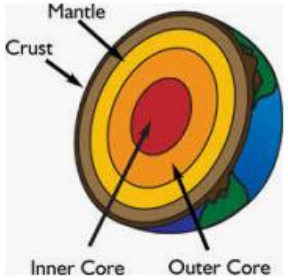
The structure of the Earth

The Crust	Varies in thickness (5-10km beneath the ocean. Made up of serval large plates.
The Mantle	Widest layer (2900km thick). The heat and pressure means the rock is in a liquid state that is in a state of convection.
The Inner and outer Core	Hottest section (5000 degrees). Mostly made of iron and nickel and is 4x denser than the crust. Inner section is solid whereas outer layer is liquid.
Hotspot	an area of volcanic activity where magma plumes (hotter than usual molten rock) in the mantle break through thin oceanic crust eg Hawaii.



Earthquake Management/Hazard Mitigation

PREDICTING

Methods include:

- Satellite surveying (tracks changes in the earth's surface)
- Laser reflector (surveys movement across fault lines)
- Radon gas sensor (radon gas is released when plates move so this finds that)
- Seismometer
- Water table level (water levels fluctuate before an earthquake).
- Scientists also use seismic records to predict when the next event will occur.

PROTECTION

You can't stop earthquakes, so earthquake-prone regions follow these three methods to reduce potential damage:

- Building earthquake-resistant buildings
- Raising public awareness
- Improving earthquake prediction
- Drop Cover Hold On drills
- Text messaging – check people are safe

Earthquake proof buildings ideas

1. Counter-weights to the roof to help balance any swaying.	2. Roof made from reinforced cement concrete.
3. Foundations made from reinforced steel pillars, bail-bearings or rubber.	4. Windows fitted with shatter-proof glass to reduce breakage.
5. Lightweight materials that cause minimal damage if fallen during an earthquake.	6. Ensure gas pipes have an automatic shut off to prevent risk of fire.

Mitigation method choices depend upon: hazard magnitude, frequency, economic status of the country eg AC, EDC, LIDC

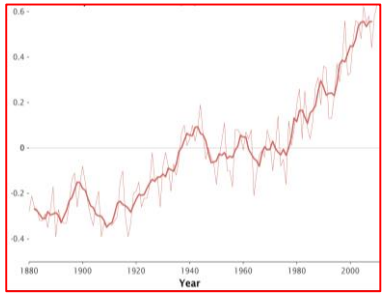
What is Climate Change?

Climate change is a large-scale, long-term shift in the planet's weather patterns or average temperatures. Earth has had tropical climates and ice ages many times in its 4.5 billion years.

Quaternary geological period

The quaternary period is the last 2.6 million years. During this period temperatures have always fluctuated. The cold 'spikes' are the glacial periods, whereas the warm points are the interglacial periods.

Today's temperature is higher than the rest of the period. Despite alternate cold and warm moments within this period, global temperatures have increased above average in the past 100 years. This current trend is what's become known as global warming.



Impacts of climate change on the UK.

The UK's climate is also changing. It is expected to…

- **See an increase in its average temperature.**
- **Have warmer, but wetter winters.**
- **Have warmer and drier summers.**

However, not all the impacts to the UK will be negative, there are clear benefits from a changing climate.

Examples of 'SEE' impacts of climate change in the UK – use your ex book too!

Evidence for climate change

Earth's temperature has changed over the last 2.6 million years. Scientist know this by collecting a range of evidence that is trapped or stored in the environment around us. In the past 100 years we have become pretty good at recording changes.

Sea Ice positions	There has been a decline in the thickness and reach of Arctic sea ice. The amount of ice reduces by 11.5% each decade.
Global temperature data	Evidence collected by NASA suggests average global temperatures have increased by more than 0.6°C since 1950.
Ice Cores	Ice cores are made up from different layers that each represents a different historical time. By exploring the water molecules of these cores, scientist have calculated fluctuating temperatures of the atmosphere.
Historical records	Historical records from ancient cave paintings, diaries and written observations have provide evidence of climate change through personal accounts from the people through them. Can be subjective
Ice sheets and glaciers	Evidence from maps and photos have shown many of the world's glaciers and ice sheets are melting. Eg Columbia Glacier in Alaska has retreated by 16km in the last 30 years.
Sea Level Change	Evidence from the IPCC has shown that the average global sea level has risen by 10-20cms in the past 100 years. This is due to the additional water from fresh water ice and thermal expansion of the ocean due to higher temperatures.

