

1. What is the journey of your iPhone?

- Camera and screen: Japan
- Glass Screen: USA
- Battery: China
- Touch screen part: Israel, Greece, Belgium, France
- Wifi Chip: Germany, Brazil, Canada, Spain
- Cobalt for battery: Democratic republic of Congo
- Design: USA

Transnational Corporation: A large company that operates in several countries around the world.
Foreign Direct Investment: Investment of capital into another country.

3. Why has Globalisation occurred?

Containerisation
The use of standardised containers to move goods globally. They can be handles anywhere in the world.

Communication
Internet, mobile phones, social media, satellite communications. TNCs can run more efficiently to reduce costs.

Transportation
Combustion engines, railways, aeroplanes.
More people and goods, longer distances, more quickly.

5. What is 'Fast Fashion'?

Inexpensive clothing produced rapidly by mass-market retailers in response to the latest trends. Impacts include:



Low pay and poor working conditions.



Increase in income and economy in developing countries.



Water and air pollution



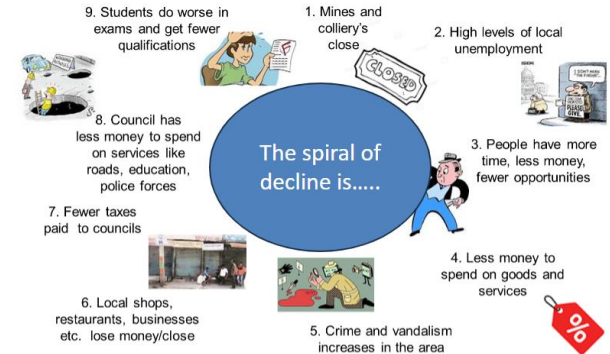
Political conflict



7. What impact has Nike had?

Nike products are made in 146 factories in China, creating over 200,000 jobs for people.	They have been accused of polluting local rivers such as the Yangtze.	Nike has invested into Chinese infrastructure, which has benefited Nikes production and China's development.	Nike continues to invest in China, e.g. it invested \$19 million into soccer.
Nike's presence in China has encouraged other TNC's to find success in China e.g. New Balance	Jobs that have been brought into China often provide a better standard of living that other local jobs.	Nike pays more than jobs in other rural areas but are still low – about \$5 per hour.	Due to improved working conditions and higher wages, Nike has relocated some production to Vietnam for lower labour costs.
Nike, claim they have improved worker conditions, pay and rights within China. This means workers should be better off than working for other companies.	Much off the profit generated in China will not remain in China and will leak back into company HQs in the USA.	Working conditions in factories often don't meet health and safety standards. Working long hours, in cramped and unsafe environments.	Nike has helped to develop a workforce with manufacturing skills. This attracts high end brands to the country.

9. What are the negative impacts of Globalisation?



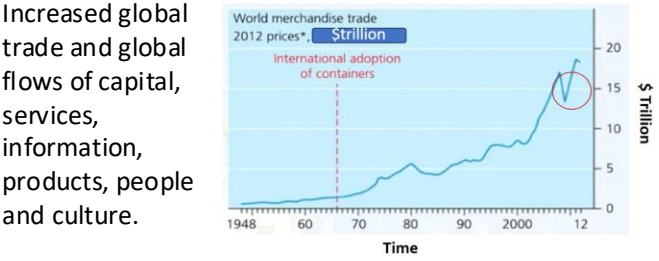
2. What is Globalisation?

Globalisation is the process by which people, culture, finance, goods and information transfer between countries with few barriers. The world is becoming increasingly interconnected.

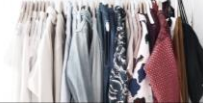
Time space compression refers to the 'shrinking' of the world whereby space between places reduces due to developments in technology.



4. How has Globalisation affected the World?
Increase in global trade.



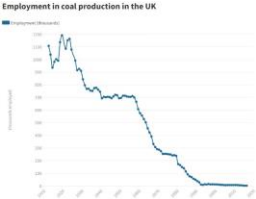
6. Should we buy from Shein?



Shein is based in China and sells globally online. It exploits workers, letting them work in poor conditions on very low pay. As the clothes are poorly made, they often don't last long and end up in landfill. They use social media as a cheap marketing tool, and have gained a lot of popularity in recent years, especially after Covid. It has lead to people becoming more environmentally aware, leading to a ride in sites like Vinted and Depop.

