LESSON D4

ADAPTATION AND MITIGATION MEASURES WORLDWIDE

MAIN SUBJECTS
Social sciences / Geography

DURATION
~ Preparation: 10 min
~ Activity: 1h

AGE GROUP
9-12 years

LEARNING OUTCOMES
Students realise that there are many solutions to deal with climate change, either through adaptation or mitigation, and that many people and organisations are already taking action. Students choose a climate adaptation / mitigation project to work on.

Students learn that:
~ We must adapt to the impacts of climate change and we must do our best to reduce greenhouse gas emissions.
~ There are many people, communities and organisations around the world implementing adaptation and mitigation solutions. We can all do many things to help.
~ Adaptation will benefit us in the short term, while mitigation will be fundamental in the long term. Both must be considered together.
~ Adaptation measures help reduce vulnerability and / or exposure to climate change, reducing the risk of negative impacts.
~ We can implement measures of adaptation to climate change effects.
~ We all have a carbon footprint, but we can help reduce climate change if we decrease our emissions of greenhouse gases.

KEYWORDS
Adaptation, mitigation, solutions, vulnerability, exposure

TEACHING METHOD
Documentary analysis

TEACHER TIP
This lesson is a good way to introduce Part 2 of the lesson plan – "We Act". Therefore, it is important for you to already have had a look at Part 2 and keep in mind examples of projects you could introduce in your school or community.

PREPARATION 10 MIN

EQUIPMENT
- Video projector, computer and an Internet connection.
- Multimedia resource: How can we act?
- If the class cannot use the online activity, **WORKSHEET D4.1** (one of each for the whole class) can be used.

LESSON PREPARATION
Feel free to use other material to illustrate adaptation or mitigation solutions. It is a particularly good idea to discuss solutions that have been implemented in the student's "vicinity" (their region or country).

INTRODUCTION 10 MIN

After a short reminder of the different impacts of climate change on land, and their consequences for ecosystems and human societies, ask the students to think about what kind of action could be taken to deal with these problems.

PROCEDURE 40 MIN

1. Let the students present their solutions to the whole class and write them on the whiteboard, without commenting on them. These should be actions that can be taken by the students themselves, as individuals, or by their families or small communities (school, village, etc.). This avoids a discussion on what other larger entities (i.e., governments, industry, etc.) could / should do.

2. Once a few actions have been identified, ask the students to propose a way of sorting them (by defining appropriate criteria). Different kinds of sorting can emerge:
- Mitigation / adaptation (some actions will reduce greenhouse gas emissions and thus the magnitude of global warming, whereas others will reduce the impact of global warming on our societies).
- Individual / collective.
- At home, at school, at the store, transportation, etc.

BACKGROUND FOR TEACHERS

In order to reduce the impacts of climate change on human societies and the Earth's ecosystems, two lines of action exist: **mitigation and adaptation.** Pages 16-19 of the Scientific Overview offer a detailed outline of both.

These two complementary strategies are to be considered at different levels: individuals, local groups (e.g., schools), cities, national or regional entities, and international or global actors (United Nations, international treaties). All levels have a role to play, even if their relative impacts vary. Both strategies involve knowledge, engineering and societal changes. Even in a simple case (school action), the timescales and the multiple possible consequences of a given action have to be considered.

3. During this activity, let the students discuss the relevance of each action (and the reasons behind the action). Some difficulties may appear during the classification process as sometimes the same action can be relevant from an adaptation point of view but not from a mitigation one (for example, using air conditioning is good from an adaptation point of view, because you can cool down rooms that are too hot, but it is harmful from a mitigation viewpoint due to energy consumption).

4. After all the actions have been discussed and categorised, the students may want to use the multimedia resource or analyse the **WORKSHEET D4.1** to discover different kinds of initiatives already underway.

5. Explain that they should try to do something tangible, and help them choose an action they wish to implement (with their class, their entire school, or even their community).

WRAP-UP 10 MIN

In conclusion, define the project in which the class will be involved (some examples of projects are proposed below).

