

WE NEED YOUR HELP!



We are glad to provide these materials for free. In order for us to continue receiving funding for new materials, we need to collect information on how they are used.

Thank you for taking the time to answer the following one-minute survey.

There are three ways to complete the survey:



- 1** Scan this code with your smartphone camera
- 2** Type the following link into your web browser:
<https://plantheroes.org/educator-survey>
- 3** Email your answers to:
plantheroes@publicgardens.org



- 1) Job title
- 2) Name of organization you belong to
- 3) What kind of educator are you?
 - Teacher
 - Summer camp counselor
 - Home schooler
 - Public garden educator
 - Informal educator
 - Other (please describe)
- 4) What grade level do you teach?
 - Elementary (K-5)
 - Middle School (6-8)
 - High School (9-12)
 - Other (please describe)
- 5) Specify what subject area you teach:
 - Science
 - Math
 - Language Arts
 - Social Studies
 - Other (please describe)
- 6) How many students do you teach in a school year?

WHAT MAKES UP A FOREST?



THEME

- Forest Health
- Ecology
- Plant Conservation

TYPE OF ACTIVITY

- Instructor-Led
- Hands-On
- Garden Exploration

POSSIBLE WAYS TO LEAD LESSON

- Outdoors
- Virtual
- Classroom
- Other:

TEACHING STRATEGY

- Place-Based Learning
- Storytelling
- Nature Play
- Art / Movement
- Other:

STANDARDS

- **LS2.A: Interdependent Relationships in Ecosystems.** A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. (Excerpt)
- **ESS2.E: Biogeology.** Living things affect the physical characteristics of their regions.



GRADES 4–5

DURATION 60 minutes



LESSON GOAL

Learners will use observation to understand that forests are made up of three layers that have different organisms and physical characteristics (the canopy, the understory, and the forest floor).

LESSON SUMMARY

Learners explore forest layers (the canopy, the understory, and the forest floor) and record observations on cards. Then each learner draws one of the layers on a strip of paper. Finally, the class combines all the drawings to create a layered forest gallery, and learners share about what they observed.

WORD BANK

abiotic factors
canopy
decomposer
ecosystem
forest floor
herbaceous stem
leaf litter
organism
understory
woody stem

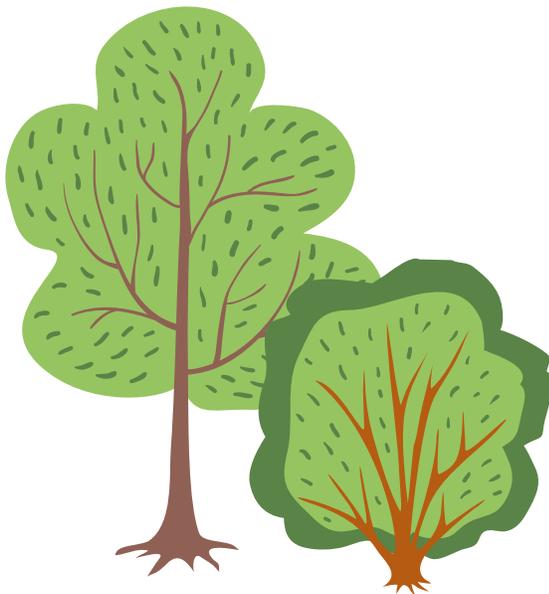


PRINTED MATERIALS

- **Observation Cards** (1 card per learner)
- **My Forest Layer Drawing** strips (1 strip per learner)
- **Forest Layer Signs** (1 set per class)
- Optional: Classroom exploration aids
 - Photos of forest layers (details below): <https://www.flickr.com/photos/usforests/service/albums>

OTHER MATERIALS

- Scissors (for instructor)
- Tape or alternatives (for instructor; see details)
- Pencils (1 per learner)
- Drawing supplies: Pencils or coloring tools (lots of greens and browns plus some others; several per learner)
- Optional: Outdoor exploration aids
 - Clipboards or other portable writing surfaces (1 per learner)
- Optional: Classroom exploration aids
 - Google Earth access



