



## SESSION 2 – Physical effects of climate change

VIEW THE SLIDES in 'SLIDE SHOW' mode – and then all the links will work!!

Please do send us photos of your children enjoying this club!

(Resources required – World map (If nec – printable A4 version attached to pack) + drawing pins)

Slide 2 – Challenge Review

Did you enjoy making your 'I am a Young Climate Warrior' image?

Did you manage to sign up to Young Climate Warriors?

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Slide 3 – Let's look at the physical effects of climate change.

A quick recap on what we've looked at so far – A TRUE or FALSE quiz.

- 1) Climate change is happening because the sun is getting hotter? – FALSE  
(One of the main reasons is because we are burning too many fossil fuels)
  - 2) Greenhouse gases are building up a blanket in our atmosphere – warming our planet – TRUE
  - 3) Weather is becoming more predictable with less storms? – FALSE  
(Climate Change means weather is becoming more extreme and unpredictable)
  - 4) Not many people are doing much about climate change, hopefully the problem will just go away – FALSE  
(Thousands of people – from all walks of life are helping to combat climate change)
  - 5) Climate can be described as the average weather conditions in a certain place over several decades – TRUE
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Slide 4 – Do you think 1 or 2 degrees of warming matters?

Global warming, global heating, climate change, climate crisis, climate emergency all refer to the fact that – our planet is heating up, causing our climate to change.

But you might not think that 1 or 2 degrees sounds like much!?!?

We need to remember that – this is referring to the average temperature of the planet – not just the temperature in one country or another. Some countries are experiencing colder or wetter weather than normal. Scientists say that our planet has already warmed by 1.1degrees on average. The poles are experiencing the most impact from the global heating – and it is thought that the average temperatures in the Arctic have already risen by 6 degrees!!



Warmed by 1.1 degrees since when? Well it is measured since the mid-1800s – since the Industrial Revolution (the beginning of the ‘era of the factory’ – iron production increased 30-fold, coal production increased 20-fold, steam engines were invented, and railroads were built – we started burning fossil fuels on a large scale)

The global average temperature during the ICE AGE was only around 6C cooler than TODAY!!

Scientists say that we need to keep our global warming to less than 1.5 degrees – and that’s why so many people are talking about climate change today! We need to act now.

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Slide 5 - Let’s have a look at some of the physical effects of climate change – Can you find these places on a map?

Using a world map – ask the children to put a pin as each of these photos is discussed. We’ve talked about how climate change results in more extreme and unpredictable weather – what does this actually mean for us?

Let’s have a look at some recent photos showing some of the effects of climate change – and why so many thousands of people are working to try and do something about it.

#### PICTURE 1 – Melting ice (Antarctic)

As our climate changes, glaciers and ice sheets are melting more than before. It’s important to realise that SOME Antarctic and Arctic ice sheets normally melt annually – when the weather warms up the ice melts and then re-freezes when the weather cools again. This was true even before climate change. This is part of nature, this is a predictable normal happening for that continent. In normal conditions – Antarctic sea ice extends to about 7 million square miles in winter and reduces to a summer minimum is about 1 million square miles.

What has changed with climate change is that the ice caps – made up of ice sheets and glaciers – that are normally frozen all year round are melting more than before. These areas of ice cannot re-form in the winter times.

#### PICTURE 2 – Flooding (Lifeboats in York, 2020)

People being rescued from their flooded homes, as rivers burst their banks.

#### PICTURE 3 – Flooding (Bangladesh, 2020)

Rickshaw drivers struggling with extreme levels of rainfall in Bangladesh –

#### PICTURE 4 – Forest fires (Australia, 2020)

These were the worst forest fires suffered by Australia in decades.

Australia’s forests are used to a cycle of fire, rain and recovery. The majority of the country’s forests are uniquely adapted to fire – some species need it – this has been happening for millennia – HOWEVER climate change is meaning [more severe fires, more often](#).

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Slide 6 – Here are other physical effects of climate change  
– can you keep finding them on the map?

Continue to find these places on the map.

PICTURE 5 – Coral ‘bleaching’ (Japan, 2020)

Our oceans are warming.

Our oceans are also absorbing more carbon dioxide from the atmosphere than they historically used to and are becoming more acidic.

Both the warming and the acidification are making it difficult for some marine ecosystems – in particular coral reefs.

70 to 90% of warm water tropical coral reefs that exist today are expected to disappear even if warming at warming of 1.5°C...

PICTURE 6 – Glacier melting (Austrian Alps – Glacier Taschachferner)

If emissions continue to rise at current rate, ice will have all but disappeared from Europe’s Alpine valleys by end of century. Half of the ice in the mountain chain’s 4,000 glaciers will be gone by 2050.

PICTURE 7 – Rising sea levels (Mabul Island, Malaysia)

Sea levels are rising – because warming oceans expand, and melting ice adds volume. Mabul Island is just one example of some of the very low-lying islands. Mabul only covers 20 hectares and is between 2 – 3metres above sea level.

