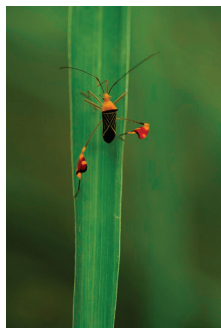


RAINFORESTS

Why they're important and
what you can do to help





Cover photos and photos above ©Murray Cooper

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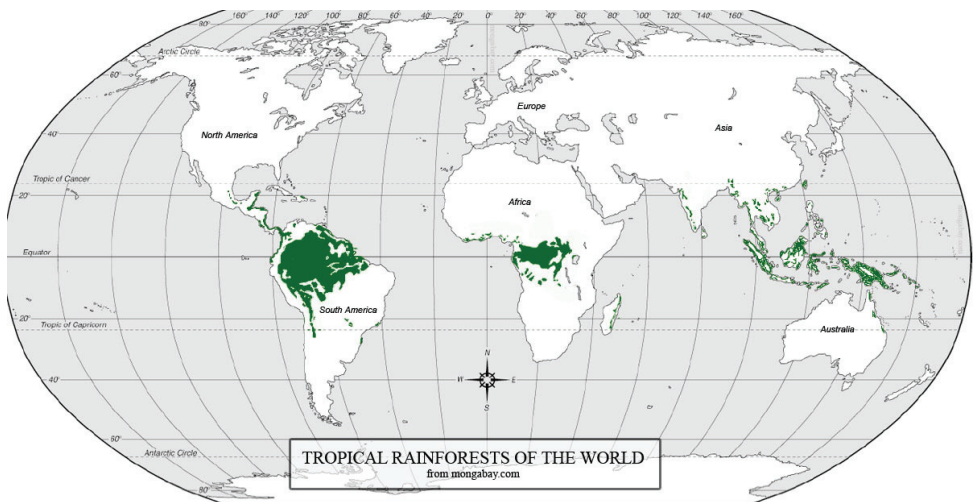


RAINFOREST FACTS

TROPICAL RAINFORESTS: WHERE AND WHAT ARE THEY?

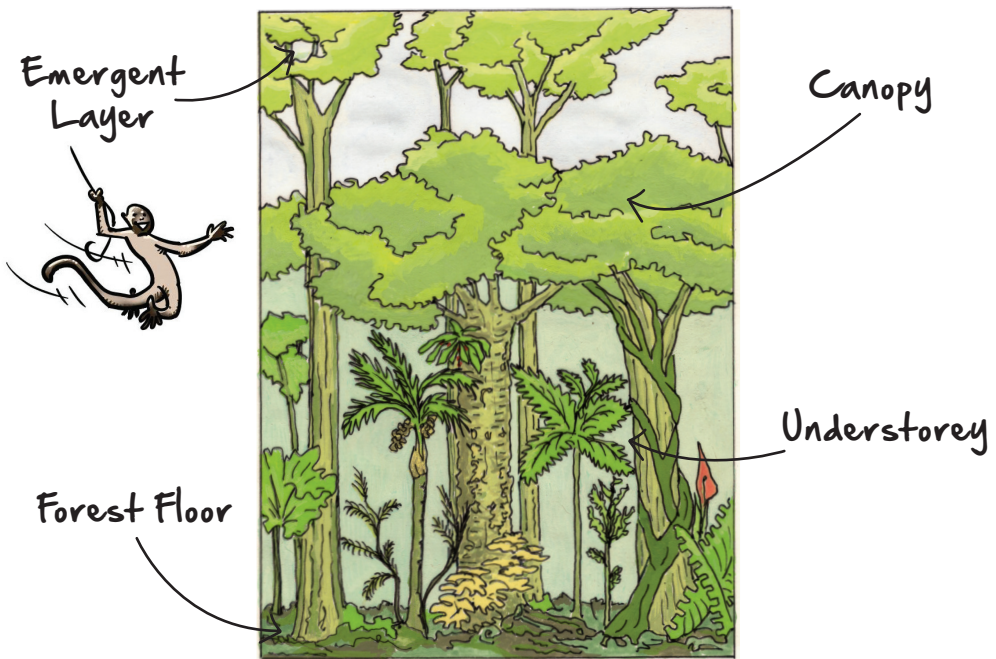
Tropical rainforests cover approximately 8% of the world's land surface - an area of around 1.2 billion hectares - and yet contain over half of the earth's species of animals and plants. The largest rainforest, the Amazon, is found in South America and spans nine nations (Brazil, Bolivia, Peru, Ecuador, Colombia, Venezuela, Guyana, Suriname and French Guiana), covering a total area of approximately 600 million hectares.

