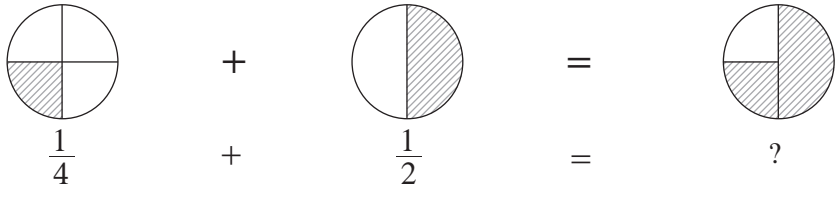
a $\frac{11}{4}-\frac{5}{4}$ **b** $\frac{13}{6}+\frac{19}{6}$ **c** $\frac{9}{8}+\frac{13}{8}$

4 **Simplify these without the aid of a calculator:**

a $\frac{4}{9}+\frac{1}{9}+\frac{2}{9}$ **b** $\frac{20}{3}-\frac{10}{3}-\frac{4}{3}$ **c** $\frac{1}{2}+\frac{1}{2}-\frac{1}{2}$

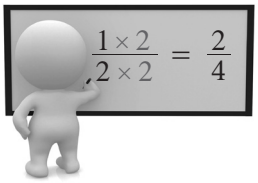
d $\frac{1}{5}+\frac{4}{5}-\frac{2}{5}$ **e** $\frac{8}{7}-\frac{4}{7}+\frac{6}{7}$ **f** $\frac{13}{6}+\frac{11}{6}-\frac{9}{6}$

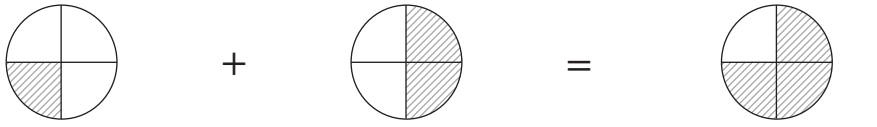
Adding and subtracting fractions with a different denominator



$\frac{1}{4}$ + $\frac{1}{2}$ = ?

one quarter and one half equals ?





$\frac{1}{4}$ + $\frac{2}{4}$ = $\frac{3}{4}$

one quarter and two quarters equals three quarters

Simplify these expressions, which have fractions with different denominators:

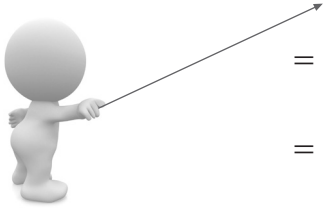
(i) $\frac{2}{3} + \frac{1}{5}$ For $\frac{2}{3}$ and $\frac{1}{5}$ ← Denominators are different

$\frac{2}{3} + \frac{1}{5} = \frac{2 \times 5}{3 \times 5} + \frac{1 \times 3}{5 \times 3}$ The LCM of the denominators is 15

$= \frac{10}{15} + \frac{3}{15}$ Equivalent fractions with LCM denominators

$= \frac{10 + 3}{15}$ Add the numerators **only**

$= \frac{13}{15}$



Multiply top **and** bottom by the number used to make the denominator equal to the LCM

(ii) $\frac{7}{8} - \frac{1}{2} + \frac{3}{4}$ For $\frac{7}{8}$, $\frac{1}{2}$, and $\frac{3}{4}$ ← Denominators are all different

$\frac{7}{8} - \frac{1}{2} + \frac{3}{4} = \frac{7}{8} - \frac{1 \times 4}{2 \times 4} + \frac{3 \times 2}{4 \times 2}$ The LCM of all the denominators is 8

$= \frac{7}{8} - \frac{4}{8} + \frac{6}{8}$ Equivalent fractions with LCM in the denominators

