1. Natural hazards pose major risks to people & property

What is the difference between a natural hazard and a natural event

Types of natural hazard		
Tectonic	Atmospheric	Other?
1 2 3	1 2 3	

Factors which affect a natural hazard

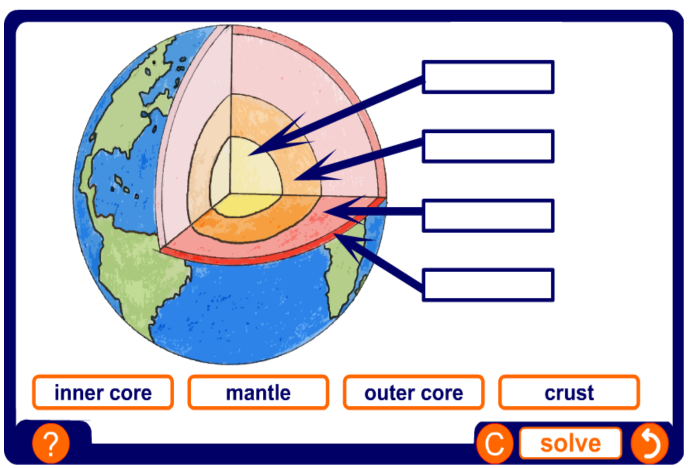
Match up the correct terms and definitions below

Urbanisation	as the world becomes warmer the atmosphere has more energy leading to more floods or droughts depending on where you live
Poverty	Densely populated areas are at greater risk from natural hazards. Tokyo & LA are built very close to plate margins and experience earthquakes
Climate Change	favelas are often built on unstable ground at risk of landslides and floods

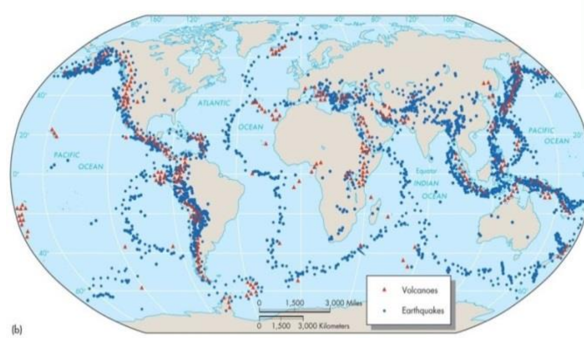
Plate Tectonics

https://www.bbc.com/education/guides/z2vjxsg/revision/1

There are four main layers inside the earth



Is there a relationship between the location of **earthquakes** and **volcanoes** and **plate margins?**



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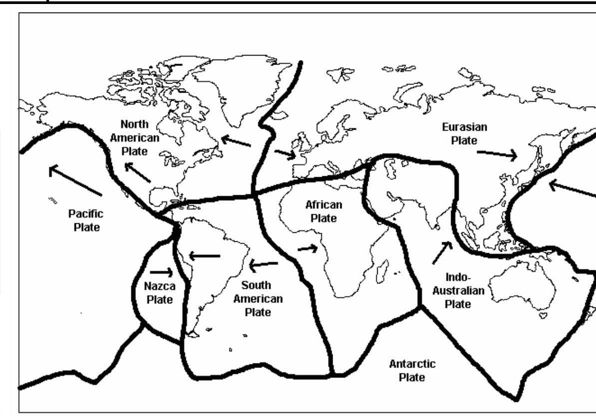

Which plate is the UK on?

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Be prepared to explain the absence of large earthquakes and volcanoes in the UK next lesson

Why do the plates move? (**<u>Key words</u>**: *crust; mantle; semi- molten rock; core; heat; convection currents*)

What happens at a **destructive** plate boundary?
What happens at a **constructive** plate boundary?
What happens at a **conservative** plate boundary?

*Practice drawing **<u>annotated sketches</u>** of these t**hree** plate boundaries on a separate sheet of paper to explain why **earthquakes/volcanoes** occur at some/all of these **plate boundaries**. You will be tested in class*

Learn these key terms and where you would use them for each diagram ☺

mantle	oceanic crust	semi- molten	friction	stress	core	heat	non- viscous
eruption	tension	pressure	earthquakes	rising magma	vent	viscous	shield volcano
subduction zone	continental crust	magma chamber	Mid ocean ridge	San Andreas Fault	convection currents	composite volcano	secondary volcano

<u>3. The effects of & responses to a tectonic hazard vary between areas of contrasting levels of wealth (Chile and Nepal)</u>

