

Genre: Public information article / free, short science course
Audience: People who are relatively inexperienced in the field of G.W.
Purpose: To inform people of Global Warming and explain what it is
To make it clear that G.W. is potentially dangerous

Climate Change: The Facts

Adapted from an article published in *The Guardian* newspaper supplement — Science Course Part III: The Earth (in association with the Science Museum)

The subject of global warming has become impossible to ignore. But what are its implications? And is mankind really to blame?

Twenty years ago global warming was a fringe subject - it seemed absurd that we could be having an effect on the Earth's climate. Today global warming has become a political hot potato and the majority of scientists agree that it is a reality and here to stay.

What is global warming?

Extra carbon dioxide [CO₂] in the atmosphere enhances a natural process known as the greenhouse effect. Greenhouse gases, such as carbon dioxide, absorb heat and release it slowly. Without this process, Earth would be too cold for life to survive.

Over the past 200 years mankind has increased the proportion of greenhouse gases in the Earth's atmosphere, primarily by burning fossil fuels. The higher levels of greenhouse gases are causing our planet to warm - global warming.

Is global warming really caused by humans?

Since 1958 scientists at the Mauna Loa Observatory in Hawaii have taken continuous measurements of atmospheric carbon dioxide. The levels go up and down with the seasons, but overall they demonstrate a relentless rise.

Bubbles of gas from ice cores and the chemical composition of fossil shells provide us with a record of atmospheric carbon dioxide going back millions of years. There have been warm periods in the past where carbon dioxide was at levels similar to those seen today. However, the rate of change that we see today is exceptional: carbon dioxide levels have never risen so fast. By 2000 they were 17% higher than in 1959.

Accompanying this rapid increase in carbon dioxide we see a rise in average global temperatures. Warming in the past 100 years has caused about a 0.8C increase in global average temperature. Eleven of the 12 years in the period 1995-2006 rank among the top 12 warmest years since 1850.

There is little doubt that humanity is responsible for the rapid rise in carbon dioxide levels. The rise in temperatures that has accompanied our fossil fuel addiction seem too much of a coincidence to be just chance. Most people now agree that our actions are having an effect on Earth's climate.

How hot will it get?

Estimates from some of the world's best climate scientists - the Intergovernmental Panel on Climate Change (IPCC) - suggest that the average global temperature will have risen between 2.5C and 10.4C by 2100.

Comment [L1]: First the Topic is explained, and then the questions come after it, which makes it more accessible to the reader and an "easy read".

Comment [L2]: This statement makes G.W. seem very dangerous and makes it stand out as something that humans should really be thinking about and caring about.

Comment [L3]: The possibility that we could be to blame for such a thing interests the readers and also a reader would want to know what they were at fault for, also to be blamed for something has negative connotations which would signify that G.W. was something that wasn't meant to be and is bad.

Comment [L4]: This use of informal language makes it more accessible to the audience as it is a daily used word

Comment [L5]: Again, this is very informal language to make it more accessible to the majority of readers, and also it shows that it has become important to the people that lead countries, so it should be to the people within them as well.

Comment [L6]: The sub headings break the information down into manageable chunks and enable the reader to easily locate the information that they are looking for. The article begins with the most basic question - what is global warming - and then progresses to more detailed topics

Comment [L7]: It is commonly known and said out as CO₂, so to have written it in brackets makes it more accessible in case people do not know that CO₂ is carbon dioxide

Comment [L8]: First the explanation and then the clear fact of what it is answers the question raised by the subheading - making the article easily accessible to the readers.

Comment [L9]: The alliteration emphasises the fact that the rise is really very rapid

Comment [L10]: That the word 'never' is used in this sentence to show how big this problem is and why people are so worried about it and are convinced that humans are part of causing G.W.

Comment [L11]: This shows how the humans are obsessed and that even if we would want to, we could not stop this rise of emissions.

Whether it will be the lower or upper end of this estimate is unclear. Currently, oceans and trees are helping to mop up some of the heat by absorbing carbon dioxide, but eventually they will reach capacity and be unable to absorb more. At this point the atmosphere will take the full load, potentially pushing temperatures sky high.

Is it just carbon dioxide we need to worry about?

No. Carbon dioxide is just one of a number of greenhouse gases, which include water vapour, methane, nitrous oxide and ozone. Livestock farming (farting cows) and rice paddy farming (rotting vegetation) have contributed to higher levels of methane in the atmosphere.

What is more, methane has a nasty sting in its tail. Although it only hangs around in the atmosphere for about 10 years, it is far more potent as a greenhouse gas, trapping about 20 times as much heat as carbon dioxide.

What are tipping points?

A steady rise in greenhouse gases won't necessarily cause a steady rise in global temperatures. Earth's climate is highly complicated and scientists fear that many delicate thresholds exist, which once passed could trigger a dramatic change. These thresholds have become known as "tipping points".

One potential trigger could be the release of methane from methane clathrate compounds buried on the sea floor. Currently these deposits are frozen, but if the oceans warm sufficiently they could melt, burping vast quantities of methane into the atmosphere. Scientists fear that this sudden release may cause a runaway greenhouse effect.

How will global warming affect us?

Although average global temperatures are predicted to rise, this doesn't necessarily mean that we'll be sitting in our deckchairs all year round. The extra energy from the added warmth in the Earth's atmosphere will need to find a release, and the result is likely to be more extreme weather.

If we stop emitting CO2 now will it get better straight away?

Unfortunately not. Research shows that we are already committed to an average global temperature rise of nearly 1C, lasting for at least the next 500 years.

