

1.3

Critiquing Data Presentation

Focus on...

After this lesson, you will be able to...

- explain how a graph is used to represent the data from a given situation

THE DAILY NEWS

Sept 24 2007

DNA Testing Helps Commercial Fishers

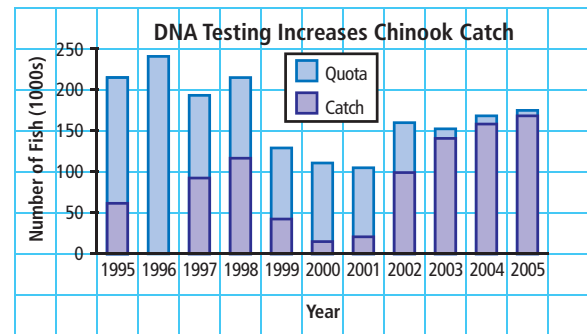
Thanks to DNA testing, B.C.'s commercial fishers can expect to catch as much as 90% of their quota of chinook salmon this year.

Since 2002, scientists have been using DNA testing to determine accurately where fish are originally from. As a result, fishery officials can better manage the fish stocks by

setting specific harvest targets to protect the weaker stocks and allow more fishing of the stronger ones.

Between 1995 and 2001, fisheries used coded-wire tags inserted into salmon to estimate the populations of different runs of salmon. They used this information to limit the catch and the areas open to fishing for the following year. Using this method, only about 15% of the available quota was harvested in 2001.

Tyler is presenting his current events report to his grade 8 Social Studies class. His report includes a newspaper article about chinook salmon and the bar graph shown. Does the bar graph support the story?



Did You Know?

A *run* refers to a group of salmon that were hatched in the same place. During the salmon run, the fish swim back up rivers to their birthplace to spawn.

Explore the Math

Literacy Link

A *stacked bar graph* has bars stacked instead of side-by-side.

Does the graph represent what it says it does?

1. Examine the graph about the chinook salmon catch. Why do you think the author used a stacked bar graph? Is it effective?
2. Decide if the graph is misleading.
 - a) Examine the scales on the vertical and horizontal axes. What do you notice?
 - b) How could you make the graph easier to understand?
3. The genetic testing of salmon began in 2002. The graph shows the quotas and catches since 1995. Use the graph and the information in the article to help answer the following questions.

- a) What support is there for the idea that relying on coded-wire tags limited the catch of salmon?
- b) What support is there for the idea that DNA testing has increased the chinook catch?

Reflect on Your Findings

- 4. What factors should you consider when you critique a graph for whether it represents a situation accurately?

Example: Critiquing a Graph

Bindi recorded the scores for two grade 8 classes that wrote the same test.

Class A (32 students)

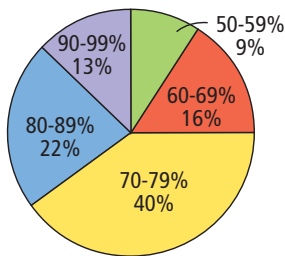
Score (%)	Frequency
50–59	3
60–69	5
70–79	13
80–89	7
90–99	4

Class B (27 students)

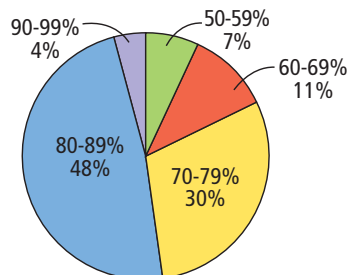
Score (%)	Frequency
50–59	2
60–69	3
70–79	8
80–89	13
90–99	1

She decided to display the data on two circle graphs.

Class A Test Scores (32 students)



Class B Test Scores (27 students)

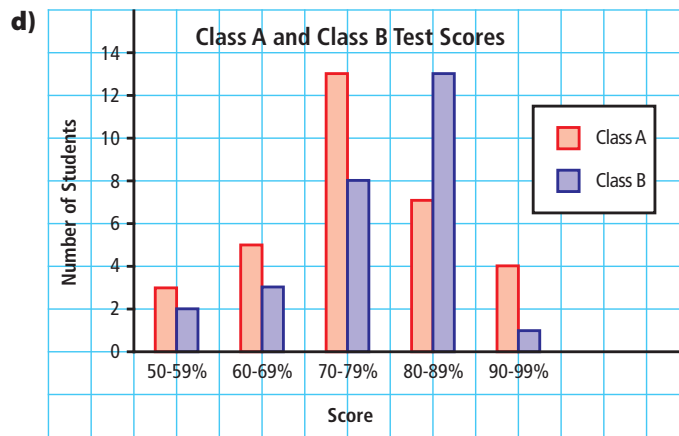


- a) Why do you think Bindi used two circle graphs to display the data?
- b) Are the graphs misleading? Explain.
- c) State two conclusions that you can make based on the graphs.
- d) Draw a double bar graph to display the data.
- e) List the advantages and disadvantages of using a double bar graph to display the data.