Read through your case study notes on Chile and Nepal:
Be able to explain the **<u>causes</u>** of both earthquakes
Learn the **<u>primary and secondary effects</u>** of each earthquake and be able to differentiate between primary and secondary effects
Learn the **<u>immediate and long term responses</u>** to both earthquakes
Be able to **<u>explain</u>** why the effects and responses to the earthquakes in **<u>Nepal and Chile were different</u>**

<u>4. Management can reduce the effects of a tectonic hazard</u>

Be able to explain these reasons for why people continue to live in areas at risk from a tectonic hazard:

- ✓ Fertile soils/good farming (volcanoes)
- ✓ Tourism (visiting volcanoes/hot springs)
- ✓ Mining for valuable minerals e.g. gold, copper, diamonds (volcanoes)
- ✓ Geo thermal energy (volcanoes)
- ✓ Inertia: some big cities built on plate margins, employing lots of people so it is difficult to give up a job and move e.g. Los Angeles or Tokyo

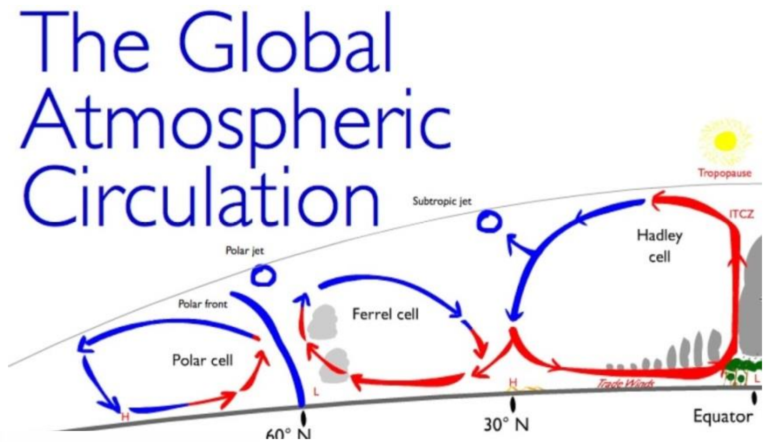
Learn these definitions below and examples of how MPPP can work in practice for volcanoes and earthquakes

- ✓ <u>Monitoring:</u> using equipment to detect signs of a volcano
- ✓ <u>Prediction</u> :using historical evidence and monitoring to predict when and where a tectonic event may happen
- ✓ <u>Protection:</u> building design to withstand an earthquake
- ✓ <u>Planning:</u> identifying and avoiding places most at risk

5. Global atmospheric circulation (learn the key terms and be able to describe and explain global circulation patterns)

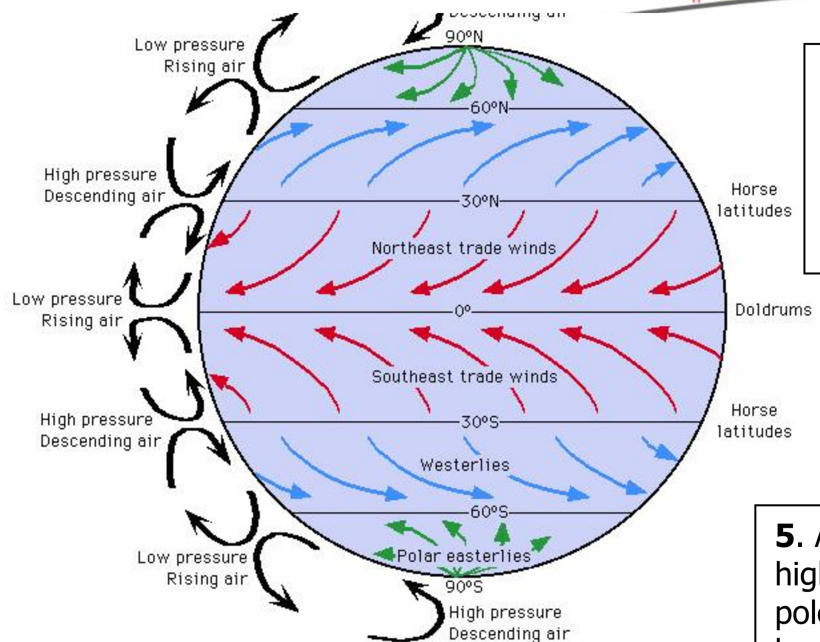
GAC affects the **Earth's climate**. For example the **UK** is affected by lots of **low pressure weather systems** that are blown in from the Atlantic Ocean by **westerly winds**. This brings wet and windy weather ☹

Winds are **large scale movements of air** caused by differences in air pressure
Differences in air pressure are caused by differences in temperature between the **equator and the poles**
Winds move from **FROM** areas of **HIGH pressure** **TO** the areas of **LOW pressure.**
Winds are part of global atmospheric circulation loops **(cells)**
These loops have warm air rising creating **low pressure belts** and cool air falling which creates a **high pressure belt**



4. **60° N and S** of the equator warmer surface winds meet colder air from the **polar cells**. The warmer air is less dense than the cold so it rises and creates low pressure belts.

