Knowledge Organiser - Geography – Year 9 - Unit 1 - Will the Earth's Nature Resources Runout?

By 2050 it is estimated the population of the world will increase to 9 billion and 11 billion by 2100!! All these extra people will need food, water and energy security...

What are Natural Resources?

A material or substance that occurs naturally in the environment and is used by humans for economic or other purposes. For example: Water, Air, Soil, Minerals, Food, Forests, Fossil fuels (like coal, oil, and natural gas), Sunlight and wind (for renewable energy).

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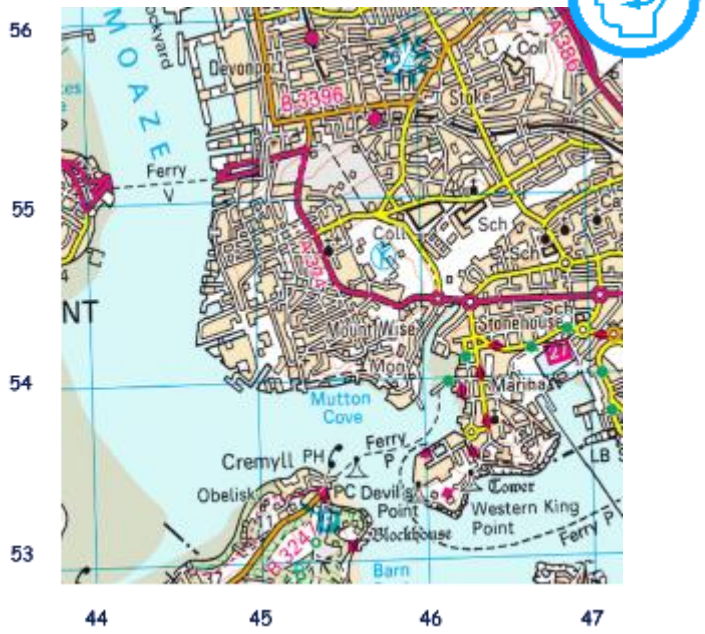
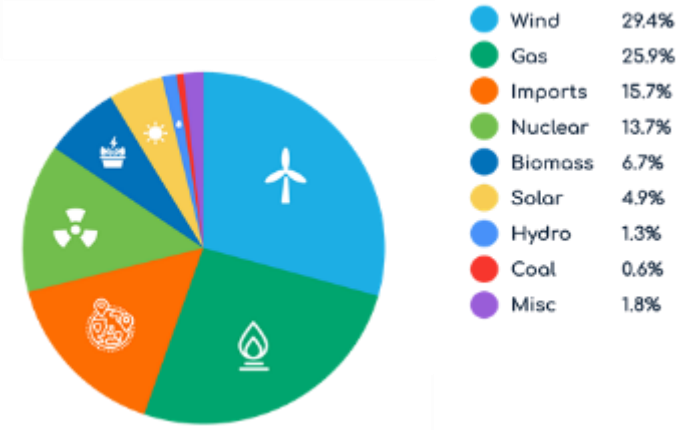


UK Energy Mix

Energy mix refers to the combination of different energy sources a region or country uses to meet its energy needs.



Resources Keywords	
Natural Resources	Natural resources are materials from the earth that are used to support life and meet peoples need. E.g. Oil, Metals, Stone
Surplus	Having more of a resource than is needed or when supply is greater than demand.
Deficit	Not having enough of a resource. Demand is greater than Supply.
[Energy/ Food] Security	Describes how reliable an access is to a source of a resource E.g. Energy
Fossil Fuels	Resources made from decomposing plants and animals. Often burned for energy.
Renewable	Cannot be depleted/run out, may have the ability to regenerate (e.g. wind, hydroelectric, solar)
Non-renewable	Can be depleted or run out (e.g. coal, oil and natural gas)
Development	The progress of a country in improving itself
Food Miles	The distance the food has travelled to be on your plate.
Carbon footprint	Measure of the impact of an activity on the environment

Water

Food

Energy

Sustainability and the Future

What does Sustainable mean? – Sustainable means being able to meet the needs of the present, without compromising the ability of future generations to meet their own needs.

How can we be sustainable for the future with our natural resources?

Energy Sustainability

1. **Renewable Energy:** Shift to solar, wind, hydro, and geothermal sources.
2. **Energy Efficiency:** Use LED lighting, energy-efficient appliances, and proper insulation.
3. **Public and Clean Transport:** Use electric vehicles, bikes, and public transit to reduce fossil fuel use.
4. **Behavioural Changes:** Turn off lights, unplug devices, and reduce unnecessary energy use.

