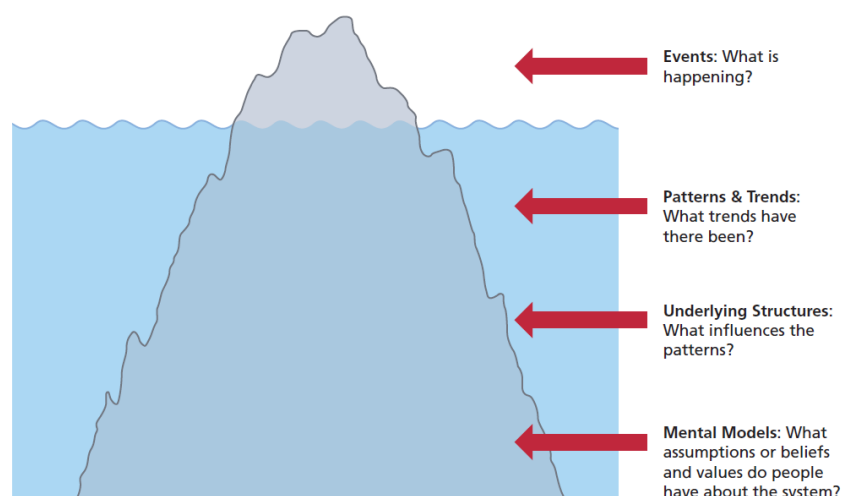# Teacher Support – the climate crisis

Introduction

Teaching the science of climate change is generally well established and there are several to support teacher knowledge (e.g. Aimhi Climate Course). When it comes to taking action, many schools face the issue of 'accepted wisdom'. These are ideas which are familiar to us all (driving less, walking more, less littering, more solar panels, etc) which appear sensible but are insufficient on their own to deliver the scale of change humanity requires.

"there was a lot of regurgitating things they'd heard already."
(Year 6 Teacher)

The aim of this support resource is to introduce you (teachers) to different ways to understand the climate crisis and how we can act to prevent it. It focuses on different strategies to address the climate crisis, ones which are effective and pragmatic. It is about thinking how to select the right actions to take and which sorts of ideas will work best.

This support resource is not intended for pupils or how to teach them about the climate crisis; it is intended to help you get to grips with this area and develop your personal understanding, and ask you to reflect on how this might influence your teaching about the climate crisis. However, the general approach can be adapted for use with pupils. Some of the material contained is thought provoking and intended to gently ask questions about our current responses to the climate crisis. We believe if we all have a deeper understanding of the climate crisis, that will start to flow out through the teaching and learning we deliver.

We will be using an iceberg as a model and metaphor to explore the climate crisis. At each level you'll dig a little bit deeper into understanding the climate crisis. One way of understanding the climate crisis is to see it as an example of systemic change: the crisis being a set of interconnected events which drive each other. The iceberg is a simple metaphor that allows us to dive into this system without getting lost.

Events: What is happening?

Patterns & Trends: What trends have there been?

Underlying Structures: What influences the patterns?

Mental Models: What assumptions or beliefs and values do people have about the system?

At each level you will be introduced to a deeper level of thinking. If you would like a quick overview of the iceberg model before starting, watch this short video clip.

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https://www.youtube.com/watch?v=Te1VYXqUH_c&t=39s

At each stage you'll be asked to reflect on what this means for you; what actions might be effective to mitigate the climate crisis and how to use this learning within your teaching.

At the end there is a task to draw it all together.

Events: What is happening?

It does not take much research to find newspaper headlines about the climate crisis: extreme weather events, more hurricanes, increased flooding, drought and coastal erosion to name a few. Try a web search for images on the climate crisis. These are the surface events we can easily see that tell us something is wrong. These can be observed at a very local level, as you are doing in Change the Story. We also need to get a sense of these events at a national and global scale.

