

**SHAPE AND SPACE
GRADE 1
MANITOBA EDITION**

hands-on
mathematics

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Introduction

Note: This module is divided into two sections:

1. Measurement
2. 3-D Objects and 2-D Shapes

Measurement

Measurement skills are essential ones for students to gain, because they apply so directly to their everyday lives. With hands-on activities that are meaningful and relevant, the first five lessons in this module will help students to build strong foundations for higher-level measurement and spatial-sense skills. By identifying attributes that can be compared, such as length, mass, volume, and area, students will build an understanding of measurement as a process of comparing. In doing so, they will order objects and make statements of comparison by matching objects, filling containers, and covering areas.

Note: At the grade-one level, it is not necessary to focus on use of standard versus non-standard units of measure.

3-D Objects and 2-D Shapes

Just like measurement skills, geometry skills apply directly to students' everyday lives. After completing the tangible and logical activities found in lessons 6 through 10 of this module, students will begin to see geometry's application in the real world. In these lessons, students will:

- explore and classify two-dimensional shapes and three-dimensional objects according to their properties.
- describe, orally, the relative position of two-dimensional shapes and three-dimensional objects.

Mathematics Vocabulary

Throughout this module, teachers should use, and encourage students to use, vocabulary such as: *length, height, mass, heavier, heaviest, lighter, lightest, volume, area, least, greatest, compare, estimate, balance scale, circle, triangle, square, rectangle, set, sort, attribute, sphere, cube, rectangular prism, pyramid, cylinder, triangular prism, face, vertex, vertices, edge, tan, and tangram.*

Consider creating a Math Word Wall for new vocabulary that is introduced in **Hands-On Mathematics**. Put the letters of the alphabet along the top of an otherwise empty bulletin board. As new terms arise in each lesson, record those words on index cards, and attach them to the bulletin board under the appropriate letter.

1 Comparing Length

Materials

- interlocking cubes
- new, unsharpened pencils (one for each pair of students)
- classroom objects (a marker, a book, a pair of scissors, and so on)
- wool or string cut to 20-cm lengths (one piece for each pair of students)
- coloured pencils, crayons, or markers
- scissors
- glue

Activity: Part One

Divide the class into pairs of students, and provide each pair with several interlocking cubes and a new, unsharpened pencil. Have each student connect some cubes together to make a train. Ask:

- Is your train the same length as your partner's train?

Have the pairs compare their trains. Ensure that each pair of students makes an accurate comparison by lining up one end of one of the trains with one end of the other. Ask:

- Whose train is longer?
- Whose train is shorter?
- Can you make a train of cubes that is the same length as the pencil?

Have each pair make a train of cubes that is the same length as the pencil. Then, identify other objects in the classroom (a marker, a book, a pair of scissors, and so on), and have students build interlocking-cube trains that are longer than or shorter than these objects.

Note: It is important that students make accurate length comparisons by lining up one end of the object with one end of their cube train. Demonstrate this for students, and circulate through the classroom to observe their comparison strategies while they work.

Activity: Part Two

Divide the class into pairs of students, and provide each pair with a 20-cm piece of string. Ask:

- Can you find an object in the classroom that you think is longer than the piece of string?
- How can you find out if you are correct?

Have each pair compare the length of their piece of string to the length of the object they identified, ensuring that they line up one end of the piece of string with one end of the object. Ask:

- Can you find an object in the classroom that you think is shorter than the piece of string?
- How can you find out if you are correct?

Have students compare the length of their pieces of string to the length of the objects they identified, ensuring that they line up one end of the piece of string with one end of the object.

Now, ask each pair to collect three different objects from around the classroom. Challenge students to put their three objects in order from shortest to longest.

Distribute Activity Sheet A (2.1.1), and have students colour a different pattern onto each of the four snakes. Then, tell students to cut out each of the snakes and glue them all onto the second sheet in order from shortest to longest.

Activity Sheet A

Note: This is a two-page activity sheet.

Directions to students:

Colour a different pattern onto each of the four snakes. Then, cut out each of the snakes, and glue them all onto the second sheet in order from shortest to longest (2.1.1).

1

Problem Solving

- There are four flowers growing in Leslie's flower pot. The daisy is the tallest flower. The marigold is the shortest flower. The pansy is taller than the marigold, but shorter than the rose. Draw the four flowers in order from shortest to tallest.
- There are four trees growing in Barry's yard. The oak tree is the tallest tree. The birch tree is shorter than the elm tree. The apple tree is shorter than the birch tree. Draw the four trees in order from tallest to shortest.

Note: Reproducible masters for these problems can be found on page 103.

