Richmond Public Schools

Curriculum Framework

Math Grade 6

Strand: Measurement and Geometry	
6.10 The student will a) represent data in a circle graph; b) make observations and inferences about data represented in a circle graph; and c) compare circle graphs with the same data represented in bar graphs, pictographs, and line plots.	
Suggested Pacing	
5 Instructional days	
Spiraling Standards	
3.15 The student will a) collect, organize, and represent data in pictographs or bar graphs; and b) read and interpret data represented in pictographs and bar graphs. **4.14** The student will a) collect, organize, and represent data in bar graphs and line graphs; b) interpret data represented in bar graphs and line graphs; and c) compare two different representations of the same data (e.g., a set of data displayed on a chart and a bar graph, a chart and a line graph, or a pictograph and a bar graph). **5. 16** The student, given a practical problem, will a) represent data in line plots and stem-and-leaf plots; b) interpret data represented in line plots and stem-and-leaf plots; and c) compare data represented in a line plot with the same data represented in a stem-and leaf plot.	**7.9** The student, given data in a practical situation, will a) represent data in a histogram; b) make observations and inferences about data represented in a histogram; and c) compare histograms with the same data represented in stem-and-leaf plots, line plots, and circle graphs. **8.12** The student will a) represent numerical data in boxplots; b) make observations and inferences about data represented in boxplots; and c) compare and analyze two data sets using boxplots. 8.13 The student will a) represent data in scatterplots; b) make observations about data represented in scatterplots; and c) use a drawing to estimate the line of best fit for data represented in a scatterplot. **A.9** The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve practical problems, using mathematical models of linear and quadratic functions.

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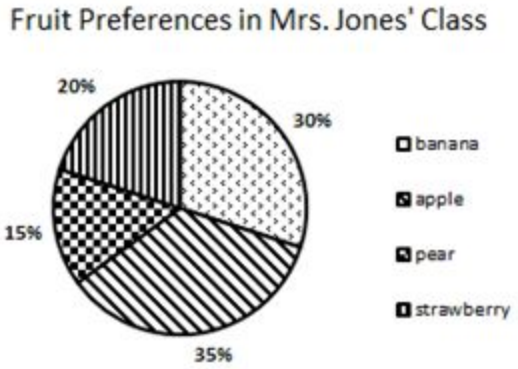
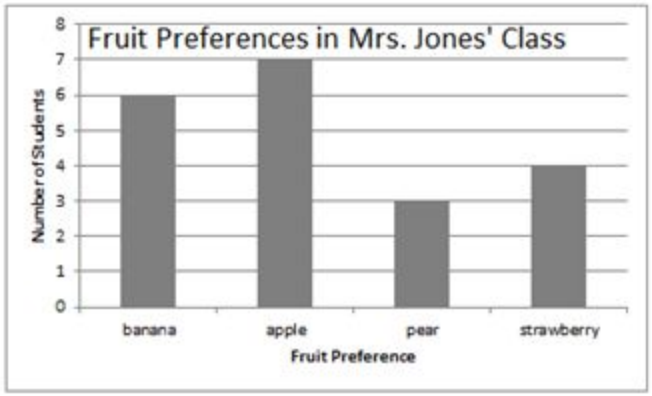
Essential Questions	Common Misconceptions
6.10a • How does a circle graph help me organize my data? **6.10b** • How do people use data to influence others? • Is it possible to manipulate data to change the way the data is perceived? **6.10c** • How does the type of data influence the choice of graph?	• Students continue to struggle with simplifying fractions • Students may not understand the relationship between fractions (percentages) and sections of the circle graph. • When comparing and contrasting data presented in different displays students aren't critical enough. • When using a circle graph to make predictions, students aren't weighing the choices based on the information displayed in the graph but instead are using their assumptions.
Understanding the Standard	**Essential Knowledge and Skills**
• Circle graphs are used for data showing a relationship of the parts to the whole. ○ Example: the favorite fruit of 20 students in Mrs. Jones class was recorded in the table. Compare the same data displayed in both a circle graph and a bar graph.	**The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to** • Collect, organize and represent data in a circle graph. The number of data values should be limited to allow for comparisons that have denominators of 12 or less or those that are factors of 100 (e.g., in a class of 20 students, 7 choose apples as a favorite fruit, so the comparison is 7 out of 20, 720, or 35%). (a) • Make observations and inferences about data represented in a circle graph. (b) • Compare data represented in a circle graph with the same data represented in bar graphs, pictographs, and line plots. (c)