8. What is the influence on the North East?

Deindustrialisation is the reduction of industrial activity like mining or manufacturing. It is one of the most significant economic processes to occur in the UK. It caused the closure of mines and shipbuilding across the North East, including Sunderland. It caused political unrest as unemployment soared.

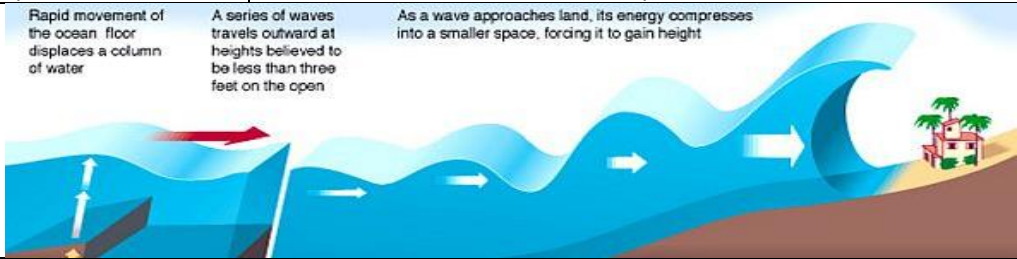
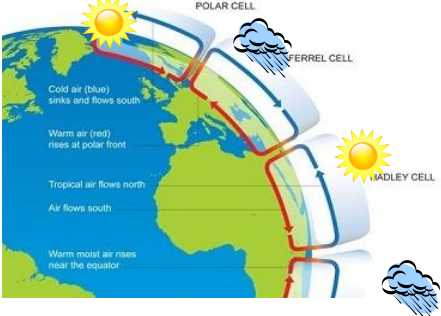
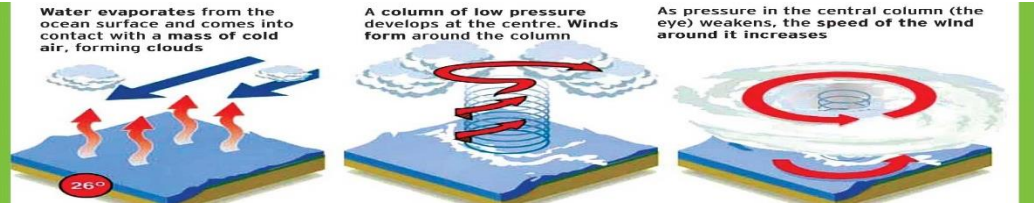


10. What are the positive impacts of globalisation?

Nissan opened in Sunderland in 1984. it opened here as it has good transport links, the port of the Tyne provided links to the rest of Erope and the world. There were a lot of skilled workers in the area, the land was cheap, and the UK was a member of the EU which made it attractive to the Japanese company.



