

# RAINFORESTS: LESSON PLANS



## LINKS TO NATIONAL CURRICULUM

### Science

- Identify and name a variety of plants and animals in their habitats (Year 2, Living things and their habitats).
- Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other (Year 2, Living things and their habitats).
- To describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food (Year 2, Living things and their habitats).
- Recognise that living things can be grouped in a variety of ways (Year 4, Living things and their habitats).
- Recognise that environments can change and that this can sometimes pose dangers to living things (Year 4, Living things and their habitats).
- Identify how animals and plants are adapted to suit their environment in different ways (Year 6, Evolution and inheritance).

### Geography

- Describe and understand key aspects of physical geography, including: climate zones, biomes and vegetation belts (Human and physical geography).
- Understand geographical similarities and differences through the study of human & physical geography of a region within North or South America (Place knowledge).

## LINKS TO PSHE CORE THEME 3: LIVING IN THE WIDER WORLD

- Economic wellbeing and being a responsible citizen: pupils should be taught about the importance of respecting and protecting the environment.

### KEY LEARNING OBJECTIVES

1. To know what rainforests are and where they are located (with particular focus on the Amazon rainforest).
2. To learn about the animals, plants and people that live in the rainforests and how they are adapted to their environment.
3. To know that living things can be grouped and understand key terms such as carnivore, herbivore, omnivore, mammal, bird, reptile, amphibian, fish.
4. To understand how animals get their food from plants and other animals, introducing the idea of a simple food chain.
5. To understand why rainforests are so important.

6. To understand the threats facing the rainforests and to think about what can be done to protect them.

## Notes to Teachers

- This is a set of lesson plans, which together cover all of the learning objectives. Lesson content is as follows:  
Lesson 1: What and where are the rainforests?  
Lesson 2: What plants, animals and people live in the rainforests?  
Lesson 3: Why are rainforests so important?  
Lesson 4: What are the threats to the rainforests?
- The lesson plans are not intended to be of equal length and can be amalgamated or split to suit timings.
- Activities given are suggestions only. The main purpose of the lesson plans and presentation is to provide key information and visual aids for teachers to adapt to their own needs.
- The PowerPoint presentation runs alongside the plans and all slides are referred to in the lesson plans. Please feel free to modify the presentation by adding your own slides or deleting those you don't need.

# 1. WHAT AND WHERE ARE THE RAINFORESTS?



## SUGGESTED STARTER ACTIVITY

**Slide 3 (sound will play).** Ask children to describe what they can see and hear. Ask them to imagine they are in a rainforest – how does it feel?

