



OUR CHANGING CLIMATE

Welcome to Generation Science

Brought to you by Edinburgh Science Learning, *Generation Science* shows and workshops spark pupils' curiosity and bring science to life.

With more than 30 years of experience delivering high quality, engaging shows and workshops, we are leaders in our field.

What we do

Each show or workshop is fully equipped and delivered by trained science communicators. We create fun, interactive environments where everyone is welcome to get involved. Our inspiring demonstrations and engaging activities are linked to the Curriculum for Excellence, explaining key concepts in a unique and memorable way.

Event Description

Our Changing Climate is an interactive show exploring our planet's climates and how they're changing. The characters Sunbeam and Raindrop lead pupils on an interactive journey to discover what climates are, what causes changes in global temperature and what we can do to help our planet.

Using interactive experiments, games, demonstrations and storytelling, *Our Changing Climate* takes a gentle approach to a big subject and helps start classroom conversations around the environment and how everyone can help.

Curriculum Links

Our Changing Climate supports the following experiences and outcomes:

SCN 0-20a: I can talk about science stories to develop my understanding of science and the world around me.

TCH 0-06a: To help care for the environment, I reduce, re-use and recycle the resources I use.

TCH 1-06a: I can take appropriate action to ensure conservation of materials and resources, considering the impact of my actions on the environment

SOC 1-08a: I can consider ways of looking after my school or community and can encourage others to care for their environment.

SOC 1-12b: By exploring climate zones around the world, I can compare and describe how climate affects living things.

SOC 0-08a: I explore and appreciate the wonder of nature within different environments and have played a part in caring for the environment.

Learning Outcomes

- Describe that climate is a pattern of weather that happens over a long period of time.
- Recall that the atmosphere is a layer of air and gases that surround the Earth.
- Identify that the ozone layer is a part of the atmosphere that helps to protect the Earth from the sun and keeps it warm.
- Describe that water (like the seas and oceans) is better at absorbing heat than air.
- Identify that the primary cause of climate change is human activity.
- Explain that different climates around the world are differently affected by climate change.
- Identify that local actions can have a global impact and list some examples.

FOLLOW-UP CLASSROOM ACTIVITY 1

Climate Choices

For each group, you will need:

- Two containers (eg: old jam jars or shoe boxes)
- Buttons, or other small items which could be used as tokens
- A bowl
- Scissors
- Felt tip pens
- Paper



A OR B



1. As a class think of two different ideas which could help the environment in and around your school (there are some ideas below).

2. Make a label for each option using the paper and pens and stick the two labels onto your containers..

3. Create signs to pin up around your school to encourage people to vote



4. Create a voting display using your containers and signs for people to vote for their favourite idea using the tokens. Place it somewhere people will see it.

5. After one week, go back and count the tokens: which options won?

6. How can you make the winning idea happen in your school? Come up with a plan as a class!

Example Ideas:

- Install an insect hotel or bird feeder in the playground
- Run a litter pick or toy swap
- Host a second-hand clothes sale or a sponsored walk to raise money for a nature charity
- Choose meat-free lunches for one week or plant a herb garden
- Make birthday cards from recycled materials or ask for pre-loved presents for your birthday

You could try this with smaller groups competing with each other. Who can make the most popular idea?

Explanation

This activity is a great opportunity to chat about ways to take action locally. By empowering the youngest people in the school and showing them they can influence action with people older than them, voting boxes are a practical way to take things into their own hands. It's a great way to spark conversations about choices and to understand that a good way to stop being overwhelmed by options is to pick one thing and do it. This ties in the CfE links to Social Studies: People, Place and Environment.

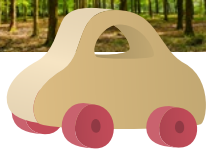
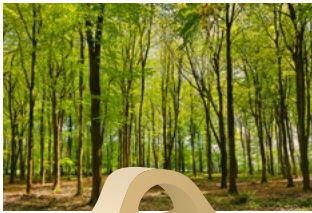
For the action planning stage, encourage the class to work backwards from the final idea until they get to where they are now. For example, if the winning idea was an insect hotel they need to think about building it, then what materials are needed for that, then where to source those materials (and if they need to find a way to fundraise as a class), and where they could research the best way to make one.

FOLLOW-UP CLASSROOM ACTIVITY 2

Materials matching game

For each group you will need:

- A selection of items made from different materials (eg: a spoon, a plastic toy, a book, a scarf)
- Pictures of different raw materials: tree, oil, sheep, metal ore, sand, cotton [a printable version is included at the end of these notes]



1. Split the class into groups and place selections of items on each table.

2. Encourage discussion to see if the teams can work out which items are made from which raw material.

3. Simplified version: group items which are made from the same thing together (eg: a book and a wooden toy).

Follow-up: tell the groups they have to design a new toy – what materials would they make it out of? Encourage them to think about things like the environment, but also how tough it is or what it would feel like to play with.

