

	<b>Is conflict inevitable?</b>	<b>How and why is our climate changing?</b>	<b>Why are our coastlines ever-changing?</b>	<b>How have physical and human processes changed our oceans?</b>	<b>The Living World</b>
Overview of Scheme of Learning	The students will explore a range of locations which experience conflict. They will study the causes of conflict, how geography impacts conflict and whether conflict is inevitable.	Students will explore the evidence for past and current climate change. They will learn about the causes and impacts and gain an understanding of how humans aim to manage/mitigate its effects.	Students will study a range of coastal processes and landforms. They will look at human usage at the coasts and how coastlines can be managed.	Students will find out many ways in which our oceans are changing due to human and physical processes. They will learn about ways in which humans use resources from the oceans, and how human activities can interact with and change physical processes.	The students will study tropical rainforests and hot deserts with a focus on the threats, challenges, opportunities, and ways to manage human interactions with the living world.
Cultural capital	<p><b>Explore</b> the history of the local air force bases and gain an understanding of their significance.</p> <p><b>Research</b> current affairs in the news.</p> <p><b>Read</b> “Prisoners of Geography – Ten maps that tell you everything you need to know about global politics” by Tim Marshall.</p> <p><b>Read</b> “IN FOREIGN FIELDS: Heroes of Iraq and Afghanistan in their own words” by Dan Collins</p>	<p><b>Watch</b> “Climate Change – the facts” on iPlayer</p> <p><b>Watch</b> “Climate Change: Ade on the front line” on iPlayer</p> <p><b>Watch</b> “Before the Flood”</p> <p><b>Watch</b> “An Inconvenient Truth”</p> <p><b>Read</b> “Collapse: How Societies Choose to Fail or Survive” by Jared Diamond</p> <p><b>Read</b> “Factfulness” by Hans Rosling</p>	<p><b>Visit</b> a local beach, for example, Cromer, Southwold or Great Yarmouth. What landforms can you see? Is there any evidence of management?</p> <p><b>Watch</b> an episode of “Coast” on iPlayer</p> <p><b>Watch</b> “Blue Planet” on iPlayer</p> <p><b>Read</b> “Listen to the moon” by Michael Morpurgo</p>	<p><b>Watch</b> “Blue Planet” on iPlayer</p> <p><b>Watch</b> “Seaspiracy” on Netflix</p> <p><b>Watch</b> “An Inconvenient Truth”</p>	<p><b>Visit</b> a local ecosystem e.g. river, pond, hedge, garden, woodland. Which animals do you see? Can you create a food web? How is this ecosystem threatened and how is it managed?</p> <p><b>Grow or plant</b> seeds/saplings.</p> <p><b>Watch and sketch</b> an animal in your garden/local park. How does it interact with its surroundings?</p>

		<p><b>Read</b> “The God Species: How Humans Really Can Save the Planet...” by Mark Lynas</p> <p><b>Read</b> “No one is too small to make a difference” by Greta Thunberg</p> <p><b>Read</b> “There is no planet B: A handbook for the make or break years” by Mike Bernard-Lee</p>			<p><b>Read</b> “The explorer” by Katherine Rundell</p> <p><b>Research</b> deforestation and/or desertification on the BBC News</p> <p><b>Watch</b> “Our World. Selling the Amazon.” On iPlayer</p> <p><b>Read</b> <a href="#">The man who planted a tree article.</a></p>
Prior learning	Students will have locational knowledge of the continents of Africa and Asia as well as the distribution of resources. Through our learning on how we are globally connected, students will appreciate how conflict can affect us all.	Students have some knowledge of geological timescales. The topic of climate change will have been touched upon in the units “Global Connections”, “Conflict” and “Geographical Issues”.	Students will have studied the water cycle, and the formation of a stack in year 7. They will have an understanding of a variety of coastlines around the world.	Students will have studied the water cycle, the causes and impacts of climate change, and have touched on species adaptation in year 7.	Students will have knowledge of the ecosystems of Africa, Asia and the USA. Students are also able to construct and interpret climate graphs. The topic of desertification will have been discussed in the units “Conflict” and “Geographical Issues”.
Number of lessons	10	9	6	11	6
Assessment Overview	<b>Pre-assessment</b> – Students select their own task from a choice – all of which must include an evaluation of the impacts of landmines, locational knowledge, and specific facts to illustrate the students’ arguments.	<b>Pre-assessment</b> – Students produce a piece of writing comparing the impacts of climate change between a low income and high income country. This requires them to use evidence and specific	<b>Assessment</b> – Includes a range of short and longer answers.	<b>Pre-assessment</b> – A piece of evaluative writing using evidence on whether we should use the oceans to generate energy. <b>Assessment</b> – A mixture of shorter and longer answers, with some skills questions and a piece of	<b>End of Year Assessment</b> – includes shorter and longer answers and skills questions. This is a standardised assessment shared with other ATT academies.

Year 9 Curriculum Overview Geography 2023-24

	<b>Assessment</b> – Includes a range of shorter and longer answers, including a longer evaluative piece of writing and key word definitions.	facts to support their argument.		evaluative writing to build on the learning from the pre-assessment.	
Link to detailed content (Knowledge Organiser/Unit Overview/Scheme of Learning)	<i>Knowledge organiser</i> <i>01. Conflict</i>	<i>Knowledge organiser</i> <i>02. Climate change</i>	<i>Knowledge organiser</i> <i>03. Coasts</i>	<i>Knowledge organiser</i> <i>04. Oceans</i>	<i>Knowledge organiser</i> <i>05. Living world</i>

## Knowledge organiser: Is conflict inevitable?

### Conflict means...

- To come into disagreement or to oppose.
- To fight.
- Controversy
- A prolonged struggle
- Conflict and war aren't the same.



Conflict has occurred in many countries globally including Israel, Russia, Sri Lanka and Colombia. There are many resources that can cause conflict such as fresh water, diamonds, coal and even sunshine.

Students will decide, based on what they have learnt in the lesson whether they think conflict is inevitable.



### How does conflict affect development?

Development is the progress of a country in terms of economic growth, the use of technology and human welfare. Indicators such as birth rate, infant mortality rate, literacy rate, HDI and GNI can be used to measure development. Conflict can sometimes be referred to as "Development in reverse".

### Conflict can cause human suffering

Life expectancy is significantly lower during conflicts. Maternal mortality also deteriorates.

Poverty exacerbates poverty and hunger. Conflict causes food insecurity. The conflict in Africa since the mid-1960s until 2000 cost the region more than \$120 billion worth of agricultural production.

Women in refugee camps are particularly vulnerable to displacement. One in six women in refugee camps is a survivor of gender-based violence. On average, primary school's enrolment rates for girls and boys are almost 13% and 9% lower in intense-conflict cases than in non-conflict cases. During civil war, states reduce its educational expenditures by 3.1-3.6% each year. Conflict also reduces educational enrolment. Therefore, the effect of conflict will be felt for many years further exacerbating the conflict trap.

