# Bridging for Math Strength Resources

## Standards of Learning Curriculum Framework (SOL)

**Standard of Learning (SOL) 5.17a** Given a practical context, describe mean, median, and mode as measures of center

| Student Strengths | Bridging Concepts | Standard of Learning |
|---|---|---|
| Students can identify, describe, create, and extend patterns found in objects, pictures, numbers, and tables. Students can describe trends they see in data (Ex. "It is increasing/decreasing.). | Students can differentiate between the different measures of center and describe the mean as a fair share. | Given a practical context, students can describe mean, median, and mode as measures of center. |

## Understanding the Learning Trajectory

***Big Ideas:***

- Students see the mean as a "leveling out" of the data in the sense of a unit rate. In this "leveling out" interpretation, the mean is often called the "average" and can be considered in terms of "fair share." (Common Core Writing Team, 2019, p.6-8 statistics and probability). It can also be discussed as a balance point.
- Mean, median, and mode are all measures of center but depending on the data each can be argued as better representation of the data.
- The median is the middle value of a data set in ranked order. Given an odd number of pieces of data, the median is the middle value in ranked order. If there is an even number of pieces of data, the median is the arithmetic average of the two middle values.
- Mean represents a fair share concept of the data. Dividing the data constitutes a fair share. This idea of dividing as sharing equally should be demonstrated visually and with manipulatives to develop the foundation for the arithmetic process. (Curriculum Framework, pg 35)

***Formative Assessment:***

- Just in Time Mathematics Quick Check 5.17a PDF
- Just in Time Mathematics Quick Check 5.17a Desmos

***Important Assessment Look Fors:***

- Student describes why the mean, median, and mode are all measures of center.



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- Student describes how to find the mean, median, and mode.
- Student can justify why the practical situation represents the mean, median, or mode.
- Student explains how finding the mean is similar to finding a fair share.

***Purposeful Questions:***

- What is the difference between each measure of center?
- Why are the mean, median, and mode all considered measures of center?
- Why did you choose the mean/median/mode to describe this situation?

| Bridging Activity to Support Standard | Instructional Tips |
|---|---|
| **Routines**<br>Notice and Wonder | If you ask students to focus on one measure of center (mean/median/mode), would their answers change? |
| **Rich Tasks**<br>About Averages from Nrich<br>Task sheet | Students will create a set of data points with specific measures of center.<br><br>Can you find sets of positive integers that satisfy the following?<br>1. Three numbers with mean 3 and mode 2<br>2. Three numbers with mean 7 and mode 10<br>3. Three numbers with mean 8, median 10 and range 8<br>4. Four numbers with mean 7.5, mode 6 and median 7<br>5. Four numbers with mean 6, median 6.5and range 11<br>6. Five numbers with mean 4, mode 3 and range 9<br>7. Five numbers with mean 4, mode 2 and range 6 (two possible solutions)<br>8. Five numbers with mean 7, mode 7 and range 10 (three possible solutions)<br><br>**Extension**<br><br>Can you find a set of four numbers with mean 4, mode 1, median 2and range 10?<br>How about a set of five numbers?<br>Or six numbers?<br>Or...<br>Or 100 numbers? |
| **Games**<br>Mean, Median, Mode, or Range | Students practice mean, median, mode, and range using 5 data points from a deck of cards. Each round they pick which measure they want to play in order to get the most points. |

**Other Resources:**

- VDOE Mathematics Instructional Plans (MIPS)
  - What's the Data All About? (Word) / PDF version
- VDOE Word Wall Cards: Grade 5 (Word / PDF)
  - Mean
  - Median
  - Mode
- VDOE Instructional Videos for Teachers
  - Mean as Balance Point

**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)