

Terrific Trees

HOW DO YOUR LOCAL TREES MEASURE UP?

Trees play an important part in our ecosystem, but we often overlook them in our daily routines. Trees provide animal habitat, control erosion, regulate temperature, store carbon, and create oxygen – which we can't live without! This activity challenges girls to take a closer look at the trees that surround them.

SMART START:

★ Find a location with a variety of types and sizes of trees.

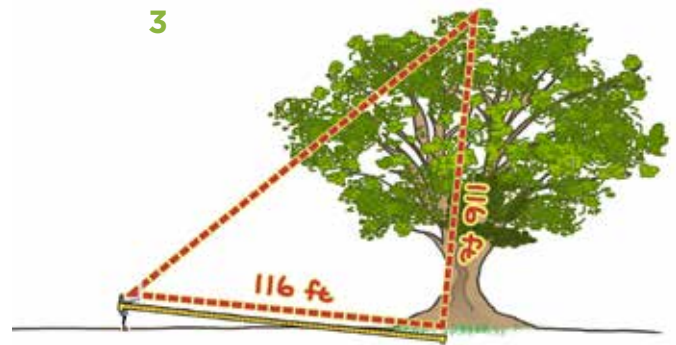
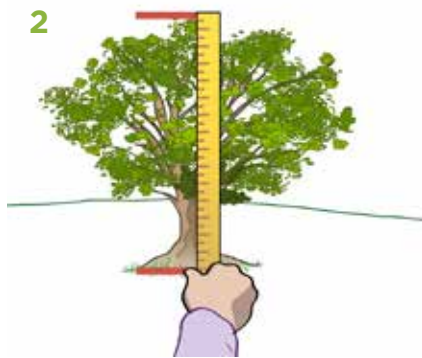
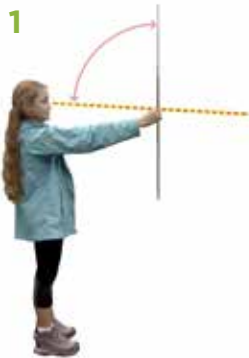
HERE'S HOW:

1. Introduce trees. As a large group, list some information about trees. What do they look like? Do they look the same year round? What are some animals that live in trees? Why are trees important? (oxygen, shade, habitat for animals, prevent erosion)



2. Measure trees. To compare trees across species, naturalists use specific standards of measurement for height, width, and crown size. As a large group, practice taking tree measurements.

★ To calculate tree height using the Stick Method, **1** hold a meter/yard stick with your arm fully extended and measure the distance between your eye and your fingertips. **2** Then, rotate the meter stick 90° and walk back until you can see the whole tree between your fingers and the top of the meter stick. **3** Have a partner measure the distance between you and the tree. (See images below.)



2 hours

You'll need:

For each group:

- measuring tape
- calculator
- meter or yard stick
- paper
- pencil

Watch the SciGirls collect data about their tree in **Asombrosos Árboles | Terrific Trees** (Data Collection: City).



POINTER: The crown, or canopy, of a tree consists of the branches and leaves (or needles) that extend from the trunk.



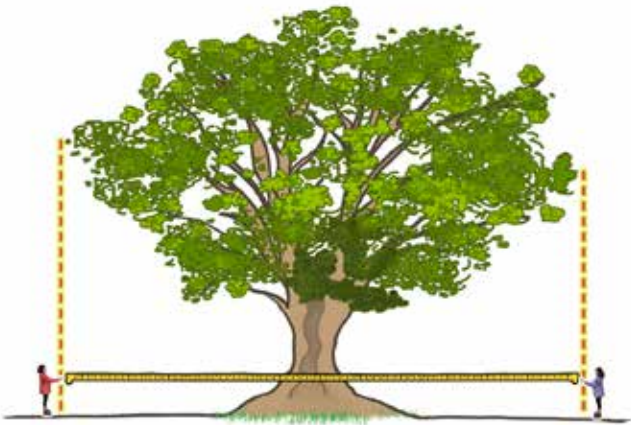
★ To measure the width of the trunk, wrap a tape measure around the trunk 4.5 feet from the ground. This is the circumference of your tree. Use the formula to calculate width to the nearest inch.

$$\frac{\text{tree circumference (inches)}}{3.14} = \text{tree width}$$

★ To compare trees, you can award points using the formula below. For example, for a tree that is 75 inches wide, 116 feet tall, and with a 100 foot crown, the formula would look like this: $75 + 116 + 25 = 216$ points