3. **Surface winds** either blow back to the equator or towards the poles.
Trade winds blow towards the equator (SE in southern hemisphere & NE in northern hemisphere)
Surface winds heading to the poles are called **westerlies**



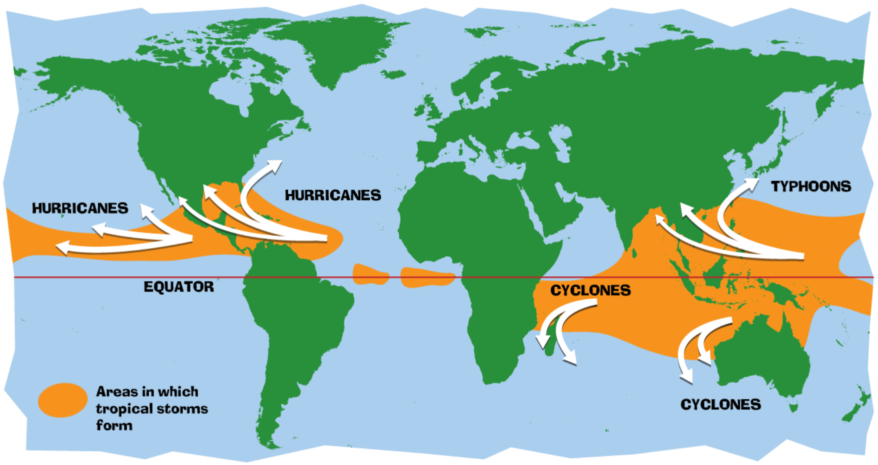
2 As the air rises at the equator it cools and moves out to **30° N and S** of the equator. The cool air sinks creating a **high pressure belt** with cloudless skies and low rainfall

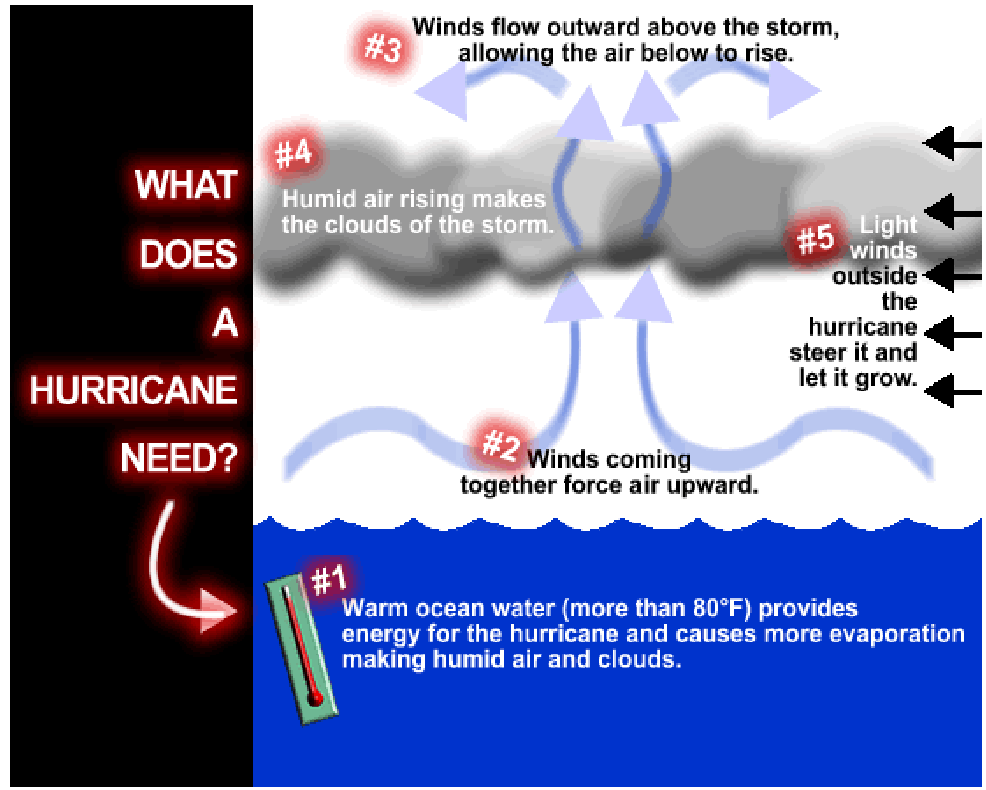
1. The sun warms the earth at the **equator.** The warm air rises creating **low pressure** and rain

5. At the **poles** cool air sinks creating high pressure at the north and south poles. The high pressure air is drawn back to the equator as surface winds.

