

Trees and forests: Teacher's topic guide

God is a Provider Year 5

Spiritual Awareness: We have responsibility to care for the creation

God has provided trees for us to use. We have been given the responsibility of caring for the land. This includes care of forests and the amazing variety of trees contained within them. Natural forests provide a home for a huge variety of plants and animals, many of which are on the verge of extinction. Rainforests contain a greater number and variety of plant and animal species than any other habitat on earth. Many are still unknown and many plants have potential healing properties yet to be discovered by medical science. Tropical rainforests are not only important to wildlife, but to the human race as well. The roots of the forest trees hold the soil in place, preventing soil erosion. The trees themselves have an effect on the climate, gathering clouds that produce rain. The trees also absorb carbon dioxide and produce oxygen. In spite of this, destruction of rainforests to satisfy man's greed continues at an alarming rate. Wise management of the land, including forest plantation, is a way in which God provides for our needs.

Our response to 'God is Provider'

Values: Our response to 'God is a Provider'

- **Thankfulness** to God for the things He provides, and thankfulness to parents for the things they provide
- **Generosity**: Sharing with others the things that God has provided

Outcomes: Students will

- identify different types of trees
- understand the value of wood as a natural resource
- understand the difference between wood from plantations and the rarer species of trees from rainforests
- appreciate the value of the rainforest to both human and animal life
- explain the threat facing the world's rainforests
- understand the effects of rainforest clearance
- understand the rainforest as a living community of plants and animals

Bible stories and passages

Matthew 25: 14-30 - The story of the talents is a story of responsibility with that which the Lord has provided for us.

Genesis 37-46 - God gave Joseph wisdom and used this wisdom in providing food for his family.

Genesis 1:11 - The land produced vegetation.

Genesis 1:28 – We are God's caretakers.

Genesis 2: 8-9 - Trees in the Garden of Eden.

Psalms 104:10-18 - God provides for His creation.

Psalms 147:7-9 - God gives food to every living creature.

Bible verses

Psalms 1:1-3 – Blessed is the man who does not walk in the counsel of the wicked, but whose delight is in the Lord. He is like a tree planted by the water side.

Psalms 92:12 – The righteous will flourish like palm trees; they will grow like the cedars of Lebanon. They are like trees planted in the house of the Lord.

1 John 5:14 – We are sure that God hears us if we ask Him for anything that is according to His will.

1 Peter 5:7 – Leave all your worries with Him, because He cares for you.

1 Phil 4:19 – My God will supply all your needs.

Key Questions

- How do trees provide for our needs?
- What would the world be like without trees?
- How do trees provide for the needs of other plants and animals in the rain forests?
- How long do some trees take to grow?
- What are the dangers facing the world's natural forests?
- What can be done to ensure that natural forests are not destroyed?
- How can we take care of forests and bushlands in our country?
- What did God mean when He asked Adam to rule over the creation?

Activities

a) Rainforests

- Identify the different layers of the rainforest: the upper and lower canopies, the emergent trees and the forest floor.
- Draw a diagram of a rainforest, showing layers.
- Explain the meaning of a canopy.
- Explain the battle for light as trees and vines grow upwards, chasing the light.
- Describe the plants growing in the different layers.
- Make a project on animals living in the rainforest.
- Describe the value of the rainforests to human life.
- Research the way of life of peoples of the Amazon rainforest, who manage to live in the forest without damaging it.
- Explain why people want to clear the forests, (agriculture, income from felling trees, dams).
- Describe the effect of this destruction upon the world's climate and upon plant and animal species.
- Make a study of an endangered rainforest species.
- Plot rainforests on a world map.
- Make a list of ways people can help prevent the destruction of rainforests.

b) Forestry

- List the different uses for wood.
- Make a collection of wood samples.
- Compare a forest plantation and a rainforest.
- Identify rare expensive varieties of wood that come from rainforests.
- Classify wood according to different qualities e.g. hard, soft.
- Test wood for properties e.g. Will it float? Is it easy to saw / hammer?
- Compare weights of wood samples.
- Classify and identify trees in the local area.
- Classify and identify types of processed wood such as chipboard & plywood.
- Make a list of things in the home made of wood.
- Identify buildings made from wood in the local area.
- Research the value of wood to early pioneers.
- Make an article from wood, e.g. rhythm sticks.
- Make paper.
- Make a collage using bark, sawdust, wood shavings.
- Use pieces of wood to make prints.
- Label the parts of a tree.
- Explain the way that water and nutrients travel from the roots to the tip.
- Explain how the leaves use sunlight and carbon dioxide to produce oxygen.

