Curriculum Visions

Rainforest Teacher's Resources

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Rainforest activities

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Curriculum Visions

A CVP Teacher's Resources PDF

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Rainforest activities

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Rainforest life and Exploring the endangered rainforest

Where to find rainforests

Tropical rainforests are found inside the part of the Earth called the Tropics.

1. Find an atlas and then choose a map of the world.
2. Look for the lines that say "Tropic of Cancer" (to the north of the Equator) and "Tropic of Capricorn" (to the south of the Equator).

   Now look for the same lines on page 5 of the *Exploring the Endangered Rainforest book* or page 6 of *Rainforest Life*.

   The line between them is the Equator.
3. The green shaded areas are places where rainforests could exist (although many have been cut down and replaced with farmland).

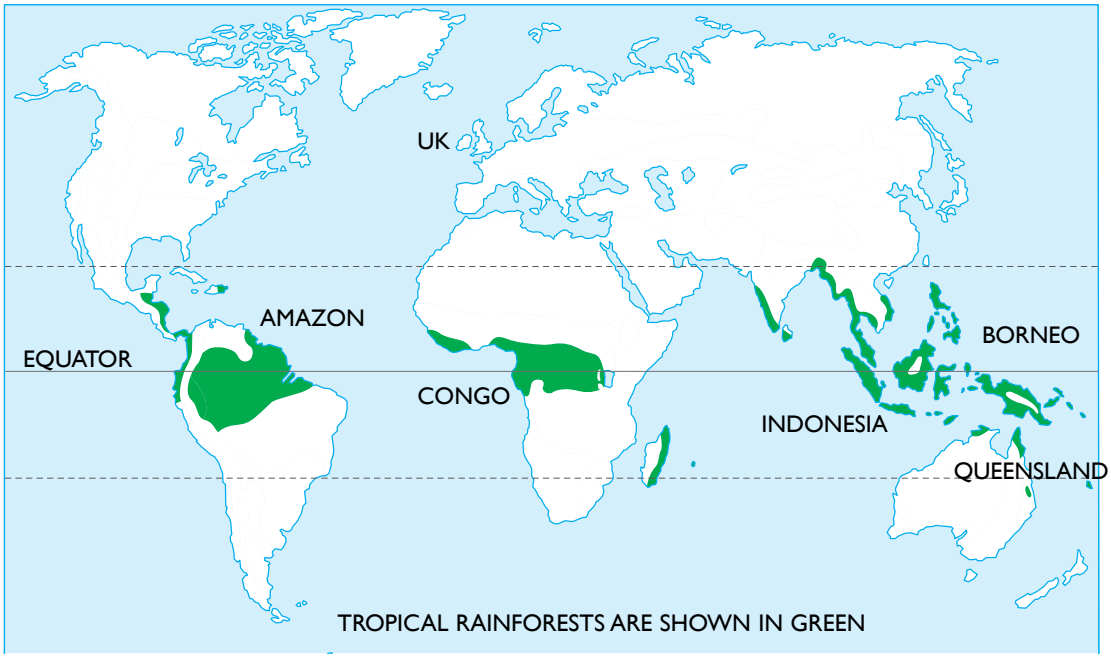
   (a) In which continent do rainforests exist farthest north?

   ✎ .....

   (b) In which continent are they found farthest south?

   ✎ .....
4. Which continent has the smallest amount of rainforest?

   ✎ .....



Where to find rainforests

This is an activity involving atlas skills.

Students will need to find an atlas (a printed version) and then flick through the pages until they find a world map. This may mean a trip to the library, but it helps establish that a variety of resources are needed.

Most world maps are at the front of an atlas.

Make sure students understand that world maps come first, then regional maps.

They will have several maps to choose from. Most of them will have the tropics marked on, but help them to select one that also has rainfall patterns on.

With your help, the more able students will be able to relate the map of tropical rainfall to the rainforest distribution and thus help explain why the two words 'tropical' and 'rain' are used before the word 'forest'.

Many students will now know the tropics and why they are where they are. You may wish to do some cross-curricular work on the Earth as a spinning planet to explain this (our Science@School book *5E Earth and beyond* has explanations). The explanation of the spinning globe also shows students why the tropical rainforest climate (which we shall come to) has no seasons.