Y9 Dynamic Planet Knowledge Organiser

What is a natural hazard?	Geophysical (earth-related): caused by processes on or under the Earth's surface e.g. volcano or tsunami Hydro-meteorological (weather/water-related): caused by processes in the atmosphere e.g. flooding or a snow storm		
What's inside our earth?	Crust: Thin layer (8-65km) of solid rock broken up into segments called plates. Can be oceanic or continental. Mantle: Very hot, semi-molten. Convection currents make the rock here move like toffee. Outer Core: Liquid iron and nickel. 2000-5000°C. Inner Core: Solid metal (iron and nickel). 5000°C		
What are plate boundaries?	Convergent Oceanic - Continental	Heavier oceanic plate subducts under the lighter continental. Frictions causes it to melt. The liquid rock mixes with sea water to create an explosive composite volcano.	
	Convergent Continental - Continental	Identical weight plates collide. Neither subduct as they are too light instead they push together to form fold mountains such as the Himalayas.	
	Divergent	Oceanic plates move apart. Magma erupts to plug the gap. Flat shield volcanoes form.	
	Conservative	Plates move side by side. They rub together to create earthquakes.	
Volcanic Eruption – Mount Niryagongo 2002	DRC had high levels of vulnerability ; fast flowing Basaltic lava drained from lava lake due to the fissures, low level of development, the city of Goma located 20 km away.		Impacts of the eruption: Economic: Farmers lost income due to acid rain destroying crops, half of the airport was destroyed by the lava flow restricting flights. Social: 14 villages destroyed due to lava flow, 245 people killed, cholera spread due to lack of sanitation in temporary housing. Environmental: Wildlife was disrupted in lake Kivu due to the lava flow.
Hazard profiling	Magnitude Speed of Onset Duration Areal Extent Spatial Predictability Frequency		The size of a tectonic hazard. How slowly or rapidly the tectonic hazard develops. The amount of time a tectonic hazard lasts. How widespread the tectonic hazard is. How likely scientists are to estimate where a tectonic event will strike. The number of times the hazard is likely to occur.
How do tsunami forms?	 Rapid movement of the ocean floor displaces a column of water A series of waves travels outward at heights believed to be less than three feet on the open As a wave approaches land, its energy compresses into a smaller space, forcing it to gain height		
Japan Tsunami 2011	Pacific plate subducted under the Eurasian. Magnitude 9 earthquake caused a tsunami. Economic cost \$300 billion. 120,000 buildings destroyed, 15,894 people killed. Fukushima nuclear power station exploded creating a leak of radiation. Damage greater on flat ground which allowed the tsunami to travel further e.g. Ofunato, or where the wave was funnelled into narrow bays and valleys and got higher e.g. Minamisanriku.		
Global circulation	 POLAR CELL Cold air (blue) sinks and flows south Warm air (red) rises at polar front Tropical air flows north Air flows south Warm moist air rises near the equator FERREL CELL HADLEY CELL Cold air sinks = high pressure. Cold air can't hold water = no rain/clouds and clear skies. Sahara desert. Warm air rises = low pressure. Warm air can hold water. Air cools, moisture condenses, clouds form = rain. Amazon rainforest.		
Tropical storms	 Water evaporates from the ocean surface and comes into contact with a mass of cold air, forming clouds A column of low pressure develops at the centre. Winds form around the column As pressure in the central column (the eye) weakens, the speed of the wind around it increases		
Hurricane Desmond	Economic impacts £500 million damage. - Overall economic costs from storm Desmond and Eva up to £2.3 billion	Social impacts 2 dead - Over 1000 People evacuated from homes. 50,000 homes without electricity.	Environmental impacts - A waterfall appeared at Malham cove never seen in living memory. - Soil eroded and dumped on floodplains.
Typhoon Haiyan Philippines	Causes: a) Warm oceans above 28°C encourages typhoon formation b) 60% people vulnerable because they live on the coast (most very poor as Philippines is a developing country) c) Mudslides more common due to deforestation d) Poor disaster planning puts people at risk e) People also at risk of injury from earthquakes		

Year 9 – Topic 4 The North East – Our Home Knowledge Organiser

Key words

- Primary** - Extraction of raw materials
- Secondary** - The production of man-made products from natural resources =
- Tertiary** - The sharing of services in a country =
- Quaternary** - The sharing of research and information =
- Spiral of Decline** - The deterioration of a area from economic decline. This usually has a drastic impact of the social and economic measurements within the location.
- MNC** - A company located in multiple nations. Its office will be based in one area and the manufacturing industry in another.
- Sense of Place** - The feeling and attachment that an individual has towards a location. This can be influenced by how long they have lived there, their age and their gender.
- Representation of Place** - How an area is shown to appear in the media or wider social media. It allows people who have never been there to develop an opinion on what that location is like.
- Social Inequality** - The extent to which there are difference between different groups in society. This could be down to race, religion, education or difference in incomes.
- Urban Decline** - The deterioration of the CBD due to wealthier individuals moving to the suburbs and commuting into the city for work.

L1 – Introduction to the North East



The North East of England is a region in the country of England, which is in the continent of Europe. The north east of England lies at approximately a latitude of 55 degrees north and longitude 1.6 degrees west . It borders the country of Scotland to the north and the English county of North Yorkshire to the south. In the east, it has a coastline with the North Sea.

Facts about the North East

- Northumberland is the least densely populated area characterised by sandy beaches, castles and countryside.
- The highest point in the region is the Cheviot Hills at 815 metres high.
- It is an area measuring 8,592Kmq2
- There are three cities in the region: Newcastle Upon Tyne, Sunderland and Durham.
- The population of the North East is 2.7million.
- The largest city in the North East is Newcastle upon Tyne with a population of 270,000.

