

CLASSVR

RAINFOREST
FOUNDATION UK
SECURING LANDS. SUSTAINING LIVES

Future Forests

STUDENT INFORMATION

Learning Objectives

7-16 years

- Experience a typical rainforest ecosystem, including Indigenous communities
- Observe and identify multiple human activities that drive deforestation
- Understand the impact deforestation has on the immediate environment, communities and wildlife, including its long-term effects on climate

Overview & Key Elements:



Get ready for a wild ride where you'll explore the world's most important ecosystem: a tropical rainforest. Discover its rich biodiversity, explore how humans are threatening its future and reveal how we can help restore it. You'll be guided through the rainforest by Nashi, a young Indigenous girl, and you will meet the people and animals who call this place home.

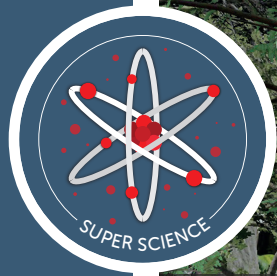
But, this is not an ordinary rainforest. Stepping through magical forest portals, you will travel through time to experience alternate futures of the same rainforest and witness firsthand the stark realities of deforestation and habitat destruction, and the hopes of sustainability and restoration.

Mission:

Your mission is to explore the rainforest ecosystem, and journeying through different future forests, observe the impacts of deforestation, discover its links to climate change, and gather information about how we can build a more sustainable future for rainforests worldwide.

While in the *Future Forests* experience you will be focusing on:

- The rainforest ecosystem
- Human activity and deforestation in action
- Impact of biodiversity loss on the immediate and wider environments



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Preparing for the Experience



Tropical rainforest ecosystems are found in the tropics, the region between the Tropic of Cancer and the Tropic of Capricorn, just above and below the equator. How does their geographic location affect the habitat and climate? Warmer tropical temperatures keep the conditions humid, reducing water loss and improving survival while the climate remains stable and consistent with no seasons.

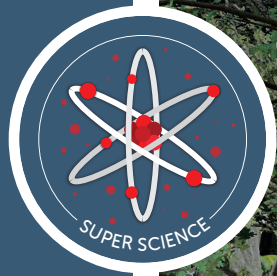
Undisturbed rainforests are extremely important as carbon reservoirs, otherwise known as carbon sinks. Undisturbed rainforests are crucial to the global carbon cycle, storing about 46% of the world's terrestrial carbon. As trees grow, they absorb carbon dioxide and turn it into wood, roots and leaves through photosynthesis. They capture the most carbon when growing quickly and are still young.

As you navigate the scene, take a closer look at the biodiversity. You can consider the interdependence between living things.

Preparation Questions

Before entering the scene, think about the following questions:

1. Can you name any countries or regions that have tropical rainforests?
2. How do you think the location of tropical rainforests near the equator affects their climate and the plants and animals there?
3. What do you already know about the effects of deforestation. Why would primary industries cut down forests?



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STEP-BY-STEP EXPERIENCE GUIDE

1

Lush Tropical Rainforest

Enter the lush, dense Amazonian-inspired rainforest. You'll see a variety of tropical rainforest trees and understory plants, including philodendrons, zebra plants and prayer plants, typical of the lush undergrowth found in tropical rainforests.

These plants thrive in the humid, shaded environment under the dense canopy, contributing to the rainforest's vibrant biodiversity.



Kapok Tree

Looking up, you'll see the towering forest canopy created by the kapok tree, which can reach up to 200 feet, standing above the rest of the rainforest vegetation.



Rubber Tree

You'll also notice the rubber tree, first discovered by ancient civilisations like the Olmec, Maya and Aztecs, who used its latex sap to make waterproof clothing and shoes. Today, this sap is still used to produce rubber.



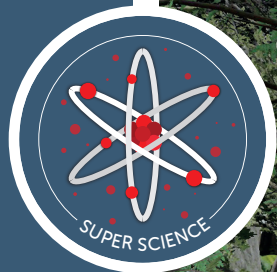
Brazil Nut Tree

Another key tree is the Brazil nut tree, recognised for its distinctive husks. These trees produce some of the Amazon's most valuable non-timber products but only bear fruit in undisturbed habitats.