By asking students which continent the rainforests go farthest north and south and asking them which continent has least rainforest we are doing two things: we are getting them to understand that rainforests occur on several continents (not just South America, with the Amazon) and that the rainforests vary in detail. Without this focus, many students will just see a band of green and not see the real pattern.

We wish to establish in their minds that there is variety across the world's rainforests.

Name:..... Form:.....

Use with Rainforest life and Exploring the endangered rainforest

First impressions from a video

Few, if any of you, will have been to a tropical rainforest, although you may have visited glasshouses such as the Eden Project or Kew Gardens. So we have to learn about rainforests from afar.

We can do this in several ways. We can watch a video and we can read about the forest and look at pictures. Here we will watch a video.

Please now watch the rainforest video with your teacher. As you go along, try to answer these questions in turn.

You may need to watch the video several times before you can answer all of them.

1. What is the main sound in a rainforest?

   ✎ .....

2. What does a rainforest look like from the air: is it very varied, or does it seem all the same?

   ✎ .....

3. Are rainforest trees short or tall? ✎ .....

4. Why does the speaker say 'like giant umbrellas' when talking of the trees?

   ✎ .....

5. Are there grassy glades in a rainforest?

   ✎ .....

6. Why can't you see many animals when you walk about?

   ✎ .....

7. What is the word for animals that are hard to spot? ✎ C.....

8. How long is the millipede? See if you can make a millipede out of a 60cm long piece of garden hose to give yourself some idea of how big it is.

   ✎ .....

9. When does it rain? ✎ .....

10. When are sounds loudest in a rainforest? ✎ .....

First impressions from a video

It is important to extract as much information from the video as possible. Much of the information in a video can go in one ear and out of the other unless there is careful guidance. The objective of the questions is to find out if the children have appreciated what they have seen, been told or heard. If not, you can simply go back over the video and then ask the question again.

1. The main sound is from the wing cases of insects being rubbed together. Other common sounds are frogs trumpeting.
2. Because trees vary in detail, a rainforest looks very uniform from the air.
3. Rainforest trees are, on average, about 30–40m tall, so they are among the tallest in the world.
4. Giant umbrellas needs a bit of explanation. Open an umbrella and show children how the handle is the trunk, the stays for the fabric are the branches, which radiate out from the trunk near its top, and the fabric is like the canopy of leaves.
5. Grass does not grow naturally in rainforests. As soon as a tree falls and allows light to reach the surface, the small trees rush into growth, producing a patch of very dense forest. Later, perhaps just one of those trees will survive and the others will remain small or die back.
6. Most animals are in the canopy high above and many are camouflaged by being green. Most are also small.
7. Camouflaged
8. The millipede shown is about 30cm long.
9. It rains in nearly all months. In some rainforests it may not rain for a couple of months, but for the rest of the year it rains most days.
10. Sounds are loudest at night.

Name:..... Form:.....

Rainforest life and Exploring the endangered rainforest

The fruits of the forest

As a class, each bring in some of the following from your local shops:

Coffee beans	Avocado	Grapefruit	Cinnamon
Chocolate	Cane sugar	Cardamom	Cloves
Banana	Palm oil	Guava	Orange
Mango	Brazil nuts	Cayenne	Ginger
Papaya	Black pepper	Coconut	Passion fruit
Macadamia	Cashew nuts	Lime	Pineapple
Nutmeg	Tapioca	Paprika	Turmeric
Plantain	Vanilla	Tangerine	

1. Do you use any of these foods at home? If so, which ones?

✎ .....

✎ .....

✎ .....

2. Did you know they originally grew wild in rainforests?

✎ .....

✎ .....

Cinnamon, cloves and nutmeg (left) and mangoes and passionfruit (right)

The fruits of the forest

Rainforests are a rich source of edible resources. You need to check carefully from reliable sources exactly which plants are of rainforest origin, as the Internet has a lot of speculative suggestions.

Note, too, that some of these plants will grow in areas that are no longer rainforest, and some may grow even outside the rainforest zone if cultivated carefully.