Tropical rainforests are found across the world between the Tropic of Capricorn and the Tropic of Cancer, 22.5° north and 22.5° south of the Equator. Approximately 50% of the remaining tropical rainforest is found in tropical America, 35% in Asia and Oceania, and 15% in Africa. The areas where rainforests occur experience a constant climate with high temperatures averaging 25°C all year round, an average annual rainfall of at least 2 metres and up to 100% humidity. Some rainforests get as much as 10 metres of rain every year!



Location of the world's rainforests. ©mongabay.com

The rainforest canopy is divided into four main layers: the **emergent layer** consists of the tallest trees (emergent trees) which can grow to heights of 70m. These trees act as a buffer, sheltering the lower trees from heavy rains. Beneath this layer is the main **canopy** of smaller trees which are intertwined with climbing vines and hold flowering plants, called epiphytes, on their branches. Below this is the **understorey** containing young saplings and shrubs. The final layer, the dark **forest floor**, contains only a few plants, as only 2% of the sunlight reaches this layer of the forest, making it difficult for plants to grow.



Forest Layers ©Alan Dun

There are three main types of rainforest: lowland, montane and mangrove.

Lowland rainforest

This type of forest is found at elevations of up to 1000 metres within the tropical belt. Due to the high rainfall and constant warm temperatures, they provide the perfect environment for plants and animals and so contain

a great diversity of life. Lowland rainforests contain the tallest trees of all the types of rainforest, with the largest variety of species.

Montane rainforest

Montane rainforests are found in mountainous areas within the tropical belt. At altitudes of 1000-2500 metres (lower montane) and 2500-3000 metres (upper montane; also called cloud forests), these forests are usually cooler than lowland rainforests and are almost constantly dripping with moisture from the swirling clouds which engulf them. The trees in cloud forests do not grow as high as in lowland rainforests due to the cooler temperatures, but there are more ferns and epiphytic plants as these plants like moisture.



Cloud forest in Ecuador. ©Murray Cooper

Mangrove forest

Found in coastal areas, mangrove forests like saltwater and can tolerate periods of drought in the dry season. Mangrove trees can reach heights of 25 metres and are supported by stilt-like roots which raise the tree above the water. Mangrove forests provide shelter for wildlife in coastal waters and river systems, and help to aerate and cleanse the water. Unfortunately, vast areas of this coastal forest are removed to make way for shrimp farms which supply foreign markets like ours.

WHY ARE RAINFORESTS SO IMPORTANT?

Plants and animals

Tropical rainforests took between 60 and 100 million years to evolve and are believed to be the oldest and most complex ecosystem on land,

containing over 30 million species of plants and animals. That's half of the earth's wildlife and at least two-thirds of its plant species!

Because most tropical rainforests grow in warm and steamy environments, they contain a huge variety of plants. One hectare of lowland rainforest may contain 1000 trees with up to 300 species. Compare this to the UK's forests which are likely to have only 5-10 species per hectare: that's 30 to 60 times more species in a hectare of rainforest! These plants in turn provide food and shelter for many rare animals that depend on the rainforest for their survival. There are many more thousands of rainforest plants and animals species still waiting to be discovered.



Climate

Rainforests store water like a huge sponge. In fact, the Amazonian basin alone contains about a fifth of the earth's rainwater! Rainforest trees draw water from the forest floor and release it back in to the atmosphere in the form of swirling mists and clouds.