6. Tropical storms (hurricanes, cyclones, typhoons) develop as a result of particular physical conditions

Where do tropical storms occur?





Climate change may affect tropical storms

Global temperatures are expected to rise as a result of climate change. This means more of the world's oceans could be above 27°C so **more places are likely to experience tropical storms**

Oceans may stay at 27°C for more of the year increasing the **frequency of storms**

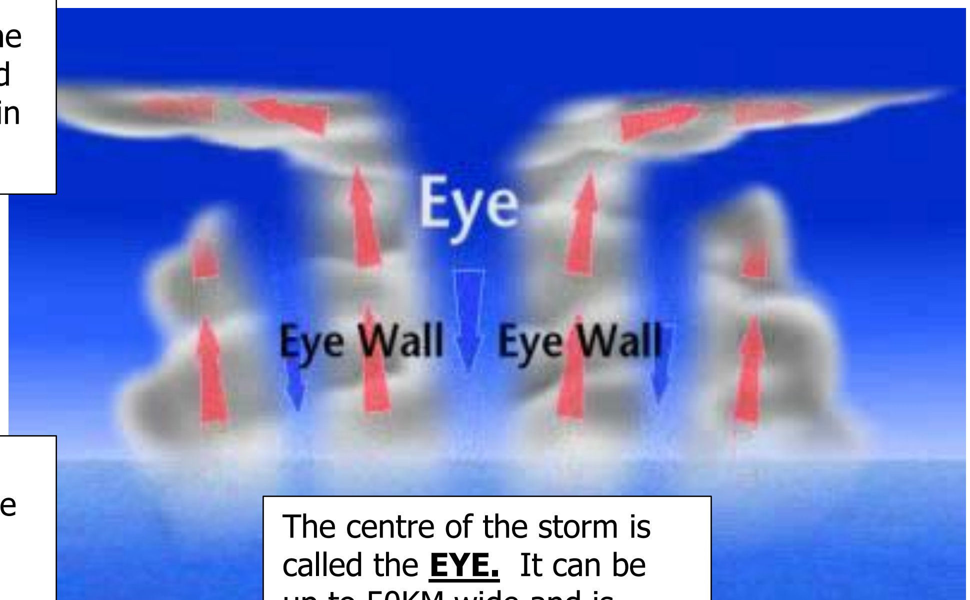
Higher temperatures will also mean storms will be **stronger and potentially more damaging**

Have you got a Tropical Storm named after you? Check it out on https://www.nhc.noaa.gov/aboutnames.shtml?text

The structure of a tropical storm

Tropical storms are **circular in shape** and hundreds of KM wide. They usually last for **7-14 days**. They spin **anticlockwise in the northern hemisphere and clockwise in the south.**

Towards the **edge of the storm** wind speeds fall, the clouds become smaller and more scattered and the rain less intense



The eye is surrounded by the **EYEWALL** where there is spiralling rising air, very strong wings (160KPH), storm clouds and heavy rain

The centre of the storm is called the **EYE.** It can be up to 50KM wide and is caused by descending air. This creates light winds, no clouds and no rain.

7. Tropical storms have significant effects on people and the environment (Typhoon Haiyan)

Read through your case study on Typhoon Haiyan:

Learn the **primary and secondary effects** of Hurricane Haiyan

Learn the **immediate and long term responses** to Hurricane Haiyan

8. There are many ways of reducing the effects of tropical storms

All of these should reduce the loss of live and damage to buildings:

- **Monitoring & Prediction** – using data from radar, satellites and aircraft to monitor storms. Computer models can then be used to calculate a predicted path. Predicting where and when a tropical storm is going to happen gives people time to evacuate and protect their homes and businesses e.g. board up windows
- **Protection** – buildings designed to withstand high winds with reinforced concrete or building on stilts to be safe from floodwater and the storm surge. Flood defences built along rivers e.g. levees and coasts e.g. sea walls
- **Planning** – future development avoiding high risk coastal areas. Emergency services trained. evacuation routes planned and well-advertised to allow people a safe route out

