



**THIRD SPACE
LEARNING**

Math Intervention Pack

Defining and writing ratios

Grade 6

How To Use This Resource

1. Title Slide

Use this slide to activate prior knowledge needed for lesson. Students should be encouraged to initially attempt the question presented independently.

2. Prior Learning

Use this slide to review the knowledge that will be required to be successful in this lesson. If students feel confident on the prior learning section of the Title Slide then this slide can be skipped

3. Let's Learn

Use this slide to introduce the concept. Tutors should work with the student to explore the concept together, usually using diagrams to support understanding.

4. Follow Me + Your Turn

The tutor should work through the follow me slide, modeling the process and explaining their thinking out loud.

Students should use the your turn slide as an opportunity to work through a question similar to the follow me questions. They should apply the method modeled by the tutor in the follow me slide. Students should be encouraged to explain their thinking out loud.

5. You Do

Students should work through a range of questions that build in complexity.

Tutors can offer support but students should initially be encouraged to attempt these questions independently.

6. Go Further

Use this slide to allow students to apply their understanding to a more challenging question in an unfamiliar context.

How To Use This Resource

7. Support for Slides

The support slide is used to support students during the lesson. In the tutor notes, there will be guidance as to when to use the support slide.

8. Check Your Understanding

Tutors should use this slide to assess the student's knowledge and whether or not they have mastered the concept within the lesson.

Standard

6.RP.A.1 - Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

Key Mathematical Ideas

1. Define ratio relationships using ratio notation.
2. Explain ratios using ratio language.

Overview

Terminology

- **Ratio:** A comparison of two quantities.
- **Ratio language:** Language used to describe a ratio relationship in number or quantity between two things, such as, “For every vote candidate A received, candidate C received 3 votes”.

Sentence Stems

- The ratio of 7 white flowers to 2 red flowers is written as _____.:_____.
- The ratio 4 to 7 can be written as _____ : _____.
- _____ are used to compare ratios.

Overview

Common Misconceptions

Common Misconceptions	Tutoring Strategies	Checks for Understanding
Confusing the order or the meaning of a ratio comparison.	Through the entire lesson, reinforce how to write, interpret and draw pictures of ratios.	Pay attention to how students read and write ratios and ask them to explain what each ratio means.

Title Slide

If students...

- get both sections correct:
 - start at You do
- miss the learning goal section only:
 - start at Let's Learn
- miss the prior learning section:
 - start at Prior Learning

Prior learning

If stuck

- Remind students that fractions are a part of a whole comparison.
- Review strategies to simplify fractions.

Let's Learn

If stuck

- Explain the connection between the picture of the vase and the tape diagram.
- Add onto the tape diagram (or the pictures of the vase) to show the new ratios.

Questions

- a) **Compare 2:10 to the original ratio.** (The new ratio is double the original ratio of 1:5. You could say that the ratio 2:10 is from adding the original ratio twice - $1:5 + 1:5$ - or that both parts were multiplied by 2.)
- a) **Is the ratio 10:2 equal to 2:10?** (No, this would be 10 vases and 2 flowers. In ratios, order matters, so the order of the ratio must match the order given - in this case, vases then flowers.)
- b) **Compare 3:15 to the original ratio.** (The new ratio is triple the original ratio of 1:5. You could say that the ratio 3:15 is from adding the original ratio three times - $1:5 + 1:5 + 1:5$ - or that both parts were multiplied by 3.)
- b) **Is the ratio 15:3 equal to 3:15?** (No, this would be 15 vases and 3 flowers. In ratios, order matters, so the order of the ratio must match the order given - in this case, vases then flowers.)

Watch out for

- Students who have trouble understanding the ratio comparisons.

Answers

- a) 2:10
- b) 3:15

Follow me

Modeling prompts

- Describe how the picture represents the ratio. Draw a circle around 1 red and 3 blue, then another around 2 red and 6 blue and a final circle around all the beads.
- Complete the ratios in a and b and discuss why they are equivalent.
- Before solving c, circle “red beads” and “total beads” and discuss how this ratio is different from the previous ones.
- Complete c and discuss other equivalent ratios.

Answers

- a) For every 1 red bead, there are 3 blue beads.
- b) 2:6 and 3:9
- c) 3:12

Your Turn

If stuck

- Use similar guidance given in the Follow Me modeling prompts.