These trees provide oxygen, water, medicine, food and shelter to many living things, including humans. Did you know that around 80% of our food originates from rainforests, including rice, tomatoes and cocoa? Trees help regulate global temperatures and cool microclimates because as they grow, they absorb carbon dioxide for photosynthesis and use the resulting sugar as an energy source to turn it into wood, roots and leaves.

Quick Fire Questions

- If the rainforest was left undisturbed, what do you think would happen to the biodiversity and the local climate?
- Can you name any other products that might come from rainforests?
- What do you notice about the ecosystem as a whole? What adjectives would you use to describe its characteristics?



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STEP-BY-STEP EXPERIENCE GUIDE

2

Spot the animals!

Toco Toucan

What animals can you see? Soaring above you, you'll notice the toco toucan. This well-known bird is an omnivore that lives among the other animals in tropical forests. They like to nest in tree cavities, laying between two to four eggs at a time. Can you find its nest?



Leaf-cutter Ants

Looking down, what do you see on the forest floor? Leaf-cutter ants! These tiny insects carry pieces of leaves back to their nests, using them to grow a special fungus that serves as their primary food source. This fungus-cultivating system is key to the ants' survival and is one of nature's unique examples of mutualism.

Mother Sloth and its Baby

You'll also notice the mother and baby brown-throated sloths on the branch in front of you. Sloths typically spend most of their time hanging from branches in the rainforest canopy, where they eat leaves, twigs and buds, reproduce and even give birth.



Poison Dart Frog

What's that colourful animal beside you? It's a poison dart frog! These amphibians can be found everywhere in the tropical rainforests of Central and South America and, unlike other amphibians, are diurnal, meaning they're active throughout the day.

Quick Fire Questions

- How do the animals rely on their surroundings for survival?
- What do you notice about each of the animals and their primary habitats and behaviours?
- How might the animal and human interaction be different in reality?



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STEP-BY-STEP EXPERIENCE GUIDE

3

Forest Guardians



Following the path, you'll notice a clearing in front of you. This Indigenous community lives in the rainforest and their way of life is harmonious with it.

Indigenous Communities

Indigenous peoples like the *Asháninka* in Peru, the *Yanomamö* (yah-noh-mam-moh) between southern Venezuela and northern Brazil, and the *Mebêngôkre* (meh-beh-Koo-kre) people in central Brazil have lived in the Amazon for thousands of years. Over this time, they've gathered extensive knowledge about the rainforest ecosystem and methods to sustain it, which have been passed down through the generations.

Daily Life

Look all-around; what do you notice? Their homes are slightly raised off the ground, made of nearby wood, and close to the river, a food source for the community.

Head over to the youngest child; This is Nashi! You'll be seeing a lot more of her. What is she looking at? Take a closer look at the river; what animals can you see? Nashi's father is fishing on the river. In these communities, both group and individual fishing are practiced.

Step closer to the fire; Nashi's mother sits on a palm-leaf mat, preparing a traditional cultural drink, *masato de yuca*, a fermented beverage made from yuca root, prepared in the Peruvian Amazon for thousands of years.

For centuries, Indigenous communities have thrived by using rainforest resources for medicine, food, tools, cultural practices, and spirituality. Undisturbed, the rainforest offers a wealth of plants, animals and materials essential to their daily lives.

Quick Fire Questions

- Look around the community clearing. What Indigenous practices do you notice?
- What role does the river play in the daily life of the community and what animals can you observe there?
- What do you think the youngest child might be observing and why could it be important?
- What impact might the loss of biodiversity have on the community?

Follow the path to find the first forest portal and step through...



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STEP-BY-STEP EXPERIENCE GUIDE

4

Human Activity – Logging and Mining

You find yourself in the same forest environment, but what has changed? You have travelled forward in time to witness the impact of human activity, particularly primary industries, on the ecosystem. What do you notice about this future forest?

As you explore this area, consider the short-term and long-term environmental impact of human activity and mass deforestation on rainforests, their inhabitants and biodiversity.



Logging

What primary industries can you identify? What do you notice about the environment as you approach the logging area? Deforestation is one of the main threats to the Amazon rainforest.