## TEACHER INPUT

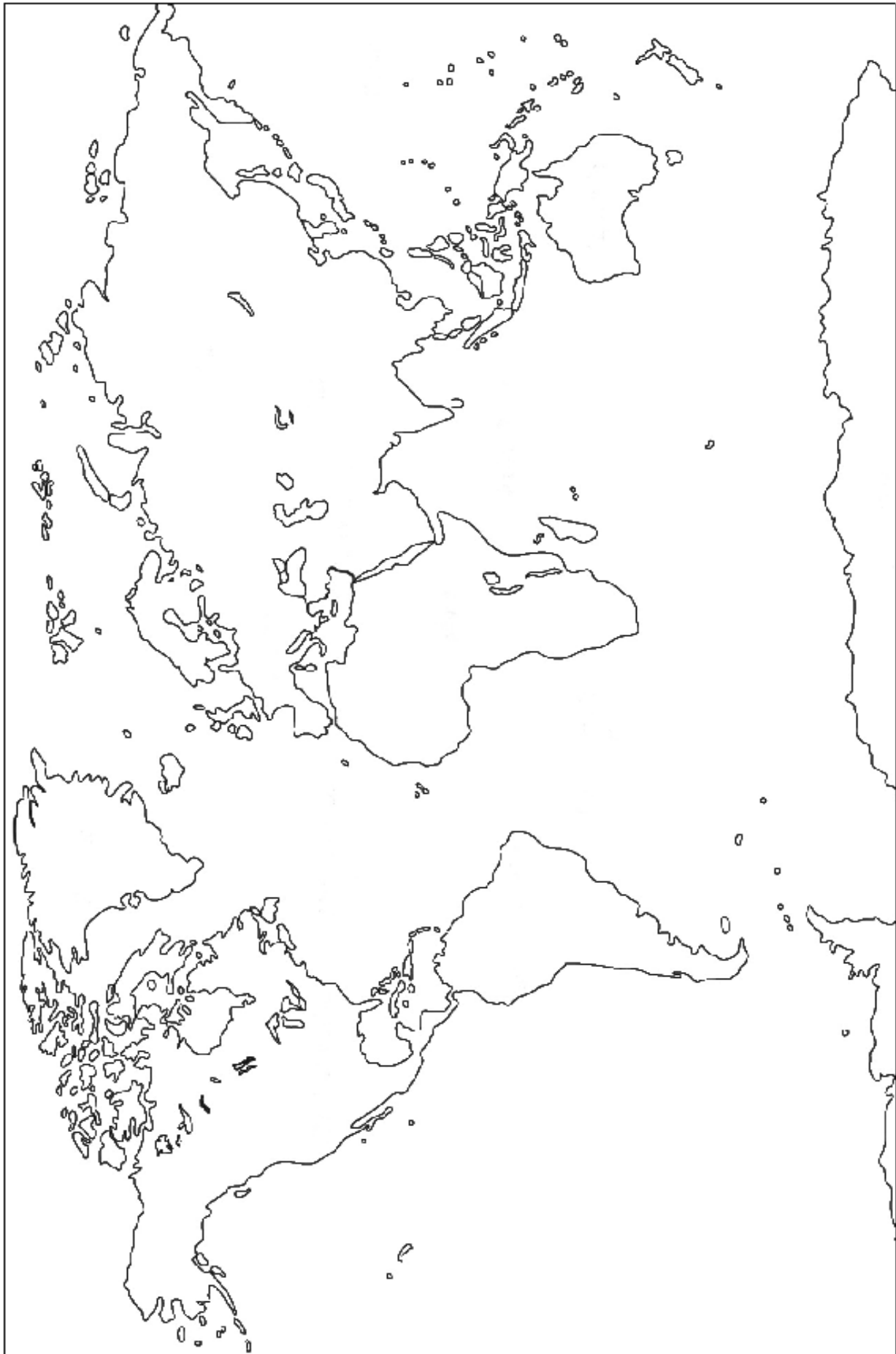
Question and answer session to explore children's ideas and knowledge about the rainforests.

### Key facts to cover:

- Rainforests are hot places, where it rains heavily every afternoon.
- They receive around 175-200cm of rainfall a year.
- Rainforests are evergreen as trees grow all of the time, so they are always in leaf.
- Rainforests are mostly found around the **Equator**, between the **Tropic of Cancer** and the **Tropic of Capricorn**.
- The world's largest remaining tropical rainforest is the **Amazon** – this covers countries such as Argentina, Peru, Paraguay and Uruguay, but 60% of the Amazon lies in Brazil (**slide 5** – ask children to locate the Amazon rainforest).

## SUGGESTED ACTIVITY

Children each provided with an outline world map (see next page for printable map). Using **Slide 5**, they are asked to shade on areas of rainforest and give their map a title and key.



## 2. WHAT PLANTS, ANIMALS AND PEOPLE LIVE IN THE RAINFORESTS?



### SUGGESTED STARTER ACTIVITY

Word search - please find at the end of this lesson plan.

### TEACHER INPUT

#### PLANT LIFE

##### KEY WORDS

**Emergents** - the tallest trees, rising above the canopy.

**Canopy** - this can be over 100 feet above ground and is made up of the overlapping branches and leaves of rainforest trees.

**Under Storey** - under the canopy, this layer is made up of smaller trees, vines and shrubs.

**Shrub Layer** - the smallest layer where many insects live.

**Forest Floor** - ground level where few plants grow as it is so dark.

**Buttress roots** - roots that grow out above ground from the tree trunk and help support the tree.

**Carnivorous plant** - a plant that gets most of its nutrients from trapping and eating animals or insects.

**Slide 7:** Explains rainforest layers.

**Slide 8** shows the **canopy**.

**Slide 9** some **emergents**.

**Slides 10-12** show examples of **buttress roots**. Much of the root is above the ground, because the soil in rainforests tends to be shallow and weak and the trees need support to stand and grow to great heights.

Many plants in the rainforest are **adapted** to their environment. For example, **fan palms** (**slide 13**) have large, fan shaped leaves that are good for catching sunshine and water.

There are many ingenious plants in the rainforest. The **rafflesia** or "corpse flower" (**slide 14**) smells of rotting flesh and is not a pleasant thing to encounter! Its foul smell attracts flies that are tricked by the flower into being pollinators; they pick up pollen from one rafflesia flower and deposit it on another flower.