Without rainforests continually recycling a huge quantity of water which feeds rivers, lakes and irrigation systems, droughts would become more common, potentially leading to widespread famine and disease.

Did you know that we also depend on trees to cleanse our atmosphere? They absorb the carbon dioxide that we exhale, and provide the oxygen we need to breathe. When trees are burned they release carbon dioxide, which pollutes the atmosphere and contributes to global warming.

Even though we depend on trees in this way, we are still removing forests from the planet at a faster rate than they can grow back.

Prevention of soil erosion

Surprisingly, soil in the rainforest is very poor in nutrients. This is because the nutrients are stored in the vast numbers of trees and plants

rather than in the soil. Tree roots bind the soil together, while the canopy protects the soil from heavy rains. When a tree dies and its trunk falls to the forest floor, it decays and the nutrients it contains are recycled. However, if trees are removed from the forest, the nutrients are removed with it, along with the protection provided by the tree roots and the forest canopy. The unprotected soil then simply washes away in heavy rains, causing blockages and floods in lowland rivers, while leaving upland rivers dry.

Home for indigenous people

Many indigenous people have been living in harmony with the rainforest for thousands of years, depending on it for food, shelter and medicines. When oil and logging companies come to remove vast areas of forest, they bring diseases which the indigenous people have no resistance to, threatening their survival. Often they are also forced to move away from their homes to unfamiliar places.

Rainforest pharmacy

It may surprise you to know that more than 25% of our modern medicines originate from tropical forest plants. Even so, we have only learned how to use 1% of these amazing plants, so imagine the potential of the other 99%!

For example, the rosy periwinkle, found in Madagascar, is used to cure leukaemia, while the anti-malarial drug quinine is taken from the bark of the Andean cinchona tree. The rauwolfia shrub found in Asian and African forests is used to treat high blood pressure and mental illness. Rainforests could hold the cure to many more diseases if we would only look after them.

Other important forest products

Many foods we consume today such as nuts, bananas, coffee and spices, and industrial products such as rubber, resins and fibres, were originally found in tropical rainforests.

WHY ARE RAINFORESTS BEING CUT DOWN?

In the past 50 years, much of the rainforest in Africa and Asia has been destroyed. It is estimated that 1% of the world's rainforest (an area approximately the size of England and Wales) is being cut down every year - the equivalent of 4 football pitches every minute. Unfortunately this means that there is a very high rate of extinction, as the wildlife depending on the forest dies with it. The principal reasons why rainforests are being destroyed are explained below.

Cattle ranching

Many rainforests in Central and South America have been burnt down to make way for cattle farming, which supplies cheap beef to the USA, China and Russia. It is estimated that for each pound of beef produced, 200 square feet of rainforest are destroyed. In the past 20 years, Costa Rica has lost the majority of its forests to beef cattle ranching. Cutting and burning forest for agriculture is known as 'slash-and-burn' and is believed to account for 50% of rainforest destruction. However, the land cannot be used for long: the soil is of poor quality and, without the forest, quickly becomes very dry. The grass often dies after only a few years and the land becomes a crusty desert. The cattle farmers then have to move on to create new cattle pastures.

Indigenous people also use slash-and-burn, but on a small scale. For centuries they have used a sustainable system where, when they finish using one small patch of land, they move away to a different area and allow the forest to regenerate. Since the area cleared is small, the soil does not dry out and therefore the forest clearance is localised and temporary rather than extensive and permanent.

Logging

This is the second largest cause of deforestation. Timber companies cut down huge trees such as mahogany and teak and sell them to other countries to make furniture. Smaller trees are often used for the

production of charcoal. Vast areas of rainforest are cut in one go (clear felling) and the most valuable trees are selected for timber, leaving the others for wood chipping. The roads that are created in order to cut and remove the timber often lead to further damage - see **oil companies** below.

Agriculture

Many of the fruits, cereals and pulses we buy from tropical countries have been grown in areas where tropical rainforests once thrived. The forests are cut down to make way for vast plantations where products such as bananas, palm oil, soya, pineapples, sugar cane, tea and coffee are grown. As with cattle ranching, the soil will not sustain crops for long, and after a few years the farmers have to cut down more rainforest for new plantations.



