Bridging for Math Strength Resources

Standards of Learning (SOL) Curriculum Framework

Standard of Learning (SOL) 1.5

a) Select a reasonable order of magnitude from three given quantities: a one-digit numeral, a two-digit numeral, and a three-digit numeral (e.g., 5, 50, 500); and

b) Explain the reasonableness of the choice.

Student Strengths	Bridging Concepts	Standard of Learning
Students understand and use conservation of number when counting up to 100. Students understand and use conservation of area when counting. Students can compare and describe one set as having more, fewer, or the same number of objects as the other set(s).	Students have experiences with sets of objects ranging from 1 digit quantities to 3 digit quantities. Students can estimate the number of objects in a set based upon appearance such as clustering, grouping, and comparing.	Students can select a reasonable order of magnitude from three given quantities: a one-digit numeral, a two-digit numeral, and a three-digit numeral (e.g., 5, 50, 500); and explain the reasonableness of the choice.

Understanding the Learning Trajectory

Big Ideas:

- Exploring ways to estimate the number of objects in a set, based on appearance, enhances the development of number sense. (VDOE curriculum framework)
- Relationships of numbers to real-world quantities and measures and the use of numbers in simple estimations can help children develop the flexible, intuitive ideas about numbers that are most desired. (Van de Walle, 2006)

Formative Assessment:

- VDOE Just in time Quick Check
  - SOL 1.5a PDF / Desmos

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- SOL 1.5b PDF / Desmos

Important Assessment Look Fors:

- The student can select a reasonable order of magnitude.
- The student can base their selection on the number of items rather than the amount of space the objects take up indicating a truer understanding of magnitude.
- The student can demonstrate an understanding of number conservation by selecting the correct magnitude even when the order of objects seems to move.

Purposeful Questions:

- How do you choose which number to match to the sunflowers?
- How do you know when an estimate is too small or too big?
- How did you know where to place each card of 5, 50, or 500?

Bridging Activity to Support Standard	Instructional Tips
Routine Mathematical Images	Using these images, students can estimate to tell about how many objects they see. The teacher can also give options of different magnitudes.
Rich Tasks Estimating Things I Estimating Things II	Using the questions posed on each site, the teacher can offer choices of different magnitudes. Students can defend their estimations by deciding what makes a guess too low or too high.
Games Cannon Ball Estimator	Students use benchmark numbers to launch the cannon ball.

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)

○ 1.5ab - Pumpkin Puzzlers (Word) / (PDF)

- VDOE Word Wall Cards: Grade 1 (Word) | (PDF)

Greater Than

Less Than

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)