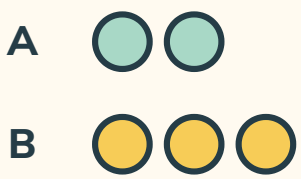
MATHS FIELD GUIDE · GRADE 5

Compare using the same-sized amount

OPENING PROBLEM

The mix is two parts A to three parts B. How many parts in all?



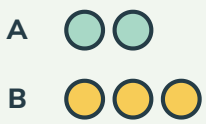
02 Keep corresponding parts together
03 Rules and worked cases
04 Choose the paint mixture
05 Compare the models
06 Read the units on a rate
07 Check your reasoning

ILLUSTRATED PROBLEM SHEET

Keep corresponding parts together

Multiply or divide both counts by the same factor to preserve a ratio.

1



The mix is two parts A to three parts B. How many parts in all?

Five. A is two fifths of the whole mixture.

2

A	B
2	3
4	6
6	9

What changes across batches?

The totals change, while the amount of B for each unit of A stays at 3/2.

3

Total 35 g
↓
35 ÷ 5 = 7 g
↓
A = 14 g

How much A is in 35 g of this mix?

One part is 7 g. Two parts give 14 g and the remaining 21 g is B.

4

A	B
2	3
3	4

Does adding one to both counts preserve this recipe?

No. Cross-products 2 × 4 and 3 × 3 differ.

1:4 by parts
first share is 1/5 of the total.

1:4 by parts
first amount is 1/4 of the second.

CHAPTER PROBLEM

Four identical packs hold twenty-eight cards. How many in six packs?

Forty-two. Each pack holds seven.

MATHS REFERENCE · GRADE 5

Compare using the same-sized amount

An informal proportional comparison asks how amounts compare after using the same-sized reference.

If a relationship scales equally, doubling one amount doubles the matching amount.

Cases to recognise

Situation	What to do and why
4 notebooks for ₹60 or 6 for ₹84	Unit prices are ₹15 and ₹14. The second offer is cheaper per notebook.
Recipe 3:2 flour to oats with 20 cups total	Five parts make 20. Use twelve cups flour and eight oats.

Read the model

Scale a recipe together

A recipe uses two cups of oats and one cup of milk.

Double the recipe: four cups of oats and two cups of milk. Both amounts scale by two.

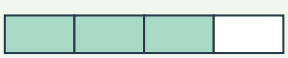
Cups of oats	Cups of milk
2	1
4	2
6	3

Why adding the same amount is different

Adding one cup to each gives three cups of oats and two cups of milk.

That is not the same mixture. One cup of milk originally matched two cups of oats, not one and a half.

scale together Multiply related amounts by the same factor.
per For each one.
reference amount A common-sized amount used for comparison.



75%

A sale price of ₹450 is 75% of the tag price. What was the tag price?

Three parts total ₹450. One is ₹150, so four parts give ₹600.

WORKED INVESTIGATION

Choose the paint mixture

Paint A uses two cups of blue per three of white. Paint B uses three blue per four white. Compare them using the same amount of white.

Look at this part	What it tells you
Mix A, white 12	blue 8
Mix B, white 12	blue 9
Bluer mix	B

Work it through

Doubling both parts of A gives four blue and six white. Each small batch has the original colour, so combining them preserves it.

Catch the mistake

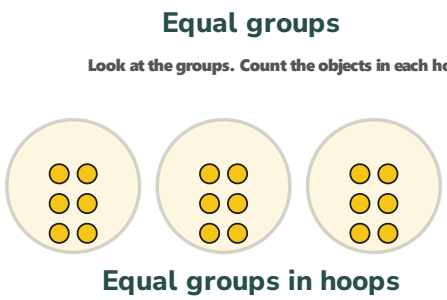
Both recipes have one extra cup of white. The equal difference does not give equal proportions.

Compare the cases

Find one equal share

Three identical packs hold eighteen pencils. One pack holds six.

Five packs then hold thirty. Divide to find one pack, then multiply for the new count.