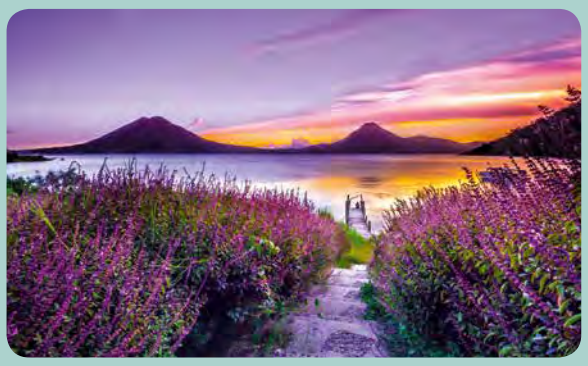
TEACHER TIP

This lesson provides an introduction to Part 2 of the lesson plan; hence, the 1 hour duration is merely indicative, as it can take you and the class longer to choose which project to carry out.

AGRICULTURE AND FOOD

Permaculture (Guatemala)

On the shores of Lake Atitlan, the Mesoamerican Permaculture Institute aims to raise awareness and educate local populations about permaculture, following the footsteps of their Mayan ancestors. Permaculture is a technique that combines different crops on the same plot of land, capitalising on the biological interactions between the various plant species. It is particularly effective, does not require polluting chemical fertilisers, and contributes to the conservation of biodiversity.



ENERGY

Cycling (Netherlands)

Amsterdam is probably the most welcoming capital in Europe if you enjoy cycling. The facilities include cycle paths, free bicycle parking and two-way lanes. Car use, on the other hand, is strongly discouraged. As a result, in this city of one million inhabitants, more than 60% of journeys are made by bicycle.

Cycling is cheap, does not emit greenhouse gases, does not contribute to urban air pollution, and allows moderate physical effort that is very beneficial to health. It is also one of the fastest means of transport in the city.

ENERGY

Football (Spain)

Teenagers who play football on Spanish streets probably do not realise that they are saving energy (and this is probably not their goal!). Yet, reading a book, playing sports and meeting friends are much better activities for the environment (but also for health and social interactions) than just sitting in front of the screen of a computer or smartphone.

Storing and sending data from computers and smartphones requires a lot of energy: about as much as global air traffic. Why not unplug from time to time?

ENERGY

Repair Café (France)

Throw it away? No way!

At a time of disposability and programmed obsolescence, some people are opting for more sustainable consumption.

"Repair Cafés", invented in the Netherlands, are being created all over the world. There are more than 1,500 of them, found on all continents. They are located in schools, bars, cafés, municipal halls, etc.

For example, in Quimper, France, on one Friday each month the resourceful residents organise Do It Yourself workshops where people bring an everyday object to repair (bicycle, coffee machine, computer or toy, for example). While meeting other people, the local residents can find help and learn simple methods to give a second life to their belongings. This approach is also used for holiday internships for young people, who dismantle the equipment, understand how it works and then see how it can be diverted and reused.

This saves energy, raw materials... and also money!

HABITAT

Bioclimatic "low tech" constructions (Burkina Faso)

Unlike other schools in Burkina Faso, this primary school in Gando is not built of cement but of raw earth. It is a locally available material, very cheap, and doesn't require transport or processing. The raw earth offers great thermal comfort, saves a lot of energy in comparison to cement, and is 100% recyclable.

Adobe, pisé, cob... these raw clay construction techniques have been around for thousands of years and are back in fashion. Homes, schools, stations... there are almost no limits!

Bioclimatic architecture takes into account the local environment to provide occupants with a comfortable, functional, water–and energy–efficient building. Some buildings are very sophisticated, but others (such as this school) use ancestral, inexpensive materials and techniques.

HABITAT

Solar cookers (Sudan)

Collecting firewood as fuel for cooking is dangerous, time-consuming and a major cause of deforestation.

This can be avoided by using solar cookers. In a solar cooker, sunlight is reflected by mirrors and concentrated into the cooking pot or pan. In very sunny and warm regions, the heat produced is sufficient to cook food. Their use makes it possible to cook with free solar energy and without emitting greenhouse gases or other pollutants. Drinking water can also be boiled in a solar cooker. Thus, both air and water are cleaner. Additionally, not having to collect firewood saves time.

Some NGOs have helped increase the use of solar cookers, thereby contributing to forest conservation and hence to climate protection, as well as improving human health.

