

**SOL 6.14**

The student, given a problem situation, will

- a) construct circle graphs;
- b) draw conclusions and make predictions, using circle graphs; and
- c) compare and contrast graphs that present information from the same data set

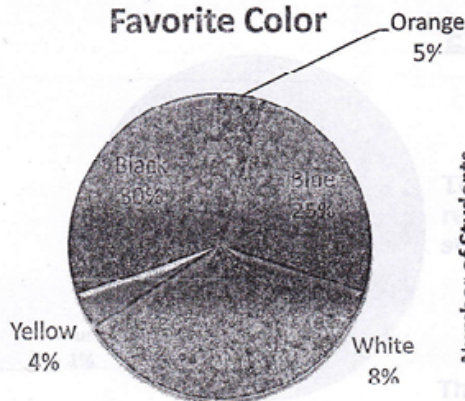
**General information about data collection and graphic representations of data:**

- To collect data for any problem situation, an experiment can be designed, a survey can be conducted, or other data-gathering strategies can be used. The data can be organized, displayed, analyzed, and interpreted to answer the problem.
- Data can be discrete or continuous.
- Different types of graphs are used to display different types of data.
  - Bar graphs use categorical (discrete) data (e.g., months or eye color).
  - Line graphs use continuous data (e.g., temperature and time).
  - Circle graphs show a relationship of the parts to a whole.
- All graphs include a title and data categories should have labels.
- A scale should be chosen that is appropriate for the data.
- A key is essential to explain how to read the graph.
- A title is essential to explain what the graph represents.

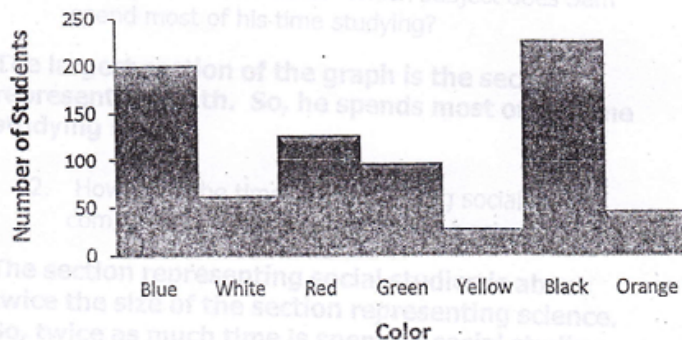
**Example:**

A school survey asked students to choose their favorite color. The results are shown in the two data displays below. You want to compare the portion of students who chose red to all the students' responses. Which data display should you use?

**Favorite Color**



**Favorite Color**



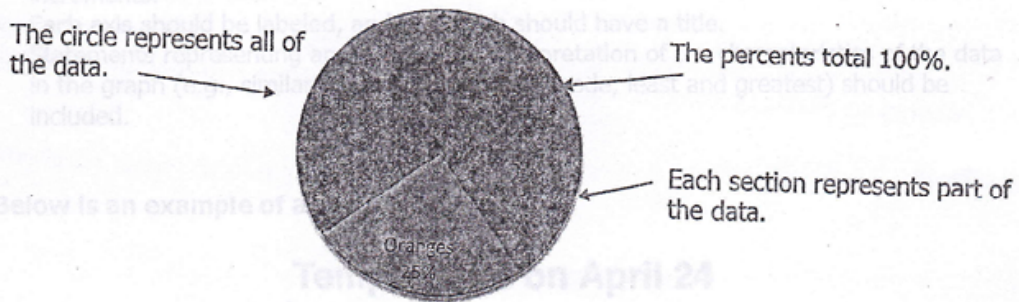
To use the bar graph, you have to estimate the number of students surveyed and the number of students that chose red. The circle graph shows exact percents, so it is the better choice.

### Circle Graphs

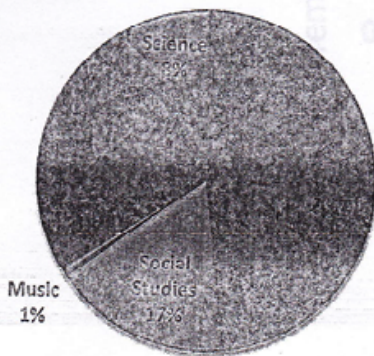
- Circle graphs show relationships of the parts to a whole. The pie-shaped sections show groups.
- Circle graphs show percent (out of 100). The percents add up to 100%.
- The sum of the angle measures in a circle graph are  $360^\circ$ .

**Example:**

**Favorite Fruit**



**Sam's Homework**



**Example:**

1. The circle graph shows the subjects Sam studies during homework time. Which subject does Sam spend most of his time studying?