### Conflict affects the economy

The loss of human life, destruction of infrastructure, political instability and future uncertainty can affect future economic growth and investment. This can lead to the conflict trap. On average, growth in countries with conflict is about 3% lower. Conflict can spread to neighbouring countries creating social strains.

The impact of conflict is not uniform across the country. Conflict is often localised and only in particular regions.

Shorter conflicts cause continued post-war decline in GDP, whereas long wars give rise to a phase of rapid growth.

### Conflict in Sub-Saharan Africa

Conflicts in Sub-Saharan Africa have occurred in Rwanda, between Ethiopia and Eritrea, Angola and Sierra Leone.

The Democratic Republic of Congo has 4.4 million internally displaced people. Surviving child soldiers are affected long after a conflict ends. In Uganda, they attend school for one year less than children who were not child soldiers, with significant impacts of earnings later in life.

### What is the impact of geography on conflict?

As well as conflict having an impact on Geography, Geography, and in particular physical Geography, can have a major impact on conflict.

Historically, when siting settlements, people looked for defensive sites, such as the inside bend of a river meander or the top of a hill, which could be easily defended in the event of an enemy attack. Topography also played an important part in the Battle of Hastings for example.

Some environments though make conflict challenging. For example, desert landscapes provide little cover and the lack of landmarks makes navigation difficult. This has been one of the most notable challenges about the conflict in Iraq. Marsh land and mountainous regions are also notoriously difficult environments in which to engage in conflict as, in the former, the land is unstable and it is difficult to set up a base or equipment and, in the latter, temperatures are low and conditions harsh.

The physical Geography of Iraq has had a major impact on conflict in the country.

The physical Geography in Iraq has had a major impact on conflict in the country. The desert environment, as well as providing challenges can present some advantages. For example, the flat terrain means that the pace of advance is fast and the lack of cover favours coalition forces who possess weapons with a greater range than the insurgents. However, the Zagros Mountains to the north and the Syrian desert to the west both mean that mass migration of refugees as a result of the conflict is unlikely and instead there is likely to be small pockets of refugee movement. Also, the majority (70%) of Iraq's population live between the Tigris and Euphrates Rivers where the capital, Baghdad is also located. It is these areas of dense population where the focus of the conflict is likely to remain and also means that the likelihood of civilian casualties is very high.

## Knowledge organiser: Is conflict inevitable?

### Why do countries fight for water?

Only a small amount of water is fresh water and available to use. Water is used in agriculture, industry and in nature. Current use of water is unsustainable. Access to sanitation is a bigger problem than access to water. Bolivia is landlocked and is surrounded by Peru, Brazil, Argentina, Brazil and Paraguay.

Over 3 million people have water struggles in Bolivia. La Paz is the capital of Bolivia. A third of the population lack access to water and sanitation. There is a 70% poverty rate in Bolivia.

El Alto is an urban area – population of 1 million. It is a fast-growing city. Some must use the toilet in the street. There is a shared open tap. Up to 40 families can use the same tap and sometimes they must walk a long way. The taps don't always work and can sometimes freeze. The city's population is growing so it is hard to ensure there is enough water.

In 2001 there was a water revote – poor people protested about the takeover of their water systems. Water prices went up.

The glaciers provide the fresh water. The glaciers are drying up.

### Is conflict with China inevitable?

A superpower is a very powerful nation that can influence countries across the globe.

Military power is the strength of a country in regards to their army i.e. navy, army, air force, nuclear weapons. Economic power is the strength of a country in regards to their economy i.e. GDP, amount of trade, what exports they produce and what they import.

China whilst it doesn't spend as much on its army as the USA it has been increasing in power by modernising its air force and navy, and maintaining a large army size of 1,600,000 compared to the USA which has 540,000 soldiers but a higher number of combat aircraft and navy vessels that are also more modern. Evidence of China's modernising is that it built its first domestic aircraft carrier in 2017. Conflict with China could be seen as inevitable as the USA increasingly feels under threat from China's growing military power as they continue to compete for global influence.

China's is considered an economic superpower. It has the 2<sup>nd</sup> largest economy in the world. It is continuing to experience rapid growth of 7.9% in GDP, despite the COVID pandemic.

It produces of 25% of the world's wealth.

It is a major supplier of medicines and medical goods to the West (40%). This could lead to conflict if China decides to increase prices of medical goods or reduce supply of medical goods/other goods that HICs import from China. This could be due to a number of reasons. For example, political conflict over human rights abuses by China against the Uyghur minority in the Xinjiang province.

### What are blood diamonds and how they have caused conflict in Sierra Leone?

Sierra Leone is located on the west coast of Africa. And it is a very poor country.

The diamond fields in Sierra Leone were originally controlled by the government and a company called DeBeers.

In Sierra Leone a rebel group called the Revolutionary United Front (RUF) tried to gain control of the diamond mines. The RUF attempted to overthrow the Sierra Leone government. The RUF began to attack the areas of the country with diamond mines in order to gain control. The RUF attacked villages which supported the government and killed those in opposition. One of the RUF's most notorious ways to terrorise was to amputate 1 or both arm using machetes. The RUF said it amputated people's arms so that they could no longer work in the mines.. The RUF abducted children aged 8 and over and trained them to be soldiers. The child soldiers were expected to kill in villages – and possibly even kill their own friends and family.

Between 1991 and 2002 the RUF was mining up to \$125 million of diamonds a year. The money from the RUF controlled diamond mines went to fund the weapons needed for war. Many people have been evicted from their homes in order to expand diamond mines in Sierra Leone.

The Sierra Leoneans who had to work very long hours in dangerous conditions received very little money.

The resource curse is when a not very developed country has a lot of natural resources that lead to conflict.

A civil war is when one or more groups want to take control of the country.

### Insulate Britain – what is all the fuss about?

Political conflict involves 2 or more groups disagreeing with how to respond to the same issue.

Insulate Britain are a political /activist group that want the government to rapidly insulate Britain's homes. It is argued this will create 220,000 jobs.

High-heating costs cost the NHS up to £2 billion a year in England because of how cold homes contributes to poor health.

Insulate Britain have staged several protests blocking major transport networks. In response the police have arrested several members

# Knowledge organiser: GCSE – The Challenge of natural hazards

Evidence for climate change
The last 2.6 million years is called the Quaternary period. Temperatures have fluctuated a great deal. As a result of climate change, many of the world's glaciers and ice caps are shrinking, Arctic sea ice is less extensive than in the past, low lying islands such as the Maldives and Tuvalu are under threat from sea-level rise and agricultural land in Bangladesh, Vietnam, India and China is under threat.
Ice and sediment cores
Ice sheets are made up of layers of snow, one per year. Gases trapped in layers of ice can be analysed. Ice cores from Antarctica show changes over the last 400 000 years. Remains of organisms found in cores from the ocean floor can be traced back 5 million years.
Pollen analysis
Pollen is preserved in sediment. Different species need different climatic conditions.
Tree rings
A tree grows one new ring each year. Rings are thicker in warm, wet conditions - This gives us reliable evidence for the last 10 000 years.
Temperature records
Historical records date back to the 1850s. Historical records also tell us about harvest and weather reports.