9. The UK experiences lots of different weather hazards

- ✓ Rain
- ✓ Wind
- ✓ Snow and ice
- ✓ Thunderstorms
- ✓ Hailstorms
- ✓ Heat waves
- ✓ Drought

Be aware of the reasons **why** the UK can experience these extreme weathers. Also know the **social, economic and environmental impacts** of extreme weather in the UK (see below)

Weather in the UK is becoming more extreme

Temperatures: Dec 2010 was the coldest for 100 years – severe snow and ice across the UK. April 2011 was the warmest April on record!

More rain: more rainfall records have been broken in 2010 – 2014 than any other decade on record. 2013 was one of the wettest years on record and December 2015 was the wettest month ever recorded

Social impacts	Economic impacts	Environmental impacts
• Several people die from hypothermia or accidents due to losing control on icy roads • People have been struck by lightning • People have to move out from their homes due to flooding from heavy rainfall • 40 000 homes and businesses across Northern Ireland were left without water after water pipes froze and burst in the winter of 2010	• The heavy snow in Dec 2010 meant Christmas sales were down in as roads were closed and people did not feel it was safe to travel • Snow, ice, flooding etc. will stop people getting to work and affect the economy • The cold snap in Dec 2010 cost the UK economy £1.6billion • Crop failures in heatwaves can cause hardship to farmers • The tourist industry in the UK benefits from a heatwave ☺	• Use of gas and electricity almost doubled in Dec 2010 causing a rise in CO_2 emissions • Trees can be damaged in strong winds

10 Extreme weather events in the UK (Somerset Levels Floods 2014)

Read through your case study on the Somerset Levels Floods in 2014 (an example of an extreme weather event):

a) Learn the **causes** of the floods in 2014
b) Learn the **social, economic and environmental impacts** of the floods
c) Learn how management strategies can reduce the risk

11.Climate change is the result of natural and human factors and has a range of effects

Evidence for climate change	Learn the possible causes of climate change:	Overview of the effects of climate change on people and the environment.
• Climate change is any significant change in the Earth's climate over a long period • The **quaternary** period is the most recent geological time period (2.6 million years ago to present day) • Prior to quaternary the earth's climate was warmer and stable, then it changed • During the quaternary global temperatures have shifted between **cold glacial periods** (lasting for around 100 000 years) and warmer interglacial periods lasting around 10 000 years. • The last glacial period was **15000 years ago** but since then the climate has been warming • **Global warming** is the term used to describe the sharp rise in temperatures over the last century. Global warming is a type of climate change. , Evidence for climate change comes from a number of sources: ✓ Ice and sediment cores ✓ Tree rings ✓ Pollen analysis	**Natural factors:** ➢ Orbital changes ➢ Volcanic activity ➢ Solar output **Human factors:** ➢ Burning fossil fuels ➢ Agriculture (farming) ➢ Deforestation ➢ Cement production	**Environmental effects** ❖ Glaciers shrink/ice caps melt causing **sea level rise** ❖ Sea ice is shrinking causing a loss of polar **habitats** ❖ **Coral reefs** are suffering from bleaching due to rising sea temperatures ❖ **Biodiversity** will change due to climate change **Effects on people** ▪ **Coastal flooding** will cause people to migrate, putting pressure on other areas ▪ **Water stress** ▪ **Farming practices** will have to change as areas experience crop failure ▪ **Weather will become more extreme** causing more deaths and money spent on protecting people and places

Managing climate change involves both mitigation (reducing causes) and adaptation (responding to change)

Learn the meaning of the terms **mitigation** and **adaptation**

Be able to **describe** and **explain** the **effectiveness** of these **methods** to mitigate and adapt

Mitigation (reducing the causes of climate change)	Adaptation (responding to climate change)
✓ **Alternative energy production**: replacing fossil fuels with 'greener energy' wind, solar, HEP etc.	✓ **Changes in agricultural systems**: use of biotechnology and new crop types
✓ **Carbon capture**: capturing and storing CO_2 deep underground	✓ **Managing water supply**: water metres; dams; water transfer schemes
✓ **Planting trees**: increases CO_2 absorption	✓ **Reducing risk from rising sea levels**: sea defences; houses on stilts
✓ **International agreements**: target setting e.g. Kyoto protocol EU has agreed to cut emissions by 20% from 1990 to 2020