But you can start with those which are common: coffee beans, cacao (cocoa), Brazil nuts, bananas, peppers, cashews, and more surprisingly, grapefruit. In fact, many citrus fruits are now grown in subtropical areas, but are hybrids of an original citrus fruit, the pomelo. You may want to start an investigation of this. For example, the grapefruit is associated with the subtropical island of Barbados, but the cultivation started with seeds probably brought from the rainforest areas of Indonesia. It makes a very interesting story. Oranges, limes, tangerines and lemons are the same.

Pineapples are members of the bromeliad family, again, usually grown in warm temperate or subtropical areas today.

Robusta coffee is a small understorey plant from SE Asia, and so on.

Finding out about the history of cultivation of these common plants can trace many of them back to rainforests.

Some trees can easily show the specialised habitats of plants. Coconuts grow only along the shore of oceans and in saline estuaries. They will grow both in rainforest areas and outside.

But the prime purpose of making these collections is to show how important the rainforest has been in providing us with many of the foods we now rely on.

Making delicious rainforest food

You may be surprised at how tasty many of the rainforest foods are.

Here is a simple way of trying them.

Get a variety of the fruits, and also some cashew nuts and flaked chocolate.

Some tubs of Crème fraiche or yoghurt and some sugar.

Get some fairy cake cases (paper) and set them out on a tray. You need one for everyone in the class.

Peel and then divide up the fruits you have into small pieces. We will be putting them into the fairy cake cases, so keep them small.

Now put a large dollop of crème fraiche or yoghurt in each fairy case until it is about three quarters up the case.

Push in, carefully, a piece of each of the fruits you have. Add a cashew nut and sprinkle with chocolate flake. You can also sprinkle with sugar if you like.

Now you have a rainforest treat, and you can try just a small piece of each fruit and nut.

1. Which of the fruits did you like most?

✎ .....

✎ .....

✎ .....

2. Do you think this was a healthy meal?

✎ .....

✎ .....

✎ .....

Making delicious rainforest food

Here is a way of getting children to try a variety of fruits and, as they are in small pieces, they may find even the strange palatable. The crème fraiche, chocolate and sugar help. Only the crème fraiche, which is there to add a creamy texture, is not from a rainforest (originally).

You may like to make up a variety of other simple recipes that do not need cooking. For example, you could put other fruits on a banana slice.

The objective is to get children to taste a variety of fruits, talk about the importance of fruits and healthy diets.

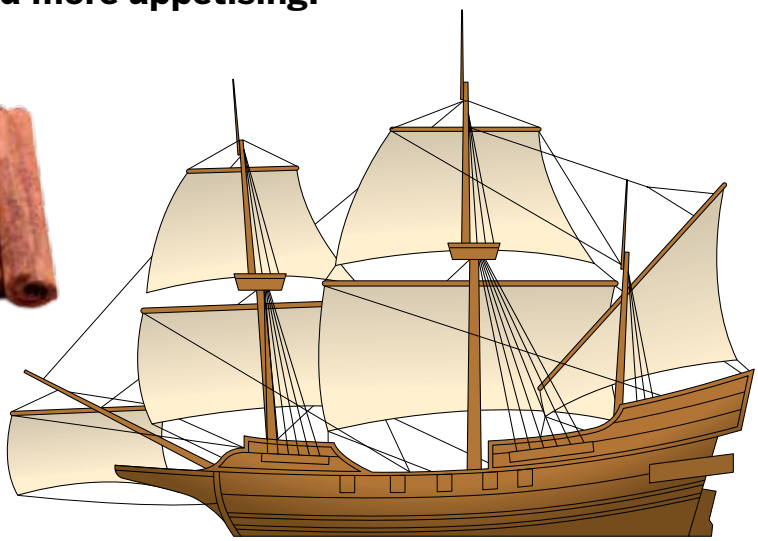
If you want to extend this, you can talk about the people who grow these fruits and the whole idea of fair trade for small producers.

Name:..... Form:.....

Rainforest life and Exploring the endangered rainforest

Where are the Spice Islands?

In Tudor times, wealthy people in Europe were very keen to have spices such as nutmeg to make their food more appetising.



