



WHAT SHOULD YOUNG PEOPLE KNOW ABOUT...

CLIMATE ACTION

...BY THE TIME THEY LEAVE SCHOOL?



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1. SCIENTIFIC BACKGROUND



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WHAT IS IT?

Today's climate change / climate crisis is a long-term, large-scale rise in Earth's global average temperature, causing shifts in weather patterns. Some models predict rises in global temperature of 4 degrees Celsius by the end of the 21st Century, which would lead to irreversible damages. It could result in a major reduction in the human population, and cause extinction for many other species. Advanced civilisation could become unsustainable. The UN aims to keep temperature rise to between 1.5 – 2°C, although there is increasing evidence that 2°C would be dangerous.

HUMAN ROLE

97% of Climate scientists agree that humans are the main cause of the climate change we see today. Temperature rises are accelerating far beyond anything in history¹. Scientific findings are presented in IPCC (Intergovernmental Panel on Climate Change) reports, produced by scientists in collaboration across the world.

HOW IT WORKS

Greenhouse gases in the atmosphere (like CO₂, methane and other gases) soak up the sun's radiation and trap it as heat. **Human consumption** (see 3 below) relies a lot on energy from burning fossil fuels which release CO₂².

“ The Earth's climate is changing at a rate that has exceeded most scientific forecasts.

–UNHCR 2018.

“ Our greatest threat in thousands of years – climate change

–Sir David Attenborough, UN Climate Change Conference, Dec 2018

“ [the] collapse of our civilizations and the extinction of much of the natural world is on the horizons

–Sir David Attenborough, Dec 2018

LEARNING OUTCOMES

1.1 Students can explain the significance of the threat that climate change poses to life-forms on earth

1.2 Students can explain that human actions such as burning fossil fuels are causing today's climate change

1.3 Students know what the Intergovernmental Panel on Climate Change is and its recent recommendations

1.4 Students know that scientific data shows rapid change in the earth's climate

1.5 Students are familiar with current targets and understand what the impacts will be of not achieving these targets

¹ <https://www.ucsusa.org/global-warming/science-and-impacts/science/temperature-is-rising>
² <https://www.studentenergy.org/topics/fossil-fuels>



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IMPACT ON THE NATURAL ENVIRONMENT

The impact on the natural environment of climate change can be seen in global temperatures, warming oceans, rise in sea-levels, droughts, floods and other extreme weather events. “Global sea levels rose about 8 inches in the last century. The rate in the last two decades, however, is nearly double that of the last century” – NASA, 2018. Effects on plant and animal life are catastrophic and already under way. Scientists argue that the rate of loss of biodiversity and extinction of species mean that we are on the brink of a sixth ‘mass extinction’³.

IMPACT ON PEOPLE

These changes could have catastrophic consequences for humanity.

LEARNING OUTCOMES

2.1 Students can name some different consequences of climate change and how these affect people, animals and plants

2.2 Students can explain current impacts of climate change on humans locally and across the world

2.3 Students can identify different future scenarios for the impact of climate change on humans, and connect these projections with different levels of heating

2.4 Students can explain predictions that climate change might lead to ‘climate conflicts’

³ <https://www.theguardian.com/environment/2017/jul/10/earths-sixth-mass-extinction-event-already-underway-scientists-warn>



3. CONSUMPTION & CLIMATE JUSTICE



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Most of the greenhouse gases humans have added to the atmosphere come from supplying energy and goods to the wealthy global north 'industrial economies' e.g. in our factories, cooking, construction, heating, planes and other transport, computer data-storage/streaming, cars and food production. Meat production produces lots of methane, a greenhouse gas 25 times more powerful than CO₂⁴.

This activity is the result of a global economic system that encourages consumption⁵ (e.g. of a lot of meat; of goods including food from far away; using planes and cars frequently). Most of the people in the world still consume little and use very little energy.

The greatest initial impact of this consumption on humans is currently on millions of people especially in the hotter majority world countries, coastal communities and low-lying countries; but Climate Change will increasingly affect us all. Millions of poor farmers in the majority world, who were not responsible for creating the problem will be amongst those first and worst affected – this is sometimes called **climate injustice**. They are trying to **adapt** to challenges like hotter climate and different rainfall patterns. As crops fail, many people are already forced to migrate, creating a new phenomenon of **Climate Refugees**.