Questions

- a) **Where do you see this ratio in the drawing?** (There are always two yellow beads, followed by 3 green beads. This pattern repeats over and over again.)
- b) **These are called equivalent ratios. What does that mean?** (They are equivalent because they represent the same relationship. The ratio 6:9, is just the original ratio, 2:3, three times. Both are shown in the picture of the beads. Equivalent ratios are similar to equivalent fractions, because they represent the same value, but just in a more simplified way.)
- b) **What if the comparison was green beads to yellow beads, how would you write the ratio?** (It would be the same numbers in the ratio, but they would be reversed, since the values for green would come first.)
- c) **How is this ratio different than the ones in a and b?** (This ratio compares part of the beads to the total number of beads. Parts a and b compared the two parts.)
- c) **What is an equivalent ratio? Explain how it could be represented in the picture.** (2:5 is an equivalent ratio, because if you circle every 5 beads, 2 of them are yellow. 12:30 is also an equivalent ratio, because you can just double the picture of the beads to see what more of them would look like.)
- c) **What if the comparison was green beads to total beads, how would you write the ratio?** (The first value of the ratio would be green, instead of yellow. The second value would be the same, since it is still the total beads.)

Watch out for

- Students who confuse the comparisons.

Answers

- a) For every 2 yellow beads, there are 3 green beads.
- b) 4:6 and 6:9
- c) 6:15

You do

If stuck

- Remind students to identify the comparisons from the visual models.
- Show each ratio as a tape diagram.

Questions

- **b) Is the ratio 3:5 equal to 5:3?** (No, this would be 3 squares and 5 circles. In ratios, order matters, so the order of the ratio must match the order given - in this case, squares then circles.)
- **b) Is there another way to compare the shapes other than circles to squares?** (Yes, you could compare total shapes to squares and total shapes to circles.)
- **c) Is the ratio 4:2 equal to 2:4?** (No, this would be 4 blue flowers and 2 red flowers. In ratios, order matters, so the order of the ratio must match the order given - in this case, blue flowers then red flowers.)
- **d) Compare the equivalent ratio to the original ratio.** (Answers will vary. Example answer: The new ratio is double the original ratio of 2:4. You could say that the ratio 4:8 is from adding the original ratio twice - $2:4 + 2:4$ - or that both parts were multiplied by 2.)
- **d) Explain how you would update the picture to show your equivalent ratio.** (Answers will vary. Example answer: You could have a ratio of 4:8 and that would be just doubling the flowers shown. You could also triple, quadruple, etc. the picture to find equivalent ratios.)
- **d) What is an equivalent ratio? Explain how you would update the picture to show your equivalent ratio.** (Answers will vary. Example answer: You could have a ratio of 3:6 and that would be just adding another group of 1 blue flower and 2 red flowers. You could also triple, quadruple, etc. the picture to find equivalent ratios.)
- **e) What picture would represent the ratio?** (You could draw 4 red circles and 7 green circles to represent the bag of marbles.)
- **e) How is this ratio different than the ones in a–d?** (This ratio compares part of the marbles to the total number of marbles. Parts a–d compared the two parts.)

Watch out for

- Students who have difficulty connecting the visual models to writing the ratios or finding equivalent ratios.
- Students who consistently mix up the ratios.

Answers

- a) For every 3 circles, there are 5 squares
- b) 5:3
- c) 2:4
- d) 4:8
- 11:7

Go further

If stuck

- Remind students that this slide is a challenge and is just intended to get them thinking about different ways to make comparisons.
- Use the Support slide.

Questions

- Explain how you solved. (Answers will vary.)

Watch out for

- Students who confuse the comparisons.

Answers

- For every 4 orange cubes, there are 2 blue cubes. ✓
- The ratio of blue cubes to orange cubes is 2:4. ✓
- For every 3 blue cubes, there would be 6 orange cubes. ✓
- The ratio of orange cubes to the total amount of cubes is 2:3. ✓

Support for Slide(s)

If stuck

- Discuss how rearranging the cubes helps to visualize and make sense of the comparison of blue and orange cubes.