URBAN RESILIENCE

Revegetation (Australia)

While cities have replaced trees and grass with buildings and concrete, residents are increasingly seeking to reconnect with nature and a greener environment. In Brisbane (Australia), local authorities have encouraged the planting of trees and grass in the city centre. Beyond its aesthetic appeal, revegetation makes it possible to develop biodiversity (the population of urban birds has significantly increased), improve air quality, contribute to the cooling of the city by limiting the "urban heat island" effect, and adapt to the consequences of climate change.

Many cities now allow their inhabitants to initiate reforestation projects. Sometimes, it is the schools that are in charge of such projects.

ECOSYSTEMS

Planting of corals (Malaysia)

While they cover less than 0.1% of the ocean bed, coral reefs are home to 30% of the world's biodiversity and play a key role in carbon sequestration and oxygen production. In addition, coral reefs are of great importance to local populations, providing food security and protection against coastal erosion.

Between 1980 and 2019, about 30% of global coral reefs disappeared (IUCN Red List Index). To address this, many NGOs, companies and scientists are working with local populations to restore coral reefs (for example, on Tioman Island in Malaysia). Some of these projects are funded through voluntary carbon offset programmes (think about it next time you fly!).

AWARENESS

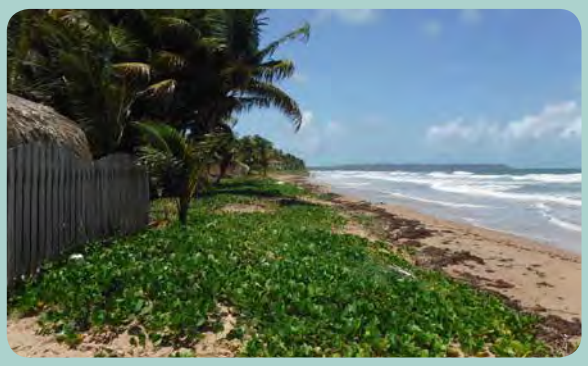
Felix and his "Plant for the Planet" organisation (Germany)

In 2007, Felix Finkbeiner, a nine-year-old boy from Bavaria, Germany, made a presentation to his class on climate change. He planted his first tree with his classmates, and decided to create the "Plant-for-the-Planet" project. At the age of ten, Felix addressed the members of the European Parliament, and at thirteen he made a speech to the United Nations General Assembly.

Ten years later, Felix is still involved, on a voluntary basis, in the development of "Plant-for-the-Planet", which now has 130 employees and 70,000 members in 67 countries. By 2019, nearly 14 billion trees have been planted under this project. On average, each tree absorbs 10kg of CO_2 per year, and a tree planted in the tropics absorbs many times this amount.

ECOSYSTEMS

Sandwatch program (Trinidad and Tobago)



Mayaro Primary School has joined the Sandwatch program, along with many other schools around the world. By "adopting", monitoring and protecting the beach near the participating school, carrying out regular clean-up operations, and studying beach transitions, biodiversity, currents and tides, the project has completely changed the way students, parents, and the whole community view the coastal ecosystem.

Many students of Mayaro Primary School later became involved in environmental studies and activities. The project taught parents, students and teachers that education goes beyond the four walls of the classroom.

AWARENESS

Amazonian school (Brazil)

Brazil hosts the world's largest biological diversity, but its forests are among the most threatened. The president of an ecological foundation and two biologists created Escola da Amazónia in 2002, to raise awareness amongst Brazilian youth.

"A day in the forest" aims to provide young people aged 11 to 14 years direct contact with the Amazonian forest and encourage them to observe the fauna and flora. Older teens (15 to 19 year-olds) participate in workshops on ecotourism, sustainable livestock and socio-economic development.

A twinning programme links urban schools to schools located at the edge of the forest.

AGRICULTURE AND FOOD

Eco-school (Mauritius)

Loreton College in Mauritius is part of the "Eco-Schools" network, made up of more than 50,000 schools around the world. The students have built a small-scale aquaponic farm, which combines salad farming with fish farming, in symbiosis. Fish droppings provide nutrients to plants, which in turn filter the water in the aquarium. It is an effective and sustainable way to produce food, especially in urban areas.

A school is awarded the Eco-School label by the Foundation for Environmental Education (FEE) if it engages students in ecological and sustainable projects within the school or the community. Eco-school themes are biodiversity and nature, climate change, energy, global citizenship, health and wellbeing, litter, marine and coast, school grounds, transport, waste and water.

Discover stories of other successful projects led by students from all over the world: https://www.ecoschools.global/stories-news