Which factors link to today's learning?
Social / Economic / Environmental

GCSE Geography: The Challenge of Natural Hazards - Weather Hazards Knowledge Organiser

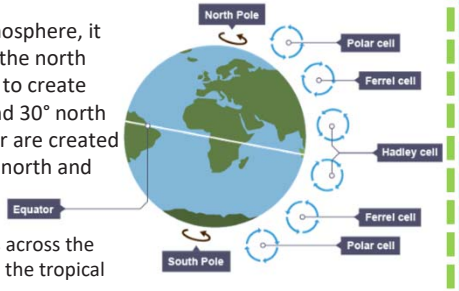
The Big Picture

- What is global atmospheric circulation and how does it work?
- Where and how do tropical storms form?
- What is the structure of a tropical storm and how might climate change affect tropical storms?
- What happened in the Philippine Typhoon 2013?
- How can the effects of tropical storms be reduced?
- What are the different weather hazards in the UK?
- What happened in the Somerset Levels 2014?
- What are the causes and effects of climate change?
- How can climate change be mitigated and how can we adapt to it?

Global atmospheric circulation

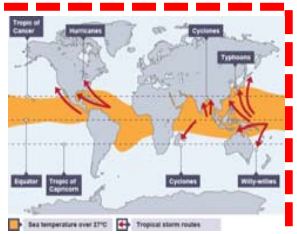
The movement of air across the planet occurs in a specific pattern. The whole system is driven by the equator, which is the hottest part of the Earth. Air rises at the equator, leading to low pressure and rainfall.

When the air reaches the edge of the atmosphere, it cannot go any further and so it travels to the north and south. The air becomes cold and falls to create high pressure and dry conditions at around 30° north and south of the equator. Large cells of air are created in this way. Air rises again at around 60° north and south and descends again around 90° north and south.



Global atmospheric circulation creates winds across the planet and leads to areas of high rainfall, like the tropical rainforests, and areas of dry air, like deserts.

What is a tropical storm? A tropical storm is a very powerful low-pressure weather system which results in strong winds (over 120 km/h) and heavy rainfall (up to 250 mm in one day). Tropical storms have different names depending on where they occur in the world. In the US and the Caribbean they are known as **hurricanes**, in South Asia - **cyclones**, in East Asia - **typhoons**. They all develop in the same way and have the same characteristics.



How do tropical storms develop?

- Tropical storms form between approximately 5° and 30° latitude. Because of easterly winds they initially move westward.
- The air above the warm ocean is heated. Once the ocean water reaches at least 27°C, the warm air rises quickly, causing an area of very low pressure.
- As the air continues to rise quickly it draws more warm moist air up from above the ocean leading to strong winds.
- The rapidly rising warm air spirals upwards, cools, condenses and large cumulonimbus clouds form.
- These clouds form the eye wall of the storm and produce heavy rainfall.
- In the centre of the storm, cold air sinks forming the eye of the storm - here, conditions are calm and dry.

Here are some key words from this topic. **Can you add anymore?**

Global atmospheric circulation	The worldwide system of winds, which transports heat from tropical to polar latitudes.
tropical storm	a very powerful low-pressure weather system.
extreme weather	This is when a weather event is significantly different from the average or usual weather pattern, and is especially severe or unseasonal.
Quaternary period	The period of geological time from about 2.6 million years ago to the present.
mitigation	Action taken to reduce or prevent the effects of something from happening. Mitigation strategies include:
Adaptation	Actions taken to adjust to natural events such as climate change, to reduce potential damage, limit the impacts, take advantage of opportunities, or cope with the consequences.

CEIAG Link: For this topic we can make links to a variety of professions:

Urban planning for hazards
Risk analysis
Meteorologist
Climatologist
Environmental Scientist
Environmental Lawyer
Flood and Risk Management

If you are interested in the above careers, don't forget you can do some research and speak to Mrs Ackroyd.

Climate Change - A long-term change in the earth's climate, especially a change due to an increase in the average atmospheric temperature.

Evidence of Climate Change:

Long-term evidence: **Ice cores -** A cylinder of ice drilled from polar areas. When layers of sediment or fresh falls of snow become buried, they trap and preserve air bubbles, which provide evidence of the global temperature at that time. Scientists can study the ice cores to calculate temperature. They can be accurately dated, and have been used to reconstruct temperature patterns from as long as 400,000 years ago.

More recent evidence: Temperature records - Since the 1850s global temperatures have been measured using thermometers and recorded. In the UK reliable weather records began in 1910. Historical records (e.g. harvest dates, newspaper weather reports) can extend the record of climate change a bit further back. By using this data, scientists have seen an average combined land and ocean surface temperature increase of 0.85°C since the end of the 19th century.