



Core Knowledge[®] MATHEMATICS

Adding, Subtracting, and Working with Data

Student Workbook



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Adding, Subtracting, and Working with Data

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Adding, Subtracting, and Working with Data Student Workbook

Core Knowledge Mathematics™

Lesson 1: Add and Subtract Within 10

- Let's add and subtract within 10.

Warm-up: What Do You Know About Math?

What do you know about math?

1.1: Check It Off: Add or Subtract within 10

1. Pick 2 cards and find the value of the sum or difference.
2. Check off the number you found and write the expression.
3. The person who checks off the most numbers wins.

	Found it!	Expression
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

1.2: What's the Value?

1. Match each expression to the value of the sum or difference.

◦ $5 + 3$

◦ 9

◦ $3 - 1$

◦ 3

◦ $10 - 1$

◦ 8

◦ $4 + 5$

◦ 7

◦ $6 + 3$

◦ 1

◦ $6 - 5$

◦ 4

◦ $1 + 6$

◦ 2

◦ $9 - 5$

◦ $8 - 5$

◦ $3 + 6$

2. Circle all the addition expressions that have a value of 10.

0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	
2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8		
3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7			
4+0	4+1	4+2	4+3	4+4	4+5	4+6				
5+0	5+1	5+2	5+3	5+4	5+5					
6+0	6+1	6+2	6+3	6+4						
7+0	7+1	7+2	7+3							
8+0	8+1	8+2								
9+0	9+1									
10+0										

3. What patterns do you see in the numbers in the expressions that have a value of 10?

Lesson 2: Relate Addition and Subtraction within 10

- Let's think about the relationship between addition and subtraction.

Warm-up: What Do You Know About 10?

What do you know about 10?

2.2: Sums of 10

1. For each cube tower, write as many equations as you can think of that represent the cubes.

A



B



C



D



E



2. Find the number that makes each equation true. Then write the letter of the cube tower that represents the equation.

$3 + \underline{\quad\quad} = 10$

Letter:

$10 - 7 = \underline{\quad\quad}$

Letter:

$10 - 5 = \underline{\quad\quad}$

Letter:

$2 + \underline{\quad\quad} = 10$

Letter:

$10 - 1 = \underline{\quad\quad}$

Letter:

$10 - 2 = \underline{\quad\quad}$

Letter:

$\underline{\quad\quad} + 6 = 10$

Letter:

$\underline{\quad\quad} + 9 = 10$

Letter:

$5 + \underline{\quad\quad} = 10$

Letter:

$10 - \underline{\quad\quad} = 4$

Letter:

Lesson 3: Relate Addition and Subtraction within 20

- Let's find the number that makes equations with 20 true.

Warm-up: Number Talk: Addition and Subtraction

Find the value of each expression mentally.

- $7 + 3$
- $10 - 7$
- $10 - 2$
- $10 - 4$

3.2: Make the Equation True

Find the number that makes each equation true.

1. $4 + \underline{\hspace{2cm}} = 20$

2. $20 - \underline{\hspace{2cm}} = 4$

3. $6 + \underline{\hspace{2cm}} = 20$

4. $20 - \underline{\hspace{2cm}} = 10$

5. _____ + 3 = 20

6. $20 - 15 =$ _____

7. $20 -$ _____ $= 18$

8. If you have time: _____ - 5 = 20

Lesson 4: Add and Subtract Your Way

- Let's add and subtract within 20.

Warm-up: Number Talk: Make 10

Find the value of each sum mentally.

- $8 + 2$

- $8 + 3$

- $8 + 5$

- $7 + 6$

4.1: Revisit How Close?

5	8	2	4
---	---	---	---

6

4.2: Add and Subtract within 20

Find the value of each expression.

Show your thinking using drawings, numbers, or words.

1. $4 + 9$

2. $15 - 3$

3. $7 + 6$

4. $17 - 9$

$$5. 14 + 5$$

$$6. 12 - 4$$

$$7. 6 + 12$$

$$8. 16 - 5$$

Lesson 5: Add Within 50

- Let's add within 50.

Warm-up: Number Talk: Two-Digit, One-Digit

Find the value of each sum mentally.

- $16 + 3$

- $16 + 5$

- $26 + 5$

- $38 + 6$

5.1: Revisit How Close, Add to 100

3	8	4	6
---	---	---	---

6	2	1
---	---	---

5.2: Add within 50

Find the value of each sum. Show your thinking using drawings, numbers, or words.

1. $37 + 8$

2. $24 + 23$

3. $16 + 30$

4. $39 + 11$

5. $27 + 15$

Lesson 6: Center Day 1

- Let's add and subtract in center activities.

Warm-up: Number Talk: Teen Numbers, Two-digit Numbers

Find the value of each expression mentally.

- $14 + 22$

- $19 + 22$

- $15 + 25$

- $17 + 25$

6.2: Centers: Choice Time

Choose a center.

What's Behind My Back?



How Close?

$$\boxed{} \boxed{} + \boxed{} \boxed{} = \underline{\hspace{2cm}}$$

Number Puzzles

$$14 = 8 + \boxed{}$$

Lesson 7: Collect and Represent Data

- Let's organize data and share with others.

Warm-up: Notice and Wonder: Let's Get There

What do you notice? What do you wonder?



7.1: How Do We Get to School?

Choose the picture that shows how you got to school today.

Write your name on the picture.

7.2: Visual Representations of Data

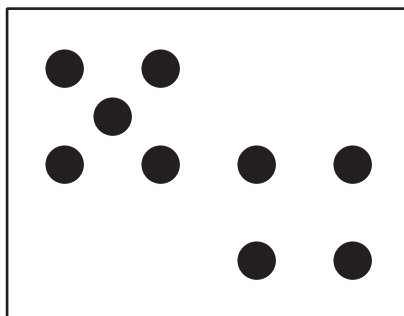
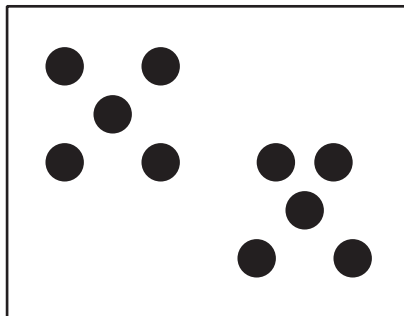
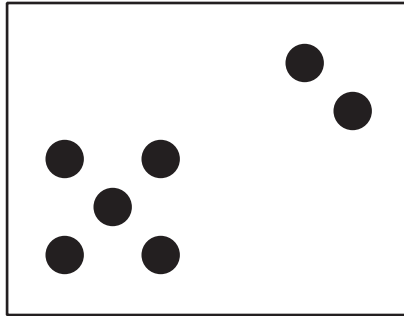
Organize and represent the **data** about how our class gets to school.

Lesson 8: Interpret Picture Graphs

- Let's answer questions based on picture graphs.

Warm-up: How Many Do You See: Dots within 10

How many do you see? How do you see them?



8.1: Veggies People Love

Clare asked a group of kids, “What veggies do you love?” Their responses are shown in this **picture graph**.



What can you learn about the veggies kids love from Clare’s picture graph?

A group of adults were asked, "What veggies do you love?" Their responses are shown in this picture graph.