$= \frac{7 - 4 + 6}{8}$

$= \frac{9}{8}$ Simplify the numerator

$= 1\frac{1}{8}$ Simplify to mixed number

Adding and subtracting fractions with a different denominator

1 **Fill in the spaces for these calculations:**

a $\frac{1}{3}+\frac{1}{6}$ The LCM of the denominators is: ☐

$$\frac{1}{3}+\frac{1}{6}=\frac{1\times\square}{3\times\square}+\frac{1}{6}$$

$$=\frac{\square}{\square}+\frac{1}{6}$$

$$=\frac{\square}{\square}$$

$$=\frac{\square}{\square}\leftarrow \text{simplest form}$$

b $\frac{4}{7}-\frac{1}{5}$ The LCM of the denominators is: ☐

$$\frac{5}{7}-\frac{1}{5}=\frac{5\times\square}{7\times\square}-\frac{1\times 7}{5\times 7}$$

$$=\frac{\square}{\square}-\frac{\square}{\square}$$

$$=\frac{\square}{\square}\leftarrow \text{simplest form}$$

2 **Simplify these without the aid of a calculator:**

a $\frac{1}{3}+\frac{1}{2}$

b $\frac{5}{6}-\frac{1}{2}$

c $\frac{2}{5}-\frac{1}{4}$

d $\frac{1}{6}+\frac{3}{4}$

e $\frac{6}{7}-\frac{2}{3}$

f $\frac{3}{5}+\frac{3}{8}$

Adding and subtracting fractions with a different denominator

3 **Simplify these expressions without the aid of a calculator, remembering to write the answer in simplest form.**

a $\frac{1}{2} + \frac{4}{5}$

b $\frac{13}{8} - \frac{3}{5}$

c $\frac{1}{2} + \frac{3}{8} - \frac{1}{4}$

d $\frac{3}{5} + \frac{3}{10} - \frac{3}{4}$

e $\frac{2}{3} - \frac{1}{4} + \frac{5}{6}$

f $\frac{7}{12} - \frac{1}{3} + \frac{11}{24}$

Adding and subtracting fractions with a different denominator

The same rules apply for questions with a mix of whole numbers and fractions. Here are some examples:

Simplify these expressions, which have a mix of whole numbers and fractions:

(i) $3+\frac{1}{4}$

$3+\frac{1}{4} = 3\frac{1}{4}$ Write the fraction after the whole number

(ii) $1-\frac{2}{5}$

$1-\frac{2}{5} = \frac{5}{5}-\frac{2}{5}$ Write the whole number as a fraction with same denominator

$= \frac{3}{5}$ Subtract the numerators **only**

(iii) $4-\frac{2}{7}$

$4-\frac{2}{7} = \frac{28}{7}-\frac{2}{7}$ Write the whole number as a fraction with same denominator

$= \frac{26}{7}$

$= 3\frac{5}{7}$ Simplify the fraction

4 **Simplify these expressions:**

a $2+\frac{1}{2}$

b $1+\frac{3}{4}$

c $1-\frac{2}{3}$

d $1-\frac{3}{8}$

e $2-\frac{3}{5}$

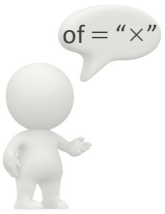
f $4-\frac{1}{4}$

g $3-\frac{5}{3}$

h $5-\frac{5}{2}$

Multiplying and dividing fractions

To **multiply** fractions, just remember: Multiply the numerators (top) and the denominators (bottom).



$$\frac{1}{3} \text{ of } \frac{2}{5} = \frac{1}{3} \times \frac{2}{5} = \frac{1 \times 2}{3 \times 5} = \frac{2}{15}$$

To **divide** an amount by a fraction, just remember: flip the second fraction, then multiply.

$$\frac{1}{3} \div \frac{2}{5} = \frac{1}{3} \times \frac{5}{2}$$ Flip **only** the second fraction.

$$= \frac{1 \times 5}{3 \times 2}$$

$$= \frac{5}{6}$$

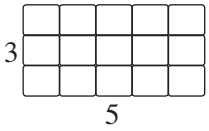
Change the "÷" to a "×"

Remember: A flipped fraction is called the **reciprocal** fraction.