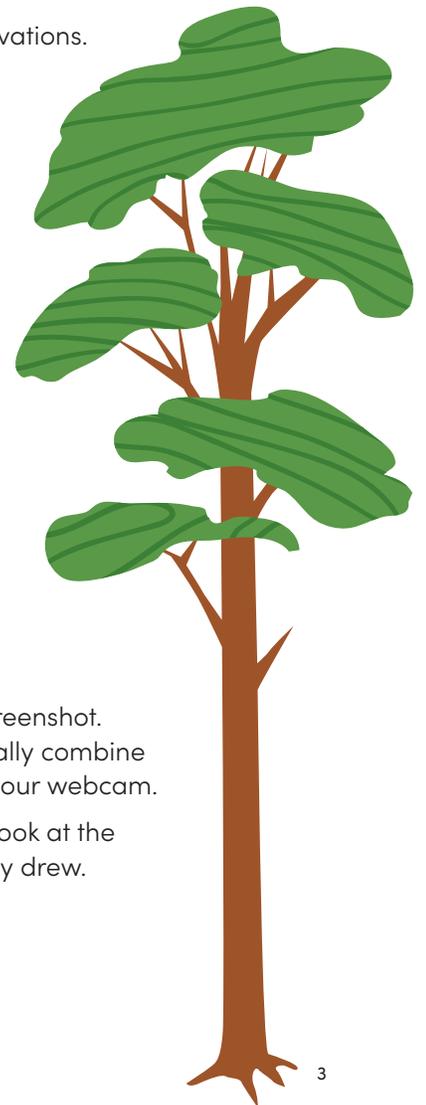
SETUP

1. Review the **lesson procedure**.
2. Decide whether you will conduct an **outdoor exploration**, a **classroom exploration**, or a **virtual exploration**. Consider a classroom or virtual exploration if you are unable to take learners outside to an area with trees.
3. Review and consider the optional **pre-** and **post-lesson explorations** and the **extensions**.
4. Prepare the lesson **materials**.
 - Print out **Observation Card sheets**, and cut each into three parts.
 - Print out **My Forest Layer Drawing sheets**, and cut each into three parts.
 - Print out **Forest Layer Signs**, and cut out each layer: CANOPY, UNDERSTORY, and FOREST FLOOR.
 - Designate suitable drawing stations, and prepare drawing supplies.
 - Class forest gallery: Decide how and where to display learners' work, and gather display materials (use tape or three long pieces of heavy string with binder clips or clothespins to attach drawings).
5. **For outdoor explorations**
 - Identify forested area, and set boundaries for guided exploration (e.g., a trail, a picnic area).
 - Consider using (or creating) clipboards as writing surfaces.
6. **For classroom or virtual explorations**
 - Select photos of the canopy, understory, and forest floor, and prepare for display (e.g., use computer stations, virtual screen sharing, or printouts).
 - Search for photos of a nearby forest on Google Earth, and prepare for display.



LESSON PROCEDURE

1. Optional: Complete one or more of the **pre-lesson explorations**.
2. Introduce the topic with the **lesson opener**.
3. **For outdoor explorations:** Review safety guidelines. Go outside to an area with trees.
Let learners know where the boundaries are for the observations.
For classroom or virtual explorations: Show learners where to find the selected photos on Google Earth or other resource.
4. Give each learner an **Observation Card**.
5. Tell learners to observe the forest (or the images), follow the directions on the card, and write down three things they see from each layer (nine written observations in total).
6. After 5–10 minutes, gather, and divide the class into three groups. Assign each group a forest layer.
7. Have learners look at their **Observation Cards**.
 - Instruct learners in the canopy group to circle their three canopy observations.
 - Instruct learners in the understory group to circle their three understory observations.
 - Instruct learners in the forest floor group to circle their three forest floor observations.
8. Direct everyone to the drawing stations.
9. Hand out a **My Forest Layer Drawing** strip to each learner.
10. Have each learner draw the three things they recorded on their circled list and label the drawing as canopy, understory, or forest floor.
11. Collect the drawings as learners finish.
12. Create a **forest layer gallery** of learners' drawings with three vertical layers. Display the canopy layer on top, the understory layer in the middle, and the forest floor layer below.
 - **For outdoor gallery setup:** Use one piece of heavy string for each layer, and use binder clips or clothespins to attach the gallery images and the matching sign for that layer: CANOPY, UNDERSTORY, or FOREST FLOOR.
 - **For classroom gallery setup:** Tape all drawings for a single layer together in a long, horizontal line, and label with the matching sign: CANOPY, UNDERSTORY, or FOREST FLOOR. Repeat for the other two layers.
 - **For virtual gallery setup:** Adapt to your platform and technology. For example, learners could do a show-and-tell of their drawings separately. They could all hold up their drawings simultaneously and you could take a screenshot. Or you could have students submit their drawings to you, and you could digitally combine them into layers, or print and arrange them and pan across the gallery with your webcam.
13. Gallery walk: When all the drawings are finished and on display, have learners look at the class forest gallery together. Give learners an opportunity to share one thing they drew.
14. Discuss the **lesson questions** (see below).
15. Optional: Complete one or more of the **post-lesson explorations**.



