



# Sample Educational Tree Activities

## My Own Mini-Forest

**Grade Level:** K-2

### Objectives for Participants

- To learn to share equipment and supplies and communicate with each other as they construct their terrariums
- To observe how simple elements in nature, such as sunlight, water, space, and clean air keep plants or seedlings growing and thriving

### Time

About one hour is needed for talking about and making the terrariums. The children will spend some time in the coming weeks checking on changes in their mini-forests.

### Materials

- One large 2 liter clear plastic soda bottle, rinsed and with cap; for each participant
- Scissors
- Gravel or small pebbles
- Sand
- Spoon or scoop
- Potting soil
- Birdseed, acorns, small tree seedlings, or other seeds
- Water

### Background

A terrarium is a clear plastic or glass container that holds soil and water and allows sunlight to enter—the right conditions for plants to grow inside.

### Discussion

As the group is setting up the supplies or cleaning up, ask the following kinds of questions:

- What do plants need to live? (Plants need air, water, sunlight and soil to grow.)
- How do trees get water? (They absorb water from the soil through their roots.)
- How do people help or hurt plants? (People can hurt plants by stepping on them, applying damaging chemicals, or exposing them to polluted water or soil.)



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- How do people use plants in their daily lives? (We use plants for food, shelter, carbon dioxide for breathing, paper and many other things.)

## Activity

1. Using scissors, adults should carefully cut straight across the plastic bottle about 3" from the bottom; resulting in 2 separate pieces.
2. Have the children place a layer of gravel or small pebbles about one inch deep in the bottom section of the bottle. Next, they place about a half-inch layer of sand over the gravel or small pebbles. Then, over the sand, they spread a layer of potting soil about one inch deep.
3. Provide each child with birdseed, an acorn, a small tree seedling (sometimes the forest service is able to provide tree seedlings), or other seeds that can be collected if you are near a forest.
4. After the children have planted their seeds, have them water the soil enough to moisten it and then cover the terrarium with the upper part of the bottle. Keep the terrariums alive by placing them in a sunny location. The plastic covering will help the terrarium keep the soil damp by preventing the moisture from evaporating.
5. Encourage participants to make observations together about their terrariums and to talk about what they can see, touch, smell, and hear. Ask them to predict what their mini-forests will look like in one week.
6. Have participants monitor the progress of their plantings and write about or draw pictures of their mini-forests.



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## FOUR AND MORE

**Grade Level:** 2-3

### Objectives for Participants

- Understand how actions impact the environment
- Understand concept of consummation and apply the concepts “reconsider, reuse, recycle, and re-gift”
- Learn about using Earth’s natural resources as it compares to a footprint that we leave behind
- Empower students to take action to improve their environmental footprint

### Time

About one hour is needed for the discussion and the activity.

### Materials

- Old sneakers, one for each child
- Potting soil
- Garden gloves
- Trowels
- Flowering plant
- Fabric paint
- Hot glue gun
- Various items found in nature such as small pine cones, seed pods, twigs, flowers, leaves, etc.

### Background

As people use Earth’s natural resources, they leave behind a mark, which some call a “ecological footprint.” As our needs for more natural resources grow, our “footprint” deepens and threatens the Earth’s balance. The Ecological Footprint estimates how much productive land and water you need to support what you use and what you throw away. Ecological Footprints can be calculated for individuals like you, communities, and even countries. We use natural resources when we consume, pollute, and discard garbage. If the Ecological Footprint indicates that more natural resources are used than the Earth supplies, than this is not a



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sustainable lifestyle. It is very important for all of us on the Earth to live a sustainable lifestyle in order to leave the planet in good shape for future generations to enjoy and prosper!

The “4 r’s” are actions that we can take to reduce our ecological footprints.

The 4 R’s are described below:

- Reconsider: Do I really need that? (Old toys and clothing that are no longer used can be donated to those in need.)
- Reuse: Can you find another use for it? (A cardboard shoebox can be used to house a diorama or a collection of miniature figures.)
- Recycle: Can it be made into something else? (Recycled plastic containers can be made into fleece for a jacket or gloves.)
- Re-gift: Can I give it back to nature? (Fruit and vegetables are returned to nature to become compost.)

## Discussion

At the beginning of the session, talk about environmental footprints and the concepts of reconsidering, reusing, recycling, and re-gifting. teach the group the 4 r rap:

Reuse, Recycle, Reconsider, and Re-gift

You can give this Earth a great big lift

1-2-3-4-R

You can take it far, just

Reuse, Recycle, Reconsider, and Re-gift.

You can give this Earth a great big lift!

Then ask the following:

- what are examples of the 4 r’s that you or members of your family are already doing?
- what else can you do?