The graphic right is produced by the Stockholm Resilience Centre. It explores nine processes that regulate earth systems including climate change. It is a visual representation of how current events are affecting the planet. Notice how the climate change has moved out of the safe green zone and into the zone of increasing risk.

www.stockholmresilience.org/research/planetary-boundaries.html

Current events are not isolated. Changes in the climate are having an impact on agriculture and economic income for example. The economist Kate Raworth has linked increasing damage to the earth's systems with increased societal harm; illustrated in this short video – Doughnut Economics (www.youtube.com/watch?v=Mkg2XMTWV4g). So, even at this level of events, we can already see there are many links and connections. You do not need to think too deeply at this stage about the causes, just get a sense that everything is interconnected, and what we do to one part of the earth's systems has impacts elsewhere.

A great website to explore is Climate Visuals (www.climatevisuals.org) which evidences which images best tell the climate crisis story.

Reflection:
- What climate change events have you observed and how have they affected you?
- Carry out a quick search online for images about the climate crisis, and select three which interest you. How does it link to the climate crisis? (make a list for each image; think about

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what 'causes' are associated with this image). How could you use similar images to stimulate questions in your classroom teaching?

- Keep a copy of the images to refer back to later.

Patterns and Trends: What has happened over time?

We need to dig a little deeper and ask ourselves what has been taking place which led to the rise of these events. Can we identify any obvious causes?

In Parts 1 and 2 we are exploring the phenomenon of change. Sometime this is beneficial for society and sometimes not; often it is more complex as many changes have mixed impacts. Understanding how patterns and trends change over time helps us to take action now. During the COVID-19 crisis, we have learnt that the virus can infect people at an exponential rate (doubling every 4-6 days if unchecked). So, acting when infection rates are still low was critically important. Another example of exponential change is the now familiar hockey stick graph of carbon emissions.

Annual total CO₂ emissions, by world region
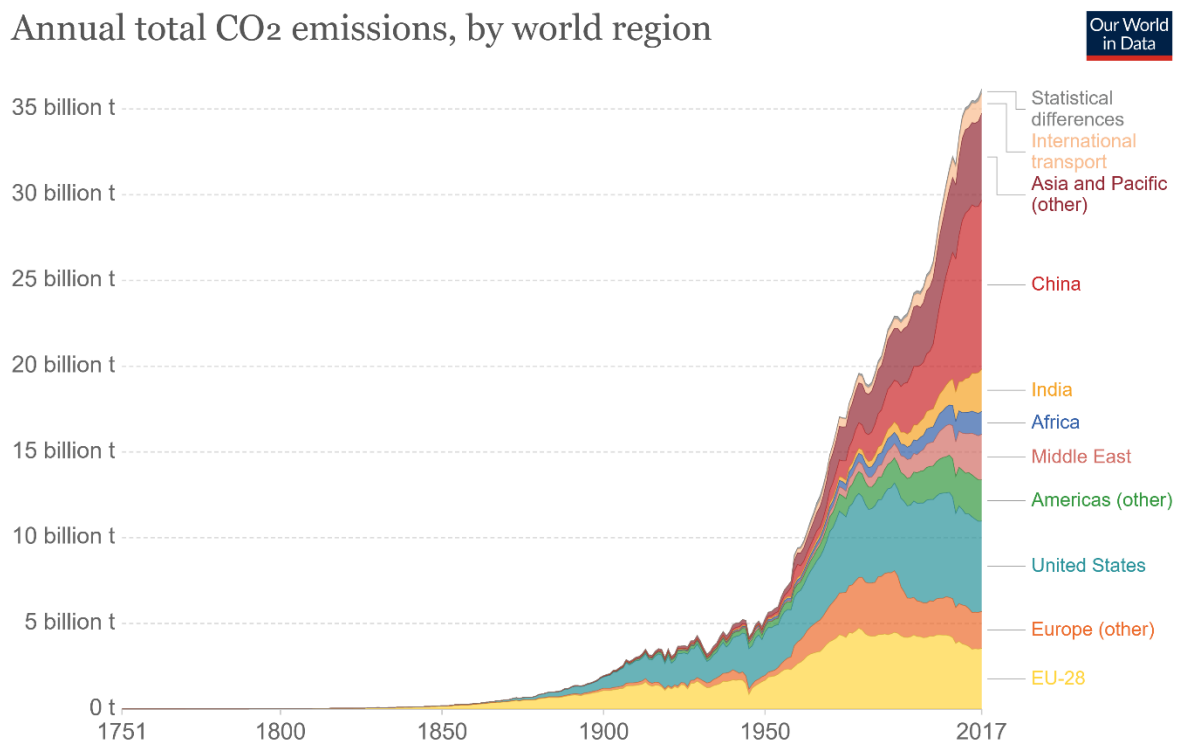
Source: Carbon Dioxide Information Analysis Center (CDIAC); Global Carbon Project (GCP)
Note: The difference between the global estimate and the sum of national totals is labeled "Statistical differences".
OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY

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Understanding the patterns and trends beneath events is important. It helps us to understand what might happen next, and how we can do something about it.

Reflection:

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- Here is a list of some trends over the past 50 years. Think about the three images you selected above, which of the trends below have contributed most to them? What might happen in the future if these trends continue? Are there other trends which need to be included?

    These come from Part 1:
    ✓ More floods.
    ✓ More trees dying.
    ✓ Wetter winters.
    ✓ Less snow.
    ✓ Warmer winters.
    ✓ Wetter summers.
    ✓ Drier hotter summers.
    ✓ Farmers having to change crops that they grow.
    ✓ More insect pests.

    And a few new ones too:
    ✓ Increases in private car ownership.
    ✓ More foreign holidays.
    ✓ Increased extraction of coal, oil and gas.
    ✓ Changes in population numbers.
    ✓ Changes in income levels.

We can also look at how these trends are affecting the climate crisis. This interactive graphic produced by Bloomberg (www.bloomberg.com/graphics/2015-whats-warming-the-world/) is helpful in understanding why carbon emissions are the central issue in the climate crisis.

Reflection:
- What actions can you think of to address the patterns and trends you have identified? Will these be enough and how might you measure this (there are some answers further down)?

Underlying Structures: What has influenced the patterns? What are the relationships?

As we dive deeper into the iceberg, we move away from tangible events. We start asking why have these trends and patterns emerged? Here are a few suggestions to consider.

Technology – our ability to invent and design new technology has increased exponentially over the last 100 years, from technology that was local and small scale to technology which now impacts the whole planet. Consider the spread of air travel, ICT and biotechnology. All have the capacity to affect the planet like technologies of the past could not. Can we rethink technology to be regenerative and deliver social good?

Markets and Competition – the way we trade goods and services encourages competition, ensures that there will be winners and losers, and that success is measured in the accumulation of wealth. In this race towards greater wealth we are using natural resources faster than they can be replaced (see Earth Overshoot Day - www.overshootday.org). Can we connect the economy with real needs,

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to promote collaboration over competition? For one view of 'real needs' take a look at the Happy Planet Index – www.happyplanetindex.org/\).

Science and Nature – back in medieval times nature appeared cruel and capricious, something we could only reconcile as acts of a higher force. Science slowly changed all that, through understanding 'how nature works' we more and more believe we can harness nature for our own development. We have lost a deep respect for and connection with nature. How can we rediscover a love of nature and respect for what the ecosystem services nature provides?

Private Ownership – increased belief in market forces has been fostered by private ownership. When communities no longer support each other, we look towards the state; when the state says it cannot afford to look after us, we need to do it ourselves. Political systems are increasingly supporting private ownership as a way to look after ourselves. We are moving away from collaboration as an organising principle towards competition. For example, can we move from ownership of goods to renting services?

Gross Domestic Product – how we measure progress matters. If we only measure success based on our income then other important areas of life suffer, such as health. Of course, we do invest in health and social services, but the key indicator for almost all countries is Gross Domestic Product. We measure the financial value of what we produce rather than the benefits it brings. How can we measure what matters?

Manufacturing – traditionally raw materials are mined from the earth, manufactured into a product which is consumed and then thrown away. This take-make-dump system is hugely wasteful and still prevalent today. In natural systems, such as a forest, there is no waste, everything upcycles. Can we design manufacturing to be like nature, a circular economy?