Questions

- How do you know the ratio of 3 blue cubes to 6 orange cubes is equal to the cubes shown? (The cubes are shown in a ratio of 2:4 (blue to orange) cubes, which simplifies to 1:2. The ratio of 3:6 also simplifies to 1:2, so they are equivalent.)
- How do you know the ratio of orange cubes to the total amount of cubes is 2:3 is equal to the cubes shown? (If you double the ratio given, you get 4:6, where 4 is the orange cubes and 6 is the total. This is what is shown in the picture.)

Assessment question:

Correct answer:

1. 2 apples, 6 oranges
2. 2:6
3. 6:8
4. 2:8

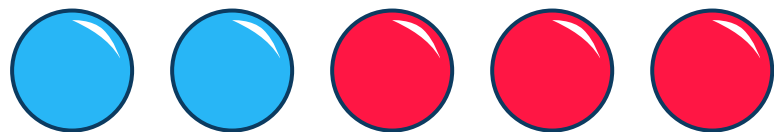
NOTE: All equivalent ratios are correct.

Today you will learn about

Defining and writing ratios

Learning Goal

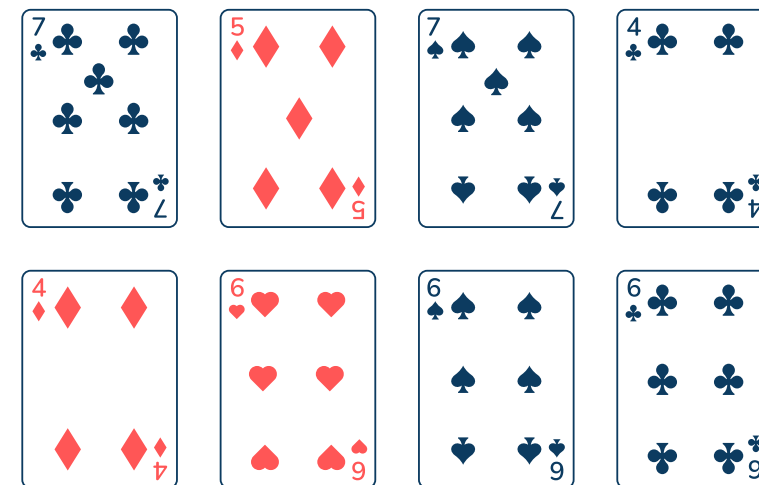
Write the ratio of blue beads to red beads.



..... :

Prior Learning

Can you write a fraction comparing the number of red cards to the total number of cards?



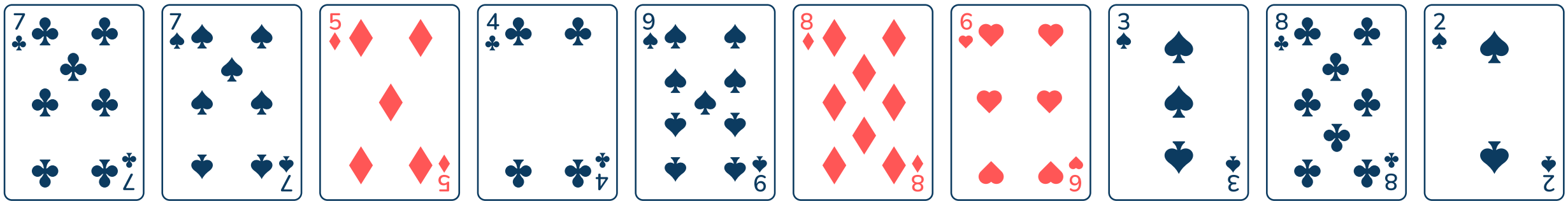
Red cards:

Total cards:

Prior learning

We can describe a set of objects by comparing **one part** to another **part** or comparing **parts** to a **whole**.

Look at this set of cards. There are 10 cards in total.



a We can compare the number of black cards with the whole amount and write this as a fraction.

.....

.....

A **fraction** compares each **part** with the **whole**.

b What fraction of the cards are hearts?

.....

.....

c What fraction of the cards are diamonds? Can this fraction be simplified?

.....

=

.....

Let's learn

A **ratio** is used to compare quantities.
It tells us how much of one quantity there is to another quantity.

When describing a **ratio**, use the words
'For every..., there are...'