L2 – History of the North East



Why did people settle in the NE?

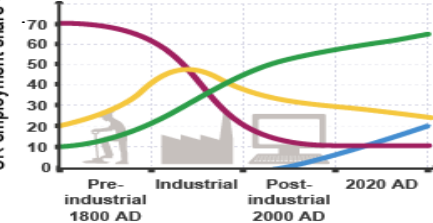
- High land e.g. The Cheviots offer defense points for settlers.
- High land in the North East provided abundant woodland that could be used for timber
- Resources were abundant due to the coastal situating, providing fish for survival.
- The River Tyne provided easily accessed water resources essential for survival for early settlers

Timeline of the North East

1080 The Normans build a fort to safeguard the crossing of the River Tyne.	1294 A shipbuilding industry has begun in Newcastle	13th C - The most important export from Newcastle is wool but coal is also exported.	1600 The population of Newcastle is about 10,000.	1751 An infirmary is built.	1773-1781 A new bridge is built over the River Tyne.
1838 Newcathle is connected to Carlisle by railway.	1844 The Catholic Cathedral of St Mary is built.	1851 The population of Newcastle is 87,000.	1853 Cholesea Mill is built.	1873 1888, 2 Park opens.	1878 The first public library in Newcastle opens.
1876 A swing bridge is built.	1879 Harrogate tram system begins running in Newcastle	1901 The population of Newcastle is 215,000.	1906 King Edward VII railway bridge is built.	1909 The first cinema opens in Newcastle.	1928 Tyne Bridge suspension bridge is built.
1963 Newcathle University is formed.	1976 Eldon Shopping Centre opens.	1983 Newcastle Military Museum is founded.	1988 Newcathle Arts Centre is built.	1992 Monument Shopping Centre is built.	2001 Millennium Bridge is opened.

L3 – Changing Industry of the NE

UK employment share



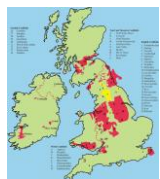
The types of industry:

Primary – Extracting raw materials
Secondary – Manufacturing products
Tertiary – Providing a service
Quaternary – Research and development

Reasons for Industry Changes

- The industrial revolution saw an increase in the number of manufacturing jobs.
- More money was found in manufacturing than agriculture.
- Mechanisation has meant fewer people are now needed to work in industries
- It is cheaper to import products such as coal from abroad.

L4 – Rise and Fall of Coal Mines



At its peak in 1913, the Great North Coalfield employed almost ¼ million men, producing over 56 million tons of coal every year from about 400 pits. The North East produced a quarter of Britain's coal in 1913, and was heavily dependent upon mining.



L5-6 - Spiral of Decline and Impacts of Decline

1. Mines and colliery's close	Icon of a mine
2. High levels of local unemployment	Icon of a person with a question mark
3. People have more time, less money, fewer opportunities	Icon of a person with a question mark
4. Less money to spend on goods and services	Icon of a person with a question mark
5. Crime and vandalism increases in the area	Icon of a person with a question mark
6. Local shops, restaurants, businesses etc. lose money/close	Icon of a person with a question mark
7. Fewer taxes paid to councils	Icon of a person with a question mark
8. Council has less money to spend on services like roads, education, police forces	Icon of a person with a question mark
9. Students do worse in exams and get fewer qualifications	Icon of a person with a question mark

Impacts of Mine Closures on the NE

Water pollution discharge of the mines
One of the lowest life expectancies in Europe
A third of the population without any qualifications
A workforce which lacks appropriate skills
100,000 lost jobs since 1976
Migration of young people
A landscape scarred by industrial waste heaps
High levels of long-term illnesses



L7-8 – Choosing the Location of Industries The 5 Cs of Industry

Cost – Included are the cost of buying and leasing land, office equipment, wages, training and IT infrastructure.
Capacity of the workforce – Availability of local labour with the right skills set for the type of industry.
Capability of the region – Good communication links such as road, rail and shipping.
Culture of the region – government initiative to support the industry, quality of life and education of the region.
Customers – Close to the market for the product.