“ An average of 22.5 million people displaced by climate- or weather-related events since 2008.

–UNCR 2018

LEARNING OUTCOMES

3.1 Students can explain the link between past industrial development and current climate change

3.2 Students are able to explain the link between human consumption (including their own) and climate change

3.3 Students can explain what a Carbon Footprint is

3.4 Students understand that generally higher income countries have much higher greenhouse gas emissions than lower income countries

3.5 Students can explain how and why Climate Change affects some places and communities more than others e.g. people in the majority world

3.6 Students can describe the connection between climate change and migration

3.7 Students can explain 'Climate Justice'

⁴ <https://www.ipcc.ch/report/srcl/>

⁵ <https://www.globalpolicyjournal.com/blog/19/11/2018/interview-climate-change-product-how-capitalism-values-nature>



4. URGENCY



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As the world's climate warms, **feedback loops** are beginning to kick in. A climate feedback loop is when the warming climate⁷ causes a change in natural ecosystems which then itself affects the climate. For example:

- a. **The sea ice and ice sheets** in the Arctic and Antarctic have been keeping the earth cool as their white surface reflects heat away from the Earth. However, as the climate warms and they melt, the darker surface of the sea or land below the ice absorbs rather than reflecting the heat and the warming is accelerated.
- b. **Permafrost** is ground that remains frozen throughout the year. As the climate warms, the permafrost is thawing and this is releasing methane and CO₂ into the atmosphere, which is exacerbating climate change.

If these and other feedback effects⁷, including **forest dieback**, reach their **tipping point**, climate change will no longer be under human control: if the climate warms enough for certain tipping points to be reached, however much humans may reduce our emissions, these natural forces will have been released causing runaway climate change and the situation will be irreversible no matter what humans do. Scientific forecasts vary as to when tipping points may be reached, with some scientists arguing that some tipping points have already been passed.

URGENCY OF ADDRESSING CLIMATE CHANGE

Because of the potentially catastrophic consequences of climate change, scientists have encouraged world leaders to adopt a 'precautionary principle' to avoid **tipping points and feedback loops** and address the main causes – over-consumption and use of fossil fuels - before it's too late. This means changing our behaviour. Scientific predictions vary, but there is a consensus that greenhouse gas emissions need to be drastically reduced extremely quickly in order to have a chance of avoiding runaway climate change. In 2018 the IPCC (Intergovernmental Panel on Climate Change, an international panel of scientists) reported that the Earth had already warmed by 1°C above pre-industrial levels, and that in order to keep to 'safe' levels of 1.5°C of warming, urgent and unprecedented changes would have to be made in the next 12 years⁸.

LEARNING OUTCOMES

4.1 Students can explain the urgency of the threat of Climate Change to human civilisation and all life on Earth

4.2 Students are aware that the global average temperature rise is accelerating

4.3 Students can describe current trends in global emissions

4.4 Students can give examples of climate feedback loops and explain the significance of climate tipping points

4.5 Students are familiar with current targets and what computer models suggest the impacts will be of achieving or not achieving these targets

4.6 Students can express views on the risks and benefits of faster and slower global responses to the crisis

⁶ <https://www.dw.com/en/when-nature-harms-itself-five-scary-climate-feedback-loops/a-43649814>

⁷ <https://www.theguardian.com/news/2019/jan/08/when-the-ice-melts-the-catastrophe-of-vanishing-glaciers>

⁸ <https://www.theguardian.com/environment/2018/oct/08/global-warming-must-not-exceed-15c-warns-landmark-un-report>



5. RESPONSES & ACTIONS



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Climate Change is being addressed at different levels: by **individuals**, by **people acting together** (collectively) and by governments. Governments are acting both individually, and, collectively as the United Nations. To avoid the worst scenarios predicted by scientific models, **multiple solutions** will have to be put into action. Governments are being encouraged and held accountable to implement laws that help stop the worst scenarios materialising.

