

Activity: Metric Trail

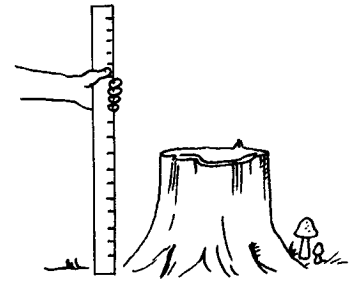
Grade Level: Grade 1

Major Emphasis: Outdoor Measurement

Major Curriculum Area: Mathematics

Related Curriculum Areas:

Refer to Outdoor Education Curriculum Matrix K-2
Language Arts
Human Relations



Program Indicator:

The student will be able to compare, estimate and measure length, height and width.

Student Outcomes: The student will:

1. measure to the nearest centimeter, natural and man-made objects found in the natural environment.
2. select the appropriate metric measuring instruments, stick, tape, calipers or slide to solve a variety of measurement problems. Refer to Figure 1.
3. state measurements in complete sentences: “The (object) is ____ centimeters long/wide/short/etc.”
4. estimate the size of natural and man-made objects.

Readiness:

1. Teach students to count to 100.
2. Introduce vocabulary:

centimeter	height	measurement
metric	estimate	tape measure
length	distance	calipers (bow and slide)
width	meter stick	
3. Borrow and demonstrate the use of meter sticks, long and short tapes and metric slide and bow calipers.
4. Develop the concept that all measurement is approximate.
5. Teach students to round off to the nearest whole unit.

Materials:

metric task cards	flexible plastic metric tapes
meter sticks	picnic table
metric bow calipers	trash can
metric slide calipers	Metric Record Chart

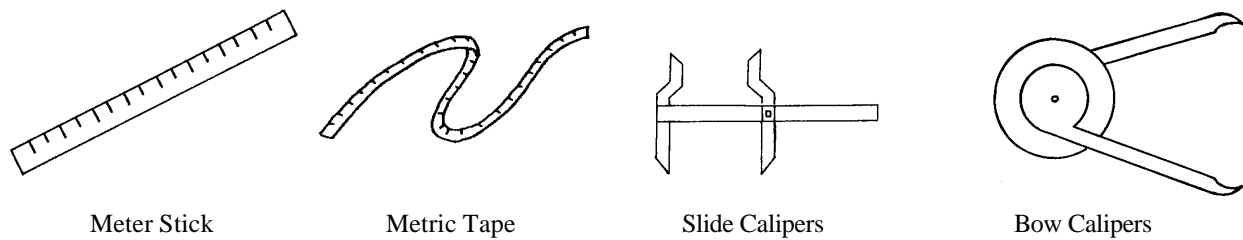


Figure 1: Measuring Equipment

Procedures: (DL2,3&4)

1. Choose a metric measurement area suitable for metric task card use.
2. Distribute the measurement tools to students. Allow a brief period of tool manipulation.
3. Encourage as many students as possible to do each measurement. Discuss causes for variations. A data collecting chart can be used for students to estimate and record their measurements. Starred * questions are optional.
 - a. Find a long twig. Use your meter stick to measure the length of the twig.
 - b. Use a meter stick to measure the width of a path. *Can you measure the height of a path? The length?
 - c. Use the meter stick to measure the length of a fallen tree trunk or branch (less than 100 cm). *Could you have used the metric tape to measure the length of the trunk/branch?
 - d. Use the metric tape to measure the distance between two trees (less than 100 cm). *What is the longest thing you have measured so far? What tool did you use?
 - e. Use the metric tape to measure the distance across (diameter) a stump. *Measure the height of the stump with the tape and with the meter stick. Which was easier? Why?
 - f. Use the metric tape to measure the distance around (circumference) the stump. *Which is greater, the height of the stump or the distance around it?
 - g. Use slide calipers to measure the width of the stump. *Can you measure the width of the stump with a tape?
 - h. Use bow calipers to measure the length of a dead leaf. *Find a shorter or a longer leaf and measure it.
 - i. Estimate the size of the following objects and then use as many tools as you can to measure them and record your answers on the Metric Record Chart, Supplement A:
 - height of the picnic table
 - width of the picnic table
 - height of the trash can
 - distance across (diameter) the trash can
 - distance around (circumference) the trash can
 - j. *Find something in your environment about 25 cm long, 25 cm high, 2 cm wide, etc. Show each length before students set out on their environmental search.

- k. *Make up a measurement problem for your group to solve.
4. Find objects that are about 10 cm.

Summary: (DL2&3)

1. The students will demonstrate proper use of four measuring devices.
2. The students will measure at least five objects in the out-of-doors.

Follow-Up: (DL4)

1. Estimate and measure objects in the classroom.
2. Ask a builder to visit the classroom to demonstrate measurement tools.
3. Construct a puzzle or trail for students to solve/follow using linear metric measurement.
4. Measure and compare by graphing body parts (i.e. foot length).
5. Play “Take a Giant Step.” Have partners measure each other’s giant step.
6. Make a 50 cm square with popsicle sticks and yarn. Measure from AB, BC, CD and AD.

Extension Activity:

1. Vary the above activities by measuring to the nearest inch.
2. List careers in which measuring skills are important.
3. Show films (available from the Board of Education’s Media Services):
 - a. How Big is Big?, 07051.
 - b. I’m Your Liter Leader, 01329.
 - c. Measure, Using Centimeters and Kilometers, 01241.
 - d. Measure Length; Think Metric, 01145.
 - e. Meet Meter Man, 01330.
 - f. Metrics for Primary: How Long is Long?, 01276.

Teacher Resources:

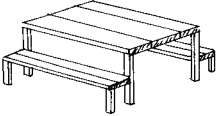


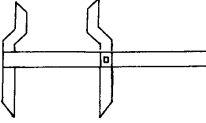
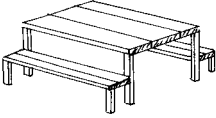


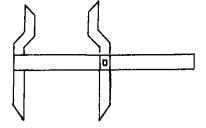



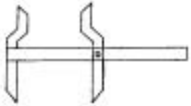




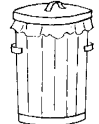



Books:

< *Meter, Shimer, J389.752.

< *Metric System Simplified, Kelly, J389.152.

< *Rainbow World, Basal Reader Story: “A Bed for the Queen,” MacMillan, pp. 88-105.

Metric Record Chart

Object	Estimate	Measure (Circle one)	Record
 Height	_____ cm	  	_____ cm
 Width	_____ cm	  	_____ cm
 Height	_____ cm	  	_____ cm
 Distance Across	_____ cm	  	_____ cm
 Distance Around	_____ cm	  	_____ cm