Ratio: fact sheet

Planner week 1 · Learn these facts

What a ratio means



3 red : 2 blue

For every 3 red there are 2 blue

red : blue = 3 : 2

Order matters

boys : girls

2 : 3

2 boys for every 3 girls. Same **order** as the words

girls : boys would be 3 : 2

Simplest form

÷ 12

24 : 36 → **2 : 3**

Divide **both** by the same number until you can't any more

24 : 36 = 2 : 3

Three-part ratios

4 : 7 : 15

Rosie : Matilda : Ibrahim

Three amounts, same order as the names

Total parts = 4 + 7 + 15 = 26

Ratio and fractions



red 3 blue 4

Add the parts: 7 in total. Red is 3 out of 7

Red = $\frac{3}{7}$, blue = $\frac{4}{7}$

The form 1 : *n* or *n* : 1

12 : 30

= 1 : 2.5

Divide both sides by the number that must become 1

Decimals are allowed here

Units

450 g : 15 g

= 30 : 1

Make the units the **same** first (1 m = 100 cm)

Then leave the units out

Which kind of question?

Underline the number you are given: **whose amount is it?**

Simplify	simplest form
Fractions	fraction / %
Sharing in a ratio	whole given
Using one part	part given
Using one part	difference given

Whole = everyone's amount added together. **Part** = one person's or thing's amount. **Difference** = how many more or fewer.

Careful: words like *share* and *total* can turn up in any type of question.

Which sheet do I need?

Writing and simplifying ratios ▸
write a ratio or simplify one

Ratios and fractions ▸
turn a ratio into a fraction, or back

Sharing in a ratio ▸
you are given the WHOLE

Using one part ▸
you are given ONE PART or the DIFFERENCE

Key words

- **Ratio** compares parts with parts (3 : 4)
- **Fraction** compares a part with the whole ($\frac{3}{7}$)
- **Simplify** divide by a common factor
- **Whole** everyone's amount added together

Exam tips

- **Draw a bar model**: one box for each part of the ratio.
- **Add the parts** to find how many parts there are in total.
- Find **one part** first. Everything else comes from it.
- Check: do your shares **add up** to the total?
- Answer in the **order** the question asks for.
- **Underline the number you are given** and ask: whose amount is it? Everyone's amount added together = **whole** given (Sharing in a ratio). One person's or one thing's amount = **part** given (Using one part). How many more or fewer = **difference** given (Using one part).
- **Careful:** words like *share* and *total* can turn up in any type of question.

Writing and simplifying ratios: fact sheet

Ratio · Planner week 1 · Learn the method

Worked example

QUESTION

A farm has 24 cows and 36 sheep.
Write down the ratio of cows to sheep. Give your ratio in its simplest form.

ANSWER

24 : 36 → ÷ 12

2 : 3

simplest form

12 is the biggest number that goes into 24 and 36.

Not sure? Divide by 2, then by 2 again, then by 3 …

24 : 36 → 12 : 18 → 6 : 9 → 2 : 3

There are 24 cows and 36 sheep. cows : sheep = 2 : 3

How to do it

1. Write the amounts in the **order** the question says, with a colon : between them.
2. Make sure the **units** are the same (e.g. all grams, or all pence).
3. Divide **both** numbers by a number that goes into both.
4. Keep going until nothing else goes into both: that is the **simplest form**.
5. For 1 : *n* or *n* : 1, divide both by the number that has to become 1.

Model answer:

24 : 36 = **2 : 3**

Watch out

- Swapping the order (36 : 24).
- Stopping too early (12 : 18 is not the simplest form).
- Writing a fraction instead of a ratio.

Ratios and fractions: fact sheet

Ratio · Planner week 1 · Learn the method

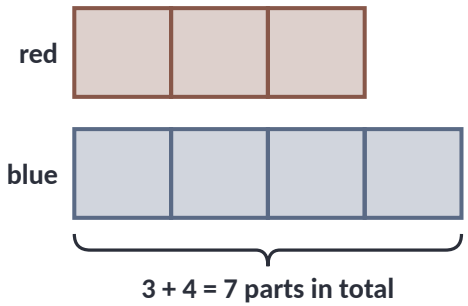
Worked example

QUESTION

A bag has red counters and blue counters in the ratio 3 : 4.

What fraction of the counters are red?

ANSWER



Fraction that are red = 3 out of 7

Fraction that are blue = 4 out of 7

3 : 4 means 7 parts in total, so $\frac{3}{7}$ of the counters are red.

How to do it

1. **Add the parts** of the ratio to get the total: this is the bottom of the fraction.
2. The part you want goes on the **top**.
3. Going back: if $\frac{1}{4}$ are white, the other $\frac{3}{4}$ are grey, so white : grey = **1 : 3**.
4. For a percentage, turn the fraction into a percentage (e.g. $\frac{2}{5}$ = 40%).
5. To compare two groups, simplify both ratios and see if they match.