Many years before, the Arabs, who were trading along the Indian Ocean shores, arrived at some of the islands that are now part of the country called Indonesia. Here they found nutmeg and other highly-flavoured nuts and fruits. Eventually they traded them back to Arab lands, and from there they were traded along the Mediterranean Sea. The city of Venice (now in Italy) found itself very handily placed to handle this spice trade.

Unfortunately, the trade was cut off due to problems between Christians and Muslims concerning Jerusalem. Without a reliable supply route from the tropical rainforests of SE Asia, the Europeans began to look for other ways of getting their spices.

The Spice Islands are to the east, but European explorers thought that if they went west, they might get to the Spice Islands without having problems with Muslim lands. This is what started the Age of Discovery.

1. From an atlas, draw a world map and mark on it the route between the Spice Islands and the Arab lands. Add Venice and then a route back to Britain.

2. Now imagine that route being cut off in the Middle East (modern Israel) and you see why the Tudors (and those in Spain, Portugal, Holland and elsewhere) wanted to find a route west. Draw a sea route to reach Indonesia from Spain and from Britain.

It was all about getting to the tropical rainforests.

Where are the Spice Islands?

Here is an opportunity to do a cross-curricular topic in which you can link rainforests with the Tudor Age of Discovery.

The reason people went east was that their home food often tasted so rotten they needed spices to make it palatable. As it happens, many spices are fruits of the rainforest, which is why they grew in tropical rainforests of Indonesia, and how part of that land came to be called the Spice Islands.

So the whole business of exploration and discovery – including the accidental finding of America, the destruction by disease of millions of Aztecs, and everything that came after, was all about getting palatable meals in Europe. The gold and silver they found were accidental, even though they turned out to be very important.

In the Learning Centre, we have a creative topic book called *Pieces of 8* which deals with this. There are also textbooks of ours called *The Tudor Age of Discovery* and *Exploring the Tudor Age of Discovery*.

Get children to draw out maps and routes.

Discuss the sea route they have chosen and then discuss some of the problems that would have faced the early navigators. For example, the Portuguese went along the coast of Africa first because striking out to sea was very dangerous as their boats were so small and could not stand up to large waves. A route west across the ocean could only be attempted after the ships were redesigned. There was also the problem of taking sufficient supplies, as the ships travelled at just a few km an hour under sail.

Plants from the garden centre

Garden centres are places that sell a huge variety of plants. Many of the ones sold as indoor plants were found in tropical rainforests.

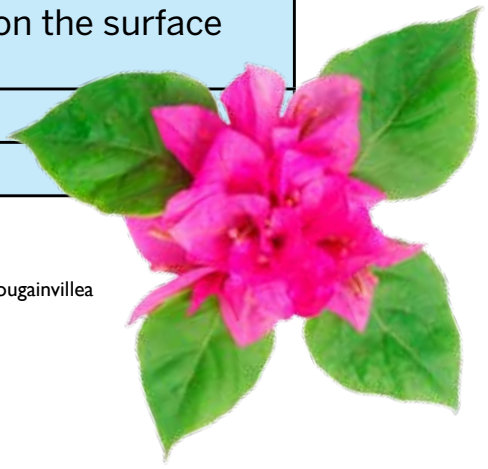
True rainforests are characterised by tall trees forming a more-or-less complete canopy overhead. Smaller plants can survive by climbing to the sunlight using trees as support, or by living entirely in the upper levels of the canopy as epiphytes (orchids and staghorn ferns being typical examples). A few might survive on the forest floor by being able to tolerate very low light levels.

Most real rainforest trees are much too large for the average house, of course, but a rainforest effect can be created with a selection of appropriate species. Tree ferns and palms are particular favourites in the home.

Here are some plants that are usually cheap to buy, grow in rainforests, and that you can find and put together in a corner of a classroom or at home.