Beacon Media student research cards: 'Rainforests'; 'Trees'

Values education Year 5

God is Provider

Stewardship

Stewardship is ...

Being responsible for the property of someone else
Taking care of another person's property

Who is the owner of everything in the whole world?

In the beginning of Genesis, God creates everything and puts Adam in the Garden to work it and to take care of it. It is clear that man was created to work; and that work is the stewardship of all of the creation that God has given him.

God owns everything. We are simply managers, looking after what God has given us. We are all stewards of the resources, abilities and opportunities that God has entrusted to our care. One day each one of us will be called to give an account for how we have managed what the Master has given us.

What are we expected to do with these resources?

Like the servants in the Parable of the Talents, we will be called to give an account of how we have wisely used everything we have been given, including our time, money, abilities, information, wisdom, relationships, and authority.

What does the Bible say about stewardship?

Psalm 24:1 The earth is the LORD's, and everything in it, the world, and all who live in it.

Deuteronomy 8:18 Remember the LORD your God, for it is He who gives you the ability to produce wealth.

Colossians 3:23-24 Whatever you do, work at it with all your heart, as working for the Lord, not for men, since you know that you will receive an inheritance from the Lord as a reward. It is the Lord Christ you are serving.

Matthew 25:14-30 The parable of the talents

Matthew 25:21 Well done, good and faithful servant! You have been faithful with a few things; I will put you in charge of many things. Come and share your master's happiness!

Practical Science Year 5

God is Provider

Topic: Trees

How water travels through leaves

Materials for Leaf Experiment

- Leaves
- Scissors
- Clear cups
- Water
- Red food coloring

Procedure for Leaf Experiment

1. Start by taking a walk outdoors and collecting various leaves.
2. Snip off the bottom of each leaf stem. Then place each leaf in a glass filled about a third of the way with water.
3. Add red food coloring to the water, (a very dark shade of red will increase your chances of seeing changes in the leaves.)
4. Observe the leaves closely. (You can use a magnifying glass if you have one.) Record your observations of how they look on Day 1 of the experiment.
5. Observe the leaves for the next two days. Be sure to record your observations in the correct area on your observation sheet.

What's Going On?

You should notice the red color move slowly through the leaf.

The colored water was moving through the xylem tubes of the leaf. The xylem tubes of plants transport water and minerals up from the roots through the entire plant. (Their thick walls also provide support for the plant.)

Practical Science

Practical Science Yr 5

Topic: Trees: Leaves breathe

You will need:

- A glass or plastic bowl
- Lukewarm water
- A large leaf

Step 1: Fill a large bowl with lukewarm water

You can use a glass or plastic bowl. (Glass bowls are better as you'll be able to see the experiment from all angles. However, you will probably have the bowl outside so you may want to use plastic).

Step 2: Go outside and find a large leaf

You'll want to remove a leaf from a tree or plant and not just pick one up off the ground as we want an 'active' leaf for the project.

Step 3: Place the leaf in the bowl of water and put a small rock on top of it so it is FULLY submerged under the water. Then put the bowl in a sunny spot.

If you have a place inside that's very sunny, you can also try keeping the bowl there.

Step 4: Wait a few hours

Step 5: Take a peek a few hours later

What you should be seeing is small bubbles that form around the leaf and the edges of the bowl.

What's happening?

If you held their breath, went underwater and then let your breath out you would see bubbles coming up in the water.

That's what's happening here. The leaf is still using the sunlight as part of the photosynthesis process (where leaves convert sunlight to energy).

