



ECO₂ Smart Schools COP30 #ECO2COP30

Lesson 2- Deforestation and Climate Change

This lesson is aimed at children aged 11+ years and confident English speakers. This document should be used in conjunction with the lesson PowerPoint slides, '*Lesson 2 Climate change impact cards*' and '*Lesson 2 Species sheets*.' A pen and paper/ exercise book will be needed, and a calculator may also be necessary for working out how much carbon your tree has absorbed. Please upload any work you complete this lesson to our 'Padlets' (links at the end of this document), so we can share our learning with schools around the world.

Trees that matter to us

Slide 2: If you or any of your class managed to take a picture of a tree last lesson please upload it (or them!) by [Clicking here](#). You can also add a short description of why this tree was chosen or why it is important to you. The reason can be anything you like such as 'I used to climb this tree,' 'I like to sit in the shade of this tree,' 'I see this tree every day.' Have a look and share with your students what other learners have added.

Carbon Storage and Photosynthesis

Slides 3-5: Recap the process of photosynthesis from last lesson so it is fresh in your students' heads, as we are going to talk about its role in carbon storage today.

Ensure that students understand the link between photosynthesis and the enhanced greenhouse effect- that the more trees we have storing carbon on Earth, the less carbon dioxide is going into our atmosphere and warming our planet.

How much carbon does your tree store?

Slides 6-9: If you or your students managed to measure the circumference of your tree, use the next few slides to work out how much carbon the tree stores and how much carbon dioxide it has absorbed in its lifetime. A calculator shouldn't be needed to work out how much carbon your tree stores but may be necessary to work out how much carbon dioxide it has absorbed. Use the closest circumference to your measurement on the to work out the tree's dry weight. Divide the dry weight by 2 to work out how much carbon the tree stores. Multiply this answer by 3.67 to find out how much carbon dioxide it has absorbed in its lifetime.

On average a person in the UK uses 10,000kg worth of CO₂ in a year (around double the world average). How many trees would it take to offset your students' CO₂ usage? Is their tree enough? Ask students to think about how much carbon one tree stores compared to all of the trees within its area (park/ street/ school grounds), how much carbon do all of these trees absorb and store? Is it enough?



Why do we cut down trees?

Slide 10-13: Ask students to think of as many reasons as they can as to why we cut down trees. If students are struggling to think of ideas, use the pictures to help. Are these good reasons or bad reasons to cut down trees? Why? Do your students know what the largest cause of deforestation is globally? The primary reason is agriculture, more specifically cattle farming. Do they think this is necessary or not? Ask would happen if we stopped cutting down trees.

Show students the world map showing annual deforestation in 2015 (point out that the map is a little outdated!) Think about the reasons we have mentioned about why we cut down trees- why don't all countries cut down the same number of trees? Some countries (like Brazil) still have large areas of forests left to cut down, other countries (like the UK) have already cut down the majority of their forests. Some countries also rely more on cutting down trees to support their economies, e.g. Brazil is the world's leading beef exporter and cattle farming is a major source of income and employment, whereas the UK's economy is heavily reliant on the service sector. Ask students to compare the reasons why these countries have cut down their forests.

What are the impacts of deforestation?

Slides 14-16: As a class, discuss the social, economic and environmental impacts from around the world. This should link in heavily with what students learned about why trees are important. If we cut down trees, we lose the benefits they bring us. However, there must also be benefits to cutting down trees or we wouldn't do it. Ask students to think about the links these impacts have on each other, for example, if we cut down an area of forest, a farmer may be able to raise more cows and make more money (an economic impact), if the farmer makes more money, their quality of life will likely improve (a social impact). Students should consider the costs and benefits of deforestation and how the impacts are not isolated but interconnected. These are the things decision makers such as governments must think about when creating policies about deforestation and other issues.

Allow the students to work in pairs and hand out the '*Lesson 2 Climate change impact cards.*' Give each pair one card and give them 30 seconds to 1 minute to discuss what they think the impact is, how it is caused by climate change, and who will be impacted by it. After 30 seconds to 1 minute, ask the students to pass along their cards and discuss a new card. Swap a few times and then ask students to feedback answers on the card they currently have. (The impacts shown on the cards are: Sea level rise, melting glaciers, drought, wildfires, coral bleaching, flooding, increased spread of disease, water insecurity, increased storms and hurricanes, food insecurity, increased temperatures, displacement, fewer fish, species extinction).



Impacts of climate change on the world's biomes

Slides 17-25: The world can be classified into 5 major climate zones shown on the map on slide 17, based on their temperature and precipitation.

There are many factors which will influence an area's climate zone and therefore it is not as simple as seen in the first map. Slide 18 shows a more complex classification of the Earth's climate zones based on the Köppen Climate Classification. The climate of an area has a direct impact on its biome and the species which live there.

Ask the students if they know which biomes they would find at each letter on the map. If needed, give the students a list of answers to match with the letters (Polar, Tropical Rainforest, Temperate Forest, Hot Desert, Tropical Grassland). When looking at the answers, discuss the types of plants and animals found in these areas- how are they adapted to live there?

What would happen to the biome if the climate changes (remember climate change is not just about temperature, but about precipitation as well, i.e. hot deserts will become hotter and drier) and what would happen to the species that live there?

Some species might be able to migrate to new areas as the world's biomes change, however, for some species this will not be possible (for example polar bears need ice to hunt, coral can't move) and some species are keystone species, so their loss would have a huge impact on their biome (such as bees).

Divide the students into groups and give each group a sheet from the 'Lesson 2 Species Sheets.' Ask one student in each group to use the sheet to teach the other students about how their species is adapted for its environment and how it will be affected by climate change. Then ask one student from each group to come up and teach the rest of the class what they have learnt.

Ask students to consider what the world will be like if deforestation and climate change continue. Ask the students to draw a picture on one side of a folded piece of paper of a world biome (you could ask them to draw whichever biome you live in). Then ask them to draw what they think the biome will look like in the future. Ask students to label their pictures with their ideas.

Next Lesson and Sharing Our Learning

Slide 22-23: The next lesson will think about the future and what is currently being done about deforestation.

- If you took a picture of/ measured a tree at the end of last lesson, please share your pictures with us, a short description and how much carbon it stores by [Clicking here](#).
- Share your pictures of the future of the world's biomes with us on our COP30 board [COP30 Board](#)