Kate Ravilious

Comment [L12]: "sky high" is a very informal term and again would suggest how this is a leaflet for less informed people and yet it still conveys the message of how "potentially" dangerous G.W. can be

Comment [L13]: This question can be answered so simply and blatantly that it emphasises to the reader that CO2 is not the only thing to worry about – again re-emphasising the fact that Global Warming is complex, caused by many factors and therefore a considerable threat to the planet. The confident tone also encourages the readers to trust the article and, in addition, the offering of fairly simple black and white answers to the questions raised once again makes this topic accessible to people who are only just beginning to explore this field

Comment [L14]: Both remarks in the brackets are things that people know of and can imagine easily, it makes it more accessible to the reader.

Comment [L15]: Again, this use of informal idiom, makes the article accessible to the average 'lay-reader' ... in many ways it is speaking their language

Comment [L16]: That scientists fear this as well would mean the rest of us should too, it heightens the level of danger that G.W. brings

Comment [L17]: the moment when things change before that moment, things are gradual, afterwards more drastic – again the sense that Global Warming is a dangerous and potential unpredictable threat is reinforced

Comment [L18]: The term "runaway greenhouse effect", once again suggests that although things seem alright now they may eventually run out of our control. One of the biggest problems facing G.W. activists is that people don't feel threatened by G.W. because they can't see any immediate evidence that it is a danger – the problem is that if we wait until the threat is obvious it may be too late and Ravilious attempts to make this clear to the reader here.

Comment [L19]: A comment that a member of the British audience might be expected to make. Again Ravilious is attacking the points against her position – G.W. won't make the weather sunnier ... just more extreme

Comment [L20]: To finish the leaflet off with this makes it clear how G.W. will affect the global temperature and that we have already had a noticeable on the temperature of the world – the implication is that we need to act soon to limit the damage that we are doing

What is global warming?

What determines the temperature of the Earth?

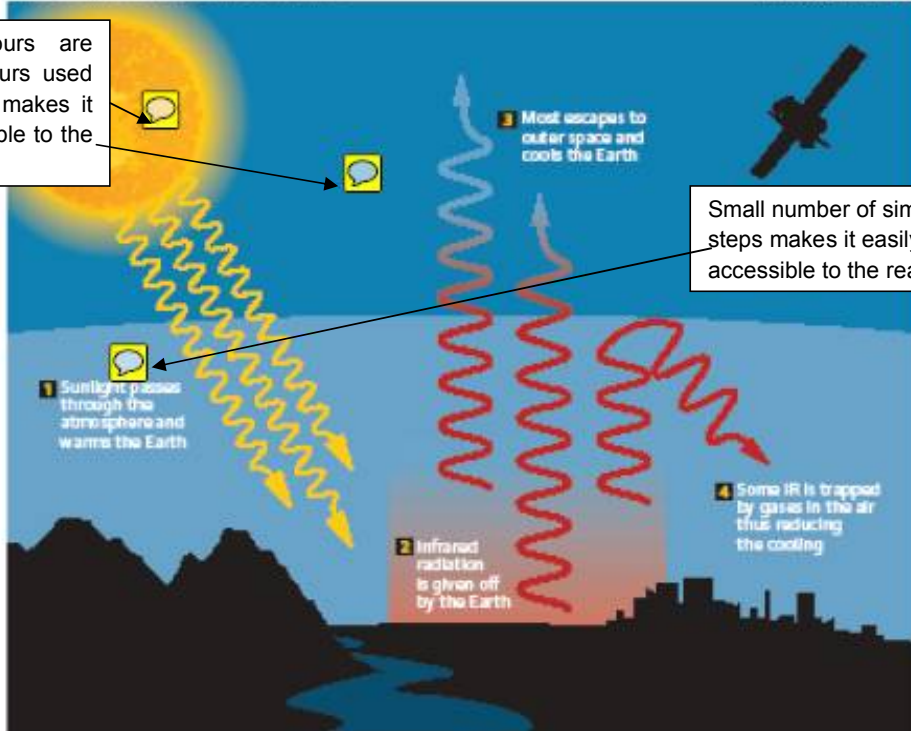
Solar energy emitted from the sun radiates to the Earth



Invisible infrared energy is radiated from the Earth to outer space

The greenhouse effect on the atmosphere

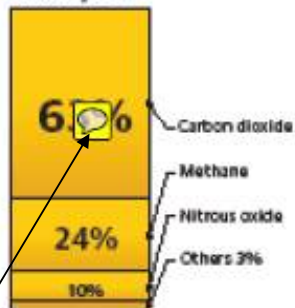
SOURCE: HADLEY CENTRE



Primary colours are the only colours used which again, makes it more accessible to the reader

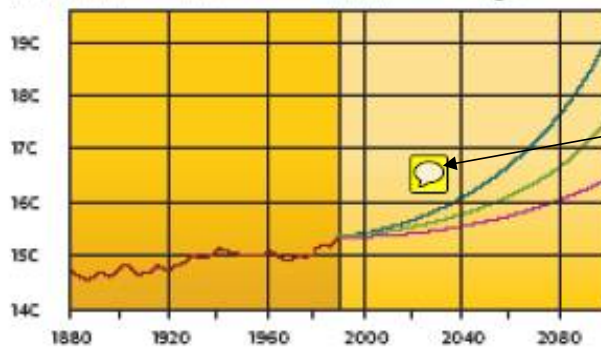
Small number of simplified steps makes it easily accessible to the readers.

CO₂ is the major contributor to global warming
Current emissions, effect over next 100 years



Projection of global average temperature to 2100

IPCC estimate — Low — Medium — High



massively simplified diagrams

big numbers very easy to read and accessible