## Causes of climate change

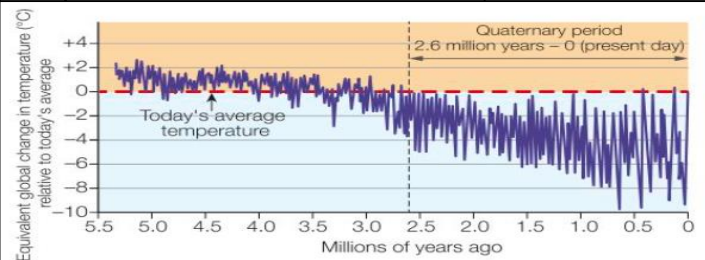
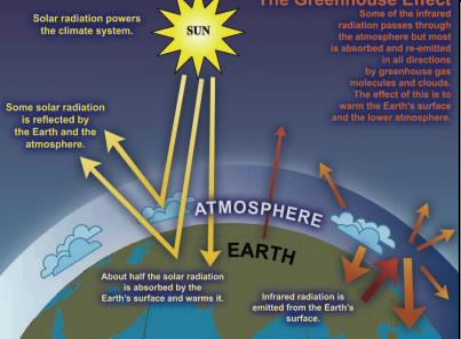
Physical causes	Human causes
<ul style="list-style-type: none"> <li>- Orbital changes – The sun's energy on the Earth's surface changes as the Earth's orbit is elliptical its axis is tilted on an angle. Milankovitch cycles – see image.</li> <li>- Solar Output – sunspots increase to a maximum every 11 years.</li> <li>- Volcanic activity – volcanic ash reflects sunlight away reducing global temperatures temporarily. E.G – Mount Tambora – 1815 – Indonesia – ash and sulphuric acid caused average global temperatures to fall by 0.4°C – 0.7°C and 1816 became known as "The year without a summer". Harvests failed, food shortages, food prices rose, riots. 200, 000 died in Europe due to famine.</li> </ul>	<ul style="list-style-type: none"> <li>Fossil fuels – release carbon dioxide with accounts for 50% of greenhouse gases.</li> <li>Agriculture – accounts for around 20% of greenhouse gases due to methane production from cows etc. Larger populations and growing demand for met and rice increase contribution.</li> <li>Deforestation – logging and clearing land for agriculture increases carbon dioxide in the atmosphere and reduces ability to planet to absorb carbon through photosynthesis.</li> </ul>

### Milankovitch Cycle

**Eccentricity** Earth encounters more variation in the energy that it receives from the sun when Earth's orbit is elongated than it does when Earth's orbit is more circular.

**Tilt** The tilt of Earth's axis varies between 22.2° and 24.5°. The greater the tilt angle is, the more solar energy the poles receive.

**Precession** A gradual change, or "wobble," in the orientation of Earth's axis affects the relationship between Earth's tilt and eccentricity.



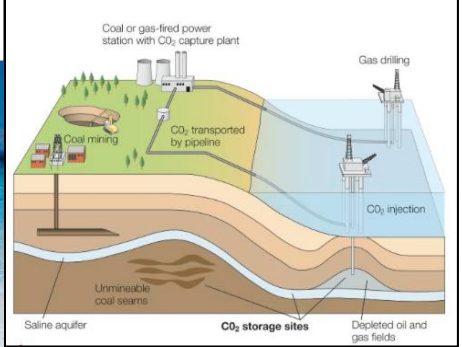
**A** Average global temperatures for the last 5.5 million years using information from sediment cores



Effects of climate change	
Social	Environmental
<ul style="list-style-type: none"> <li>Increased disease, e.g. skin cancer and heat stroke.</li> <li>Winter deaths decrease with milder winters. Crop yields affected by up to 12% in South America but will increase in Northern Europe but will need more irrigation.</li> <li>Less ice in Arctic Ocean increases shipping and extraction of oil and gas reserves.</li> <li>Droughts reduce food and water supply in sub-Saharan Africa. Water scarcity in South and South East UK.</li> <li>Increased flood risk. 70% of Asia is at risk of increased flooding</li> <li>Declining fish in some areas affect diet and jobs.</li> <li>Increased extreme weather</li> <li>Skiing industry in Alps threatened.</li> </ul>	<ul style="list-style-type: none"> <li>Increased drought in Mediterranean region. Lower rainfall causes food shortages for orangutans in Borneo and Indonesia.</li> <li>Sea level rise leads to flooding and coastal erosion.</li> <li>Ice melts threaten habitats of polar bears.</li> <li>Warmer rivers affect marine wildlife.</li> <li>Forests in North America may experience more pests, disease and forest fires.</li> <li>Coral bleaching and decline in biodiversity.</li> </ul>

## Managing climate change

Mitigation	Adaptation
<ul style="list-style-type: none"> <li><b>Alternative energy production</b> will reduce CO2 production such as hydro-electricity, nuclear power, solar, wind and tidal. The UK aims to produce 15% of its energy from renewable sources by 2020.</li> <li><b>Planting Trees</b> – helps to remove carbon dioxide.</li> <li><b>Carbon Capture</b> – takes carbon dioxide from emission sources is stored underground.</li> <li><b>International Agreements</b> e.g. the Paris Climate Agreement.</li> </ul>	<ul style="list-style-type: none"> <li><b>Changes in agricultural systems</b> need to react to changing rainfall and temperature patterns and threat of disease and pests.</li> <li><b>Irrigation in the Gambia</b> – drought resistant strains of crops, education, new cropping patterns introduced.</li> <li><b>Managing water supplies</b> – eg. by installing water efficient devices and increasing supply through desalination plants.</li> <li><b>Himalayas</b> – millions of people depend on rivers fed by snow melt. Glaciers are retreating which threatens water security in the region. Artificial glacier projects are used where water is collected in winter. It freezes and the "melt" is used to provide water for the local villages.</li> <li><b>Reducing risk</b> from rising sea levels would involve constructing defences such as the Thames Flood Barrier or restoring mangrove forests, or raising buildings on stilts.</li> <li><b>Managing rising sea levels in the Maldives</b> – the highest point on the islands is just 2.4m. A 3m sea wall is being constructed around the capital city Malé. Houses are being built on stilts. Mangrove forests are being restored. Their roots trap sediment and offer protection from storm waves.</li> </ul>



Reducing risk from rising sea levels would involve constructing defences such as the Thames Flood Barrier or restoring mangrove forests, or raising buildings on stilts.

