

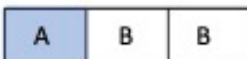
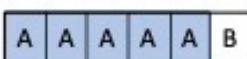
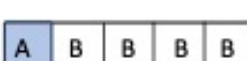
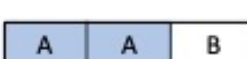




RATIOS AND FRACTIONS

Cut out and match the cards. Make some extra cards so that there is at least one card of each type in each set

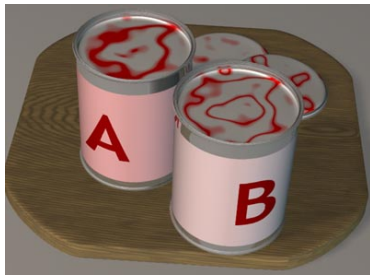
FRACTIONS	DIAGRAMS	WORDS	RATIOS
Ali receives $\frac{1}{4}$ of the total F1	 D1	Ali and Busi both receive the same amount W1	The money is shared between Ali and Busi in the ratio 1 : 2 R1
Ali receives $\frac{2}{3}$ of the total F2	 D2	Busi receives three quarters of the total. W2	The money is shared between Ali and Busi in the ratio 1 : 3 R2
Ali receives $\frac{1}{2}$ of the total F3	 D3	Busi receives double the amount that Ali receives. W3	The money is shared between Ali and Busi in the ratio 1 : 4 R3
Ali receives $\frac{1}{5}$ of the total F4	 D4	Ali receives half the amount Busi receives. W4	The money is shared between Ali and Busi in the ratio 2 : 3 R4
Ali receives $\frac{1}{3}$ of the total F5	 D5	Ali receives double the amount that Busi receives W5	The money is shared between Ali and Busi in the ratio 3 : 5 R5
Ali receives $\frac{4}{5}$ of the total F6	 D6	Busi receives three times the amount that Ali receives. W6	The money is shared between Ali and Busi in the ratio 1 : 1 R6
Ali receives $\frac{2}{5}$ of the total F7	 D7	Ali receives one quarter of the amount that Busi receives W7	The money is shared between Ali and Busi in the ratio 2 : 1 R7
Ali receives $\frac{3}{5}$ of the total F8	 D8	Ali receives four tenths of the total. W8	The money is shared between Ali and Busi in the ratio 3 : 2 R8
F9	D9	W9	The money is shared between Busi and Ali in the ratio 1 : 4 R9
F10	D10	W10	The money is shared between Busi and Ali in the ratio 1 : 5 R10

HELP

Some sets have two cards of the same type. Match the fraction and diagram cards first. Then include the word cards in each set and finally include the ratio cards in each set.

NEXT

Make up a few more sets of cards to add to the collection.



Paint A is made up from red and white paint in the ratio 1:3 and paint B is made up from red and white paint in the ratio 1:7. The cans are the same size.

You can mix the paints to produce different shades of pink. Explain how to find the ratio of red paint to white paint if you mix one can of A with one can of B.

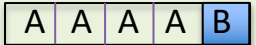
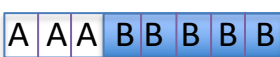
What is the ratio of red to white if 1 can of A is mixed with 2 cans of B? What about mixing one can of A with 6 cans of B?

What is the least number of cans of each type needed to produce pink paint containing red and white in the ratio 1:4?

<https://aiminghigh.aimssec.ac.za/mixing-paints/>

Go to the NRICH website and mix your own paint and see the colours change. This problem is adapted from the NRICH tasks [Mixing Paints](#) and [Mixing More Paints](#) with permission of the University of Cambridge. All rights reserved.

NOTES FOR TEACHERS

SOLUTION			
FRACTIONS Ali receives:	DIAGRAMS	WORDS	RATIOS Ali's share : Blair's share
F1 $\frac{1}{4}$	D2	W2 W6	R2 1:3
F2 $\frac{2}{3}$	D6	Blair receives $1\frac{1}{2}$ times the amount Ali receives	R7 2:1
F3 $\frac{1}{2}$	D7	W1	R6 1:1
F4 $\frac{1}{5}$	D5	W7	R3 1:4
F5 $\frac{1}{3}$	D3	W3 W4	R1 1:2
F6 $\frac{4}{5}$		Ali receives 4 times the amount Blair receives	R9 4:1
F7 $\frac{2}{5}$	D1	W8	R4 2:3
F8 $\frac{3}{5}$	D8	Ali receives $1\frac{1}{2}$ times the amount Blair receives	R8 3:2
F9 $\frac{3}{8}$		The total is divided into 8 parts, Ali takes 3 and Blair takes 5.	R5 3:5
F10 $\frac{5}{6}$	D4	Ali receives 5 times the amount Blair receives	R10 5:1

Why do this activity?