The Amazon, the largest rainforest on Earth, spans approximately 40% of the South American continent and is home to about 3 million plant and animal species. However, it is also increasingly threatened by deforestation and illegal logging, activities which, on a controlled scale, are important for domestic economic growth but, on a larger scale, cause huge problems, like displacing animals and communities from their homes.

Mining

Looking over toward the river, what might they be mining for? Considering the area's topography and previous knowledge, what types of minerals or materials might the Amazon be rich in?

The Amazon is rich in mineral assets, including copper, nickel, iron ore and gold. This wealth of natural resources has made the Amazon a focal point for mining activities, both legal and illegal.

Head toward the riverbank. What do you notice about the increased mining, and how has this affected water availability? Which animals are missing and can you spot any clues about what may have happened to them? In the short to medium term, mining activities like gold significantly contribute to water pollution.

Impact on the Local Community

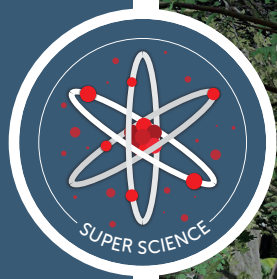
Can you find Nashi? How has her community been impacted by large-scale deforestation? Extensive mining operations across the river have drastically altered the landscape, destroying habitats and posing significant contamination risks.

Illegal mining on communal land without authorisation, in protected zones, or without proper permits, such as the example visible near the dredging pipe across the river, is a major issue in the rainforest and for the people and animals living there as many use mercury to extract minerals like gold.

Mercury used in gold extraction contaminates rivers, poisoning wildlife and threatening communities that depend on the river for food. The widespread felling of trees and plants further eliminates essential homes and food sources for both people and animals, disrupting the entire ecosystem.

Quick Fire Questions

- How has increased mining affected the availability of water in the area?
- What animals are missing from the area, and what might have happened to them?
- Why do you think deforestation is a major concern for both the environment and the Indigenous people of the Amazon?



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Future Forests

STEP-BY-STEP EXPERIENCE GUIDE

5

Human Activity – Agriculture and Soybeans



Soybean Production

Following the paved road, you'll notice the soy plantation to your left. Soybean production is the second biggest contributor to tropical deforestation in the Amazon. It is estimated that the area of land used for soy production expanded significantly between 1990 and 2010, reaching a size comparable to that of Washington State.

Cattle Ranching

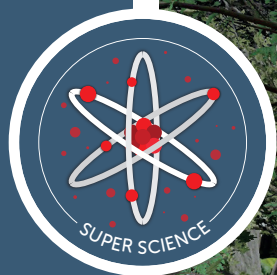
Head toward the cattle ranching area. This is where the land has been cleared specifically to raise cattle that we eat. Globally, our planet loses about 5 million hectares of forest annually to make space for these primary industries, the greatest of which is beef production, as more people can afford to buy it. 80% of this deforestation occurs in the Amazon.

Impact on the Global Community

What clues can you find that the ecosystem has been disrupted? As increasing deforestation occurs it doesn't just affect the local communities and animals that live there. Did you know that compounds found in rainforest plants, like periwinkle or *Catharanthus roseus*, are used to treat leukaemia, breast cancer and Hodgkins? While the vanilla flavour we enjoy in cookies derives from the vanilla orchid, which grows in tropical rainforests. As biodiversity decreases, so does the global availability of these medicinal and tasty compounds.

Quick Fire Questions

- What do you notice about the topography of this future forest compared to the past?
- What other types of agriculture might contribute to deforestation in the Amazon?
- What impact has the clearing of land for agriculture had on the local wildlife and Indigenous communities?



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Future Forests

STEP-BY-STEP EXPERIENCE GUIDE

6

Choose the Future



Venture ahead to find the fork in the road, where you'll be presented with an important choice on the sacred kapok tree in front of you.

Do we continue down a path of destruction? Or, as a global community, can we implement sustainable changes to protect our future forests?

There are two paths to choose from. Which future will you explore first? The following sections can be swapped, depending on which path you choose first.

Quick Fire Questions

- Which path do you think represents rewilding, sustainability and guardianship?
- Which path do you think represents destruction, mass deforestation and abandonment?





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Future Forests

STEP-BY-STEP EXPERIENCE GUIDE

7

A Sustainable Future

Welcome to the positive future! This forest reveals what could happen if the global community implements the best sustainability and protection practices to protect our rainforests.