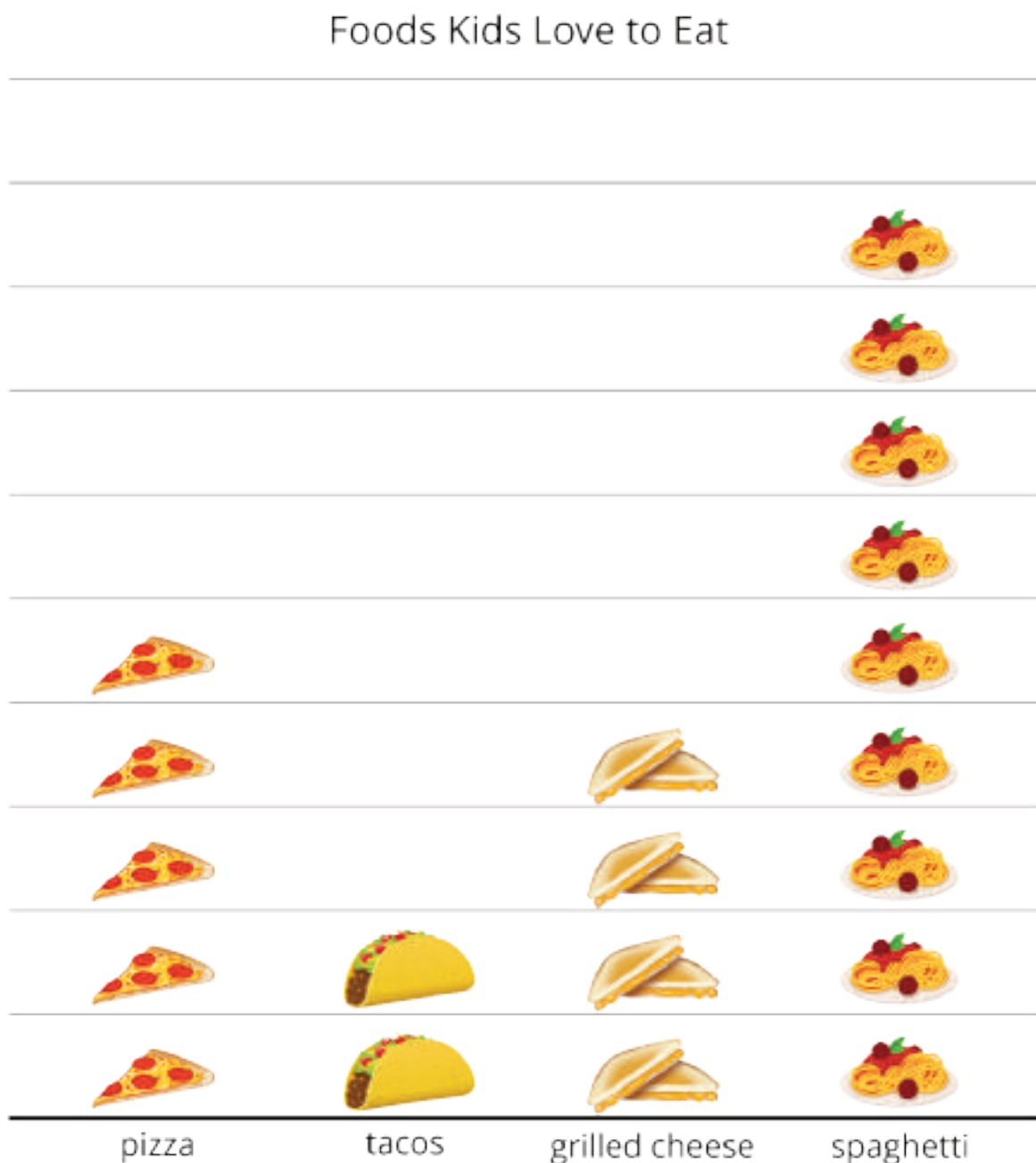


Answer the questions based on the graph.

1. How many adults like spinach?
2. What is the total number of adults who like carrots or corn?
Show your thinking using drawings, numbers, or words.
3. Write one fact you learned about the veggies adults love based on the data represented in the picture graph.

8.2: Answer Questions

A group of kids were asked, "What foods do you love to eat?" Their responses are shown in this picture graph.



1. Circle the 4 questions that can be answered using the graph.

- a. How many kids chose pizza?
- b. How many chose tacos or grilled cheese?
- c. Why did so many kids choose spaghetti?
- d. How many more kids chose pizza than tacos?
- e. What is the total number of kids who chose spaghetti or pizza?

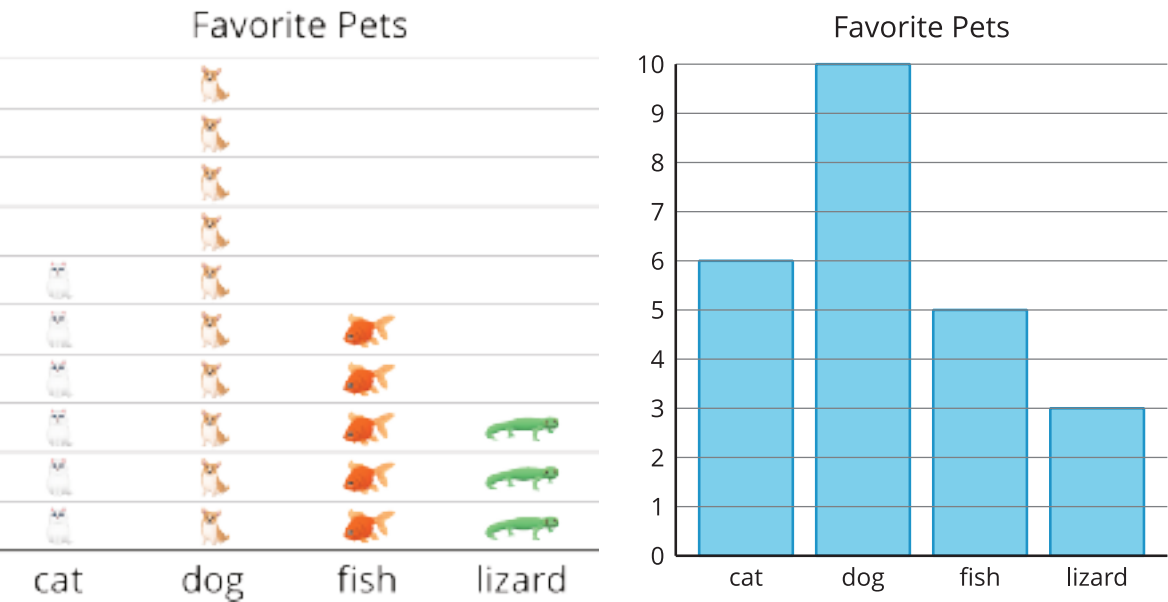
2. Answer each question you circled.

Lesson 9: Interpret Bar Graphs

- Let’s interpret data in bar graphs.

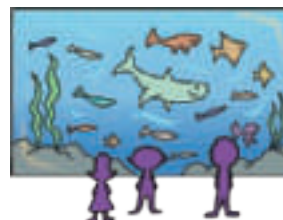
Warm-up: Notice and Wonder: Favorite Pets

What do you notice? What do you wonder?

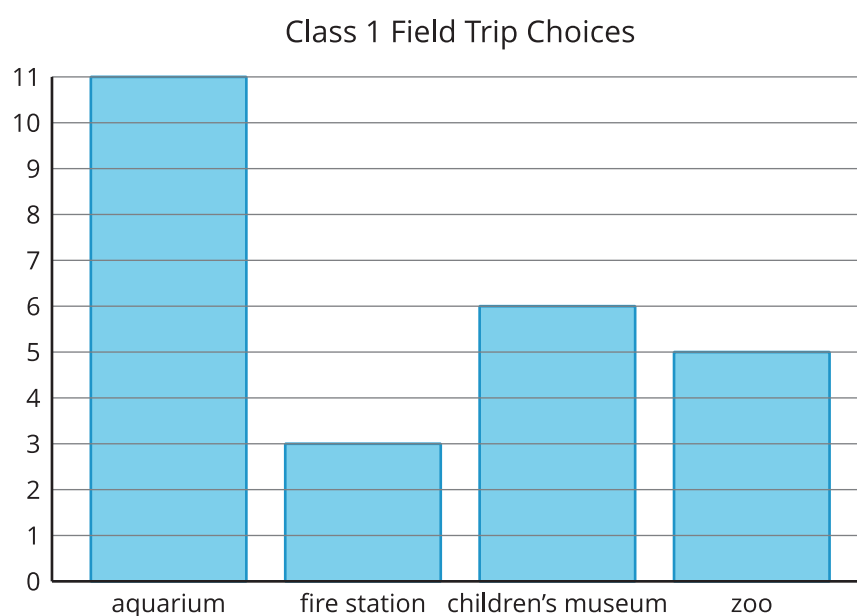


9.1: Field Trip Choices

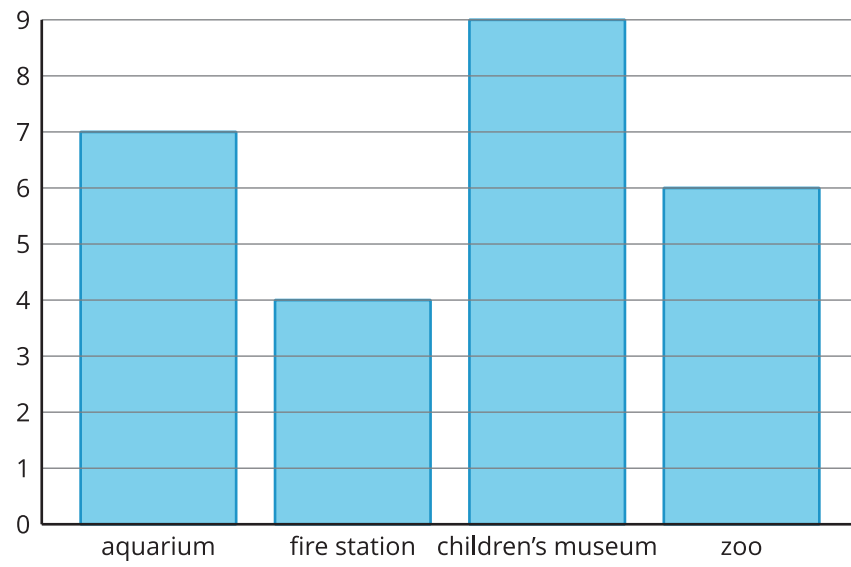
Groups of students in different classes were asked, “Where would you like to go for our field trip?” Their responses are shown in the bar graphs below.