**Managing rising sea levels in the Maldives** – the highest point on the islands is just 2.4m. A 3m sea wall is being constructed around the capital city Malé. Houses are being built on stilts. Mangrove forests are being restored. Their roots trap sediment and offer protection from storm waves.

## Relief of the UK

Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.

### Key

Lowlands

Uplands



Areas +600m: Peaks and ridges cold, misty and snow common. i.e. Scotland

Areas - 200m: Flat or rolling hills. Warmer weather. i.e. Fens

## Types of Erosion

The break down and transport of rocks – smooth, round and sorted.

<b>Attrition</b>	Rocks that bash together to become smooth/smaller.
<b>Solution</b>	A chemical reaction that dissolves rocks.
<b>Abrasion</b>	Rocks hurled at the base of a cliff to break pieces apart.
<b>Hydraulic Action</b>	Water enters cracks in the cliff, air compresses, causing the crack to expand.

## Types of Transportation

A natural process by which eroded material is carried/transported.

<b>Solution</b>	Minerals dissolve in water and are carried along.
<b>Suspension</b>	Sediment is carried along in the flow of the water.
<b>Saltation</b>	Pebbles that bounce along the sea/river bed.
<b>Traction</b>	Boulders that roll along a river/sea bed by the force of the flowing water.

## Mass Movement

A large movement of soil and rock debris that moves down slopes in response to the pull of gravity in a vertical direction.

- 1 Rain saturates the permeable rock above the impermeable rock making it heavy.
- 2 Waves or a river will erode the base of the slope making it unstable.
- 3 Eventually the weight of the permeable rock above the impermeable rock weakens and collapses.
- 4 The debris at the base of the cliff is then removed and transported by waves or river.

## Types of Weathering

Weathering is the breakdown of rocks where they are.

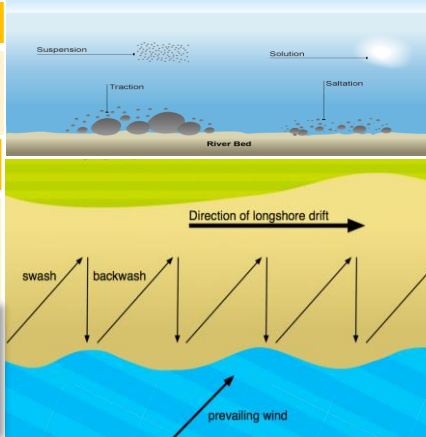
<b>Chemical</b>	Breakdown of rock by changing its chemical composition, e.g. acidic rainwater
<b>Mechanical</b>	Breakdown of rock without changing its chemical composition, e.g. freeze-thaw weathering
<b>Biological weathering</b>	This occurs due to the actions of plants and animals. E.g. plant roots break rocks, animals burrow into weak rocks.

## What is Deposition?

When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.

## What is longshore drift?

The movement of material along the beach. When the waves approach at an angle, sediment will be moved along in a zig-zag pattern.



## Coastal landforms at Swanage

### Where?

Dorset, south coast of England. It has many erosional and depositional landforms. It is also known as the Jurassic Coast.



### Landforms -

This indented coastline is called a discordant coastline. The south coast has one rock type – limestone – this forms a concordant coastline. To the south of Swanage is Poole Harbour. A lot of deposition has taken place in this bay. There are two spits at the mouth of the harbour. At Studland there are lagoons, saltmarshes and sand dunes.

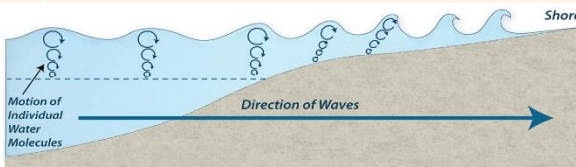
## Why are our coastlines ever-changing?

## How do waves form?

Waves are created by wind blowing over the surface of the sea. As the wind blows over the sea, friction is created - producing a swell in the water.

## Why do waves break?

- 1 Waves start out at sea.
- 2 As waves approaches the shore, friction slows the base.
- 3 This causes the orbit to become elliptical.
- 4 Until the top of the wave breaks over.



## Mechanical Weathering Example: Freeze-thaw weathering

### Stage One

Water seeps into cracks and fractures in the rock.



### Stage Two

When the water freezes, it expands about 9%. This wedges apart the rock.



### Stage Three

With repeated freeze-thaw cycles, the rock breaks off.



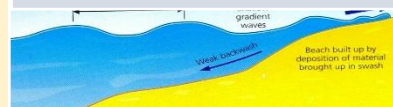
## Size of waves

- **Fetch** how far the wave has travelled
- Strength of the wind.
- How long the wind has been blowing for.

## Types of Waves

### Constructive Waves

This wave has a **swash that is stronger** than the backwash. This therefore builds up the coast. They form gentle beaches



### Destructive Waves

This wave has a **backwash that is stronger** than the swash. This therefore erodes the coast. They form more steep beaches



Coastal Defences - Hard Engineering Defences			
<b>Groynes</b>	Wood barriers prevent longshore drift, so the beach can build up.	£150,000 each, at 200m intervals	<ul style="list-style-type: none"> <li>✓ Beach still accessible.</li> <li>✗ No deposition further down coast = erodes faster.</li> </ul>
<b>Sea Walls</b>	Concrete walls break up the energy of the wave. Has a lip to stop waves going over.	£5000-100000 per metre	<ul style="list-style-type: none"> <li>✓ Long life span</li> <li>✓ Protects from flooding</li> <li>✗ Curved shape encourages erosion of beach deposits.</li> </ul>
<b>Gabions or Rip Rap</b>	Cages of rocks/boulders absorb the waves energy, protecting the cliff behind.	Up to £50,000 per 100m.	<ul style="list-style-type: none"> <li>✓ Cheap</li> <li>✓ Local material can be used to look less strange.</li> <li>✗ Will need replacing.</li> </ul>

Coastal Defences - Soft Engineering Defences			
<b>Beach Nourishment</b>	Beaches built up with sand, so waves have to travel further before eroding cliffs.	up to £5000,000 per 100m	<ul style="list-style-type: none"> <li>✓ Cheap</li> <li>✓ Beach for tourists.</li> <li>✗ Storms = need replacing.</li> <li>✗ Offshore dredging damages seabed.</li> </ul>
<b>Dune regeneration</b>	Grasses planted to stabilise dunes and help them develop. Fences used to keep people off sand dunes.	£200-1000 per 100m	<ul style="list-style-type: none"> <li>✓ Cheap</li> <li>✓ Maintains a natural coastline, popular with people and wildlife.</li> <li>✗ Time consuming to plant grasses and fence areas off.</li> <li>✗ Can be damaged by storms.</li> </ul>
<b>Managed Retreat</b>	Low value areas of the coast are left to flood & erode. <b>Medmerry Managed retreat, West Sussex</b> – the flat, low lying coast is mainly used for farming and caravan parks. It was protected by a sea wall, but this now need repairing. Due to the low value of the land, it was decided to allow the sea to breach the wall.		<ul style="list-style-type: none"> <li>✓ Reduce flood risk</li> <li>✓ Creates wildlife habitats.</li> <li>✓ Most sustainable option</li> <li>✗ Compensation for land.</li> </ul>

**Case Study: Lyme Regis**

**Location and Background**  
Located on the south coast of England, on the Jurassic coast. It is a popular tourist destination.