**The largest section of the graph is the section representing math. So, he spends most of his time studying math.**

2. How does the time spent studying social studies compare to the time spent studying science?

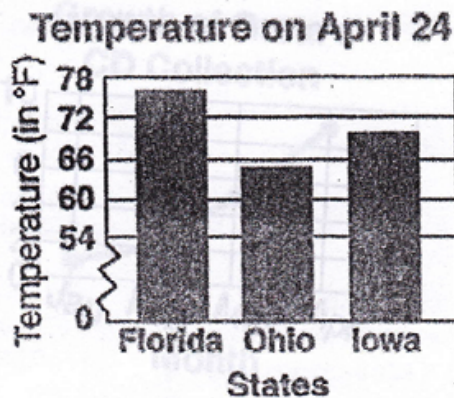
**The section representing social studies is about twice the size of the section representing science. So, twice as much time is spent on social studies as on science.**



### Bar Graphs

- Data are analyzed by describing the various features and elements of a graph.
- Inferences and convincing arguments are based on data analysis.
- **Bar graphs** are used to compare counts of different categories (categorical or discrete data).
  - A bar graph uses either horizontal or vertical parallel bars to represent counts for several categories. One bar is used for each category, with the length of the bar representing the count for that category.
  - There is space before, between, and after the bars.
  - The axis displaying the scale representing the count for the categories should extend one increment above the greatest recorded piece of data. The values should represent equal increments.
  - Each axis should be labeled, and the graph should have a title.
  - Statements representing an analysis and interpretation of the characteristics of the data in the graph (e.g., similarities and differences, mode, least and greatest) should be included.

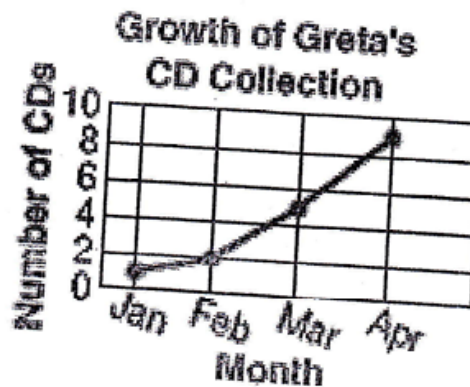
Below is an example of a vertical bar graph.



### Line Graphs

- Line graphs should be utilized to show how one variable changes over time. By looking at a single-line graph, it can be determined whether the variable is increasing, decreasing, or staying the same with the passage of time.
- The values along the horizontal axis represent continuous data on a given variable, usually some measure of time (c.g., time in years, months, or days). The data presented on a line graph is referred to as continuous data because it represents data collected over a continuous period of time.
- The values along the vertical axis represent the frequency with which those values occur in the data set. The values should represent equal increments of multiples of whole numbers, fractions, or decimals, depending upon the data being collected. The scale should extend one increment above the greatest recorded piece of data.
- Each axis should be labeled, and the graph should have a title.
- Statements representing an analysis and interpretation of the characteristics of the data in the graph (e.g., trends of increase and/or decrease, least and greatest) should be included.

Below is an example of a line graph.





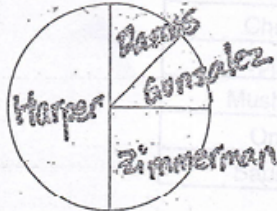
## SOL 6.14

line graph	A graph used to show how a set of data <b>changes over a period of time</b>
circle graph	A graph used to compare parts of a whole. The circle represents the whole and is separated into <b>parts of the whole</b> , usually expressed as a <b>percentage</b>
scale <i>* even spacing</i>	The set of all possible values of a given measurement, including the least and greatest numbers in the set, separated by the intervals used
title	Used to explain the subject of any graph, plot, table, or chart
bar graph	A graph using <b>bars to compare quantities</b> . The height or length of each bar represents a <b>designated number</b> <i>↳ exact #</i>
data	Information, often numerical, which is gathered for statistical purposes
key	A sample data point used to explain the stem and leaves. It is also used to explain the meaning of symbols of any graph, plot, table, or chart.

Use the graph to answer problems 4-8.

Home Runs by Player — Current Season

Go!  
Nacks!



4. What fraction of the total home runs did Zimmerman hit?

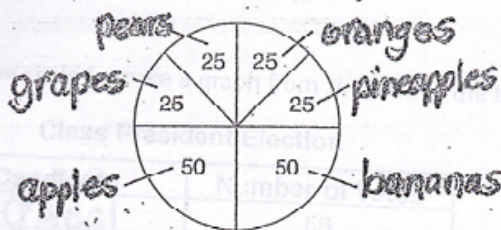
- A  $\frac{1}{16}$
- B  $\frac{1}{8}$
- C  $\frac{1}{4}$
- D  $\frac{1}{2}$

5. Which of the following statements is true?

- A Ramos hit a greater number of home runs than Zimmerman.
- B Zimmerman hit a greater number of home runs than Harper.
- C Zimmerman hit the fewest home runs.
- D Ramos and Gonzalez hit the same number of home runs.

Use the graph to answer problems 9-11.