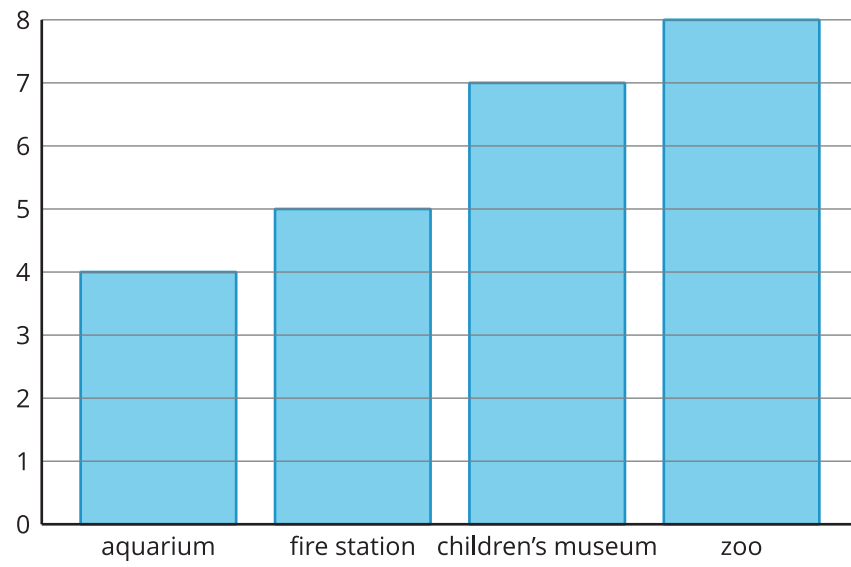
Write as many statements as you can to show what can be learned about the students’ field trip choices from the bar graph.



Class 2 Field Trip Choices

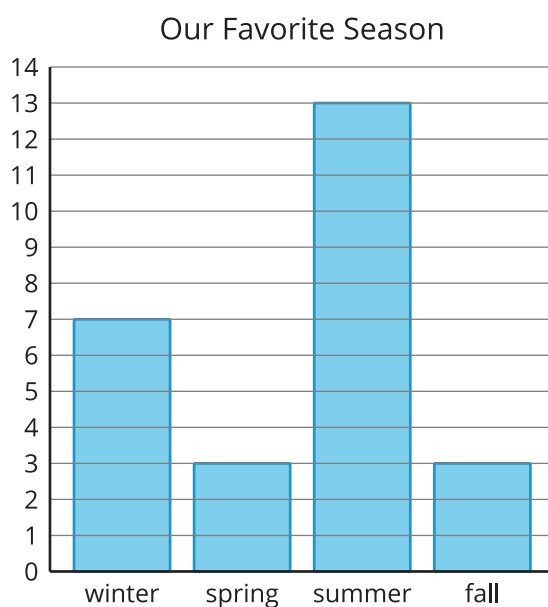


Class 3 Field Trip Choices



9.2: Our Favorite Seasons

A group of students were asked, “What is your favorite season?” Their responses are shown in the bar graph.



Answer the questions using the graph.

1. How many students voted for summer?
2. What is the total number of students who voted for fall or spring?
3. Which two seasons have a total of 10 votes?
4. How many students voted?

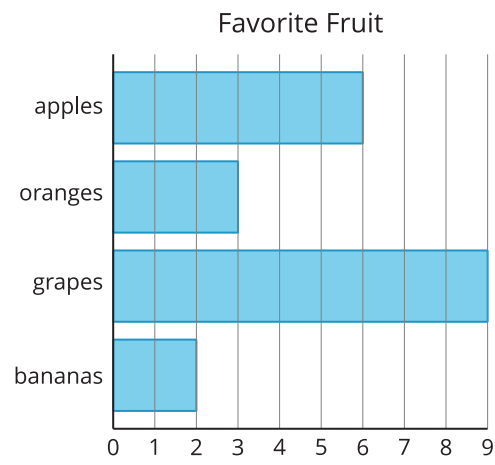
Lesson 10: Represent Data Using Picture Graphs and Bar Graphs

- Let’s make our own picture graphs and bar graphs.

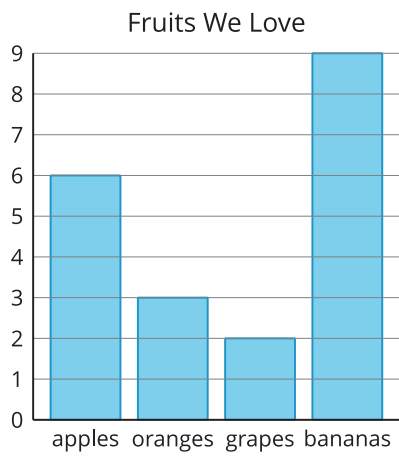
Warm-up: Which One Doesn’t Belong: Data

Which one doesn’t belong?

A



B



C

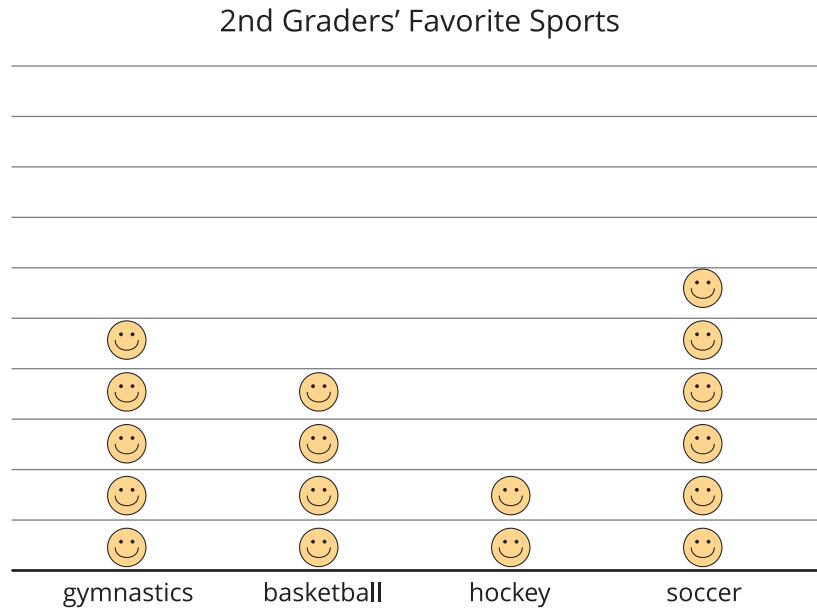


D

apples	6
oranges	3
grapes	9
bananas	2

10.1: Draw Picture Graphs

A group of 2nd graders were asked, "What is your favorite sport?" Their responses are shown in this picture graph.

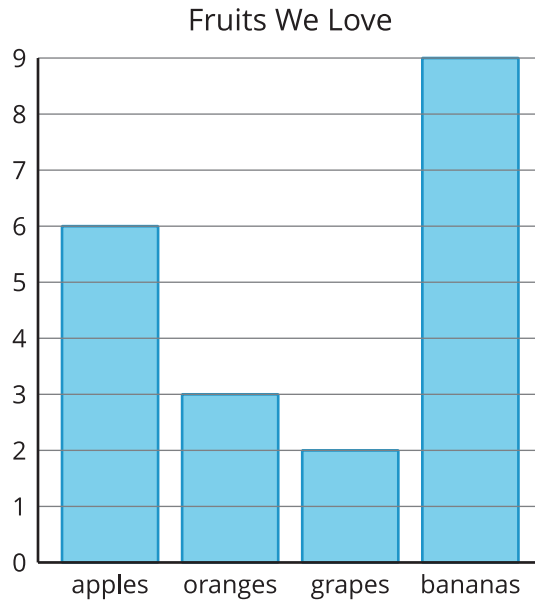


Represent the data shown in your table in a picture graph.

Table # _____

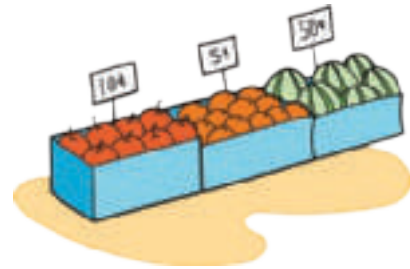
10.2: Draw Bar Graphs

A group of students were asked, "What fruit do you love to eat?" Their responses are shown in this bar graph.



Represent the data shown in your table in a bar graph.

Table # _____



Lesson 11: Questions About Data

- Let's answer questions using picture graphs and bar graphs.

Warm-up: Number Talk: Make a Ten with 3 Addends

Find the value of each sum mentally.

- $3 + 7$

- $3 + 7 + 2$

- $5 + 7$

- $2 + 4 + 8$

11.1: Write Questions Based on Graphs

Write 4 questions you could ask about the data in your graphs. Make sure you have 2 for each graph.

1. _____

2. _____

3. _____

4. _____

Bonus question:

11.2: Answer Questions Using Graphs

Answer your partner's questions from Activity 1 using the graphs.