Nissan	Metro Centre
Located in Washington, Sunderland. Just off the A19. Close to rail/ port. More than 50 dealerships in 30 miles. Land was a disused airfield. Government gave £40 million to locate here. A1 is 10 mins drive west. Decline in industries so workers were available. Land was cheaper due to mine closures.	Located Gateshead, Tyne and Wear. Just off the A1. Close to rail/city. 4.5 million potential customers in an hours drive. The DoF paid 1.75m towards the cost of roads. Good communication links. The area has few planning rules, was cheap and available.

L9 – Living in the North East

A 'sense of place' is how you feel towards a place.

- People can have positive and negative experiences which can result in different strengths of a 'sense of place'.
- People that have a **strong** 'sense of place' have pride for where they come from.
- People who have a **weak** 'sense of place' may have not lived in or experienced that place.
- Places hold meanings to people and memories are formed at these places.
- There are often distinctive physical features and landmarks that creates this sense of place.



Key concepts within Geography at Emmanuel College:



Location



Scale



**Physical
Processes**



**Human
Processes**



**Environmental
interaction**



**Decision
making**

- **Location (relative and absolute), space and place** – understanding the physical and human characteristics of real places. Developing geographical imaginations of places. Understanding the interactions between places and the networks created by flows of information, people and goods. Knowing where places and landscapes are located, why they are here, the patterns and distributions they create, how and why these are changing and the implications for people
- **Scale** - appreciating different scales – from personal and local to national, international and global, whilst making links between scales to develop understanding of geographical issues
- **Physical and human processes** – understanding how sequences of events and activities in the physical and human worlds lead to change in places, landscape and societies
- **Environmental interaction and sustainable development** – understanding that the physical and human dimensions of the environment are interrelated and together influence landscapes and societies. Exploring sustainable development and its impact on environmental interaction and climate change.
- **Planning and decision making** – understanding that physical and human dimensions are interrelated and together influence landscapes and societies. Analysing geographical problems and drawing on knowledge and understanding to consider, select and justify choices of proposed solutions or ways of tackling a Geographical issue.

Rock Types

The UK is mainly made up of 3 rock types: sedimentary, metamorphic and igneous.

Sedimentary - formed in layers, called beds, from deposited sediment at the bottom of rivers/ lakes. They are easily eroded. Examples include chalk and sandstone.

Metamorphic - formed from extreme heat and pressure. They are resistant to erosion. Example include slate and marble.

Igneous - formed from volcanic activity, when lava/ magma cools and solidifies. If the magma cools slowly, the crystals are bigger. They are very resistant to erosion. Examples include granite and basalt.

Upland and Lowland Landscapes

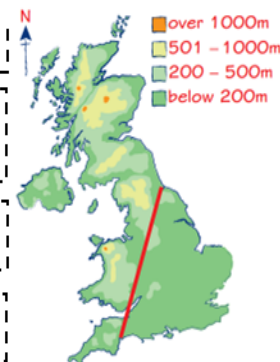
Geology and past tectonic activity have influenced the landscape of the UK.

Relief - the shape of land. There can be upland or lowland landscapes.

Upland - areas that are high above sea level. They are often, but not always mountainous. These areas are made from more resistant rocks, such as metamorphic and igneous because they take longer to erode.

Lowland - areas that closer to sea level and are flat. These areas are made from less resistant rock such as sedimentary because they are easier to erode.

Past tectonic processes - millions of years ago, the UK was close to plate boundaries. Plate movements created mountains.



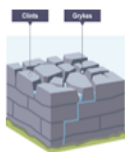
The Tees-Exe Line

- The line separates the UK into uplands in the north and lowlands in the south.
- North-western UK is mainly more resistant igneous and metamorphic rock, creating uplands.
- South-eastern UK is mainly less resistant sedimentary, forming lowlands.

Limestone Pavements

The landscape near Malham, in the Yorkshire Dales shows how carboniferous limestone rocks and physical processes interact to create distinctive landscapes.

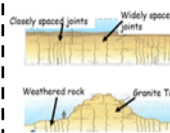
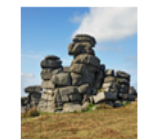
- In the ice age, the topsoil was eroded by ice, exposing limestone.
- The rock is made of blocks with horizontal lines (planes) and vertical cracks (joints).
- Limestone is weathered by chemical weathering.
- The joints in the limestone are widened by chemical weathering, forming grykes.
- This exposes blocks of limestone called clints and creates the limestone pavement.
- Limestone is a pervious rock, and so most weathering takes place between the grykes, where the acidic rainwater can flow.
- Drainage is usually underground and can only be seen where the limestone meets an area of impermeable rock. This process can be seen in the appearance of natural springs and is known as a resurgent stream.