Negative impacts of climate change for the UK

Coastal Flooding

- Vulnerable low lying areas could flood homes and infrastructure.
- Increase of coastal erosion.
- Damage to the economy.

Extreme Rainfall

- Increase in extreme flash floods.
- Flood damage to homes and businesses.
- Soil contaminations on farmland.

Water Shortages

- Farmers will find it difficult to irrigate land.
- Water restrictions, with London being worst affected.

Extreme Heat

- Warmer weather can increase health problems.
- Infectious diseases such as malaria might spread.

Positive impacts of climate change for the UK

Tourism

- More people likely to take holidays within the UK.
- The economy could be boosted: helping to create new jobs.
- More outdoor events could become common.

Environment

- New wetlands from coastal flooding could become established.
- New wildlife and plants could be drawn to the UK'.

Farming

- Agriculture productivity may increase under warmer conditions.
- Farmers could potentially grow new foods used to warmer climates.

Industry

- Heating cost will fall.
- Construction industry will be boosted by the need to build sea defences.
- New designs produced to cope with conditions.

8.2ai: Feeding 9 billion by 2050: Food Security

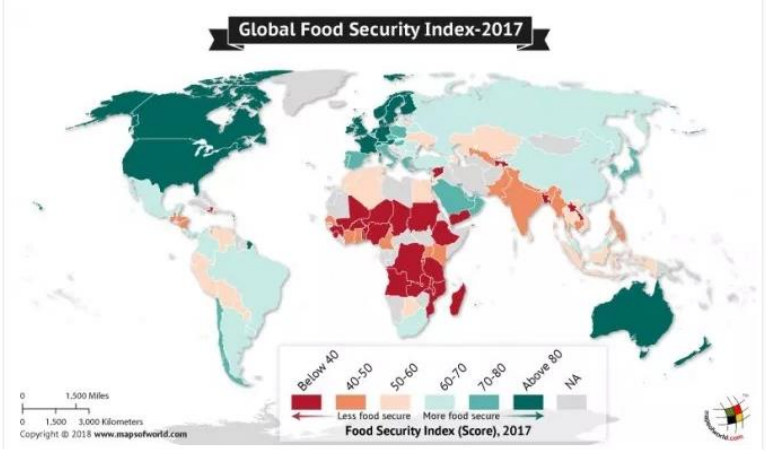
'Food Security' is when all people at all times have [physical & economic] access to sufficient, safe & nutritious food to meet their dietary needs for an active & healthy life.

Human factors affecting FS

- **Poverty** prevents people affording food and farmers buying modern equipment.
- **Poor infrastructure** makes it difficult to transport fresh food quickly
- **Conflict** disrupts farming and prevents supplies.
- **Food waste** due to poor transport and storage.
- **Climate Change** is affecting rainfall patterns making food production difficult.

Physical factors affecting FS

- **Temperature** needs to be ideal for certain crops to grow.
- The **quality of soil** is important to ensure crops have the necessary nutrients.
- **Water supply** needs to be reliable to allow food to grow.
- **Pest, diseases and parasites** can destroy vast amounts of crops that are necessary to feed large populations.
- **Extreme weather** events can damage crops (i.e. floods).



Global Food Security

'Food Security' varies globally. Generally speaking ACs are most food secure, LEDCs are on the way and LIDCs least food secure. Study the map carefully …. Can you name the most food secure continents ? Where in the World are they? Think CLOCH (continent; latitude; ocean; hemisphere) and the least?

Graphical & Numerical skills

Mean: add all numbers and divide by how many there were eg 5 7 9 = 21 divide by 3 = 7; Mode = most popular/frequent eg 3 4 5 6 7 8 7 7 6 5 7 = 7; median = the number halfway in the set. Need to arrange in order before calculating eg: 3 9 11 4 8 6 1 becomes 1 3 4 6 8 9 11 then the answer is 6 as there are three numbers either side! If there is an even number of items in the data set, then the **median** is found by taking the mean (average) of the two middlemost numbers.

