

Role of Trees in the Amazon Answer Key

In a tropical rain forest, trees play important roles in the water and nutrient cycles, including providing habitats for many organisms. Deforestation, or the destruction or removal of forests and their undergrowth, is happening throughout the Amazon rain forest due to human activity. Mining, logging, and the construction of dams and roads are clearing sections of the forest faster than the forest can rebuild. This is causing the plants and animals that live in these areas to relocate or die. Using the map, Amazonia: Vital and Fragile, explore the effects of deforestation on the Amazon rain forest.

Part 1. Types of Rain Forest

1. There are three main types of forest described on the map. What are they and how have trees adapted to living in the different environments?

Type of Forest	Tree Adaptations	Reason for Adaptations
Igapó	<ul style="list-style-type: none"> • Aerial roots • Leaves stay on underwater 	<ul style="list-style-type: none"> • Several months of flooding each year results in low oxygen levels • Photosynthesis can occur underwater in low light
Várzea	<ul style="list-style-type: none"> • Floating meadows and grasslands • Trees provide leaves and fruit to migratory fish 	<ul style="list-style-type: none"> • Seasonal flooding up to 230 days a year • When levels are low, sediments create fertile ground for growing
Terra firme	<ul style="list-style-type: none"> • Very tall trees and palms 	<ul style="list-style-type: none"> • At a higher elevation, there is little seasonal flooding

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2. Using the map, list three animals that live in each type of forest.

Type of Forest	Animals That Live There
Igapó	<ul style="list-style-type: none"> • Blue-and-yellow macaw • Yellow-headed sideneck turtle • Pink river dolphin • Black caiman • Tambaqui • Giant South American turtle
Várzea	<ul style="list-style-type: none"> • Horned screamer • Bald-headed uakari • Capped heron • Pirarucu • Amazonian manatee • Red-bellied piranha • Gilded catfish • Dark-spotted anaconda
Terra firme	<ul style="list-style-type: none"> • Harpy eagle • Red-and-green macaw • Blue-and-yellow macaw • Brown-throated three-toed sloth • Green iguana • Emerald tree boa • Pied tamarin • Blue morpho • White-lipped peccary • Brazilian tapir • Jaguar • Termites

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3. Complete the table below to identify the three types of water in the rivers in Amazon, how they differ, what type of forest they are found in, and at least two animals that live in that water type.

Water Type	Description	Type of Forest	Animals
Black water	<ul style="list-style-type: none"> acidic, low in nutrients, stained dark by decomposing plants 	Igapó Forest	<ul style="list-style-type: none"> Yellow-headed sideneck turtle Pink river dolphin Black caiman Tambaqui Giant South American turtle
Clear water	<ul style="list-style-type: none"> low in sediments 	Igapó Forest	<ul style="list-style-type: none"> None included on map.
White water	<ul style="list-style-type: none"> contains sediments that are rich in nutrients 	Várzea Forest	<ul style="list-style-type: none"> Pirarucu Amazonian manatee Red-bellied piranha Gilded catfish Dark-spotted anaconda

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Part 2. Forest Layers

1. Along the right side of the map, there are descriptions of the four layers (strata) of the forest. What varies at each vegetation level?

Temperature, sunlight, moisture

2. Identify the four layers of the forest, describe the climate in each, and list at least two different organisms (trees and animals) that live in each layer.

Forest Layer	Climate Description	Types of Organisms
Emergent Canopy	<ul style="list-style-type: none"> • Hot • Dry • 100% Light 	<ul style="list-style-type: none"> • Tall trees (kapok, Brazil nut) • Harpy eagle • Macaw
Canopy	<ul style="list-style-type: none"> • Less light because branches and leaves are close together • Rainfall is captured here so there is more moisture 	<ul style="list-style-type: none"> • Trees with flowers and fruits • Brown-throated three-toed Sloth • Emerald tree boa • Pied tamarin
Understory	<ul style="list-style-type: none"> • Dark • Humid 	<ul style="list-style-type: none"> • Small trees and little plants • Insects (blue morpho) • Animals with camouflage (green iguana) • Jaguar
Forest Floor	<ul style="list-style-type: none"> • Dark • Hot • Humid • Little breeze • 2% Light 	<ul style="list-style-type: none"> • Seedlings • Ferns • Brazilian tapir

Role of Trees in the Amazon Answer Key, continued

3. Why do certain organisms live in certain parts of the forest?

Answers will vary, but students should indicate some interdependence of organisms: animals need to inhabit strata that provide the resources they need to survive (food, shelter, space, and places to reproduce).

4. What happens to the organisms if their habitat is destroyed or reduced?

Answers will vary, but students should indicate that if one of the resources they need to survive is damaged or removed (food, shelter, space, or places to reproduce), then the organisms will have to relocate or their population will not survive.

Part 3. Water and Nutrient Cycles

Study the water and nutrient cycles on the map and answer the following questions:

1. Describe, step-by-step, what happens to the water when it rains in the Amazon.

Step 1: Leaves in the canopy catch rainwater.

Step 2: Rainwater drips off leaves and falls to the forest floor. It then becomes runoff or sinks into the soil and is taken up by tree roots.

Step 3: Roots carry water up into the tree's leaves and branches.

Step 4: Leaves send water vapor into the atmosphere. Leftover rainwater evaporates, starting the cycle again.

Role of Trees in the Amazon Answer Key, continued

2. How much rainfall circulates back into the atmosphere?

More than half

3. Where are nine-tenths of the Amazon's nutrients stored?

In the trees and their leaves

4. Summarize the role of trees in both the water and nutrient cycles in the Amazon rain forest.

Answers will vary, but students should mention that the trees help to circulate much of the rainfall back into the atmosphere and that the tree roots absorb water and nutrients that are then sent up to the branches and leaves. Most of the nutrients in the Amazon are stored in the trees and their leaves.

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