



LAURITZEN
GARDENS

Tropical Rainforest Lesson Plans and Video

**VISIT LAURITZEN GARDENS ANYTIME WITH
THIS VIRTUAL FIELD TRIP THROUGH OUR
MARJORIE K. DAUGHERTY CONSERVATORY!**

This field trip and accompanying lesson plans will explore the adaptations of tropical rainforest plants. Students will also discover the role of the tropical rainforest ecosystems and all that they have to offer our world.



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Tropical Rainforest Lesson Plans and Video Links

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Type or click on the following link to access the
Tropical Rainforest Virtual Field Trip on Lauritzen
Garden's YouTube page.

<https://youtu.be/yNfCcUHnM3g>



Required Materials: rainforest stories diagram (1 per student), fake leaves (can be checked out from Lauritzen Gardens' education department OR pictures will work, if needed)

Activities:

1. Watch the video as a class.
2. Use the background information that is located under the "Background Information" tab, to teach students about the different layers of the rainforest and conditions that each layer presents.
3. As you are going through the layers, students will write adjectives describing each layer on their diagram.
4. Break students up into smaller groups (groups of 3-4 students works well), and hand each group a plant (either fake or photo).
5. Have them inspect and make observations about the features that they think would be helpful for the plants to survive the rainforest. They can write these notes on the back of their diagram sheet. Please Note: basic facts about the plants are located on a white slip attached to the stem of the plant.
6. If time allows, you can rotate the plants so that each group gets to see them, or just have them work with one.
7. Once they make their observations, allow them time to briefly research the adaptations of their assigned plant. They may use the links listed under the "Website Links" tab. Please double-check the links to make sure they are still working before letting students use them.
8. Once their research is completed, have them come back to the group and discuss their findings! Some common plant adaptations have been placed under the "Background Information" tab for you to use during the discussion!



Extension Activity #1: Materials for Daily Living

Materials: The Great Kapok Tree by Lynne Cherry, other materials for presentation visual aids (not required)

Activities:

1. Read The Great Kapok Tree by Lynne Cherry aloud to the class.
2. Allow students some time to briefly research the scope of plant and animal life that live in the rainforest as well as the products that we harvest from it. See the following examples:
 - Medicine, coffee, chocolate, bananas, spices (clove, vanilla, black pepper, etc.), chewing gum, oils (coconut, camphor, sandalwood, etc.), rubber, exotic hardwoods (mahogany, balsa, teak, etc.), rattan, bamboo, fibers (burlap, ramie, etc.)
 - Links for rainforest products are found towards the end of this packet.
3. Students can then present the material learned in a variety of ways: verbal presentations, using various forms of technology, posters, etc.

See potential research links to use for this project on the last page. Remember to check the links before using to make sure they are still working.



Extension Activity #2: Conservation

Materials: depends upon your project

Activities:

1. Introduce students to the dangers facing rainforests today.
2. Watch the video done by PBS. Use your phone or other device to scan the QR code. (please watch before showing students - mentions climate change)
3. Once finished watching, discuss the impacts that humans have on the environment.
4. Brainstorm and potentially research ways you and your students can help protect and preserve tropical rainforests. Some ideas are included below.
 - Launching an awareness campaign
 - Writing local government representatives
 - Hosting special events
 - Raising money to donate to nonprofit organizations involved in rainforest preservation (a few are listed below)
 - Rainforest Action Network
 - Amazon Watch
 - Rainforest Trust
 - Amazon Conservation Association
 - Rainforest Alliance
 - Rainforest Foundation U.S.
 - Create a list of sustainably sourced products





Rainforest Layers Information

Canopy: The uppermost story is the continuous leaf canopy formed by trees 60-100+ feet tall. The tallest trees, sometimes *referred to as the emergent layer*, can reach astonishing heights of 100 to 250 feet above the rainforest floor! The trees support an extremely diverse ecosystem. Vines climb the trunks and plants such as orchids grow on the bark, branches, and leaves. Millions of insects, birds, mosses, fungi, lichens, and some mammals also find themselves at home in the rainforest. The trees have adapted to survive the most intense impacts of the sun, wind, and rain. Water continually lands on the canopy and falls through the sub-canopy to the forest floor. Most of the trees' leaves have adapted to this constant barrage of rain to have pointed tips, called drip tips, to shed water and prevent mold growth.