See if you can visit a rainforest and spot these:

Bamboo	Tall thin rods (for example, Bengal bamboo)
Rubber plant	Rich, deep green broad leaves
Cheese plant	A climber
Palm	
Bromeliad	**See activity 8**
Orchid	Tropical ones that grow without roots – ask the garden centre
Bougainvillea	Lots of bright flowers
Curare	A vine with light green leaves and dark veins. This vine makes some of the long hanging 'ropes' or lianes in a rainforest.
Coconut	Usually grown with the nut on the surface of the soil
African violets	
Spider plant	**See activity 7**



Bougainvillea

Plants from the garden centre

So many tropical rainforest plants have been cultivated for home use that people often do not know they are rainforest plants at all.

If you have room, you can collect a few of these plants because some of them are among the cheapest plants you can buy.

By placing them carefully, you can get children to think about variety in rainforests.

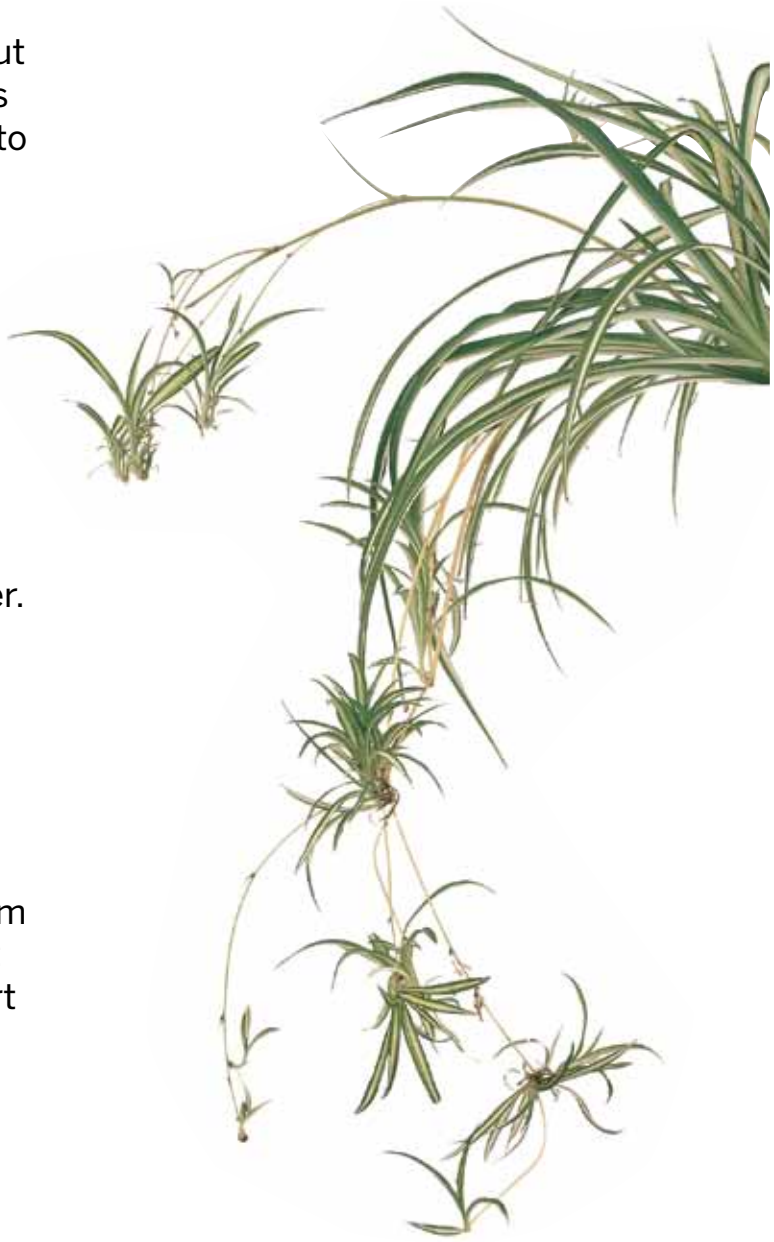
Name:..... Form:.....

Rainforest life and Exploring the endangered rainforest

Everyone in class can have a rainforest plant

Spider plants are one of the most common house plants around.

Spider plants (from the African rainforest) are the ones that send out long shoots with lots of 'baby' plants on – good for everyone in the class to have a small rainforest plant.