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## Activity

1. Ask the participants what kind of R “using sneakers as a planter” is.
2. Have the children fill the planters about 3/4 full with potting soil and then water lightly. Ask each one to choose one of the small plants to put into the soil, using a trowel to make a hole for the plant.
3. Have the children decorate their “planters,” using fabric paint. You can also help them glue small objects that represent nature on the sneaker. If fabric paint is used, you will need to allow the sneakers to dry for a day before they are taken home.
4. Talk with the children about how the sneaker represents an environmental footprint. They can use it as a reminder of what they need to do to help the Earth.

## Extension Activities

- Make posters of actions they can take to reduce their impact on the environment (turn off the light when you leave the room, recycle beverage containers, etc.) by placing their ideas in a traced footprint. Once the posters have been completed, they should see if they can hang them in a public place, such as a school, house of worship, or store window.
- Have the student take a pledge to do for the next week to reduce their environmental footprints. Visit [www.nwf.org/rrgreenzone](http://www.nwf.org/rrgreenzone) for a sample pledge. For more ideas, visit [www.climateclassroom.org](http://www.climateclassroom.org)
- Take the next step by creating an Eco-School team at your school and make a change within your school for energy usage, water consumption, transportation or other pathways. ([www.eco-schoolsusa.org](http://www.eco-schoolsusa.org))



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## Sensing a tree

**Grade Level:** 4-6

### Objectives for Participants

- Learn about the characteristics of different kinds of trees
- Understand how trees live and why they are so important to people.
- Understand that each person has choices to make in how to use natural resources smartly
- Identify interrelationships among forest citizens

### Time

About 1 1/2 hours including discussion, online and print research, the activity outside, and follow-up. More time is needed if the wooded area is some distance from your meeting place.

### Materials

- Tree guidebook
- Blindfolds, enough for half of the participants
- Sound recorders (digital camera, cassette recorder, camera cell phone)—one for each group of three or four participants

### Background

Using a variety of senses, participants can learn more about the differences among trees than they can if they just look at them.

In one part of this session, participants will be blindfolded. Children who are very fearful about being blindfolded can just shut their eyes.

### Discussion

Before the participants go to a park or other wooded area where different kinds of trees are found, give them an opportunity to learn more about trees by holding a discussion with the following questions:

- What kind of tree drops its leaves in the fall?
- What kind of tree appears to be dead and then looks alive again in the spring?
- What kind of tree looks alive all year long?



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- What kind of tree has needles instead of leaves?

The participants can use a tree guidebook, the glossary in this guide, and the Internet as they try to find answers to questions they don't know.

## Activity

1. Once the group is in the wooded area, divide the children into pairs. Have one person in each pair put on a blindfold. The partner should carefully lead the blindfolded child to different trees, guiding the exploration of the textures of the leaves, needles and bark of each tree. Once the blindfolded children remove their blindfolds, ask them if they can identify the trees, needles and leaves that they felt while blindfolded. Then ask the children to switch places and repeat the exercise.
2. Ask what they learned by doing this exercise. What senses did they use?
3. Take the group on a nature walk. Each group of three or four children should take along a sound recorder for this part of the activity. Each group tries to find sounds that they like as well as sounds that they don't like. The groups should be encouraged to try to find "tree sounds" of rustling leaves, wind in trees, storm sounds, water, wildlife sounds, etc. remind the children not to speak as they record themselves walking on different surfaces such as leaves, crunching branches, gravel, etc.
4. When the group goes back inside, play the recordings and ask the children to identify the sounds. They might try to imitate the forest sounds using body percussion and objects. For example, they could rub their hands together to imitate the sound of rustling leaves, or pat their legs softly for the sound of a light rain, harder for a heavier rain.

## Extension Activity

- Create a play using sound effects of sounds that you might hear during a dark and stormy night. Once the children have learned the routine well enough, they can teach it to a group of younger children and then the groups can perform together.
- Become a tree detective by using National Wildlife Federation lesson plans at [www.nwf.org/schoolyardhabitat](http://www.nwf.org/schoolyardhabitat)



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## STREAM DETECTIVE

**Grade level:** 6-8

### Objectives for Participants

- Observe a stream habitat
- Examine the many ways streams are used and impacted by humans
- Identify characteristics of good or poor quality streams

### Time

Total time a month or several weeks. The group will need to be at a stream for two to three hours each time. Repeated visits to the same site several times over many months or even a year or more are very useful, particularly if the participants are collecting data for an environmental organization, water company, or government office.