Understory: This layer is defined as the level containing plants up to 15 feet tall. Understory species are adapted to deep shade - only 2-5 percent of the sunlight reaches this layer. Many plants here have large leaves to absorb what little sunlight does reach them; others are climbers with aerial roots that cling to the taller trees' bark. The air is very still, and humidity is high (above 70 percent).

Forest Floor or Shrub Layer: The air is somewhat cooler at this particular level. The air is still and humidity is almost always above 70 percent. Very little light reaches this level. The vegetation therefore, is made up of seedlings, fungi, mosses, ferns, algae, and other plants that are adapted for surviving with low light. The forest floor is actually very open.



Potential Plant Adaptations List

Aerial Roots: Plants such as orchids and tillandsia are considered epiphytes - they live on other plants and their aerial roots grab onto the plants, but they do not actually steal nutrients from or harm their host. The main benefit they derive is to be off of the forest floor and away from predators and, if they're high in trees, they also have access to brighter light. The aerial roots are also adapted to more easily absorb water and nutrients from the air rather than needing to be surrounded by soil.

Buttressing Roots/Above-Ground Roots: Many tropical rainforest trees will develop roots from their trunks or branches that help provide additional stability as they grow tall and reach for the light. Although the tallest of rainforest plants are not good candidates for houseplants, you may see these develop on plants like Ficus trees too.

Water Tanks/Reservoirs: The tightly whorled leaves at the base of bromeliads act as water reservoirs. Of course, these reservoirs provide water to the plant. But more importantly, they serve as homes for insects and other small creatures, and then the plant derives nutrients from the waste and decaying remains of the insects.

Drip Tips: Many tropical plants have leaves with pointy tips and waxy surfaces that help water slide off quickly. These help prevent water buildup that could lead to decay and mold. Ficus, philodendron, and monstera leaves provide good examples. Crotons have especially shiny leaves to shed water.

Large Leaves: Many plant species that live on the floor or in the understory have large leaves that maximize the surface area for catching what little sunlight filters down to their level. Tropical ferns and monstera are good examples. The more shade you grow them in, the larger their leaves will be.

Carnivorous Plants: Some plants are adapted to catch insects to access nutrients. Pitcher Plants are a rainforest example of a plant with this adaptation.

Smooth Bark: Many rainforest plants have smooth bark so water runs off quickly. It also serves as a deterrent to climbing vines by giving them little to cling to. (Left to grow unchecked, vines can sometimes overtake trees, choking their trunks and shading their leaves from sunlight). The Ficus Tree will provide an example of this for you.



Additional Conservation Information

Because the rainforest ecosystem is so fragile and relies on the interconnection of so many species, it is almost impossible for them to regenerate. A forest that may have taken 10,000 years to establish can be destroyed in a matter of days. Some of the potential impacts include:

- **Loss of Species:** Plant and animal species are being lost forever at a high rate. In addition to the general tragedy of such losses, many species have potential value to us for things such as medicine. We have barely scratched the surface when it comes to identifying and understanding the vast potential for benefits such as cures for diseases, and every time a species is lost, a possible cure is lost too.
- **Loss of Habitats:** Animals are losing their homes, which will increase the loss of species over time. A few species may be able to move on and adapt to slightly different environments, but most organisms are uniquely adapted to the rainforest's conditions.
- **Destruction of Indigenous Cultures:** An estimated 140 million indigenous people live in the rainforests. Destroying their habitat leads to displacement of individuals and the destruction of their cultures. Losing an indigenous group and culture is not only a profound loss for the diversity of our world, it also means losing the innate wisdom of that culture; for example, the uses of different plants that outsiders may never discover.
- **Climate Change:** The living plant material in a rainforest stores an incredible amount of carbon. When those trees are cut and left to decay, the carbon is released into the air. There it is converted into carbon dioxide, one of the greenhouse gases that are contributing to overall global climate change. Also, water that had been pumped into the air through plant transpiration is being decreased, leading to a decrease in humidity and rainfall in the region - as well as potentially affecting weather patterns near and far from the forest.
- **Loss of Topsoil:** Without the tree roots for stabilization, precious soil is running off into streams, rivers, and ultimately oceans.



