

What do you want to know about climate change?

Is the climate warming?

ANSWER

Yes. Earth's average surface air temperature has increased by about 1°C since 1900. Over half of the temperature increase has occurred in the past 50 years.

A wide range of other observations include:

- A reduction in Arctic sea ice.
- An increase in ocean temperatures.
- Indications from the natural world, such as movement towards the poles by temperature-sensitive species of fish, mammals and insects.

These together provide undeniable evidence of warming around the world.

What do you want to know about climate change?

How do scientists know that recent climate change is largely caused by human activities?

ANSWER

Scientists know that recent climate change is largely caused by human activities from an understanding of basic science and analysing the detailed patterns of climate change caused by both human and natural influences. The climate has changed in the past from volcanic eruptions and small changes in the amount of energy arriving from the Sun. However, the rapid changes we are seeing cannot be explained by natural causes so they must be being caused by human activity.

What do you want to know about climate change?

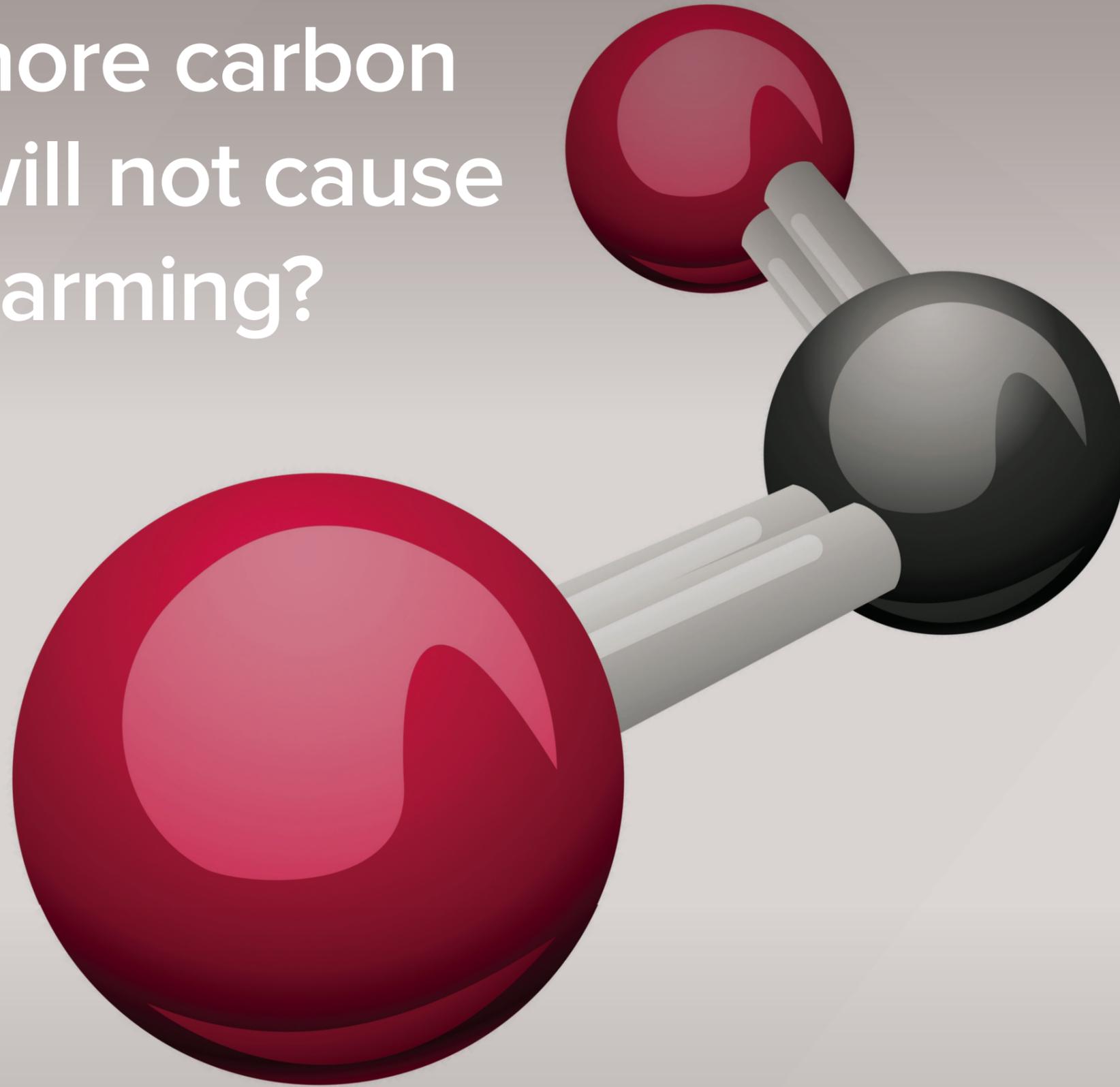
Climate is always changing. Why is climate change of concern now?

