

Folded Geometry

Strand: Measurement and Geometry
Topic: Drawing representations of points, line segments, rays, angles, and lines
Primary SOL: 3.11 The student will identify and draw representations of points, lines, line segments, rays, and angles.

Materials

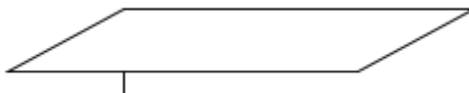
- 18" x 20" construction paper
- Scissors
- Pre-made index cards with images of a point, line, line segment, rays, and angles (1 image per card)
- Geometry Sort Recording Sheet (attached)
- Cards for Geometry Sort (attached)

Vocabulary

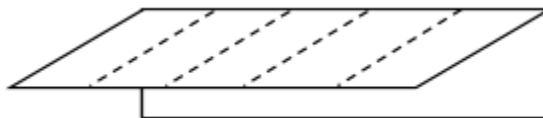
angle, endpoint, line, line segment, point, ray, vertex, vertices

Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Explain to students that they will be making a flip book for the geometry terms *point*, *line*, *line segment*, *ray*, and *angle*. Distribute sheets of 18" x 20" construction paper and scissors. Have each student lay the sheet of paper down horizontally and fold it in half horizontally, folding the top edge down to create a top flap.



2. Next, model for students and lead them in folding their papers vertically into thirds by folding the left and right thirds over, one on top of the other. Then, lead them to fold their papers again vertically in half. Ask students how many sections the papers will have when they are unfolded at the vertical folds. Have students unfold the vertical folds and cut off one of the sections because only five sections are needed to create the flip book. Next, have students cut along the four creases in the top flap up to the horizontal fold to create five top flaps. This creates the "flip" pages of the book.
3. Instruct students to write one of the terms (*point*, *line*, *line segment*, *ray*, and *angle*) on the outside of each of the five top flaps and the meaning of each term on the underside of each flap. Then, have students draw each figure under each flap on the surface of the paper that was not cut.



Point: An exact location in space. It has no length, width, or height.

Line: A collection of points extending indefinitely in both directions. It has no endpoints.

Line segment: A part of a line. It has two endpoints and includes all points between and including those endpoints.

Ray: A part of a line. It has one endpoint and extends indefinitely in one direction.

Angle: Formed by two rays that share a common endpoint (vertex). Angles are found wherever lines or line segments intersect.

4. Have students work with a partner to practice matching the terms with the meanings and drawings using their flipbooks.
5. To check for understanding use the premade index cards to do a “quick image” activity. In this activity, the teacher will flash each index card and students will name the image on the card.
6. Display index cards and ask, “How are all of these images alike? How are they different?”

Assessment

- **Questions**
 - How is a ray different from a line segment?
 - How many points are on a line?
 - What is an angle made of?
- **Journal/writing prompts**
 - Look around the classroom for real-world objects that have line segments and angles. Draw a sketch of three examples, and label the line segments and angles.
 - Draw a ray and a line segment. Write two statements that describe how these two figures are different.
- **Other Assessments**
 - Have students place the Cards for Geometry Sort on the attached Geometry Sort Recording Sheet to identify points, line segments, rays, angles, and lines. Instruct students to explain their reasoning in the space provided at the bottom of each column.

Extensions and Connections (for all students)

- Have students play Geometry Simon Says. Before playing, explain and model the motions for each geometry term discussed previously. The moves are as follows:
 - Point: Student will hold up a closed fist.
 - Line: Student will spread arms out (in a straight line) and point with index fingers.
 - Line Segment: Student will spread arms out (in a straight line) and keep hands in closed fists.
 - Ray: Student will spread arms out, keeping one hand closed in a fist and the other hand point pointing in the opposite direction.
 - Angle: Student will raise one arm while pointing up, while the other arm will be pointing to the side.

- Once these motions have been taught, the teacher will play Geometry Simon Says using the basic rules for Simon Says. When students incorrectly model the term, they have to sit down until a new game can be played.

Strategies for Differentiation

- Flip chart booklet can be created before the lesson so students need only to fill in the pages.
- Display visual models of each geometry term for extra visual aids during lesson and review.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Geometry Sort Recording Sheet

Name: _____ Date: _____

Lines	Line Segments	Rays	Angles
How do you know?	How do you know?	How do you know?	How do you know?

Cards for Geometry Sort

Copy cards on card stock, and cut out.

