

Our Changing World

Learners will have/be able to:

- Describe the nature of a gas, and the mix of different gases making up the atmosphere of planet Earth.
- Use an example to explain how/ why the amount of some gases in the atmosphere has been changing, and the effect this has had on world climate patterns over time.
- Describe examples of natural causes of climate change, and examples of causes of climate change thought to be due to human activities.

World globe/ball

If possible painted with the continents and swirling white clouds representing the atmosphere.

Finger puppet animal

Finger puppet or real leaf

Selection of layers of warmth

Hats, scarves, coats, blankets

Schools Global Footprint

Resource – energy & transport

www.ltscotland.org.uk/schoolsglobalfootprint

SNH pack + poster - Advances 7

The heat is up and it's raining

www.snh.org.uk

Nature's Detectives and Nature's Calendar

(phenology) – Woodland Trust

www.woodland-trust.org.uk or

www.naturedetectives.org.uk

Royal Highland Education Trust

www.rhet.org.uk

Forest Education Initiative

www.foresteducation.org.uk

This activity looks at one of the current causes of climate change – the burning of fossil fuels.

You can make it as simple or detailed as you wish, depending on the age/ ability of your class, and whether you use it as an introductory, or summing up activity. It works well for younger learners (Y3&4/P4&5), and those who are unfamiliar with the concept or vocabulary associated with climate change, due to it delivering the message visually. It is not advised for Y7/S1 or above. The aim is providing both a balanced viewpoint and understanding that climate change is a natural process, but that scientists now generally believe that human activity can influence the speed of change. In turn, this may be a challenge for certain species, in adapting to the results of such change – whether cooler/hotter - food supply, habitat creation/destruction, access to water etc.

Preparatory activity

There are many media sources of information about climate change – it is important to understand what level of prior knowledge and understanding your learners have about climate change, and associated terms, such as 'fossil fuels', 'natural' and 'man-made'. Ask the group if they have heard about climate change. If not, can they guess what the term means? It may be necessary to discuss the difference between 'weather' (day to day) and 'climate' (weather patterns of a region) and that 'climate change' is the change in our weather patterns over time (decades and centuries) which is a natural process, but may also be speeded up/effected by human activity.

Is climate change new? Discuss with the group that climate change is a natural process, it has always been happening. Remind the group that in the past there have been times of a colder climate (the last Ice Age), and times of even warmer climates (e.g. the world of the dinosaurs in the Jurassic time period) when our island was located in tropical latitudes – use the globe to demonstrate.

What's different in our time is the rate at which climate change is taking place. This activity looks at one of the reasons why climate change is happening more quickly.



Activity 5

- 01** Ask for a volunteer – stress that they need to be someone who likes to be the centre of attention – to represent the Earth and its citizens, the ‘Planet Protectorate’. Sit them down and give them the globe to hold, representing the planet Earth and its atmosphere – a precious resource. If possible, give them a finger puppet/model animal to represent the ‘animals of the world’, and a large leaf to represent the ‘plants of the world’. Ask the rest of the group to sit down in a circle around the ‘Planet Protectorate’. Give out the hat, scarves, coats and rug/blanket layers to members of the group.
- 02** Ask what we mean by the ‘atmosphere’ and why it is important for us. Our world – planet Earth – is surrounded by a layer of gases, including oxygen, carbon dioxide, dust and water vapour – our ‘atmosphere’. The mix of gases is necessary as it enables plants and animals to breathe, and keeps our planet warm enough for life to exist, but not too hot. There are other gases, do they know them? Or, encourage them to do some research themselves.
- 03** Explain that one activity that happens naturally, but can also be man-made is burning/fire. It uses up oxygen and results in the creation of carbon dioxide. Can they give examples of natural examples of burning – not due to human actions. These activities have always affected the mix of gases in the atmosphere. Grass and forest fires ignited by lightning, or meteor strikes; volcanic eruptions and ash clouds/lava flows on land and at sea, tar fields etc..
- 04** Explain how humans discovered and used fire, and how, over time, moved from burning wood to later, through technological advances, discovering, extracting and burning fossil fuels. Since then, the amount of carbon dioxide released into the atmosphere has increased – changing the mix of gases in the atmosphere, and preventing heat from escaping as it used to – as a result there has been a rise in global temperatures, especially of the oceans. What do we mean by ‘fossil fuels’ – which different fossil fuels can they name? (Oil, natural gas, diesel, petrol, coal, peat – draw a diagram in sand/ on paper that shows the original fossil fuel and its products).

To reinforce this message, invite the group to name an activity that burns a fossil fuel. For each activity add a layer of warmth around the volunteer. Use words such as ‘cars burning petrol, releasing carbon dioxide into the air – a thicker cover around the world’. It is a good idea visually to use one of your blankets or coats at the beginning so that the rest of the group can see the world being surrounded by a layer of warmth. Keep adding layers - at least 5 i.e. 5 examples of burning leading to warming.

Eventually the volunteer will say they are getting hot, or someone in the group will exclaim that it must be hot under all those layers. If not, simply ask the volunteer how they are feeling - warmer. They will be investigating the effects of this warming affect another time. Thank the volunteer and ask them to take off all their layers.

Ask the group what the game illustrates – let them explain, or if necessary summarise for the group that, for each activity that burns a fossil fuel, more carbon dioxide is released into the atmosphere, making a thicker blanket of gases around the world, which results in warming our climate, especially near the equator (show on the globe where this is). This is an example of how climate change, with its natural and man-made causes together, is happening faster than in the past. This faster speed of climate change will make it more difficult for some plants, animals and people of the world to adapt in time.

BUT trees and other plants can be part of the solution, let's find out how!

05

06

07