

What do mangroves mean to you?



Many people see mangroves as unpleasant, muddy places with too many mosquitoes. They take up space that could be used for fish ponds and the wood is useful for building, so mangroves are often cleared. Other people, who know more about them, see them differently. What do you think? This activity is all about sharing your ideas and opinions.

What you need

- A chalk board, white board, or large sheets of paper, markers and an eraser
- Your brain

What to do

- Divide the board down the middle
- Write the title “Good things” on one side of the board and “Bad things” on the other
- Think up words about mangroves. Take turns to write them on one side of the board or the other.
- Discuss your words with your teacher and your friends. If you decide any are wrong, cross them out, erase them or even move them to the other side!
- If you think of new words as you go along, add them too!
- When you run out of ideas, count up the words on each side and see which list is longer.

More things to do

- Repeat this game when you have learned more about mangroves. Did the results change?
- Make some posters about mangroves explaining why they are important to us.
- Play this game again, but talk about a different kind of ecosystem.

A visit to the mangroves



Mangroves are unusual trees which are suited to growing in salt water. They form forests along the shore in sheltered coastal areas. As the mangroves start to grow their roots cause the water that flows between the trees to move more slowly. When water flows slowly, any sediment begins to sink out, so fine mud collects around the base of the trees. The fine sediment blocks out any oxygen, so many mangroves have special roots called **pneumatophores** that stick up into the air. A mangrove forest is

also known as a **mangal**. This is a very different habitat from an open sandy beach! Many small animals survive by hiding between the mangrove roots, including small fish. Mangroves are sometimes described as nursery areas where young fish can grow in safety.

The mangroves are best visited at low tide. Be careful where you walk in the sticky mud. You will find the air is still and humid among the trees, ideal for sand flies. Wear an old long-sleeved shirt if they bother you!

What you need

- Suitable old clothing
- Trainers or boots to protect your feet
- Key to mangroves
- Pen and paper
- Plastic bags
- Tide tables

What to do

- Check the tide table to find a good time to visit the mangroves. If you don't have any tide tables then note what time the tide is lowest the day before you go, and plan to get to the mangroves an hour later.
- Use the key on the next page to try and identify the mangroves. If you have a field guide then use that too, but don't just look at the pictures.
- Collect a few leaves and flowers from each type of tree and place them carefully in a plastic bag. Make sure you can remember which leaves came from which tree!
- If you have a camera you could take a photograph of each tree as well.
- Walk from the low tide mark up towards the top of the beach. Are the trees all the same? Keep a note of any birds or other animals that you see.

Be careful walking around the mangroves, it can be very slippery! !

Further work

- Try pressing the mangrove leaves and flowers. Follow the instructions for pressing algae from the "On the Rocks" section. You won't need to float them in water or change the paper as often!
- Make a display of your pressed mangrove leaves and photographs.

Key to Indian Ocean mangrove species

1. Leaves large (longer than 10 cm) 2
 Leaves smaller than 10 cm 6

2. Leaves much longer than they are wide (elliptical) 3
 Leaves thick and rounded, very dark green, almost as wide as they are long. Tree up to 12 m tall with thick, stumpy vertical breathing roots (pneumatophores). *Sonneratia alba*

3. Leaves pale green and shiny, the underneath paler still and with tiny hairs and salt crystals. Trees tall, up to 30m with large numbers of conspicuous, flexible pneumatophores. *Avicennia marina*
 Leaves dark green and shiny on upper surface 4

4. Leaves very large, up to 20 cm, whitish underneath. Trees up to 35 m tall with no aerial roots or pneumatophores. *Heritiera littoralis*
 Leaves not whitish underneath. Trees with conspicuous stilt roots or buttresses. 5

5. Leaves dark green and pointed with a spine at the tip. Trees up to 20 m tall with very conspicuous prop or stilt roots up to 3m long. *Rhizophora mucronata*
 Leaves dark green and pointed but with no spine. Base of trunk with pyramidal buttressing. *Bruguiera gymnorhiza*

6. Leaves very small or compound (small leaflets in groups of 2, 4 or 6) 7
 Leaves up to around 8 cm 9

7. Leaves very small but quite thick, only 1-2 cm long and not arranged in groups of 4 or 6. Plant is a smallish bush or shrub, 1-5 m tall with many slender branches. *Pemphis acidula*
 Small compound leaves composed of groups of up to 6 on a shared stalk. 8

8. Leaves sharply pointed. Tree up to 6m with ribbon like roots. *Xylocarpus moluccensis*
 Leaves not sharply pointed. Trees up to 10m with ribbon like roots. *Xylocarpus granatum*

9. Leaves yellowish green, about half as wide as they are long. Tree up to 7m tall with small buttress and “knee” roots poking up from the sediment. *Ceriops tagal*
 Narrow leaves arranged in a spiral around the stem. Tree is a small shrub up to 3 m tall with no conspicuous roots. *Lumnitzera racemosa*

Mangrove food webs



This crab-eating frog is the only salt water amphibian in the world!