Rainforest Plants Links

Orchids:

- <https://kids.kiddle.co/Orchid>
- <https://academickids.com/encyclopedia/index.php/Orchid>

Air Plants:

- <https://kids.kiddle.co/Epiphyte>
- <https://academickids.com/encyclopedia/index.php/Epiphyte>

Monstera:

- <https://kids.kiddle.co/Monstera>
- <https://greenlifestylestore.nl/en/the-ultimate-monstera-guide-origins-plant-care-fun-facts/>

Autograph Tree:

- <https://www.biisc.org/clusia-rosea-autograph-tree/>

Ferns:

- <https://kids.kiddle.co/Fern>
- <https://academickids.com/encyclopedia/index.php/Ferns>

Bromeliads:

- <https://kids.kiddle.co/Bromeliad>

Pitcher Plants:

- Facts About the Pitcher Plant: <https://sciencing.com/pitcher-plant-5385098.html>
- https://kids.kiddle.co/Carnivorous_plant
- https://academickids.com/encyclopedia/index.php/Carnivorous_plant



Rainforest Products Links

Ten Products and Ingredients that Come From Tropical Forests:

<https://www.wwf.org.uk/updates/ten-products-and-ingredients-come-tropical-forests>

Tropical Forests in Our Daily Lives: <https://www.rainforest-alliance.org/articles/tropical-forests-in-our-daily-lives>

7 Everyday Foods From the Rainforest: <https://www.rainforest-alliance.org/articles/7-everyday-foods-from-the-rainforest>

Find Certified Products: <https://www.rainforest-alliance.org/find-certified>



Tropical Rainforest Virtual Field Trip Materials List

Please use the following list of materials to ensure that ALL provided materials are returned to Lauritzen Gardens' Education Department PRIOR to your end date.

REMINDER: If materials are lost or returned in bad shape, as determined by the education staff, the person(s) checking out the materials will be responsible for replacing the materials within the kit.

- The Great Kapok Tree by Lynne Cherry (English version)
- El Gran Capoquero por Lynne Cherry (Spanish version)
- Tropical Rainforest Virtual Field Trip Teacher's Guide (red binder)
- Fake air plant
- Fake banana plant leaf
- Fake orchid plant
- Fake orchid plant leaves
- Fake Monstera leaf
- Fake tropical fern
- Fake Bromeliad with flower
- Fake Pitcher Plant
- Fake Philodendron
- Fake Croton
- Fake Ficus leaves
- ALL fake plants/leaves should have white labels on or near the stems



Tropical Rainforest Virtual Field Trip

Closing Thoughts

Dear Educator,

We here at Lauritzen Gardens, owe you a huge thank you. Your dedication to your craft and the time and energy that you spend enriching students' academic and personal lives is admirable to say the least.

With that said, the education team hopes that the lessons and materials provided to you within this virtual field trip produce an experience that lives up to your high standards as an educator.

Our education staff has worked hard to create materials that teachers and students WANT to use and LOOK FORWARD to using within their classrooms. We understand the high standards that teachers place upon themselves to be at your best everyday and our team is no different. Please take a moment to take a very brief, three question survey that can be found at the link below. This survey will allow us as educators to reflect upon our materials and use your feedback to guide us as we continue to grow and change to better our resources.

Sincerely,
Lauritzen Gardens' Education Team

Survey Link - please type in or click on the following link
<https://www.surveymonkey.com/r/newedopportunities>

Rainforest Stories

Name: _____ Date: _____

Directions: As you and your teacher discuss each layer — or story — of a tropical rainforest, please color in that section on the illustration.