**What are the issues?**  
Much of the town has been built on unstable cliffs. The coastline is eroding rapidly. Many properties have been destroyed. The sea wall has been breached many times.

**Management**  
**Phase 1** – 1990-1995 – New sea wall and promenade, 2003-2004 a £1.4 million emergency project was completed to stabilise the cliffs. Hundred of large nails were used to hold the rocks together.  
**Phase 2** – 2005-2007 – improvements to the sea front, costing £22 million. New sea walls, creation of wide sand and shingle (from the English channel) beach to absorb wave energy, extension of rock armour at The Cobb.  
**Phase 3** – The plan was to help prevent landslips and erosion to the west of The Cobb. It was decided to leave this area alone as the costs outweighed the benefits.  
**Phase 4** – 2013-2015 – final phase focused on the coast east of the town. Cost £20 million. Construction of a 390m sea wall in front of the existing wall, nailing, piling and drainage to provide cliff stabilisation to protect 480 homes.

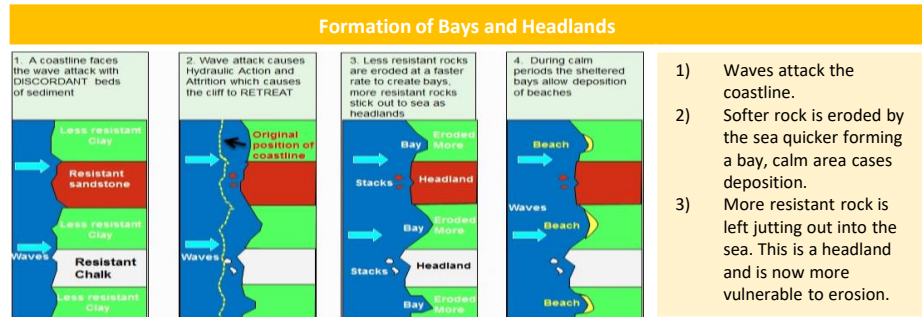
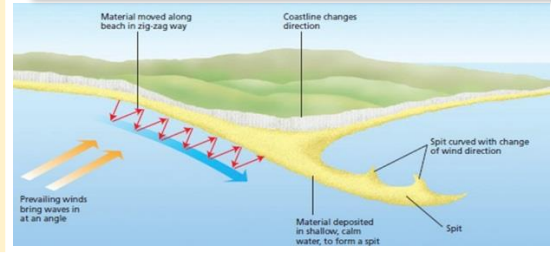
**How successful?**  
**Positives** – increased visitors due to beaches, defences have stood up to stormy winters, boat owners and fishermen benefit from harbour being better protected.  
**Negatives** – increased visitors lead to conflict with locals, natural landscape spoilt, sea defences interfere with other stretches of coastline.

**Formation of Coastal Spits and Bars- Deposition**

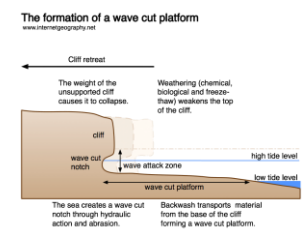
**Example: Spurn Head, Holderness Coast.**

- 1) Swash moves up the beach at the angle of the prevailing wind.
- 2) Backwash moves down the beach at 90° to coastline, due to gravity.
- 3) Zigzag movement (Longshore Drift) transports material along beach.
- 4) Deposition causes beach to extend, until reaching a river estuary.
- 5) Change in prevailing wind direction forms a hook.
- 6) Sheltered area behind spit encourages deposition, salt marsh forms.
- 7) A bar forms when a spit grows right across a bay.

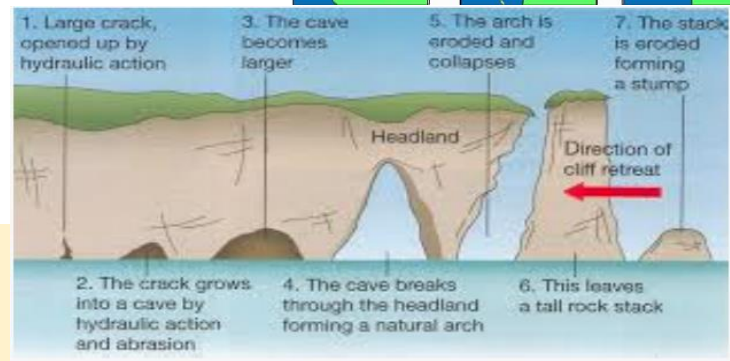
**Why are our coastlines ever-changing?**



**Formation of cliffs and wave-cut platforms.**



- 1) When a wave breaks against a cliff, erosion will wear away at the bottom on a cliff, forming a wave-cut notch.
- 2) Over a long period of time, the notch will get deeper and deeper, undercutting the cliff.
- 3) Eventually, the cliff above collapses.
- 4) Over time the cliff will retreat
- 5) In it's place will be a gentle sloping rocky platform called a wave-cut platform.



