Theme 8. Trees

Teacher guide - Ages 8-10

Preparation

Review the materials and watch the videos. Do some preparation on the topic. For the Outdoor Experience some materials are required (see Materials section below). Feel free to add any resources or materials you have available to enrich the lessons. Also check the *Introduction lesson Teacher guide* for useful tips and suggestions for preparing and giving the lessons within a theme.

Learning Goals

The students …

- know the difference between trees and a forest.
- know how trees 'work'.
- know why trees and forests are important.
- know what problems deforestation causes.
- know why trees are important for our climate.
- know what you can do to help the climate.

Key Vocabulary

- evaporate
- stomata
- cooling down of
- the atmosphere
- recover
- forest fire
- burning of
- season
- rainforest
- fuel
- deforestation
- foliage
- oxygen
- CO_2
- sprout
- seedling
- germination (or sprouting)

Introduction

[Slides 3 - 4]

Hold up a piece of paper, show it to the students. Write a word or sentence in the middle of the page. Scrunch up the piece of paper and throw it in the (recycling) bin.

Allow the students to react briefly.

- *Why is it a shame to just throw a piece of paper away?*

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- *What is paper made from? (Paper is made from wood, such as reeds, or recycled (old) paper.*
- *Retrieve the piece of paper you threw away. How can you be more economical with paper? What could you do instead of throwing it away?*

For example:
- *Use less paper (what can you use instead of paper?), share paper or use both sides.*
- *Look around the classroom. What things are made of paper?*
- *Is used paper picked up from school and your home? What happens to that paper then?*

After this, discuss the learning goals of this theme.

Instruction

[Slides 5-9]
Problem
Show the picture of the tree, or of your own favourite tree. What strikes you about this tree?
Ask some questions:
- *What do you know about trees? (How do they come to be? How do they grow? Where do you find them? What types of trees do you know?)*
- *What animals live in trees? (for example birds, insects)*

Explain that this lesson is about trees and forests.
Examine the parts of a tree by completing Exercise 1. Discuss as a class.

Trees are not only the largest and tallest living things on Earth, they are also the oldest.

You can tell how old a tree is from the number of rings inside it. But can you also see that from the outside? Watch the film and discuss afterwards.
How can you tell how old a living tree is? For example, by measuring the circumference of a tree you can estimate how old it is.

Complete exercise 2.
This tree in California is nearly 5,000 years old. It is called Metusalem, named after the man in the Bible known for having been so old.

[Slides 10-13]
Complete exercise 3 and discuss it together.

In a forest there are not only trees, but also plants and flowers, animals and insects. Trees can stand alone or in groups. But, a group of trees is not automatically called a forest. To be able to call it a forest, the group of trees needs to be about as big as a football field.

Discuss with the students what a sprout and a seedling is. *Here you first see a sprout: a young plant, coming from the seed. As soon as the first leaf appears, you call it a seedling. A seedling is a miniature plant or tree grown from seed.*
Watch the film.

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*Trees are not only nice to look at, they are also hard workers. They are like small factories. They change **sunlight, carbon dioxide (CO_2)** and **water** into **oxygen** and **sugar** (glucose). That way they can feed themselves.*

[Slides 14-17]
Watch the video about photosynthesis.

Because trees take CO_2 out of the atmosphere, they are very important for the climate. They help stop global warming, and provide oxygen and clean air.
Also, their roots retain (hold) water. Because of this, water stays in the ground. That way there is less flooding and water is kept in the ground. People and animals then have enough water to drink. People cannot survive without trees.

Yet, there are more reasons why trees are important. Complete exercise 4 and discuss it together afterwards.

Trees and forests give us clean air, healthy soil and provide a home and food to plants, trees, insects and animals. People also eat the fruit from trees.

[Slides 18-22]
Explain that trees are cut down for different reasons. For example, to make room for other trees to grow, or if a tree is sick. Trees are also cut down to make products of use. Ask the students to look around the classroom and point out what is made of wood. After that, look at the picture on the interactive whiteboard.
There are many more examples. What other things do you use that are made of wood?

People cut down trees for wood. They use it to keep themselves warm (fuel) and to make things with it. Trees are also cut down because people want to use the land for something else. For example, to build houses or for farming.

Because the population is growing, there is more need for wood and paper. Also, we need more farmland. Worldwide there is more demand for products like palm oil and soya. Soya is grown in a lot of countries in South America. It is used to make, for example, animal fodder (feed). But to do this, entire forests are chopped down.

Complete exercise 5 together.
Deforestation means that large forest areas are disappearing, due to humans. The trees are being cut down or burned.

In some areas, like South America and Indonesia, there is a lot of deforestation. According to the World Wildlife Fund, a football field worth of forest is lost every two seconds.