Consumption – we used to consume to survive, to meet our basic needs. As some countries have got much richer, consumption has moved from meeting basic needs to luxury shopping and holidays which reinforce a changed identity. We know increased consumption does not always lead to increased happiness. Can we consume in ways which provide pleasure and satisfaction, without accumulating lots of stuff and generating huge amounts of waste?

There are those who propose alternative ways of thinking about our underlying structures. The Happy Planet Index is one of them – watch a short clip (www.youtube.com/watch?v=sZPYI8BfnBs).

Reflection:
- Think back to your three selected images (events), how do the structures described above influence them: positively or negatively?
- What actions can you think of to address the underlying structures? Will these be enough to really change them?

Mental Models: What assumptions, beliefs, and values do people hold? How do they keep systems in place or change them?

We are now at the deepest level of the iceberg, where our core beliefs and convictions lie.

Task:

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- Imagine how your community would look like if the climate crisis has been successfully tackled and your community thriving. Look at the list of values and select five which would underpin that community.
- Imagine the UK today with the climate crisis. Look again at the list of values and select five which you think have led us here.
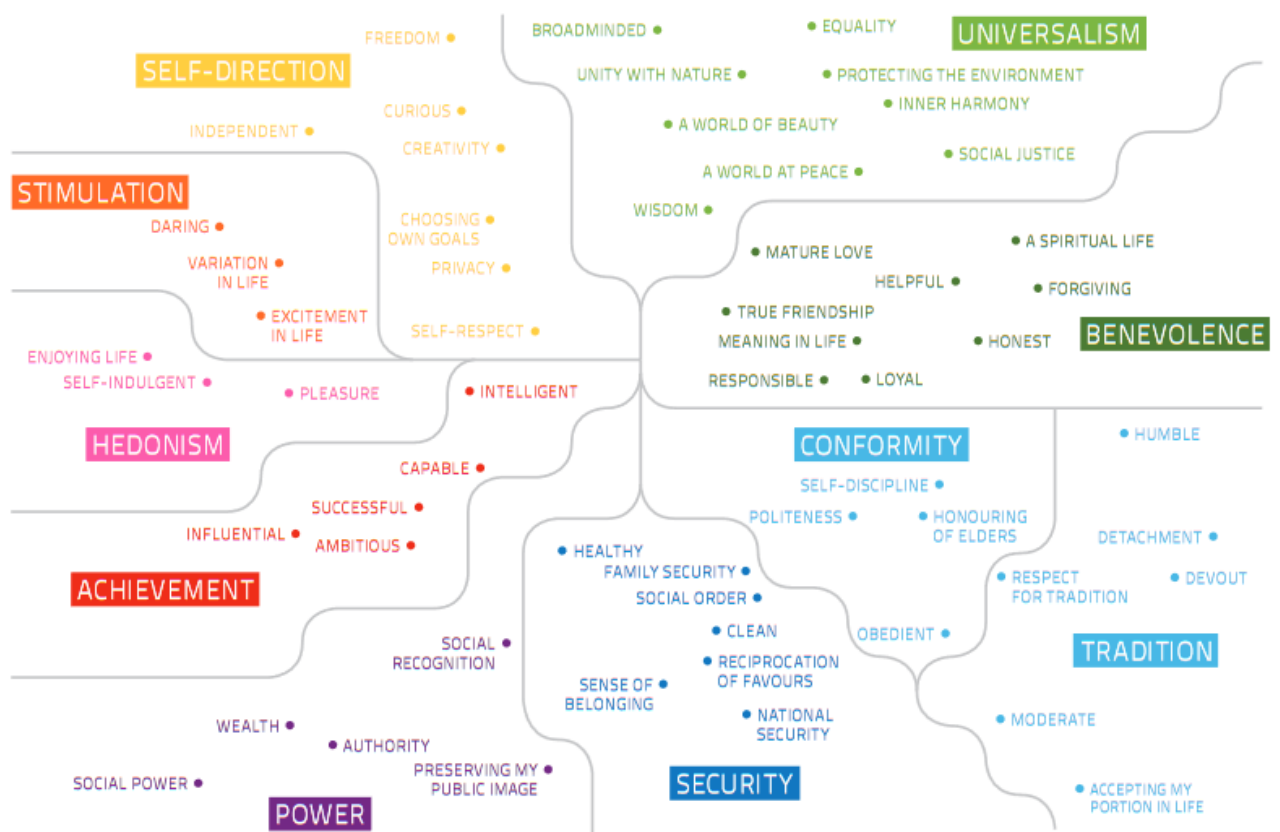
(See the Common Cause Handbook for a more detailed description – www.commoncausefoundation.org/_resources/the-common-cause-handbook/).
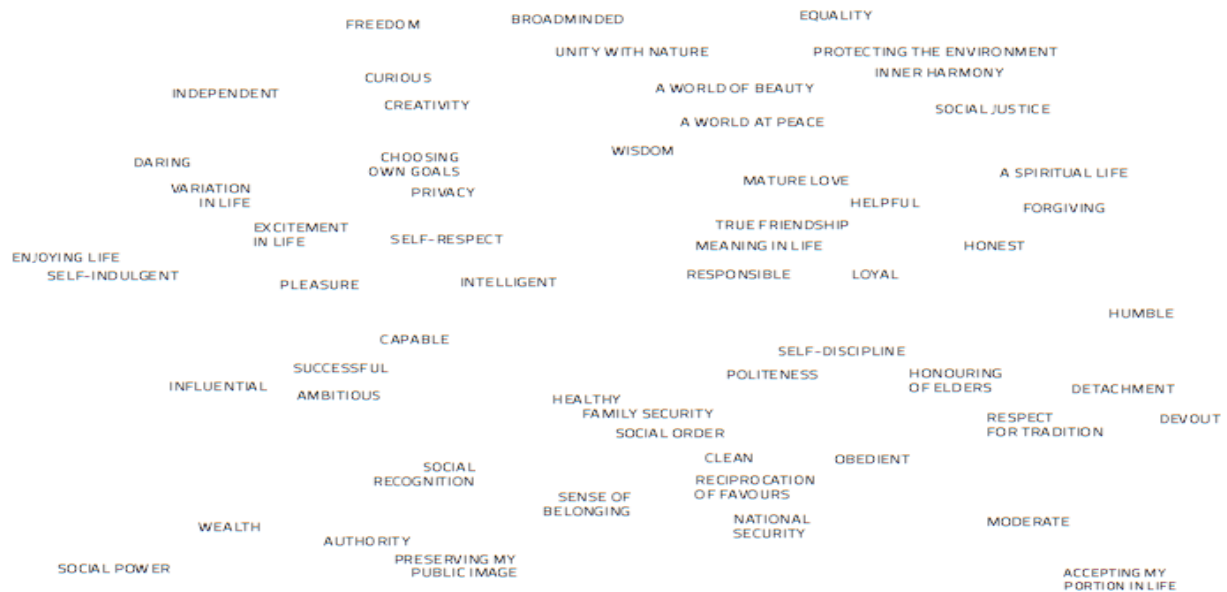
(Source: Common Cause Handbook licensed under a Creative Commons Attribution ShareAlike 3.0)

Debriefing: This list of values is not accidental. It is drawn from research across 60 countries and represents a list of the most common values we all share. What the research also tells us is not surprising, certain values lead us towards happier lives (intrinsic values) and others towards less happy lives (extrinsic values). More surprisingly perhaps, the same values which lead towards happiness also strongly correlate with pro-environmental behaviour and those leading towards less happiness with less environmental behaviours. The background research can be accessed at www.researchgate.net/publication/271231569_An_Overview_of_the_Schwartz_Theory_of_Basic_Values.