**Slide 15:** **Carnivorous plants** in the rainforest include **pitcher plants**, which have a slippery-rimmed "pitcher" formed from a cupped leaf. Insects are attracted by colours or by nectar "bribes". They can slip into the pitcher and are then drowned in liquid, which gradually dissolves the insect's body.

**Slide 16:** **Venus flytraps** close their jaws when they detect an insect or spider; this happens when the prey moves two or more tiny hairs within the trap.

## ANIMAL LIFE

### KEY WORDS

**Herbivore** – an animal that only eats plants.

**Carnivore** – an animal that only eats meat.

**Omnivore** – an animal that eats both plant matter and other animals.

**Insectivore** – an animal that only eats insects.

**Predator** – an animal that lives by killing and eating other animals. The animal eaten is called the **prey**

**Vertebrate** – an animal with a backbone (all mammals, birds, amphibians, reptiles and fish). Animals without backbones are called **invertebrates**.

**Mammal** – warm-blooded animal that breathes air, has a backbone (vertebrate) and grows hair at some point during its life. Also, all female mammals have glands that can produce milk.

**Bird** – warm-blooded vertebrate with a body more or less completely covered with feathers and forelimbs modified as wings.

**Amphibian** – cold-blooded vertebrate that can live on land or in water. All amphibians begin life in the water with gills and tails. As they grow, they develop lungs and legs for their life on land.

**Reptile** – cold-blooded vertebrate that lays eggs and has a body covered with scales or hard parts.

**Fish** – mostly cold-blooded vertebrates, usually with scales and they breathe through gills.

Please note that on the accompanying presentation, the name of the animal on each slide will not appear until the second click. This allows the children to identify the animal themselves, before the name is revealed.

**Slide 18:** **Poison arrow/poison dart frogs** (amphibian). The slime on their skin is poisonous to touch, but tribal peoples have learned to trap the frogs and to coat the tips of their arrows and darts with the poison. This means that when they hunt (**slide 19**) they only have to aim to hit, not kill their prey - the poison does the rest and the prey falls dead from the trees. They are **carnivores**, eating ants, termites and beetles.

Many animals in the rainforest are ingeniously **adapted** to their environment. **Slide 20** shows a poison arrow frog carrying tadpoles on its back. They live in the trees and use tiny pools formed by curled leaves of bromeliads (**slide 21**) to rear their young. **Slide 22** shows a **bromeliad** in the foreground.

**Slide 23:** **Harpy eagles** (bird) are **carnivores** that share the top of the rainforest's food chain with jaguars and anacondas. They eat sloths, monkeys and other small mammals. Harpy eagles can look quite scary because of their huge claws, massive beak and legs that can be nearly as thick as the wrist of a person!

**Slide 24:** **Toucans** (bird) are fruit eaters but have large, sharp bills because much of the fruit they eat has hard skins or shells that they need to be able to break into to get to the soft flesh beneath. They also eat insects and sometimes young birds, eggs or lizards. So they are **omnivores**.

**Slide 25:** **Macaws** (bird) also live in the Amazon. Various bird species will gather at a clay lick (**slide 26**) to get salt, which is essential for health in small quantities. They are **omnivores**, feeding on fruit, nuts, insects and snails.

**Slide 27:** **Sloths** (mammal) spend most of their time in the canopy. They eat leaves (they are **herbivores**), which provide little energy value, so they move very slowly, and have very low body temperatures (30-34 degrees C when active). Sloths get almost all their water from juicy plants. They climb to the ground only once a week to urinate and defecate.

**Slides 28/29:** **Jaguars** (mammal) are among the largest predators in the Amazon, eating animals as large as deer, crocodiles, snakes, monkeys, sloths, tapirs, fish and frogs - they are **carnivores**. Jaguars are the third largest big cat, after tigers and lions, and the largest in the Western Hemisphere.



**Slide 30:** **Emerald tree boas** (reptile) are constrictor snakes, coiling around their prey and crushing it by gradually tightening the coils. They live in the trees and eat small mammals, lizards, monkeys and even birds (so they are **carnivores**). They grow to around 2 metres in length.

**Slide 31:** **Giant anteaters** (mammal) are the largest insectivorous mammals in Central and South America. They can grow to over 2 metres long and weigh up to 41kgs. Anteaters have no teeth but their long tongues are more than sufficient to lap up the 35,000 ants and termites they swallow whole each day (so they are **carnivores**).