Model answer:

$\frac{3}{7}$ of the counters are red

Watch out

- Writing $\frac{3}{4}$: the bottom must be the **total** (3 + 4 = 7).
- Writing $\frac{1}{4}$ as 1 : 4 (it is 1 : 3).
- Forgetting to simplify the fraction.

Sharing in a ratio: fact sheet

Ratio · Planner week 1 · Work out which type it is, follow the example

1 Two people

Amy and Ben share £40 in the ratio 3 : 5. How much does each get?

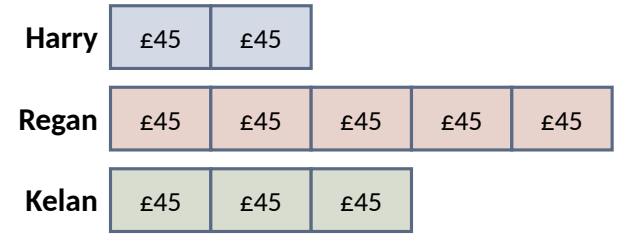


1. **Add the parts**: 3 + 5 = 8
2. **Divide the total by the number of parts**: £40 ÷ 8 = £5
3. **Multiply**: Amy 3 × £5 = £15 · Ben 5 × £5 = £25
4. **Check**: 15 + 25 = 40 ✓

Use this when: the number is everyone's amount added together

2 Three people

Harry, Regan and Kelan share £450 in the ratio 2 : 5 : 3.

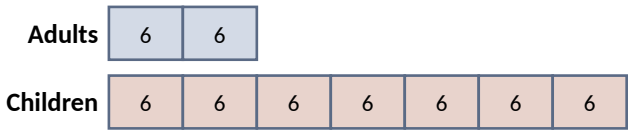


1. **Add the parts**: 2 + 5 + 3 = 10
2. **Divide the total by the number of parts**: £450 ÷ 10 = £45 for one part
3. **Multiply**: Harry £90 · Regan £225 · Kelan £135
4. **Check**: 90 + 225 + 135 = 450 ✓

Use this when: there are three numbers in the ratio: add all three

3 Only one share asked for

A club has 54 members. Adults : children = 2 : 7. How many children are there?



1. **Add the parts**: 2 + 7 = 9
2. **Divide the total by the number of parts**: 54 ÷ 9 = 6
3. **Multiply** just the children: 7 × 6 = **42 children**

Use this when: the question asks about one person or group: give only that answer

The big question

Have I been given the **WHOLE**, **ONE PART** or the **DIFFERENCE**?

Underline the number you are given and ask: **whose amount is it?**

Whole: this is the Sharing in a ratio sheet. **One part** or the **difference**: use the Using one part sheet.

Watch out

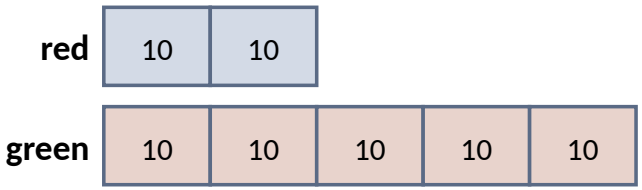
- Dividing the total by each number in the ratio (450 ÷ 2, 450 ÷ 5 …).
- Forgetting to add the parts first.
- Giving every share when only one was asked for.

Using one part: fact sheet

Ratio · Planner week 1 · Work out which type it is, follow the example

1 PART given

A bag has red beads and green beads in the ratio 2 : 5. There are 20 red beads.

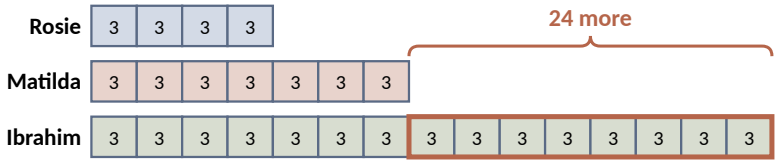


1. Red is **2 parts** = 20
2. **One part** = 20 ÷ 2 = 10
3. **Multiply**: green = 5 × 10 = 50
4. Total = 7 parts = 7 × 10 = **70 beads**

Use this when: the number belongs to one person or one thing

2 DIFFERENCE given

Rosie, Matilda and Ibrahim share some sweets in the ratio 4 : 7 : 15. Ibrahim gets 24 more sweets than Matilda.



1. The difference is **15 − 7 = 8 parts** = 24
2. **One part**: 24 ÷ 8 = 3
3. **Multiply**: Rosie 12 · Matilda 21 · Ibrahim 45
4. **Check**: 45 − 21 = 24 ✓

Use this when: the number is the gap: how many more or fewer

The big question

Have I been given the **WHOLE**, **ONE PART** or the **DIFFERENCE**?

Underline the number you are given and ask: **whose amount is it?**

Whole: this is the Sharing in a ratio sheet. **One part** or the **difference**: use the Using one part sheet.

Watch out

- Sharing the amount you know as if it were the **total**.
- Forgetting to add the shares when the total is asked for.
- Using the wrong number of parts for a difference.