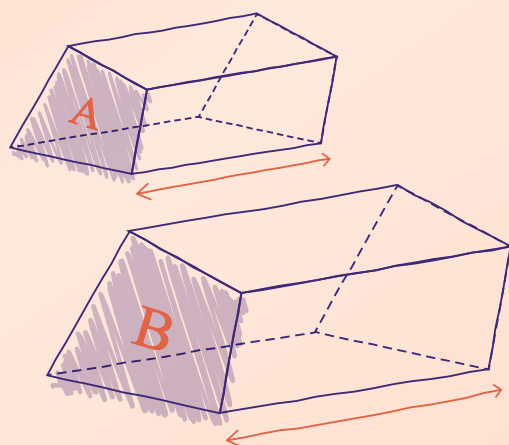


# GCSE Maths Focus on:

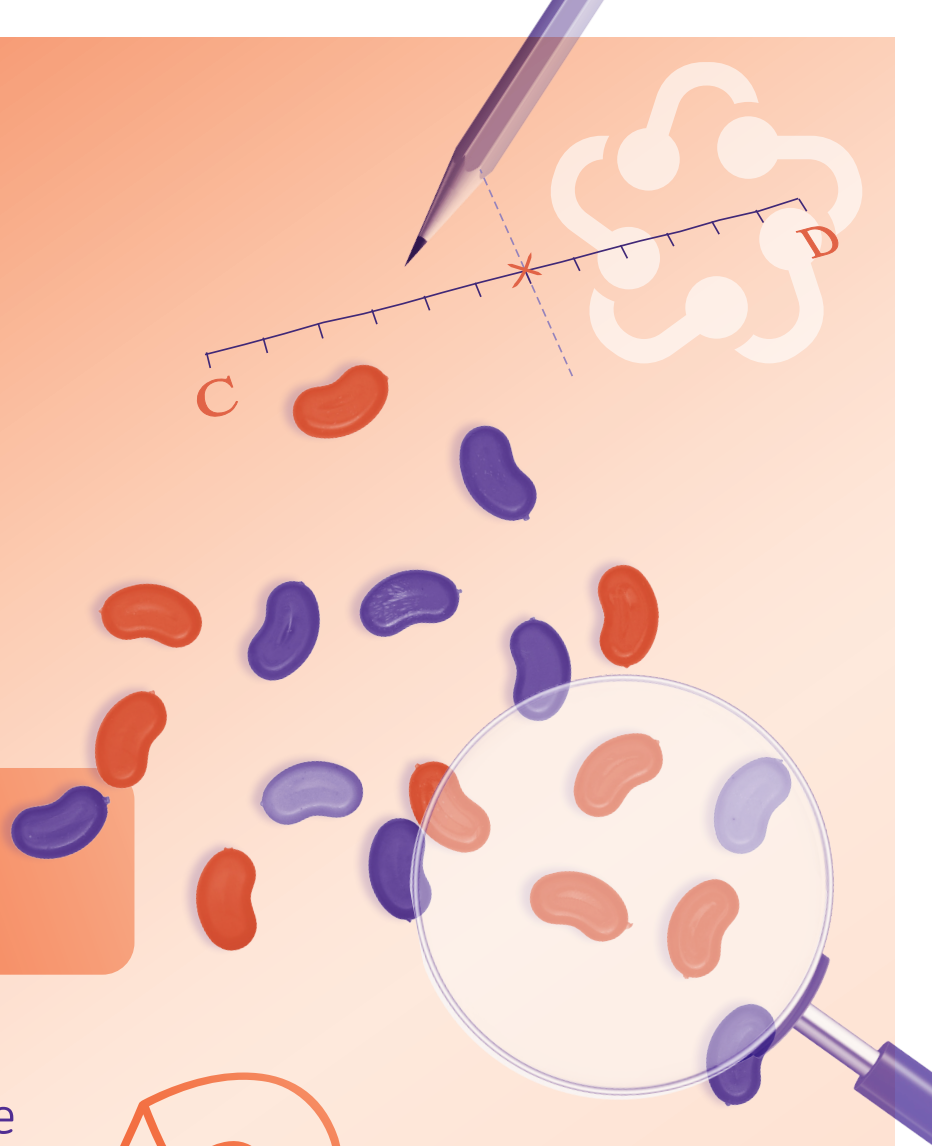
## Ratio

Build on your students' assessment performance using our self-guided, modular training pack

Activities  
booklet



$$A:B=4:9$$





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# Switching representations

## Activity 1a Discussion notes

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# Discussion notes

# Switching representations (fractions and ratio)

## Activity 1b i

Work through the 16 questions in the exercise. Consider the questions on the following when working through the exercise.