In class, put some spider plants on a shelf (but NOT in direct sunlight). Within a few weeks they will send out long thin stems and at each joint (node) a small baby will grow, complete with roots. Put a pot with soil under where the baby is and weight it down on the soil with stones. Add a bit more soil and water. Wait for the roots to 'take' and then cut it away from the parent plant.

Getting new plants from old ones is called propagation.

These babies will even grow if you cut the stem off before planting them out, but then you must keep the pot they are in very moist until they start to grow.

Everyone in class can have a rainforest plant

The spider plant is one of the easiest plants to grow, one of the cheapest, and one of the best for simple propagation. It also grows very fast.

If you buy a couple of these plants, you can use them to give everyone a plant by the end of term, showing each child how to propagate a 'baby' and then putting their name on the plant pot.

Get them into a routine of testing the soil to make sure it has moisture.

Think about fertiliser and so on.

You can also use this for variation. Do all baby plants grow up the same, or do some grow larger than others etc, etc?

Bromeliads

In a rainforest, bromeliads do not grow in the soil, but in the crook of trees high off the ground.

They have hardly any roots, so they need to get the nourishment and water that normal plants get in some other way.

Look closely at a bromeliad (which are common garden centre plants) and watch what happens when it is watered. Pour the water slowly in over the plant, not the soil.

You will find that the water ponds up in the middle.

Can you see how the pattern of the leaves makes this possible?

Bromeliads

Use the book *Rainforest life* to show children what bromeliads look like in a rainforest.

Ask them why they might be different in a garden centre (convenience of selling them, etc).

Get them to watch what happens when a bromeliad is watered.

Name:..... Form:.....

Rainforest life and Exploring the endangered rainforest

Keeping a rainforest alive in the holidays

You may think that rainforest plants need to have water all the time, and that is mainly true. So what will happen to your plants during the holidays? Will they all die?

If you were to visit a rainforest, such as the Amazon rainforest, you would find that much of the moisture in the plants is used to make the rain that falls back to the ground. That is, rainforest plants recycle much of their rainfall.

So you can do the same.

For very small plants you can put them in a small glass container and pop on a cork. That makes a self-contained system that will not need watering. It is called a terrarium. But if you have big rainforest plants, that will not do.

The idea is to keep the moisture in while allowing light to get to the plants. While you are away from school it does not matter if your giant terrarium does not look all that pretty, so have you any ideas?

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

Keeping a rainforest alive in the holidays

Looking after living things is an important teaching task. People often worry about plants when they go on holiday. There are two solutions you may want children to investigate.

What we have set out on the opposite page are the requirements: water supply and light. We are assuming the room will not be subject to frost.

There are many ways to do this. One is to put all of the plants in big tubs (at home people often put their plants in a bath and then fill it with an inch or two of water). This is not a close system, for the water will evaporate, but it will last for two or three weeks. Discuss with children why you might not want to fill the tubs up to the top with water.

Another solution is to water the plants well and then put them in a large dustbin bag, the white ones that are thin and let light through. Tie a knot in the top and you have a terrarium which will be fine for the plants, and as children will not be present, the fact that the bags are not very pretty will not be a problem.

If you have very big plants like bamboo, use sticky tape to put two bags together to make a tall cylinder.

Name:..... Form:.....

Rainforest life and Exploring the endangered rainforest

Adapting to their environment

As in all parts of the world, animals are adapted to their environment.

One of the most interesting animals in a rainforest is a chameleon.

Here is a picture of a chameleon:

Can you explain how it is adapted to catch its insect food? Talk about its colour, its eyes, its tongue and how it moves.

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

Adapting to their environment

There are more adaptations in a tropical rainforest than anywhere else.

The chameleon has many adaptations which are fascinating to children:

it remains motionless

it swivels its eyes

it is camouflaged

it has a lightning-fast long sticky tongue

Talk about how adaptation is both for attack and defence. Chameleons are food for snakes and other lizards, so the camouflage helps, as do the rotating eyes. Many animals look for movement, so being absolutely motionless helps, too.

Name:..... Form:.....

Rainforest life and Exploring the endangered rainforest

Rainforest clothes

I wonder what you would wear in a rainforest?

First, find out about the weather using the book *Exploring the endangered rainforest*. On page 6 of the book you can see the weather month by month.