Solution

- a) There are more students in Class A than in Class B. By making circle graphs, Bindi can compare the percent of students who scored in each category. It would be less meaningful to compare the number of students who scored in each category.

- b) The circle graphs are not misleading. Each sector of the graph is labelled with the category and percent, and the title includes the number of students in each class.
- c) Two possible conclusions are:
- The majority of the students in both classes scored between 70% and 89%. A greater number of students in Class B scored between 70% and 89% than students in Class A.
 - A total of 35% (11 students) in Class A scored over 80%. A total of 52% (14 students) in Class B scored over 80%. Therefore, a greater percent of students in Class B scored over 80% than students in Class A.



- e) A double bar graph lets you compare the number of students who scored in each interval. It does not let you compare the percent of students who scored in each interval. Comparing the number of students in each interval is less meaningful in this case because the class sizes are not the same.

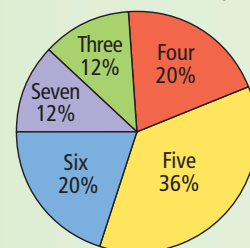
Show You Know

A group of teens picked pears during the pear harvest. The number of teens that picked each number of baskets is shown in the table.

The circle graph shows the percent of teens that picked each number of baskets.

Number of Baskets	Tally	Frequency
Three		3
Four		5
Five		9
Six		5
Seven		3

Baskets of Pears Picked (25 teens)



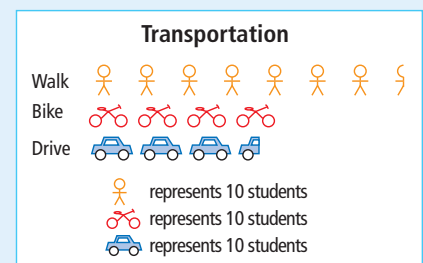
- a) What is an advantage of displaying the data on a circle graph?
- b) Is the graph misleading? Explain.
- c) State two conclusions that you can make based on the graph.

Key Ideas

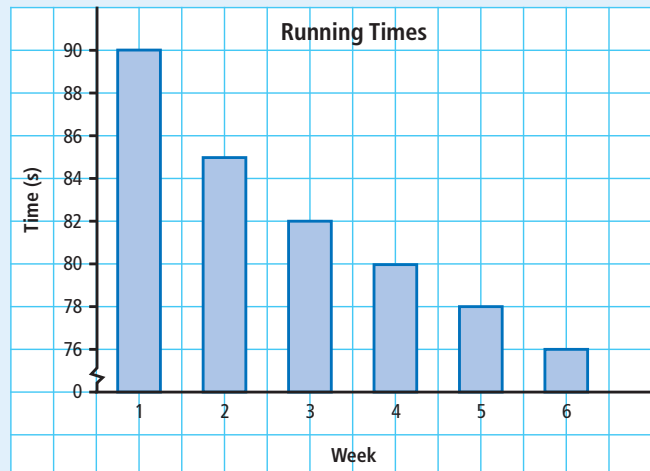
- When critiquing a graph, it is important to consider several factors:
 - Graph type: Is the graph the best choice for displaying the data?
 - Graph format: Is the graph designed in a way that represents the data accurately?
 - Graph usefulness: Is the graph informative? Does the graph support a claim or an argument?

Communicate the Ideas

- a) Is the pictograph an effective way to display the data about how students get to school? Explain.
 - b) Is the graph misleading? Explain.
 - c) How informative is the graph? How could it be made even more informative?
 - d) Suggest another type of graph to display the data. Give an advantage and a disadvantage of using this graph.



- a) Danny made a graph to record his running times over a six-week period.
 - a) What can you conclude about Danny's performance from this graph?
 - b) How might this graph be misleading? How would you improve this graph?



- a) Your friend missed the lesson on critiquing graphs. Write her an explanation of how to critique graphs and why it is important to do so.

