

## CLIMATE SCIENCE

Supporting Resources  
for the Primary Classroom



PSTT Fellow Paul Tyler shares his Topical Science Update about Climate Change

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PSTT is working hard to support climate science education for primary children. In this Climate Science section, we share the outputs, updates and ideas from some of the initiatives we are developing.

### What is Climate Change?

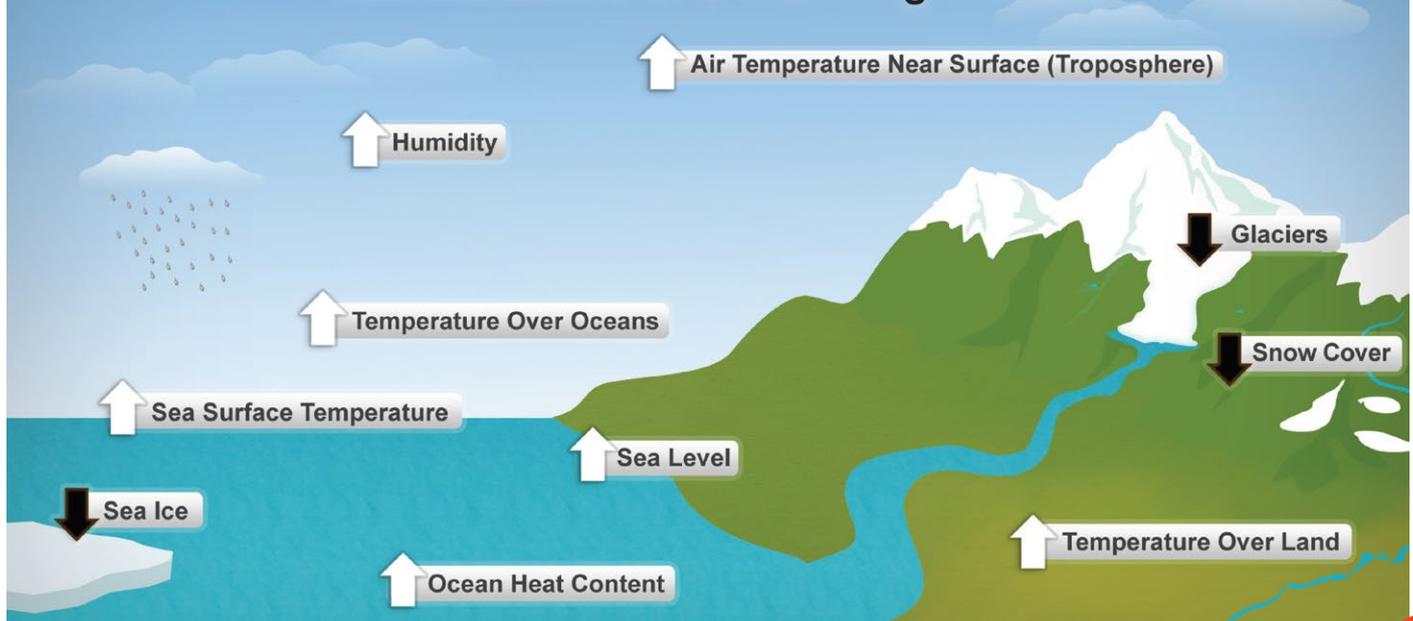
Climate is an average measure of the weather conditions for an area over a long period of time, typically 30 years. Scientists have been closely monitoring the Earth's climate for the last 150 years and in that time they have observed significant changes in the global climate. As well as immediate measurements, scientists are able to study Earth's climate changes over 1000s of years using ice core samples, ocean sediment analysis and fossil records. They have measured that global temperatures are increasing faster than at any other time in Earth's history and they conclude that the increases are directly linked to a variety of human activities.

### Why does Climate Change Matter?

But why does climate change matter? Surely if the Earth is getting a bit warmer, we can just enjoy nicer summers and more ice cream? Unfortunately changes in global climate don't just mean it's going to be a bit warmer. Melting ice caps, rising sea temperatures, ocean acidification and increased natural disasters are just some of the effects of long term climate change. The global population continues to rise - 7.6 billion on 16th July 2018 – and all these people need food, water, accommodation, transport and energy, all of which draw on the Earth's natural resources and affect climate change.

*Ten indicators of global warming*

### Ten Indicators of a Warming World





## Why do people talk about it as the Climate Change Debate?

Science tells us we have a problem that affects all of us, so surely we can all pull together to solve it? That'd be great, wouldn't it? Unfortunately it's not quite that simple. Science is often influenced by politics and economics; global leaders hold the power to make real change - most of them agree, but not all of them, hence the word debate which is unhelpful.

## The Energy Issue

Seven and a half billion people use a lot of energy! In the last 50 years, global energy consumption has more than tripled and shows no signs of slowing down. More concerning is the fact that, even with advances in renewable technology, we still get about 75% of our energy from non-renewable fossil fuel sources: gas, coal and oil. Energy scientists and engineers are constantly working on new solutions and improving current technologies to meet the growing needs of an energy-hungry global population.

Read more about:

[Non-Renewable Energy](#)

[Renewable Energy](#)

[Energy Sources](#)

*Wind and solar power – examples of renewable energy*



*Power from burning fossil fuels – an example of non-renewable energy*





## Pollution Problems

Pollution is closely linked to society's increasing demands for energy. Burning fossil fuels produces carbon dioxide which is a greenhouse gas. The build up of CO<sub>2</sub> in the atmosphere traps more heat from the Earth that is trying to escape to space, with some of that trapped heat being redirected to the Earth's surface, causing warming. Other significant contributors to the global pollution crisis are deforestation, concrete production and agriculture. Pollution is also linked to a number of serious health issues, such as asthma, which are on the rise globally.

Other large scale agricultural pollutants are fertilisers and pesticides, which are sprayed on crops and often run off into streams and rivers polluting water supplies.

Read more about:

[The Greenhouse Effect](#)

[Carbon](#)

## Australian Bushfires



Bushfires are common throughout Australia, but since September 2019 they have been raging out of control across South Eastern regions of the country, leading to thousands of people having to abandon their homes to escape not just the fire itself, but the polluted air caused by the fires. Bushfires are most likely to start when the weather is very dry and very hot. The hotter it is, the more likely a fire will start, or carry on burning and if it is windy, this can spread the fire very quickly. Sometimes they are started by human activity which may be deliberate or accidental, but they can also start naturally, e.g. because of lightning.

[How did the fires start in Australia?](#)

[What is it like in Australia for kids right now?](#)

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## Trophic Cascades

Until the 1960s it was thought that ecosystems were always controlled by the primary producers: green plants. It was then discovered that top predators can also play a significant role in determining the success of ecosystems. These predators not only affect their own specific ecosystems, they can have a significant effect on keeping the global ecosystem balanced.

Read more about:

[How Wolves Change Rivers](#)

[How Whales Change Climate](#)



### Questions to support children's discussions and research

- *What can we do in our school to reduce the amount of energy we use?*
- *What can we do as individuals or families to reduce the amount of energy we use?*
- *Can we find out which human activities contribute most to climate change?*
- *Why might some countries and companies not want us to worry about climate change?*
- *Can we find out how climate change could affect our lives in the future?*

Useful websites

[Climate change guide](#)

[World Population Counter](#)

[The 2° Problem](#)

[Effects of Climate Change](#)

[The Paris Agreement](#)

We are grateful to Paul Tyler for sharing this resource on which this article is based. To subscribe to the mailing list for Paul's FREE Topical Science Updates, please e-mail him on [topicalscienceupdates@gmail.com](mailto:topicalscienceupdates@gmail.com)