



GRAPH IT!

☆☆ Grades 7-8

Skills and Objectives:

- Students will practice calculating percentages.
- Students will determine measures of central angles.
- Students will display information in a circle graph.

Suggested Groupings:

Small- to medium-sized groups

Materials: Protractors, calculators (optional)

Getting Started:

1. Begin this lesson by providing students with some information about the U.S. Census. Did they know that the United States collects more varied and complete census information than any other country? The Census Bureau gathers information from households about population and housing, including questions about age, race, and education. Once census data are collected, statistics are used to compile this information in a more meaningful way so it can be shared with agencies, businesses, universities, and the public. Information such as age distribution of a population is crucial because it impacts government programs and spending. For example, if the percentage of U.S. citizens ages 65 and over increases between 1990 and 2000, this might affect the allocation of funds to social security and programs for the elderly.

2. Explain to students that they will be calculating percentages to complete a table and then use the table to create a graph. To prepare for the activity, ask students to write the ages of their household members on a piece of paper. If students completed Lesson 5, they will already have this information.

Using the Activity Worksheets:

1. Divide class into groups (no less than 6 students each) and distribute one copy of the Activity Worksheet on page 19 to each group. Introduce them to the activity and remind them that they will need the information about the ages of their household members to complete it.

- After students have completed the table, review the answers so they can correct their data before performing the graphing activity.

2. Distribute one copy of the worksheet on page 20 to each group and introduce them to this activity.

- Guide students through the steps for creating sections of the circle graph. Make sure students understand how to calculate central angles. If necessary, have a volunteer demonstrate how to use a protractor.

Wrapping Up:

- Have students compare their completed tables and circle graphs.
- **What if the number in each age group was doubled? Would its percentage of the total change? (no) Would its angle in the circle graph change? (no)**
- If the class requires additional practice, have them determine how many students have last names that start with A-H, I-Q, or R-Z. Calculate each number as a percentage of the class. Have students create circle graphs to display these percentages.

Extension Activities:

1. Have students visit the library or the U.S. Census Bureau Web site (www.census.gov) to research a table of census information for their city or county. Have them create a circle graph to display percentage data for one statistic.

2. Students can use household population data collected from Lesson 5 or from the Census Bureau Web site to create computer spreadsheets, using graphing features in spreadsheet or database software.

Answers:

Worksheet answers will vary.

Chalkboard Definitions

circle graph (pie chart): a graph that is used to show the relationship of parts to a whole.

percent: the ratio of a number to 100. Like a fraction, a percent signifies a part of a whole.



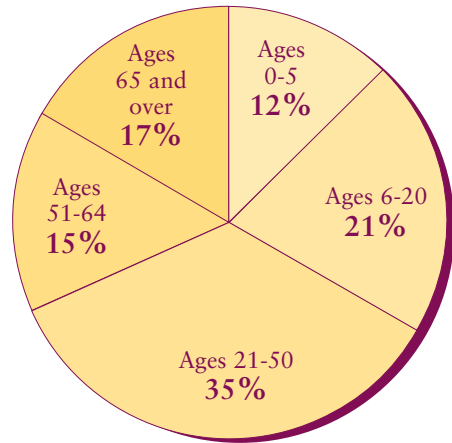


Name: _____

Graph It!

Collecting data is a big part of the U.S. Census Bureau’s work, but displaying that information in a useful way is also important. The Census Bureau and other data users convert numbers into percents and display those percents in tables and graphs. One graph that shows percents is a **circle graph**, or pie chart. For example, the circle graph at right shows household age-group percents for Mr. Stilwell’s 7th Grade Class.

**Example:
Household
Population
by Age
Group of
Mr. Stilwell’s
7th Grade
Class**



CALCULATING PERCENT

Using the information each member in your group wrote down about the ages of members of their household, determine what part of your group’s total household population each age group represents. First, add up your group’s totals in each age group, then follow these 3 steps:

Step 1: Divide the population for the age group by the total population. (Use a calculator.)

Example: 136 (population for age group) \div 1200 (total population) = $.1133333333$

Step 2: Round the decimal to the hundredth place.

Example: $.1133333333$ becomes $.11$

Step 3: Multiply by 100. Add the % sign.

Example: $.11$ becomes 11%

Now find the percent of the total population for each of your group’s age groups.

Group Household Population Table

| AGE GROUP | NUMBER | PERCENT |
|------------------|--------|---------|
| 0-5 | | |
| 6-20 | | |
| 21-50 | | |
| 51-64 | | |
| 65 and over | | |
| Total Population | | |



Name: _____

Graph It! (continued)

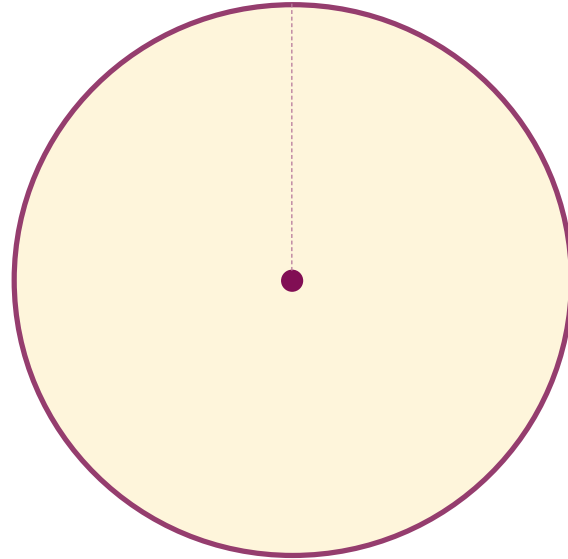
Now you can display the percents you calculated about your group's household ages in a circle graph. Here's how to do it:

1. Begin with the percent for each group. Use your percent figures from page 19 to fill in the percent column in the table below.
2. Calculate the measure of the central angle for each age group. Remember, a circle has 360° .

For example: If the percent for age group 0-5 is 11%, then
 $11\% \text{ of } 360^\circ = 0.11 \times 360^\circ = 39.6^\circ$

If you are using a calculator, percent can be calculated by $360^\circ \times 11$, followed by the % sign.

3. Now complete the circle graph for your group. Place your protractor on the graph so that the black dot in the middle of the circle lines up with the 0° indicator on the protractor. For the 0-5 Age Group, use your protractor to indicate the angle measure on the circle graph. For each succeeding group, reorient your protractor so that the endpoint of the last line drawn is now the 0° line. Label each section and your circle graph is complete.



**Population by Age Group
Circle Graph**

Group Population by Age Group Table

| AGE GROUP | PERCENT | ANGLE MEASURE |
|-------------|---------|---------------|
| 0-5 | | |
| 6-20 | | |
| 21-50 | | |
| 51-64 | | |
| 65 and over | | |