Bridging for Math Strength Resources

Standards of Learning Curriculum Framework

Standard of Learning (SOL) 3.15a Collect, organize, and represent data in pictographs or bar graphs.

Student Strengths	Bridging Concepts	Standard of Learning
The students can collect, organize, and represent data in pictographs and bar graphs. They can also read and interpret data represented in pictographs and bar graphs. The students can count forward by twos, fives, and tens to 120, starting at various multiples of 2, 5, or 10.	Students can collect, organize, and represent data to create pictograph and bar graphs. Students can apply skip counting to create and read a key and/or scale that is appropriate for a given set of data.	Students can collect, organize, and represent data in pictographs or bar graphs.

Understanding the Learning Trajectory

Big Ideas:

- Some questions can be answered by collecting and analyzing data.
- Categorical data are displayed in pictographs and bar graphs (Common Core Progressions, p. 2)
- Pictographs and bar graphs are labeled with accurate titles, key or scale, and appropriate categories (Common Core Progressions, p. 7).
- Data can be represented visually using objects, tables, charts, and graphs. The type of data to be collected often determines the best choice of visual representation.

Formative Assessment:

- VDOE Just in time Quick Check SOL 3.15a PDF / Desmos

Important Assessment Look Fors:

- The student correctly labels all parts of the bar graph, including each axis and category, and titles it appropriately.
- The student correctly labels all parts of the pictograph, creates an appropriate key for the data, and gives the graph a title.

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- The student uses the scale and/or key to correctly record the data.

Purposeful Questions:

- Why do we collect data?
- How is data gathered and organized?
- What are the characteristics of bar graphs and pictographs?
- How are bar graphs and pictographs constructed to represent data?
- How are bar graphs and pictographs read and interpreted?
- How is the data represented in the graph?
- How did you decide what the key or scale should be?
- What questions could you ask, based on the data in the graph?
- What statements can you make that explain the data represented?
- How might the data change if more students are surveyed with the questions the graph is representing?

Bridging Activity to Support Standard	Instructional Tips
Routine Same & Different: What's in My Robot?	For the Same & Different routine, display pictures A and B and ask students to think about how they are the same and how they are different. Provide students with time to think. Then have the students share their thinking while the teacher records students' ideas on the board using a T-chart. Click here for more information about the routine: Same and Different routine.
Which One Doesn't Belong? We See Seashells	As students discuss this routine, consider recording the big ideas and highlighting the vocabulary that students use as they explain their thinking. Challenge students to think of reasons why each image might not belong with the other three.
Would You Rather? Playground Preferences	Engage students in conversation during this routine. The scales used for each graph are different so that students are forced to think about how the data is represented in order to justify their decision.
Slow Reveal Graph Desmos	The first slide begins with a bar graph that has information missing. Then each subsequent slide adds a necessary component in order to read the bar graph. Have kids observe what is different and how it changes what they know about the bar graph.
Rich Tasks Graph What You Choose Task (Henrico Public Schools)	You will be an investigative reporter finding out fun information about your classmates. Think of what information you would like to gather then decide how you will record and order your data. Take your data and graph it. Which tool will you use to record and represent your data (tally graph, bar graph,or pictograph)? Write about what you have learned from the data. List 3 things you noticed from the data. Think about what the data *may not* have told you. What questions would you have?
Games/Tech Desmos 3.15 Graphing Change	This activity reviews counting sets of coins in order to create and analyze a bar graph. Problem solving is embedded.

Other Resources:

- VDOE Mathematics Instructional Plans (MIPS)
  - 3.15ab - Data Mania (Word) / PDF Version
  - 3.15ab - Statistics Throughout the Year (Word) / PDF Version
- VDOE Word Wall Cards: Grade 3 (Word) and (PDF)
- Desmos Activity:
  - 3.15 Vocabulary Review
- Virtual Manipulatives
  - Create Plots- Students can create their own bar or pictograph. Change graph type by clicking on the drop down arrow in the bottom left of the screen.
  - Spinners- Students can use a variety of spinners to collect data.
  - Dice- Students can use a virtual dice to collect data.

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)