In doing this activity learners revise what they know about ratios and they are motivated to work out the links with fractions and fraction diagrams for themselves.

Learning objectives

In doing this activity students will have an opportunity to develop their understanding of ratios and fractions and the connections between them.

Generic competences

In doing this activity students will have an opportunity to develop:

- critical thinking
- communication and team working if they work in pairs.

DIAGNOSTIC ASSESSMENT

This should take about 5–10 minutes.

Write the question on the board, say to the class:

“Put up 1 finger if you think the answer is A, 2 fingers for B, 3 fingers for C and 4 for D”.

1. Notice how the learners respond. Ask a learner who gave answer A to explain why he or she gave that answer. **DO NOT** say whether it is right or wrong but simply thank the learner for giving the answer.

A scale drawing of a building uses a scale of 1 : 3000
The length of the building on the scale drawing measures 5.1 cm
What is the length of the real building?

A	15300m
B	1530m
C	153m
D	15.3m

<https://diagnosticquestions.com>

2. It is important for learners to explain the reasons for their answers. Putting thoughts into words may help them to gain better understanding and improve their communication skills.
3. Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.
4. Ask the class to vote for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.
5. If the concept is needed for the lesson to follow, explain the right answer or give a remedial task.

The correct answer is: C that is 153 m

Possible misconceptions: A: Students have multiplied 5.1×3000 giving answer in cm, not metres

B: Misunderstanding of scale, using 1:30000 instead of 1:3000

D: Misunderstanding of scale, using 1:300 instead of 1:3000

<https://diagnosticquestions.com>

Suggestions for teaching

You may choose, especially if you plan this task for two lessons, to give out only the Fractions and Diagrams cards first and, when the learners have matched them, to give out the Word cards next and later to give out the Ratio cards.

Ask the class to find the card (or cards) that match F1. Then ask for explanations of why they match and manage a class discussion until the learners understand what to do.

Use the 1–2–4–MORE groupwork teaching method. Give learners about 15 - 20 minutes working alone to match the cards, then ask them to work in pairs and to check and agree exactly how the cards should be sorted.

After another 10 – 15 minutes (or longer if necessary) ask the pairs to work, either with the pair in front or with the pair behind, to check that they agree on the solution, and to make the extra cards so that there is at least one card of each type in each set.

Then ask a representative of each group, one by one, to explain to the class how they matched the cards in each set. It will be useful to have big cards for this part of the lesson. See page.

This learning activity is adapted from the Maths-for-Life Lesson 1 see

<https://www.nottingham.ac.uk/maths-for-life/teacher/classroom-materials.aspx>

Key questions

- What fraction is shaded in that picture.
- What is the ratio of shaded to unshaded parts in that picture.
- If two people get shares in that ratio what fraction of the total does each get?
- If the total is shared in that ratio what fraction does each get?
- What is the connection between fractions and ratios?

Follow up

University of Nottingham Maths-for-Life Resources

<https://www.nottingham.ac.uk/maths-for-life/teacher/classroom-materials.aspx>

PIZZA <https://aiminghigh.aimssec.ac.za/pizza/>

MIXING PAINTS <https://aiminghigh.aimssec.ac.za/mixing-paints/>
<https://www.nottingham.ac.uk/maths-for-life/teacher/classroom-materials.aspx>

PERCENTAGE DECIMAL AND FRACTIONAL INCREASES

<https://aiminghigh.aimssec.ac.za/percentage-decimal-and-fractional-increases/>

Go to the **AIMSSEC AIMING HIGH** website for lesson ideas, solutions and curriculum



links: <http://aiminghigh.aimssec.ac.za>

Subscribe to the **MATHS TOYS YouTube Channel**

<https://www.youtube.com/c/MathsToys/videos>

Download the whole AIMSSEC collection of resources to use offline with the **AIMSSEC App** see <https://aimssec.app> or find it on Google Play.

Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA, to Years 4 to 12 in the UK and school years up to Secondary 5 in East Africa.

New material will be added for Secondary 6.

For resources for teaching A level mathematics (Years 12 and 13) see <https://nrich.maths.org/12339>

Mathematics taught in Year 13 (UK) & Secondary 6 (East Africa) is beyond the SA CAPS curriculum for Grade 12

	Lower Primary Approx. Age 5 to 8	Upper Primary Age 8 to 11	Lower Secondary Age 11 to 15	Upper Secondary Age 15+
South Africa	Grades R and 1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
East Africa	Nursery and Primary 1 to 3	Primary 4 to 6	Secondary 1 to 3	Secondary 4 to 6
USA	Kindergarten and G1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
UK	Reception and Years 1 to 3	Years 4 to 6	Years 7 to 9	Years 10 to 13