Water Sustainability

1. **Conservation:** Fix leaks, use water-efficient appliances, and reduce unnecessary use.
2. **Rainwater Harvesting:** Collect and store rainwater for irrigation or non-drinking uses.
3. **Wastewater Recycling:** Treat and reuse greywater for non-potable purposes.
4. **Protect Water Sources:** Prevent pollution in rivers, lakes, and groundwater through better waste management.

Food Sustainability

1. **Reduce Food Waste:** Plan meals, store food properly, and compost organic waste.
2. **Sustainable Agriculture:** Use organic farming, crop rotation, and reduced pesticide use.
3. **Local and Seasonal Eating:** Consume locally grown and in-season food to lower transportation emissions.
4. **Plant-Based Diets:** Reduce meat and dairy consumption to decrease environmental impact.

HILLSIDE HIGH SCHOOL

Knowledge Organiser - Geography – Year 9 - Unit 2 - Will living in the Middle East ever be Sustainable?

Where is the Middle East?

The Middle East is a region primarily located in Western Asia, with parts extending into North Africa. It serves as a cultural, historical, and geopolitical crossroads, connecting Europe, Asia, and Africa.
Known as the birthplace of major world religions such as Islam, Christianity, and Judaism, the region has played a central role in world history for thousands of years.
Today, it is especially significant for its vast oil and natural gas reserves, as well as its complex political dynamics and conflicts.
The Middle East includes countries like Saudi Arabia, Iran, Iraq, Israel, Egypt, and the United Arab Emirates, among others, and is characterized by a diverse mix of languages, cultures, and religious traditions.

When describing the location of a place you need to include:

1. Continent
2. Region
3. Country
4. Nearby human/physical features
5. Compass directions

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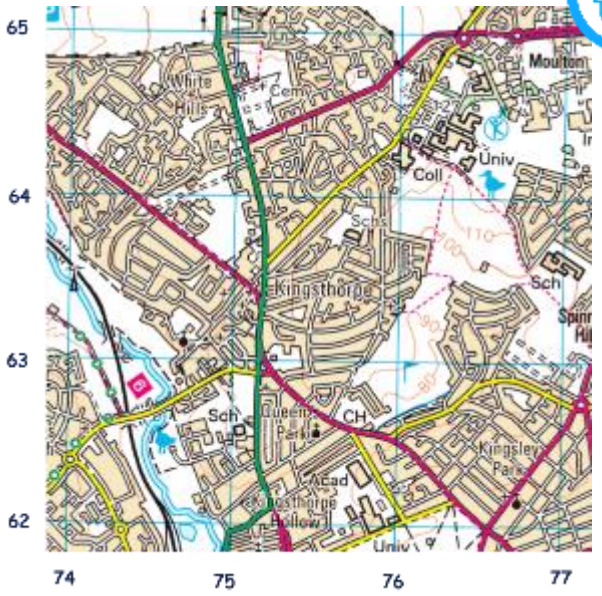

Map of the Middle East:

Keywords & Definitions

OPEC	is group of 13 oil-exporting countries, founded in 1960. The 13 countries account for 40% of oil production.
Barrel of Oil	Is 160L
UK Oil Reserves	Measure of the impact of an activity on the environment
Social	The study of people and their environment
Economic	Studies how humans make and create money
Environmental	Interactions between humans and the natural world
Sustainability	Sustainability is the practice of using natural resources responsibly, so they can support both present and future generations
Israel	A country that was created in 1948 as a 'Jewish homeland' 73% of the population are Jewish and the official language is Hebrew
Palestine	Is made up of two territories – the West Bank and the Gaza strip, most of the population are Muslims and the official language is Arabic
Arab spring	The Arab Spring was a series of pro-democracy uprisings that enveloped several largely Muslim countries, including Tunisia, Morocco, Syria, Libya, Egypt and Bahrain
Resources	A resource is any physical material constituting part of Earth that people need and value
Conflict	a serious disagreement or argument, typically a protracted one
Terrorism	the unlawful use of violence and intimidation, especially against civilians, in the pursuit of political aims.
Displaced person/refugee	A person who is forced to leave their home country because of war or persecution; a refugee

Challenges of Living in the Middle East:

1. **Political Instability –** Conflicts, authoritarian regimes, and limited political freedoms.
2. **Human Rights Issues –** Restrictions on speech, gender inequality, and lack of LGBTQ+ rights.
3. **Economic Problems –** High unemployment, reliance on oil, and income disparity.
4. **Environmental Stress –** Water scarcity, extreme heat, and climate change impact.
5. **Social Pressures –** Conservative norms, tribalism, and sectarian tensions.
6. **Weak Infrastructure –** Inconsistent healthcare, education, and public services.
7. **Geopolitical Tensions –** Sanctions and regional rivalries cause further instability.

