

**Minnesota School Forest Program**

[www.mndnr.gov/schoolforest](http://www.mndnr.gov/schoolforest)

**Standard Unit of Measurement Video Lesson**

**Overview:** Students will measure a tree’s trunk using estimation, their hands, and a measuring tape.

**Addresses MN Math Standards (2007 version): 2.1.1 (read and write whole numbers), 2.3.2 (standard units; length is measurable; use tools to measure length), 3.3.2.3 (measure around objects)**

**Materials:** Tape, flexible measuring tapes\*, pencil, student worksheets

\*In place of measuring tapes, students can use string, yarn, or ribbon and a standard ruler or yardstick.

**Objective:** Students will understand the importance of using a standard unit of measurement.

**Background:**

Measuring tree circumference (perimeter) is something all foresters and most natural resource professionals need to know how to do. Have students make estimates and measure a tree’s circumference with their hands and then a measuring tape to experience the need for a standard unit of measurement.

This activity can work well as a class, in student pairs, or individually.

Make sure students are measuring at the same height\*. Foresters measure at 4.5 feet. If this is too tall for students, use another height, such as 2 feet. Two feet is the standard used in the video.

\*If you are working with students in-person you can place flagging tape (yarn or masking tape can work, too) all the way around the tree and instruct students to measure their tree at that location. This ensures students follow a straight line around the tree and the knot provides a place to start and stop measuring.

**Procedure:**

1. Have students estimate how many of their hands are needed to measure around the tree.
2. Next, have them use their hands to count how many it takes.
3. Discuss. How did students measure? Hands open, closed, vertical, or horizontal. Talk about the importance of having standards in how we measure.
4. Discuss. If we all measured the same way can we compare our answers? Why not?

We all have different sized hands. Hand size is not standard. We need to use a standard unit of measurement.

You can have students measure their hand width and length to compare how hand sizes differs.

1. Discuss needing a standard height. Have students look at their trees. What happens to the trunk as it gets higher? (It gets smaller.) We need to measure circumference at a standard height from the ground to compare answers. The video uses 24 inches as a standard.
2. Have students make an estimate of how many inches it will take to get around the tree.
3. Then have students measure their tree with a tape measure.
4. Compare answers to their estimate.

Adaptations: Graph tree circumference as a class, order from smallest to largest, or have students measure the same trees in the school yard and compare answers. Students can do additional activities with their tree – consider using [My Tree Journal](https://files.dnr.state.mn.us/education_safety/education/plt/activity_sheets/my-tree-journal.pdf) (grades K-2) or [My Tree Notebook](https://files.dnr.state.mn.us/education_safety/education/schoolforests/distance-learning/my-tree-notebook.pdf) (grades 3-5).

Edit the attached worksheet to best meet your classroom needs.

**Standard Unit of Measurement – Tree Trunks**

**Name:\_\_\_\_\_­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

The outside shape of a tree’s trunk is a circle.

The distance around an object is called the **perimeter**.

The perimeter around a circle is called **circumference**.

Today we will measure around the tree trunk find its circumference.

1. Make an estimation. How many hands do you think it will take to go around the tree?

Estimate in hands =

2. Measure the circumference of the tree with your hands.

Circumference in hands =

4. Why is it a bad idea to measure things with your hand?

5. What happens to your tree’s trunk as it goes from the ground up to the top of the tree?

Use the standard height of 24 inches off the ground. Measure from the ground up and mark it with a piece of tape.

6. Look at a ruler or tape measure and look at the size of 1 inch. Estimate the circumference of the tree’s trunk in inches.

Estimate in inches =

7. Use a tape measure to measure the circumference of the tree.

Circumference in inches =

8. Why is it important to measure using a standard unit of measurement such as an inch?

9. Foresters always measure a tree’s circumference at 4 ½ feet off the ground using a standard tape measure (inches). Why do they do this?