

Lesson 4

Objective: Draw a bar graph to represent a given data set.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
 Application Problem (5 minutes)
 Concept Development (35 minutes)
 Student Debrief (8 minutes)
- Total Time (60 minutes)



Fluency Practice (12 minutes)

- Coin Drop 2.NBT.2, 2.OA.2
- Sprint: Skip-Counting by 5 2.NBT.2 (9 minutes)

Coin Drop (3 minutes)

Materials: (T) 2 quarters, 10 pennies, can

Note: In this activity, students practice adding and subtracting ones.

- T: (Hold up a quarter.) Name my coin.
- S: A quarter.
- T: How much is it worth?
- S: 25 cents.
- T: Watch carefully as I drop the quarter and some pennies in my can. Count along in your minds.

(3 minutes)

Drop in a quarter and some pennies, and ask how much money is in the can. Take out some pennies, and show them. Ask how much money is still in the can. Continue adding and subtracting pennies for a minute or so. Then, repeat the activity with two quarters and some pennies.

Sprint: Skip-Counting by 5 (9 minutes)

Materials: (S) Skip-Counting by 5 Sprint

Note: This Sprint gives practice skip-counting by 5 in preparation for counting with coins in Topic B.



14: Draw a bar graph to represent a given data set.



Application Problem (5 minutes)

Materials: (T) Favorite animals bar graph (Template)

After a trip to the zoo, Ms. Anderson's students voted on their favorite animals. Use the bar graph to answer the following questions.

- a. Which animal got the fewest votes?
- b. Which animal got the most votes?
- c. How many more students liked Komodo dragons than koala bears?



d. Later, two students changed their votes from koala bear to snow leopard. What was the difference between koala bears and snow leopards then?

Note: Project or draw this graph on the board. This problem reviews yesterday's Concept Development, where students learned to read and interpret a bar graph. It leads into today's lesson, where students create bar graphs to represent new data sets.

Concept Development (35 minutes)

Materials: (T) Horizontal and vertical bar graphs (Lesson 3 Template 2), 2 pieces of chart paper (see the list below) (S) Horizontal and vertical bar graphs (Lesson 3 Template 2), colored pencils or crayons, personal white board

Note: Prior to the lesson, prepare two tables:

- Chart 1: Our Birthdays, labeled with the seasons of the year and the months that comprise each season
- Chart 2: Favorite Books, labeled with three titles

Part 1: Complete the bar graph using the table, Our Birthdays. Then, ask and answer questions using the data.

Post the table entitled *Our Birthdays*, conduct a class survey, and record the results. Note that some students may not know their birthdays, so have the information readily available. Then, distribute the horizontal and vertical bar graphs (Lesson 3 Template 2).

Our Birthdays			
Spring Mar., Apr., Hay	Summer June, July, Aug.	Fall Sept; Oct, Nov.	Winter Dec., Jan., Feb.
8	6	2	9

Chart 1



4: Draw a bar graph to represent a given data set.





- T: Now that we have new data, let's create a bar graph that represents the information.
- T: We're going to use the horizontal graph at the top of your page. What information do we need to fill in first? Discuss with your partner.
- S: We have to write the title. → We have to label the categories with the names of the seasons.
 → We need to put the number scale below the graph.
- T: You are all correct! Let's fill in those elements. (Model as students do the same.)
- T: Now, fill in the bars to match the table. (Pause.)

Pose questions such as those below, and have students write their answers on their personal white boards. Then, invite students to pose comparison questions to the class based on the bar graph.

- Do we know who has a birthday in the fall by reading this graph? What do we know about fall birthdays?
- How many fewer students have birthdays in the summer than in the winter?
- How many more students have a birthday in the spring and fall than in the winter?



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Use a ruler to provide visual support along with the explicit explanation of how the vertical scale mimics the ruler or number line. Provide a ruler to students who need the extra concrete support of turning the ruler.

Part 2: Complete the bar graph using the table, Favorite Books. Then, ask and answer questions using the data.

Repeat the above procedure to generate the new data set.

- T: We're going to record our new data on the second graph. Talk with your partner about how these two graphs are similar and different.
- S: The first one goes across, and the second one goes up and down. → The one on top is horizontal, and the bottom one is vertical. → We'll compare how tall the bars are instead of how long they are. → The scale goes on the side instead of on the bottom.

MP.6

The Miraculous Journey of Edward Tulane	Click, Clack, Hoo: Cows That Type	Zen Shorts
	9	5

Chart 2

Lesson 3 Template 2



Lesson 4:

Draw a bar graph to represent a given data set.



- T: Ah! Yesterday some of you said the numbers of the scale reminded you of a meter strip, a ruler, or a number line. Those are very good observations.
- T: Just as on the ruler the space from 0 to 1 is one length unit, the space from the beginning of the bar to the first line represents a count of 1.
- T: We can also turn our scale vertically, just like we can turn a ruler vertically to measure height.
- T: Let's fill in the scale together, starting at 0. (Model as students do the same.)
- T: Now, fill in the rest of the graph. Then, ask and answer questions based on the data with a partner.

As students demonstrate proficiency interpreting the data, allow them to move on to the Problem Set. Continue working with any students who need support.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students should solve these problems using the RDW approach used for Application Problems.

Student Debrief (8 minutes)

Lesson Objective: Draw a bar graph to represent a given data set.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a

conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- Explain to your partner the labels you wrote on your graph before you started to record the data. Is it important to label and write a number scale before you start graphing the data? Why or why not?
- In the bug graph, which problems asked a comparison question? (Problem 1 (b), (c), and (e).) If you used equations to figure out the answer to the comparison questions, what operation did you use? If you did not write an equation, tell your partner how you figured out the answer to Problem 1 (b) and (e).
- Look at O'Brien's farm bar graph. Did you write a number scale? Where did you put it? Does it matter if we write the number scale across the bottom or on the side?



n 4: Draw a bar graph to represent a given data set.