**Formation of Coastal Stack**

**Example: Old Harry Rocks, Dorset**

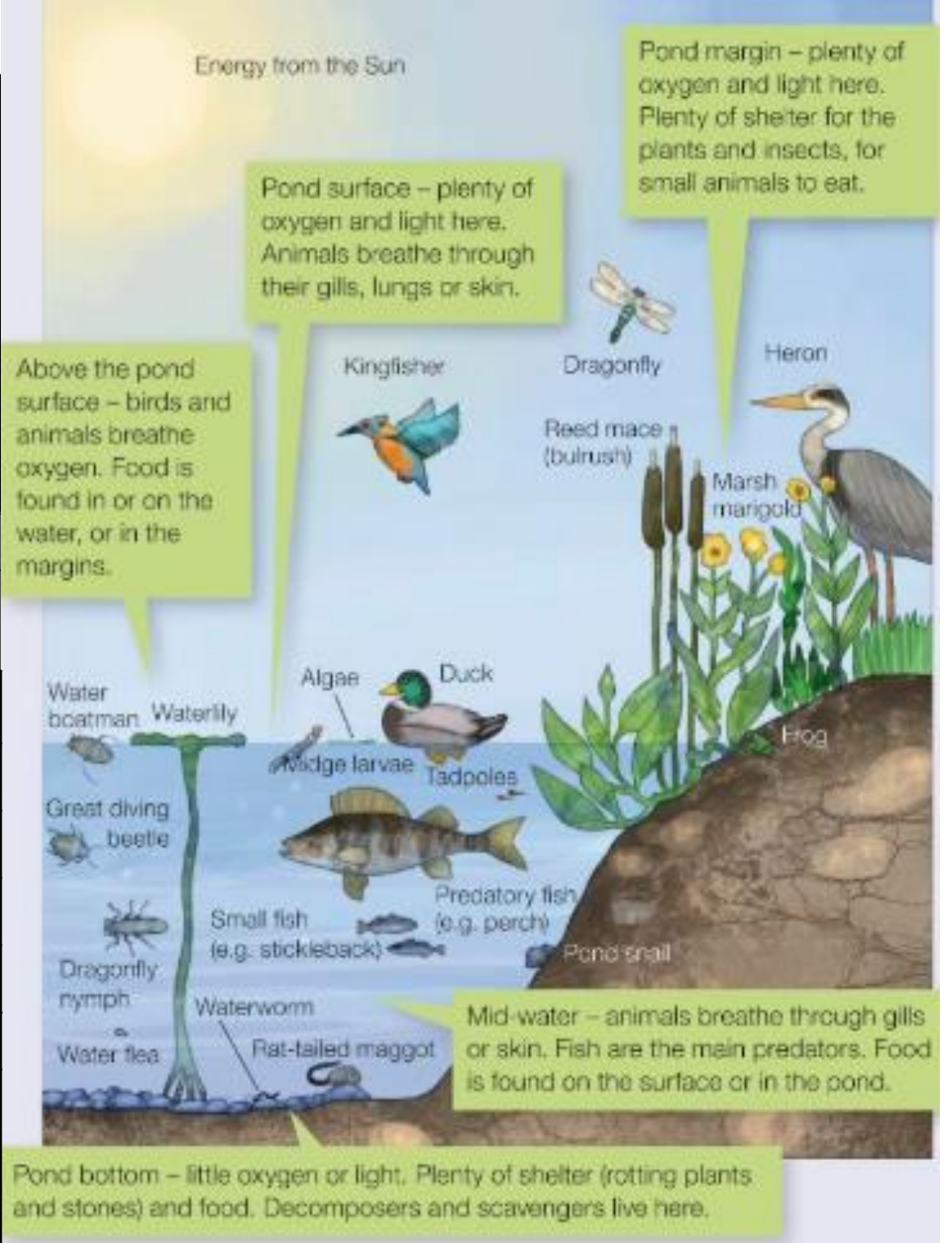
- 1) Hydraulic action widens cracks in the cliff face over time.
- 2) Abrasion forms a wave cut notch between HT and LT.
- 3) Further abrasion widens the wave cut notch to from a cave.
- 4) Caves from both sides of the headland break through to form an arch.
- 5) Weather above/erosion below –arch collapses leaving stack.
- 6) Further weathering and erosion eaves a stump.



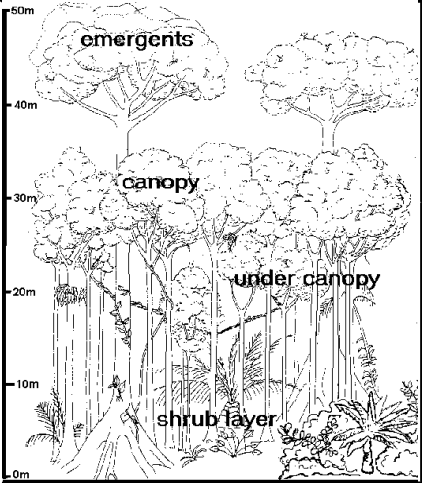
# Knowledge organiser: The Living World - Ecosystems

Abiotic	Relating to non living things
Biotic	Relating to living things
Consumer	Creature that eats herbivores and / or plant matter
Decomposer	An organism that breaks down dead tissue which is then recycled to the environment
Ecosystem	A community of plants and animals that interact with each other and the physical environment
Food chain	The connections between different organisms that rely on one another as their food source
Food web	A complex hierarchy of plants and animals relying on each other for food
Nutrient cycling	A set of processes whereby organisms extract minerals necessary for growth from soil and water before passing them on through the food chain
Global ecosystem	Large biomes with flora and fauna adapting to their environment
Producer	An organism or plant that is able to absorb energy from the sun through photosynthesis

ECOSYSTEM	Key Characteristics	Biodiversity	The way of life in the world or a particular habitat
Tropical Rainforests	<ul style="list-style-type: none"> <li>Along equator (Asia, Africa / South America)</li> <li>6% earth's surface</li> <li>25°C – 30°C and over 250mm rain per year</li> </ul>	Convectional rainfall	Warm air at the surface heats up, rises, cools and condenses forming clouds. This leads to heavy daily rainfall
Temperate Grassland	<ul style="list-style-type: none"> <li>40° - 60° N of the equator (N America and E Europe)</li> <li>Centre of continents away from the sea</li> <li>Short grasses</li> <li>Wet and dry seasons</li> </ul>	<b>Factors affecting an ecosystem</b>	<b>How it affects it</b>
Coniferous Forest	<ul style="list-style-type: none"> <li>60°N (Scandinavia / Canada)</li> <li>Cone bearing evergreen</li> <li>No sunlight for part of the year</li> </ul>	Natural changes	Droughts can affect ponds and lakes.
Deciduous forests	<ul style="list-style-type: none"> <li>Higher latitudes (W Europe, N America, New Zealand)</li> <li>5 – 20°C and between 500 – 1500 mm rain per year</li> <li>4 distinct seasons</li> <li>Lose leaves in the winter to cope with the cold</li> </ul>	Human activity	Agricultural fertilisers – leads to eutrophication.  Woods cut down – destroys habitats and affects nutrient cycle
Tundra	<ul style="list-style-type: none"> <li>Above 60°N (Arctic Circle)</li> <li>Less than 10°C and less than 500mm per year rain</li> <li>Cold, icy and dry means 2 month growing season</li> </ul>		Conversion of ponds to farm land – kills fish and other pond life.
Mediterranean	<ul style="list-style-type: none"> <li>30- 40°N and S on west coast of continents</li> <li>Drought resistant small trees and evergreen shrubs</li> </ul>	<b>Example – Yellowstone National Park</b>	
Tropical Grasslands	<ul style="list-style-type: none"> <li>Between equator and tropics</li> <li>20 – 30°C and between 500- 1500 mm of rain per year</li> <li>Wet and dry seasons</li> </ul>	In 1995 wolves were introduced into the area. They killed the deer which meant that the trees grew back. This had many other knock on effects such as birds and beavers returning. The rivers banks were also stabilised due to the trees roots stabilising the banks.	
Deserts	<ul style="list-style-type: none"> <li>Tropics (Sahara and Australia)</li> <li>Over 30°C and less than 300 mm per year rain</li> <li>20% of land's surface</li> </ul>		



# Knowledge organiser: The Living World – Tropical Rainforest



- Average temperature 27°C
- More than 2000 mm rain per year
- Wet season (December to May)
- Infertile soils
- Shallow roots
- 4 layers of vegetation
- Trees lose leaves all year

