Bridging for Math Strength Resources

Standards of Learning Curriculum Framework

Standard of Learning (SOL) 5.17c Describe the range of a set of data as a measure of spread.

Student Strengths	Bridging Concepts	Standard of Learning
The student can find the difference between two numbers. The student can name the largest and smallest data point within a set of data.	The student can look at numerical and graphical data and note its organization. They can then find the difference between the largest and smallest data points.	Students can describe the range of a set of data as a measure of spread.

Understanding the Learning Trajectory

Big Ideas:

- The best descriptor of the center of a numerical data set (i.e., mean, median, mode) is determined by the nature of the data and the question to be answered. Data interpretation is enhanced by numerical measures telling how data are distributed (Charles, 2005, p. 25).
- Range shows the distribution of the data including any outliers that may exist. It represents how close or far apart the lowest and highest data points are.
- Range affects the choice of graph one may use to represent a set of data. For example, a large range is better represented on a stem-and-leaf plot rather than a line plot.

Formative Assessment:

- VDOE Just in time Quick Check SOL 5.17c PDF / Desmos

Important Assessment Look Fors:

- The student demonstrates understanding that the word “spread” is a synonym for range.
- The student finds the range by subtracting the highest and the lowest number in a set of numbers in random order.
- The student describes how range can be found using data represented on a bar graph.

- When given 4 data points, the student finds a 5th data point that would result in a given range. This means the student must understand that they can manipulate the lowest or highest data points to change the range.

Purposeful Questions:

- What does the question mean by the word spread?
- Looking at this data, what will give someone trouble when trying to find the range of this data?
- How is finding range on a bar graph similar or different to finding the range of a list of data points?
- If you have some data points, how can you change one of the points to make the range smaller or larger?

Bridging Activity to Support Standard	Instructional Tips
Routine: Professional Sports Stats Daily Graph	Each day, pull-up the statistics of your favorite team or player. Students can find the range of a variety of information: number of games per year, hits, goals, etc. Baseball NFL NBA WNBA USWNT Example slide here. Each day, look at one graph and discuss the presentation of the data. Discuss how the range can be found from the graph.
Rich Tasks: Gym Class Games	Students determine the winners of 4 gym events. While doing so they practice comparing and ordering fractions, decimals, and whole numbers as well as subtracting these numbers to find the range. They then determine who they believe to be the best athlete of the games.
Games: Range Game Choose Your Average Game	In the Range Game, players try to make the largest possible range with 3 cards. Players consider how the range changes with each new card added to a set. The game can be modified by having students choose just 2 cards or 4 or more cards. Any number cards can be used for this game, such as playing cards with face cards removed or Uno cards with special cards removed. You can also print generic numeral cards on card stock to use for this game and others. Multiple copies of the set of generic number cards will be needed for this game. You can use a wider range of number cards to increase the challenge. Numeral Cards 1-10 Numeral Cards 0-35 See video demonstration of the Range Game. In Choose your Average, players take turns throwing (clicking on) the 3 dice. The player then chooses either the mean, median, mode, or range of the scores and claims a square (if that value is available). The first player to claim four squares in a line or as a 2x2 square is the winner.

Other Resources:

- VDOE Mathematics Instructional Plans (MIPS)
  - What's the Data All About? (Word) / PDF version
- VDOE Word Wall Cards: Grade 5 (Word / PDF)
  - Range: Measure of Spread
- The Price Is Right Range Game Clip
  - Contestants must guess the price of the items within a $150 range.

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)