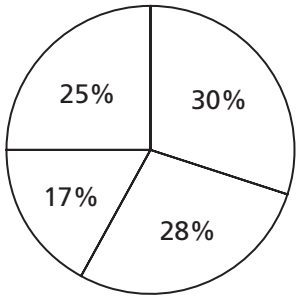
Topic 15: Circle Graphs

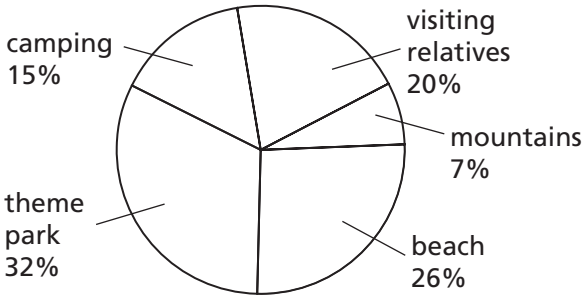
for use before ***Data Distributions*** **Investigation 1**

Circle graphs, or pie charts, show data by the percent of a quantity divided into several categories. A circle graph always represents all (100%) of the data.



Problem 15.1

A. The circle graph shows the vacation choices for 200 middle school students.



1. What percent of the students like to go to a theme park on a vacation?
2. Of the 200 students, how many students preferred to go to the beach on their vacation?
3. Of the 200 students, how many students like to go camping or to the mountains? Explain.

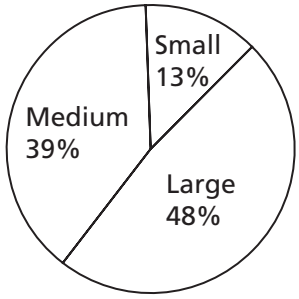
B. Nate goes to Westville Middle School. He wants to make a circle graph to represent the three grades of his school.

Grade	Percent of students
6	33%
7	42%
8	25%

1. Nate knows that 50%, or one half, of a circle is a straight line. How many degrees are there in a straight line?
2. Multiply the percent of students in the eighth grade by 360 to find the central angle for that piece of the circle.
3. Find the central angle for each of the other two grades.
4. Use a compass and protractor to draw a circle graph.
5. Label each sector with the appropriate grade and percent.

Exercises

1. The circle graph shows the size of the businesses in Westville that have made a decision to "Go Green."



a. What percent of the businesses that decided to "Go Green" were small?

b. There are 170 businesses that participated. How many medium-sized businesses decided to "Go Green?"

2. a. Make a circle graph for the table of data.

Homeroom Teacher	Number of students
Steel	20
Anderson	38
Payne	28
Johnson	36
Harmon	42
Martin	36

b. Make a circle graph for the table of data.

Favorite color	Percent of students
green	26%
purple	13%
pink	12%
blue	30%
red	19%

c. Determine the actual number for each color group.

4. Explain how a circle graph represents data differently from a bar or line graph.

Topic 15: Circle Graphs

At a Glance

PACING 1 day

Mathematical Goals

- Read and organize data in circle graphs.

Guided Instruction

Vocabulary
- circle graph

Materials
- compass
- protractor

Because circle graphs depend on fractions, percents, and central angles of a circle, you should review the connections between these topics.

Start with a clock as a point of reference.

- *A clock is a circle divided into segments by numbers. How many segments are on a clock face?* (12)
- *What fractional part of the entire clock face is each segment?* $\left(\frac{1}{12}\right)$
- *What fractional part of the circle is between 12 and 3?* $\left(\frac{3}{12}, \text{or } \frac{1}{4}\right)$
- *How do you write* $\frac{1}{4}$ *as a percent?* (25%)
- *If one clock hand is on the 12 and the other is on the 3, what is the name of the angle that is formed in the center of the clock face?* (right angle)
- *How many degrees are in a right angle?* (90°)

Continue relating $\frac{1}{4}$ to 25% to 90° to establish the understanding of representing percents within a circle.

If it has been a while since the students have used a compass and/or a protractor, you may need to give them an opportunity to practice drawing circles and central angles.

Let the students work in pairs. It would be a good idea to check each student's work at Question B, part 2. If any student has an incorrect answer to this question, they will need assistance finding the central angles.

Summarize with questions like:

- *When would you use a circle graph to display data?* (When you want to see how each part compares to the whole.)
- *How is the data expressed?* (percents)
- *What do you need to find before you can display the data in the circle graph?* (the central angle)
- *How can you find a central angle?* (by multiplying the percent by 360°)

You will find additional work on circle graphs in the grade 6 unit *Data About Us*.

ACE Assignment Guide for Topic 15

Core 1–3

Answers to Topic 15

Problem 15.1

A. 1. 32%

2. 52

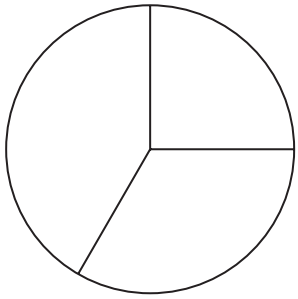
3. 44 students; Explanations may vary. Sample: I added the 7% of the Mountains to the 15% of Camping for a total of 22%. 22% of 200 students is 44 students.

B. 1. 180°

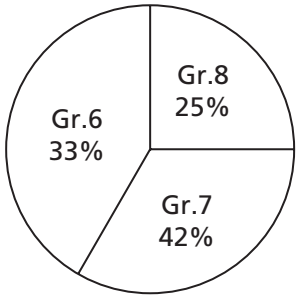
2. $0.25 \times 360° = 90°$

3. $0.33 \times 360° = 120°$; $0.42 \times 360° = 150°$

4.



5.

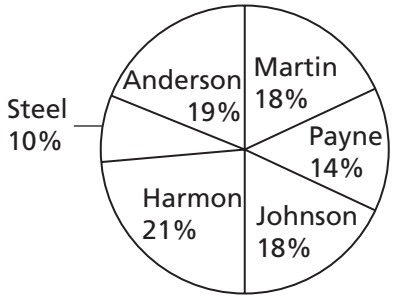


Exercises

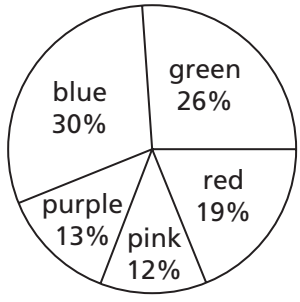
1. a. 13%

b. 66.3, or 66 businesses

2. a.



b.



c. student total 200; green 52, purple 26, pink 24, blue 60, and red 38.

3. Answers may vary. Sample: A circle graph compares parts of a whole and visually shows relationships of one category to another. A bar graph is good for ordering the data, but does not give a good visual of the whole. A line graph usually shows changes over a progression of time for the left to the right.