Mining

The developed nations relentlessly demand minerals and metals such as diamonds, oil, aluminium, copper and gold, which are often found in the ground below rainforests. The forest therefore has to be removed in order to extract them. Poisonous chemicals are sometimes used to separate the waste from the minerals, for example mercury, which is used to separate gold from the soil and debris with which it is mixed. These chemicals often end up in rivers, polluting water supplies which local people depend on, and killing fish and the animals that feed on fish.

Oil companies

Rainforests are seriously affected by oil companies searching for new oil deposits. Often large roads are built through untouched forests in order to build pipelines and extract the oil. This encourages settlers to

move into previously pristine forests and start slash-and-burn farming or cutting more timber to sell or to produce charcoal.

Once established, the oil pipelines which transport the oil sometimes rupture, spouting gallons of oil into the surrounding forest, killing wildlife and contaminating the water supplies of local villages.

Dams

The World Bank and large companies invest money in developing countries to build dams for the generation of electricity. This is often viewed as renewable, 'clean' energy, but it can involve flooding vast areas of rainforest. Dams built in rainforest areas often have a short life because the submerged forest gradually rots, making the reservoir water acidic, which eventually corrodes the dam turbines. The dams can also become blocked with soil washed down from deforested highlands in heavy rains. This can cause additional problems such as flooding.

RAINFOREST ANIMALS

Below are shown just a few of the wonderful rainforest animals whose home is at risk (all photos by Pete Oxford).



Brazilian tapir (*Tapirus terrestris*)

Tapir

There are 4 species of tapir: 3 in Central and South America and 1 in Southeast Asia. The Asian species, the Malayan tapir, is the largest of the 4 species. All are endangered due to habitat destruction and overhunting.

Did you know?

Tapirs have hardly changed in appearance over the last 20 million years!

Jaguar

The majestic jaguar is the largest cat in the Americas and, like most cats, it is a solitary animal that needs a large territory to survive. Therefore large areas of land must be designated as refuge areas where



Jaguar (*Panthera onca*)

jaguars can be protected from habitat loss, hunting and competition with agriculture.

Did you know?

The word "jaguar" comes from the word "yaguara", which in Guarani (the language of the Guarani people in South America) means "beast that kills with one leap."

Macaw

Macaws are the largest members of the parrot family, and amongst the most threatened, largely due to their popularity as pets and the destruction of their habitat. There are 17 species of macaw, but 5 species have already become extinct. Macaws can live for more than 60 years.

Did you know?

Macaws are famous for gathering in huge flocks at "clay licks" to eat clay. They do this because many of the fruits and seeds they eat are poisonous, and clay absorbs the toxins, which stops the birds getting ill.



Scarlet Macaws (*Ara macao*)

Caiman

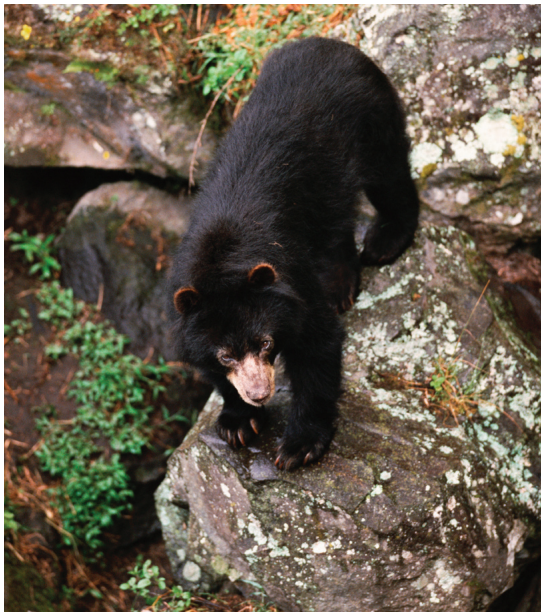
"Caiman" is a Spanish word for an alligator or any crocodilian species. There are 5 species of caiman, all living in the Americas. The principal threats to their survival are hunting for their skin and habitat loss.



