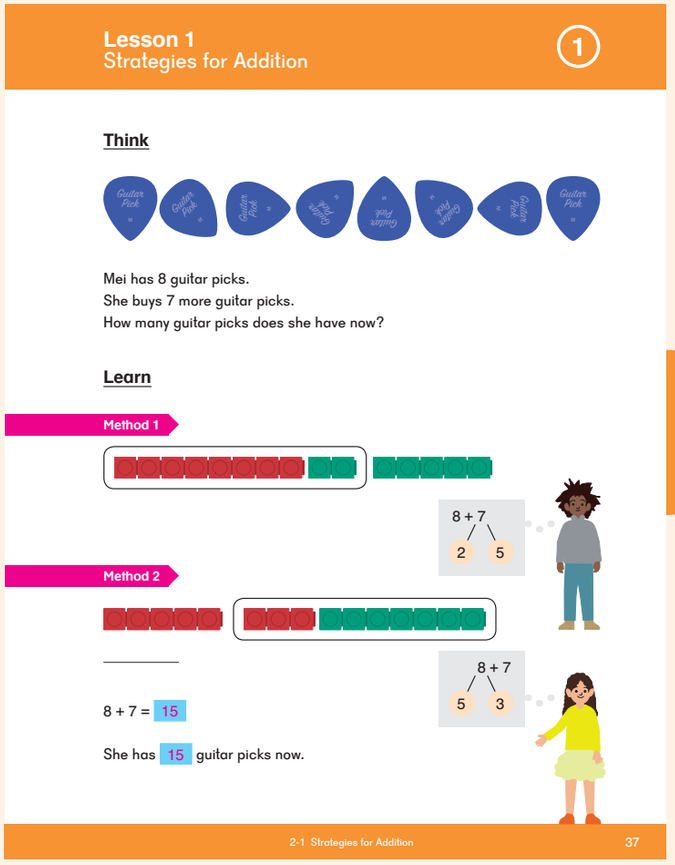
Objective

- Add with regrouping within 20 by making a 10.

Lesson Materials

- 20 linking cubes, 10 each of 2 different colors per student



Think

Provide students with linking cubes and pose the **Think** problem. Have students share their equation and how they solved the problem.

Learn

Have students discuss the strategies that Dion and Sofia used. Ask students how many solved their problem like Dion, and how many like Sofia.

Both Dion and Sofia start by making 10, a strategy that students learned in **Dimensions Math® 1A** and used throughout **Dimensions Math® 1B**.

Dion decomposes, or splits, the 7 into 2 and 5. He adds the 8 and the 2 to get 10, then easily adds the remaining 5. 8 + 2 = 10, 10 + 5 = 15

Sofia splits the 8 into 5 and 3. 3 + 7 = 10, 10 + 5 = 15

Students should see that these are two ways to solve the same problem, and that they are not looking at two different problems.

Do

1. Ask students why Emma split the second number in her problem while Mei split the first number. Students may note that the 9 only needs 1 more to make a 10. Some students may find that splitting 9 into 5 and 4 is just as efficient.

2. Have students discuss both ways of splitting the addends.

Activities

▲ Flash Cards

Materials: Index cards or construction paper

Provide students with index cards and have them create their own flash cards for future practice and games.

Students can also fold construction paper into 8 equal parts and cut out their own flash cards.