1. _____

2. _____

3. _____

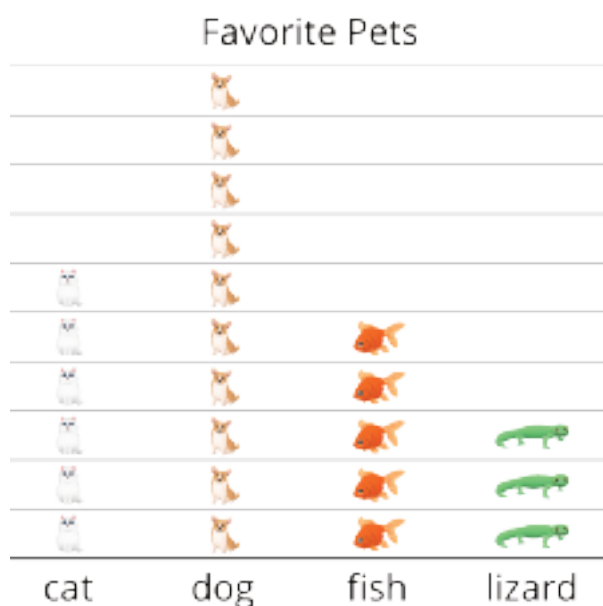
4. _____

5. How did you know where to find the answer to each question?

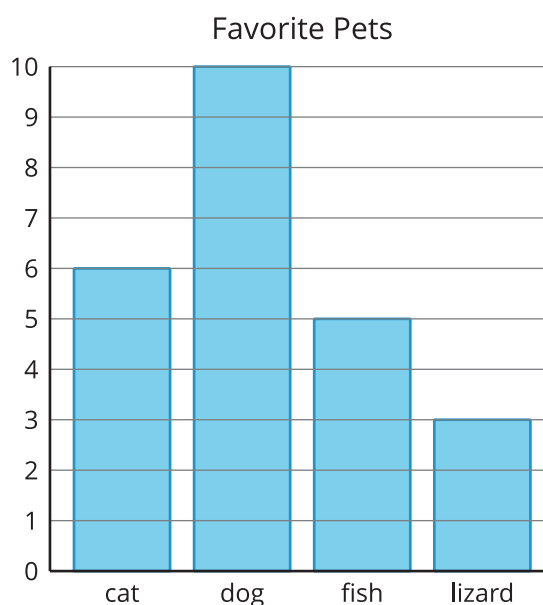
Section Summary

Section Summary

In this section we represented **data** in picture graphs and bar graphs and used them to answer questions.



A **picture graph** is an organized way to share data using pictures of the objects.



A **bar graph** is an organized way to share data using the height or length of rectangles to show how many in each category or group.

We can use these graphs to answer the questions below.

1. How many students chose a dog?
2. How many more students chose cats than chose lizards?
3. How many students voted for their favorite pet?

Lesson 12: Center Day 2

- Let's sort a collection and make graphs to represent it.

Warm-up: Number Talk: Differences

Find the value of each expression mentally.

- $17 - 7$

- $17 - 9$

- $15 - 5$

- $15 - 8$

12.2: Centers Choice Time

Choose a center.

What's Behind My Back?



How Close?

		+			=	
--	--	---	--	--	---	--

Number Puzzles

$$14 = 8 + \boxed{}$$

Lesson 13: Use Bar Graphs to Compare

- Let's use bar graphs to solve Compare problems.

Warm-up: True or False: Make Ten with 9

Decide if each statement is true or false. Be prepared to explain your reasoning.

- $9 + 4 = 9 + 1 + 3$

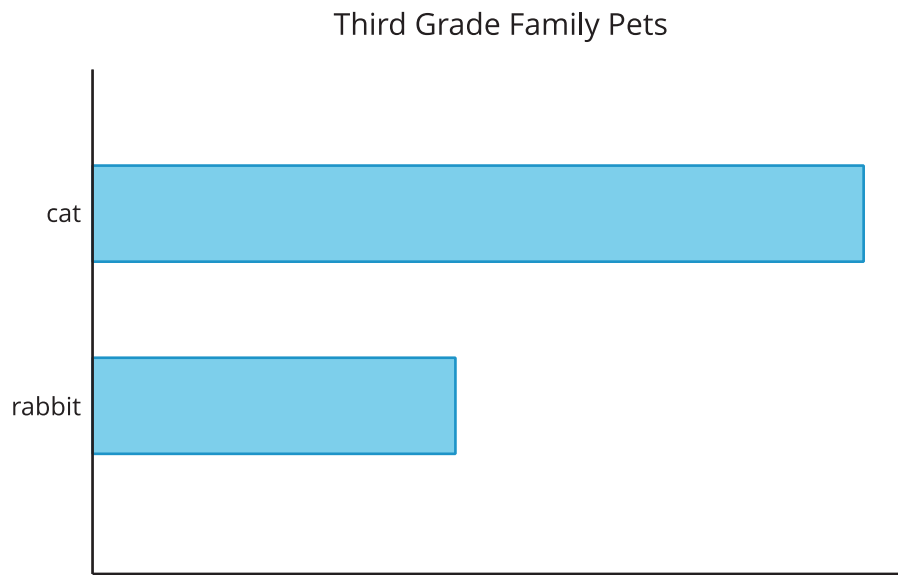
- $9 + 4 = 10 + 3$

- $9 + 5 = 10 + 6$

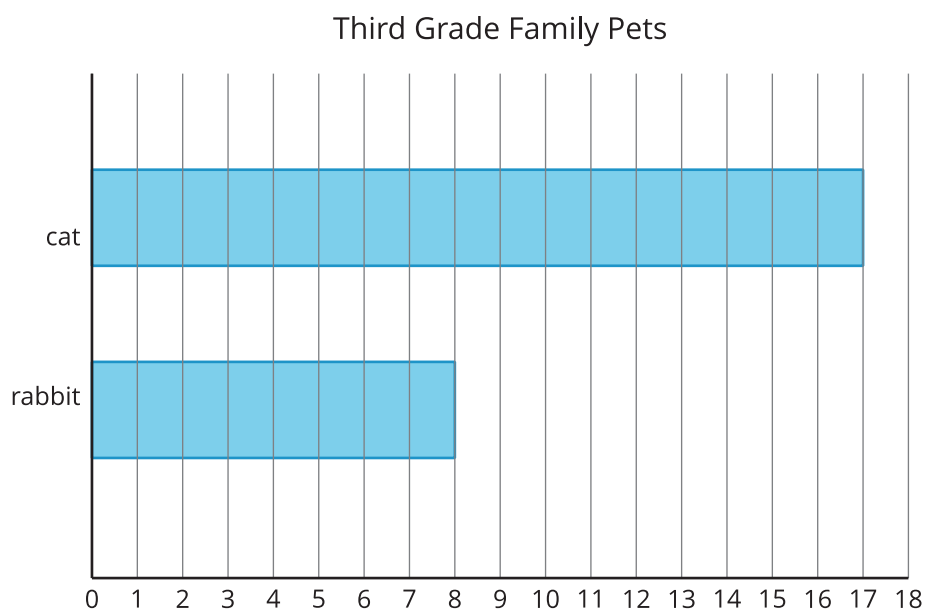
13.1: What's the Difference?

A group of third grade students were asked, "What pets do you have?" Their responses are shown in the bar graph.

What do you notice? What do you wonder?



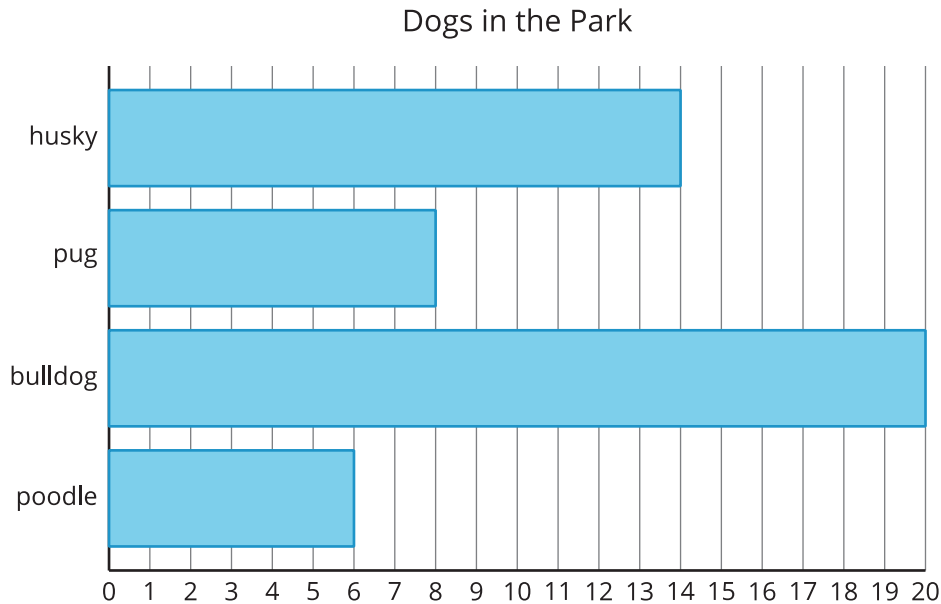
Their responses are also shown in this bar graph.



How many more students have cats than have rabbits? Show two ways to find the difference.

13.2: Dogs in the Park

Kiran and Lin counted the types of dogs they saw in a park. Their data is shown in the bar graph.