**Slide 32:** **Red-Bellied Piranha** (fish) - with its powerful jaws and deadly razor-sharp triangular teeth that lock onto food, the red-bellied piranha is a well-known predator of Amazonian rivers. It can strip flesh from the bones of any large animal in minutes. But actually it is more likely to feed on other fish, insects, invertebrates and even plants, so the red bellied piranha is an **omnivore**.

**Slide 33:** This shows a simple food chain for the Amazon rainforest. A **food chain** or **web** shows how animals eat the plants and other animals around them. The chain usually starts with a plant, the plant gets eaten by an animal, then the animal gets eaten by a bigger animal and so on.

**Producers** - plants get energy from the sun and use it to make their own food, so they are called producers.

**Consumers** - animals eat the plants and other animals. They do not make their own food so are called consumers.

## PEOPLE OF THE RAINFOREST

**Slides 34/35:** The Amazon is the ancestral home of 1 million Indians. They are divided into about 400 tribes, each with its own language, culture and territory. The **Yanomami** is the largest tribe in the Amazon rainforest; others include the **Kayapo**, **Guarani** and **Xingu** tribes. They all rely on the rainforest for their survival and in remote parts of the Amazon there are tribes that have never seen people from the outside world. Over 90 tribes have been completely wiped out in the Amazon alone, as a result of contact with the modern world. Many died out during the time of the Conquistadors, when simple diseases like flu or measles wiped out entire tribes, as they had no natural immunity to diseases they had never encountered before.



## **SUGGESTED ACTIVITIES**

### **Art/Design**

Children asked to invent/design their own rainforest plant or animal. They should label their drawing to show how it is adapted to its environment.

This activity could be extended by asking the children to make their rainforest plant/animal (cross-curricular link to Art and Design).

### **Food Chains**

Challenge the children to create their own food chains for the rainforest.

### **Research**

To research a rainforest tribe. Information gathered could include:

- Where they live.
- How they live - do they live in villages? Who is in charge?
- What they wear.
- What they eat - how do they get their food?
- What language they speak.
- The threats to their way of life
- What they could teach us.

You will find plenty of information on rainforest tribes on the YPTE website:

<https://ypite.org.uk/factsheets/rainforest-tribes>

### 3.WHY ARE RAINFORESTS IMPORTANT?

#### SUGGESTED STARTER ACTIVITY

Brainstorm children's ideas, creating a mind map and drawing on information covered in previous lessons.

#### TEACHER INPUT

##### Biodiversity

**Slide 37 with sounds:** Over half of existing animal and plant species in the world live in rainforests. They also hold a third of the world's bird species and 90% of its invertebrates. In 2.5 acres of Amazon rainforest, there could be 300 different tree species, compared to the 40 found in the whole of the UK.

##### Medicines

**Slide 38:** A quarter of all medicines use ingredients that are derived from rainforest plants. These include the **Madagascar Rosy periwinkle** (slide 39), from which an extract is used to treat leukaemia in children and the **cinchona tree** (slide 40) from which quinine is derived - this is used to treat malaria. Only about 1% of plant species have been studied, so there are very likely to be many more cures to illnesses waiting to be discovered.

##### Foods

**Slide 41:** It is estimated that 80% of the world's diet originated from rainforest plants. Many of the foods we eat daily such as pineapples, potatoes, cocoa (for chocolate), coffee, rice and sweet potatoes originally came from the rainforest. Many food sources are still being discovered in the rainforests.

##### Oxygen

**Slide 42:** Rainforests are also vitally important for our Earth and are often called the "**lungs of the World**". This is because the plants of the rainforest provide 20% of the Earth's oxygen. They also absorb about 20% of the world's man-made carbon dioxide emissions.

(Link to **Greenhouse Effect** - [ypte.org.uk/videos/the-greenhouse-effect](https://ypte.org.uk/videos/the-greenhouse-effect)).

#### SUGGESTED ACTIVITY

Creative writing (cross-curricular link to Language and Literacy) - children asked to write a poem, song or speech that expresses the importance of the rainforests and why we must protect them. They could then perform these to the class.

## 4. WHAT ARE THE THREATS TO THE RAINFOREST?



This section deals with many of the issues that threaten to reduce or destroy the rainforest, both in South America and throughout the world. Before humans started destroying the rainforests, they covered 15% of the Earth's land area. Today it is only around 3%.

### SUGGESTED STARTER ACTIVITY

Ask the children to think about a football pitch – how big is it, how long would it take to walk around it? Tell them that every day an area of rainforest equivalent to a number of football pitches is destroyed. Ask them to guess how many.

