Bridging for Math Strength Resources

Standards of Learning Curriculum Framework (SOL)

Standard of Learning (SOL) 5.16b Interpret data represented in line plots and stem-and-leaf plots

Student Strengths	Bridging Concepts	Standard of Learning
Students can interpret data by making inferences from bar graphs and line graphs. Students can interpret the data to answer the question posed, and compare the answer to the prediction.	Students can create a line plot and then use this data to create a stem-and-leaf plot.	Students can interpret data represented in line plots and stem-and-leaf plots.

Understanding the Learning Trajectory

Big Ideas:

- By the end of Grade 5, students should be comfortable making line plots for measurement data and analyzing data shown in the form of a line plot. (Common Core Progression, 2019, p. 11)
- The emphasis in all work with statistics should be on the analysis of the data and the communication of the analysis, rather than on a single correct answer. Data analysis should include opportunities to describe the data, recognize patterns or trends, and make predictions.
- There are two types of data: categorical and numerical. 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.

Formative Assessment:

- Just in Time Mathematics Quick Check 5.16b PDF
- Just in Time Mathematics Quick Check 5.16b Desmos

Important Assessment Look Fors:

- The student can interpret data by making observations from line plots and describe the characteristics of the data and describing the data as a whole.
- The student can interpret data by making observations from stem-and-leaf plots and describe the characteristics of the data and describing the data as a whole.

- The student can interpret data by making inferences from line plots and stem-and-leaf plots.
- The student can make generalizations based on the observations of the data.

Purposeful Questions:

- Can you describe the data as a whole explaining patterns or trends that you see?
- What does each X represent in the line plot, and what does it mean when an X appears multiple times above a number on the number line?
- What is the difference between a stem and a leaf?
- Which graph do you think better represents the data and why?

Bridging Activity to Support Standard	Instructional Tips
Routines: Think/Pair/Share Display a line plot with real world data Think/Pair/Share Display a stem and leaf plot with real world data Use this resource to find graphs of various types. Slow Reveal Graphs.	Think/Pair/Share is a great way to increase engagement and accountability. Since some students may be hesitant to participate in a brainstorming session, hold each student accountable by giving them a recording sheet. You can use Slow Reveal Graphs to scaffold student learning. 1. Students spend a minute (or more depending on their stamina) 2. Quickly go around the room hearing each pair's items. Students should add noticings and wonderings they didn't come up with to their own sheets. 3. Finally ask, "Did anyone have any other noticings or wonderings they wanted to share?" and collect those. --- Use this resource to find graphs of various types. Slow Reveal Graphs. 1. Students will write their noticings and wonderings on the recording sheet. 2. Students work with the person next to them to compare their lists and see if they can add two more things. 3. Each pair chooses one item to share with the whole group. In this fashion, each student is accountable for noticing and wondering before hearing from others, and students who need more wait time get a chance to organize their thoughts before sharing.
Rich Tasks What's the Weather?	Students correctly create a stem-and-leaf plot using the weather data. Students accurately interpret the data to create questions for others. Students will then answer the questions by interpreting the data. --- Pick a region of the United States and have the students research the current temperatures of the capitals of each state of that region on Weather Central. Use 2 different line plots to graph the high and low temperatures within the region for that day. Have students create and label a line plot using the data. Next, students can create questions that can be answered using the line plot. Compile student questions together for the class to answer using the weather line plot. 2. Teacher will display a stem-and-leaf plot. Students will write two questions that can be answered from the stem and-leaf plot. Students will then switch papers with a

	neighbor and answer their questions.
Class Graph From Good Questions for Math Teaching	There are many possible responses to the Class Graph task. Once students decide what the graph could represent, they can add labels to the axes. Facilitate a discussion in which students compare and contrast the different graph labels that are possible.
Games Interpret Line Plot Data with up to 5 Data Points Stem and Leaf Plots	Students read the word problem and use the data to answer questions and unlock stars. Stem-and-leaf plots are helpful when you need to organize data that spans a large range, or data that needs to be organized by place value.

- **Other Resources:**
- Line Plot Video-Line Plot Intro: Explains how to make and read a line plot.
- Line Plots: Line plots help organize information. Using line plots can help us easily analyze the range and the mode of a set of data.
- Stem and Leaf Chart Generator - Online: Students can enter values and labels and print. Flash required.
- TASK 40 STACKING SHOE BOXES REPRESENT DATA IN A LINE PLOT from Classroom-Ready Rich Math Tasks. By: Beth McCord Kobett, Francis (Skip) Fennell, Karen S. Karp, Delise Andrews, Sorsha-Maria T. Mulroe. Plan for heterogeneous groups of 2 or 3. The shoeboxes will need to be cut apart to arrange on the shelf (see student page). If desired, to save time during the task, teachers may wish to cut the shoeboxes apart using a paper cutter and just give each group a pile to arrange. If possible, consider bringing a large delivery box in with several smaller boxes inside it. This can serve as a visual aid during the launch.
- Slow Reveal Graphs: The Slow Reveal Graph is an instructional routine that promotes sensemaking about data. This highly engaging routine uses scaffolded visuals and discourse to help students make sense of data. As more and more of the graph is revealed, students refine their interpretation and construct meaning, often in surprising ways. This routine increases access for students without sacrificing rigor or engagement (quote from linked website).
- Study Jams Line Plots and Stem-and-Leaf Plots: Walk students through line plots and stem-and-leaf plots with this how-to and practice.
- VDOE Mathematics Instructional Plans (MIPS)
  - Statistics: Learning about Our Class from Mystery Data (Word) / PDF Version
- VDOE Algebra Readiness Remediation Plans
  - Data Organizers (Word) / PDF version
  - Graph Match (Word) / PDF version
  - Interpreting Graphs (Word) / PDF version
  - Mystery Data (Word) / PDF version
- VDOE Word Wall Cards: Grade 5 (Word) / (PDF)
  - Line Plot
  - Stem-and-Leaf 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.

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.

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)