LESSON OPENER

Share the following with learners to orient them to the topic:

- Forests are a type of ecosystem. An ecosystem is a place made up of living and nonliving things.
- When you think about a forest, you might think about trees. That is because forests are mostly made up of trees. We are going to explore trees plus what *else* makes up a forest.
- We will look at the three main layers that make up a forest: the canopy, the understory, and the forest floor.
- The canopy is the top layer. This is where the tallest trees are. The treetops in this layer are not shaded by anything. You can think of this layer as an umbrella that spreads over the top of the forest.
- The understory is the middle layer of the forest. It is made up of smaller trees and bushes that are mostly shaded by the canopy.
- The forest floor is the ground layer of the forest. It is made up of fallen leaves, branches, fungi (mushrooms), and animals called decomposers (such as worms and centipedes) that eat the fallen leaves and dead plants.
- We are going to explore each layer of the forest today and learn what makes up a forest.



LESSON QUESTIONS

- Did we all draw the same organisms?
- What makes each layer unique? What is the same among the layers?
- What makes up the forest floor in our forest? The canopy? The understory?
- What would this forest look like if we took away a layer?
- Did you find anything from one layer that came from another? If so, how did it get there?
- What other living and nonliving things might be in this forest that we didn't see today?

PRE-LESSON EXPLORATIONS

Have learners complete any of these prompts:

- Research the definition of each forest layer before class. What is the canopy? Understory? Forest floor?
- Write your own definition of a forest.
- Make a guess about what you will see in a forest. Who lives there? What sounds would you hear if you visited?

POST-LESSON EXPLORATIONS

Have learners complete any of these prompts:

- Write a new definition of what a forest is after you have made observations. Did your definition change?
- Compare the forest you saw with another forest from research. What do you notice about the three layers?
- Recreate this forest observation from imagination based on your prediction of what this forest will look like in a different season.
- Research what kind of forest you observed.
- Interview a family member about a forest they visited and the organisms they remember seeing.

ADDITIONAL RESOURCES

- **How Do Forests Work? What Is a Forest?**
Background video for educator;
from Harvard Museum of Natural History:
<https://www.youtube.com/watch?v=jbRgJGqI98I>
- **Forest Habitat.** Background for educator;
from World Wildlife Fund:
<https://www.worldwildlife.org/habitats/forest-habitat>

ADAPTATIONS / OPTIONS FOR ACCESSIBILITY

- Use sound observations instead of writing for auditory learners.
- For older age groups, focus on more in-depth observations of the plant layers; discuss different tree species, herbaceous and woody-stemmed plants, and leaf litter leaf identifications.

WORD BANK

abiotic factors: nonliving features of an environment, such as sunlight, water, and climate

canopy: the top layer of a tree or forest; where the branches are

decomposer: an organism that breaks down dead organic material to get energy

ecosystem: a community of interdependent organisms and their environment

forest floor: the lowest layer of a forest; includes topsoil mixed with decaying plant matter and everything that lives in it, such as insects and herbaceous plants

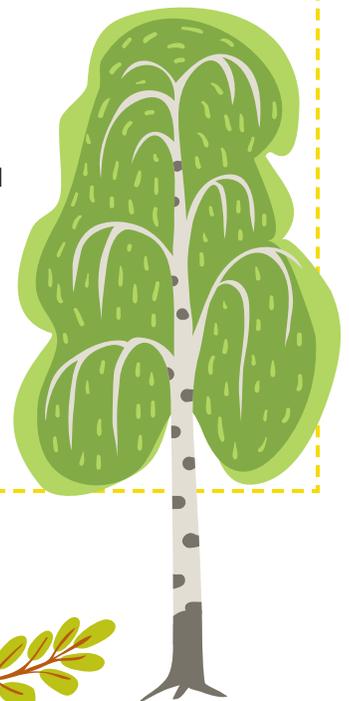
herbaceous stem: a nonwoody plant stem; usually lives for just one growing season

leaf litter: the dead leaves and other organic matter starting to decay on the forest floor

organism: life-form, such as an animal, plant, fungus, or bacterium

understory: the middle layer of a forest between the canopy and the forest floor; includes shrubs, smaller trees, and the organisms that live on them

woody stem: a plant stem made of wood or wood fibers; found in trees and shrubs



OBSERVATION CARD

Look around, and write down 3 things you see . . .

. . . up in the canopy:

. . . ahead in the understory:

. . . down on the forest floor:

_____	_____	_____
_____	_____	_____
_____	_____	_____

OBSERVATION CARD

Look around, and write down 3 things you see . . .

. . . up in the canopy:

. . . ahead in the understory:

. . . down on the forest floor:

_____	_____	_____
_____	_____	_____
_____	_____	_____

OBSERVATION CARD

Look around, and write down 3 things you see . . .

. . . up in the canopy:

. . . ahead in the understory:

. . . down on the forest floor:

_____	_____	_____
_____	_____	_____
_____	_____	_____

MY FOREST LAYER DRAWING

My forest layer is _____

MY FOREST LAYER DRAWING

My forest layer is _____

MY FOREST LAYER DRAWING

My forest layer is _____

CANOOPY

UNDERSTORY

**FOREST
FLOOR**