- PLANT ADAPTATIONS**
- Tall and straight to reach the sun
  - Buttress roots to support the tall trees
  - Lianas use trees to reach the sun
  - Drip tips so leaves don't rot
  - Thick waxy eaves
  - Smooth thin bark
  - Epiphytes grow on trees and get nutrients from air and water
  - Shade tolerant ferns

- ANIMAL ADAPTATIONS :**
- Sloths – hook to grip branches
  - Parrots – sharp beak for nuts and fruit; 4 toes per foot to clamber
  - Long limbed spider monkey – sharp nails to peel bark to get to sap
  - Flying frog – web like feet to glide through the air
  - Titan beetle – flies and lives on decaying material
  - Anteaters – long tongues; good smell and hearing; sharp claws to open ant hills
  - Harpy eagle – short pointy wings to manoeuvre

- INTERDEPENDENCE OF CLIMATE, WATER, SOILS, PLANTS, ANIMALS AND PEOPLE**
- Small changes to biotic and abiotic factors can have serious knock on effects
  - Biomass is the largest nutrient store and the biggest transfer is from soil to biomass
  - Fertility s quickly lost from the soil if trees are cut down
  - Poor soils due to leaching (the washing away of nutrients)
  - Thick litter layer. Rapidly breaks down due to climate
  - Warm humid climate means rapid plant growth


- ISSUES RELATED TO BIODIVERSITY**
- More than half the world's species are found in rainforests
  - Human exploitation is a major threat
  - Many extinct and endangered species are leading to a decrease in ecosystem productivity

**Goods and services**

**GOODS from rainforest :** Food; Building materials; HEP; Water; Medicines (1/4 of drugs use products found in the rainforest)

**SERVOCES from rainforest :** Air purification; Water and nutrient cycling; Protection from soil erosion; Habitats; Biodiversity; Employment.

**The Main Range, Peninsular Malaysia** – has over 600 species. 25% of all plant species found in Malaysia are here. There are many undiscovered medical plants.

Cause of deforestation	Definition and facts
Commercial farming	Farming on a large scale Malaysia is the largest exporter of palm oil in the world.
Deforestation	The chopping down and removal of trees to clear an area of forest 
Logging	The business of cutting down trees and transporting the logs to sawmills. Selective logging and clear felling. Teak and Mahogany worth the most. In the 1980's Malaysia became the world's largest exporter of highly valued tropical wood.
Subsistence farming	A type of agriculture producing food and materials for the benefit only of the farmer and his family. Slash and burn fires can grow out of control destroying large areas of forests.
Other uses	<ul style="list-style-type: none"> <li>• Road building – provide access to logging and mining areas</li> <li>• Settlement – Government resettled poor and gave them land</li> <li>• Energy development – HEP projects boost Malaysia's electricity supplies, e.g. The Baku Dam which opened in 2011.</li> <li>• Mineral extraction – tin mining and drilling for oil and gas.</li> </ul>


**Impact of deforestation in Malaysia**

- Economic development**
- Brings in jobs and income
  - Destroys resources in the long term
  - Livelihoods of locals destroyed
  - Rainforest tourism could decrease
  - Improved infrastructure for locals

- Soil erosion**
- Land left unprotected from heavy rain leads to landslides and flooding
  - Nutrients are washed away decreasing nutrients in the soil
  - Rivers silt up

- Contribution to climate change**
- Trees cut down change the water cycle and make it drier and warmer
  - Rainforests are the lungs of the earth and so when deforested there is ore carbon dioxide in the air and less oxygen. Burning also releases carbon to the air (Greenhouse effect)

- Others**
- Loss of biodiversity – undiscovered plant species and their medicinal properties
  - Loss of indigenous tribes (90 since 1990)
  - Tribal people moving to towns and cities and have drugs and alcohol issues. Loss of indigenous knowledge
  - Conflicts between developers and indigenous people
  - Water pollution

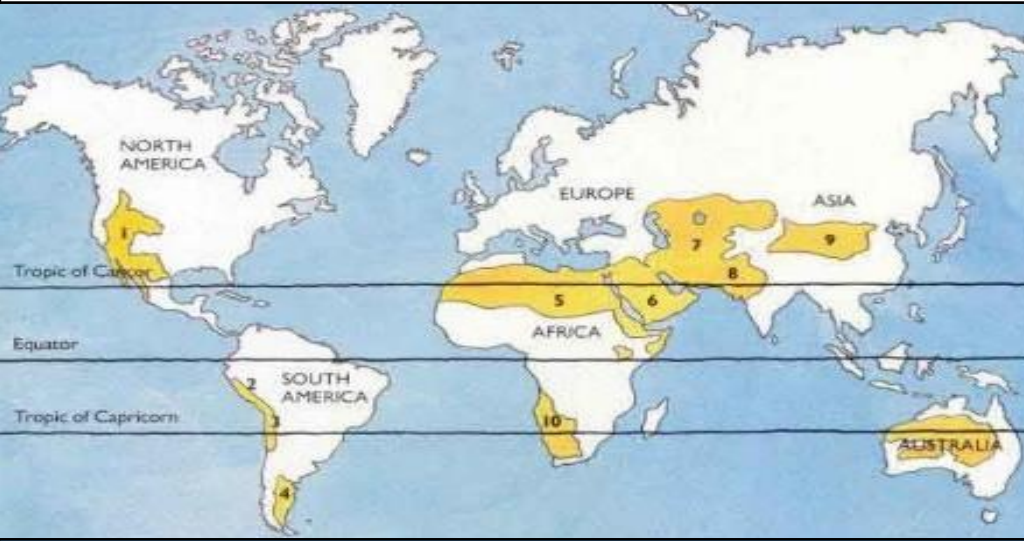
Sustainability	Actions and forms of progress that meets the needs of the present without reducing the ability of future generations to meet their own needs
STRATEGY	KEY FACTS
Selective logging and replanting	<ul style="list-style-type: none"> <li>• The cutting down of trees which are mature or inferior to encourage the growth of the remaining trees</li> <li>• Only fell fully grown trees on 30 – 40 year cycle</li> <li>• Replanting – collect seeds from primary forest; grow in nurseries and replant</li> <li>• Forest Stewardship Council – mark sustainably sourced timber</li> </ul>
Conservation and education	<ul style="list-style-type: none"> <li>• Education of locals key</li> <li>• WWF (NGO) – education; train conservation workers; provide practical help; buy threatened areas and set up nature reserves</li> </ul> 
Ecotourism	<ul style="list-style-type: none"> <li>• Responsible travel to natural areas that conserve the environment, sustains the well being of local people and may involve education</li> <li>• Minimises damage to environment and benefits locals</li> <li>• Small visitor numbers</li> <li>• Waste and litter disposed of properly</li> <li>• Locals employed so incentive to preserve environment</li> </ul>
International agreements about use of tropical hardwoods	<ul style="list-style-type: none"> <li>• International Tropical Trade Agreement 2006 and 2011 – restricts trade in hardwood from rainforests</li> <li>• Needs to be felled from sustainably managed areas and stamped with registration numbers</li> <li>• UN Sustainable development goals include protection of forests</li> <li>• The FSC promotes sustainably managed forestry through education programmes and its FSC labelled products.</li> </ul>
Debt reduction	<ul style="list-style-type: none"> <li>• Countries are relieved of some of their debt in return for protecting their rainforests</li> <li>• Debt for nature swaps – in 2010 USA converted debt of \$13.5 million from Brazil and used the funds to protect the rainforest</li> <li>• HICs wipe off debts of LICs</li> </ul>