Dartmoor Tors

Granite is resistant to erosion, but does get freeze thaw weathered. It is impermeable, so landscapes are badly drained and boggy.

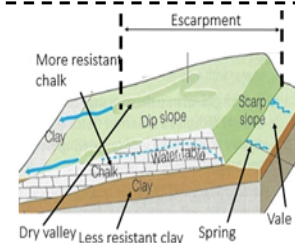
- Millions of years ago a dome of magma was intruded (pushed into) the sedimentary rocks of Southwest England. This is known as a batholith.
- The magma did not reach the surface but cooled slowly underground, cracking into vertical sections.
- The sedimentary rock is eroded causing a reduction in pressure. This causes the granite to crack horizontally creating horizontal joints. This is known as pressure release.
- Chemical and freeze thaw wearing enlarges the joints until the block of rock breaks off.
- Joints close together = more weathering = lower surface. Joints wide apart = less weathering = granite tors.
- Loose blocks of rock are called scree and create scree slopes/ clitter slopes. Scree is moved downslope by mass movement.



South Downs

Chalk and clay creates distinctive landforms in the South Downs.

- To form an escarpment, you need two rock types of different levels of resistance. Here, there is more resistant chalk and less resistant clay.
- Earth movements tilted the rock. As a result, the beds of rock now dip at an angle.
- The more resistant chalk erodes slower than the less resistant clay. As a result, the chalk forms the higher escarpment and the clay the lower vale.
- As the chalk is permeable, water soaks through it until it meets the impermeable clay, where a spring appears.



Human activity on the UK's distinctive landscapes

The South Downs National Park is an example of how a landscape can be shaped by human activity, in particular: agriculture, forestry and settlements.

Agriculture - Over 85% of the park is farmed, with 1,100 farm businesses operating.

Positive impacts of farming:

- Income generated supports the local economy; agricultural business accounts for 6% of employment in the park.
- Formation of hedgerows has led to wildlife corridors for bats.

Negative impacts of farming:

- Decline in arable farming & changes in farming practices has reduced the presence of arable plants, which has damaged habitats.
- Decline in chalk grassland from the use of chemicals in farming.

Forestry - managing woodland for timber. 23% of the park is woodland.

Positives:

- Woodland provides habitats for a diverse range of wildlife.
- Wood harvested is valuable. It is sold for construction and fuel.

Negatives:

- Remove of woodland is threatening some tree species and biodiversity.
- Hazel and chestnuts are under threat because they are no longer managed - they are overgrown and low quality.

Settlements - 120,000 people in the park

Positives:

- Increased settlement has boosted the economy (shopping in local businesses).
- Increased employment as people are needed to staff the services.

Negatives:

- Lost its local 'distinctiveness' - houses look the same and chain companies are moving in (Tesco).
- Decline in community facilities (post office) as chain stores take over.

Erosion

Wearing away of rock along the coastline.

Hydraulic Action - the force of water pushes water and air into cracks in the rock and explodes.

Abrasion - rocks are thrown at the cliff. It has a sandpaper effect.

Attrition - rocks hit off each other. They become smoother, smaller and rounder.

Solution - rocks hit off each other. They become smoother, smaller and rounder.

Weathering

Weathering breaks down rocks by the action of rainwater, temperature and biological activity.

Mechanical/ Physical - water is trapped in cracks in the cliff. It freezes and expands. When it thaws the water runs deeper into the crack. The process continues until parts of the cliff break off.

Chemical - the acid in the rain/seawater dissolve some rocks.

Biological - tree roots grow in the cracks in the cliff. The roots grow and break the cliff apart. Animals burrow in cracks in the cliff / rocks and break them apart.

Mass Movement

The downhill movement of sediment under the force of gravity.

Sliding - when rock, weathered or eroded material, or Earth moves down a slope. The material shifts in a straight line.

Slumping - where the river erodes the base of valley slopes, making it steeper. Material above slides downwards, particularly if it is saturated with rainwater. In slumps, the material shifts with a rotation.

