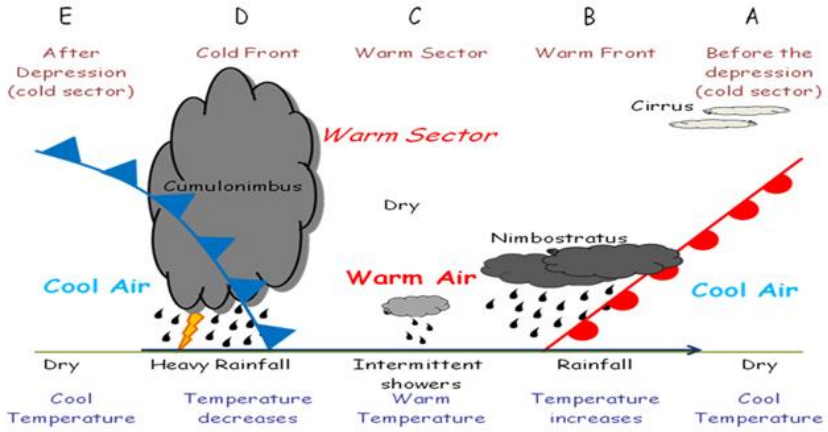
Year 8 Our Changing Climate Knowledge Organiser

Air mass: A large body of air that has similar temperature, pressure and moisture properties.
Anticyclone: High pressure system in which air descends to give calm conditions and clear skies. Associated with summer heatwaves and winter frosts and fogs.
Atmosphere: The envelope of air surrounding the Earth and bound to it by gravity.
Climate: Long-term weather averages (over a least a year)
Climate Change: Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among others, that occur over several decades or longer
Convectional Rainfall: When the land heats up it warms the air above it. This causes the air to expand and rise. As the air rises it cools and condenses.
Depression (cyclone, low, low-pressure area): Area in the atmosphere in which the pressures are lower than those of the surrounding region at the same level. In its development a depression usually has the following phases. A wave (young) depression forms and moves along a front. Mature depressions have well-developed warm sectors and both cold and warm fronts. An occluded depression is that within which there has developed an occluded front.
Evaporation: The physical process by which a liquid or solid substance is transformed to a gas; the opposite of condensation.



Key topics to be studied

1. UKs climate
2. Depressions
3. Anticyclones
4. UK extreme weather
5. Global warming
6. Hurricanes

Global Warming: The recent and ongoing global average increase in temperature near the Earth's surface.
Hurricane: A hurricane is a powerful, rotating storm that forms over warm oceans near the equator in the Atlantic Ocean, the Caribbean Sea, or the eastern Pacific Ocean. Hurricanes have strong, counter clockwise winds (at least 74 miles per hour), a huge amount of rain, low air pressure, thunder and lightning.
Hurricane eye: Hurricane winds blow in a spiral around the calm, roughly circular centre called the eye. In the eye, which is about 20 - 30 miles wide, it is relatively calm and there is little or no rain. The eye is the warmest part of the storm.
Precipitation: Any of all of the forms of water particles, whether liquid or solid, that fall from the atmosphere and reach the ground. The forms of precipitation are: rain, drizzle, snow, snow grains, snow pellets, diamond dust, hail, and ice pellets.
Prevailing wind: The most common wind direction for a particular location.
Relief rainfall: Formed when air is forced to rise over relief features such as hills or mountains. Cooling and condensation occurs as the air rises.
Storm surge: A storm surge is a rise in the ocean as the result of strong winds from a hurricane or other intense storm. A storm surge can cause dangerous flooding, especially when a storm surge coincides with a high tide. The height of the storm surge waters is the difference between the level of the ocean and the level that would have occurred normally. A storm surge is usually estimated by subtracting the regular high tide level from the observed storm tide - it can be 15 feet tall or more.
Temperature: A physical quantity characterizing the mean random motion of molecules in a physical body. In other words, it is a measure of the degree of hotness or coldness of a substance.
Water vapour: Water substance in vapour (gaseous) form; one of the most important of all constituents of the atmosphere.
Weather: The state of the atmosphere, mainly with respect to its effects upon life and human activities. As distinguished from climate, weather consists of the short-term (minutes to about 15 days) variations of the atmosphere state.
Wind: movement of air caused by changes in temperature and air pressure. Winds are always identified by the compass direction from which they blow.

Climate change is causing the earth's temperature to rise.

The **greenhouse effect** is a natural function but is affected by human activity.

1. The atmosphere allows heat from the sun to heat the earth

2. The earth gives off heat

3. The heat is trapped by greenhouse gases e.g. methane, CO2 and nitrous oxide

Natural causes	Human causes
• **Orbital changes**—the Milankovitch cycles bring the earth closer or further from the sun. • **Volcanic activity**—during a volcanic eruption CO2 is released into the atmosphere. It can also block the sun causing cooling.	• **Burning fossil fuels** e.g. gas, coal and oil which release carbon dioxide into the atmosphere • **Deforestation**—trees absorb carbon dioxide during photosynthesis, if they are cut down it releases CO2 into the atmosphere • **Dumping waste in landfill**—when waste decomposes it produces methane • **Agriculture (incl animal)**—releases nitrogen oxide and methane into the atmosphere

Evidence to show climate change

1. **Ice cores**—the snow traps air. The gas in the air can reveal what the temperature was like

2. **Rising sea levels**—between 1901 and 2010 the sea rose by 0.19m

Impacts of climate change

Global positive impacts	Global negative impacts
• Energy consumption may decrease (because less need for heating) • Longer growing seasons for farming (agriculture) • Frozen regions such as Canada may be able to grow crops	• Sea level rise will affect 80 million people • Tropical storms will increase in strength • Diseases such as malaria increase, another 280 million people may be affected • Species in affected areas (e.g. Arctic) may become extinct

UK Positive impacts	UK negative impacts
• Crops such as oranges, grapes and peaches can be grown in the UK • Winter heating costs will be reduced • Accidents on roads in winter will be less likely	• Sea levels rise flooding low areas e.g. east England • Scottish ski resorts may have to close due to lack of snow • Drought and flooding becomes more likely as extreme weather increases • Water supplies under pressure as there is more need for water in hotter summers

Climate change management

Mitigation is reducing or preventing the effects of something from happening. These strategies are:

*Alternative energy - solar, wind, tidal power reduces the use of fossil fuels, so less CO2 is produced

*Reduce meat and dairy consumption

*Carbon capture—storing waste gases deep underground

*Planting trees—encouraging **afforestation** reduces CO2 levels in the atmosphere during photosynthesis

*International agreements - countries sign treaties e.g. the Kyoto Protocol in 2005 to reduce carbon emissions.

Adaptation strategies respond to the effects after they have happened

*Agriculture (farming) must adapt as some crops can't grow in water temperatures. But other crops can be grown e.g.. oranges and grapes

*Water supply - water can be transported

*Reducing risk from sea level rise—using sea defences