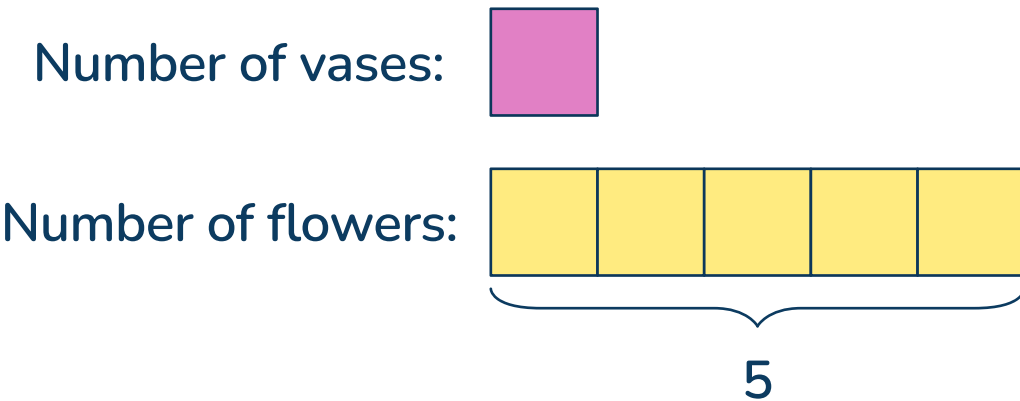
For example,
For every 1 vase, there are 5 flowers.



The **ratio** of vases to flowers is 1:5

Write a **:** between the quantities to represent a ratio.

A ratio can be represented by a tape diagram.



a What is the ratio of vases to flowers if there are 2 vases?

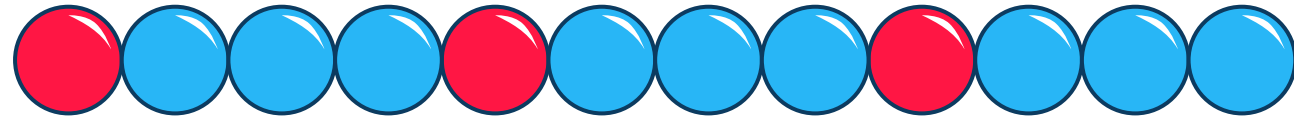
..... :

b What is the ratio of vases to flowers if there are 3 vases?

..... :

Follow me

Let's compare the red beads to the blue beads.



- a How many blue beads are there **for every** 1 red bead?

For every red beads,

there are blue beads.

- b Write two equivalent ratios of red beads to blue beads.

..... : :

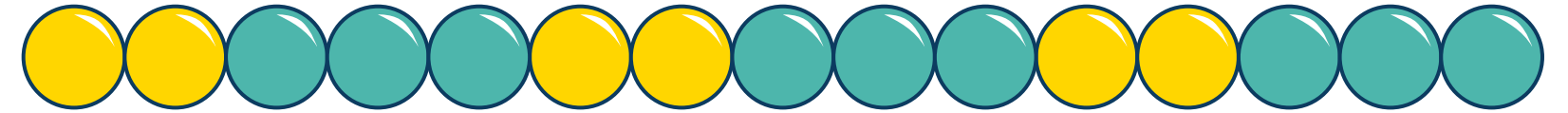
The **ratio symbol** : is read as the word '**to**'.

- c What is the ratio of red beads to total beads?

..... :

Your turn

Compare the yellow beads to the green beads.



- a How many green beads are there **for every** 2 yellow beads?

For every yellow beads,

there are green beads.

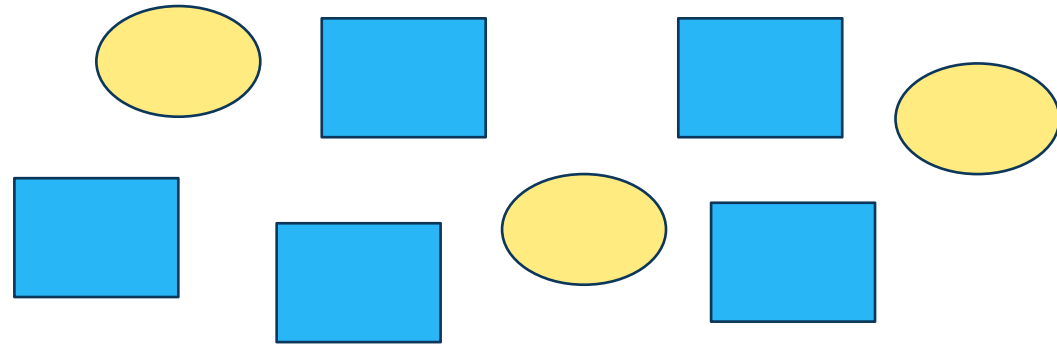
- b Write two equivalent ratios of yellow beads to green beads.

