

RAINFORESTS

MIDDLE SCHOOL

Life Science TEKS

Sixth Grade: 6.12E, 6.12F

Seventh Grade: 7.11B, 7.12A, 7.13A, 7.13B

Eighth Grade: 8.11A, 8.11B, 8.11C

Life Science Vocabulary

abiotic, adaptations, balance, biomes, biodiversity, biotic, community, consumer, ecosystem, environments, external, food web, host, hibernation, insects, internal, kingdoms, microhabitats, migration, organism, parasite, population, predator, prey, producer, species, structures, stimuli, sustainability, variation

Pre-Show Activity

Pre-Show Lesson: Rainforest Revelations

Materials: Appendices A-1 (questions), A-2 (answers), A-3 (website list), A-4 (8th grade), A-5 (7th grade), A-6 (6th grade)

The teacher will need to provide a list of appropriate websites for students to use as resources. These should be easily accessible to students so they can just click and connect. If students do not have online access the teacher will need to find other resources or print material ahead of time. See Appendix A-3 for suggested websites.

Procedure:

1. Students will read and discuss the rainforest statements in Appendix A-1 with a partner. They will decide if they agree or disagree with each statement. Students can number their papers from 1-10 and write agree or disagree for the corresponding statements. Come back together as a group and discuss statements as a class. The answers are in Appendix A-2.
2. Working in partner groups, students will use web sites and library books to complete the information available in Appendices A-4 to A-6 for their grade level. As students are

working you may want to play rainforest music or show a live rainforest webcam such as <http://www.worldlandtrust.org/webcams>.

3. As students are working, facilitate by asking questions that bring in some of the TEKS vocabulary.
4. When sufficient time has passed, have partner sets pair up and give one another feedback. Allow students to make corrections to their charts.
5. Come together as a class to review the important TEKS objectives as they relate to the charts the students filled out about tropical rainforests. Encourage students to listen for additional information that they could add to their chart during the Houston Museum of Natural Science rainforest presentation.

Post-Show Enrichment Activities

Activity One: Rainforest Reflections

Allow students some time to write a reflection to the following prompts:

- **8th Grade:** Describe producer/consumer, predator/prey and parasite/host relationships as they occur in food webs within a tropical rainforest.
- **7th Grade:** Explain how external and internal structures or body parts of organisms, both plants and animals, have adaptations that help them survive in the rainforest.
- **6th Grade:** Describe the biotic and abiotic parts of a tropical rainforest in which organisms interact.

After about 5 minutes of writing, have half of the class take their writing and form a line in the front of the room. This is the inside line. The other half of the class will go stand across from someone in the line. This is the outside line. The inside line will share what they wrote and partners will discuss it for one minute. After one minute, the outside line will share what they wrote and partners will discuss it for one minute. Then, the inside line will stay in place. The last person on the outside line will go to the beginning of the outside line and everyone in that line will move down one partner. Students will share again with their new partner. After sharing, students will return to their seats. Students should draw a line under their writing. They will write new understandings that they obtained while sharing.

Activity Two: Rainforest Destruction Cause and Effect Wheel

1. Students will write "Rainforests are being cut down" in the center of the cause and effect wheel available in Appendix A-8.
2. Students will use the article in Appendix A-7 to help them complete the cause and effect wheel. They will add effects around the center such as, "A whole species of an unknown plant may be wiped out."
3. They will then add even more effects branching off from their originals, such as, "Possible cures for diseases are gone." and "Possible food source for an organism is gone." Effects could be positive or negative. A positive effect might be something like, "Farmland is created for locals to grow food."

Activity Three: Rainforest Diagram

1. Students will choose a rainforest organism and, using the diagram in Appendix A-9, will chart the levels of organization within the ecosystem, including organism, population, community and ecosystem.
2. Students start with one *organism*, then a *population* of that organism, followed by a *community* which shows the living organisms in that area.
3. Finally, the *ecosystem* shows the living and nonliving parts of the environment. Students should draw and label each level. They may want to use a web resource or rainforest resource book to help them.

Activity Four: Rainforest Food Web

1. Assign students into groups of four. Each person in their group represents one layer of the rainforest ecosystem.
2. Each student will be responsible for creating a food web for their layer. You may partner students who need help with a student from another group that is working on the same layer.
3. Student will return to their original group and put the rainforest food webs together to create one giant rainforest food web. You may want to have students label the organisms as producer and consumer. If they are consumers, students may want to further label them as herbivore, carnivore and omnivore.
4. The teacher will introduce a negative human interaction to the rainforest, such as, "The neighboring 10 square miles of rainforest has been chopped down. One hundred new monkeys have moved into your area of rainforest. Name some possible consequences."
5. Students will work together to make a list of as many possible consequences as they can in 5 minutes.
6. Discuss the consequences as a class.

Appendix

A-1

Directions: Think about each rainforest statement. Write an “A” beside the ones you agree with and a “D” beside the ones you disagree with.

