41.

Elastic Percent Approximator

Level: Introductory Grade 7

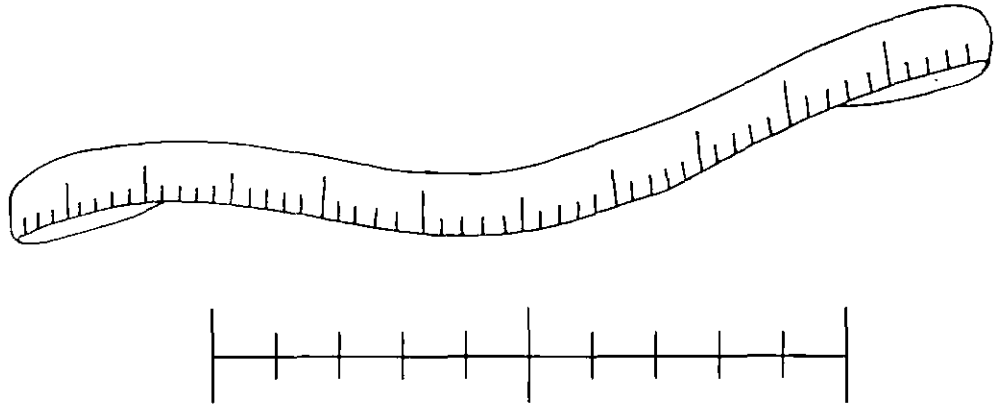
Time: 2 class periods (80–100 minutes)

Objective: To approximate fractions as percentages in problem solving using geometric figures.

Materials and Preparation: A piece of elastic or a rubber band can be made into a percent calculator for approximating. You can use:

(a) a piece of elastic that is 8 cm long and 3 mm wide (the smaller the width, the more stretch the elastic has);

(b) a 6.5 to 8 cm piece of a rubber band that is 1 to 4 mm wide.



Two students work together to mark the elastic or rubber band. One stretches the material along the scale at the top, while the other marks the divisions. If the material is wide enough, the left end can be labeled 0%, the middle 50%, and the right end 100%. The labels indicate that the part of the elastic or rubber band with the marks is the reference set (100% quantity).

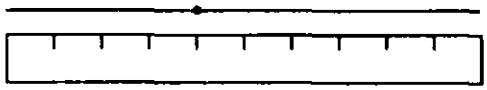
At this point, the students should experiment with the elastic or rubber band to see that the marks remain evenly spaced regardless of how much it is stretched. Students should be reminded that their answers will be approximate and that each segment represents 10% of the reference set because the reference set (100%) was divided into 10 equal parts.

The following section shows examples of student problems. Depending on your students, you may want to supply separate worksheets on the length, area, and volume concepts or include all 3 on the same worksheet. It is hoped that students will see that n% of a quadrilateral with opposite sides congruent can be shown in 2 ways and that n% of a 6-sided polyhedron with opposite faces congruent can be shown in 3 ways.

Exercises for Students

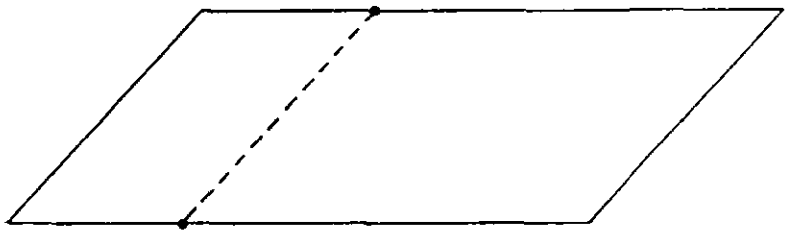
1. Divide this line segment so the left-hand part represents 40% of the entire line segment.

(a) Place 0% on the left-hand endpoint.
(b) Stretch the elastic until 100% falls on the right-hand endpoint.
(c) Mark a point to represent 40% of the line segment.



2. Divide a parallelogram so the left-hand part represents 75% of the parallelogram.

(a) 0% on left endpoint—100% on right endpoint.
(b) Approximate 75% and mark.
(c) Repeat on top segment.
(d) Connect points.

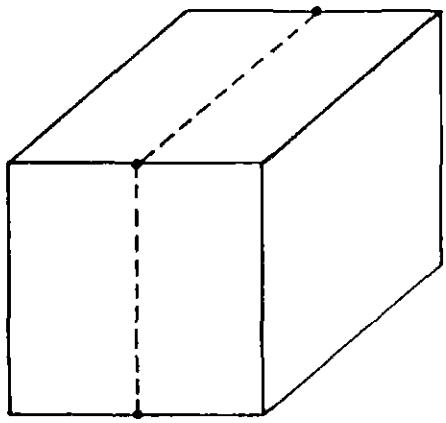


NOTE: If the side dimension is less than the length of the elastic, the elastic could not be used to find 75% of the parallelogram.

3. Divide a cube so the left side shows 50% of the cube.

(a) 0% on left endpoint—100% on right endpoint.
(b) Mark 50%.
(c) Repeat on other edges.
(d) Connect points.

NOTE: Similarly, the front 50% and the bottom 50% can be found.



These concepts could be developed into a series of lab activities using different lengths of string for the lines, transparent quadrilaterals and a felt-tip pen for marking, and transparent commercial polyhedron models with a felt-tip pen for marking.