▲ Addition Face-off

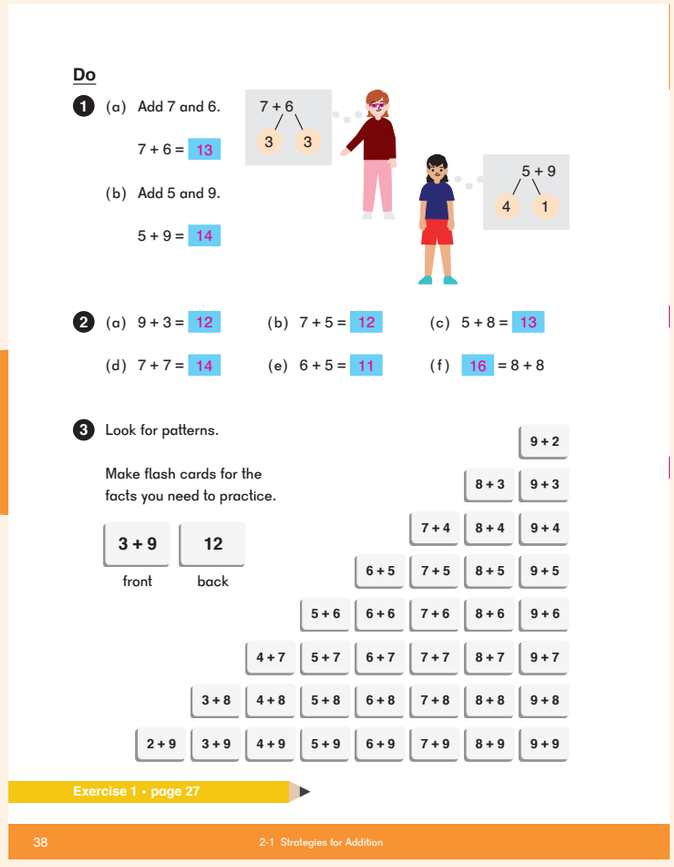
Materials: Number Cards (BLM) 0 to 10, or regular playing cards

Play in groups of 2–4. If using a regular deck of cards, aces are one, and face cards are ten.

Deal out cards evenly to players. Players flip over 2 cards each and call out their sums. The student with the greatest sum wins and collects all the cards.

If there is a tie, repeat, turning over 2 more cards.

Exercise 1 • page 27

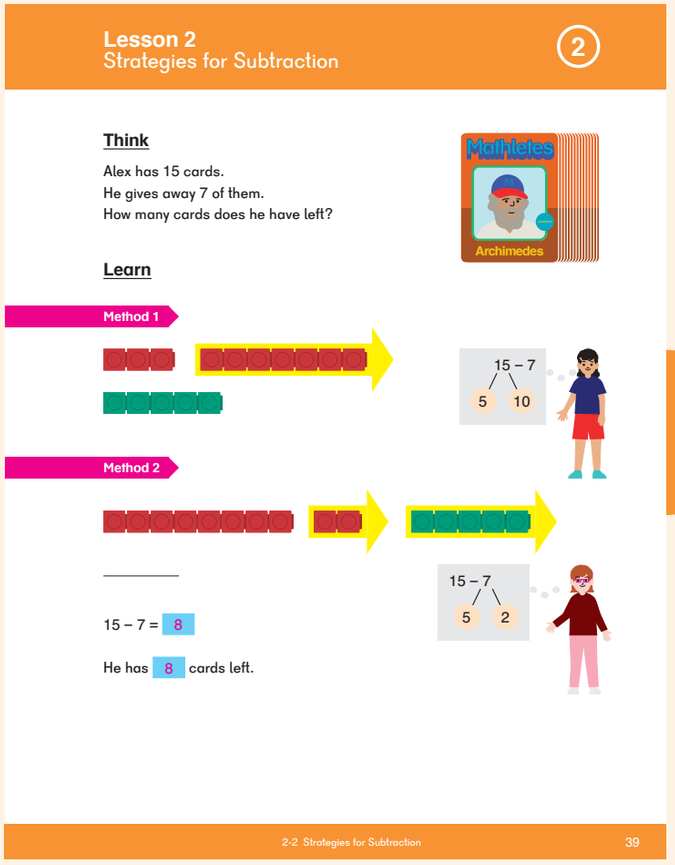


Objective

- Subtract with regrouping within 20 by decomposing the minuend or subtrahend.

Lesson Materials

- 20 linking cubes, 10 each of 2 different colors for each student



Think

Pose the **Think** problem. Students should represent Alex's card problem with linking cubes. Have them write the equation, find the answer, and then share how they solved the problem.

If needed, prompt students to recall methods they learned from a previous grade level. Ask, "Can we split 15 or split 7 to make it easy to subtract by using the facts within 10?"