Check Your Understanding

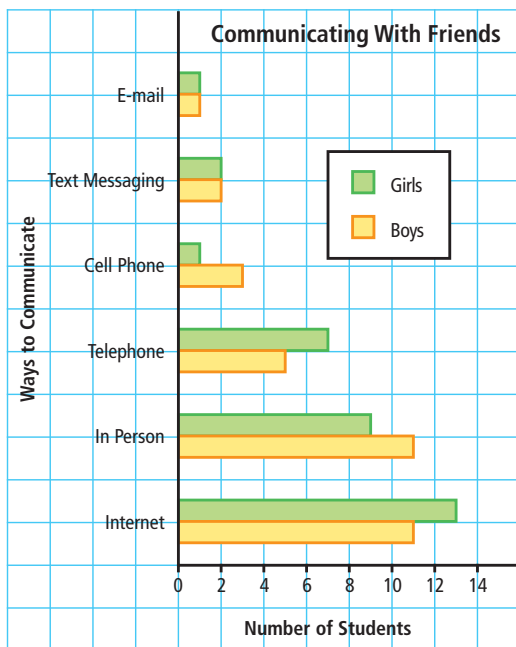
Practise

For help with #4 to #6, refer to the Example on pages 29–30.

4. Madison surveyed grade 8 students about which method they use most often to communicate with friends.

Means of Communication	Girls	Boys
Internet chat	13	11
In person	9	11
Telephone (land line)	7	5
Cell phone	1	3
Text messaging	2	2
E-mail	1	1
Total	33	33

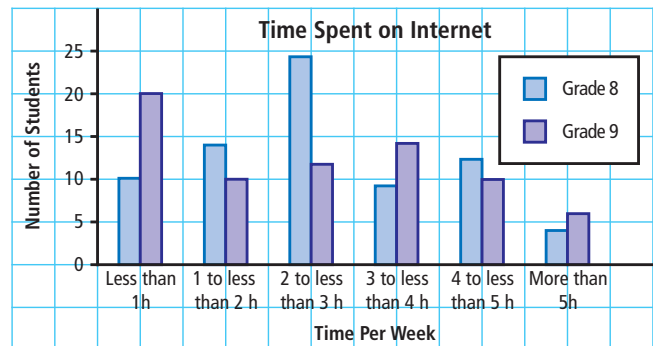
She decided to make a double bar graph to display the data.



- a) Why did Madison choose a double bar graph to display the data?
 b) Is this graph misleading? Explain.

- c) State two conclusions that you can make from this graph.
 d) Why would you not represent the data in a double line graph?

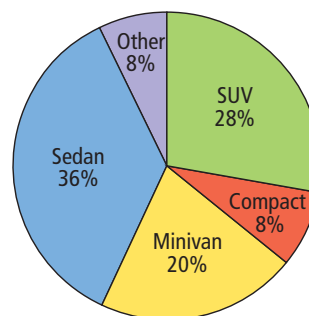
5. a) Identify two conclusions you can make based on this double bar graph.



- b) Is the graph misleading? Explain.
 c) What improvements would you recommend for this graph?
 d) What is one advantage of using a double bar graph to display the data?
 e) Would another type of graph be more informative? Explain your reasoning.

6. a) What are two conclusions you can make based on this circle graph?

Cars in Parking Lot (50 cars)

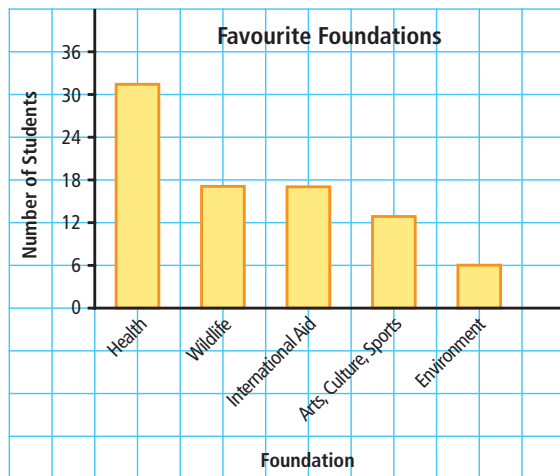
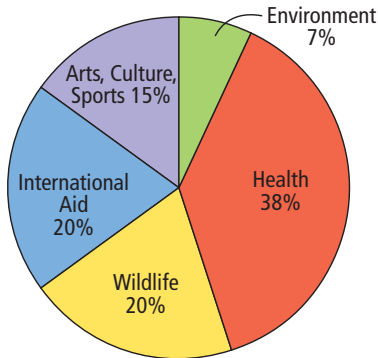


- b) Is the graph misleading? Explain.
 c) What is one advantage of using a circle graph to display the data?
 d) Would another type of graph be more informative? Explain your reasoning.