1. An area of rainforest the size of a football field is being destroyed each second.
2. The trees of a tropical rainforest are so densely packed that rain falling on the canopy can take as long as 1 hour to reach the ground.
3. 90% of the flowers in the Australian rainforests are not found anywhere else in the world.
4. Flying animals of Asian rainforests include frogs, squirrels and snakes.
5. One out of four ingredients in our medicines is from rainforest plants.
6. About 1,000 trees per minute are cut down in the rainforests.
7. More than three fourths of the world’s plant and animal species live in rainforests.
8. A number of tribes in areas such as central Africa and Brazil still live in rainforests, having no contact with the outside world.
9. Most tropical rainforest soils are relatively high in nutrients.
10. If a rainforest is removed, the entire region becomes drier.

A-2

Answers:

1. An area of rainforest the size of a football field is being destroyed each second. T
2. The trees of a tropical rainforest are so densely packed that rain falling on the canopy can take as long as **10 minutes** to reach the ground. F
3. **80%** of the flowers in the Australian rainforests are not found anywhere else in the world. F
4. Flying animals of Asian rainforests include frogs, squirrels and snakes. T
5. One out of four ingredients in our medicines is from rainforest plants. T
6. About **2,000** trees per minute are cut down in the rainforests. F
7. **More than half** of the world's plant and animal species live in rainforests. F
8. A number of tribes in areas such as central Africa and Brazil still live in rainforests, having no contact with the outside world. T
9. Most tropical rainforest **soils are relatively poor in nutrients**. F
10. If a rainforest is removed, the entire region becomes drier. T

Rainforest facts found at:

http://www.srl.caltech.edu/personnel/krubal/rainforest/serve_home.html

A-3

Possible Web sites

<http://www.blueplanetbiomes.org/rainforest.htm>

<http://www.buzzle.com/articles/rainforests/>

<http://rainforests.mongabay.com/>

http://www.pbs.org/wnet/africa/explore/rainforest/rainforest_eco_lo.html

<http://www.rain-tree.com/facts.htm#.U7i8fohOU5s>

A-4 (Eighth Grade)

How do rainforest organisms compete for light, water, appropriate temperature and soil? Give examples of competition for each element at each layer of the rainforest.

	Light	Water	Temperature	Soil
Emergent Layer				
Canopy Layer				
Understory				
Forest Floor				

A-5 (Seventh Grade)

Explain the variation within a population or species by comparing external features, behaviors, or physiology of organisms that enhance their ability to survive at each layer of the rainforest.

	Population or Species and its Variation	Explanation of how this variation helps the population or species survive.
Emergent Layer		
Canopy Layer		
Understory		
Forest Floor		

A-6 (Sixth Grade)

Describe the biotic and abiotic parts of the layers of the rainforest and how they interact. Give a specific example for each layer that is unique to that layer.

	Abiotic	Biotic	Interaction
Emergent Layer			
Canopy Layer			
Understory			
Forest Floor			

Modern-Day Plague

Deforestation is clearing Earth's forests on a massive scale, often resulting in damage to the quality of the land. Forests still cover about 30 percent of the world's land area, but swaths the size of Panama are lost each and every year. The world's rain forests could completely vanish in a hundred years at the current rate of deforestation.

Forests are cut down for many reasons, but most of them are related to money or to people's need to provide for their families. The biggest driver of deforestation is agriculture. Farmers cut forests to provide more room for planting crops or grazing livestock. Often many small farmers will each clear a few acres to feed their families by cutting down trees and burning them in a process known as "slash and burn" agriculture. Logging operations, which provide the world's wood and paper products, also cut countless trees each year. Loggers, some of them acting illegally, also build roads to access more and more remote forests—which leads to further deforestation. Forests are also cut as a result of growing urban sprawl.

Not all deforestation is intentional. Some is caused by a combination of human and natural factors like wildfires and subsequent overgrazing, which may prevent the growth of young trees.

Deforestation has many negative effects on the environment. The most dramatic impact is a loss of habitat for millions of species. Seventy percent of Earth's land animals and plants live in forests, and many cannot survive the deforestation that destroys their homes. Deforestation also drives climate change. Forest soils are moist, but without protection from sun-blocking tree cover they quickly dry out. Trees also help perpetuate the water cycle by returning water vapor back into the atmosphere. Without trees to fill these roles, many former forest lands can quickly become barren deserts.

Removing trees deprives the forest of portions of its canopy, which blocks the sun's rays during the day and holds in heat at night. This disruption leads to more extreme temperature swings that can be harmful to plants and animals. Trees also play a critical role in absorbing the greenhouse gases that fuel global warming. Fewer forests means larger amounts of greenhouse gases entering the atmosphere—and increased speed and severity of global warming.

The quickest solution to deforestation would be to simply stop cutting down trees. Though deforestation rates have slowed a bit in recent years, financial realities make this unlikely to occur. A more workable solution is to carefully manage forest resources by eliminating clear-cutting to make sure that forest environments remain intact. The cutting that does occur should be balanced by the planting of enough young trees to replace the older ones felled in any given forest. The number of new tree plantations is growing each year, but their total still equals a tiny fraction of the Earth's forested land.

Article Retrieved from National Geographic

http://environment.nationalgeographic.com/environment/global-warming/deforestation-overview/?rptregcta=reg_free_np&rptregcampaign=20140623_rw_membership_r1p_us_se_w

Cause and Effect Wheel