Favorite Fruit Survey



9. What fraction of people chose apples?

- F  $\frac{1}{8}$
- G  $\frac{1}{4}$
- H  $\frac{1}{2}$
- J  $\frac{3}{4}$

10. Which player had the greatest number of home runs for the season?

- F Ramos
- G Gonzalez
- H Zimmerman
- J Harper

11. What fraction of the total home runs did Ramos hit?

- F  $\frac{1}{16}$
- G  $\frac{1}{8}$
- H  $\frac{1}{4}$
- J  $\frac{1}{2}$

12. Which of the following cannot be determined from the graph?

- F The number of home runs Zimmerman hit
- G The player who hit the greatest number of home runs
- H The player who hit  $\frac{1}{4}$  of the home runs
- J The player who hit  $\frac{1}{2}$  of the home runs

13. How many people were surveyed?

- A 100
- B 200
- C 250
- D 300

14. What fraction of people chose grapes or oranges?

- A  $\frac{1}{8}$
- B  $\frac{1}{4}$
- C  $\frac{1}{3}$
- D  $\frac{1}{2}$



Which circle graph best displays the data in the table.

$$\frac{160}{320} = .50$$

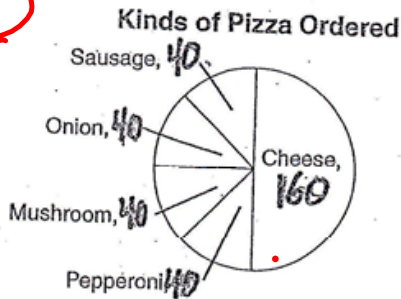
$$\frac{5}{10} = \frac{50}{100}$$

Kinds of Pizza Ordered	
Pizza	Number
Cheese	160
Pepperoni	40
Mushroom	40
Onion	40
Sausage	40

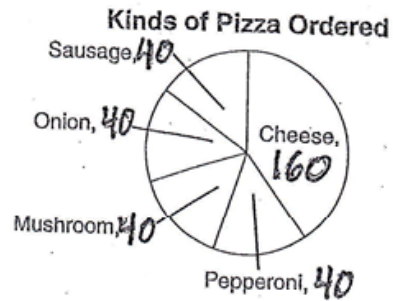
50%

Which of the following graphs shows this information correctly graphed?

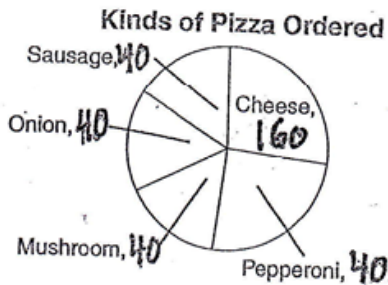
**F**



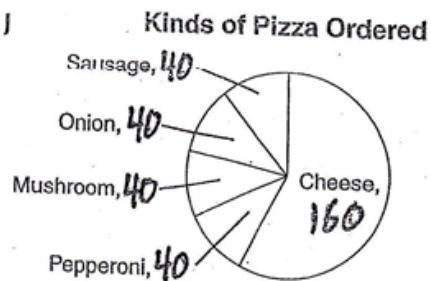
H



G



J



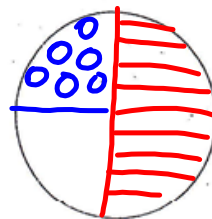
Use the circle to make a graph from the data in the table. Show your work.

Class President Election

Candidate	Number of Votes
O'Neal	56
Smith	28
Lopez	28

O'Neal  
 Smith

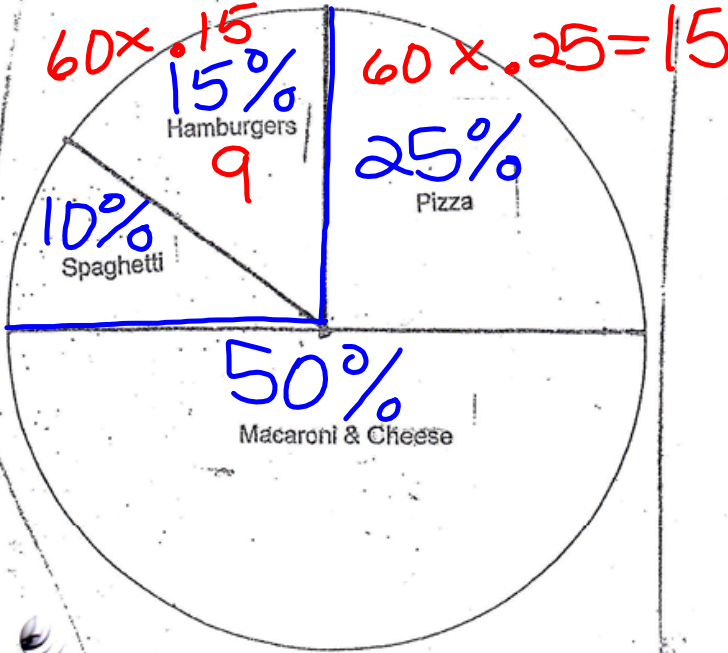
$$\frac{56}{112} = .50 \quad \frac{28}{112} = .25$$



(7)

60 students were surveyed about their favorite foods.

Heading:



Construct a bar graph that could represent the same data.

Favorite Foods