Transportation

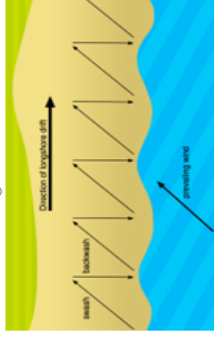
Beach material can be moved in 4 different ways: Sediment is carried by waves along the coastline. This is known as longshore drift.

Traction - larger material are rolled along the seabed.

Saltation - small pieces of shingle or large sand grains are bounced along the seabed.

Suspension - small particles such as silts are suspended in the flow of water.

Solution - when minerals in rocks are dissolved in sea water and carried in solution. The load is not visible.



1. Prevailing wind determines the direction of the swash.
2. Swash transports sediment up the beach.
3. Backwash transports sediments down the beach in a straight line, at a 90° angle.
4. The sediment is transported along the beach in a zigzag pattern.

How physical processes affect the coast

Constructive waves:

- Long wave length and short wave height (smaller wave frequency of 8-9 waves per minute)
- Stronger swash than backwash = deposits sediment on the beach.

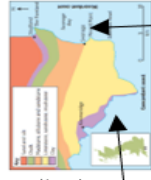


Destructive waves:

- Short wave length and high wave height (higher wave frequency of 11-15 waves per minute)
- Stronger backwash than swash = erodes sediment from the beach.



Rock type (concordant/ discordant coastline)



Concordant coastline

Bands of rock of different levels of resistance are parallel to the coast.

This means that only one type of rock can be eroded at once.

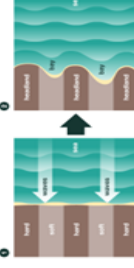
Discordant coastline

Bands of rock of varying levels of resistance are at a right angle to the coast. This means they can all be eroded at the same time, so the coastline will change shape.

Coastal Landforms - erosion

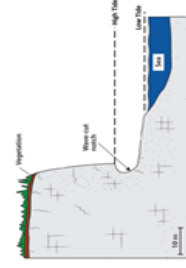
Headland and Bays

1. The coastline has bands of resistant and less resistant rock at a right angle to the coast. This is known as a discordant coastline.
2. Hydraulic action and abrasion erode the less resistant rock quicker than the more resistant rock.
3. The less resistant rock erodes inland, forming a bay, and the more resistant rock is left sticking out into the sea, leaving a headland.
4. As the waves hit the headland, they lose energy. Any eroded material is then deposited in the bay, forming a beach.



Wave-cut platforms

1. At high tide, the cliff is eroded by hydraulic action and abrasion, creating a wave cut notch.
2. As the wave cut notch becomes bigger, the cliff above is undercut and becomes unsupported. Eventually the unsupported rock above collapses.
3. A new wave cut notch is created and the process repeats.
4. Eventually, a wave cut platform is left below the high tide mark, and is only visible at low tide.



Caves, Arches, Stacks & Stumps

1. Hydraulic action and abrasion erode the headland, creating a crack.
2. The crack is eroded by hydraulic action and abrasion creating a cave.
3. The back wall of the cave is eroded by hydraulic action and abrasion and eventually it breaks through the headland, creating an arch.
4. The base of the arch is widened by hydraulic action and abrasion and the top is weakened by biological weathering. The arch top of the arch becomes unsupported and collapses, leaving a stack.
5. The base of the stack is eroded, undercutting the top, which falls of, leaving a stump.



Coastal erosion and recession

Rising sea levels:

Sea levels along the English Channel have risen about 12cm in the past 100 years. Expected to rise by another 11-16cm by 2030. Warmer climate causes seawater to expand (thermal expansion), ice sheets & glaciers to melt = increased sea level. This will affect erosion. For example, the position of the wave cut notch will now be higher up the cliff.

Storm surges:

A storm surge is a large-scale increase in sea level, up to 3 metres around the UK, as gale force winds drive water towards the coastline. They can last from hours to days and span hundreds of kilometres.

Human causes

1. **Urbanisation** - Building can put pressure on coastal land, making them more susceptible to coastal erosion.
2. **Agriculture** - Agriculture can cause soil erosion, making bedrock and land weaker and more susceptible to erosion.
3. **Industry** - Building facilities for industries at the coast can remove natural defences.

Impacts of coastal erosion and recession

1. **Social** - 20 million people in the UK live on the coast. At Holderness, 29 villages have been lost in the last 1000 years.
2. **Economic** - getting to work becomes more difficult - e.g. trainlines area damaged. People are forced to move home.
3. **Environmental** - wetlands are drained causing wading birds and animals to lose their habitats.