CAPTURING CO₂ AND REDUCING EMISSIONS

As the evidence points to burning fossil fuels as a cause of climate change, countries have moved towards renewable energy and protecting / renewing natural **carbon sinks** (e.g. plants, soil, oceans) which take carbon out of the atmosphere. Renewable energy derives from natural resources (e.g. water, wind and sun) which do not run out. Wind turbines and solar panels produce energy which can power entire communities or your own home. Reducing consumption is also important in reducing the emissions of greenhouse gases.

International

195 governments worldwide have come together to combat “our greatest threat in thousands of years”⁹ - climate change - signing the 2015 **Paris Climate Agreement**. This aims to strengthen the ability of countries to deal with the impacts of climate change and emphasises the need for collective action to limit overall temperature rises.

The 2018 UN Intergovernmental Panel on Climate Change¹⁰ report states that global CO₂ emissions need to **decline 45% by 2030** to keep the temperature rise to 1.5°C¹¹.

Action Collective Responses

There are many collective groups taking action. People join campaigning groups, or lobby organisations they are already members of. Farmers' organisations across the world are taking action. Businesses are responding to this 'demand' by providing more environmentally-friendly products and services (e.g. power). These collective and individual actions can help governments to make policy changes.

Individual Action

Many individuals are looking at their **Carbon Footprint** and reducing their consumption – using and buying less e.g. reducing their food waste & the amount of clothes they buy, buying renewable energy and electric cars, nurturing carbon sinks by planting trees or forests.

LEARNING OUTCOMES

5.1 Students can explain the difference between mitigating and adapting to Climate Change.

5.2 Students understand that action on Climate Change is taking place worldwide at different levels: individual, collective and governmental. They can explain why action on all of these levels is important to address the climate crisis.

5.3 Students can express their opinion about the pros and cons of different strategies to address climate change e.g. renewable energy; protection / renewal of carbon sinks

5.4 Students appreciate that individuals reducing their footprint is an important part of collective efforts to slow climate change and that deep structural changes are also essential

5.5 Students can describe practical things people can do, individually or collectively, to reduce greenhouse gas emissions

5.6 Students can name the current international agreement on climate change and its key target

⁹ <https://nypost.com/2018/12/03/un-chief-calls-climate-change-most-important-issue-we-face/>
“Even as we witness devastating climate impacts causing havoc across the world, we are still not doing enough, nor moving fast enough, to prevent irreversible and catastrophic climate disruption” UN Secretary General, 2018

¹⁰ https://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf

¹¹ <https://www.theguardian.com/environment/2018/oct/08/global-warming-must-not-exceed-15c-warns-landmark-un-report>



6. POSSIBLE FUTURES



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DISCUSSION ABOUT FUTURES

Climate change is accelerating. The global consensus is that we are just seeing the initial phase of Climate Change, with relatively small effects. Most scientific models predict more drastic changes. We can expect to see some of these in all our life-times. Addressing the problem of Climate Change has stimulated discussion of how to address the underlying cause – **human consumption**. The relationship between the prevalent model of economic growth and consumption based on a capitalist approach¹² is now being questioned and alternatives explored. Some experts say a 'Zero Carbon future' is the only way to slow Climate Change sufficiently and that different economic models are needed. A zero carbon future could be a more equal and more pleasant future with many benefits¹³ (e.g. less traffic congestion means cleaner air which means better health). Some argue for a **Just Transition** – meaning that those who are poorest and so least able to cope with the adaptation necessary for a climate-changed world and a zero carbon economy are supported through the necessary changes.

New technologies aiming to reduce greenhouse gas emissions in order to mitigate climate change are constantly being developed. These are vital but are only part of the solution.