1. Make this statement true: There are more

_____ than _____.

2. Write an addition and a subtraction equation to show how many more.

3. Make this statement true: There are fewer

_____ than _____.

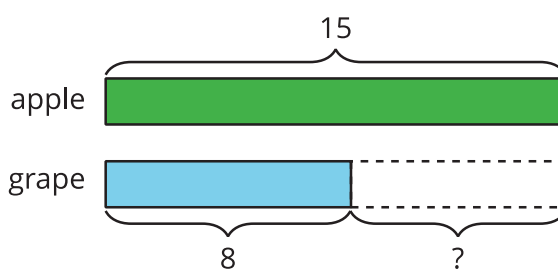
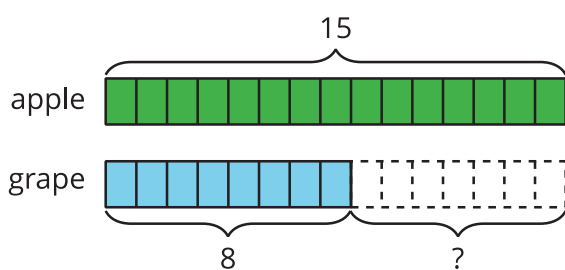
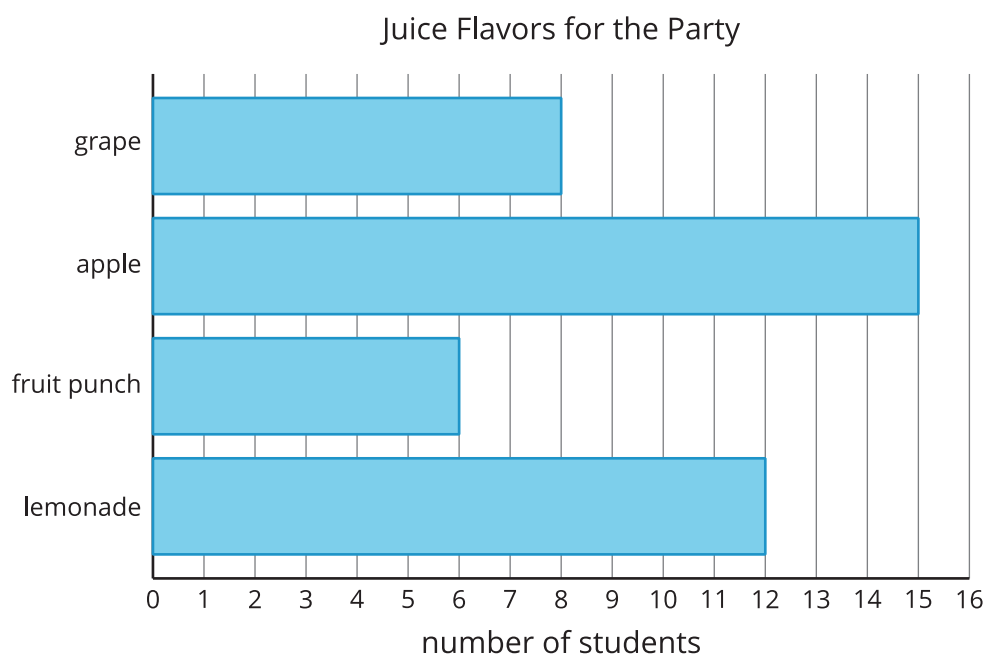
4. Write an addition and subtraction equation to show how many fewer.

Lesson 14: Use Diagrams to Compare

- Let's use bar graphs and diagrams to solve Compare problems.

Warm-up: Notice and Wonder: What Kind of Graph Is This?

What do you notice? What do you wonder?



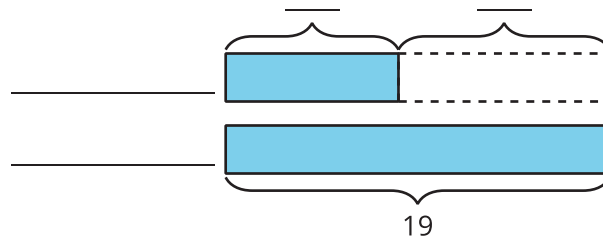
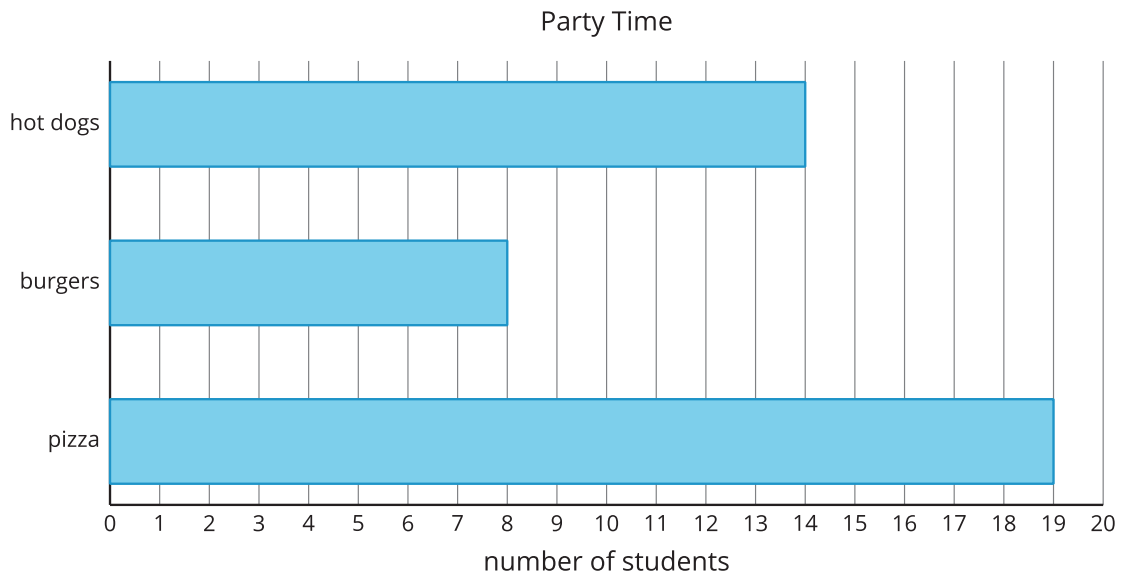
14.1: Party Time (Part 1)

1. Glue down the two bars that compare the number of students who picked hot dogs to the number who picked burgers.

2. Write two statements that compare the number of students who picked hot dogs to the number who picked burgers.

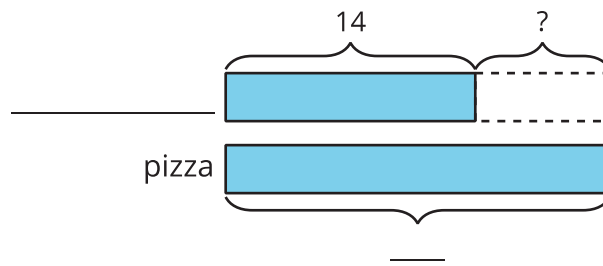
14.2: Party Time (Part 2)

1. Use the data from the bar graph to complete the diagram.



2. How many more students chose pizza than chose burgers?
Write an equation to show how you found the difference.

3. Use the data from the bar graph to complete the diagram.



4. Write a statement that compares the student votes in the diagram.

Lesson 15: Diagrams with All Kinds of Compare Problems

- Let's connect Compare problems to diagrams.

Warm-up: Number Talk: 10 and Some More

Find the value of each sum mentally.

- $4 + 8 + 2$

- $4 + 5 + 3 + 2$

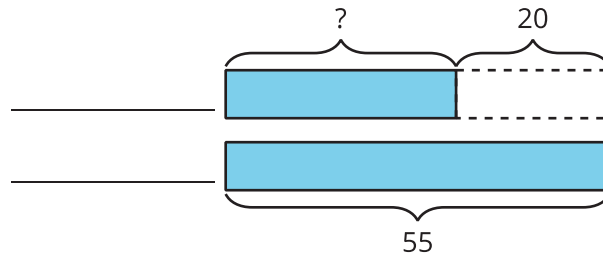
- $9 + 3 + 1$

- $9 + 5$

15.1: Shell Collections

Diego has 55 shells. Lin has 20 fewer shells than Diego.

1. Use the story problem to complete the diagram.



2. Write an equation to show how you could find the unknown number of shells. Use a question mark to represent the unknown.



15.2: Card Sort: At the Beach

1. Read a card with a story problem.
2. Find cards that match the story problem.
3. Explain why the cards match.

Lesson 16: Solve All Kinds of Compare Problems

- Let's solve Compare problems.

Warm-up: True or False: Multiples of 10

Decide if each statement is true or false. Be prepared to explain your reasoning.

- $18 + 5 = 18 + 2 + 3$

- $28 + 5 = 30 + 3$

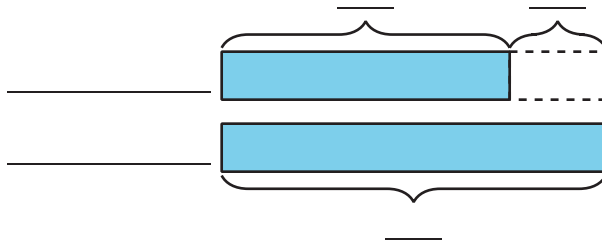
- $38 + 4 = 40 + 3$

16.1: A Trip to the Library

1. Priya and Andre returned books to the library. Priya returned 29 books. Andre returned 8 more books than Priya.

a. Who returned more books?

b. Use the story problem to complete the diagram.

