

## MODULE 1: WHAT IS CLIMATE CHANGE?

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### ANSWER SHEET

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#### WHAT IS CLIMATE?

Aims: To help students understand the difference between weather and climate.

To define the elements of weather and climate.

To introduce the idea of a changing world temperature over time.

To test climate change knowledge and learn relevant scientific terms.

#### ACTIVITY ONE

Elements of weather and climate

- Temperature
- Precipitation
- Humidity
- Cloud cover
- Wind direction
- Wind speed
- Pressure

Weather varies over time, keep records of the weather at significant times of the year for your location

#### ACTIVITY TWO

Find climate graphs for your nearest town, <http://www.worldweather.org/> the World Meteorological Organisation, is a useful source as are Atlases.

#### ACTIVITY THREE

Students study the interactive or the downloadable work sheet to discover the major global influences on climate.

The interactive and downloadable sheet show the following global effects on climate

- Latitude – the effect of changes in the amount of incoming solar radiation
- Atmospheric circulation patterns – the effect of winds moving hot air from the tropics to the poles warming up places and cold air from the poles to the tropics cooling places.
- The global ocean heat conveyor – cold ocean currents will keep adjacent coasts cooler than the norm for that latitude and warm currents will keep the adjacent coasts warmer. They can also affect precipitation amounts as less water evaporates from colder water than from warmer water.
- The greenhouse effect – some gasses act as a blanket around the Earth. Without them, the surface of the Earth would be, on average 33°C colder than it currently is. As the concentration of these 'greenhouse gases' in the atmosphere increases, the Earth's surface temperature, on average, rises.

#### ACTIVITY FOUR

As well as global influences on climate there are local ones.

- How does temperature and precipitation change with altitude? As altitude increases the air pressure decreases and the temperature falls. As air cools, more water vapour condenses as cloud droplets and precipitation forms. .
- What effect does the way a slope is facing (aspect) have on the climate? In the northern hemisphere north and east facing slopes are cooler than south and west facing ones. In the southern hemisphere north facing slopes are warmer and south facing slopes are cooler.
- What is the effect of the distance from the sea on the climate of a place? Generally land warms up more quickly than the sea and cools down more quickly. Places that are in the centre of large land masses have more extremes of temperature (continentality)
- What is the effect of a large urban area? Urban areas tend to be warmer and more polluted than rural ones, because of the different materials covering the surface, the amount of heat released and the complex three-dimensional structure of the environment. The urban climate can also have different amounts of cloud cover and rain to the surrounding countryside..
- What happens to the climate of a place if forests are cut down over a large area of land? Forests hold moisture and absorb carbon dioxide. Their destruction on a large scale can affect the amount of water vapour in the atmosphere and contribute to an increase in green house gasses.

#### ACTIVITY FIVE

- Up to 1950 the squares are distributed evenly below and above the pink line, with one period approximately 1930 when they are mostly above the line.
- From 1975 the squares are all above the line.
- The pink line fluctuates but after 1950 the line is continually rising.
- This means that the global average climate is warming.
- In general, when the oceans and air are warmer, the whole hydrological cycle is stronger –with more rain falling over the planet as a whole. However, in some places rainfall might fall. The national futures section gives information about specific countries.