Sustainable Living in the Middle East: The Sustainable City Dubai

1. **Net Zero Energy:** Powered by solar energy; energy-efficient homes.
2. **Water & Waste Management:** Recycled greywater for irrigation; zero waste to landfill.
3. **Green Transportation:** Car-free zones, electric buggies, and EV charging stations.
4. **Urban Farming:** Greenhouses, community gardens, and biodomes for local food.
5. **Eco-Friendly Design:** Energy-efficient buildings, shaded walkways, and green spaces.
6. **Social Sustainability:** Community-centred design, schools, healthcare, and public spaces.
7. **Education & Innovation:** SEE Institute promotes sustainability learning and research.
8. **Economic Sustainability:** Low utility costs, green job creation, and long-term value.

HILLSIDE HIGH SCHOOL

Knowledge Organiser - Geography – Year 9 - Unit 3 - Will it ever be safe to live in Extreme Environments?

What is an Extreme Environment?

Environments with harsh climates that make life challenging. Includes Hot Deserts, Tropical Rainforests, and Polar Regions

Plant and Animal Adaptations

Desert: Cactus stores water and have spikes instead of leaves to conserve water; camels have fatty humps and thick eyelashes.
Rainforest: Trees have **buttress roots**, drip tips; animals live in layers.
Polar: Polar bears have thick fur/blubber; penguins huddle to stay warm.

Opportunities & Challenges in Extreme Environments

Human Activity & Opportunities
Desert: Nomadic herders, renewable energy (e.g. solar), mining, tourism (e.g. camel rides).
Rainforest: Indigenous tribes, logging, farming.
Polar: Scientific research stations, some tourism, fishing.

Environmental Issues & Challenges
Desertification: Land turns to desert (e.g. Sahel in Africa).
Deforestation: Trees cut down in rainforests for timber or farming.
Climate Change: Melts polar ice, threatens wildlife and ecosystems.

Biome	Climate	Flora	Fauna
Tropical Rainforest	Hot all year (~27°C) / Very high – between 2000-3000mm / 80% Humidity, daily rainfall	Trees have tall top canopy to reach sunlight	Vast amounts of animals. Frogs, insects and large mammals
Desert	Very hot (40°C+ day), cold at night / Very low – less than 250mm / Dry, dusty, high evaporation	Plants have long roots to reach water sources. Plants grow together in bunches such as cacti.	Camels, desert foxes are often nocturnal
Polar	Extremely cold (down to -50°C) / Very low – less than 250mm / Long winters, icy	Only 5% of land has plant cover. Short grasses and moss	Thick fur animals such as penguins and polar bears

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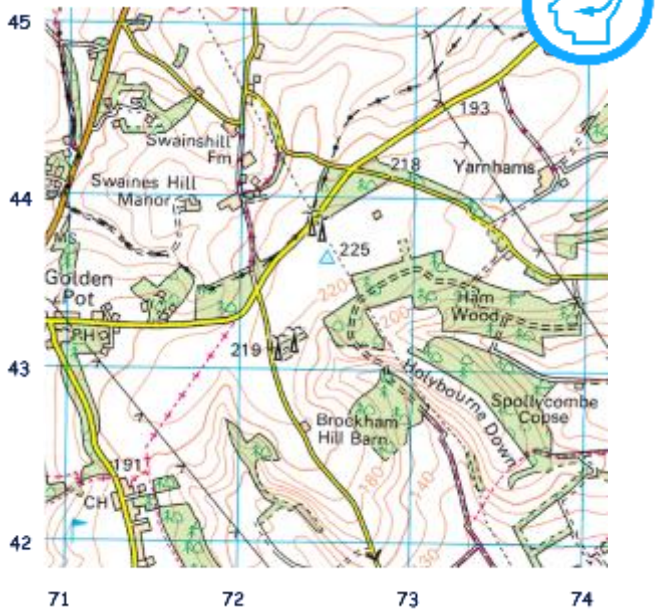
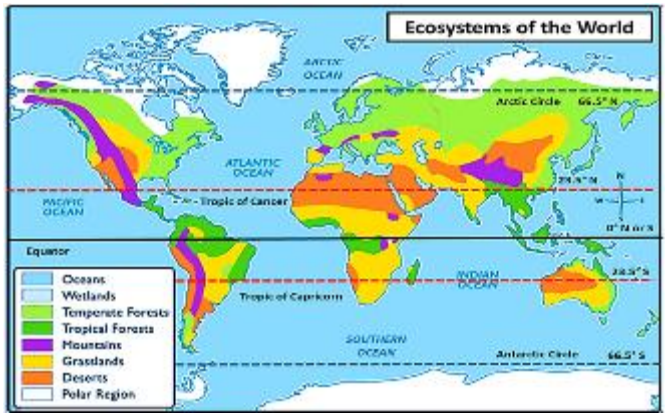