Learn

Mei's strategy is to split the minuend (first number or whole) into 10 and 5 ones. She is subtracting 7 from 10. In grade 1, this is referred to as "subtracting from ten." 10 – 7 = 3, 3 + 5 = 8

Emma's strategy is to split the subtrahend (second number or part). First she subtracts 5 from 15 to get 10, then she subtracts a further 2 from 10 to get her answer. In grade 1, this is referred to as "double subtracting" or "subtract twice." 15 – 5 = 10, 10 – 2 = 8

Ask students if they solved their problem like Mei or like Emma. As with the addition example in the previous lesson, students should see that these are two different ways to solve the same problem.

Do

❷ Have students share and discuss how they split the numbers in the problems.

Activities

▲ Flash Cards

Materials: Index cards or construction paper

As in the previous lesson, provide students with index cards or construction paper, and have them create their own flash cards for future practice.

▲ Salute!

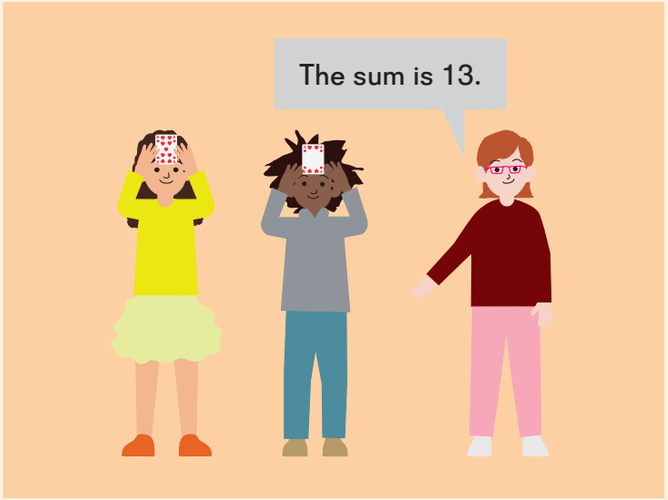
Materials: Deck of cards with face cards removed

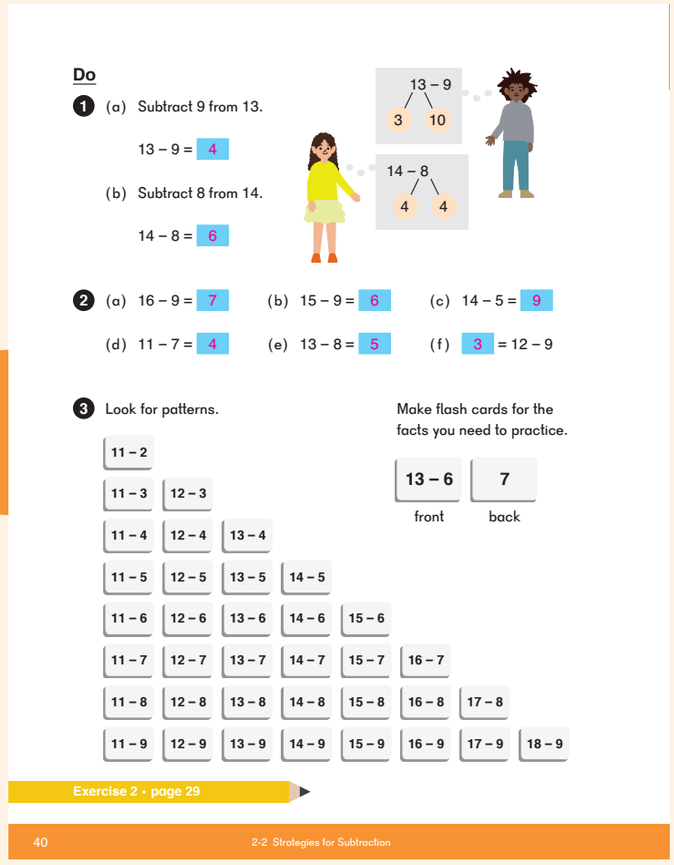
Salute! is played with three students. The Caller shuffles, then deals out the deck to two players. The third player is the Caller.

When the Caller says, "Salute!" the other players place the top cards from their piles on their foreheads. The two players can see each other's cards, but not their own.

The Caller tells the players the sum of the two numbers on their cards. (Think of the three players as a number bond with one of the addends missing.)

The player who says the number on his card first is the winner.





▲ Alligator! Alligator! Alligator!