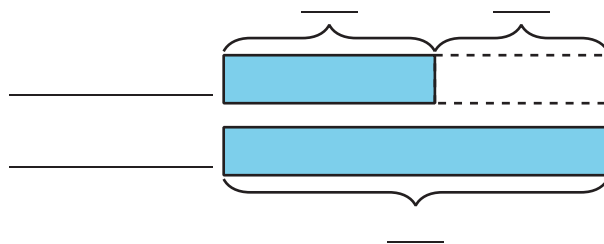


c. How many books did Andre return?

2. Andre read 45 pages of his book last night. Priya read 20 fewer pages of her book than Andre.

a. Who read more pages?

b. Use the story problem to complete the diagram.



c. How many pages did Priya read?



16.2: Solve Compare Problems

1. Jada read 10 fewer pages than Noah. Noah read 27 pages. How many pages did Jada read?
2. Noah spent 25 minutes reading. Jada spent 30 more minutes reading than Noah. How many minutes did Jada spend reading?

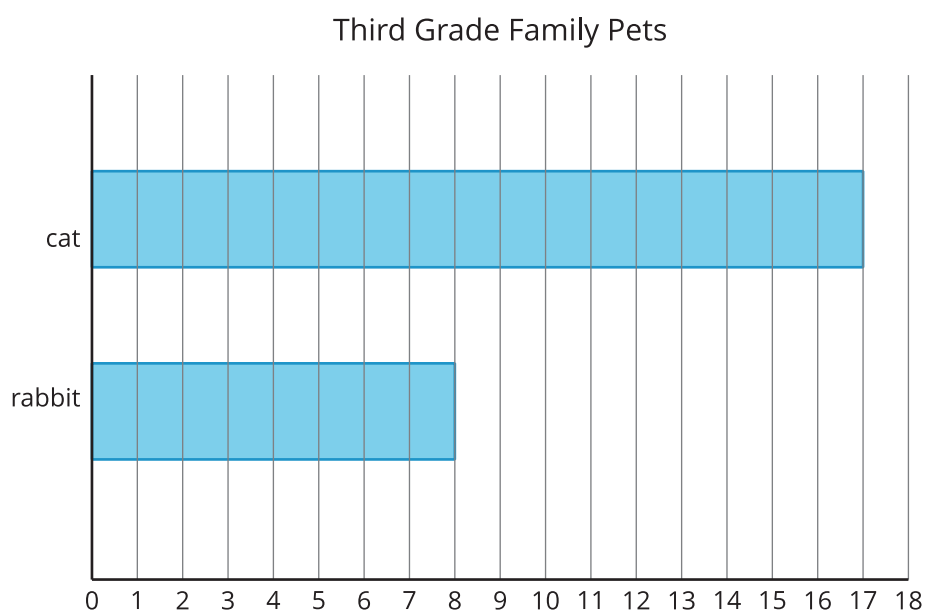
3. Jada read 47 pages of the book. Noah read 20 pages of the book.
How many fewer pages did Noah read?

4. Noah stacked 14 more books than Jada. Jada stacked 28 books.
How many books did Noah stack?

Section Summary

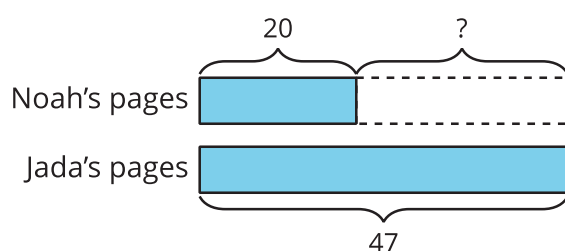
Section Summary

In this section of Unit 1, we learned how to represent and solve Compare problems. First, we used bar graphs to find the difference between two categories.



How many more students have cats than have rabbits? Show two ways to find the difference.

We learned about a new representation called a diagram. It helps us make sense of story problems. We can use diagrams to show which part of a comparison we need to find.



Jada read 47 pages of the book. Noah read 20 pages of the book. How many fewer pages did Noah read?

In this problem, we are finding the difference. We know how many pages Noah and Jada read, so the ? represents the difference.

Lesson 17: Center Day 3

- Let's count large groups of objects and play games to practice adding and creating graphs.

Warm-up: Number Talk: Add Ten More

Find the value of each sum mentally.

- $27 + 10$
- $27 + 10 + 10$
- $27 + 30$
- $37 + 30$

17.2: Centers Choice Time

Choose a center.

What's Behind My Back?



How Close?

$$\begin{array}{|c|c|} \hline & \\ \hline \end{array} + \begin{array}{|c|c|} \hline & \\ \hline \end{array} = \underline{\hspace{2cm}}$$

Number Puzzles

$$14 = 8 + \boxed{}$$

Sort and Display



Lesson 18: Class Surveys

- Let's create our own surveys to get to know our classmates better.

Warm-up: What Do You Know About Bar Graphs?

What do you know about bar graphs?

18.1: Classroom Survey and Graph

1. What is your survey question?

2. What are your categories?

- Category 1: _____
- Category 2: _____
- Category 3: _____
- Category 4: _____

3. Record the data.

4. Organize and represent the data in a picture graph or bar graph.

18.2: I Ask, then You Ask

1. Trade graphs. Create questions about the other group's graph.

Sentence stems:

How many students picked _____ and _____ all together?

How many more students picked _____ than _____?

2. Take turns asking and answering questions.

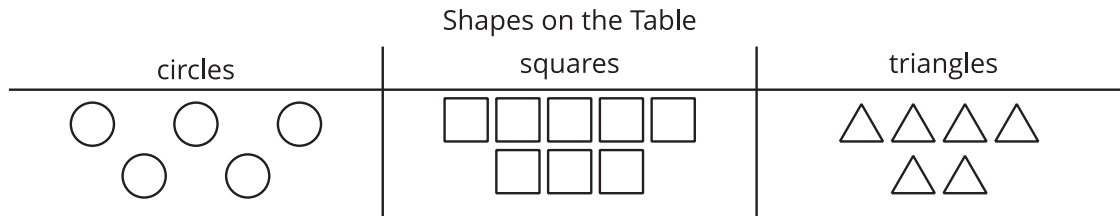
18.3: Analyze the Data with Diagrams

1. Draw a diagram. Your diagram should compare two facts you learned from your survey.

Section A: Practice Problems

1. Pre-unit

The picture shows how Jada sorted the shapes on her table.



Use the picture to answer the questions:

- How many squares were on the table? _____
- How many triangles were on the table? _____
- Which shape has the smallest number? _____

2. Pre-unit

The table shows the favorite magical powers of some students.

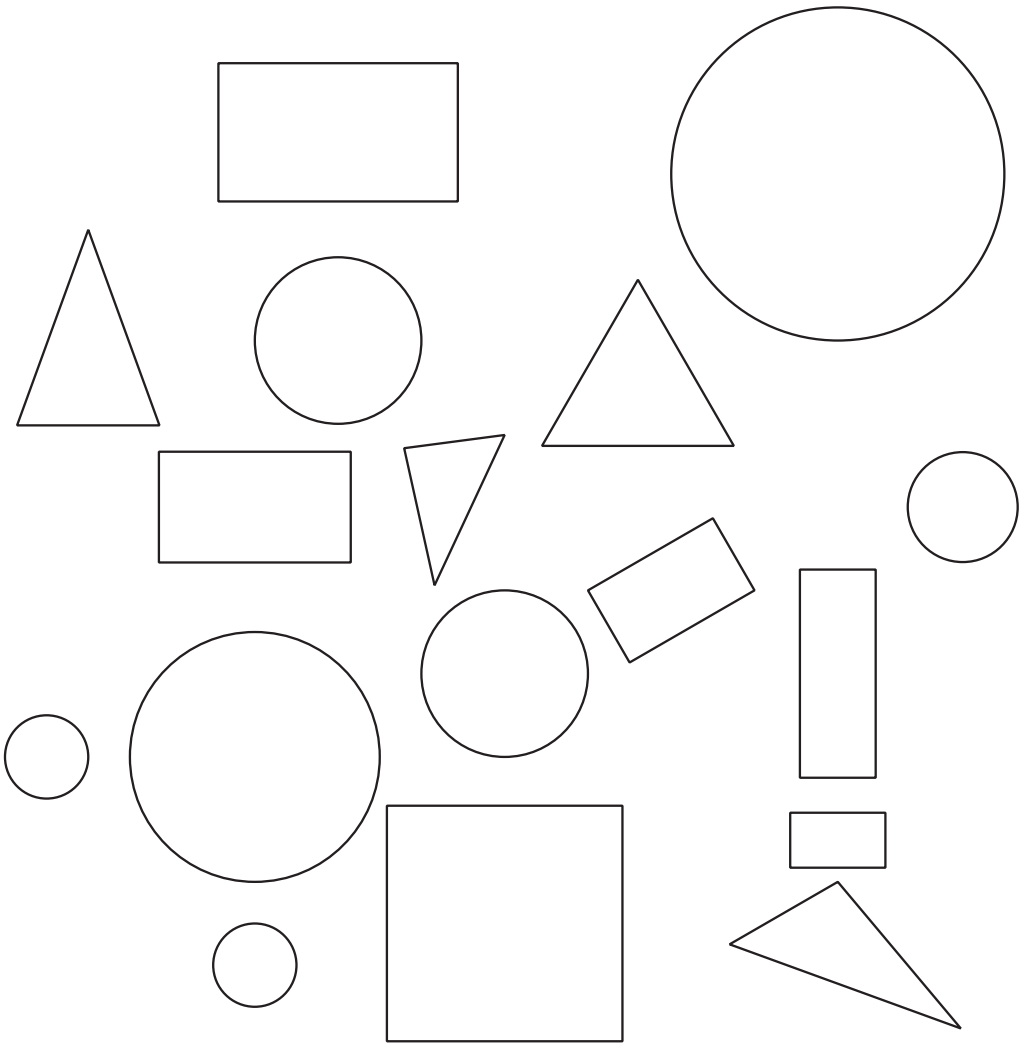
Favorite Magical Power		
read minds	become invisible	fly
6	8	3

- How many more students prefer being invisible to flying?