Replanting

Head toward the people replanting saplings; projects like this can help forest structures recover, regrow the forest canopy that many animals call home, provide habitats for animals that would otherwise be displaced and help preserve ecosystem biodiversity. Reforestation is one of the most effective ways to restore ecosystems that have been damaged or cleared.



On a local and global scale, these projects can help restore climate imbalance as younger, faster-growing trees capture carbon quicker. They also prevent floods and landslides by absorbing water and gradually releasing it through transpiration, while anchoring the soil with their tree roots.

Rewilding and Reintroduction

Can you see the crates on the floor? Nashi is now much older and she's helping release the protected animals back into their natural habitats. The Amazon is home to numerous species, some of which haven't even been discovered, including animals that aren't found anywhere else in the world, such as the sky-blue poison dart frog, the Andean cock-of-the-rock (*gallito de las rocas*) and various species of monkeys. Rewilding can help improve biodiversity by restoring ecosystems and creating safe environments for these species to thrive once again.

Indigenous Business and Guardianship

Look toward the man standing by the hessian sacks. This is an example of Indigenous-owned entrepreneurship that supports local communities through sustainable practices. In remote regions, these businesses unite groups to produce, export and manage their lands for goods like cacao, coffee and handicrafts. These can help communities thrive while preserving their land and culture and connecting them to local producers and national and international markets.

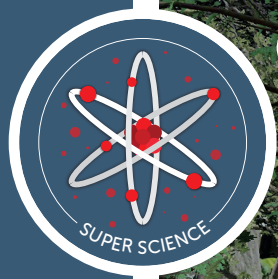
Forest Protection, Guardianship and Advocacy

Walk toward the forestry hut. One important aspect of forest protection is self-protection and advocacy. Technology can support Indigenous communities in enhancing their monitoring efforts and asserting control over their territories, building on practices already deeply embedded in their communal traditions. Improved connectivity by using drones and smartphones allows them to supervise their territories more efficiently, demarcate their lands and get alerts of threats like wildfires, illegal activity and territorial invasions.

While mass deforestation and biodiversity loss are global issues, not just individual ones, as individuals and communities we can make informed choices to help protect our rainforests and those living there. Walk back through the forest portal and see what could have happened if you had made a different choice.

Quick Fire Questions

- What examples of Indigenous entrepreneurship can you see? How do you think these help communities?
- Can you spot any animals being reintroduced back to the environment? Why is this important?
- Discuss the idea of global responsibility versus individual responsibility with the students. As a global community, how can we support and nurture our rainforests?



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Future Forests

STEP-BY-STEP EXPERIENCE GUIDE

8

An Unstable Future



Welcome to the future no one wants! This future forest shows what could happen if we continue to let mass deforestation and illegal activity overwhelm the Amazon ecosystem.

Riverbed Destruction

Head over to where the river once flowed! The riverbed is completely dried up and the landscape is barren with leftover remnants of human activity. After extensive illegal gold mining, the river sediment has become heavily polluted with toxic chemicals like mercury, killing river biodiversity and displacing local communities who depend on the river for drinking water and agriculture.

Climate Destruction

What do you notice about the climate? Look up toward the sky. The lush canopy is gone and the rainforest floor is exposed to intense sunlight. The climate has changed. It is hotter and drier, meaning it is now uninhabitable to many species that rely on the stable and humid environment under a lush tree canopy.

Mass deforestation disrupts natural cycles like water and nutrients, reducing rainfall and soil fertility. This forest now experiences longer periods of hot, drier climates with periodic heavy rain. Exposed soil erodes under the heavy rain due to uncharacteristic flash flooding and topsoil washes away as it is no longer anchored down by tree roots.

Ecosystem Destruction

Go and see what's left of the logging area. What long-term effects has extensive logging had on the animals and community that call this place home?

Can you find Nashi? She's standing by the cleared area, looking at the sloth that has suffered the destruction of its habitat. The once thriving ecosystem has been destroyed, leaving a landscape where little can survive.

Walk back through the portal and see what could have happened if you had made a different choice.

Quick Fire Questions

- What changes do you notice in the environment as you explore this area?
- What differences do you see in this future compared to the other?
- What has happened to the local wildlife and plants in this barren, dry environment?