Bridging for Math Strength Resources

Standards of Learning Curriculum Framework

Standard of Learning (SOL) 6.10

a) represent data in a circle graph;

c) compare circle graphs with the same data represented in bar graphs, pictographs, and line plots.

Student Strengths	Bridging Concepts	Standard of Learning
Students can represent and interpret data in bar graphs, pictographs, and line plots.	Students can determine fractions/percentages of numbers. Students can make comparisons between a variety of data representations.	Students can a) represent data in a circle graph; c) compare circle graphs with the same data represented in bar graphs, pictographs, and line plots.

Understanding the Learning Trajectory

Big Ideas:

- Different graphs are appropriate for different types of data, and provide different information about the data set. The choice of graphical representation can affect how well the data are understood (Van de Walle et al., 2018).
- Circle graphs display part-to-whole ratios of categorical data, usually. They can be used to compare ratios between different-sized data sets (Van de Walle et al., 2018).

Formative Assessment:

- VDOE Just in time Quick Check SOL 6.10a (Word) / PDF / Desmos
- VDOE Just in time Quick Check SOL 6.10c (Word) / PDF / Desmos

Important Assessment Look Fors:

- The student uses data to create a circle graph.
- The student creates a circle graph that shows appropriate proportions based upon the data.
- The student determines the fractions/percentages based on the total data collected.
- The student collects data and represents that data in an appropriate circle graph.
- The student compares a circle graph to a bar graph, pictograph, and line plot.
- The student explains which graph is better for answering different types of questions.

Purposeful Questions:

- How many parts does your circle graph need?
- What percentage/fraction of the total people surveyed are represented by_____?
- What are the similarities/differences between the circle graph and the (bar graph, pictograph, line plot?
- How can you determine the percentages in the circle graph if the data is not out of 100?
- How many people were surveyed when this data was collected?

Bridging Activity to Support Standard	Instructional Tips
Routine: Slow Reveal Graphs Slowrevealgraphs.com	In this routine, parts of the circle graphs are revealed on each slide giving students more information. It allows for them to be able to think critically about the information that is being shared. There is also an opportunity to make comparisons between the circle graphs and determine the percentages for each graph based on a 24 hour period.
Rich Tasks: Nuts Mars Tasks (page 22) If the World Were A Village Henrico County	In the Nuts task, students use clues to complete a circle graph and then must analyze the data. Students should be asked to think about the possible number of nuts and percentages that each section of the graph represents. In the World Village task, students use information to create both a bar graph and a circle graph. They then make comparisons between the two graphs. It gives students an opportunity to represent and analyze data.
Games/Tech: Desmos 6.10c What are you trying to say? Comparing Data Displays	In this Desmos activity, students will compare data represented in a circle graph with the same data represented in bar graphs, pictographs, and line plots.

Other Resources:

- Graph Creator: Students input their data and create different types of graphs. This allows for them to examine and compare the data when it is represented in different graphical forms.
- VDOE Mathematics Instructional Plans (MIPS)
  - 6.10abc - May I have Fries with That? (Word) / PDF Version
- VDOE Algebra Readiness Remediation Plans
  - Analyzing Graphs (Word) / PDF
  - Data Organizers (Word) / PDF
  - Interpreting Graphs (Word) / PDF
  - Circle Graph Pieces (Word) / PDF
  - Circle Graphs (Word) / PDF

- VDOE Word Wall Cards: Grade 6 (Word) | (PDF)
    - Circle graph
    - Comparing Graphs: Circle and Bar Graph
    - Comparing Graphs: Circle and Pictograph
    - Comparing Graphs: Circle and Line Plot

Learning Trajectory Resources:

Charles, R. (2005). Big ideas and understandings as the foundation for elementary and middle school mathematics. *Journal of Mathematics Education Leadership*, *7*(3), NCSM.

Clements, D. H., & Sarama, J. (2019). Learning and teaching with learning trajectories [LT]2. Marsico Institute, Morgridge College of Education, University of Denver. https://www.learningtrajectories.org/

Common Core Standards Writing Team. (2019). Progressions for the Common Core State Standards for Mathematics. Tucson, AZ: Institute for Mathematics and Education, University of Arizona.

Richardson, K. (2012). How Children Learn Number Concepts: A Guide to Critical Learning Phases. Bellingham: Math Perspectives Teacher Development Center.

Van De Walle, J., Karp, K. S., & Bay-Williams, J. M. (2018). *Elementary and Middle School Mathematics: Teaching Developmentally.* (10th edition) New York: Pearson (2019:9780134802084)

VDOE Curriculum Framework for All Grades - Standard of Learning Curriculum Framework (SOL)