Materials: Alligator Cards (BLM), Addition and Subtraction to 20 Fact Cards (BLM)

Play the game from the **Chapter Opener** on page 42 of this Teacher's Guide, but with fact cards to 20.

Exercise 2 • page 29

Objectives

- Understand the part-whole meanings of addition and subtraction.
- Solve problems involving a missing part or whole.

Lesson Materials

- 20 linking cubes, 10 each of 2 different colors for each student
- Paper strips, 2 colors of the same length

Think

Read the two **Think** stories aloud and have students compare and discuss the two different stories. Ask students how the two stories are the same or how they are different.

Have students draw the number bonds for the two problems, then write the equations and find the answers.

Have students discuss why they added or subtracted.

Learn

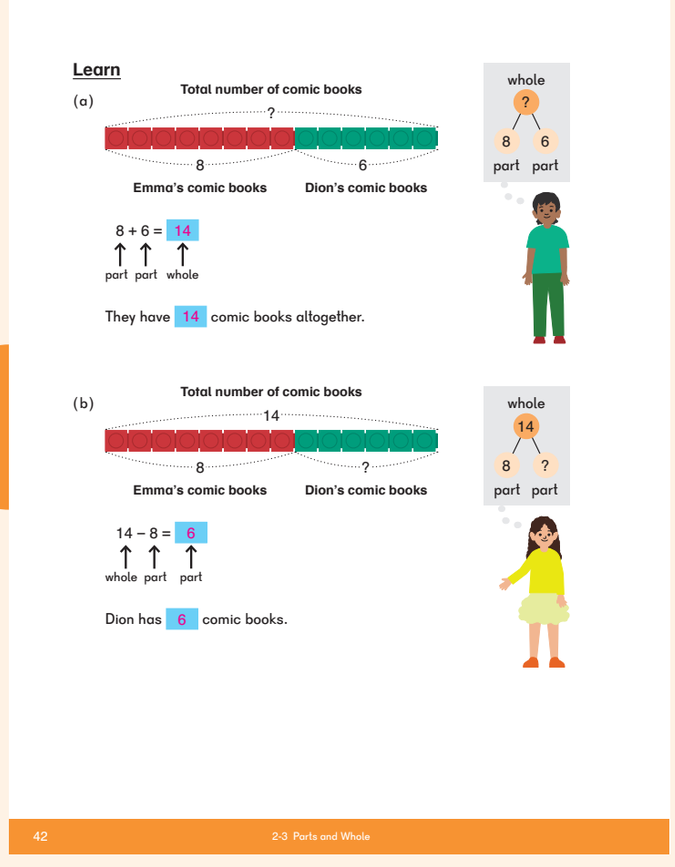
In this and the next lesson, bar models are introduced as a way to help students visualize the problem situation. Provide students with linking cubes and have them model each story. Students are not required to draw the models.

Alex thinks that if he knows two parts in a problem, he can add them together to find the whole, just like in a number bond.

Sofia's number bond shows that if she knows a whole and one part, then she can find the missing part. She will use subtraction to find the missing part.

Tell students these are called **part-whole** bar models. If we know the two parts, we can find the whole. If we know a whole and a part, we can find the missing part.