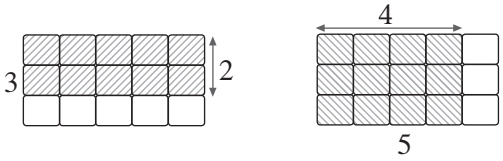
Simplify these:

We can use shaded diagrams to calculate the multiplication of two fractions.

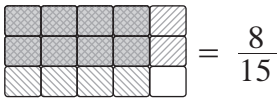
(i) $\frac{2}{3}$ of $\frac{4}{5}$



Draw a grid using the denominators as the dimensions



Use the numerators to shade columns/rows



$$= \frac{8}{15}$$

$$\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$$

Write where they **overlap** as a fraction

If whole numbers are involved, write them as a fraction.

(ii) $28 \div \frac{2}{7}$

$$28 \div \frac{2}{7} = 28 \times \frac{7}{2}$$ Flip the second fraction and change the sign to "×"

$$= \frac{28}{1} \times \frac{7}{2}$$ Write the whole number as a fraction

$$= \frac{196}{2}$$

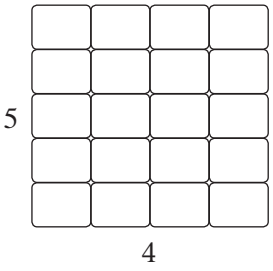
$$= \frac{98}{1}$$ Simplify

$$= 98$$

Multiplying and dividing fractions

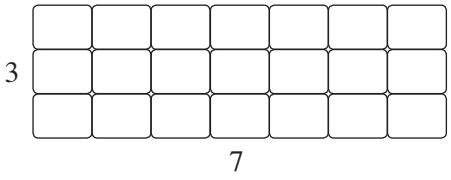
1 **Calculate these fraction multiplications by shading the given grids:**

a $\frac{1}{5}$ of $\frac{3}{4}$



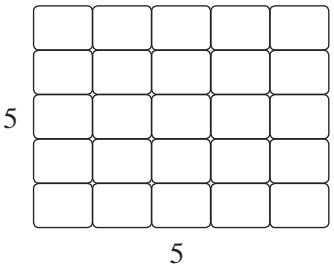
$\frac{1}{5}$ of $\frac{3}{4} = \frac{\square}{\square}$

b $\frac{2}{3}$ of $\frac{4}{7}$



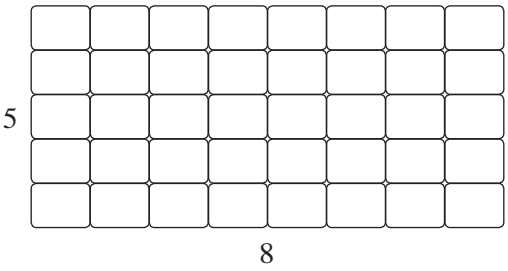
$\frac{2}{3}$ of $\frac{4}{7} = \frac{\square}{\square}$

c $\frac{4}{5}$ of $\frac{4}{5}$



$\frac{4}{5}$ of $\frac{4}{5} = \frac{\square}{\square}$

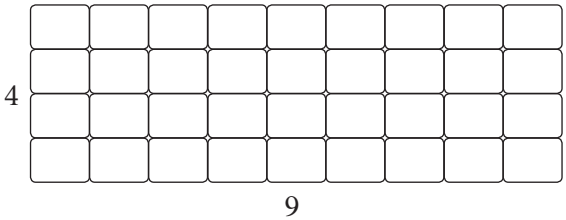
d $\frac{2}{5}$ of $\frac{3}{8}$



$\frac{2}{5}$ of $\frac{3}{8} = \frac{\square}{\square} = \frac{\square}{\square}$

