

Border Path Detectives

Estimate, measure and explain the whole border.

GRADE 3 • 3.MG.2.b.ii

3.MG.2.b.ii "Solve problems, including those in context, involving perimeter: estimate and measure the distance around a polygon (with no more than six sides) to determine the perimeter and justify the measurement; and"

NAME _____

DATE _____

Write your estimate before measuring. In each record, show side lengths and a perimeter sum with units. Keep your estimate. Explain your checks aloud.

Materials and setup

Adult: prepare the four paper polygons A-D described on the key, with no side-length labels. Provide centimeter and inch rulers, nonstretch string, a pencil and a rectangular book.

Start each ruler at zero. Mark a starting corner and trace around the outside until you return to it. Record to the nearest whole unit; a measured total is approximate. Use centimeters or inches as the task directs.

Trace every outside side

Perimeter is the distance around a shape. Estimate first. Measure each outside side once, using one unit. Add those lengths. Follow every turn, including inward corners.

Try it together

An adult estimated a small triangular flag border at 10 cm, then measured its sides. Find the perimeter.

Example measurements

Record	My result
First side	3 cm
Second side	4 cm
Third side	5 cm

Use every side once: $3 + 4 + 5 = 12$ cm. Compare 12 cm with the 10 cm estimate. The perimeter is 12 cm. The estimate was 2 cm low.

1. Triangle A

Estimate A's perimeter in centimeters. Measure its three sides and complete your record.
Trace the border to explain why your sum is complete.

2. Rectangle B

Estimate B's perimeter in inches. Measure all four sides and complete the record. Explain how you know no side was skipped.

Border record

Record	My measurements
Estimate	
Side lengths	
Perimeter sum	

3. Pentagon C

Estimate C's perimeter in centimeters. Measure its five sides and complete your record.
Explain why both sloping sides count.

4. Six-sided polygon D

Estimate D's perimeter in centimeters. Measure all six sides, including the inward corner, and complete the record.

Six-side record

Record	My measurements
Estimate	
Side lengths	
Perimeter sum	

5. Ribbon around a book

Estimate the inches of ribbon needed around your book cover. Measure all four edges and complete your record. Explain aloud why a diagonal would not give the perimeter.

6. Check the pennant border

Lay nonstretch string around all five sides of C. Measure the marked string in centimeters. Record its length and compare it with your earlier sum. Explain any small difference aloud.

7. Find the skipped edges

A partner skips the two edges at the inward corner of D. Trace all six sides. Write the two skipped lengths and the correct perimeter. Explain aloud why those edges count.

Teacher notes

Adult setup: prepare unlabeled cutouts. A: right triangle with 6 cm and 8 cm perpendicular legs. B: 3 by 5 inch rectangle. C: 6 by 3 cm rectangle topped by an isosceles triangular roof of height 4 cm on its 6 cm top; cut around the five outside edges. D: 4 by 4 cm square with a 2 by 2 cm corner removed. Students measure the real cutouts. Check estimate-first procedure, units and complete boundaries; accept small cutting/rounding differences.

Task 1

Expected sides 6, 8 and 10 cm; $6 + 8 + 10 = 24$ cm. Check the estimate was recorded first.

Task 2

Expected sides 3, 5, 3 and 5 inches; $3 + 5 + 3 + 5 = 16$ inches. Check all four sides and the student estimate.

Task 3

Expected sides 6, 3, 5, 5 and 3 cm; their sum is 22 cm. Both roof-like slopes are outside sides.

Task 4

Expected successive lengths 4, 2, 2, 2, 2 and 4 cm, totaling 16 cm. The two edges at the inward corner remain part of the outside boundary.

Task 5

Answers vary with the book. Add all four outside edges in inches. The diagonal crosses the cover rather than following its border.

Measure all four edges from zero. Compare the recorded estimate with the sum; use the same inch unit throughout.

Task 6

The string should measure about 22 cm and agree with the five-side sum. Small differences may come from rounding, ruler placement or string placement. Check that all five edges were followed once.

Straighten the marked string for the ruler reading. Compare two measurements of the same outside path.

Task 7

No. The two 2 cm edges meeting at the inward corner were omitted. All six sides total 16 cm.