Complete exercise 6 and discuss it together.
Fewer forests means more CO_2 remains in the air. Then the Earth warms up and animals become threatened.

A solution
[Slides 23-26]
To help the climate we must:

- *emit less CO_2, for example, by cycling more, using the car less, flying less*
- *prevent food waste and buy fewer things (and reuse things).*

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- *take care of the forests (restore forests)*
- *cut down and burn fewer forests*
- *provide more greenery and plant trees.*

Do the students see the paradox between cutting down and planting trees?

The German Felix Finkbeiner started to plant trees at 9 years old. Felix is now 18 and with his organisation Plant for the planet, they have planted more than 14 billion trees !

Watch the film.

Planting trees is a good way to help the climate. Yet, you can't just plant a tree anywhere. There are rules about where you can plant trees and you need people who have knowledge about this. *Trees need to have enough room to grow and need to be planted in the right place. The right tree in the right place!*

What can you do?
[Slide 27]
A green environment is healthy!
How could you make your environment (schoolyard, house, street) greener?
Students write down their ideas and exchange. Think of plants on your balcony, in the garden, by your front door.

Suggested related themes

Preferably, do the theme climate change prior to this lesson. This lesson is linked to the theme of climate change: trees help combat climate change. The lesson also connects to other themes such as water, air, waste and recycling.

What is CO_2?
The layer around the Earth consists of greenhouse gases. Gases such as CO_2, but also methane and water vapour. Because of these gases, some of the heat from the sun stays within the atmosphere. Without these gases it would be far too cold on Earth.
But humans also emit greenhouse gases, for example from factories and cars. And that's where it goes wrong. More and more CO_2 is being released into the atmosphere and this is causing the Earth to warm up too much.

Worksheet

[Slide 28]
Complete the worksheet. Discuss the exercises on the worksheet. Note excercise: Forests don't work exactly like lungs, but the comparison is often made.

Practical Assignment

[Slide 29]
Take a picture of a tree in your neighbourhood.
Do you know what type of tree it is? Try to find out some interesting facts about this tree (for example on the internet) and write them down. Plan a circle moment in which everyone can briefly present their tree.

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Long-term tip: Keep following the tree through different seasons. Take a picture of the tree each time. What changes do you see?

Closing

[Slide 30]
Discuss the worksheet exercises and learning goals. Let the students exchange and talk about their green surroundings drawings. Then agree with the students how and when they can continue working on their practical assignment.

Outdoor Experience

[Slide 31]
Take a walk in your neighbourhood with the class or parents / caregivers. Make a list of the plants and animals you see.
You can map out a 15~30-minute route in advance, with a few areas with a lot of greenery. The students could also have a sort of card with them (e.g. like a bingo card) in which they can note all the things they encounter.

Extras

[Slides 32 - 37]
Game: Hangman

Game: Tree tag
You can play this game in an area with some trees, e.g. a park or a forest. Depending upon the number of trees, agree upon the number of students that can stand by a tree. It is important that each student can touch the tree trunk with at least one hand. Then choose who is 'it'. Explain that the signal that everyone has to change trees is when you clap or whistle. You are only safe when you are touching a tree. If the maximum number of students is standing by a tree, the student has to find another tree. The student who is 'it' tries to catch all the students who are not standing by a tree. Students who have been tagged come and stand by you.

When the students have grasped the game, you can add the following variations:
- Variation 1: start with more than one 'it' (tagger)
- Variation 2: Students that have been tagged, become 'it' too
- Variation 3: When a maximum of three students is standing at a tree, if a fourth student arrives, the student who has been standing there the longest needs to find another tree.

Choice task
Let the students choose from one of the following exercises:
1. Write a story or poem
Write a short story or poem (half a page) about what a tree has gone through during its life. Really try to put yourself in the shoes of the tree. For example, try to think about what happens to the tree during different seasons or what happens around the tree.

2. Tree proverbs.
There are quite a few proverbs with the word tree in them. Look up proverbs with the word tree in them. Write them down and write down what the proverbs also mean.
Can you think up your own proverb with the word tree in it? Let the other students guess what your proverb means.

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Extra films.

Materials Required

For the introduction some paper is required. You could also bring along some things made of wood.
Outdoor Experience: A prepared walking route is useful if being done as a class. You can also make a bingo-type card for students to note the plants and animals.

Theme 9. Trees

Answer key - Ages 8-10

Exercise 2

Write down at least three reasons. For example:

- *for the climate*
- *cleaner air*
- *taking in CO_2*
- *oxygen*
- *habitat for animals*
- *retains water*

Exercise 3

A. They are the Earth's lungs.

Forests and jungles are also called the Earth's lungs (this is also said about the oceans).

Exercise 4

Less CO_2 storage (or more CO_2 in the atmosphere), less oxygen, loss of forests and trees from which they exist, also important because they are home to many sorts of plants and animals.

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