Sample Grade 3 Unit—Area/Perimeter
Unit Introduction

In this unit, students:

☞ Use rulers to determine length, width, and perimeter.

☞ Use color tiles to find area.

☞ Estimate area and perimeter with benchmarks.

☞ Measure area and perimeter in metric and customary units.

☞ Explain how figures with the same area can have different perimeters.

☞ Explore perimeter and area formulas.

Assessment
A unit test in multiple-choice format is provided on page Assessment • 3.

KWL

Use a KWL chart to activate prior knowledge and set learning goals as a class. A reproducible KWL chart is provided on page BLM • 15.

Games for Practice and Review
Use the MeasureWorks Game Board to reinforce learning. Game rules begin on page BLM • 23.

Have students keep the KWL chart in their math folders and add to it as they work through this unit.

Focus on Vocabulary

area (p. T-1)	length (p. T-10)	polygon (p. T-3)	width (p. T-10)
benchmark (p. T-4)	metric units (p. T-5)	square centimeters (p. T-9)	
centimeter (p. T-5)	millimeter (p. T-5)	square inch (p. T-8)	
circumference (p. T-2)	perimeter (p. T-1)	square units (p. T-1)	

Since young students easily confuse the ideas of area and perimeter, it is especially important to reinforce vocabulary related to these concepts. Throughout the unit, ask students to describe how they measure perimeter and area: What does area measure? What does perimeter measure? In addition, display shape cards with regular and irregular polygons and ask students to describe their areas and perimeters as they learn the concepts.

Heads Up!
Some third-grade students may not yet understand that shape does not determine area. This unit allows students to explore this notion on their own.
Place students who have difficulty with area concepts in groups where they can feel successful and take time to explore and learn.

Book Nook

Grandfather Tang's Story

by
Ann Tompert

Crown Publishers, Inc.
1990

Grandfather Tang uses tangrams to illustrate a story about a clever fox, fairies, and friendship. All the figures look different, but they have the same area.

Sample Grade 3 Unit—Area/Perimeter

Pages	Learning Goals	Beginning rulers	Tape measures	PopCubes	Color tiles
T-1–1	Explore ways to measure area and perimeter.				
T-2–2	Measure perimeter in inches and feet. Find different objects with the same perimeter.		✔		
T-3–3	Find and use perimeter formulas for polygons.	✔			
T-4–4	Estimate the perimeter of irregular polygons. Order irregular polygons by perimeter.	✔			
T-5–5	Measure perimeter in millimeters and centimeters.		✔		
T-6–6	Apply perimeter formulas to polygons with metric measurements.	✔			
T-7–7	Draw different polygons that have the same perimeter.	✔			
T-8–8	Explore area with color tiles. Count partial and whole units to estimate area.				
T-9–9	Use PopCubes to measure changes in area. Measure changes in perimeter.	✔		✔	✔
T-10–10	Find and use area formulas for rectangles.	✔			✔
T-11–11	Calculate the area of composite figures by finding the area of simpler shapes. Use a benchmark to estimate area.				✔

Manipulatives

Measure Perimeter in Metric Units

Objective

Measure perimeter in millimeters and centimeters.

Materials

- Tape measures

Grouping

Whole class, then pairs

Open It Up

Prepare ahead: Measure the width of a student's desk in centimeters. Do not tell students.

Say: Today we are going to measure perimeter in **centimeters** and **millimeters.**

Have students hold up their fingers to show the length of a centimeter and then look at a tape measure to check. Repeat for a millimeter.

Say: I'm thinking of something that has a side that is ___ centimeters long. Can you guess the object? [a desk]

Have students play "20 Questions" until they guess the desk. Then have someone measure to check.

Demonstrate & Discuss

Explain that centimeters and millimeters can both be used to measure small things. Make a class list of objects with perimeters that can be measured in centimeters and millimeters (books, pictures, lids, desks, playing cards, etc.).

Ask: How is measuring perimeter in centimeters and millimeters different from measuring perimeter in inches and feet? [Sample: We count with smaller units.]

Guide students to see that although the units are different, they can use the methods they already know to measure perimeter in **metric units.**

Review metric conversions. Remind students that to convert centimeters to millimeters, they multiply by 10; and that to convert millimeters to centimeters, they divide by 10. Do examples on the board, as time allows.

Student Activity

Prepare ahead: Each pair will need a tape measure.

Students work in pairs. Each pair picks four objects from the class list of items that can be measured in centimeters and millimeters. Then partners use a tape measure to measure the perimeter of each object.

Students convert between centimeters and millimeters so that each measurement is expressed in both units. Remind students that millimeters and centimeters are called metric units. *Note:* If students are measuring the perimeter of three-dimensional objects, remind them to use a flat surface on the object and find its perimeter.

Informal Assessment

Ask: How did you measure the perimeter of that book? [Sample: I wrapped the tape measure around the cover of the book.] / DESCRIBE /

Why do you multiply by 10 when you convert centimeters to millimeters? [Sample: because there are 10 millimeters in 1 centimeter] / ANALYZE /

Sum It Up

Say: Today we learned to measure perimeter in centimeters and millimeters. We also reviewed how to convert between centimeters and millimeters.

Ask: How can you tell that a perimeter of 80 mm is the same as a perimeter of 8 cm? [Sample: I can divide the number of millimeters by 10 to see if the measures are the same.] / GENERALIZE /

Extension

Have students draw figures on Centimeter Grid Paper. On a separate sheet of paper, have them write the equation for their polygon and find the perimeter. This is their answer sheet.

Have students exchange papers with their classmates and figure out each other's formulas and perimeters.

Name _____

Metric Fun

Try This

- Choose four objects from the class list to measure.
- Measure the perimeter of each object in either centimeters or millimeters. Record the measurement in the correct column.
- Convert the measurements to the other unit.

Object	Perimeter in cm	Perimeter in mm
1 _____	_____ cm	_____ mm
2 _____	_____ cm	_____ mm
3 _____	_____ cm	_____ mm
4 _____	_____ cm	_____ mm

To convert centimeters to millimeters, multiply by 10. To convert millimeters to centimeters, divide by 10.