simplified

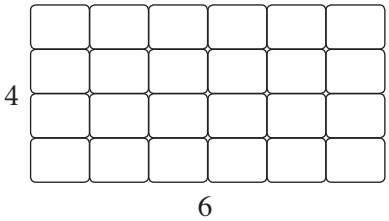
e $\frac{3}{4}$ of $\frac{7}{9}$



$\frac{3}{4}$ of $\frac{7}{9} = \frac{\square}{\square} = \frac{\square}{\square}$

simplified

f $\frac{3}{4}$ of $\frac{5}{6}$



$\frac{3}{4}$ of $\frac{5}{6} = \frac{\square}{\square} = \frac{\square}{\square}$

simplified

Operations with mixed numbers

Just change to improper fractions, then use the same methods as shown earlier.

Simplify these calculations involving mixed numbers:

Addition and subtraction

(i) $1\frac{2}{3}+2\frac{1}{6}$

Or just add the whole numbers and the fractions separately.

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

$$1\frac{2}{3}+2\frac{1}{6}=\frac{5}{3}+\frac{13}{6}$$ Change to improper fractions

$$=\frac{10}{6}+\frac{13}{6}$$ Equivalent fractions with LCM denominators

$$=\frac{23}{6}$$

$$=3\frac{5}{6}$$ Simplify to mixed number

(ii) $4\frac{1}{5}-1\frac{1}{2}$

$$4\frac{1}{5}-1\frac{1}{2}=\frac{21}{5}-\frac{3}{2}$$ Change to improper fractions

$$=\frac{42}{10}-\frac{15}{10}$$ Equivalent fractions with LCM denominators

$$=\frac{27}{10}$$

$$=2\frac{7}{10}$$ Simplify to mixed number

Multiplication and division

(iii) $1\frac{3}{4}\times 2\frac{1}{3}$

$$1\frac{3}{4}\times 2\frac{1}{3}=\frac{7}{4}\times\frac{7}{3}$$ Change to improper fractions

$$=\frac{49}{12}$$ Multiply tops and bottoms together

$$=4\frac{1}{12}$$ Simplify to mixed number

(iv) $1\frac{1}{6}\div 2$

$$1\frac{1}{6}\div 2=\frac{7}{6}\div\frac{2}{1}$$ Change to improper fractions

$$=\frac{7}{6}\times\frac{1}{2}$$ Flip second fraction and multiply

$$=\frac{7}{12}$$ Multiply numerators and denominators together

Remember

$2=\frac{2}{1}, 3=\frac{3}{1}$, etc.

Word problems with fractions

While on a shopping trip, Xieng spent two-fifths of her money on clothes and one-third on cosmetics.

What fraction of her money did Xieng have left?

$$\frac{2}{5}+\frac{1}{3} = \text{fraction of Xieng's money spent on shopping}$$

$$= \frac{6+5}{15}$$

$$= \frac{11}{15}$$ Add the numerators together

$$\frac{15}{15}-\frac{11}{15} = \frac{4}{15}$$

Fraction for all of Xieng's money — Fraction spent — Fraction of money Xieng has left

Xieng still has $\frac{4}{15}$ of her money after shopping

Here are some other word problem examples:

(i) In a group of eighteen friends, one-third are girls and one-sixth of these girls have blonde hair. How many blonde girls are in the group?

$$\frac{1}{6} \text{ of } \frac{1}{3} \text{ of } 18 = \text{number of blonde girls in the group}$$

$$= \frac{1}{6}\times\frac{1}{3}\times\frac{18}{1}$$

$$= \frac{18}{18}$$

$$= 1$$

There is 1 blonde girl in the group of friends.

