For Every 2 Wings: What Is a Ratio?

Teacher		**Class**	Grade 6
Subject	Math	**Topic**	Understanding ratios
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn what a ratio is and how to describe it with for-every language. They model wings and beaks and write ratios in the right order.

Curriculum links

- Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. [12]

Learning objectives

- Students will understand a ratio shows how two amounts go together.
- Students will use for-every language to describe a ratio relationship.
- Students will write the same ratio in order with words, colon and fraction.

Success criteria

- I can explain what a ratio shows about two amounts.
- I can say a ratio with for-every language in order.
- I can write the same ratio with words, colon and fraction.

What students already know

Show 4 pencils and 2 books. Ask: Which group is larger and by how many? Listen for additive comparison to contrast with ratio thinking.

Key words

ratio	a comparison that shows how two countable amounts go together [10]
for every	words that link a fixed count of one thing to a fixed count of another [12]
order	which amount is said or written first and which is second [5]
colon	the : mark placed between two numbers to show a comparison [9]

Materials

- Whiteboard, markers
- 6 wing cutouts and 3 beak cutouts for modeling
- Wing cutouts and beak cutouts per pair (6 wings, 3 beaks)
- Slides 1-7, 10-12
- Video clip 1 (0:00-4:30) on slide 6
- Printed copies of Worksheet Task B

Before the lesson

- Print Worksheet Task B, one per student
- Cut out wing and beak sets: 6 wings and 3 beaks per pair plus a teacher set
- Load Slides 1-7, 10-12 and test Video clip 1 (0:00-4:30) on slide 6 with sound
- Set up whiteboard with sentence frame: For every __ of the first thing, there is __ of the second thing.

Lesson outline

0–8 min **Starter** 8 min · Whole class

To hook interest and surface the idea that two amounts can go together in pairs.

YOU DO

1. Greet the class and show the mystery bird situation.
2. Ask the hook question and take 2-3 quick estimates without confirming.
3. Show 2 wings with 1 beak, then build to 10 wings, counting beaks as you go.
4. Link answers to today's learning: describing how two amounts go together.

STUDENTS DO

1. Listen to the hook and give estimates with thumbs up or hands.
2. Count aloud as wings and beaks are grouped.
3. Tell a partner what pattern they notice in the pairs.

Say: Today we learn how mathematicians describe two amounts that go together. Listen for how many of the first thing go with how many of the second thing. Order counts, so we always say what is first and what is second.

Worked example: If a bird house has 2 wings for every 1 beak: Step 1: 2 wings go with 1 beak. Step 2: 10 wings is 5 groups of 2 wings because 5 x 2 = 10. Step 3: So 5 groups need 5 beaks because 5 x 1 = 5.

Ask: If a bird house has 2 wings for every 1 beak, how many beaks go with 10 wings? (5 beaks, because 10 wings makes five 2-wing groups) · What are the two amounts we are comparing? (Wings and beaks)

Check understanding: Ask all to hold up fingers for beaks with 10 wings. If mixed, regroup 2 wings with 1 beak on the board again.

Support: Point to each 2-wing group and its 1 beak while counting: 2 and 1, 4 and 2. **Stretch:** Ask: What if we had 20 wings? How many beaks, and how do you know so fast?

Use: Slides 5, 7

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8–20 min **Teaching** 12 min · Whole class

To explain what a ratio is and model for-every language in order.

YOU DO

1. Show the big idea and steps, then play the video for for-every language.
2. Model with 6 wings and 3 beaks that the ratio of wings to beaks is 2:1, because for every 2 wings there was 1 beak [12].
3. Explain students are learning ratio language to describe the association between two quantities [8].
4. Model writing the same comparison three ways and stress placing the first term first [10].

STUDENTS DO

1. Watch and listen for for-every language and name the two quantities compared.
2. Repeat the for-every sentence aloud with the teacher.
3. Copy the three forms for wings to beaks on mini whiteboards.