Beaches		Spits		Bars	
Beaches are areas of sand, pebbles and shingle between the high and low water mark.		A spit is an extended stretch of sand or shingle jutting out into the sea from the land.		A bar is created when a spit connects two headlands together.	
Sandy Beaches - Found in sheltered bays. - They are wide and slope down gently to the sea. - They are formed from constructive waves.		 - Sediment is carried along the beach by LSD in the direction of the prevailing wind. - When there is a change in the shape of the coastline, deposition occurs in the same direction of the prevailing wind in the shallow water. - A hooked end of the spit forms if there is a secondary wind direction. - Behind the spit is sheltered so a salt marsh forms.		 - LSD transports sediment along the beach, creating a spit. - A bar is formed when the spit joins two headlands together. - The bar cuts off the bay between the headlands and the sea. - A lagoon forms behind the bar.	
Pebble Beaches - Found in areas where cliffs are being eroded where there are high energy waves. - They have steep gradients. - They are formed from destructive waves.					

Case Study – Dawlish Warren Spit

Location & info about spit

– Dawlish Warren is a seaside resort on the south coast of Devon. The spit extends for 2km north eastwards, protecting the Exe Estuary from the open sea.

Why the spit is important

Social:

- Home to residential properties.
- Popular for water sports.

Economic:

- Fishing (mussels harvested in calm water behind spit).
- Tourist destination (480,000 per year, boosting the local economy).

Environmental:

- Unique landscape for coastal species.

Causes of change

Human:

- Properties built on the spit have placed pressure and caused erosion.

Physical:

- Storm surges have eroded the spit.

Dawlish Warren Beach Management Scheme

A £14 million scheme to protect 2,900 properties.

Groynes

– stop LSD. They have been repaired and replaced.

Riprap

– Absorbs wave energy. Been maintained. Placed at the western end near tourist facilities.

Sand dune stabilisation

– prevents erosion of sand dunes.

Sea wall

– prevents flooding and erosion of land behind.

Gabions

– removed to allow sand dunes to follow a more natural alignment.

Management Strategies

Hard engineering

– building artificial structures which try to control natural processes.

Scheme	Description	Advantages	Disadvantages
Sea wall	Concrete walls that deflect the wave's energy back to sea, so the waves do not erode the coastline.	Protects the base of the cliffs from erosion. Protects against coastal flooding. Hard wearing – approx. 75 years.	Can be seen as ugly and spoiling the natural beauty of the coastline. Expensive to build – between £5,000-£10,000 per metre.
Rip rap/ rock armour	Large resistant boulders of rock placed at the bottom of a cliff to absorb the wave's energy.	Reasonably cheap compared to other hard engineering methods - £3,000 per metres. More natural looking than sea walls. Wildlife create habitats between the boulders.	Can be dangerous for people accessing the beach. Sometimes does not match the natural environment. Destructive waves can move the boulders, so they need to be replaced.
Groynes	Wooden barriers constructed at right angles to the beach to trap material in certain sections of the coastline.	Builds up beaches with lots of sediment, so reduced erosion. Tourism increases because people like to visit sandy beaches, so create economic gains.	Beaches further down the coastline are starved from sediment, so face even more erosion. Can spoil the natural look of a beach.

Soft engineering

– does not involving building but takes a more sustainable and natural approach

Scheme	Description	Advantages	Disadvantages
Beach nourishment	Sand is pumped onto a beach, making it higher and wider. The material is brought onshore by barge and reprofilled by large trucks and diggers.	Relatively cheap at £5,000 per mile. Can fit in with the natural environment is the sand is locally sourced. Wider and sandier beach is more attractive to tourists = economic gain.	Requires constant maintenance & replacement because the sand will eventually be eroded by the waves.
Managed retreat	Areas of coastline that are low value and allowed to naturally erode and flood, in order to protect land that is of higher value.	Salt marshes develop which can attract tourists and increase economic gains of the area. Salt marshes are habitats for many species – biodiversity increases. Can be relatively cheap – cost depends on the amount of compensation needed to be paid to people affected.	Most of the land that is eroded and flooded is farmland – so farmers have to relocate and potentially lose income.