41



42

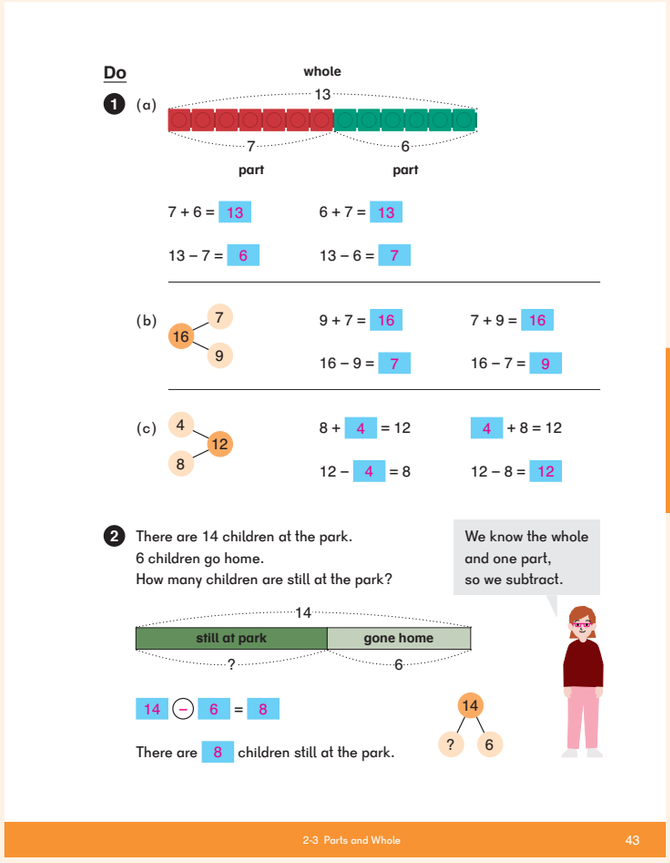
Do

1. Students can find four facts from the bar model just as they have from the number bond.

2. Ask students:

   - What is similar and what is different about the model in this problem compared to the cubes in the previous problems?
   - What does the question mark mean?

   In this problem, the bar model diagram changes from individual cubes that can be counted to a length that is somewhat proportional. Students can continue to use linking cubes as needed.



3 Provide students with paper strips. Have them represent the parts of the bar model with the paper strips on a whiteboard, where they can write the numbers above and below.

Students should begin with two strips the same length.

Ask:

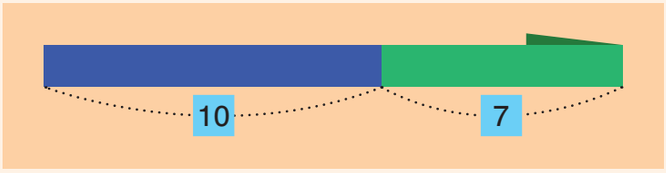
- Which strip will represent the children?
- Which will represent the adults?
- Are there the same number of children and adults?
- Should our strips be the same length?

Have students fold the strip that represents the adults to be a bit shorter than the strip that represents the children.

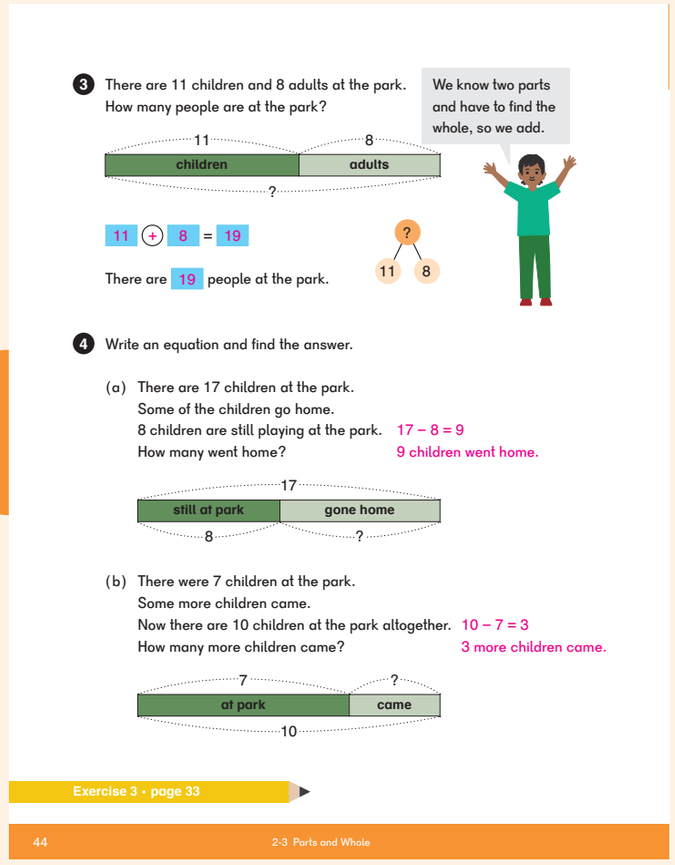
Have them put the strips together, as shown in the textbook, to find the whole.

4 Paper strips may still be used to find the difference, however, students do not have experience estimating to find the missing part. Have them start with strips of equal length and fold them after completing the problem.

Have students keep their strips for future lessons.