You can identify the values you selected in the diagram below. Values located close together tend to support and strengthen each other. Values far apart tend to work as opposites; strengthening one weakens the other. The groups of values labelled universalism and benevolence are strongly intrinsic. These values correlate strongly with people who are happier and more pro-environmental. The groups of values labelled power and achievement are strongly extrinsic. People holding these values are less happy on average and demonstrate weaker commitment to the environment.

SELF-DIRECTION — FREEDOM • — BROADMINDED • — • EQUALITY — UNIVERSALISM

UNITY WITH NATURE • — • PROTECTING THE ENVIRONMENT

CURIOUS • — • INNER HARMONY

INDEPENDENT • — • A WORLD OF BEAUTY

CREATIVITY • — • SOCIAL JUSTICE

A WORLD AT PEACE •

STIMULATION — WISDOM •

DARING • — CHOOSING OWN GOALS • — • MATURE LOVE — • A SPIRITUAL LIFE

VARIATION IN LIFE • — PRIVACY • — HELPFUL • — • FORGIVING

• EXCITEMENT IN LIFE — SELF-RESPECT • — • TRUE FRIENDSHIP

ENJOYING LIFE • — MEANING IN LIFE • — • HONEST — BENEVOLENCE

SELF-INDULGENT • — • PLEASURE — • INTELLIGENT — RESPONSIBLE • — • LOYAL

HEDONISM — • HUMBLE

CAPABLE • — CONFORMITY

SUCCESSFUL • — SELF-DISCIPLINE •

INFLUENTIAL • — AMBITIOUS • — POLITENESS • — • HONOURING OF ELDERS — DETACHMENT •

• HEALTHY — • RESPECT FOR TRADITION — • DEVOUT

ACHIEVEMENT — FAMILY SECURITY •

SOCIAL ORDER • — • CLEAN — OBEDIENT •

SOCIAL • RECOGNITION — • RECIPROCATION OF FAVOURS — TRADITION

SENSE OF BELONGING — • NATIONAL SECURITY — • MODERATE

WEALTH • — • AUTHORITY

SOCIAL POWER • — PRESERVING MY PUBLIC IMAGE • — SECURITY — • ACCEPTING MY PORTION IN LIFE

POWER

(Source: Common Cause Handbook licensed under a Creative Commons Attribution ShareAlike 3.0)

This short video clip – The High Price of Materialism (www.youtube.com/watch?v=oGab38pKscw) – explains it nicely. To delve a little deeper, explore the work of the Common Cause Foundation (www.commoncausefoundation.org) which prompts you to reflect on how values can support or undermine your message.

Reflection:
- Think back to the images activity when you explored events, review the causes you identified and reflect on how your views have (or have not) changed.
- What actions can you think of to address values, beliefs and assumptions? How would you do this in your classroom?

Putting the Iceberg to Work

There are lots of places you can find lists of actions to take for a low carbon future. We will focus on just one – Project Drawdown, but feel free to explore and critique others.

Context:
Since the industrial revolution, humans have emitted more than 2,000 gigatons (1 gigaton = 1 billion metric tons) of CO_2 into the atmosphere. One gigaton is also roughly 200 million elephants; enough elephants to stretch from the Earth to the moon, which would be bad for the elephant at the bottom.

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To limit warming to 1.5˚C we need to reduce CO_2 production by 800 $GtCO_2$ over the next 30 years.

The Plan:
Project Drawdown has created a list of actions which either reduce emissions of CO_2 or increase the ability of nature to capture and store CO_2. Each solution has been selected because they are:
- Currently available and scalable.
- Is economically viable.
- Can reduce greenhouse gas emissions by at least 50 million tons of over 30 years.
- Based on significant data and research.

Your Challenge:
How would you reach the goal to reducing CO_2 emissions by 800 gigatons?

Search the different climate solution categories (www.drawdown.org/solutions) to select 5 key solutions.

Reflection:
- Can you imagine your solutions being implemented in the UK?
- For your solutions to be successful, which levels in the iceberg model will be most critical?
- Think about the climate crisis story you might want to tell; how would you tell the story which brings about the change you want?
- Are there ways you can introduce this into your teaching and learning?
- Would this activity be more manageable as a short webinar using more visual representations of change?

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