

MEASUREMENT

GRADE 1

ONTARIO EDITION

hands-on
mathematics

Project Editor

Jennifer E. Lawson

Senior Author

Dianne Soltess

Mathematics Consultant

Meagan Mutchmor

Unit Writers

Patricia Ashton

Joni Bowman

Gail Ruta Fontaine

Betty Johns

Cathy Haggart

Kara Kolson

Suzanne Mole



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Series Editor:	Leslie Malkin
Book and Cover Design:	Relish Design Ltd.
Illustrations:	Jess Dixon
Senior Consultants:	Meagan Mutchmor Dianne Soltess
Program Reviewer:	Pat Steuart

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PORTAGE & MAIN PRESS
100-318 McDermot Avenue
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Email: books@portageandmainpress.com
Tel: 204-987-3500
Toll Free: 1-800-667-9673
Fax: 1-866-734-8477

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Introduction

Measurement skills are important skills for students to gain, because they apply directly to their everyday lives. This module comprises activities that are meaningful and relevant to students, with many hands-on and concrete experiences to build a strong foundation for future skills in measurement and spatial sense.

In this module, students will estimate, measure, and compare, using whole numbers and non-standard units of measure. As they take part in the investigations, they will begin to realize the importance of measurement in the world around them.

Note: The concept of number sense and the ability to count are both prerequisites for understanding measurement and for successfully participating in measurement activities. Students who are struggling with counting (1-20) or who do not yet have one-to-one correspondence (the ability to count objects by pointing to an object and saying “one,” then pointing to the next object and saying “two,” and so on) may find measurement activities challenging. Consider this when planning lessons, and modify according to student needs.

Mathematics Vocabulary

Throughout this module, teachers should use, and encourage students to use, vocabulary such as: *estimate, measure, compare, length, height metre, distance around, unit of measure, mass, balance scale, and temperature*. Continue adding new vocabulary to your classroom Math Word Wall, as terms are introduced in lessons.

2

Measuring Around an Object Using Non-Standard Units

Materials

- string (cut into 1-metre lengths. Tie a knot at one end of each piece. Have one piece of string for each pair of students.)
- masking tape
- interlocking cubes
- bags (lunch or sandwich type)
- chart paper
- markers
- metre sticks (one for each pair of students)

Activity: Part One

Have students think back to the previous activity. Ask:

- How did we measure the lengths of different things? (cubes, hand cutouts, stir sticks)

Review how they used interlocking cubes, as a non-standard unit of measure, to measure the length, width, and height of various objects. Now, ask for two volunteers: one volunteer to measure around the other's head. Put a pile of interlocking cubes in front of them. Ask:

- Can you find out how many interlocking cubes it would take to go around your partner's head?

Give the students a couple of moments to try to measure the distance around one of their heads. Ask:

- Why is this a difficult task? (interlocking cubes will not bend around a head)
- Does anyone have any ideas how we could solve this problem?

Have students brainstorm a list of suggestions, and discuss the pros and cons of each suggestion.

Now, give a piece of string to the two volunteers. Ask:

- Can you use this piece of string to help you find the distance around his/her head?

If the students have difficulty coming up with a way to use the string, ask:

- How can we use the string to figure out how many interlocking cubes it would take to go around his/her head?

Ask the volunteer doing the measuring to measure the distance around the other's head by gently wrapping the string around his/her partner's head and then pinching the string to mark the distance. Now, give the measurer a piece of masking tape to mark the string where it was pinched. Have the measurer hold up the string for all students to see. Tell them to look carefully at the length of string that is marked. Ask:

- What does the distance from the end of the string to the tape mark represent? (the distance around the student's head)
- How can this marked piece of string help us to find out the distance around this student's head, using interlocking cubes?

Have students estimate how many interlocking cubes long the piece of string is. Record their estimates on chart paper.

Now, have the measurer snap together interlocking cubes to measure the length of the marked string. Have students count the number of interlocking cubes required. Compare the actual number of interlocking cubes the measurer used to the estimates recorded on chart paper. Ask:

- Were any of the estimates correct?
- Which estimate was the closest?
- How close was this estimate?
- Which was less/more, the estimate or the actual result?

2

Distribute Activity Sheet A (3.2.1), and provide each pair of students with a bag of interlocking cubes and a length of string (tie a knot at one end to give students a reference, or starting point, for measuring). Explain to students that they will be working with partners to select ten objects in the classroom and find the distance around each one, using interlocking cubes and string. Some examples include a garbage can, a pencil holder, and a thermos. They should estimate the distance around each object first and record their estimates on the chart. Then, using a piece of string and interlocking cubes, they should measure the object in the same way one volunteer measured the other volunteer's head, earlier. Finally, they should record the actual distance around each object in the space provided on the chart.

Activity Sheet A

Directions to students:

Look carefully at the object to measure. Record your estimate on the chart before you measure the distance around it. Find the distance around the object using a piece of string and the interlocking cubes. Record your results in the space provided on the chart (3.2.1).

Activity: Part Two

Divide the class into pairs of students, and provide each pair with a metre stick. Ask:

- What is this stick called?

Explain that it is called a metre stick, and it is used to measure length. Ask:

- Can you think of any objects in the classroom that would be shorter than the metre stick?
- Longer than the metre stick?

Record students' ideas on chart paper.

Provide each pair with a copy of Activity Sheet

B (3.2.2), and have students work together to find, and record, classroom objects that are shorter than and longer than one metre.

Activity Sheet B

Directions to students:

Work together to find five classroom objects that are shorter than one metre (the metre stick) and five classroom objects that are longer than one metre. Record, and draw, each item on the activity sheet (3.2.2).

Problem Solving

Measure around five different objects, using string. Place the five objects in front of students, as well as five pieces of string representing the distance around each object. Have students use logical thinking to determine which piece of string belongs to each object. Some strategies include:

- Have students arrange the string pieces in order from shortest to longest.
- Organize the objects from smallest to biggest (looking specifically at distance around the object).
- Guess and check which string belongs to which object.

Note: A reproducible variation of this problem can be found on page 96.

Extensions

- Add the term *distance* to the Math Word Wall.
- Discuss the need for measuring around objects (e.g., putting up a fence, finding a belt that fits your waist, painting lines on a field for a sports game).

Date: _____

Names: _____

Measuring the Distance Around Objects

Object to Be Measured	Estimate (Number of Cubes)	Actual (Number of Cubes)
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Date: _____

Names: _____

Compare to a Metre

Shorter than one metre	
Object	Picture

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Date: _____

Names: _____

Larger than one metre	
Object	Picture