Exercise 3 • page 33


3 There are 11 children and 8 adults at the park.
How many people are at the park?

We know two parts and have to find the whole, so we add.

11 children 8 adults ?

11 + 8 = 19

There are 19 people at the park.

? 11 8

4 Write an equation and find the answer.

(a) There are 17 children at the park.
Some of the children go home.
8 children are still playing at the park. 17 − 8 = 9
How many went home? 9 children went home.

17 still at park gone home 8 ?

(b) There were 7 children at the park.
Some more children came.
Now there are 10 children at the park altogether. 10 − 7 = 3
How many more children came? 3 more children came.

7 ? at park came 10

Exercise 3 • page 33

44 2-3 Parts and Whole

44

Objective

- Solve addition and subtraction problems involving comparison.

Lesson Materials

- 20 linking cubes, 10 each of 2 different colors for each student
- Paper strips, 2 colors of the same length

Think

Pose the two problems from **Think**. Have students represent the quantities with cubes or paper strips to solve the problem.

Ask:

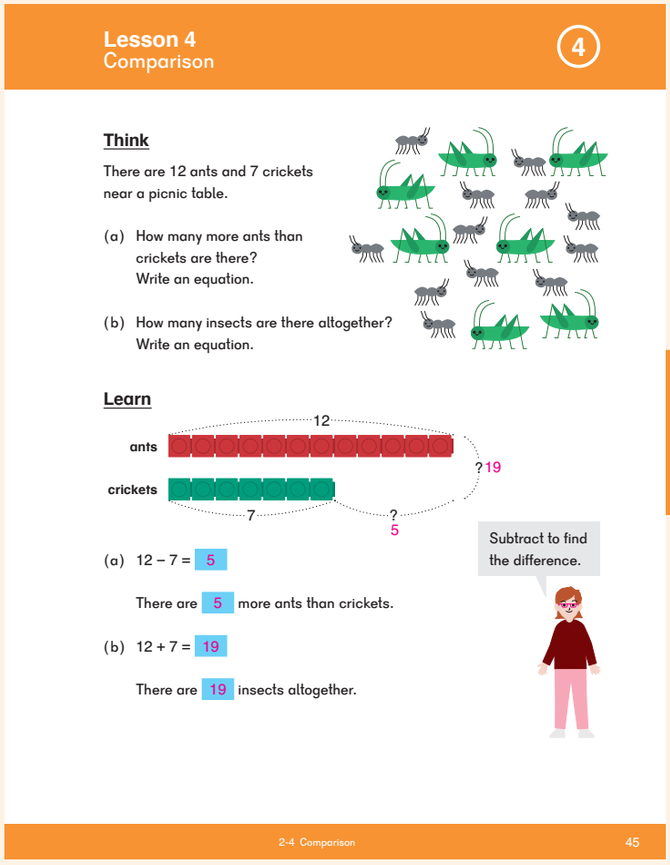
- How can we use what we learned in the last lesson?
- Can we use our cubes or paper strips to model this problem?
- How do the cubes/paper strips help determine what equation to write?

Have students share their strategies.

Learn

Have students compare and discuss the two different stories and equations:

- How are the linking cubes lined up in this example?
- Why do you think they are lined up that way?
- Where are the "more" ants represented on the cubes?
- Where are "all of the insects represented" on the cubes?
- What do the 2 question marks represent?
- Why is one of them written on the right side?
- How can we find how many more ants there are than crickets?
- How can we find how many insects there are altogether?



Emma tells us that to find the difference numerically, we can subtract.

Tell students these are called **comparison** bar models. We can use them to tell the difference between two or more quantities.

Do

1 Students can continue to use linking cubes or paper strips.

If students use paper strips, they should begin with two strips the same length.