The Achuar Tribe – 11, 000 people in the Peruvian Amazon, rely on the rainforest for food, fuel and buildings. There is oil in their region. The Achuar are resistant to oil exploration and in 2012 the oil company Talisman



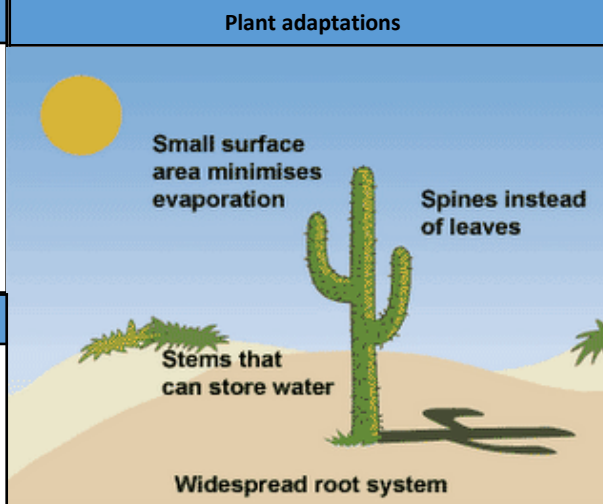
# Knowledge organiser: The Living World - Hot deserts

Characteristics
<ul style="list-style-type: none"> <li>Aridity – hot deserts are extremely dry, with annual rainfall below 250 mm.</li> <li>Heat – hot deserts rise over 40 degrees.</li> <li>Landscapes – Some places have dunes, but most are rocky with thorny bushes.</li> <li>Soils – sandy or stony. Little organic matter. They can soak up water rapidly after rainfall. They are not fertile.</li> </ul>



Distribution
Most of the world's hot deserts are found in the subtropics between 20 degrees and 30 degrees north & south of the Equator. The Tropics of Cancer and Capricorn run through most of the worlds major deserts.

Climate of hot deserts
<ul style="list-style-type: none"> <li>Very little rainfall with less than 250 mm per year.</li> <li>It might only rain once every two to three years.</li> <li>Temperate are hot in the day (45 °C) but are cold at night due to little cloud cover (5 °C).</li> <li>In winter, deserts can sometimes receive occasional frost and snow.</li> </ul>



Animal adaptation
Many rodents, such as the jerboa are nocturnal and survive the heat by burrowing underground. Snakes and lizards retain water by having a waterproof skin and producing only small amounts of urine.

## Hot Desert: Case Study Thar Desert – India/Pakistan

The Thar Desert is located on the border between India and Pakistan in Southern Asia. With India soon becoming the most populated country in the world in the next five years. With this, more people will plan to live in the desert.

### Opportunities and challenges in the Hot desert

Opportunities	Challenges
<ul style="list-style-type: none"> <li>There are valuable minerals for industries and construction, such as gypsum and stone.</li> <li>Energy resources such as coal and oil can be found in the Thar desert.</li> <li>Great opportunities for renewable energy such as The Jaisalmer Wind Park.</li> <li>Thar desert has attracted tourists, especially during festivals.</li> </ul>	<ul style="list-style-type: none"> <li>The extreme heat makes it difficult to work outside for very long.</li> <li>High evaporation rates from irrigation canals and farmland.</li> </ul> <p>The <b>Indira Gandhi Canal</b> is the main form of irrigation in the desert. It was constructed in 1958 and has a total length of 650km.</p> <ul style="list-style-type: none"> <li>Water supplies are limited, creating problems for the increasing number of people moving into area.</li> <li>Access through the desert is tricky as roads are difficult to build and maintain.</li> </ul>

Hot Deserts inhabitants
<ul style="list-style-type: none"> <li>People often live in large <b>open tents</b> to <b>keep cool</b>.</li> <li>Food is often <b>cooked</b> slowly in the <b>warm sandy soil</b>.</li> <li><b>Head scarves</b> are worn by men to provide <b>protection from the Sun</b>.</li> </ul>



### Causes of Desertification

**Desertification means the turning of semi-arid areas (or drylands) into deserts. It is caused by both human and physical factors and it affects both poor and rich countries.**

<b>Fuel Wood</b> People rely on wood for fuel. This removal of trees causes the soil to be exposed.	<b>Overgrazing</b> Too many animals mean plants are eaten faster than they can grow back. Causing soil erosion.
<b>Over-Cultivation</b> If crops are grown in the same areas too often, nutrients in the soil will be used up causing soil erosion.	<b>Population Growth</b> A growing population puts pressure on the land leading to more deforestation, overgrazing and over-cultivation.
<b>Climate Change</b> Reduce rainfall and rising temperatures have meant less water for plants.	<b>Soil erosion</b> Where vegetation is destroyed, soil is exposed which cracks and breaks up. It can then be eroded by wind/rain.

**Example – Desertification in the Badia, Jordan**

The Badia is located in Jordan.

Physical causes of desertification

- less than 150mm of rainfall per year
- Temperatures exceed 40 degrees

Human causes of desertification

- 1991 Gulf War – sheep came in with people which led to overgrazing.

Desertification has made the land unproductive and people have moved away from the area.

## Strategies to reduce Desertification

- Water management** - growing crops that don't need much water.
- Tree Planting** - trees can act as windbreakers to protect the soil from wind and soil erosion.
- Soil Management** - leaving areas of land to rest and recover lost nutrients.
- Technology** – using less expensive, sustainable materials for people to maintain. i.e. sand fences, terraces to stabilise soil and solar cookers to reduce deforestation.
- Creation of National Parks** – The Desert National Park in the Thar desert – created in 1992 to protect 3000km2 of desert.

**Examples**

The Tal Rimah Rangeland Rehabilitation project – local people have build stone walls. Water is used to water the Atriplex shrubs. The shrubs hold the soil together and provide grazing for sheep and goats.

Jammi tree – used in the Thar desert. It provides foliage and seeds for animals to eat, fire wood, building materials, shade and the roots stabilise the sand dunes.



Magic Stones in Burkino Faso – Lines of stones have been used. Basic tools and trucks are used to transport the stones and locals build walls between 0.5-1.5m high along the contours. This stops any rainwater from washing down the slope.

