6. 3 white counters to 5 black counters

○ ○ ○
● ● ● ● ●

3 white counters to 5 counters

○ ○ ○
● ●

7. 2 : 3; Os to Xs
3 : 2; Xs to Os
2 : 5; Os to letters
3 : 5; Xs to letters

8. For example,
6 : 4, 4 : 6, 4 : 10, 6 : 10, 10 : 4, 10 : 6

10. Students might use an organized list to write the ratios. For example: 1 : 3 (raisins to nuts or sunflower seeds to nuts); 1 : 2 (raisins to papaya or sunflower seeds to papaya); 1 : 1 (raisins to sunflower seeds); 3 : 1 (nuts to raisins or nuts to sunflower seeds); 3 : 2 (nuts to papaya); 2 : 1 (papaya to raisins or papaya to sunflower seeds); 2 : 3 (papaya to nuts); 1 : 1 (sunflower seeds to raisins); 1 : 7 (raisins to all ingredients or sunflower seeds to all ingredients); 3 : 7 (nuts to all ingredients); 2 : 7 (papaya to all ingredients); and so on.

Practice

1. Write each ratio 2 ways.
   a) apples to pears — 4 to 3, 4 : 3
   b) caps to scarves — 5 to 6, 5 : 6
   c) roses to daisies — 1 to 4, 1 : 4

2. Write a ratio to show the numbers of:
   a) ladybugs to ants 3 : 7
   b) ants to ladybugs 7 : 3
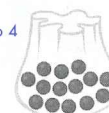   c) ladybugs to insects 3 : 10
   d) ants to insects 7 : 10

3. Write each ratio in as many ways as you can.
   a) red marbles to green marbles 10 : 4, 10 to 4
   b) green marbles to all the marbles 4 to 14, 4 to 10, 4 : 10
   c) green marbles to red marbles 4 : 14, $\frac{4}{14}$
   d) red marbles to all the marbles 10 to 14, 10 : 14, $\frac{10}{14}$

4. Ms. Zsabo has 13 girls and 11 boys in her class. Write each ratio.
   a) girls to boys 13 : 11
   b) boys to girls 11 : 13
   c) boys to students 11 : 24
   d) girls to students 13 : 24

5. What is being compared in each ratio?
   a) 3 : 4 Cats to dogs
   b) $\frac{4}{7}$ Dogs to animals
   c) 3 to 7 Cats to animals
   d) 4 : 3 Dogs to cats

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Use *Connect* to introduce the term *ratio* and the ways of writing both part-to-part and part-to-whole ratios. Reinforce the idea that a fraction is a ratio that compares a part of a set to the whole set. Have students work with their partners to write each of their comparisons from *Explore* in two ways (for example, 7 to 12, 7 : 12). Then have students write fractions for any part-to-whole comparisons.

Continue to provide comparisons for which students can write ratios until they are comfortable with the concept. For example, have students use the number of boys and girls in the class to write as many ratios as they can.

Practice

Students will need 2-colour counters for questions 6 and 11. Question 8 requires 10 pennies and a paper cup. The 2-colour counters will also be helpful for the other *Practice* questions.

Assessment Focus: Question 10

Students should realize that they can compare each ingredient of the trail mix to each of the other ingredients (part-to-part ratios), and each ingredient to all the ingredients (part-to-whole ratios). They write each ratio and describe what it means.

Some students might include parts-to-parts ratios, such as raisins and nuts to sunflower seeds and dried papaya.

Students can play the Additional Activity *Counter Ratios* (Master 5.11).

6. Use counters to model the ratio 3 : 5 in 2 different ways.
   Draw diagrams to record your work.
   Explain each diagram.

7. Write 4 different ratios for this picture.
   Explain what each ratio compares.

8. A penny can show heads or tails.
   Place 10 pennies in a cup. Shake and spill.
   Write as many ratios as you can for the pennies.

9. Write a ratio to show the numbers of:
   a) triangles to squares   2 : 3
   b) squares to rectangles   3 : 5
   c) triangles to all shapes   2 : 10
   d) red shapes to yellow shapes   5 : 5
   e) yellow triangles to yellow rectangles   1 : 2
   f) red triangles to yellow squares   1 : 2
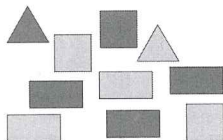
10. Write as many ratios as you can for the trail mix recipe.
    Explain what each ratio compares.

    TRAIL MIX
    1 scoop raisins
    3 scoops nuts
    2 scoops dried papaya
    1 scoop sunflower seeds
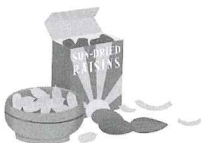
11. Use 11 counters to show each ratio.
    Sketch counters to record your work.
    a) 5 : 6   b) 8 to 3   c) $\frac{2}{11}$ d) 6 : 11

Reflect

When you see a ratio, how can you tell
if it is a part-to-part or part-to-whole ratio?

Assessment Focus | Question 10

11. a)
    b)
    c)
    d)

REFLECT: A part-to-whole ratio is the only type of ratio that can be written as a fraction. So, if a ratio is written as a fraction, it must be part-to-whole. Also, in a part-to-whole ratio, the second term is always greater than the first term; for example, 3 : 9. If the second term is less than the first term, the ratio must be part-to-part. However, 3 : 9 could be a part-to-part ratio but I would have to read the context of the question to find out. For example, if there are 3 dogs and 9 cats in a kennel, 3 : 9 is a part-to-part ratio.

ASSESSMENT FOR LEARNING

What to Look For	What to Do If You Don't See It
Conceptual Understanding ✔ Students explain that a ratio is a comparison of two quantities with the same unit. **Procedural Knowledge** ✔ Students can use a ratio to compare a part of a set to the whole set, and a part of a set to another part of the set.	**Check Further** Ask questions, such as: • What are you comparing? • How can you compare one part of the set to the whole set? • How many counters are there altogether? How many are red? How can you compare red counters to all the counters? **Adjust Instruction** Have students work in pairs with counters of two different colours. One student names a ratio and the other student models it with the counters. Provide students with a magazine or newspaper. Students select a photo that has at least two different categories of people or objects. Students write as many ratios as they can for their photo.

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