- Talk to your partner about how picture and bar graphs help us organize and compare information. Can you think of a time in your life when making a graph would help you?
- So far, what has each box or picture represented in our graphs? (One thing. → One animal. → One unit.) Do you think each box always has to be one unit?

Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.



Lesson 4



4: Draw a bar graph to represent a given data set.



Number Correct:

A

Skip-Counting by 5

1.	0, 5,	
2.	5, 10,	
3.	10, 15,	
4.	15, 20,	
5.	20, 25,	
6.	25, 30,	
7.	30, 35,	
8.	35, 40,	
9.	40, 45,	
10.	50, 45,	
11.	45, 40,	
12.	40, 35,	
13.	35, 30,	
14.	30, 25,	
15.	25, 20,	
16.	20, 15,	
17.	15, 10,	
18.	0,, 10	
19.	25,, 35	
20.	5,, 15	
21.	30,, 40	
22.	10,, 20	

35,, 45	
15,, 25	
40,, 50	
25,, 15	
50,, 40	
20,, 10	
45,, 35	
15,, 5	
40,, 30	
10,, 0	
35,, 25	
, 10, 5	
, 35, 30	
, 15, 10	
, 40, 35	
, 20, 15	
, 45, 40	
50, 55,	
45, 50,	
65,, 55	
55, 60,	
60, 65,	
	35,, 45 15,, 25 40,, 50 25,, 15 50,, 40 20,, 10 45,, 35 15,, 5 40,, 30 10,, 0 35,, 25 , 10, 5 , 35, 30 , 15, 10 , 35, 30 , 15, 10 , 40, 35 , 20, 15 , 45, 40 50, 55, 45, 50, 45, 50, 55, 60,



Lesson 4:

4: Draw a bar graph to represent a given data set.



B

Skip-Counting by 5

Lesson 4 Sprint 2•7

Number Correct:

Improvement: _____

1.	5, 10,	
2.	10, 15,	
3.	15, 20,	
4.	20, 25,	
5.	25, 30,	
6.	30, 35,	
7.	35, 40,	
8.	40, 45,	
9.	50, 45,	
10.	45, 40,	
11.	40, 35,	
12.	35, 30,	
13.	30, 25,	
14.	25, 20,	
15.	20, 15,	
16.	15, 10,	
17.	0,, 10	
18.	25,, 35	
19.	5,, 15	
20.	30,, 40	
21.	10,, 20	
22.	35,, 45	

23.	15,, 25	
24.	35,, 45	
25.	30,, 20	
26.	25,, 15	
27.	50,, 40	
28.	20,, 10	
29.	45,, 35	
30.	15,, 5	
31.	35,, 25	
32.	10,, 0	
33.	35,, 25	
34.	, 15, 10	
35.	, 40, 35	
36.	, 20, 15	
37.	, 45, 40	
38.	, 10, 5	
39.	, 35, 30	
40.	45, 50,	
41.	50, 55,	
42.	55, 60,	
43.	65,, 55	
44.	, 60, 55	



Lesson 4:

4: Draw a bar graph to represent a given data set.



Name _____

1. Complete the bar graph using the table with the types of bugs Alicia counted in the park. Then, answer the following questions.

Types of Bugs				
Butterflies	Spiders	Bees	Grasshoppers	
5	14	12	7	



- 0 ____
- a. How many butterflies were counted in the park? _____
- b. How many more bees than grasshoppers were counted in the park? _____
- c. Which bug was counted twice as many times as grasshoppers?
- d. How many bugs did Alicia count in the park? _____
- e. How many fewer butterflies than bees and grasshoppers were counted in the park? _____



Lesson 4: Draw a bar graph to represent a given data set.



engage

2. Complete the bar graph with labels and numbers using the number of farm animals on O'Brien's farm.

O'Brien's Farm Animals			
Goats	Pigs	Cows	Chickens
13	15	7	8



- a. How many more pigs than chickens are on O'Brien's farm?
- b. How many fewer cows than goats are on O'Brien's farm?
- c. How many fewer chickens than goats and cows are on O'Brien's farm?
- d. Write a comparison question that can be answered using the data on the bar graph.





Name _____

Date _____

Complete the bar graph using the table with the types of bugs Jeremy counted in his backyard. Then, answer the following questions.

Types of Bugs				
Butterflies	Spiders	Bees	Grasshoppers	
4	8	10	9	



a. How many more spiders and grasshoppers were counted than bees and butterflies?

b. If 5 more butterflies were counted, how many bugs would have been counted?



14: Draw a bar graph to represent a given data set.



Name _____ Date _____

1. Complete the bar graph using the table with the types of reptiles at the local zoo. Then, answer the following questions.

Types of Reptiles				
Snakes	Lizards	Turtles	Tortoises	
13	11	7	8	



- b. How many more snakes and lizards than turtles are at the zoo?
- c. How many fewer turtles and tortoises than snakes and lizards are at the zoo?
- d. Write a comparison question that can be answered using the data on the bar graph.





2. Complete the bar graph with labels and numbers using the number of underwater animals Emily saw while scuba diving.

Underwater Animals			
Sharks	Stingrays	Starfish	Seahorses
6	9	14	13



- a. How many more starfish than sharks did Emily see? _____
- b. How many fewer stingrays than seahorses did Emily see? _____
- c. Write a comparison question that can be answered using the data on the bar graph.







favorite animals bar graph



Lesson 4:

4: Draw a bar graph to represent a given data set.