Black caiman (*Melanosuchus niger*)

Did you know?

The most common caiman, the spectacled caiman, can change colour like a chameleon! It gets its name from the ridge between its eyes, which makes it look as though it is wearing glasses.



Spectacled bear

This species is confined to the Andes mountains and is found in habitats ranging from dry coastal desert to treeless alpine areas to rainforests.

This South American bear is a vegetarian and, like the jaguar, requires large areas of forest to survive. Habitat destruction and hunting for its meat and fur are the principal threats to its survival.

Spectacled bear (*Tremarctos ornatus*)

Did you know?

The spectacled bear is the closest living relative of the giant panda. Paddington Bear is a spectacled bear!



Red howler monkey (*Alouatta seniculus*)

Howlers make eerie calls before dawn and can be heard up to 3 miles away.

Howler monkey

Howler monkeys are the largest monkey in the Americas. There are 15 species and they live in Central and South American forests. These monkeys are threatened by hunting and habitat destruction.

Did you know?

The only animal that is louder than a howler monkey is a blue

Hummingbird

These tiny nectar-eating birds all live in the Americas, from Alaska to Chile. There are between 325 and 350 species of hummingbird, half of which live in the tropics. This means that many species depend directly on rainforests for their survival. Hummingbirds range in size from the bee hummingbird, which weighs just 1.95g, to the 20g giant hummingbird.



Did you know?

Some species of hummingbird can beat their wings at an astonishing 80 beats per second! They are also the only bird that can hover and fly backwards.



Giant otter (*Pteronura brasiliensis*)

Giant otter

Giant otters are endemic to South America and live in slow-moving rivers, lakes and swamps. They can grow up to 2 metres in length and have no natural predators, but are at risk from habitat loss and water pollution from mining activities. There are only an estimated 2000 to 5000 left in the wild.

Did you know?

The giant otter is known locally as "River Wolf" and they like to eat fish floating on their backs!

Sloth

There are 2 types of sloth: two-toed and three-toed. There are 5 species, all of which live in dense primary tropical rainforest, which means that the sloth's main threat is habitat destruction. However, it is also threatened by the meat, fur and pet trades. It is the slowest mammal on earth! Despite barely being able to walk on the ground, surprisingly sloths are strong swimmers.



Did you know?

The sloth's hair runs from its belly to its back, in the opposite direction to

Three-toed sloth (*Bradypus torquatus*)

other animals. People thought that moss grew on sloths' fur because they move so slowly, but it is in fact algae and mould, which give its fur a green tint and helps it blend in with its leafy home.

HOW CAN YOU HELP SAVE THE RAINFOREST?

YOU CAN SPONSOR YOUR OWN ACRE OF TROPICAL RAINFOREST!

If you would like to become involved in rainforest conservation then why not sponsor your own acre of tropical rainforest? This will help us to save the lives of thousands of trees and plants as well as the animals that depend on these forests for their survival.

You can find out how to sponsor an acre of rainforest on our website, **www.rainforestconcern.org**. In return we will send you a certificate recording your sponsorship to hang in your classroom or at home. We will also keep you updated with our progress through our newsletter, Rainforest Review. We look forward to hearing from you!

FUNDRAISING IDEAS

Below is a compilation of fundraising ideas - tried and tested and tremendously successful!

- Non-uniform day: students pay for the privilege and the proceeds go towards rainforest conservation.
- Home-made cake and biscuit sales (a Rainforest Café) and brick-a-brack stalls held during break times, or in the evening for parents.
- Egg decorating, egg hunts and rolling competitions, which is excellent fun at Easter time.
- Coin collections appealing to parents and local businesses especially (please note you must check legal requirements and restrictions when collecting from the public).