As a leaf creates that energy, it needs to get rid of the items it no longer needs so it will expel both the extra oxygen during photosynthesis along with water (the release of water from a plant is called transpiration).

The process of photosynthesis is what allows us to see the bubbles. As the leaf releases its extra oxygen while submerged, the oxygen can be seen as bubbles in the water.

And since oxygen is lighter than water, the bubbles will eventually rise to the surface.

Art Year 5

God is Provider

Topic: Trees and forestry

Biblical connection: God provides for his creation through the world of plants. Trees provide food, medicine, shade, oxygen and homes for animals.

Bible art as a wall display: Psalm 92:12 – The righteous will flourish like palm trees; they will grow like the cedars of Lebanon. They are like trees planted in the house of the Lord.

Construction

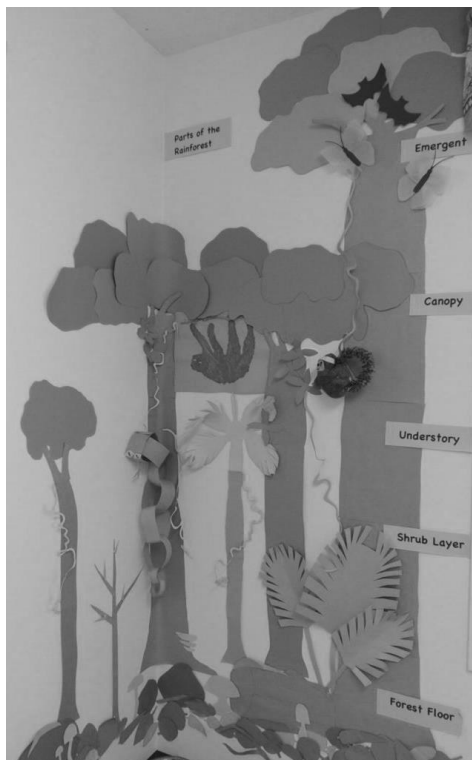
- Make something from wood.

Collage / painting / drawing

- Create a rainforest scene, adding cut-out plants and animals to a basic painted background.
- Make a collage or drawing of different shaped leaves.
- Paint a landscape that includes trees.

Printing

- Use pieces of wood, dipped into paint on sponges, to create a printed scene.



Trees 1

What does a tree need?

Did you know that trees can teach us about God?

A tree is very strong, but it needs a constant supply of certain things from God's creation in order to stay strong.

Draw a picture of a tree and show how it needs the following things:

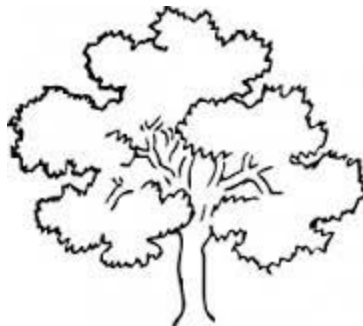
- Sunlight
- Nutrients from the soil
- Air
- Water

Sometimes, when there is a serious drought that goes on for a long period, a tree can die. A tree can also die if it gets too much water. If an area becomes flooded, and water surrounds the roots for a long time, the tree will die because the roots cannot get air.

To stay alive, a tree must have a constant supply of the life-giving resources from God's creation.

What does a tree need to stay alive?

What happens when a tree does not get the things it needs?



Trees 2

The Grape Vine

Jesus told us that as Christians, we are like trees. In order to stay alive in our relationship with Jesus, we must stay connected to Him. Jesus gives us the things we need.

Jesus is the living water. A tree needs water. We need the living water to keep our relationship with Him alive.

Read the story of Jesus and the Samaritan woman in John 4.

What is special about the water that Jesus gives? (verse 13)

Jesus said, "I am the Vine, you are the branches. A grape vine is a kind of tree. We have to stay connected to the strong part of the grape vine. Jesus is the strong part of the vine. When we stay connected to Him we will have eternal life.

Read about the Jesus, the Vine in John chapter 15.

1. What do we have to do to stay healthy in our relationship with Jesus? (verse 5)
2. What happens to those who do not stay connected? (verse 6)
3. What kind of life is Jesus offering?



