Bridging for Math Strength Resources

Standards of Learning Curriculum Framework

Standard of Learning (SOL) K.13 Identify, describe, extend, create, and transfer repeating patterns.



Student Strengths	Bridging Concepts	Standard of Learning
Student is able to identify shapes, numbers, letters, and colors. Student can participate in a call-and-repeat type of activity such as repeating a clapping pattern.	Student identifies repeating patterns in the world around them such as on the calendar, in a movement/ sound/ clapping way, or in colors. Student identifies the part of the pattern that repeats called the core.	Students can identify, describe, extend, create, and transfer repeating patterns.

Understanding the Learning Trajectory

Big Ideas:

- Patterning is a fundamental cornerstone of mathematics, particularly algebra. The process of generalization leads to the foundation of algebraic reasoning.
- Eventually, students learn to find patterns in numbers, such as skip counting, which leads to understanding multiplication and division.
- A variety of patterns are introduced. Examples include:
    a. ABABABAB
    b. ABCABC
    c. ABBAABBA
    d. AABBAABBAABB
    e. AABAAB.
- Translates patterns into new media or using new materials; that is, abstract and generalize the pattern.

Formative Assessment:

- VDOE Just in time Quick Check SOL K.13 PDF / Google slides

Important Assessment Look Fors:

- Student extends the pattern by two repetitions of the core, not just by a few shapes.

Copyright ©2022 by the Commonwealth of Virginia, Department of Education, P.O. Box 2120, Richmond, Virginia 23218-2120. All rights reserved. Except as permitted by law, this material may not be reproduced or used in any form or by any means, electronic or mechanical, including photocopying or recording, or by any information storage or retrieval system, without written permission from the copyright owner. Commonwealth of Virginia public school educators may reproduce any portion of these items for non-commercial educational purposes without requesting permission. All others should direct their written requests to the Virginia Department of Education at the above address or by e-mail to vdoe.mathematics@doe.virginia.gov.

- Student translates the given pattern using two different manipulatives/shapes/colors/numbers/etc.
- Student is able to create a repeating (not growing!) pattern.

Purposeful Questions:

- How can you identify the core of the pattern?
- How is your pattern like the pattern you see above?
- What is the core of your pattern? How many times will it repeat?

Bridging Activity to Support Standard	Instructional Tips
Routine **Unit Chats**	Download the PDF and use the images to describe patterns in real life objects. You could also frame this as a "Notice and Wonder".
Rich Tasks **Wall Design** **Stickers**	Student finds the missing shapes in the patterns. This activity uses common and uncommon shapes, and students must justify their answers. There are missing stickers on the roll. The stickers are in a repeating pattern. Students must find the missing stickers and justify their answers.
Games/Tech Desmos K.13 Extend the Pattern Slides: **Create a Repeating Pattern** **Pattern Task Cards**	Students will identify the core and extend repeating patterns. Can share with students via Google Classroom. Insert different objects in the last few slides to have students create or transfer their own patterns. Have students use blocks or square tiles to extend or transfer the patterns in the strips. Would be best to print in color.

Other Resources:

- VDOE Mathematics Instructional Plans (MIPS)
  - K.13 - People Patterns (Word) / PDF Version
- VDOE Word Wall Cards: Grade K (Word) | (PDF)

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)