

Unit 1 Dynamic Planet

Topic 2 Changing Climate

1. Write definitions for the 2 words

A. **Climate** = Average temperature and rainfall over a year

B. **Weather** = Day to day changes in things like temperature, wind, cloud cover and rainfall.

3. Evidence of climate change

Distant past

-fossilised plants, animals and pollen That no longer live in the UK
-Landforms like U shaped valleys left by retreating glaciers.

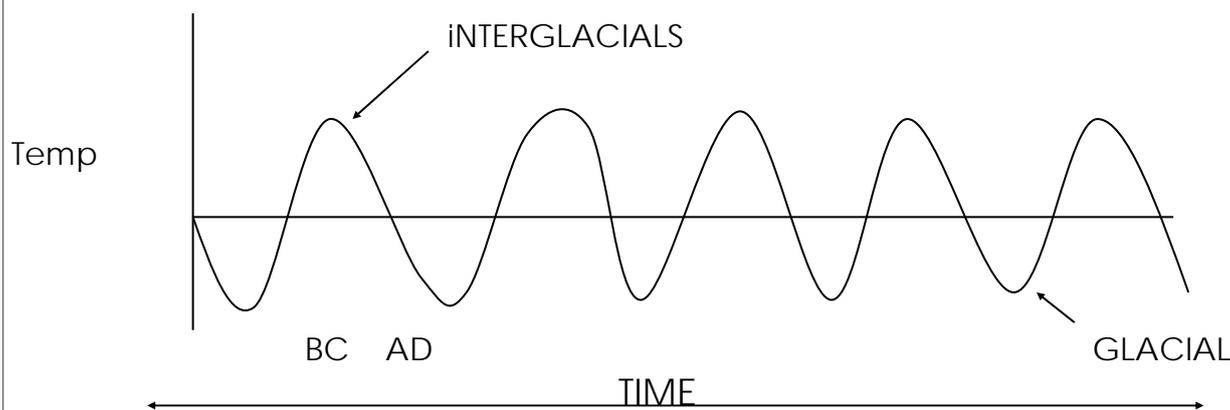
-Samples from ice sheets (analysis of gases present in the atmosphere)

Recent past

-old photographs, drawings and paintings
-written records (diaries, books, newspapers)
-recorded dates of regular events e.g. harvests, arrival of migrating birds and tree blossom.

2. Long term climate change

Make a copy of the graph on page 25 below and write a few sentences describing how climate has changed over time.



There have been different climatic periods in the past.

Roman warm period (100BC—400 AD) = Grape vines grown in Britain . Temperatures 21.5 degrees above average.

Dark Ages 400 AD—950AD) = Cold and wet. Crop failure and famine.

Medieval warm period (950 AD—1350 AD) = 1.5 degrees above average. Crops grew well. Population increased.

Little Ice Age (1350 AD—1850 AD) 1.5 degrees below average. Crop failure. Famine. Frost fairs

4. Natural causes of climate change

Complete the table below to explain the 3 theories of natural climate change.

Theory	Explanation
1. Eruption Theory	The earth will get colder by 0.5 degrees because after the eruption the sun rays reflect off ash so that the earth cools. It reflects gas back into space. And it lowers the temperature.
2. Sunspot Theory	If there are lots of sun spots. This indicates that there is more solar energy and that the sun is at its highest activity and gives more heat.
3. Orbital Theory	Some times the earth is closer to the sun. and sometimes its further away. If its closer it will be hotter and colder if its further away. How it orbits (circular or elliptical) tilts and wobbles will affect the distance
4. Asteroid Collisions	A large asteroid strike would blast thousands of tonnes of ash and dust into the atmosphere. This would cool the climate as the dust and ash block incoming sunlight, It is similar to a large volcanic eruption and the effects could last between to 5- 10 years.

5. The little Ice age

Between 1350 and 1850 the UK experienced a very cold period called the "Little Ice age".

List 5 problems caused by the little ice age below.

- wheat and oats didn't ripen and the harvest failed
- the cool wet weather continued in 1316 and 1317
- by 1317 the great famine had begun. It lasted until 1325
- in some areas 10-20% of the peasant farmers may have died from hunger
- cold and rain lashed Europe in spring and summer of 1315
- Bubonic plague broke out in 1349 and was probably made worse by the cold climate and difficult farming conditions.
- Glaciers in the Alps grew and destroyed villages.
- Farmers stopped growing wheat and started to grow potatoes which were better suited to the cold wet

6. The impact of Natural Climate Change in the past. The mass extinction of Mega Fauna.

DEF: EXTINCTION = means a species of plant or animal dying out completely, so non survive

A. The Dinosaurs

Date of extinction = 65 million years ago dinosaurs became extinct.