All ecosystems depend upon **energy**. Energy comes from the sun and is trapped by plants to make food. We refer to the amount of energy captured by plants, as '**productivity**'. **Herbivores** feed on marine plants, small **carnivores** eat the herbivores, larger **predators** hunt the smaller ones and so on. Long **food chains** are formed, together making up a complicated **food web**. Some energy is transferred from level to level in food chains as one organism eats another but much of it is used up. This means the chains rarely have more than 4-5 levels because so little energy is left. There may be millions of tiny plants at the bottom of the chain, but there are very few large animals at the top as there just isn't enough for them to eat.

Weave a tangled food web

- Make picture cards of the sun, plants and animals that live in the mangrove.
- Find out where all the organisms get their energy (who do they eat?!) and who eats them.
- Give everyone some pieces of string about 3m long.
- Hold up your card so that everyone else can see it .
- Tie a piece of string between yourself and anyone who you eat, or anyone who eats you. Don't forget that all the plants use the sun for energy, even if they don't eat it...

Pick someone and have them walk along the strings from person to person telling the story of who eats who, and what happens to all the energy in the food chain!

What happens if someone in the food web disappears?

For a really fun version of the game, don't just make a card, make a costume!

Make a mangrove food web wall

- Put all of your pictures up on a wall and add big arrows to show who eats who.
- Put the producers at the bottom and the carnivores at the top.

Mangroves in the past



Mangroves are being lost and in some places are no longer there at all. Someday they may be restored, but what if no one remembers all the old ways in which they were used? Your parents, grandparents, aunts or uncles may still remember how mangroves were used. In this activity you will make a record so that people in the future can remember. You don't need to visit museums for this – the clues are all around you! In this activity you will also consider how we use mangroves today.

Compile a mangrove scrapbook

- Interview older family members and/or neighbours. Do they have anecdotes about how mangroves were used, such as medicinal uses or fishing?
- Find out where mangrove wood has been used in your area. Has it been used in the building of your house? Is your furniture made from mangrove timber?
- If you have a camera, include some photographs.
- If you have a tape recorder, you could record people talking about mangroves.
- Compare your scrapbooks and store in a safe place as an important historical record – remember to date it!

Mangrove role play



Before you start this activity, you need to understand the importance of mangroves to wildlife and people. If you have created a scrapbook of past and present uses of mangroves, that would be useful reference for this activity. You can also use the information you gathered for your mangrove food chain games, or perhaps your food web wall.

This is a role-playing exercise, you will pretend to be someone involved in a decision as to how to use a mangrove. Try to imagine how that person would feel or behave and to act like them – even if you think they're horrible or you don't agree with them. If we try to put ourselves in other people's position it helps us to understand them and perhaps to make important decisions!

The scenario

A hotel/industrial/airport development (pick something relevant to your area!) is proposed for the area and the mangroves will have to be cut down. The development will bring jobs and money to the area, but some people are opposed to it and want to protect the mangroves. A public meeting is to be held, where the local community will vote and decide whether the development will be allowed.

The following people come to the meeting:

- The developer – a businessman
- A local politician in favour of the development
- A local politician against the development
- A local schoolteacher
- A fisherman
- An unemployed person
- An old woman
- A hotel owner

Perhaps you can think of more people who should also be there! Pretend to be one of the people on the list and hold a meeting to decide whether the development should go ahead or not. Make sure everyone gets a chance to speak!

Remember, say what you think that person would really say and use what you have learned about mangroves to make really good arguments.

Take a vote at the end!

Mangroves quiz

1. Where do mangroves grow?
2. What is another word for a mangrove forest?
3. What do buttress roots do?
4. How do mangrove roots get oxygen?
5. How many species of mangrove are there in the Indian Ocean?
6. Which mangrove has salt crystals on its leaves?
7. List three ways in which people can use mangroves
 - i.
 - ii.
 - iii.
8. True or false? Mangroves are a dangerous place for young fish
9. True or false? There are more mangroves than there used to be.
10. True or false? The mangrove is the national plant of Australia.