..... : :

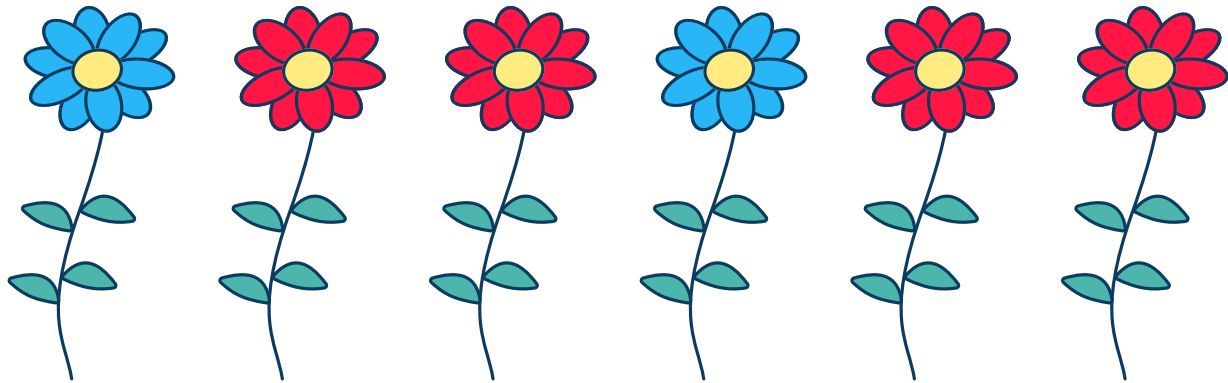
- c What is the ratio of yellow beads to total beads?

..... :

You do



- a For every circles, there are squares.
- b What is the ratio of squares to circles? :



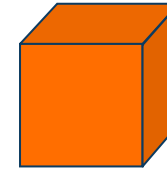
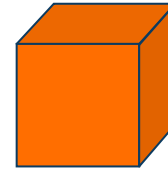
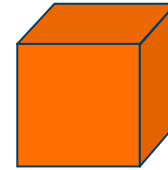
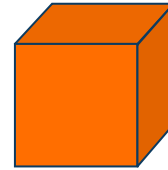
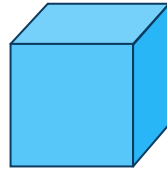
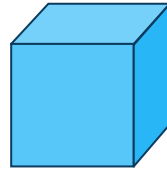
- c What is the ratio of blue flowers to red flowers? :
- d Write an equivalent ratio of blue flowers to red flowers. :

There are red and green of marbles in a bag.
The ratio of red to green marbles is 4:7.

- e What is the ratio of total marbles to green marbles? :

Go further

Check off the statements below that correctly describe the cubes.



For every 4 orange cubes, there are 2 blue cubes.

☐

For every blue cube, there are 4 orange cubes.

☐

The ratio of blue cubes to orange cubes is 2:4

☐

For every 3 blue cubes, there would be 6 orange cubes.

☐

For every 8 orange cubes, there would be 3 blue cubes.

