

## Rising sea levels

Global warming is a huge problem on Earth. The Arctic is heating up faster than any other place. Higher temperatures are melting the frozen soil or 'permafrost' and in winter there is less sea ice than there used to be. These changes harm the homes of the polar wildlife and humans but they also affect the whole planet.



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Does it make a difference if melting ice is sea ice or land ice (ice sheets and glaciers)? This experiment should help you find out.

### Equipment

- Trays or pans with high sides
- Ice cube trays
- Freezer
- Large pebbles
- Ruler

### Method

1. Make lots of ice cubes
2. Use the pebbles to build an island in the pan.
3. Place half the ice cubes in the pan, around the island.
4. Pour water in until the ice cubes are floating but it doesn't quite cover the pebbles.
5. Use a ruler to measure the depth of the water.
6. Leave the 'sea ice' to melt. Measure the water level afterwards.
7. Repeat the experiment but this time place the ice cubes on top of the pebble island.
8. Use the ruler to measure the measure the water level at the beginning and then again at the end when the ice has melted.

### You should find:

**Melting** sea ice (like Arctic sea ice) does not make **sea levels rise**. This is because the ice is already in the sea, so it's already **displacing the same volume** of water that it will displace once melted.

Melting land ice does make sea levels rise. This is because the **melted ice** runs into the oceans, adding **extra volume**. Sea levels are already around 20cm higher than they were in 1900.

For more information, take a look at this website:

<https://www.natgeokids.com/uk/discover/geography/general-geography/what-is-climate-change/>

Now have a go at this quiz. Answers are at the bottom – no peeping!!



## CLIMATE CHANGE AND GLOBAL WARMING QUIZ



1. Carbon dioxide, methane and ozone are all examples of 'greenhouse gases' which trap heat in the Earth's atmosphere. **True / False**
2. Water vapour and clouds in our atmosphere also contribute to the 'greenhouse effect'. **True / False**
3. If we could remove all of the greenhouse gases from the Earth's atmosphere our planet would be a better place. **True / False**
4. Scientists have only been aware of global climate change for about 50 years. **True / False**
5. Planet Earth's climate did not change for hundreds of millions of years until humans started burning fossil fuels. **True / False**
6. Fossil fuels such as coal, oil and gas are formed from the remains of animals and plants that died millions of years ago. **True / False**
7. Global warming will mostly affect humans and not animals. **True / False**
8. Coal burning power stations (which generate electricity) are responsible for most of the man-made carbon dioxide in our atmosphere. **True / False**

## **\* ANSWER SHEET \***

1. Carbon dioxide, methane and ozone are all examples of 'greenhouse gases' which trap heat in the Earth's atmosphere. **TRUE**
  
2. Water vapour and clouds in our atmosphere also contribute to the 'greenhouse effect'. **TRUE** *In fact, water vapour is responsible for more of the greenhouse effect that warms our planet than any other gas.*
  
3. If we could remove all of the greenhouse gases from the Earth's atmosphere our planet would be a better place. **FALSE** *Without greenhouse gases our planet would not be warm enough to support life. The gases only cause problems when they become too concentrated.*
  
4. Scientists have only been aware of global climate change for about 50 years. **FALSE** *It was around 200 years ago that scientists first began to suspect that the Earth's climate had changed many times in the past.*
  
5. Planet Earth's climate did not change for hundreds of millions of years until humans started burning fossil fuels. **FALSE** *The Earth's climate has regularly changed over its 4.5 billion year history.*
  
6. Fossil fuels such as coal, oil and gas are formed from the remains of animals and plants that died millions of years ago. **TRUE**
  
7. Global warming will mostly affect humans and not animals. **FALSE** *Scientists predict that in this century global warming will be the main cause of animals becoming extinct. A global temperature rise of just 1.5°C (1.8°F) could put a quarter of all species at risk!*
  
8. Coal burning power stations (which generate electricity) are responsible for most of the man-made carbon dioxide in our atmosphere. **TRUE** *It is estimated that coal burning power stations are responsible for around 40% of all man-made carbon dioxide in our atmosphere.*