Trees 3

A tree planted by the water

Psalm 1 says, "Happy are those who reject the advice of evil men, who do not follow the example of sinners. Instead they find joy in obeying the law of the Lord, and they study it day and night. They are like the trees that grow beside a stream, that bear fruit at the right time, and whose leaves do not dry up. They succeed in everything they do." (GNB)

1. What do you think the water in the stream represents?
2. What are the benefits of having your roots on the bank of the stream?

Psalm 92:12-14 says, "The righteous will flourish like palm trees; they will grow like the cedars of Lebanon. They are like trees planted in the house of the Lord, that flourish in the temple of our God, that still bear fruit in old age, and are always green and strong." (GNB)

3. Name two trees mentioned in these verses.
4. What are the benefits of being planted in the House of the Lord?



Trees 4

Parts of a tree

1. Make a drawing of a tree big enough to fill half a page. Write the names of all the parts. Use arrows. Here are the names of the parts of a tree.

trunk roots leaves branches bark twigs

2. There are some parts of the tree that we only see sometimes. Add these to your drawing

- fruit
- nuts
- sap
- berries
- cones



Trees 5

The leaves

The leaves have a special work to do. They make food for the tree. They use sunlight and water and a special gas called carbon dioxide from the air to make sugar. We can see this sugary food on trunks sometimes. It is called sap. It looks like syrup. The leaves have another important job to do. They give out oxygen to the air.

1. What is the special job of the leaves?
2. What do the leaves need to make the food?
3. What does the food look like?
4. What else do the leaves do?



Trees 6

The roots

The roots have a special work to do. They hold the tree in the ground. They also take water from the ground and send it up to the leaves. The leaves need water to make food.

The trunk

The trunk has a special work. It carries food and water up and down the tree. It has little tubes that act like the veins and arteries in our bodies.

The branches

The branches have a special work. The leaves fruit, flowers and nuts grow on them. They must be strong!

Why are the roots important?

What does the trunk do?

What is the job of the branches?



Trees 7

Festival of Fruits

The Jewish people have a festival each year to celebrate the fruits produced by their trees. When a tree matures it produces its first fruits.

Jewish people give thanks to God each year for the first fruits of the trees of Israel. These fruits are oranges, raisins, figs, dates and carobs.

The festival is called Tu B'Shvat. They recognize the importance of trees by planting new trees planting in the desert areas. The children are told this story, to help them understand how important trees are. Here is the story:

The king was riding through the countryside, when he noticed an old man planting a tree.

"What are you planting?" he called.

"A carob tree," replied the old man.

"How long will it be before your tree bears fruit?" asked the king.

The old man shrugged his shoulders. "Maybe seventy years," he replied.

"And how old are you?" the king said.

Seventy years old," was the answer.

"Do you expect then, to eat the fruit of that tree you are planting?"

"Oh no!" answered the old man.

"But I when I was young there were many fruit trees and plenty of fruit for me to eat. The trees were planted by people in the past. So I plant trees, so that my children's children may eat fruit too."

What can we learn from this story?

Trees 8

Trees of the world

Trees grow all around the world.
Some trees grow where it is hot. Some trees grow well where it is cold.

Many countries have summer and winter seasons, where it is hot in the summer and cold in the winter. It would be too cold for the leaves of many the trees to stay green. So these leaves turn yellow, red and brown before winter, and fall to the ground. Then the tree has no leaves for the winter. But that is alright, because when the spring comes, the tree grows new leaves. God has made it that way.

There are some trees that grow perfectly well in the snow. These are pine trees. They have thin needles that can survive the snow. They do not lose their leaves. You have probably seen a pine tree. A Christmas tree is a pine tree.

Leaf shapes

Trees have leaves of many different shapes.
Draw some different shaped leaves.
You could also do some leaf rubbings.

Draw a pine tree.
Draw a tree that has lost its leaves for the winter.
In which country might you find this tree?