(ii) During one night, possums ate two-fifths of the fifty-five fruits on a tree. If one-eleventh of the eaten fruits grew back, how many fruits are now on the tree?

$$\frac{2}{5}\times 55 = \text{Number of fruits eaten}$$

$$= \frac{110}{5}$$

$$= 22$$

$$\frac{1}{11}\times 22 = \text{Number of fruits that grew back}$$

$$= \frac{22}{11}$$

$$= 2$$

$$\text{Number of fruits now on the tree} = 55-22+2$$

$$= 35 \text{ pieces of fruit}$$

Word problems with fractions

1. **At a recent trivia night, one table of competitors answered five-eighths of the fifty-six questions correctly. How many questions did they get incorrect?**

2. **Co Tin usually takes approximately sixty and one-quarter steps every minute when walking. How many steps does he expect to take when he exercises by walking for one and two-third hours each day?**

3. **A vegetable garden has one-third carrots, one-sixth pumpkins, one-quarter herbs. The rest are potato plants. How many potato plants are in this garden of eighty plants?**

4. **A class of twenty-four students compared eye colors on a chart. Two-thirds of the class had brown eyes, and three-eighths of those brown-eyed students were boys. How many girls had brown eyes?**

5 **For one particular school: There are 256 students in Grade 7. Grades 8, 9, and 10 all have half the number of students as the year just below them. How many students are there at this school in Grades 7 to 10?**

6 **Five-sevenths of the fifty-six images used as backgrounds on Meagan's touchpad were photos she took herself. After five-eighths of these photos were deleted, what fraction of the background images now are not photos taken by her?**

Summary of the things you need to remember for fractions

Proper fractions

Represent parts of a whole number or object. The numerator is smaller than or equal to the denominator.

numerator → $\frac{1}{2}$ ← number of equal parts **you have**

denominator → $\frac{1}{2}$ ← **total** number of equal parts

Equivalent proper fractions

These are fractions with different numbers that represent the same amount. $\frac{4}{8} = \frac{2}{4} = \frac{1}{2} =$ Equivalent fractions

Improper fractions and mixed numbers

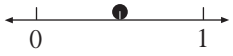
$\frac{3}{2}$ ← Improper fractions → $\frac{5}{4}$

numerator > denominator

$1\frac{1}{2}$ ← Mixed numbers → $1\frac{1}{4}$

A "mix" of whole numbers and proper fractions.

Fractions on the number line



$\frac{1}{2}$ ← number of equal steps taken between 0 and 1

total number of **equal** steps between 0 and 1

Start → $3\frac{1}{2}$ ← number of equal steps towards the next whole number

total number of equal steps between start and next whole number

Reciprocal fractions

Original fraction → $\frac{2}{5}$ → $\frac{5}{2}$ ← Reciprocal fraction

Mixed number → $3\frac{1}{2}$ → $\frac{7}{2}$ → $\frac{7}{2}$ → $\frac{2}{7}$ ← Reciprocal fraction

Comparing fractions

Write equivalent fractions by changing the denominators to their LCM, then compare the numerators

$\frac{1 \times 3}{2 \times 3} \rightarrow \frac{3}{6} > \frac{2}{6} \leftarrow \frac{1 \times 2}{3 \times 2}$

Adding and subtracting fractions

If the denominators (bottom) are the same, then simply add or subtract the numerators (top).

If the denominators are different, change to equivalent fractions with the same denominators using the LCM. Then add or subtract the numerators of the new fractions.

Multiplying and dividing fractions

To **multiply** fractions, just remember: Multiply the numerators (top) and the denominators (bottom).

To **divide** an amount by a fraction, just remember: flip the second fraction (reciprocal), then multiply.

Fractions of an amount "of" means "×." Find $\frac{2}{5}$ of 2 means calculate $\frac{2}{5} \times 2$

Two amounts as a fraction

2 out of 5 as a fraction is $\frac{2}{5}$. If the two amounts are in different units, change the larger amount into the smaller units.

So 200 g out of 2 kg becomes 200 g out of 2,000 g.