There are 38 countries designated by the United Nations as [Small Island Developing States](#) – these are some of the countries most affected by climate change and rising sea levels.

PICTURE 8 – Drought + water shortages (South Africa, 2018)

Severe water shortages in South Africa meant that people had to queue at standpipes at the end of their streets to get water.

They could no longer just ‘switch on the tap’ – like we are so used to being able to do –  
Can you imagine having to worry about every drop of water you use?

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Slide 7 – ‘Human beings are the greatest problem-solvers our planet has ever known’. – Sir David Attenborough, Davos 2019

Those were pretty dramatic photos – they showed some of the physical effects of climate change. Climate Change is affecting lives all around the world, and is and will increasingly make many animals and human lives more difficult.

But there are lots of things we can do to help improve the situation.

Can you think of some examples of problems humans have already solved?

We are hard-wired to solve problems. From finding food and establishing safe homes, to landing on the moon and designing prosthetic limbs.



In ten years we progressed from no human ever leaving the Earth's orbit to a man standing on the moon, and at that time NASA didn't have a single computer as powerful as the gadget you're probably reading this on.

How many small problems will you solve even today?

I wonder how many small little problems you will even solve today –

How to best take the core out of an apple?

How best to arrange your school books so you can get them out quickly?

Where to keep your socks so you can easily find them?

How to wipe your shoes effectively so you don't muddy the carpet?

Scientists have agreed that we have just over a decade – 10 years – to solve this climate crisis.

Prince William and David Attenborough have launched the Earth Shot Prize (designed to incentivize change and help to repair our planet over the next 10 years.)

Five categories – fix our climate, build a waste-free world, revive our oceans, clean our air, protect and restore nature

Prizes – £1m for 5 projects each year for 10 years – providing at least 50 solutions to the world's greatest environmental problems by 2030.

Watch this space over the next decade – and what ideas people come up with!



WATCH THE VIDEO – (click the link on the slide in 'slide show' mode)

Earthshot Prize – 3 minutes

<https://youtu.be/bymiMNa6QJk>

When you grow up what problems would you like to help solve?

Maybe when you grow up you'll be instrumental in helping to solve some of the big problems for other people and our world

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Slide 8 – Entrepreneurs and Pioneers

There are lots of exciting projects happening around the world to help combat climate change.

Do you know who these entrepreneurs are?

Bill Gates, the computer software innovator, has just published a book (how to avoid a climate disaster) arguing that we need to keep innovating to tackle climate change. He talks about how it used to seem like a 'wild idea' to have computer on every desk – and now we just take them for granted! He is investing in lots of projects and hopeful that our power to invent will help us succeed in tackling climate change.

Elon Musk, industrial designer and engineer, he runs the SpaceX project, as well as Tesla – making some of the first electric cars



Bill Gates and Elon Musk are big names – but there are thousands of other Pioneers – people who are venture into the unknown – who are taking risks, and trying out ideas – if there are enough different projects being trialled some of them might succeed!

Check out these Pioneering seaweed projects

Pioneering projects involve risk-taking – they may or may not succeed, however if there are enough different ideas being trialled some of them might succeed.

What do you think of these underwater seaweed farming ideas?

(Optional - IF YOU HAVE TIME? )



WATCH THE VIDEO (click the link on the slide in 'slide show' mode)

Seaweed as a food – 5 minutes

<https://youtu.be/LIK7IUMFqw8>.

Seaweed as a biofuel – 1.5 minutes

<https://youtu.be/rlxwiOuZ61o>.

Do these seaweed ideas seem crazy to you – or not? Would you like to be involved in these sorts of projects when you are older?

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Slide 9 – Design a newsfeed / social media image / poster

David Attenborough also said ' Right now, we are facing our greatest threat in thousands of years – climate change' (as well as - 'Human beings are the greatest problem-solvers our planet has ever known)

Use one or both of these two quotes to put together a poster.

What is the purpose of your poster? Are you trying to 'share information' or 'persuade people to act'?

What type of image would you choose?

Is tone and language important?

Slide 10 – Challenge for the week!

Find a climate change related article in the newspaper / website – and bring it with you next week.

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Take-away points from this session:

- Scientists say that we need to keep our global warming to less than 1.5 degrees above 'pre-industrial levels' – we have already reached 1.1degrees.



- Climate Change is already beginning to mean more rainfall and storms, more droughts and forest fires, changing seasons, melting glaciers, shrinking sea ice and rising sea levels.
- Humans are our greatest problem solvers. We have 10 years to 'solve' this climate crisis.
- The EarthShot Prize – launched by Prince William and David Attenborough is designed to incentivize change and help find solutions to repair our planet.
- There are many exciting projects underway – Entrepreneurs and Pioneers are throwing themselves into helping to tackle climate change.