ANSWER

All changes in climate, including those caused naturally, are disruptive. Past climate changes led to the extinction of many species, such as the dinosaurs, population migrations, and significant changes in the land surface and ocean circulation. The speed of the current climate change is faster than most of the past natural events, making it more difficult for human societies and the natural world to adapt.

What do you want to know about climate change?

Is there a point at which adding more carbon dioxide will not cause further warming?



ANSWER

No. Adding more carbon dioxide to the atmosphere will cause surface temperatures to continue to increase.

Extra carbon dioxide becomes less effective at trapping energy from the Sun, but surface temperature will still rise.

What do you want to know about climate change?

If the world is warming, why are some winters and summers still very cold?

ANSWER

Global warming is a long-term trend, but that does not mean that every year will be warmer than the previous one.

Day to day and year to year changes in weather patterns will continue to produce some unusually cold days and nights or winters and summers, even as the climate warms.

What do you want to know about climate change?

How does climate change affect the strength and frequency of floods, droughts, hurricanes and tornadoes?

ANSWER

The air near to the Earth's surface is becoming warmer and wetter as a result of human-caused greenhouse gas emissions. This gives the potential for more energy for storms and extreme weather events. The types of events most closely related to temperature, such as heatwaves and extremely hot days, are becoming more likely.

Heavy rainfall and snowfall events (which increase the risk of flooding) are also generally becoming more frequent as warm air causes higher rates of evaporation.

What do you want to know about climate change?

What is ocean acidification and why does it matter?

ANSWER

Direct observations of substances in the ocean have shown that the chemical balance of seawater has shifted to be more acidic. Some marine organisms (such as corals and some shellfish) have shells made of calcium carbonate, which dissolves in acid.

As the sea water becomes more acidic, it becomes more difficult for these organisms to form or maintain their shells.

What do you want to know about climate change?

How confident are scientists that Earth will warm further over the coming century?

ANSWER

Very confident.

If emissions continue at their present rate, without efforts to reduce them through new technology or regulations, then warming of 2.6 to 4.8°C in addition to the warming already experienced would be expected during the 21st century.

THE
ROYAL
SOCIETY

© acilo.

The text of this work is licensed under the terms of the Creative Commons Attribution License which permits unrestricted use, provided the original author and source are credited. The license is available at: creativecommons.org/licenses/by/4.0. Photography is not covered by this license and should not be reproduced. © The Royal Society. Issued: June 2021 DES6894_2.

What do you want to know about climate change?

Are climate changes of a few degrees a cause for concern?

ANSWER

Yes. Even though an increase of a few degrees in global average temperature does not sound like much, global average temperature during the last ice age was only about 4 to 5°C colder than now. Global warming of just a few degrees will cause widespread changes in temperature and rain or snowfall as well as increases in some types of extreme weather events.

These and other changes (such as sea level rise and storm surge) will have serious impacts on human societies and the natural world.

What do you want to know about climate change?

If emissions of greenhouse gases were stopped, would the climate return to the conditions of 200 years ago?

ANSWER

No. Plants and the ocean will continue to store some carbon dioxide from the atmosphere, but even if emissions of greenhouse gases were to suddenly stop, Earth's surface temperature would require thousands of years to cool and return to the level in around 1850, the pre-industrial era.