### Materials

- Stream observation assessment sheets
- Pencils
- Containers
- Paintbrushes
- Magnifying lenses
- Sensitivity to pollution identification charts
- Plastic spoons

### Background

Observations of the types and numbers of animals that live in stream habitats can provide information about the health of the stream. For example, certain insects can only live in very clean water while others are able to survive in polluted water. Collecting, identifying, and counting the types of insects can give us important information about the health of a stream, vital knowledge for the many people in the United States and throughout the world who get their water from streams.

When people use the area directly next to a stream for buildings, roads, farming or other uses, pollution has a chance to enter the streams. When trees and shrubs are removed, less shade is a result, which is harmful to those animals that need cold water to survive. In addition, the



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absence of nearby trees hurts animals in the stream that rely on falling leaves as a source of food.

Some streams have been straightened so that they no longer curve as they flow downstream. The water then moves too quickly, erodes the stream banks, and may cause flooding downstream. Leaving a natural area of trees and shrubs next to streams—referred to as the riparian zone—provides a buffer area that can stop pollution from getting into streams and provides shade and leaves for stream animals. Planting trees next to a stream is a simple and effective way to help keep water clean and healthy both for the animals who live there and for people living downstream who may use the water for drinking.

Prior to conducting this activity, you and your group will need to locate a stream in an area that is safe and has public access.

## Discussion

Before beginning the activity, talk to the children about stream habitats. Ask them the following questions:

- How are streams affected by the actions of people?
- How can you tell if a stream is in good health?

Other discussion questions will be part of the activity.

## Activity

1. Have the participants pace 300 steps to mark the start and end points of their stream detective work.
2. If the group is large, divide them into teams of three to five people. If the group is relatively small, divide the children into pairs. Each team will observe the entire section of a stream that has been marked. Using the stream observation assessment sheet, each team will circle the answers that best describe the stream. Encourage the participants to spend time observing and discussing their observations as they try to arrive at consensus responses.
3. Have each team count up the number of circled answers in each column. Ask the participants to decide whether the condition of the stream is good, ok, or not good and to explain the reasons for their rating.
4. Bring the group together to discuss the following:
  1. What is happening upstream that could be affecting the stream?



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2. If the stream is in good condition, what can be done to keep it that way? If they think there is a problem, what could be done to help improve the stream?
5. Have each participant collect about an inch of water in the bottom of a container and then pick up a rock from the stream and hold it over the container of water. After examining the rock for any signs of movement or life, participants should use a paintbrush to gently brush anything on the surface of all sides of the rock into the container. The process should be repeated for several rocks.
6. Have the participants place the rocks back into the stream where they were found.
7. With their magnifying lenses, they can now examine any animals found and identify them, using the sensitivity to pollution identification charts (see pages 6–7). Remind participants to gently return the animals to the section of stream where they were collected, using the plastic spoons if needed.
8. Ask the participants:
  - Did you find mainly animals that were sensitive, somewhat sensitive, or not sensitive to pollution?
  - What do your findings say about the health of the stream?

## Extension Activities

- Monitor long-term water quality by having participants compare changes over time if they repeat this activity several times a year (or longer), always recording and saving the data collected. If changes occur, see if the group can explain what caused the changes in the quality of the stream's water.
- Researching the ways the land in the area of their stream had been used throughout history and what may be impacting the stream.
- Participants might want to contact local, state, or other environmental organizations that are interested in collecting information on water quality to report their findings. Or your group could adopt the stream and make regular trips to clean up the trash in and around it.
- Draw the stream life under the water and the trees surrounding the stream.



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## Stream Observation Assessment

Names of Team Members:

Date	Location		
Stream Observation	Good	Ok	Not Good
Circle your team's observations			
Does the stream bend and curve?	Bends or curves	Little curving	Straight
Is there trash in or near the stream?	None	Some	Lots
Do you notice any unusual smells, such as sewage, rotten eggs, or chlorine? (Streams may have some natural odor.)	None	Some	Stinky
Does the stream bank look natural (plants and roots along the edge of the stream)?	Lots of plants	Mostly bare soil	Concrete
Are there trees near the stream?	Many trees	Some trees	Few or no trees
Is the stream shaded?	Very shaded	Some shade	Little or no shade



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Are there good places for animals to live in the stream? (Logs, sticks, and leaves provide good habitats for stream animals.)	Lots	Some	Little
Do you see any fish in the stream?	Lots	Some	None
<b>TOTALS</b>			
Count up number of circles in each column and enter total			

## Sensitivity to Pollution Identification

<i>Class One: Sensitive to Pollution</i>			
Mayflies	Stoneflies	Caddisflies	Water Pennies
<i>Class Two: Somewhat Sensitive to Pollution</i>			
Dragonflies	Net-Spinning	Caddisflies	Crayfish
<i>Class Three: Tolerant of Pollution</i>			
Flat Worms	Midges	Segmented Worms	



# Sample Educational Tree Activities

## TREES AS HABITATS

**Grade Level:** 9-12

### Objectives for Participants

- Identify habitats in living, decaying, and dead trees
- Understand the interrelationships between trees and the animals that inhabit them
- Practice observation skills, including making inferences from these observations

### Time

About two hours for this activity, including the discussion and fieldwork.