1. The ratio of red balls to green balls in a bag is 1 : 3  
What fraction of the balls are red?
2. The ratio of red balls to green balls in a bag is 1 : 3  
What fraction of the balls are green?
3. The ratio of red balls to green balls in a bag is 3 : 1  
What fraction of the balls are green?
4. The ratio of red balls to green balls in a bag is 4 : 1  
What fraction of the balls are green?
5. The ratio of red balls to green balls in a bag is 4 : 1  
What fraction of the balls are red?
6. The ratio of red balls to green balls in a bag is 8 : 1  
What fraction of the balls are red?
7. The ratio of red balls to green balls in a bag is 2 : 1  
What fraction of the balls are red?
8. The ratio of red balls to green balls in a bag is 4 : 2  
What fraction of the balls are red?
9. The ratio of red balls to green balls in a bag is 4 : 4  
What fraction of the balls are red?
10. The ratio of red balls to green balls in a bag is 1 : 1  
What fraction of the balls are red?
11. The ratio of red balls to green balls in a bag is 1 : 1  
What fraction of the balls are green?
12. The ratio of red balls to green balls in a bag is 1 : 5  
What fraction of the balls are green?
13. The ratio of red balls to green balls to blue balls in a bag is 1 : 5 : 2  
What fraction of the balls are green?
14. The ratio of red balls to green balls to blue balls in a bag is 1 : 5 : 2  
What fraction of the balls are red?
15. The ratio of red balls to green balls to blue balls in a bag is 3 : 5 : 2  
What fraction of the balls are red?
16. The ratio of red balls to green balls to blue balls in a bag is 9 : 15 : 6  
What fraction of the balls are red?

**What two things do you like about the collection? What are two things you would hope students notice when working through the exercise?**

I like:

1	
2	

I would hope they notice:

1	
2	

**Can you continue the exercise up to Question 20 (writing the next four examples)?**

17	
18	
19	
20	

**Can you identify the pros and cons of this exercise using variation compared with an exercise of random examples?**

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# Switching representations (fractions and ratio)

## Activity 1b ii

Design an exercise using variation to practice either:

- converting ratios to the 1:n form or
- switching from fraction to ratio.



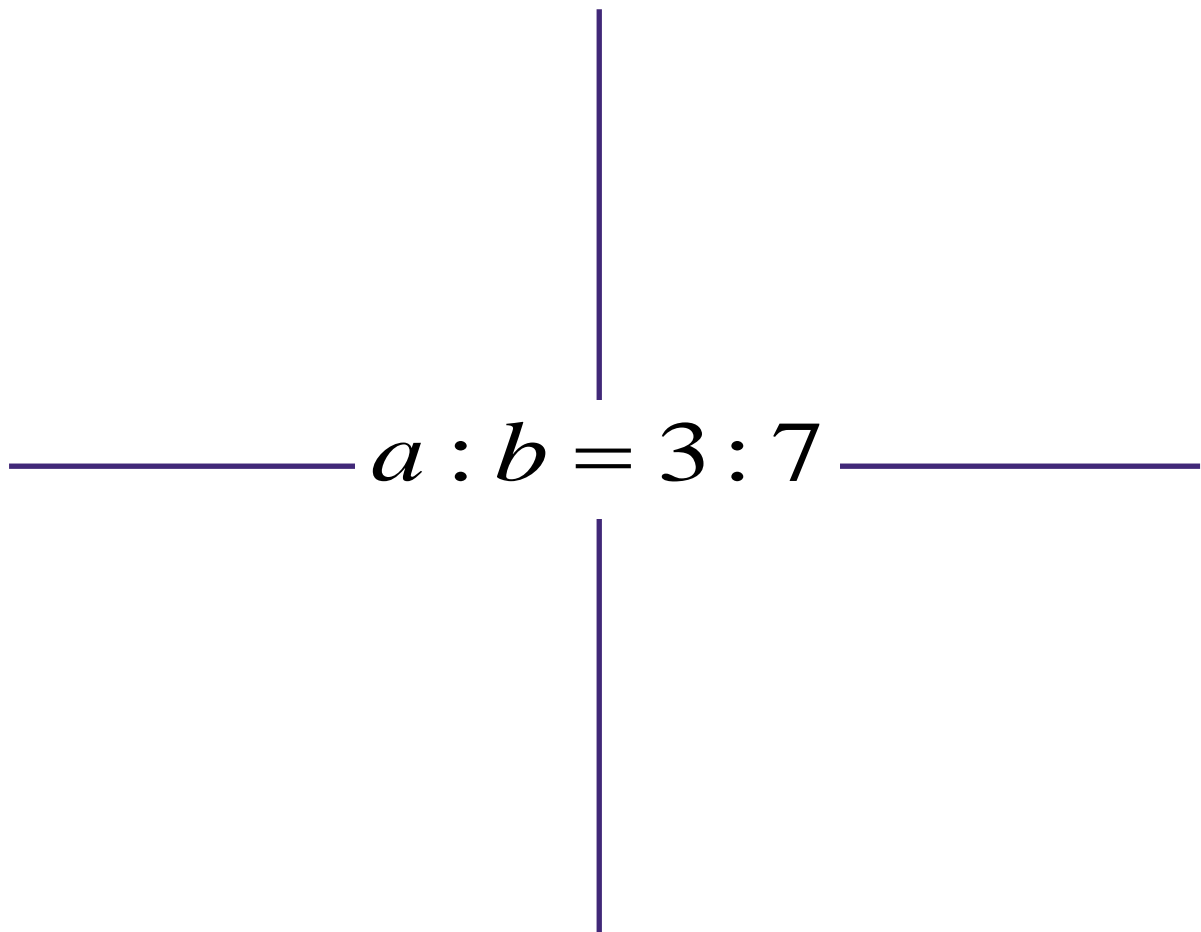
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# Switching representations