Global Distribution of Extreme Environments

Hot Deserts: Found around the **Tropic of Cancer and Capricorn** (e.g. **Sahara Desert** in Africa).
Tropical Rainforests: Found near the **Equator** (e.g. **Amazon Rainforest**, Brazil).
Polar Regions: Near the **Arctic and Antarctic Circles** (e.g. **Antarctica**, **Greenland**).



Sustainable Strategies & Management of Extreme Environments

🔥 **Hot Deserts – Example: Thar Desert (India & Pakistan)**
- **Water conservation**: Using **drip irrigation** to reduce water waste on farms.
- **Afforestation**: Planting trees to prevent soil erosion and reduce desertification.
- **Solar power**: Using solar energy instead of fossil fuels to reduce carbon emissions.

🌳 **Tropical Rainforests – Example: Amazon Rainforest (South America)**
- **Selective logging**: Only cutting down certain trees instead of clear-cutting whole areas.
- **Ecotourism**: Promoting low-impact tourism that benefits local communities and encourages conservation.
- **Conservation**: National parks and reserves where logging and farming are banned or controlled.

❄️ **Polar Regions – Example: Svalbard (Norway, Arctic Circle)**
- **Strict environmental laws**: Norway enforces rules on pollution, wildlife protection, and waste management.
- **Svalbard Global Seed Vault**: Stores millions of seeds to preserve biodiversity and protect food security.
- **Research and monitoring**: Scientists study climate change impacts, helping shape global environmental policy.

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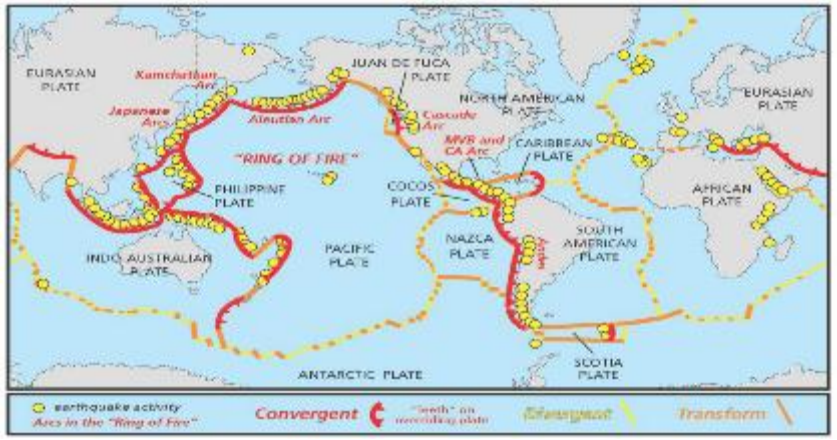
Knowledge Organiser - Geography – Year 9 - Unit 4 - Will it ever be safe to live Near Volcanoes?

Global Distribution of Volcanoes

- Most volcanoes are found along tectonic plate boundaries. Especially destructive and constructive boundaries.
- Around 75% of the world's active volcanoes surround the Pacific Ocean. This is known as the Pacific ring of Fire..
- However, some Volcanoes are found in the middle of plates, not at boundaries. These are known as hotspot volcanoes. Example: Hawaiian Islands.