Rainforests 1

Student activities

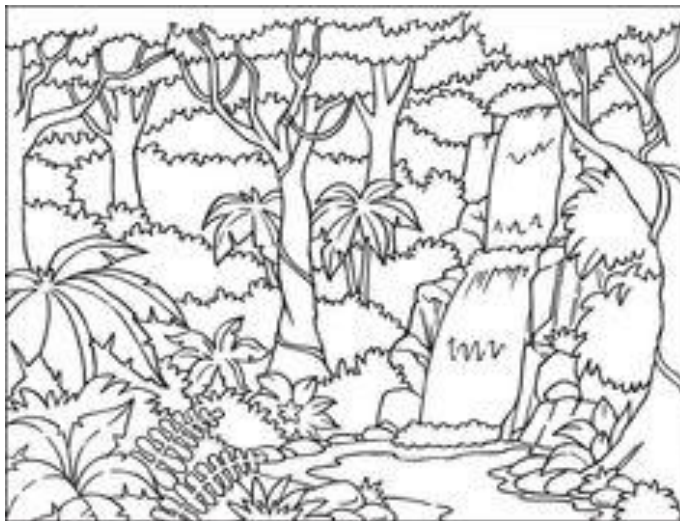
What is a Rainforest?

On the outside, a rain forest has a wall of about 6 metres (20 feet) thick that is made of a tangle of vines that love light.

This wall is very thick on the outside and it looks as if the whole jungle is this thick. But inside this wall you will find animal paths or a stream to follow. It is like entering another world.

Once you're inside, you can look up and see a tree canopy that's as high as a 17 storey building!

It's fairly dark inside the canopy. Only 1% of the sunlight ever actually gets to the floor of the forest because of the tall trees above. And moonlight, even a full moon, doesn't get through at all.



1. What makes up the outside wall of a rainforest?
2. What might you find inside this wall?
3. Why do you think it is dark inside the rainforest?

Rainforests 2

Plants of the rainforest

Draw a picture showing these plants:

- **Trees** grow tall as they push their way up to get the light.

The tallest trees in the rainforest grow up to 60 metres (200 feet) high. The tall trees that poke through are called the "*emergents*". They make an umbrella that can cover an entire acre.

The soil on the rain forest floor is rich in nutrients, but only 100 cm (4 inches) deep with red clay beneath it. This causes the trees to have very shallow roots. That's why many tall trees have buttresses or extra trunks supporting the first one around the bottom. These *buttresses* help stabilize and hold the tree up, like a set of crutches.

- **Stranglers** are plants that grow on a tree as a parasite plant.

The stranger plant grows up the tree and the tree dies. The strangler plant tree now keeps growing around the dead tree.

- **Vines** grow around and around other trees. They use little hooks called tendrils to hold on to trees.

- **Tree ferns** grow out from trunks of trees to catch light and water. They have broad leaves, which grow into the shape of baskets. They can catch water in the baskets.

- **Lichens, mosses and fungi** grow on other plants. They grow on trees to get sunlight.

Rainforests 3

Layers of a rain forest

Rain forests have different layers that support different animals and insects. Some plants and animals live in specific layers, while others live and feed wherever they can.

EMERGENT LAYER

The tallest trees are the emergents, growing high as 60 metres (200 feet) above the forest floor with trunks that measure up to 5 metres (16 feet) around. Most of these trees have broad-leaves. Sunlight is plentiful up here. Many animals can be found here.

CANOPY LAYER

This is the main layer of the forest and forms a roof over the two remaining layers. Most canopy trees have smooth, oval leaves that come to a point. Many animals live in this area since food is abundant.

UNDERSTORY LAYER

Little sunshine reaches this area so the plants have to grow larger leaves to reach the sunlight. The plants in this area seldom grow to 4 metres (12 feet). Many animals live here

FOREST FLOOR

It's very dark down here. Almost no plants grow in this area. Since hardly any sun reaches the forest floor things begin to decay quickly. A leaf can decompose in just 6 weeks.

Draw a rainforest showing the different layers.

