



Bridging for Math Strength Resources

[Standards of Learning Curriculum Framework \(SOL\)](#)

Standard of Learning (SOL) 5.19a Investigate and describe the concept of variable



Student Strengths	Bridging Concepts	Standard of Learning
Students can identify ways to solve a problem with an unknown number and students can write an equation.	Students can write an equation with an unknown and represent the unknown with a symbol.	Students can investigate and describe the concept of variable.

Understanding the Learning Trajectory

Big Ideas:

- According to [Blanton](#)'s research on early algebra, in order to overcome the difficulty students have with variable (and variable notation) in formal algebra in later grades, she cites the need for children to begin to engage with mathematical situations, such as the revised task given here, in which they are not operating entirely on knowns: "If Marta has a box of candies and her mother gives her 6 more pieces, how would you describe the number of pieces she has all together?" (This type of task is adapted from Carraher, Schliemann, & Schwartz, 2008). Although the transformation of this task is simple (making the known number of candies in Marta's box unknown), the opportunity for young children to "mathematize" a problem where an unknown exists as part of the formulation of the problem is critical. This helps students recognize the unknown in a situation or a word problem.
- Students are introduced to the concept of a variable (presented as boxes, or other symbols) as a representation of an unknown quantity in earlier grades and are substituted with a letter as they advance to upper grades.

Formative Assessment:

- [Just in Time Mathematics Quick Check 5.19a PDF](#)
- [Just in Time Mathematics Quick Check 5.19a Desmos](#)

Important Assessment Look Fors:

- The student can identify the variable in a given expression.
- The student can use words to describe the unit the variable represents.

Purposeful Questions:

Virginia Department of Education

August 2021

- What unit/unknown does the variable represent? How do you know?
- Describe what a variable is in your own words.

Bridging Activity to Support Standard	Instructional Tips
Routines: Numberless Word Problems	Numberless word problems allow students to make sense of real world situations without number distractions. They describe the operations needed, “You would need to add the socks and shoes to get the total” rather than just finding numbers and randomly adding or subtracting them. Problem Bank * For this standard, emphasize the concept of a variable (presented as boxes, or other symbols) as a representation of an unknown quantity
Rich Tasks: Age Difference	In this open-ended task, students can choose ages for two siblings and figure out the difference in their ages, represented by the variable d . Students draw models and write equations to represent the relationship between the siblings ages.
Games: Solve me mobiles	This game is perfect to transition to algebra.

Other Resources:

- [Two Minute Teacher Guide](#) describes what variables are.
- [Creating Equations from Word Problems](#): This Study Jams walks students through an example step-by-step.
- [Choose the Best Expression](#): Practice on this website. Warning: Ads.
- VDOE Mathematics Instructional Plans (MIPS)
 - [5.19a - Variables, Operations, Numbers, Oh my](#) (Word) / [\(PDF\)](#)
- VDOE Algebra Readiness Formative Assessments
 - [SOL 5.19a](#) (Word) | [\(PDF\)](#)
- VDOE Algebra Readiness Remediation Plans
 - [Verbal Quantitative Expressions and Equations](#) (Word) | [\(PDF\)](#)
- VDOE Word Wall Cards: Grade 5 [\(Word\)](#) | [\(PDF\)](#)
 - Patterns
 - Expressions
 - Variable Expressions

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)

--