Start with the temperature.

1. How hot is it compared with a summer's day in Britain (which might be 20°C in mid-afternoon)?
2. What would you wear in summer?

✎ .....

3. Would the same kind of clothes be suitable?

✎ .....

Now look at the rainfall.

4. What would you wear for the rain?

✎ .....

The weather is always humid, even when it is not raining.

5. What does humid mean and what happens to your body on a hot, humid day?

✎ .....

6. What happens to your clothes as a result?

✎ .....

How much cooling breeze is there in a rainforest?

7. So, now what is it like, and what might you wear? Write this down in your own words.

✎ .....

Now, on to a final point. Look at the book called *Rainforest bugs*.

8. Does that affect what you might wear? Write down why it might have an effect.

✎ .....

Rainforest clothes

In this activity, children use knowledge of the temperature, rainfall and humidity of a rainforest to work out what they might wear.

They have three factors to consider immediately and they each bring conflicts:

It rains a lot, so waterproofing might seem the right thing.

But it is very hot, and waterproofs in hot weather make you as wet inside as you would be if you did not have waterproofs on.

In a high humidity environment, your body regulates its temperature by trying to make you sweat and the evaporating sweat cools you down. So you want to have as much skin exposed to the air as possible.

So it turns out that a minimum of clothing is a good idea.

But then introduce the idea of rainforest bugs.

There is more on malaria in the next activity.

Name:..... Form:.....

Rainforest life and Exploring the endangered rainforest

Mosquitoes

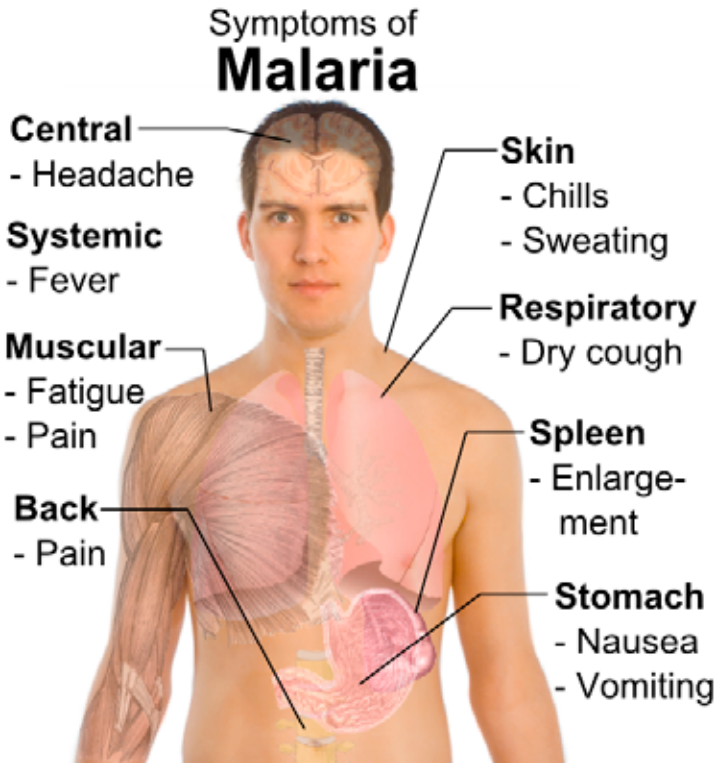
Have you ever heard the buzzing sound of a mosquito?

Mosquitoes in Britain are just a nuisance, but in other parts of the world they can be a greater danger.

Mosquitoes are found in tropical rainforests.

They are a carrier of a small organism that lives in the blood. This parasite is injected into humans when mosquitoes suck blood.

Malaria can cause death.



1. How could clothes help keep mosquitoes at bay?

   ✎ .....

   ✎ .....

2. When might you use a mosquito net?

   ✎ .....

3. When might you use an insect repellant?

   ✎ .....

You can also take (disgusting-tasting) pills to stop you catching malaria.

4. Of the people in a rainforest, who could afford to use these things, and who could not?

   ✎ .....

5. As a result, which people living in a rainforest are most affected by malaria?

   ✎ .....