Rainforests 4

People of the rainforest

Some very interesting people live in the rain forest of Papua New Guinea. They are called the *Huli Wigmen* tribe. The men of this tribe wear large wigs of matted human hair, that they grow themselves. They must stay in a special "school" in the forest for up to three years while their hair grows. This school is a group of huts in the rain forest surrounded by tall wooden fences. Every day the men sprinkle special water on their hair and use twigs and rope to shape the wig. Once it has grown bushy enough, they shave their heads. Then they use natural dyes found in the rain forest to colour their wigs red or black. They decorate them with flowers, leaves, shells, bones, feathers, and fur that they also collect from the rain forest.

Many of them have two wigs, one for wearing every day and one for ceremonies. When they dress up, they paint their faces with juice from berries and rub pig fat over their bodies. Then they put big bushy leaves in woven belts to make a skirt and dance in a big circle. They'll usually invite other tribes from the area to join them. The wigmen can be very fierce, so these dances are a good way to build friendships with other tribes.

1. Where do the wigmen live?
2. What do the wigmen do at their school?
3. What are the two wigs used for?

Rainforests 5

Where are rainforests found?

South America, Central Africa, India, South East Asia, Papua New Guinea and the South Pacific Islands.

Rainforests of the South Pacific

South Pacific Islands with rainforests are:

American Samoa, Cook Islands, Fiji, French Polynesia, Niue, Samoa, Tonga, Wallis and Futuna Islands

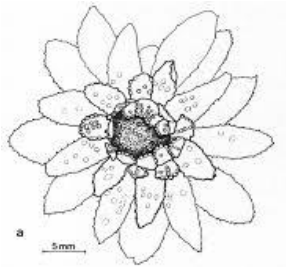
Draw a map of the South Pacific and name the islands with rainforests.



Rainforests 6

Rare plants of the Fijian rainforest

In Fijian rainforests you can find a species of tree called Degeneraceae. This is a flowering tree related to magnolias, and only grows in Fiji. Look at the pictures below and draw a picture of this tree.



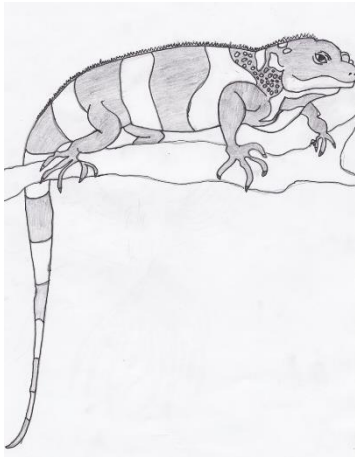
The Fijian rainforest is also a home for different kinds of orchids. They come in pinks, purples and yellows. Draw some of these.



Rainforests 7

Animals of the South Pacific rainforests

- Iguanas, including the Crested Iguana (now endangered)
- Orange dove
- Red shining parrot
- Fruit bats including the Fijian monkey-faced flying fox
- Snakes
- Geckos
- Frogs



Banded Iguana (green and blue)



Crested Iguana (blue or green)

Draw and name five animals of the Fijian rainforest.

Rainforests 8

Our vanishing rainforests

The world's rainforests are currently disappearing at a rate of 6000 acres every hour (this is about 4000 football fields per hour). When these forests are cut down, the plants and animals that live in the forests are destroyed, and some species are at risk of being made extinct. As forest trees are cut down on a large scale, the balance of the earth's eco-system is disrupted.

We need the rain forests to produce oxygen and clean the atmosphere to help us breathe. We also know that the earth's climate can be affected, as well as the water cycle. Rainforests also provide us with many valuable medicinal plants, and may be a source of a cure from some deadly diseases.

As a world community, we must be careful not to destroy the resources that people will need in the future.

Many animals are illegally taken from rainforests and sold in other countries. Parrots and iguanas, for example, are often imported illegally. We should not buy these animals, since that encourages other people to bring in more animals.

Many products, such as rubber, coffee and timber come from rainforests. Rainforests are cut down to harvest the timber and also to make room for farms to grow coffee and spices. Each of us needs to be thoughtful about the way we consume these products. Recycle and re-use whenever possible, and help keep the earth green and healthy.

*Why are rainforests so important?
How can the world's rainforests be protected?*