- Compile a booklet of rainforest poems and stories written by each member of the class and sell them to parents.
- Hold an evening of rainforest dance, poetry and song and invite parents along.
- Sponsored events (all of which could be carried out on school grounds - with permission!):
 - Roller disco
 - Run
 - Forest walk
 - Cycle
 - Silence (day time only!)
 - Read - how many books can you read in a week?
 - Litter picks (perhaps involve the wider community?)
 - Welly throwing
 - Custard baths
 - Jelly sculptures
 - Belly dancing
 - Smiling!



- Turn your classroom into a rainforest! One class did this and called it the 'Tropical Island'. They covered the ceiling with netting and wove in vegetation, insects and animals made from paper to create a canopy effect. Parents were then invited to view the rainforest classroom for themselves for a small fee. Tropical fruit punches and rainforest-themed cakes were also on sale.

The list is endless and raising money can be a great character-building exercise, not to mention all the fun involved! Let us know of any successful new ideas you have, and send us pictures of your event!

OTHER WAYS TO HELP THE RAINFOREST

There are lots of other things you can do that will make a difference to the world's rainforests, as well as your local environment: a few of them are listed below. You will be surprised how your choices in a local shop or supermarket can affect forests halfway across the world! And remember that it is just as important to look after your local wildlife and environment as it is to save rainforests. Try to persuade your family and friends to join in too.



Shopping

When you go shopping, think about all the packaging involved...

- Try to buy things that come in recycled packaging, or with as little packaging as possible.
- Aluminium that makes food and drinks cans also has to be mined, and like oil mining, this can destroy forests.
- Don't forget that trees have to be cut down to make paper, so try to buy recycled paper and products in recycled cardboard packaging. If you can't find recycled products, look for the FSC (Forest Stewardship Council) logo instead. This shows that the wood used to make the paper and cardboard comes from sustainable sources and does less damage to wildlife habitats.
- Don't forget to REUSE your shopping bags: plastic is made from oil, which comes from beneath the ground. Oil mining can destroy forests, and not only that, plastic is not biodegradable (it does not decompose) and so will lie around in ever-growing landfill sites for hundreds of years.

Also, try to look for products that give more consideration to the environment. For example:

- **organic foods:** these are produced without the use of harmful chemicals that can damage wildlife;
- **locally grown foods:** this will reduce pollution and the energy used to transport food to your local shop;
- **fair trade products:** this will support producers in developing countries, providing them with a fairer and more secure income;
- **"shade-grown"** coffee, tea and cocoa: this method provides better support to wildlife, as these products are grown underneath trees rather than where trees have been cut down;
- foods such as **Brazil nuts** and **vanilla** which need their native tropical forests to grow. Supporting the trade of these products will encourage local people to protect their forests in order to sustain this trade and provide them with an income.



There are products that you should **AVOID**, such as:

- products containing **palm oil**. Huge areas of rainforest in Southeast Asia are being destroyed to make way for oil palm plantations, threatening many animals including the beautiful, intelligent and critically endangered orangutan. The problem is also increasing in Latin America. Did you know that 1 in 10 products on supermarket shelves contains palm oil? Look at the label before you buy!
- **tropical wood** or **wood-based** products such as mahogany, ebony or teak, as it probably comes from rainforests. If you can't avoid it, then look for recycled or second-hand products or wood with the FSC logo (see the Shopping section for more information about FSC). Tell your parents too!
- products containing **dangerous chemicals** or **solvents**: look for water-based paints, glues and varnishes instead as these do less damage to the environment.

Recycling

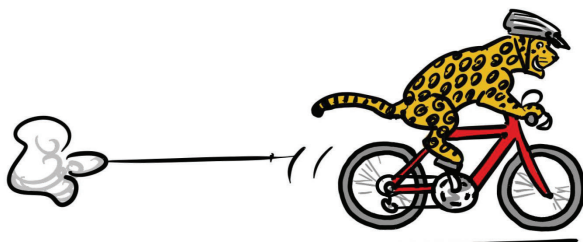
Recycling services are improving quickly: in many places, paper, glass, aluminium (drinks and food cans), kitchen and garden waste and plastic bottles are now collected from your house or school just as your rubbish is collected. Even if they aren't, there are usually recycling banks in towns and cities where you can take them. In some areas you can even recycle plastic packaging. Clothes, shoes, old books and toys can also be recycled by giving them to a charity shop or to your younger brothers or sisters. Remember, 80% of household waste is actually recyclable!