Apply

7. The school web site posted a survey about the type of organization that grade 8 students would support if they had \$1000 to donate. Each student was allowed to vote once. Colin made two graphs to display the data.

Favourite Foundations (85 votes)

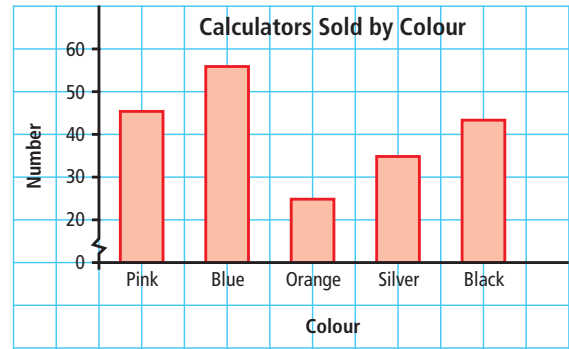


Imagine that you are a spokesperson for a youth health foundation. Which graph would you use to encourage people to donate to your foundation? Explain why.

8. Truong recorded the sales of different colours of graphing calculators during the last month.

Colour	Number
Pink	45
Blue	56
Orange	25
Silver	35
Black	44
Total	205

He displayed the data in a bar graph.



- Why might Truong claim that blue calculators are about three times as popular as orange calculators? Is he correct? Explain.
 - Redraw the graph so it is more accurate. What conclusions can you make from the graph you drew?
 - Draw a circle graph to display the data.
 - Give an advantage of using a circle graph.
9. The director of a ski school tracked the snowboard rentals for one week.

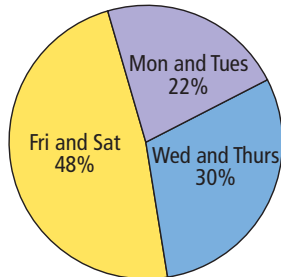
Snowboard Type	Number
Freestyle	59
Freerider	138
Freecarve	49
Alpine	41
Total	287

- Create a graph to display the data.
- What conclusions can you make based on your graph?
- Give an advantage of using the type of graph you made.
- Exchange graphs with a classmate and critique each other's graph. What improvements can you make to your graph?

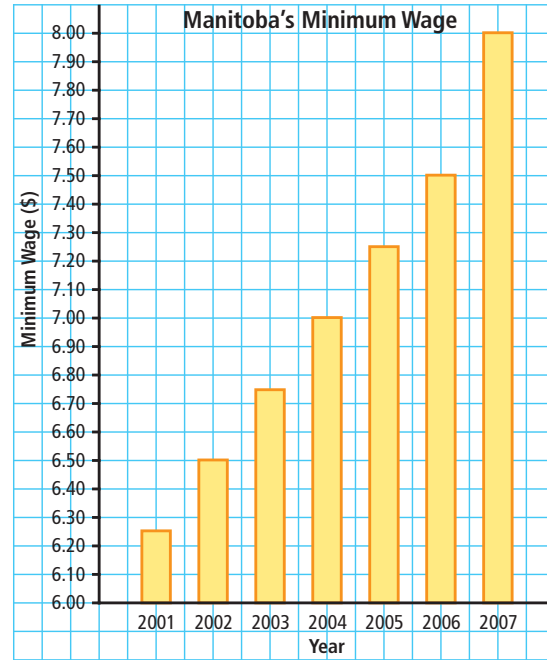
10. Chloe recorded the number of hours she spent on homework over the past six days. She displayed the data in a circle graph.

Day	Hours
Monday	2
Tuesday	1
Wednesday	2.5
Thursday	1.5
Friday	0.5
Saturday	6
Total	13.5

Time Spent on Homework (13.5 h)



- Chloe feels that the time she spends on homework has been increasing over the last six days. Why might she think so? Is she correct? Explain your reasoning.
- Is Chloe's graph misleading? If yes, redraw the graph so it is more accurate.
- What conclusions can you make based on the new graph?
- Display the data in a bar graph.
- What conclusions can you make based on the bar graph?
- Is a bar graph a better way to display the data than a circle graph? Explain.