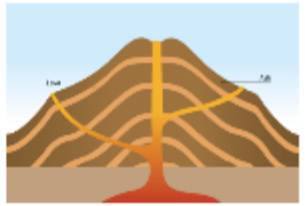
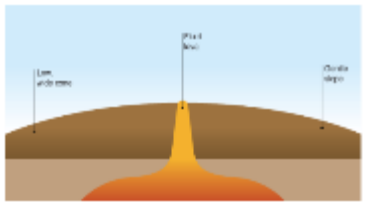


Retrieval:

Key words and definitions

Active	An active volcano that has erupted recently or is expected to erupt quite soon
Climate	The general weather conditions that are typical of a place
Core	The central part of the earth, beneath the mantle
Crust	The Earth's crust is its outer layer
Dormant	not active but is capable of becoming active later on
Earthquake	A shaking of the ground caused by movement of the Earth's crust
Erupt	when a volcano erupts, it throws out a lot of hot melted rock called lava, as well as ash and steam
Lava	the very hot liquid rock that comes out of a volcano
Magma	Molten rock that is formed in very hot conditions inside the earth
Mantle	the part of the earth between the crust and the core
Molten	A material such as rock, metal or glass which has been heated to a very high temperature and has become a hot, thick liquid
Pressure	force that you produce when you press hard on something
Vent	the part of a volcano through which lava and gases erupt
Volcano	an opening in the Earth's crust where red-hot rocks and gas break to the surface from underground

Types of Volcanoes

	Composite	Shield
Diagram		
Shape	Steep sides.	Gentle sides.
Plate boundary	Form at **destructive** plate boundaries.	Form at **constructive** plate boundaries.
Lava	Thick lava.	Thin, runny lava.
Eruptions	Eruptions happen **less often** but are usually **violent**. The eruption consists of **ash, pyroclastic flow and lava**.	Eruptions happen **often** but they are usually quite **gentle**. The eruption is mainly **lava**, with little **pyroclastic flow.**
Example	Mount Vesuvius in Naples, Italy. Mount St. Helens, USA	Mauna Loa in Hawaii. La Cumbre, The Galapagos Islands

LIC/NEE Case Study: Mount Nyiragongo, DR of the Congo (2021)

Eruption Type: Effusive
Tectonic Setting: Divergent boundary (East African Rift)
Key Features:
- Lava flows destroyed homes and infrastructure in Goma
- 32 died & 400,000 displaced
- Limited resources & warning systems
- Slower and less coordinated emergency response

HIC Case Study: Eyjafjallajökull, Iceland (2010)

Eruption Type: Explosive (VEI 4)
Tectonic Setting: Constructive boundary (North American & Eurasian Plates)
Key Features:
- Disrupted air travel across Europe (over 100,000 flights cancelled)
- Major economic impacts on global air travel & trade
- No deaths, due to effective monitoring & emergency planning
- Use of technology for prediction & response

Comparison of these two eruptions

- **Economic impact vs human impact** (HIC had high financial losses, LIC had higher loss of life)
- **Preparedness and response** (HIC had strong infrastructure and monitoring; LIC had limited capacity)
- **Type of eruption and effects** (both had lava, ash, and disruption but with very different outcomes)
- **Access to resources** (HIC could recover quickly, LIC faced long-term challenges)

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Knowledge Organiser - Geography – Year 9 - Unit 5 - Will the UK Coastline stay the Same?

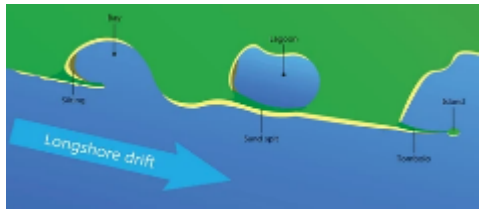
Retrieval:

Depositional Landforms

Beaches – The zone of deposited material that extends from the low water line to the limit of storm waves. The beach can be divided into the foreshore and the backshore.

Spits – A narrow stretch of sand deposited by the sea, joined to the land at one end, usually forming where the coastline abruptly changes direction.

Bars – A strip of deposited material parallel to the coast. Formed when a spit grows across a bay, eventually enclosing the bay to create a lagoon. Offshore bars can develop as a result of breaking waves.

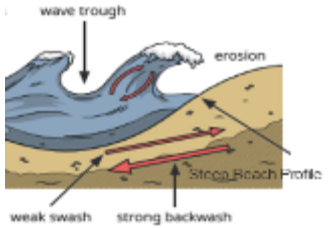


Coastal Processes

Erosion

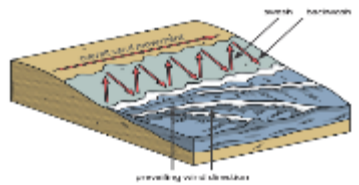
- **Hydraulic Action**
- **Attrition**
- **Abrasion**
- **Solution**

Destructive Waves – High- energy waves which remove material from beaches by dragging it into the sea. The backwash is stronger than the swash.