If you don't have recycling at school, talk to your teachers and try to persuade them to arrange it - it's not difficult! You can also help by making sure you don't waste paper and by always using both sides of a piece of paper. Why not keep a store of scrap paper in your classroom or at home from one-sided photocopies or print-outs that you don't need any more? It is also possible to recycle CDs, used batteries and printer cartridges - look on the internet to find a recycling company or charity near you!

Travelling

Try to walk or cycle to school instead of going in the car. If your school is too far away, then take public transport instead, if possible. This will save petrol, which is made from oil and comes from below the ground and so, like plastic, can cause the destruction of rainforests. Petrol also causes pollution and contributes to global warming, as poisonous gases and carbon dioxide are released when it is used.

Encourage friends and family to use their cars less too, especially for short journeys. You will be helping the planet as well as getting fit!



CLASSROOM AND HOME ACTIVITIES

- Most of the animals described in this booklet live in Central and South American rainforests. Can you find out what animals live in rainforests in other parts of the world?
- Why not draw us a picture of your favourite rainforest animal, or write a poem or story about it? We are always pleased to see your creativity!
- Go outside into the playground or park and look for fallen leaves of different colours, sizes and textures. Autumn is an especially good time to do this! Then take them back to the classroom or your home and make a picture of the rainforest or different animals with them, cutting the leaves into different shapes if you need to. You could also use the leaves to make prints using different coloured paints. Think of other ways to use the leaves in your picture. If you make a big picture collectively with your class you can use it to decorate your classroom.



- Write about why it is important to save the world's rainforests. You can include things you have learnt and use your imagination to think of other reasons. What cures or discoveries do you think could lie in the depths of the forest?
- How about getting a compost bin at school (if you have any green space in your school grounds) or at home for all your vegetable and fruit peels, apple cores, tea bags, egg shells, grass cuttings, other garden waste and any confidential papers that your parents or teachers don't want to put in the recycling bin? Some local councils will deliver a compost bin to your door if you request one. "Minibeasts" such as worms and woodlice will turn all your waste into compost, which can be used for planting flowers and trees. Don't underestimate how clever those little creatures are!

RAINFOREST BOOKLIST

Butler, R. A., 2011. *The Rainforests*. Mongabay (10+ years)

Cherry, L., 2000. *The Great Kapok Tree: A Tale of the Amazon Rain Forest*. Voyager Books (4-8 years)

Cherry, L. and Plotkin, M.J., 2001. *The Shaman's Apprentice: A Tale of the Amazon Rain Forest*. Voyager Books (5-9 years)

Lasky, K., 1997. *The Most Beautiful Roof in the World: Exploring the Rainforest Canopy*. Harcourt Brace International (9-12 years)

Platt, R., 2007. *The Vanishing Rainforest*. Frances Lincoln Children's Books (7+ years)

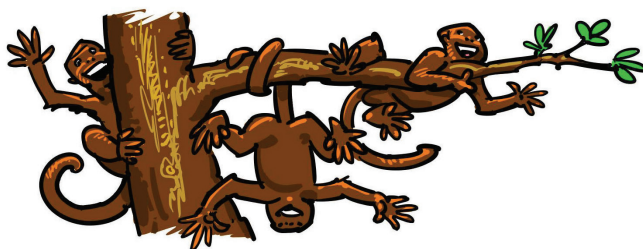
Pratt, K. J., 1992. *A Walk in the Rainforest*. Dawn Publications (4-8 years)

Sharman, H., 2004. *Rainforest* (Eye Wonder series). Dorling Kindersley (5-8 years)

USEFUL LINKS

rainforests.mongabay.com. An excellent source of information and news about the rainforest.

kids.mongabay.com. Rainforest information specially tailored to junior readers.







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