Graph B

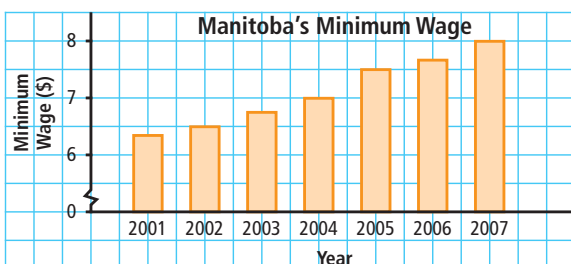
- Describe how each of the graphs is misleading.
- Which graph would support a claim that wages have not increased much over time? Write a statement to support such a claim using the data.
- Who would use Graph B to support a claim to the government about changing the minimum wage—an employer or an employee? Explain.

12. The graphs show the following sales for the first six months of the year for two car dealerships.

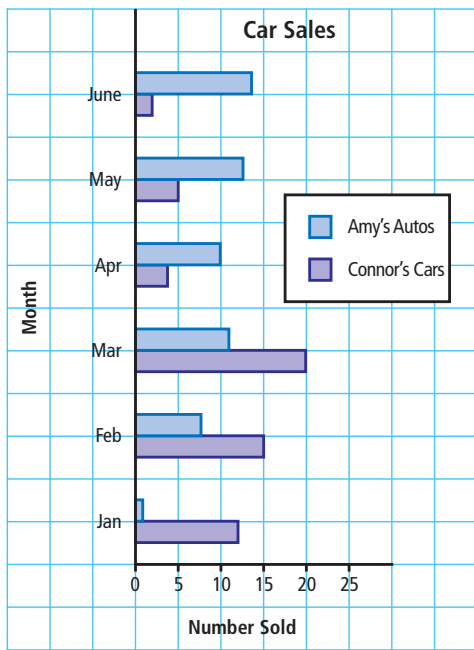
Month	Connor's Cars	Amy's Autos
January	12	1
February	15	8
March	20	11
April	3	10
May	5	13
June	2	14

Extend

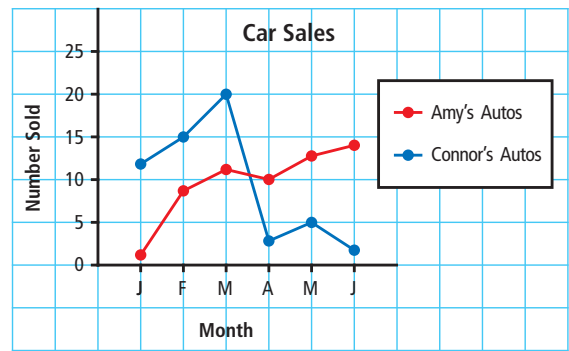
11. The two graphs show the same data about Manitoba's minimum wage.



Graph A



Graph A



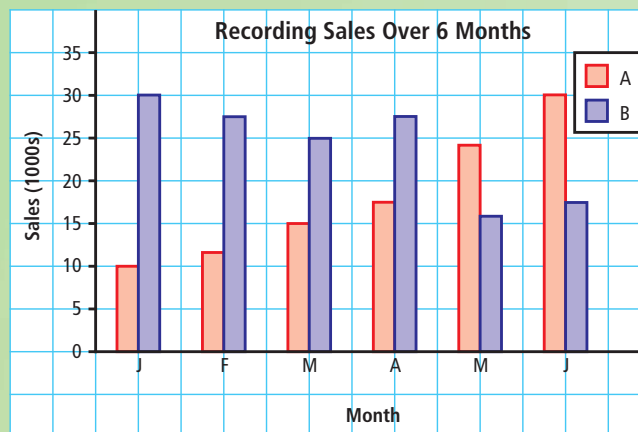
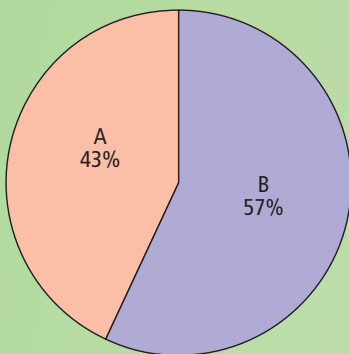
Graph B

- Which graph did the manager of Connor's Cars likely develop? Explain.
- What conclusions can you make based on the line graph?

MATH LINK

The organizers of a music concert are deciding between two performers as their headline attraction for a concert in December. The organizers want to use recording sales data to help make their decision. Consider the following graphs.

Recording Sales Over 6 Months



- What information does each graph provide? Explain.
- The organizers know they must attract a large crowd to cover expenses. Which performer would you select? Justify your answer.