Mosquitoes

This activity allows you to investigate health and well being. Children should know that malaria causes a wide range of debilitating symptoms. You might wish to go through them using the diagram.

Mosquitoes breed by laying eggs in still water. So the farther you are from still water, the less your chance of meeting a mosquito.

Ask children where most people live in rainforests.

You may wish to introduce these facts:

- About 3.3 billion people – half of the world's population – are at risk of malaria.
- Every year, this leads to about 250 million malaria cases and nearly one million deaths.
- People living in the poorest countries are the most vulnerable.

However, these figures need to be treated cautiously with regard to rainforests. Malaria affects all tropical countries, and most of these do not have rainforests. In fact the rainforest populations are low compared to other parts of the tropics. So here is a good example of helping children to sort out facts and not apply very simple facts without thinking the implications through.

Name:..... Form:.....

Rainforest life and Exploring the endangered rainforest

Watching animals

Where would you build an observation hut for tourists visiting the rainforest?

First, make sure you know about the main animals that people might want to see.

Here are some examples:

Parrot

Monkey

List some others.

Choose one of these animals and name your tourist house (for example) 'Parrot house'

Now decide where your hut should be.

Should it be on a mountaintop overlooking the forest?

Should it be on a river bank, or on a boat in the river?

Should it be on the ground ?

Should it be on a tree trunk half way up a tree?

Should it be among the tree tops?

Write down why you chose your location.

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

✎ .....

Watching animals

Here is an example of getting children to think about habitats.

Each animal has its own habitat. But when children see animals in zoos they might not realise that the environment they see them in is not natural at all.

So, ask children about habitats. It might be useful to start with local habitats. Where would you find a woodpecker, a badger and so on. Having established that the woodpecker and badger do not live in the same place, children can read the textbooks to find out what the habitats are of tropical animals.

From there they can decide where the hut should be. The point is, the children should have a scientific reason for making their choice, not just pluck a place out of thin air.

If you have more able children, you might also extend this idea because the food pyramid in a rainforest means that there will be more herbivores than carnivores. So it will be more productive (as a tourism manager) to encourage people to look at herbivores (parrots, monkeys and the like) because they are more numerous and so can be seen more commonly, than to look for carnivores (tigers) which have very large hunting areas and so are very unlikely to be seen.

You can take this further and ask whether there would be any point taking tourists to a hut at night, on the grounds that many animals are nocturnal. How would they see them? By turning on searchlights? By using infra-red cameras?

Name:..... Form:.....

Rainforest life and Exploring the endangered rainforest

Rainforest food

In a rainforest, nearly everything is food for something else.

Plant-eating birds eat fruits and seeds, eagles may catch small seed-eating birds and, when they die, vultures may pick over their bones.

This natural pattern of eating is called a food chain.

Can you make up a food chain and draw the animals in the space below?

Rainforest food

The rainforest provides an ideal opportunity to think about food chains and to explain the different types of living things that go to make all food chains. This is a cross-curricular link with science.

1. Explain the ideas of herbivores, carnivores and decomposers (help children to understand that carrion are carnivores that eat dead animals). Decomposers are all microscopic bacteria and similar organisms that release the nourishment in dead materials into soluble forms that will mix with soil water and be available for plant roots to use as fertiliser (nourishment).

2. Explain that the bottom of the food chain is made by plants.

The next part of the food chain is herbivores.

The next part is carnivores (which are at the top of the food chain).

Explain that, as things die and are not eaten, so they are decomposed, thus enabling the dead matter to be recycled. (Explaining about a compost heap will help this.)

Explain that plants get their food in soluble form mainly from decomposed liquid fertiliser released by microbial digestion – they do not get it from the rocky bits of the soil.

Explain that there has to be a balance between plants, herbivores and carnivores. There have to be more plants than herbivores. There have to be more herbivores than carnivores because, at each stage, plant or animal tissue is not converted straight into tissue of the eater, but mostly used as heat (feel your own body to prove this).

Make sure that the students get the right kinds of animals. A ground-dwelling animal is not going to catch a canopy one, for example. Also, one native to Africa is not going to catch one native to South America!

Rainforest life has many animals to choose from.