Say: A ratio shows how two amounts go together. We spot two amounts we can count. Then we say for every there is, and we write in order from first to second. A ratio is a way to show a relationship or compare two numbers of the same kind [10].

Worked example: 6 wings and 3 beaks: Step 1: Name in order: wings to beaks. Step 2: Say: For every 2 wings there is 1 beak. Step 3: Write 2 to 1, 2:1, and 2/1 as a ratio. All three mean the same comparison [9].

Ask: What is the ratio of wings to beaks if for every 2 wings there is 1 beak? (2 to 1, written 2:1) · Why do we write wings first? (Because we said wings to beaks first, so when you write the ratio you place the first term first [10]) · How can you write 2 to 1 two other ways? (2:1 and 2/1 as a ratio)

Check understanding: All hold up whiteboards showing 2:1 for wings to beaks. Reteach order if reversed.

Support: Give the sentence frame: For every __ of the first thing, there is __ of the second thing. **Stretch:** Ask what changes if the order flips to beaks to wings, and have students say the new for-every sentence.

Use: Slides 1-4, 6; Video clip 1 (0:00-4:30)

20–38 min **Main activity** 18 min · Pairs

To use for-every language to describe the wings-to-beaks ratio relationship.

YOU DO

1. Hand out wing and beak cutouts and remind pairs that a ratio has two numbers connected by a multiplicative relationship [7].
2. Have pairs build the 6-wing, 3-beak display and practice saying the comparison both ways.
3. Circulate, correct order, and prompt full for-every sentences.
4. Select 3 pairs to read one sentence aloud and have the class check first to second.

STUDENTS DO

1. Arrange cutouts into 2-wing and 1-beak groups and take turns saying for-every sentences.
2. Write two for-every sentences about wings and beaks on the whiteboard.
3. Read one sentence aloud while the class checks the order.

Say: With your partner, make groups that show 2 wings for every 1 beak. Take turns saying the full sentence. Then write two for-every sentences about what you see and read one aloud. Keep first to second every time.

Worked example: Pair display with 6 wings and 3 beaks: Sentence 1: For every 2 wings, there is 1 beak. Sentence 2: For every 6 wings, there are 3 beaks. Flipped: For every 1 beak, there are 2 wings.

Ask: Tell me in one for-every sentence how your wings compare to your beaks. (For every 2 wings, there is 1 beak) · What happens to the sentence if we mean beaks to wings? (It flips to: For every 1 beak, there are 2 wings)

Check understanding: Listen to read-alouds for correct order and counts. If a pair reverses, have them point to each pile while rereading first to second.

Support: Give the sentence frame: For every __ of the first thing, there is __ of the second thing. **Stretch:** Ask what changes if the order flips to beaks to wings, and have students say the new for-every sentence.

Use: Slide 7

38–52 min **Practice** 14 min · Pairs

To write the same ratio three ways in the correct order.

YOU DO

1. Explain that ratios can be expressed using the colon, as a fraction, or with the word to, such as 3:2, 3/2, or 3 to 2 [9].
2. Model with a tray of 3 apples and 2 oranges: apples to oranges is 3 to 2, 3:2, 3/2 as a ratio.
3. Stress when taking ratios, the order of the two numbers matters [5].
4. Hand out Worksheet Task B and have pairs write each ratio in order with for-every language.

STUDENTS DO

1. Copy the three forms for apples to oranges and say them with a partner.
2. Complete Worksheet Task B: write each ratio in order with for-every language.
3. Sort matches and read one set aloud using ratio language.

Say: Same math, three ways to write it. We can write to, colon, or fraction, but the first thing stays first. For 3 apples and 2 oranges, apples to oranges is 3 to 2, 3:2, and 3/2. Oranges to apples would be different.

Worked example: 3 apples and 2 oranges: Apples to oranges = 3 to 2 = 3:2 = 3/2. Say: For every 3 apples there are 2 oranges. Backwards, oranges to apples = 2 to 3 = 2:3, which tells a different story.