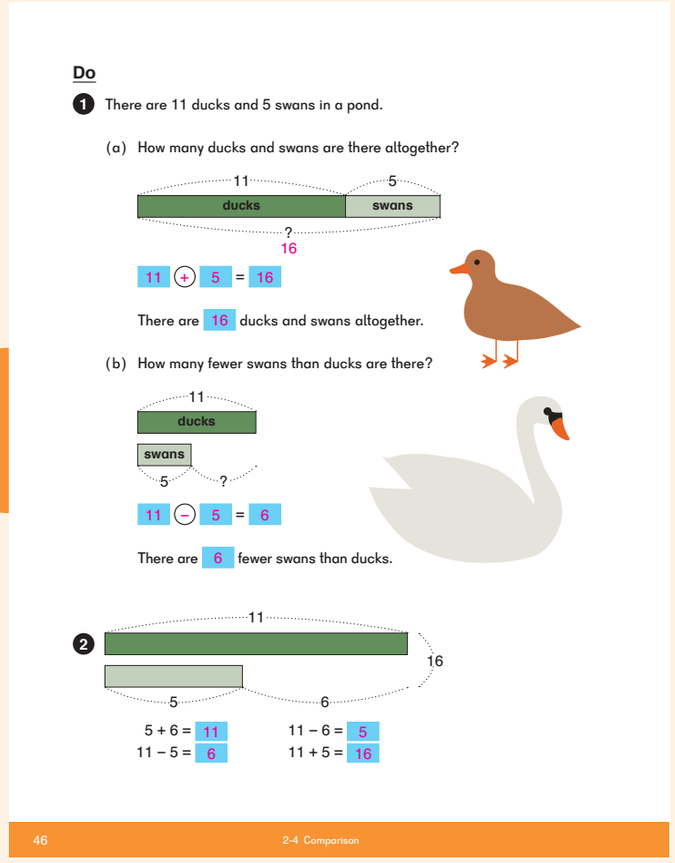
Ask:

- Which strip will represent the ducks?
- Which will represent the swans?

1 (b) Have students stack the strips, one above the other, as shown in the textbook. Explain that the problem is comparing the number of ducks to the number of swans. When comparing, we want to know which quantity is more and which is less.

While there are four different equations that can be found from this model, they are not a fact family. Have students come up with a story for each equation. For example:

- 11 – 5 = ? There are 11 chairs and 5 tables. How many more chairs? How many fewer tables?
- 11 – 6 = ? There are 11 chairs. There are 6 more chairs than tables (or 6 fewer tables than chairs). How many tables?
- 5 + 6 = ? There are 5 tables. There are 6 more chairs than tables (or 6 fewer tables than chairs). How many chairs?
- 11 + 5 = ? There are 11 chairs and 5 tables. How many pieces of furniture are there in all?



❸ — ❽ Ask students questions about the problems:

- What do we need to find?
- Are we comparing two quantities?
- Do we know the whole or total?
- Do we know one part?
- Where is the more/fewer in the model?
- How do we know whether to subtract or add?
- In ❺, which question mark represents the total?

Students should keep their paper strips as a tool for use in the future, or keep extra paper strips with other math tools in the classroom.

By the end of this lesson, many students may not need the paper strips or linking cubes to represent the problems. Students who are interested and prefer to draw the bar models should be allowed to do so.

Activity

▲ Model Posters

Materials: Paper strips (2 colors of the same length), markers or crayons, art paper, glue

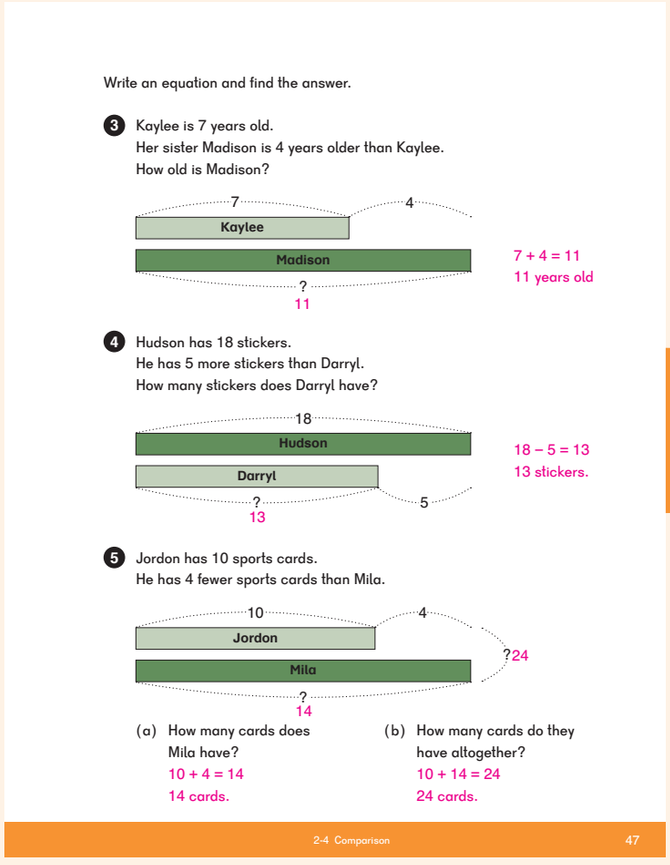
Provide students with paper strips and an equation such as 9 + 3 = ☐ or 14 − ☐ = 7. Have them:

- Create a word problem.
- Illustrate the problem.
- Glue down the strips for the bar model for the problem.
- Write the equation and solution.

Have students discuss and share their work.

★ For a greater challenge, have students write their own equations.

Exercise 4 • page 37



Write an equation and find the answer.

❸ Kaylee is 7 years old.
Her sister Madison is 4 years older than Kaylee.
How old is Madison?

7 + 4 = 11
11 years old

❹ Hudson has 18 stickers.
He has 5 more stickers than Darryl.
How many stickers does Darryl have?

18 − 5 = 13
13 stickers.

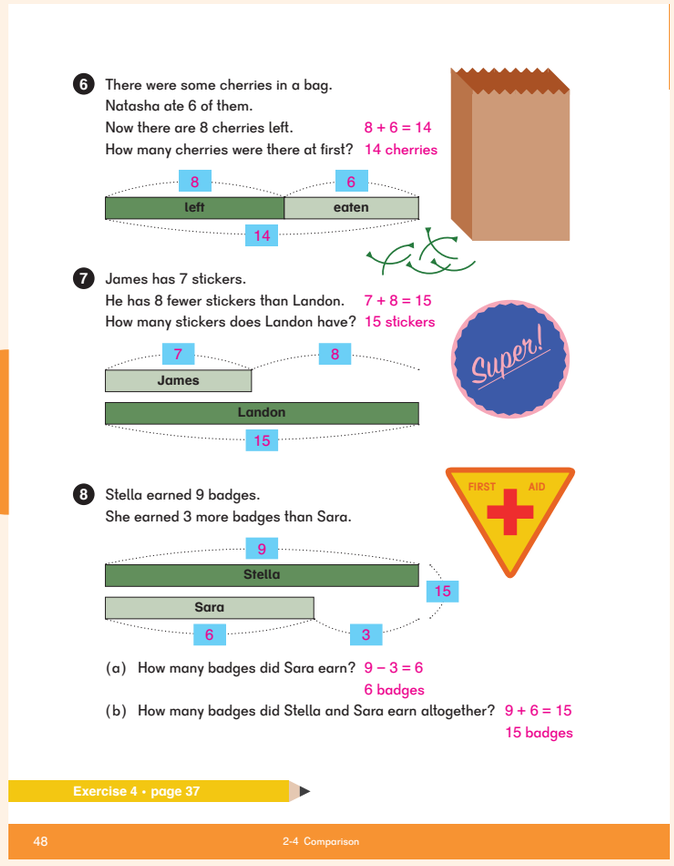
❺ Jordon has 10 sports cards.
He has 4 fewer sports cards than Mila.

(a) How many cards does Mila have?
10 + 4 = 14
14 cards.

(b) How many cards do they have altogether?
10 + 14 = 24
24 cards.

2-4 Comparison 47

47



❻ There were some cherries in a bag.
Natasha ate 6 of them.
Now there are 8 cherries left.
How many cherries were there at first?

8 + 6 = 14
14 cherries

❼ James has 7 stickers.
He has 8 fewer stickers than Landon.
How many stickers does Landon have?

7 + 8 = 15
15 stickers

❽ Stella earned 9 badges.
She earned 3 more badges than Sara.

(a) How many badges did Sara earn? 9 − 3 = 6
6 badges

(b) How many badges did Stella and Sara earn altogether? 9 + 6 = 15
15 badges

Exercise 4 • page 37

48 2-4 Comparison

48