

# May I Have Fries with That?

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**Reporting Category** Probability and Statistics

**Topic** Constructing and using circle graphs

**Primary SOL** 6.14 The student, given a problem situation, will

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

## Materials

- May I Have Fries with That graphic organizer (attached)
- Straight edge
- Colored pencils or markers

## Vocabulary

*bar graphs, line plots, stem-and-leaf plots (earlier grades)*

*ratio, percentage, percent, circle graphs (6.14)*

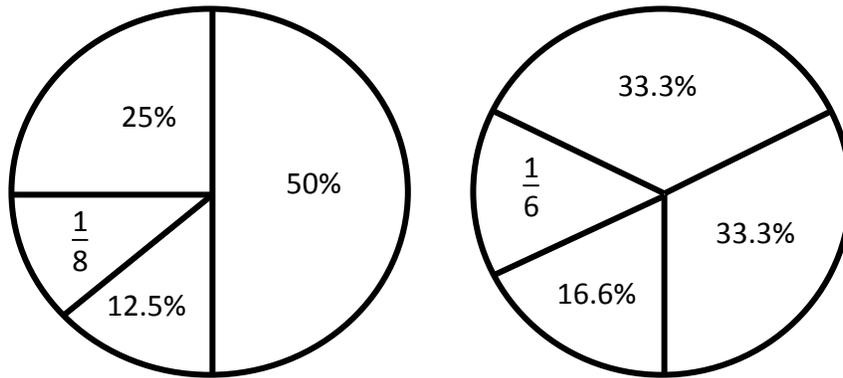
## Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Ask students to name their favorite five fast food chains. Have them write their top choice on a scrap sheet of paper. Collect the papers.
2. Review what students learned about graphs in previous grades, as follows:
  - Grade 3:
    - Bar graph: used to compare counts from different categories (SOL 3.17, Curriculum Framework).
    - Line plot: used to show the frequency of data on a number line, to show the spread of the data, and to quickly identify the range, mode, and any outliers (SOL 3.17, Curriculum Framework).
  - Grade 5:
    - Line graph: used to show how two continuous variables are related; may be used to show how one variable changes over time (SOL 5.15, Curriculum Framework).
    - Stem-and-leaf plot: used to organize exact data values, displaying the data's shape and distribution (SOL 5.15, Curriculum Framework).
3. During a discussion of the definitions and usages of these four types of graphs, have students describe different types of data sets, and ask them which of the four types of graphs would be best to represent each type of data set. Provide several types of data sets (e.g., the numerical spread of data across a data set, temperature over time, amount of snow accumulated in specific months, the middle number of a data set, the number that appears the most), and have students individually determine the type of graph that would be best to represent each data set.
4. While students are working, tally the number of students selecting each *category* of fast food chain. Create a chart to display the top five categories of the fast food chains selected

by the students, the number of students choosing each category, and the percent of students choosing each category. For example, out of a class of 23 students, 9 might choose a popular hamburger place, 3 might choose a popular sub shop, 1 might choose another hamburger place, 4 might choose a popular taco place, and 6 might choose a popular pizza place, as shown below.

| Fast Food Category      | Number of Students Choosing | Percent of Students Choosing |
|-------------------------|-----------------------------|------------------------------|
| Popular Hamburger Place | 9                           | 39%                          |
| Popular Sub Shop        | 3                           | 13%                          |
| Another Hamburger Place | 1                           | 4%                           |
| Popular Taco Place      | 4                           | 18%                          |
| Popular Pizza Place     | 6                           | 26%                          |

- Introduce the **circle graph** as the type of graph used to display data showing the relationship of parts to a whole. Draw circles on the board, and show different examples of percents of the circles, as shown below:



This will assist students in developing skills in drawing conclusions and making predictions based on data presented in circle graphs. In addition, students will become able to determine the amount of data necessary to cover specific areas of the circle. When presenting the values in each section of the circles, use fraction, decimal, and percent notations. Make sure that students know that the total of the various percents in each circle must be 100%, and why.

- Distribute straight edges, colored pencils or markers, and copies of the attached May I Have Fries with That graphic organizer. Display the chart you created in step 4, and have students fill in the class data collected about fast food categories. (Note: You may choose not to provide the percents to students, but to have them calculate the percents themselves.) Next, have them construct the circle graph by dividing up the given circle into the same number of equal sections as there are students in the class. Then, have them show the various percents by color-coding the appropriate number of sections for each category and filling in the corresponding percent. Finally, have them list the names of the fast food categories in the spaces provided and use the boxes to create a color key for each category.
- Ask students what components a graph needs to accurately describe the graph (e.g., title, scale, key).

### Assessment

- **Questions**
  - Why must the percents in a circle graph have a total of 100%?
- **Journal/Writing Prompts**
  - Explain why there is a need for different types of graphs to represent different data sets.
  - Describe whether there are different types of graphs that provide similar types of information.
- **Other**
  - Post a data set, and have students construct a circle graph of it individually.

### Extensions and Connections (for all students)

- Provide students with data represented in a selected type of graph, and have them construct a circle graph to present the information from the same data set.
- Present data sets represented by all the types of graphs. Have students develop questions that could be answered about the data by using each graphical representation.

### Strategies for Differentiation

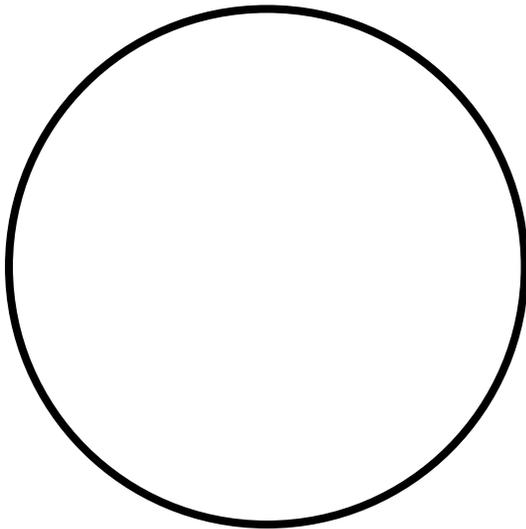
- Starting with a circle divided into four quadrants, show students how to move the lines dividing the quadrants to accommodate different data sets.
- Use all fractions, decimals, or percents in circle graphs to further student understanding of the data.

# May I Have Fries with That?

Name \_\_\_\_\_ Date \_\_\_\_\_

| Fast Food Category | Number of Students Choosing | Percent of Students Choosing |
|--------------------|-----------------------------|------------------------------|
|                    |                             |                              |
|                    |                             |                              |
|                    |                             |                              |
|                    |                             |                              |
|                    |                             |                              |

**Fast Food Category Circle Graph**



**Key**

|                          |       |
|--------------------------|-------|
| <input type="checkbox"/> | _____ |

Which fast food category is the most popular with our class?

Which fast food category is the least favorite with our class?

How did you use the number of students choosing each category and the total number of students in the class to determine the percent for each category?

Explain how the sizes of the sections of the circle depict the data.