Equal groups in hoops

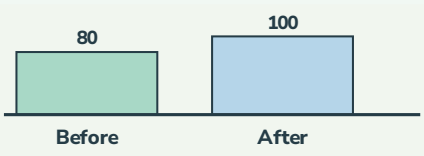
Make a fair comparison

Two packs hold twelve pencils; three packs hold fifteen.

The first has six per pack, the second five per pack. More pencils altogether does not mean more in each pack.

Change one condition

Using total paint instead, A has 2/5 blue and B has 3/7 blue. Cross-products 14 and 15 confirm B has more blue per equal total.



How large is the increase as a percent of the starting value?

The increase is 20 out of 80. That is 25%.

COMPARE USING THE SAME-SIZED AMOUNT

Compare the models

The assumption matters

The packs must be identical in their pencil counts.

If one pack has extra pencils, scaling the pack count alone is not a reliable rule.

Use a table, not a guess

List matching amounts together: one pack, six pencils; two packs, twelve pencils.

Check that every row keeps six pencils per pack.

Keep this informal

Explain with equal groups, fractions and scaling.

Formal ratio equations and cross-multiplication are not needed for these questions.

Explain your reasoning

A mixture uses three cups of water for two cups of juice. What amounts make a double batch?

Six cups of water and four cups of juice.

Two more worked cases

Situation	Reasoning
Compare 3/8 and 5/12 juice concentrate	In twenty-fourths these are 9/24 and 10/24. The second is stronger.
A 2:3 mix gains one cup of each	It becomes 3:4. Only scaling both quantities by the same factor preserves the ratio.

₹200 × 1.10
↓
₹220 × 0.90
↓
₹198

Why do a 10% rise and a 10% fall fail to cancel?

The fall is 10% of ₹220. It removes ₹22 after a rise of ₹20.

ILLUSTRATED PROBLEM SHEET

Read the units on a rate

A rate compares two quantities with different units.

1

Time (h)	Distance (km)
1	18
2	36
2.5	45

At steady speed, how far in 2½ hours?

Two hours give 36 km and half an hour adds 9 km. Total 45 km.

2

600 m in 5 min
↓
120 m per min
↓
7.2 km per hour

Why divide before multiplying?

Find distance in one minute, then scale to sixty minutes and convert metres to kilometres.

3

Pack	Price
250 g	₹40
400 g	₹60

Which pack costs less per 100 g?

₹16 versus ₹15. The 400 g pack costs less per 100 g.

4

Time (min)	Water (L)
0	3
1	5
2	7

Is water volume proportional to time?

It grows by 2 L each minute but starts at 3 L. Doubling time need not double the amount.

₹45 for three equal packs
₹15 per pack.

Three packs per hour
one pack every 20 minutes at a steady rate.

CHAPTER PROBLEM

Two boxes hold ten blocks; three boxes hold twelve. Which has more blocks per box?

The two-box set: five per box rather than four, assuming equal counts within each set.

QUESTION BANK · FOLD OR COVER THE RIGHT COLUMN

Check your reasoning

Try the problem	Solution and reasoning
01 In the same mix B weighs 18 g. How much does A weigh?	Three parts weigh 18 g, so one weighs 6 g and A weighs 12 g.
02 A cyclist rides one hour at 10 km/h and two hours at 16 km/h. Average speed?	42 km over 3 hours gives 14 km/h.
03 Which is more concentrated, 2 cups juice in 5 cups total or 3 cups in 8 cups total?	Compare fortieths: 2/5 = 16/40 and 3/8 = 15/40. The first drink contains the larger share of juice.
04 Which is cheaper per metre, 8 m for ₹96 or 5 m for ₹65?	Unit prices are ₹12 and ₹13. Choose the first.
05 A 2:5 recipe uses 350 g of the second ingredient. How much of the first?	One part weighs 70 g. Two parts weigh 140 g.

Fraction	Decimal	Percent
1/8	0.125	12.5%
3/8	0.375	37.5%

How do you get the second row from the first?

Triple each representation. Each column still names the same share.

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