## ('ssdd')

### Activity 1c

How you would create your own 'ssdd' set using the same ratio as a starting point? Complete the template below and be prepared to discuss your solution.


$$\text{————— } a : b = 3 : 7 \text{ —————}$$

# Combining ratios

## Activity 2a

Turn to page 7 of the *Handouts booklet* for the relevant exercises for this activity and complete the questions below.

### Combining ratios

**What two things do you like about this exercise?**

1	
2	

**What two things would you change within this exercise?**

1	
2	

**Give two different explanations as to why would use in class to describe the relationship between consecutive questions.**

1	
2	

**Choose two problems to continue the sequence.**

1	
2	

---

Write a:b:c in its simplest form

What two things do you like about this exercise?	
1	
2	

What two things would you change within this exercise?	
1	
2	

Give two different explanations as to why would use in class to describe the relationship between consecutive questions.	
1	
2	

Choose two problems to continue the sequence.	
1	
2	

---

Write the ratio  $a:b:c$  in the form  $1:m:n$

What two things do you like about this exercise?	
1	
2	

What two things would you change within this exercise?	
1	
2	

Give two different explanations as to why would use in class to describe the relationship between consecutive questions.	
1	
2	

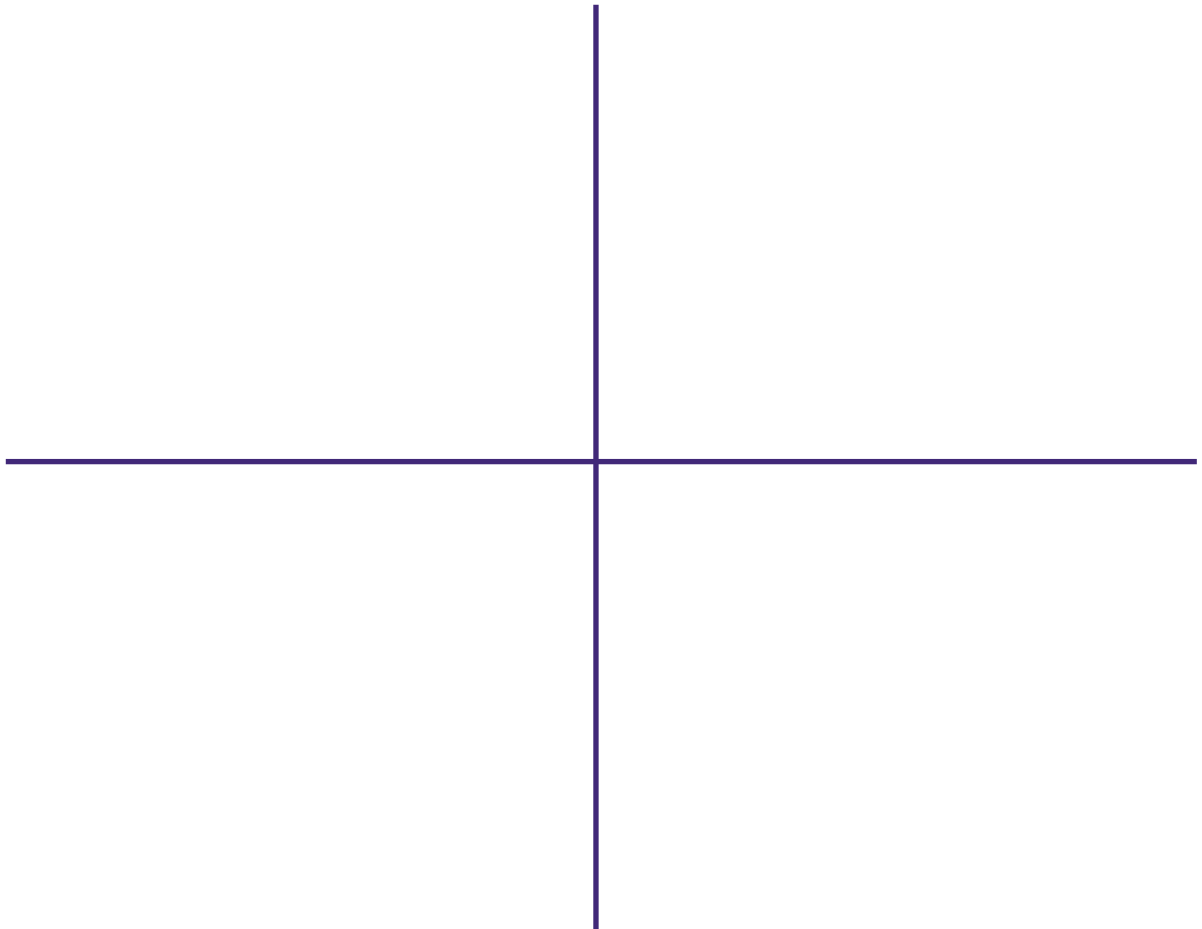
Choose two problems to continue the sequence.	
1	
2	

---

# Combining ratios

## Activity 2b

Working with your partner, write a set of 'ssdd' problems that involve combining ratio.



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# Problem-solving with ratio

## Activity 3a Discussion notes

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# Problem-solving with ratio

## Activity 3b

As discussed, re-write each problem with suitable scaffolding to support students

### Problem 1:

**25** In an office there are twice as many females as males.

$\frac{1}{4}$  of the females wear glasses.

$\frac{3}{8}$  of the males wear glasses.

84 people in the office wear glasses.

Work out the number of people in the office.

**[4 marks]**

### Problem 1 re-written:

---

### Problem 2:

26  $b$  is two thirds of  $c$ .

$$5a = 4c$$