“ A matter of life and death.. (the world is) nowhere near where it needs to be (in the transition to a low-carbon economy)¹⁴

–Antonio Guterres, UN Secretary-General, Dec, 2018

LEARNING OUTCOMES

6.1 Students understand that Climate Change will have an effect on the future of their lives and the lives of everyone in the world

6.2 Students know there are different possible future scenarios that scientists have modelled, and can describe how different courses of action now would lead to different possible futures

6.3 Students know that scientific understanding is developing and that scientific predictions may change

6.4 Students know that what individuals and the global community as a whole do now, will determine the probable future of life on Earth

6.5 Students can give examples of new technologies that could help in the fight against climate change and can explain their advantages and disadvantages

¹² <https://www.thebalance.com/capitalism-characteristics-examples-pros-cons-3305588>

¹³ https://www.theguardian.com/commentisfree/2019/jul/04/enough-climate-nightmare-paint-dream-inequality?CMP=share_btn_fb

¹⁴ <https://www.bbc.co.uk/news/science-environment-46398057>



7. MINDSETS & VIEWPOINTS



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Our 'mindsets' can have a big effect on the way we think and act towards the natural world. The prevailing **human-centred (anthropocentric)** view of the world (where people view the planet, and the other species we share it with, as being there to provide for humans' needs) is at the root of the approach which led to humans causing climate change. This mindset (heavily influenced by Judaeo-Christian 'stories') has prevailed for a long time in western, industrialised countries. It is connected with a view on 'development' and 'progress' where human enterprise and achievement takes us 'ever forward', with no limits to our 'growth' (which is seen in economic terms). It has also become closely linked to an economic system where the 'bottom line' of profit is emphasised above other priorities.

Other mindsets and perspectives have existed through human history, and still exist, for example in indigenous societies. Some of these emphasise connection (both with other humans and other species and ecosystems) over individualism. An **eco-centric** view of the world sees humans as one amongst many species sharing the planet, recognising our interdependence with other species and ecosystems.

These different mindsets are not just theoretical, they have a real impact on the way we act in the world. A shift in mindset could help humans regain 'balance' with each other and with our environment, and, help tackle climate change.

LEARNING OUTCOMES

7.1 Students can describe how they see the relationship of humans with the natural world / planet

7.2 Students can describe a range of different perspectives on climate change (e.g. of indigenous communities; spiritual and faith perspectives; people of colour, from the majority world)

7.3 Students can explain how different perspectives & viewpoints might lead to different behaviours

7.4 Students can suggest how prevailing human mindsets might

need to change or develop in response to the climate emergency

¹⁷ https://www.theguardian.com/commentisfree/2019/jul/04/enough-climate-nightmare-paint-dream-inequality?CMP=share_btn_fb

¹⁸ <https://www.bbc.co.uk/news/science-environment-46398057>



7. FEELINGS & BEHAVIOURS



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Faced with the enormity and urgency of the current climate crisis, it would be extraordinary if young people (and adults) did not respond with very strong feelings. Droughts, floods, mass migration, conflict, mass extinctions, the potential breakdown of human civilisation as we know it, are all real threats. Anxiety, fear and feeling overwhelmed are all perfectly normal responses to a situation of this magnitude. In fact, it would be abnormal not to feel them. Nearly $\frac{3}{4}$ of young people in the UK are anxious about climate change, and 3 in 5 children are worried about the impact of climate change on their lives.¹⁵

In addition, we know that we are 'part of the problem'. This crisis is caused by humanity as a whole, but individually we continue to contribute to causing it. The mismatch between what we know about the crisis, and the way we continue to act (cognitive dissonance), can be very uncomfortable for us to cope with. To protect ourselves from these negative emotions, a common response is to retreat into denial of some form, for example denial about the scale of the crisis, or, of our ability to make a difference. Our very anxiety and guilt can block us from taking action.

However, recognition of the scale of the crisis can also lead to other emotions: resolution to be part of a solution, hope invested in a more positive future, even excitement at being part of the generation that can have a decisive impact on the future of our species and planet. Being involved in positive action, especially collective action with others, can be an effective way of addressing climate anxiety.

LEARNING OUTCOMES

8.1 Students can discuss their own and others' feelings about the climate crisis

8.2 Students understand that anxiety is a normal response to understanding climate change

8.3 Students can explain methods people use to cope with anxiety about climate change (including taking collective action)

8.4 Students understand that when people are aware of a problem they don't always change their behaviour accordingly. They can give an example relating to climate change

¹⁵ <https://www.bbc.co.uk/newsround/51451737>