☐

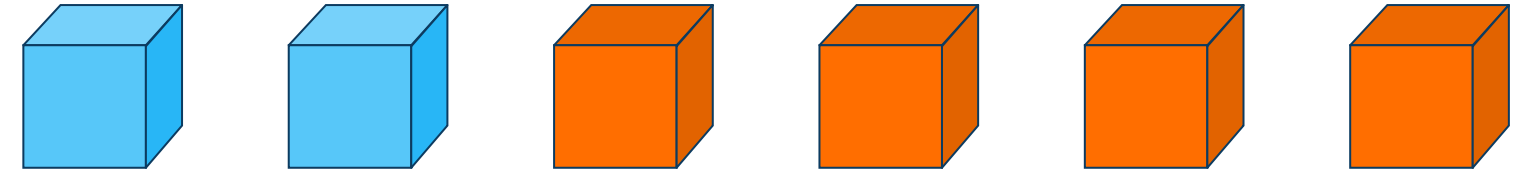
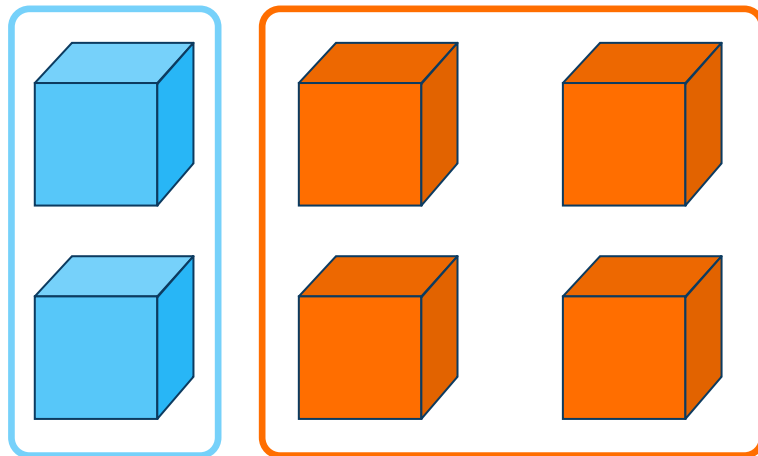
The ratio of orange cubes to the total amount of cubes is 2:3.

☐

Let's look more closely at each of the statements given. Check off the ones that are correct.

We can rearrange the cubes to help us see the relationship between the cubes more clearly.

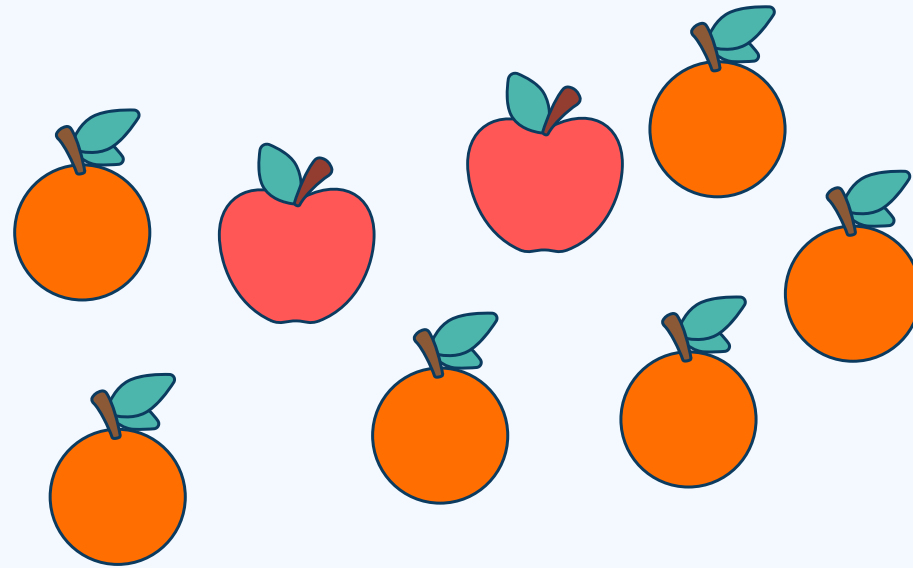
The ratio can be described as 2:4.



Pay attention to the order of each written ratio

- ☐ For every 4 orange cubes, there are 2 blue cubes.
- ☐ For every blue cube, there are 4 orange cubes.
- ☐ The ratio of blue cubes to orange cubes is 2:4
- ☐ For every 3 blue cubes, there would be 6 orange cubes.
- ☐ For every 8 orange cubes, there would be 3 blue cubes.
- ☐ The ratio of orange cubes to total cubes is 2:3.

Check your understanding



- a For every apples, there are oranges.
- b What is the ratio of apples to oranges? :
- c What is the ratio of oranges to total fruit? :
- d What is the ratio of apples to total fruit? :




Why do I need to try this question on my own first?

- To show your tutor what you understand
- To give you more practice
- To show your teacher how you are doing



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“We just had our first session and it went great! The kids really liked it and felt like they were learning! One even said he finally felt like math was making sense.”



Michelle Craig, Instructional Coach,
Sherwood Forest Elementary, Washington

Speak to us

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