Work out the ratio  $a : b : c$

Give your answer in its simplest form where  $a$ ,  $b$  and  $c$  are integers.

**[3 marks]**

### Problem 2 re-written:



---

# Dividing quantities in a given ratio

## Activity 4a

As a group, discuss how many different approaches can you find to solve the question below.

### Question

Ben and Zoë share some money in the ratio 2 : 5  
Zoë gets £210 more than Ben.  
How much does Ben get?

### Discussion notes

## Activity 4b

Turn to page 10 of the *Handouts booklet* to find your variation exercise. Answer the following questions.

**Can a standard approach be used to answer every question? If so, how would you model that approach for students?**

**Can you 'break' it? Can you come up with a 'dividing in ratio' question that cannot be done using your chosen approach?**

---

**Does your preferred method work on the 'ssdd' set of questions?**

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# Next steps

## Activity 5a

Visit the websites listed in the *Handouts booklet* (page 4) and select some ‘intelligent practice’ exercises to use in your teaching next term.

**Website(s) visited:**

**Exercise(s) selected:**

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## Activity 5b

Have a look at the same websites listed (especially the 'get involved' section). Follow the guidance to design your own exercises for a different area of ratio and proportion content. You may wish to share these with other members of the group at a later time.

# Post-session health check

Grade the area of development statements according to your confidence where 0 is not confident at all and 5 is very confident.

Area of development	Grading 0-5	Reasons/notes
I am familiar with the way ratio content is assessed in GCSE maths.		
I am familiar with the resources on Craig Barton's various websites.		
I understand the principles of variation theory and apply them in my teaching.		
I have good strategies to support students in developing problem solving skills.		
I have good subject knowledge in this area of content and understand the most effective way to teach all aspects of this content.		

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## Notes

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