Activity Centre

Have wool, string, cashier tape, fabric strips, glue, and scissors at an activity centre along with copies of the two activity-centre sheets: "Ordering from Shortest to Longest" (Activity Centre A) and "Ordering from Longest to Shortest" (Activity Centre B). Ask students to select one of the materials and cut it into four pieces of various lengths. Tell students to put the pieces in order from shortest to longest (or longest to shortest) and then glue them onto one of the activity-centre sheets in that order. Have students repeat the activity with different materials and on each of the two activity-centre sheets (2.1.2, 2.1.3).

Extensions

Add the following new terms to your classroom Math Word Wall: *length*, *shorter*, *longer*, *shortest*, and *longest*.

Assessment Suggestions

Meet with students individually. Have them examine and compare three strips of paper and then put them in order from shortest to longest. Focus on each student's ability to estimate, and then line up the strips at one end to confirm their findings. Use the Individual Student Observation sheet, found on page 15, to record your results.

Date: _____

Name: _____

Snakes in the Grass!



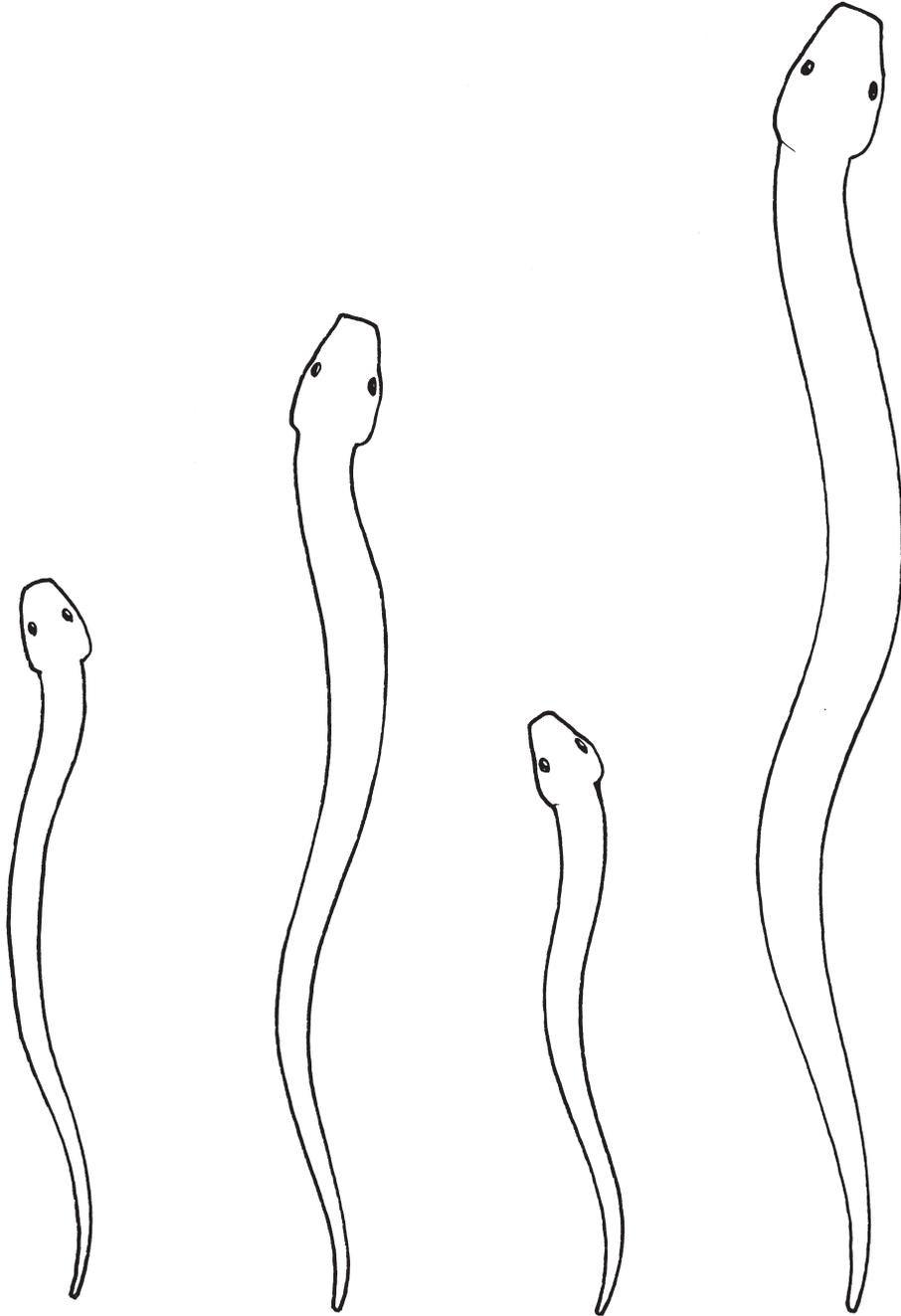
Shortest snake



Longest snake



Snakes



Date: _____

Name: _____

Ordering from Shortest to Longest

Sample Pages

Shortest

Longest

Activity Centre A

