Bridging for Math Strength Resources

Standards of Learning Curriculum Framework (SOL)

Standard of Learning (SOL) 4.10a Identify and describe points, lines, line segments, rays, and angles, including endpoints and vertices

Student Strengths	Bridging Concepts	Standard of Learning
Students can identify and draw representations of points, lines, line segments, rays, and angles.	Students can recognize points, lines, line segments, rays, and angles in their world.	Students can identify and describe points, lines, line segments, rays, and angles, including endpoints and vertices.

Understanding the Learning Trajectory

Big Ideas:

- Points, lines, line segments, rays, and angles, including endpoints and vertices are fundamental components of noncircular geometric figures. (VDOE Grade 4 Curriculum Framework)
- In mathematics, the core attributes of space objects include point, line, line segment, and plane. Real-world situations can be used to think about these attributes (Charles, 2005).

Formative Assessment:

- VDOE Just in Time Mathematics Quick Check 4.10a PDF
- VDOE Just in Time Mathematics Quick Check 4.10a Desmos

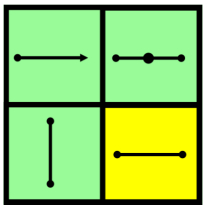
Important Assessment Look Fors:

- The student identifies and describes points, lines, line segments, rays, and angles, including endpoints and vertices using words and symbolic notation.
- The student uses words and symbolic notation when naming points, lines, line segments, rays, and angles.
- The student identifies points, lines, line segments, rays, and angles, including endpoints and vertices in real world settings.
- The student draws points, lines, line segments, rays, and angles.

Purposeful Questions:

- Can you show me the ____ (line, line segments, etc.) in this picture? In our room?
- How do you know this is a ____?
- What is the difference between ___ and why__? (example line and line segment)
- Do you see any other____ ? (line, line segments, angles, etc)

- Can you use words to describe a _____ (line, line segment, ray, angle, and/or point)?
- How can you name this angle? Is there more than one way?

Bridging Activity to Support Standard	Instructional Tips
Routines: Which One Doesn't Belong: Shape 44 	As students discuss this routine, consider recording the big ideas and highlighting the vocabulary that students use as they explain their thinking. Other shape cards could be included throughout this unit to explore other geometric figures and symbolic notations.
Rich Tasks: Geometry Maps NC Department of Public Instruction	This task connects multiple standards and skills, such as geometric markings, geometric figures (points, lines, line segments, rays, and angles), and a variety of lines (parallel and perpendicular). Exploring this task will help students to connect and apply different skills related to geometry. Note: This task also addresses 4.10b.
Games: Geometry Showdown	When using this game with your students, consider incorporating other concepts such as using words to describe a term and the concept of symbolic notations to name a particular image. It is important for students to not only identify a geometric figure but to also be able to describe and correctly name a geometric figure. Note: the terms in this game cover standards 4.10a and 4.10b.

Other Resources:

- Desmos
  - Segment, Line, Ray Symbols Discovery
- VDOE Mathematics Instructional Plans (MIPS)
  - 4.10ab - Geometry in Real-world Situations (Word) / PDF Version
- VDOE Word Wall Cards: Grade 4 (Word) | (PDF)
  - Point
  - Line
  - Ray: Endpoint
  - Line Segment: Endpoint
  - Angle
  - Vertex
  - Symbolic Notation

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)