- How many fewer students prefer flying to reading minds?

3. Pre-unit

Here are some shapes:



Fill out the chart showing the shapes.

Shapes		
circle	triangle	rectangle

4. Find the value of each expression.

a. $9 - 2$

b. $5 + 3$

c. $2 + 8$

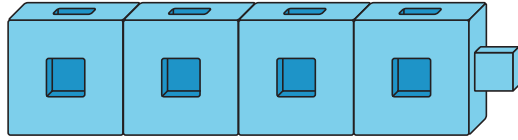
d. $7 - 4$

e. $10 - 3$

f. $1 + 6$

(From Unit 1, Lesson 1.)

5. Jada is playing “What’s Behind my Back?” with Han. Han has 10 cubes and shows Jada these connecting cubes.



- a. How many connecting cubes are behind Han’s back?
- b. What’s an addition equation that you can write that matches the game?
- c. What’s a subtraction equation that you can write that matches the game?

(From Unit 1, Lesson 2.)

6. Find the number that makes each equation true. Show your thinking using drawings, numbers, or words.

a. $20 - 10 = \underline{\hspace{2cm}}$

b. $17 + \underline{\hspace{2cm}} = 20$

c. $20 = 5 + \underline{\hspace{2cm}}$

d. $7 = 20 - \underline{\hspace{2cm}}$

(From Unit 1, Lesson 3.)

7. Here are the numbers on seven cards:

1 2 3 5 6 7 9

a. Choose three of the numbers to add to get as close as you can to 20.

b. Write an equation to show your choice.

(From Unit 1, Lesson 4.)

8. Find the value of each sum. Show your thinking using drawings, words, or numbers.

a. $31 + 15$

b. $17 + 8$

c. $26 + 17$

(From Unit 1, Lesson 5.)

9. Exploration

Choose 3 of these 7 cards and get as close to 20 as possible.

1 3 4 5 7 8 9

- a. Can you make 20?
- b. Can you make 20 in more than 1 way?
- c. Can you make 20 using the 1?

10. Exploration

Clare has a set of cards numbered 1, 2, 3, 4, 5, 6, 7, 8, 9.

She picks out seven of the cards. Clare was NOT able to make 20 with 3 of her 7 cards. Which cards do you think she picked out if she was NOT able to make 20?

Section B: Practice Problems

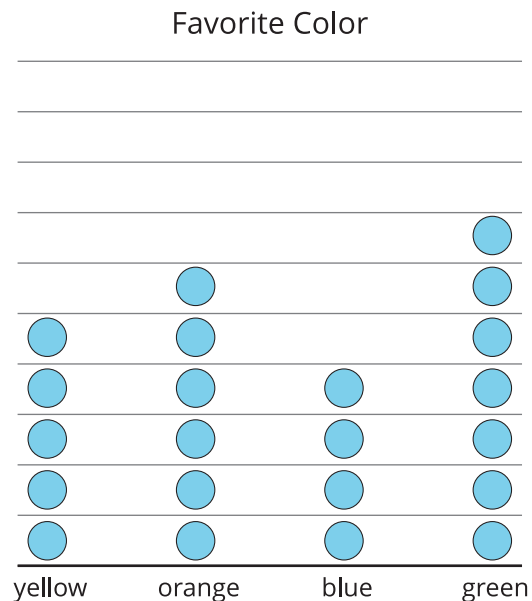
1. Here is how Diego recorded his classmates' favorite colors:

yellow	red	red	blue	red	blue	purple
yellow	red	red	blue	purple	red	blue
blue	yellow	red	red			

Create a representation to show Diego's data.

(From Unit 1, Lesson 7.)

2. The picture graph shows the favorite colors of some students.

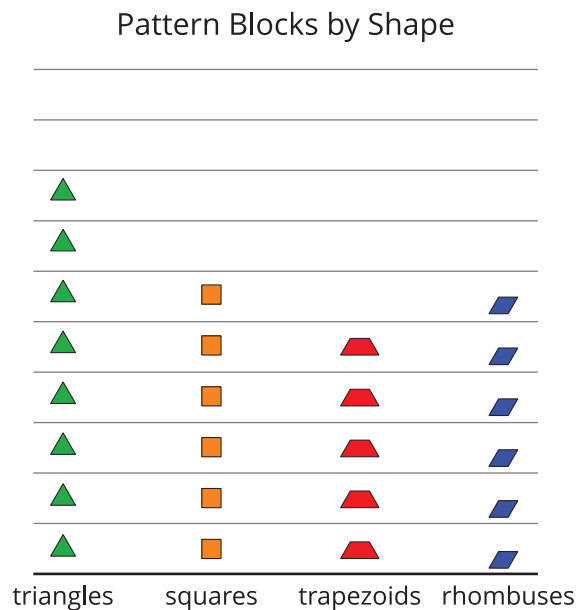


Select **3** statements that are true about the data recorded in the graph.

- A. More students like green than any of the other colors.
- B. 5 students chose blue as their favorite color.
- C. 2 more students chose blue than orange.
- D. 22 students voted in all.
- E. 3 fewer students chose blue than green.

(From Unit 1, Lesson 8.)

3. The picture graph shows the pattern blocks that were used to create a pattern.

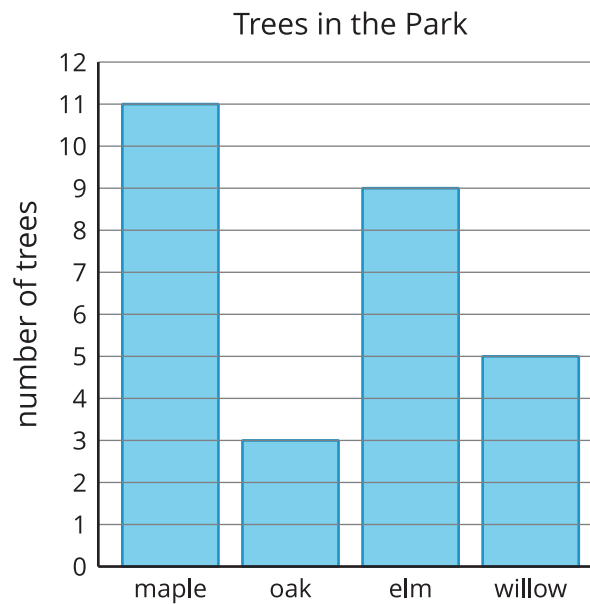


Select 3 questions that you can answer with the graph.

- A. Are there more trapezoids than squares?
- B. Are all of the triangles together in the pattern?
- C. How many hexagons are there?
- D. How many more triangles are there than rhombuses?
- E. How many squares and trapezoids are there in the shape altogether?

(From Unit 1, Lesson 8.)

4. Use the bar graph to answer the questions about the trees in the park.



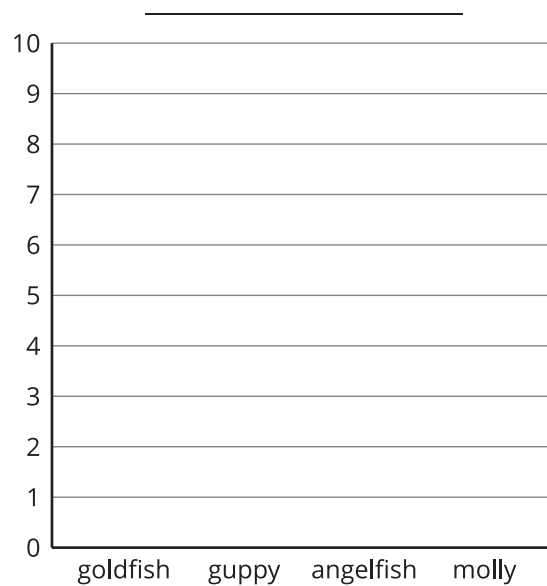
- a. How many trees are there altogether?
- b. How many more maple trees are there than willow trees?
- c. Which kind of tree has the smallest number?

(From Unit 1, Lesson 9.)