Transportation

Longshore Drift – The process by which material is transported along a beach through a combination of swash and backwash.

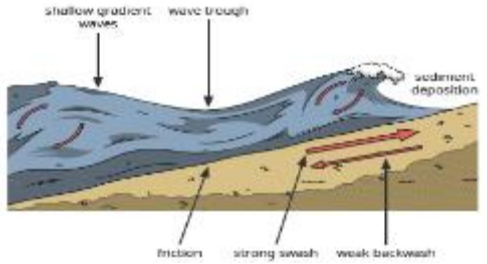


Deposition

Constructive Waves – Waves which add material to beaches by carrying sediment onto the beach when the swash is stronger than backwash.

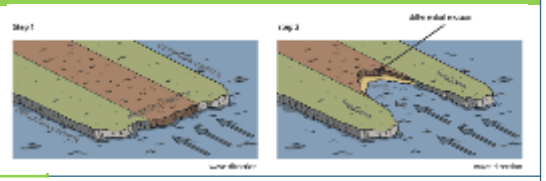
Key characteristics:

- low and long waves;
- low frequency waves (6-8 waves a minute);
- the wash is more powerful than the backwash, depositing material on the coast.

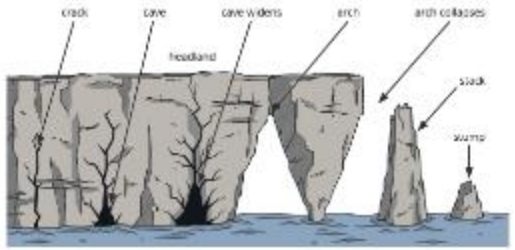


Erosional Landforms

Headlands and Bays – Discordant coastlines formed of different types of rock, erode at different speeds. The least resistant rock is eroded fastest, forming a bay. The more resistant rock is eroded slowly, forming headlands on either side of the bay.



1. **Crack** - Waves hit the cliff and water gets into small cracks in the rock. The crack gets bigger over time due to hydraulic action and abrasion.
2. **Cave** - The crack becomes wider and deeper due to further erosion. This forms a cave.
3. **Arch** - The cave is eroded all the way through the headland, making an arch.
4. **Stack** - The top of the arch collapses due to freeze-thaw weathering. This leaves a tall column of rock called a stack.
5. **Stump** - Waves keep hitting the stack and it collapses leaving a stump.



Coastal Management Strategies

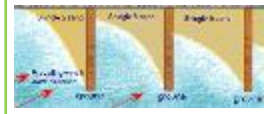
The Costs and Benefits of Management Strategies

Hard Engineering

Sea Walls – A wall-like structure built at the edge of the land along the coastline to protect the land from the erosive force of the sea.
Pros: Coastal erosion and flooding is prevented.
Cons: They are expensive to build and maintain. Can cause greater erosion downdrift due to waves reflecting off seawall.

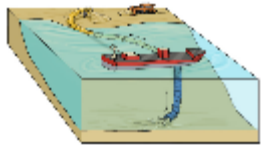
Rock Armour – Huge boulders of resistant rock, such as granite, placed in front of landforms to absorb and reflect wave energy.
Pros: Material is deposited.
Cons: They are expensive to build. Boulders need to be transported long distances (e.g. from Norway).

Groynes – Large wooden barriers built out into the sea to catch sand and material being moved along the beach by the sea via longshore drift.
Pros: Material transported by longshore drift is trapped.
Cons: They can be costly and cause greater erosion downdrift.



Soft Engineering

Beach Nourishment – Sand and shingle are dredged from offshore and added to the beach to make it larger and more effective at absorbing wave energy.
Pros: This creates wider beaches which reduces erosion and flooding.
Cons: Constant maintenance is needed, especially after extreme weather/high tides.



Dune Regeneration – The process which aims to strengthen sand dunes and protect them from excessive coastal retreat. Marram grass is planted to stabilise the sand.
Pros: They provide a barrier between land and sea.
Cons: This is often limited to small areas as nourishment is expensive.

Managed Retreat – The controlled and intentional removal of defences to allow areas of land to flood and erode naturally. This process often creates wetland areas or saltmarshes.
Pros: This is a cheap an easy option.
Cons: Land and buildings will be lost – compensation cost could be high.

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