**Slide 44** gives them the answer and may shock them.

### TEACHER INPUT

#### Logging

**Slides 45-48:** Logging for timber is a major threat. Whilst in the UK little rainforest hardwood is sold, there is still a strong market for it in other parts of the world and the high price paid for the timber encourages logging to continue. Much of the hardwood is used to make furniture. Once an area of forest is cleared, it will probably never recover.

**Slide 49:** Google Earth made this animation to illustrate forest loss from 2000-2012. To play, click anywhere on the animation.

**Slide 50:** This animation zooms in on an area of rainforest in Paraguay and shows how it was deforested over the course of just over a decade. To play, click anywhere on the animation.

**Slide 51:** To ensure that the wood and paper products they buy are produced from responsible sources, children should look for the **Forest Stewardship Council** logo and encourage their parents to buy these products.

#### Cattle Ranching

**Slides 52/53:** Some scary facts about cattle ranching in Brazil. The children will enjoy slide 52!

**Slide 54:** In order to feed cattle both in areas that were formerly rainforest and indeed across the world, soya is planted in deforested areas and produced on an industrial scale.

## Oil Palm Plantations

**Slide 55:** Rainforests in Indonesia in particular are being destroyed to make way for oil palm plantations, from which palm oil is produced. Destruction of their habitats is one of the biggest threats to species like the orangutan (**slide 55**).

**Slide 57:** Around one in ten products in a supermarket will contain palm oil, such as bread, cereals, chocolates, pizza, cleaning products, chewing gum and shampoo.

**Slide 58:** Palm oil is also used to make biodiesel, using up valuable food-producing land to create fuel for cars.

**Slide 59:** The burning of the rainforest produces more greenhouse gases each year than are produced by all the cars, trains, planes and ships on the planet.

## Mining

**Slide 60:** Mining operations in the rainforest not only destroy the rainforest. Mud and poisons such as mercury that are used in the process to extract gold end up in the rivers, poisoning the water and increasing the silt build-up in rivers.

## Hydroelectric Dams

**Slide 61:** Hydroelectric dams like **Tucuruí** in Brazil produce huge amounts of clean power. However, they also divert the flow of rivers in the Amazon basin and flood huge areas of rainforest.

**Slide 62:** The new hydroelectric scheme at **Belo Monte** in Brazil will cause massive damage to the rainforest and has been the cause of a great deal of protest from the tribal peoples inhabiting the region (**slide 63**).

## What Can We Do To Protect the Rainforest?

Ask children if they have any ideas about what is being done or could be done to save the rainforests. As consumers, children and their families can make choices that can benefit the rainforest.

**Slide 65** shows **Fair Trade** and **Rainforest Alliance** logos. Each logo is a guarantee that the food has been produced in an ecologically sound way. Fair Trade logo guarantees a fair price for the growers and to qualify for it, they have to follow strict ecological standards. The **FSC** mark shows that wood used in paper, timber or furniture has been sourced from responsibly managed forests. The **Assured Food Standards** logo shows that animals have been reared in the UK and have been kept in humane conditions.

**Slide 66:** A variety of **Fair Trade** products. Fair Trade farmers are paid sufficiently to give them a good standard of living. The children have access to education, their families have access to medical care and they all have access to clean drinking water.

**Slide 67:** A Fair Trade Coffee farmer in Mexico.

**Slide 68:** As a school or class it is possible to adopt an acre of rainforest to protect it for the future. This involves paying a fee to one of the organisations managing such schemes, which can easily be found on the internet.

**Slide 69:** You could also look into the idea of adopting an animal from the rainforest. The fee you pay helps to ensure that it remains protected and able to live safely in its natural habitat.

## **SUGGESTED ACTIVITY**

Role-play: children each given a character and asked to prepare a short speech to be given at a UN convention debating whether the rainforests should be protected or exploited.

Some possible characters:

Logging company owner and family members

Mining company owner and family members

Cattle farmer and family members

Oil palm plantation owner and family members

Loggers, miners, cattle ranch workers, plantation workers

Hunter of endangered species

Biodiversity expert

Greenpeace campaigner

Scientist

Environment Minister

Native Kayapo tribe leader and family

Native Yanomami tribe leader and family

## **We value your feedback!**

Let us know what you thought of this lesson plan by completing this Google Form

<https://forms.gle/cGAwi9AWXfSZgrYa9>. **Thank you!**