### Materials

- Magnifying lenses
- Small notebooks
- Pencils, pens

### Background

Many endangered or threatened species are at risk because of disruption to their habitats. While some species can rely on diverse sources of food or places to breed, a surprising number of species are very specific in their requirements and can only live when particular host plants are available to provide the nutrition or habitat upon which they depend for survival and reproduction.

Maintaining a diversity of trees in forest habitats supports a wider diversity of animals in the forest ecosystem. Some very important habitats include those found in dead or decomposing trees. Not only do fallen trees provide locations in which animals live, but as the trees decompose, they return minerals and nutrients to the forest soil.

One of the most direct relationships between trees and other species are those that use a tree as food source. Leaf feeders may be found almost any time a tree has green leaves, and tree flowers can provide important food for flower specialists. Bark and wood are consumed by a variety of insect larvae, and sap that leaks from trees often attracts butterflies as well as wasps and some flies. Those organisms that directly consume tree tissues as food may themselves attract another level of predators that feed upon (and help control) these plant feeders.



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Caterpillars are eaten by birds and wasps and can serve as the “nursery” for the larvae of certain wasps and flies. Some bird species have very particular nesting requirements that are only met by certain kinds of trees. Mammals also may use trees for nesting, shelter, and food, especially in the form of the very energy-rich fruits produced by trees like oaks, chestnuts, and beech trees.

## Discussion

Ask the participants to brainstorm what they are likely to observe as evidence of animal inhabitants (for example, hollow sections, nests, burrows, dampness, willow galls, oak balls, borings in the bark, tent caterpillars, bag worms, leaf rollers, carpenter ants).

Keep a list of whatever is mentioned. ask for any ideas about how the addition of one species, (such as a moth or caterpillar that eats one kind of tree leaf), might attract and support other species in the ecosystem. Try brainstorming about how the different uses of the tree as habitat might change over different seasons or life and death of the tree.

## Activity

1. Take the group to the field site where they will do their observations. divide the group into teams of three or four, with each team observing at least three trees, ideally in different stages of life and decomposition (i.e. partially or standing dead, recently fallen, very decayed fallen trunk). Make sure that each team has a notebook and pencil for recording observations and drawing pictures of the habitats.
2. Remind the teams to take care not to disturb any established habitats as they observe. ask them to consider what role the tree plays in the life of the animal and what role the animal plays in the life of the tree. Also, ask them to look at the state of the tree—alive or dead. The following are some questions to guide the observations:
  1. Which animals prefer live trees to dead trees? Which prefer dead trees?
  2. What value might dead trees have in a forest?
  3. Try to leave the area cleaner than you found it. Ask the group to remove any stray litter or other items that are not biodegradable as they do their observations.
  4. Compare what was actually observed to the initial list of ideas.



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## Extension Activities

- Find a number of small trees or larger trees with low branches in order to find sample animals that are using the foliage and branches as habitat.
- Bring a soft pole, a length of bamboo, or a piece of plastic tubing to use as a tapping stick and a white sheet (about 2–3 feet square) of cotton, nylon or canvas to use as a sampling surface. With two to four participants holding the corners of the sheet under a leafy branch, have one team member rap the wood of the branch gently but abruptly five or so times to dislodge small animals from the leaves and branch surfaces. Observe what appears in the collecting sheet for a given tree species.
- Try the same tree species at several different locations and see which organisms are most common in the sheet. Compare the samples obtained from one type of tree to a completely different tree and see whether some of the organisms are the same and which ones are different. If you are not going to do further observations or study, be sure to deposit all samples back beneath each tree.
- Take a trip to a nature center, arboretum, or wildlife sanctuary; secure permission from the institution in advance and repeat either activity above and compare to the initial effort. You could learn more by taking a guided tour, workshop, or by following interpretive trails or signage, if offered.
- Have the participants mark off two square areas of equal size (about 1 meter by 1 meter) with string, one in the shade of a tree they have just investigated and the second nearby in the sunshine. Ask the participants to count as many insects as they can find within each area. Magnifying lenses may be helpful. They should compare the total number found in the shade with the total found in the sun and then discuss the following questions:
  - What influence does the shade have on the number and type of insects found?
  - Do insects appear to prefer to be in the shade or the sun?
  - What influence does the shade or sun have on the activity of insects observed? Are they more active, less active, or about the same in the sun?
  - What other factors could you investigate besides sun vs. shade?