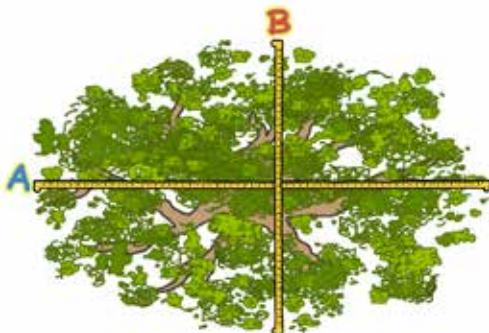
$$\text{width (in.)} + \text{height (ft.)} + \text{crown (ft.)} / 4 = \text{points}$$

★ To determine the crown size, measure the widest part of the crown and the narrowest part (see images below). Add the two measurements and divide by two to get the average crown size. This should be measured in feet.



3. Brainstorm. Introduce the **SciGirls Challenge:** Investigate a tree and study its environment. As a large group, create a list of data to collect about each tree, in addition to size. Each group should collect the same information about its tree so comparisons can be made later.

- ★ size (height, width of the trunk, size of canopy)
- ★ plants/animals living around the tree
- ★ shape and color (draw a picture)
- ★ type of tree
- ★ images of the different parts of the tree (photos)



$$A + B = C \quad C \div 2 = \text{average}$$



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POINTER: Make sure to talk about the order girls should collect the data in. Observe plants and animals living around the tree first so the girls don't destroy or scare away anything when taking the measurements.



4. Tree study. Have the girls work in small groups¹ and select a tree to study. (You can also assign each group a tree.) Each group should collect the same data about their tree.



Watch the SciGirls analyze their results and share what they learned in **Asombrosos Árboles | Terrific Trees (Conclude & Share)**.

8. Learn more. Girls can look online to learn more about trees in their area, and what they can do to protect them and their habitats². (See the Arbor Day Foundation website for volunteer opportunities).

Introduce your girls to inspiring role models, like Amelia Merced, by watching **Role Model Profiles** on the *SciGirls* website!⁷

5. Analyze. As a large group, discuss these questions: How does the data from the trees compare? What did you notice about the wildlife? If a tree were removed, what would the impact be?⁶

6. Share. Have each group creatively share what they learned about their tree⁴. The girls can make a collage, create a poster, or write a play or story, for example, then present it to their school or local community. The girls could invite community members to share wishes for the future of trees in their area.

7. Extension. If time allows have the girls collect data about their tree over several seasons, returning to the same tree and taking the same measurements each time. The girls can also look at the Champion Tree Registry www.americanforests.org/explore-forests/americas-biggest-trees/champion-trees-national-register/ to see how their tree compares to others.



Mentor Moment

Amelia Merced is a biologist who helps people use microscopes to take images for their experiments. She believes that creativity and thinking outside the box are important in research projects.

Visit scigirlsconnect.org for access to videos and national standards.

¹⁻⁷ See **SciGirls Seven** strategies

The Scigrs Seven

Strategies for Engaging Girls in STEM

The **SciGirls** approach is rooted in research on how to engage girls in STEM. A quarter of a century of studies have converged on a set of common strategies that work, and these have become **SciGirls'** foundation—aka the **SciGirls Seven**. All the activities in this booklet were created with the **SciGirls Seven** in mind and incorporate as many strategies as possible. We even mark the use of select strategies within each activity. (Look for superscript numbers and refer back to this page.) For additional information, please see our introductory booklet, *SciGirls Seven: How to Engage Girls in STEM*, which includes tips for implementing these strategies. You can download it for free at scigirlsconnect.org.

- 1. Girls benefit from collaboration, especially when they can participate and communicate fairly.**
- 2. Girls are motivated by projects they find personally relevant and meaningful.**
- 3. Girls enjoy hands-on, open-ended projects and investigations.**
- 4. Girls are motivated when they can approach projects in their own way, applying their creativity, unique talents, and preferred learning styles.**
- 5. Girls' confidence and performance improves in response to specific, positive feedback on things they can control—such as effort, strategies, and behaviors.**
- 6. Girls gain confidence and trust in their own reasoning when encouraged to think critically.**
- 7. Girls benefit from relationships with role models and mentors.**

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