8.2c: Attempts to Achieve Food Security

There are various measures to maintain or even improve our food security. These measures are often taken to be socially, economically, environmentally viable for the longer term.

Social	Economic	Environmental

8.2ci: Ethical Consumerism

This involves buying products that have a positive social, economic and environmental impact today, without compromising future generations.

Fair Trade	• This is a global movement to give farmers a **fairer price for their products**. • The profits benefit the community **with schools and medical facilities**. • Involves using farming methods that **protect rather than destroy the environment**.
Food Waste	• One-third of all food gets lost or wasted. • Aim to **eat locally sourced food** to **reduce waste** through transport. • Eating 'ugly' food despite it not being 'ideal' can prevent waste and **save money**. • Prevents wasted energy for producing food and therefore **reduces CO2 emissions**.

8.2b: Food availability in Tanzania

Tanzania's population is around **51 million**; food security is **low but improving.**
*On the GHI Tanzania ranks 89/116 with a score of 28.7
*Most farmers are subsistence – growing to feed families>make profit
*Food **imports** are expensive and are best avoided

8.2b: Food consumption in Tanzania

Average daily calorie intake has **increased** from **1696** in **1964** to **2137** by **2009**.
Reasons for this include:

- Better health care so more babies survive (IMR ↓) so Birth Rate drops so fewer mouths to feed.
- Changes to farming practices

8.2bi: Success in securing local food security

FARM AFRICA Babati Goat Aid project (bottom up)
**Toggenburg goats introduced to villagers of Babati district (cope better with drought than local goats)
**Aid project cost £200,000 to supply 500 goats
**Socially – improved diet – meat and milk (3 litres/day); people trained to look after goats
**Economically – people paid for the goats; valued them more. Surplus milk and meat sold for £. 16 baby goats per year – sold for £ - can send kids to school.
**Environmentally – manure = natural fertiliser for crops – crop yields increase = more spare for sale.

https://www.adageogjoe.com/links.html

8.2bii: PAST attempts at NATIONAL Food Security in Tanzania – some success achieved.

1973-1974 droughts in Tanzania affected its home grown food supplies. 90% of its maize and 80% of its wheat were being imported at this time.

*Tanzania approached Canada for help. Canada provided $95 million between 1968 & 1993.
*Large scale wheat growing occurred (26,400 hectares).
*Canada sent seeds, expertise, training, ferts & machinery
☺ T was able to grow 60% of all of its wheat needs & didn't need food aid in the 1992 drought
☺ Transport infrastructure improved so less food waste; people gained skills (mechanics)
BUT ☹ Soc: Barabaig people forced off their land (40,000); most T's eat maize so growing wheat didn't help; Env: one crop = reduced biodiversity; Ec: ltd jobs were created; spare parts for tractors expensive so couldn't afford to repair them.

8.2biii: Effectiveness of present attempts at food security – the jury is out ……

SAGCOT – growth corridor – development of a fertile strip of land across central Tanzania for farming. Multi-lateral aid ($1250 million) provided plus TNC investment. Aims to be successful by 2030. Hub farms help smaller farms. Some successes (8x yield ⇧; spin off industries) BUT worries that the small farms don't gain afterall. Not all $ aid has materialised. Nomadic tribes have lost water access.

Human Geography Fieldwork

How successful has urban regeneration in Birmingham been?

Primary Data Collection techniques (methodology)
EXPERT SPEAKER – town planner from council
FIELDSKETCH / PHOTO – to assess land use in the area now and compare to past/future
QUALITY OF LIFE SURVEY – for local people who use the area (to measure social success of the regeneration)
ENVIRONMENTAL QUALITY SURVEY – bipolar analysis (-3 to +3), measures SEE sustainability, traffic, green space, buildings etc
SUSTAINABILITY SCORECARD – score of 0-10 based on criteria
QUESTIONNAIRES – assessed public's view of regeneration