Explanation

This game encourages the class to consider that everything they own comes from somewhere, and that often when it's been manufactured into something, it's very hard to return to its original form.

Oil is the main ingredient in most plastics, but it is possible to make plastic with other materials like biomass.

Biomass is stuff made from organisms which were living, and can include food waste, sugars and vegetable oil. Not all biomaterials are necessarily good for the environment, but – as with everything we talk about in Our Changing Climate – it's all about balance.

Discussion around wood [and paper products] can include talking about recycling. Paper can be recycled – by

being pulped with liquids and then pressed back into shape – which creates about 40% less carbon dioxide emissions than new paper. However, it uses a lot of water and still has an environmental impact. What could be better than recycling? Reducing our consumption of materials and understanding that not wasting resources is by far the best option is an important learning point.



THE SCIENCE BEHIND THE SHOW

Climate is a long-term pattern of weather in a certain area.

By understanding our planet's climates, we can understand how changes in temperature caused by human activity can have a huge impact on the environment. Different parts of the world have different climates, including: polar, tropical, desert, continental (which includes most of Europe) and temperate (climate affected by the sea, including Scotland).

The air above us contains a lot of things, including the moisture which causes clouds. We call this area the atmosphere. Our atmosphere is made up of different layers: the troposphere (which is the part nearest the ground), the stratosphere (which is home to the ozone layer), then the mesosphere, thermosphere, ionosphere, exosphere and the magnetosphere, which protects our atmosphere from things like the strong solar winds.

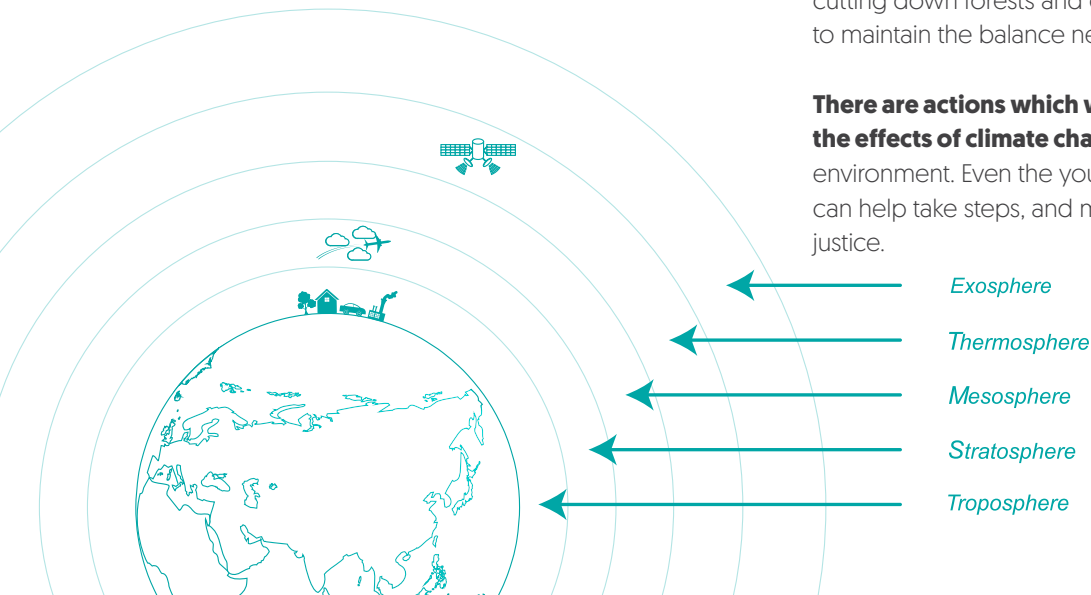
The ozone layer, which is vital to life on Earth, sits within the stratosphere. The ozone layer traps heat from the sun, which helps to keep our planet warm.

The atmosphere is the name we give to the gases which surround the Earth. It's a hugely important part of life on Earth, and is finely balanced with life on our planet.

Water has a large thermal capacity, which means the seas can absorb a lot of additional heat. This helps to maintain a liveable temperature on the planet, but aquatic life can be damaged by too high a rise in sea temperature.

Human activity is directly linked to climate change. Gases which warm the planet's atmosphere are released through manufacturing, plane travel and farming, while humans are cutting down forests and other habitats which naturally help to maintain the balance needed for a stable climate.

There are actions which we can all take to try and mitigate the effects of climate change, and to help our local environment. Even the youngest members of the school can help take steps, and make their voices heard for climate justice.



Some Useful Links

Earth Day is celebrated on 22 April each year:
earthday.org/

Keep Scotland Beautiful has some useful climate-related materials:
keepscotlandbeautiful.org/climate-action-schools

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