Ask: Imagine a tray with 3 apples and 2 oranges. What is the ratio of apples to oranges? (3 to 2, 3:2, 3/2 as a ratio; for every 3 apples there are 2 oranges) · Why does 2:3 not match that tray? (Because order matters [5]; 2:3 would mean 2 apples to 3 oranges)

Check understanding: Collect whiteboards showing 3:2 and 2:3 labeled correctly. Re-model first-term-first if many reverse.

Support: Keep numbers to 6, keep the picture visible next to the words, and use the frame: The ratio of __ to __ is __ to __. **Stretch:** Show a reversed card and ask teams to explain why it does not match and fix it in all three forms.

Use: Slides 4, 11; Worksheet Task B

52–60 min **Plenary** 8 min · Whole class

To check that order matters and that ratios scale multiplicatively.

YOU DO

1. Show the 2:3 to 4:5 error and explain the relationship is multiplicative in nature, not additive [3].
2. Lead true-or-false voting on order and for-every language.
3. Return to the starter: confirm 10 wings need 5 beaks.
4. Hand out exit tickets.

STUDENTS DO

1. Vote true or false and explain in one sentence why.
2. Correct the 4:5 to 4:6 with a partner.
3. Answer the 3 exit questions on paper.

Say: Good ratio thinkers watch order and scale by multiplying, not just adding. If we have twice as many wings, we need twice as many beaks. Say it with for every, and keep first to second.

Worked example: Claim: 2:3 becomes 4:5 by adding 2. That is not a ratio rule. Correct scaling multiplies: 2:3 scales to 4:6 because 2 x 2 = 4 and 3 x 2 = 6. The multiplicative link stays the same [7].

Ask: True or false: The ratio of A to B is written B:A. (False; order matters, A to B is A:B) · True or false: For every 3 apples there are 2 oranges is a ratio. (True; for-every language describes a ratio [12])

Check understanding: Use true-false mini-whiteboard vote. If many miss the additive error, show 2:3 with dots and double both piles.

Support: Label two piles with word cards and point to each while reading first term first [10]. **Stretch:** Ask students to make up a classroom example where reversing the order would give the wrong message.

Use: Slides 10, 12

Common mistakes

Mistake	How to spot it	How to fix it
Thinking 2:3 is equivalent to 4:5 by adding 2 to each number	Student writes 2:3 = 4:5 and talks about difference of 2 [3]	Show with drawings that both piles must be multiplied: 2:3 scales to 4:6, because the relationship is multiplicative in nature, not additive [3]
Reversing order, writing B:A for A to B	Student says wings to beaks but writes 1:2	Have them point to first pile then second while saying first to second, because when taking ratios, the order of the two numbers matters [5]
Mixing part-to-part with part-to-whole	Student says 3 apples to 5 fruit as 3:2	Count and label part, part, total first; practice that we can compare one kind to total nuts in a jar as well as one kind to another kind [10]

Support

- Give the frame: For every __ of the first thing, there is __ of the second thing.
- Start with totals under 10 and keep pictures next to words.
- Have students write each ratio as a fraction first, then read colon and to forms.

Stretch

- Ask what changes if the order flips to beaks to wings, and have students say the new for-every sentence.
- Ask students to describe the same groups as a part-to-whole comparison.
- Call a larger ratio like 3 to 2 and ask groups to predict how many of each 12 and 8 would need.

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For the LSE or teaching assistant

Stay with the main-activity pairs. Prompt the for-every frame, check wing-beak grouping, and pre-point to first then second pile before they speak.

Check for understanding

Question	Answer
Imagine a tray with 3 apples and 2 oranges. What is the ratio of apples to oranges? Say it with for every.	3:2; For every 3 apples there are 2 oranges.
Write the ratio of beaks to wings if wings to beaks is 2:1.	1:2; For every 1 beak there are 2 wings.
True or false with reason: 2:3 and 4:5 show the same ratio relationship.	False; you must multiply both numbers by the same number, so 2:3 matches 4:6, not 4:5.

Homework

Find one pair of countable things at home and write the ratio three ways with a for-every sentence.

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