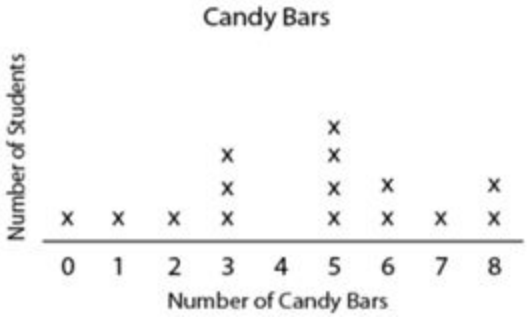
Fruit Preference	# of students
banana	6
apple	7
pear	3
strawberry	4





- Circle graphs can represent percent or frequency.
- Circle graphs are not useful for representing data with large numbers of categories.

● Teachers should be reasonable about the selection of data values. The number of data values can affect how a circle graph is constructed (e.g., 10 out of 25 would be 40%, but 7 out of 9 would be 77.7%, making the construction of a circle graph more complex). Students should have experience constructing circle graphs, but a focus should be placed on the analysis of circle graphs. ● Students are not expected to construct circle graphs by multiplying the percentage of data in a category by 360° in order to determine the central angle measure. Limiting comparisons to fraction parameters noted will assist students in constructing circle graphs. ● 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 solve the problem. ● Categorical data can be sorted into groups or categories while numerical data are values or observations that can be measured. For example, types of fish caught would be categorical data while weights of fish caught would be numerical data. ● Different types of graphs can be used to display categorical data. The way data are displayed often depends on what someone is trying to communicate. ○ A line plot is used for categorical and discrete numerical data and is used to show frequency of data on a number line. It is a simple way to organize data. Example:	



- A bar graph is used for categorical and discrete numerical data (e.g., number of months or number of people with a particular eye color) and is used to show comparisons.
- A pictograph is mainly used to show categorical data. Pictographs are used to show frequency and compare items. However, the use of partial pictures can give misleading information.
    - Example:

The Types of Pets We Have

Cat	Dog	Horse	Fish
☺	☺ ☺ ☺ ☺	☺	☺ ☺ ☺

☺ = 1 student

- A circle graph is used for categorical and discrete numerical data. Circle graphs are used to show a relationship of the parts to a whole.
- All graphs must include a title, percent or number labels for data categories, and a key. A key is essential to explain how to read the graph. A title is essential to explain what the graph represents.
- A scale should be chosen that is appropriate for the data values being represented.
- Comparisons, predictions, and inferences are made by examining characteristics of a data set displayed in a variety of graphical representations to draw conclusions.
- The information displayed in different graphs may be examined to determine how data are or are not related, differences between characteristics (comparisons), trends that suggest what new data might be like (predictions), and/or "what could happen if" (inferences).

Vocabulary

circle graph
data
observation
pictograph
line plot
frequency
scale
trends
predictions
inference
bar graph

Assessment

Instructional Activities Organized by Learning Objective

Textbook
Virginia Math Connects, Course 1, ©2012, Glencoe/McGraw-Hill
page(s) – 644 -650 and 651 – 655 Extra Practice page –EP31-32
Lessons 11-3 and 11-4

Notes
SOL 6.14 Probability and Statistics Interactive Notes: Interpreting Data

Resources
- Print

ia Department of Education
May I Have Fries with That? – lesson plan

	SOL 6.14a – lesson plan page 49 -59 ● **Technology-based** Exchange - interactive skill practice , Charts, and Analysis of Data Part 1 [SMART Notebook lesson] Interactivesites weebly – Graphing **Station Activities**
Cross-Curricular Connections	Tiered Differentiations
As part of the Scientific Method taught in science class, students are required to record and analyze the data of their experiments. Here graphs can be created to display data and determine if the stated hypothesis is correct or incorrect.	To meet the needs of all learner the following manipulatives can be used throughout the unit: square tile, centimeter cubes, two color counters, transparent counters, grid paper, and newspaper/internet articles with data. A quick review of pictographs, bar graphs, line plots, stem and leaf and frequency tables is beneficial when starting this unit. Have several of each type of graph around the room. Have students walk around and write everything they remember about that graph. The more relevant the data, the more the students will be engaged.