MODULE 12: MITIGATION AND ADAPTATION

STUDENT ACTIVITY 1-4

Climate change affects different places in different ways. There are a lot of different factors which affect the rate of climate change, some of them are global but many of them are local. That's why action about climate change needs to be done at a local level to have an impact. It is no good saying it is someone else's problem; we all have to do something about changing the way we live to stop the predicted changes to the temperature and precipitation that you have been studying in this module.

There are a lot of examples around the world of how people are changing the way they live to **adapt** and **mitigate** (reduce) climate change. Some solutions could be used anyway in the world, others are more suited to a particular type of place.

ACTIVITY ONE

Because of the global climate system any greenhouse gas emissions in one place will have an impact everywhere else in the world (although, as you have seen in earlier modules, the climate will not change in the same way in every place). Some of the ways of mitigating climate change – reducing the amount of greenhouse gas in the atmosphere – are quite simple, for example simple changes to our homes.How can the amount of energy needed to heat a home be reduced?

1. How could the source of the energy being used to heat the home be improved?
2. Make a list of renewable sources of energy, why are they sustainable?
3. How can homes be cooled other than by using air conditioning?

PERSONAL ACTIVITY

What sustainable solutions are already in place in your home?

What other sustainable solutions could you use to reduce your consumption of fossil fuel derived energy in your home?

ACTIVITY TWO

We will have to adapt to cope with changes to the climate that are already happening. However, we can also act to mitigate the amount of climate change we get by reducing the amount of carbon dioxide and other greenhouse gases emitted into the atmosphere, or even by starting to remove greenhouse gases from the atmosphere.

1. Why might adaptation not always be desirable?
2. Think of four reasons why mitigation is desirable.

ACTIVITY THREE

A number of measures have been suggested to minimize the changes to the climate. Some of these involve releasing less greenhouse gas into the atmosphere, or even starting to remove some of the excess greenhouse gas that is already there. Other solutions involve trying to adjust other parts of the climate system to compensate for the extra greenhouse gases.

OCEAN FERTILIZATION

Adding huge quantities of iron and other nutrients to encourage the growth of algae and phytoplankton which then absorb carbon dioxide.

ARTIFICIAL TREES

A machine like a tree which can act as a 'carbon scrubber' to capture carbon dioxide from the air.

INCREASING CLOUD REFLECTIVITY

Building a fleet of specially designed wind-powered ships that would spray sea water particles into the atmosphere to create clouds to make clouds more reflective.

INCREASING REFLECTIVITY

Rooftops and pavements could be painted paler colours to reflect rather than absorb more of the sun's energy (increase the surface albedo)

SULPHUR SCREENS

Adding sulphur particles to the stratosphere in high latitude areas like the Arctic to reflect some of the sun's energy (increase the albedo of the atmosphere).

CARBON CAPTURE AND STORAGE (CCS)

A technique for capturing carbon dioxide as it is emitted from large producers, compressing it into a liquid and transporting it to a suitable storage site where it is injected into the ground

1. Use the internet, in particular http://www.21stcenturychallenges.org/challenges/engineering-our-climate/60-seconds/ to complete a table like the one below.

TYPE OF MITIGATION	WHAT IT IS SUPPOSED TO DO	POSITIVE ASPECTS	NEGATIVE ASPECTS
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2. Add any other forms of mitigation you have found into the table.

ACTIVITY FOUR

How is your school implementing changes to adapt to or mitigate climate change? Consider the following aspects.

- How is the climate expected to change in my area?
- Give an example of climate change, for example summer rainfall shortages.
- How will your school adapt to this? For example installing rainwater harvesting tanks.
- How is your school helping to reduce emissions? For example by installing solar panels.

PERSONAL ACTIVITY

Make a pledge to halt climate change. Write down all the things you can do to reduce the amount of emissions you contribute to the atmosphere. For example: What actions could you take in your home, at school, shopping, travelling, in your community?

Make a diary showing which of those actions you do each day.