Kemnal Keys: Geography — How and why do we measure weather?
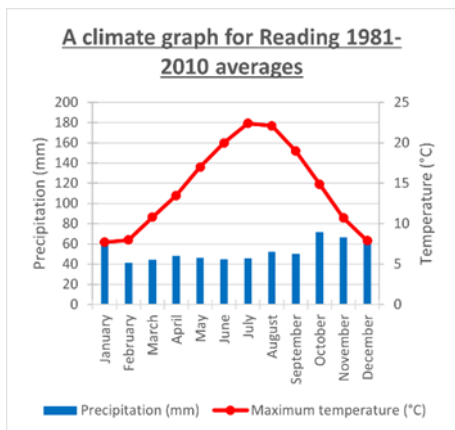
What you should know	What you should be able to do
Weather is the day-to-day changes in atmospheric conditions Weather is **measured** in terms of **temperature** (how hot or cold the air in a place is) and **precipitation** (how much rainfall fells in a place) **Climate** is the long-term pattern of weather in a particular area, usually measure over 30 years **Microclimate** is the distinctive climate of a small-scale area, such as a garden, park, valley or part of a city The **hydrological cycle** is the continuous circulation of water within the Earth's hydrosphere, driven by solar insolation **Solar insolation** is the heat from the Sun Solar insolation passes through the **Earth's atmosphere** and heats up the land and the sea The land and the sea then **radiates** some of this heat back out into the atmosphere **Evaporation** is the change in water from a liquid to a gas through heating **Condensation** is the change in water vapour from a gas to a liquid through cooling **Precipitation** is water released from clouds in the form of rain, freezing rain, sleet, snow, or hail **Interception** is when precipitation does not directly enter the land or sea but is diverted into trees or plants **Surface run-off** is when precipitation hits the land is passes down a slope towards a river or the sea **Infiltration** is when water sinks through the soil **Percolation** is when water passes through rock **Throughflow** is when water passes through the soil and passes down a slope under the surface of the Earth towards a river of a sea **Transpiration** is the evaporation of water from plants and trees into the atmosphere **River discharge** is the volume of water that flows past a fixed point in a river **Atmosphere:** Insolation → Evaporation → Condensation → Precipitation **On Land**: Interception, Surface Run-off, Infiltration, Through flow, Transpiration, River Discharge and back to the ocean Cloud types that bring rainfall are **cumulonimbus** and **nimbostratus**	**Describe** the differences between weather and climate **Describe** the hydrological cycle **Choose** the most appropriate site for a weather station within a microclimate area **Read and extract** data from climate graphs **Analyse** climate data to understand trends **Plot** a climate graph from given temperature and precipitation data **Compare** climate data between 2 sites **Describe** the climate zones of Europe and give examples of areas within each region e.g., Tundra – Northern Norway, Sweden & Finland **Explain** the reason for changes in climate between different latitudes
<u>**Weather instruments:**</u> **Barometer –** measures atmospheric pressure = millibars (mb) **Thermometer –** measures air temperature = degrees Celsius **Hygrometer –** measures humidity = percentage of moisture in the atmosphere **Anemometer –** measures wind speed = km per hour **Wind vane –** measures wind direction = the direction the wind is blowing from **Rain gauge –** measures precipitation = mm **Campbell-Stokes recorder –** duration of sunshine hours	**Identify** the different weather instruments and describe what data they collect and the units of measurement
High air pressure means the air above a place is **sinking** and therefore has a greater downward force than the other air around it. This air is stable and leads to settled conditions, often dry and is slow moving **Low air pressure** means the air above a place is **rising** and therefore has a greater upward force than the other air around it. This air is unstable and leads to unsettled conditions, often with high winds precipitation and is fast moving **Anticyclones** are areas of high pressure typically resulting in stable, fine weather with clear skies **Depressions** are areas of low pressure associated with cloudier, wetter, and windier conditions A **heatwave** is an extended period of hot weather relative to the expected conditions of the area at that time of year A **coldwave** is weather event involving a cooling of the air, or the invasion of very cold air, over a large area The **monsoon** is a seasonal change in prevailing wind direction in Asia bringing heavy rainfall A **tornado** is a violently rotating column of air that is in contact with the surface of the earth and a thunderstorm in the atmosphere A **hurricane** is a giant tropical storm that produces heavy rainfall and super-strong winds	**Explain** the differences between the three types of rainfall: • Relief/ Orographic • Convectional • Frontal **Explain** how wind is caused by differences in atmospheric pressure. Air moves from an area of high pressure to low pressure across a pressure gradient **Describe** the distribution of a feature on a map e.g., the relief/ topography of the land **State** the difference between hurricanes, typhoons, and cyclones **Explain** the causes, impacts and responses of an extreme weather case study **Make decisions** about how to provide aid to an area after an extreme weather event

What you should know	What you should be able to do
1) Analyse the climate graph below	2) Draw a diagram to explain the three types of rainfall

1) Analyse the climate graph below

A climate graph for Reading 1981-2010 averages

Precipitation (mm) / Temperature (°C)

Precipitation (mm) —●— Maximum temperature (°C)

a) What is the temperature range for Reading?

b) What is the average precipitation in Reading in February?

c) In which month does Reading experience the highest temperature? What is this peak value?

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3) State 3 factors which could make readings at a weather station inaccurate

4) Explain the different characteristics of anticyclones and depressions

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5) Draw and annotate a diagram to show a cross-section of a tropical storm (hurricane)

6) Complete the table of the physical and human impacts of Hurricane Katrina

Physical impacts	Human impacts