5. The table shows the fish in a tank.

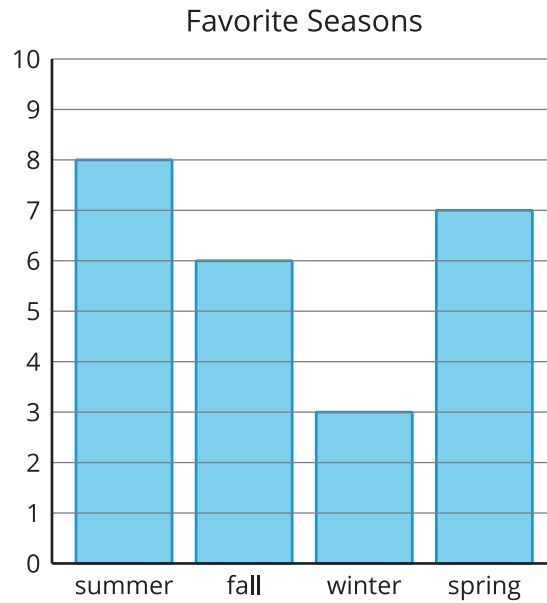
name	number
goldfish	3
guppy	9
angel fish	4
molly	5

Make a bar graph showing the data from the table.



(From Unit 1, Lesson 10.)

6. The bar graph shows the favorite seasons of some students.



a. Write two questions that you can answer using the graph.

b. Answer your questions.

(From Unit 1, Lesson 11.)

7. Exploration

The data display about some shapes in a bag is not finished. It shows the kinds of shapes, but not how many of each are in the bag.

triangles	squares	circles

Create a set of data about how many shapes are in the bag that makes all of these statements true:

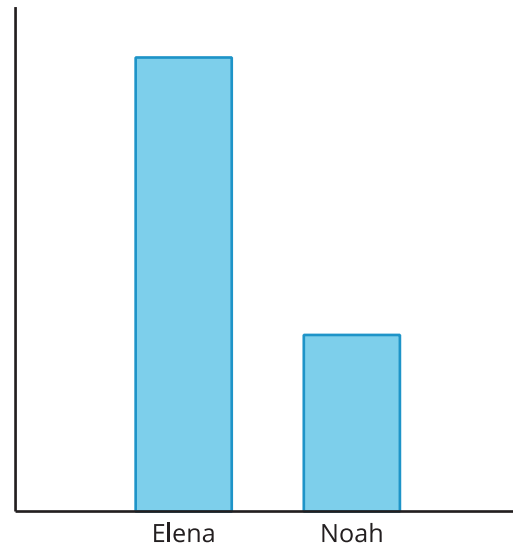
- There are more than 15 shapes altogether, but less than 25 shapes.
- There are 6 more squares than circles.
- There are 7 fewer circles than triangles.

8. **Exploration**

- a. Gather data at school or at home and make a graph showing the data.
- b. Ask a math question that can be answered with the data.
- c. Trade with a partner and answer each other's questions.

9. Exploration

Han made this bar graph showing the number of songs Elena and Noah listened to on Saturday.

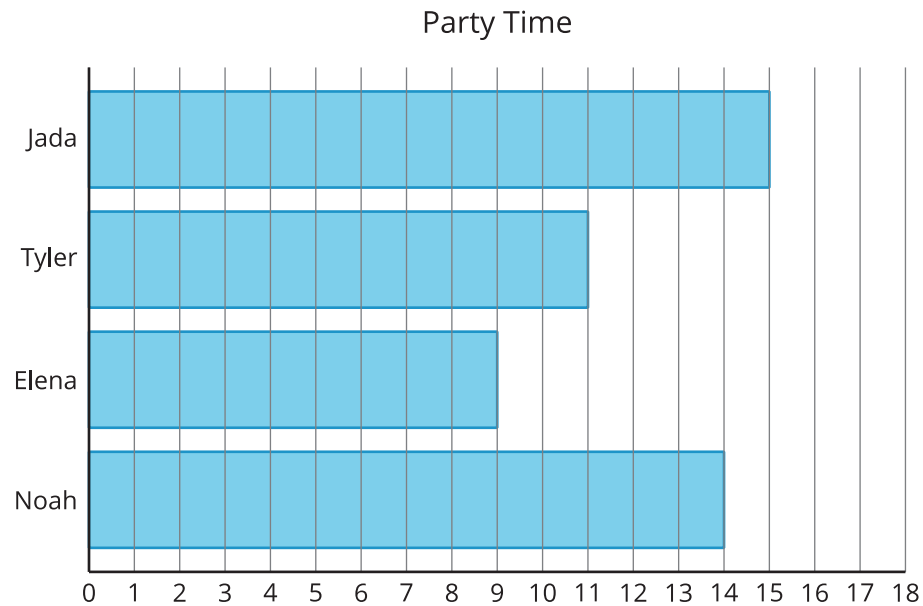


a. How could Han improve the diagram?

b. If Noah listened to 7 songs, how many songs do you think Elena listened to? Explain your reasoning.

Section C: Practice Problems

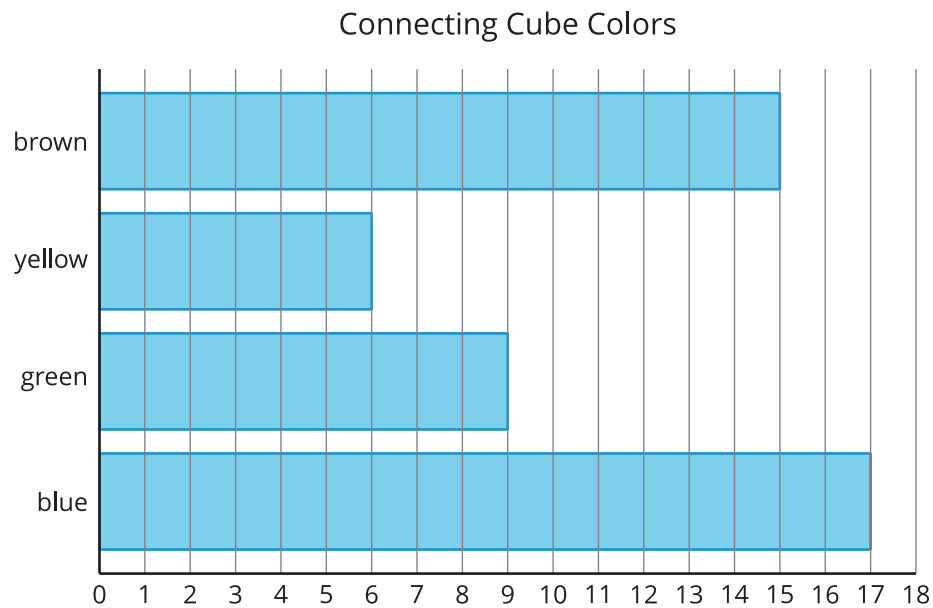
1. The graph shows the number of friends these students had at their birthday parties.



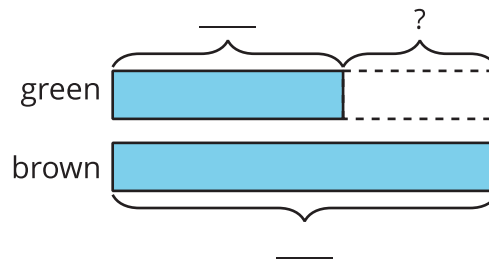
- a. How many fewer friends were at Elena's party than at Jada's party?
- b. Write an equation to show how you found the difference.

(From Unit 1, Lesson 13.)

2. The bar graph shows the number of connecting cubes of different colors in a bag.



- a. Use the bar graph to complete the tape diagram.



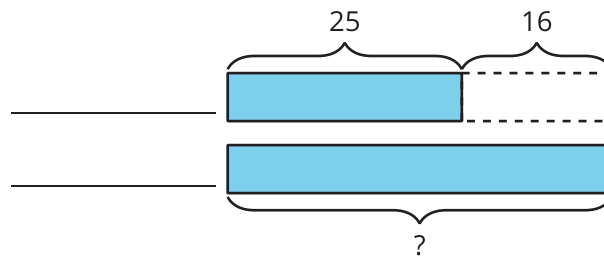
- b. How many fewer green connecting cubes than brown connecting cubes are in the bag? Show or explain your reasoning.

(From Unit 1, Lesson 14.)

3. There are 25 crickets chirping in the front yard.

There are 16 fewer crickets chirping in the front yard than in the back yard.

a. Label the rectangles to match the story. Explain your reasoning.



b. Write an equation to represent the story problem.

(From Unit 1, Lesson 15.)

4. There are 35 cherries in the bowl. There are 17 more cherries in the bowl than on the plate. How many cherries are on the plate? Show your thinking using drawings, numbers, or words.

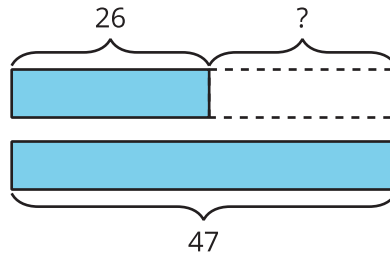
(From Unit 1, Lesson 16.)

5. There were 26 students in the cafeteria. There were 18 more students on the playground than in the cafeteria. How many students were on the playground? Show your thinking using drawings, numbers, or words.

(From Unit 1, Lesson 16.)

6. Exploration

Write a story to match the diagram. Explain why the story matches the diagram.



7. Exploration

Write a Compare story problem.

Solve your problem. Include an equation and a tape diagram.

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