Possible causes

1. A strike by a massive asteroid in Mexico
2. A huge volcanic eruption in Deccan India lasting up to 1 million years.

Explanation of causes: both of these events are known to have happened at the time. They may have happened together. Both would have thrown up huge amounts of dust ash and gas into the air, blocking out the sun. Plants would have struggled to grow as they climate cooled. Ecosystems would have broken down as food chains collapsed, sealing dinosaurs fate as little food was available to them.

7. The UK Climate today The UK has a Maritime climate and is effected by 5 different air masses. Put a star next to the one that effects the UK most.

DEF: Maritime Climate = are found close to the sea. Most air moving in from the sea cools the summer months and warms the winter months, bringing rain all year round_

DEF: Air Mass = A huge body of air with uniform temperature and humidity.

Polar maritime = Brings cool and wet (sometimes snow) weather in autumn, winter and spring.

Polar Continental = Brings cold dry (sometimes snowy weather) in winter.

Arctic Maritime = Brings very cold weather in the winter.

Tropical Maritime= Brings warm and wet weather in autumn, winter and spring.

Tropical Continental = Brings hot and dry weather in the summer

7. Label the map below to show the air masses effecting the UK



8. The atmosphere

List the 4 gases (and %) that make up the atmosphere.

1. Nitrogen 78%
2. Oxygen 21%
3. carbon dioxide 0.3 %
4. water vapour 0.7%

9. Greenhouse gases

Green house gases are found in they atmosphere and help to keep the planet warm. List the greenhouse gases (and %) below.

Gas	%
1. CO2	89 %
2. Methane	7%
3. Nitrous oxide	3%
4. Halocarbons	1%

10. Sources of C02 emissions

List the 4 main sources of C02 in rank Order below.

1. Energy supply 39%
2. Transport 24%
3. Industry and business 17%
4. Homes 17%

11. Predictions (projections) of future global temperature change and sea level rise

Temperatures = increase by between 1.1% and 6.4% by 2100.

Sea Level Rise = increase by between 30cm and 1 metre by 2100

Changes are predicted to be **greater** if ... Population and economies grow (e.g. China and India) and more fossil fuels are used

Changes are predicted to be **lesser** if there is low population growth, more renewable sources of energy are used and recycling is increased,

12. Carbon emissions vary around the world

Complete the table below to show regional carbon emissions.

Region	Tonnes of CO ₂ per person 2003
1. North America	19.3
2. Europe	8.5
3. America and Caribbean	2.9
4. South America	2
5. Africa	1.4
6. middle east & North Africa	4.1
7. Asia	2.4
8. Australia	17.1

14. Do you think the UK or Egypt are equally able to cope with climate change?

Explain your answer

below. Yes the UK because they have more money, more resources and can handle the change better than Egypt. They will be able to build defences (flood walls) to prevent flooding. Flood proof housing. Relocate people to safe areas. Egypt is very vulnerable as Alexandria has a large population and is on the coast—vulnerable to sea level change. It is also very arid and cc will make this worse effecting export crops like cotton.

13. Impacts of climate change on countries

UK an MEDC	Egypt an LEDC
<p>Changes to temperature Temperatures will increase especially in the south/south east. 1 degree increase = Scotland 2.5 degrees increase = London</p>	<p>Changes to temperature -temperature rise of double the global average of 8 degrees by 2080. -increasing heat waves</p>
<p>Changes to winter precipitation Will increase all over the country. Increases will be greatest on the east coast— by up to 20%</p>	<p>Changes to rainfall -Less reliable rainfall. -less rainfall- -Increasing droughts</p>
<p>Changes to summer precipitation = Will decrease all over the country The south may have 20% less rainfall</p>	<p>Changes to the Sahara desert Increase in size through desertification</p>
<p>Economic Impacts Positive -Winter heating and road gritting costs could fall -Increase in tourism in the UK -New crops = new sales opportunities e.g. English wine -More land could be farmed at higher altitudes Negative -Cost of more heat related illnesses e.g.. Heat stroke and skin cancer - Loss of the Scottish ski industry due to higher temperatures</p>	<p>Economic Impacts Positive Negative Falling crop yields (food (famine) and cash crops (income) like cotton) as temperatures rise and water shortages increase. - Flooding 1/3 of Alexandria as sea level rise causing 7 million to be homeless and loss of businesses and tourism.</p>
<p>Environmental Impacts Positive -New habitats created increasing biodiversity -Higher temperatures = less fossil fuels used for eating Negative -Plant and animal extinctions as temperatures and drought increase -Increase flood risk -Loss of habitats due to flooded land</p>	<p>Environmental Impacts Positive Negative More droughts Less rainfall Sahara desert increasing in size Desertification Erosion of the coastline</p>