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KPI 8.1.1

Coasts – subject summary

The basics of waves:

1. Waves are formed as a result of **wind** blowing over the ocean. The longer the **fetch** (the distance the wind blows over the water), the bigger the wave will be.
2. They can also be formed as a result of **earthquakes** or **volcanic eruptions**. These waves are usually very large and are called **tsunamis**.
3. As waves approach land, the rising seabed disrupts their shape and they break on the land. Waves at the coast are either **destructive** or **constructive**.

Type 1 - Constructive waves:

1. These waves are **gentle,** and they are **far apart**.
2. They have a **strong swash** and a **gentle backwash**.
3. As a result, these waves transport and deposit a large amount of material onto the beach, 'constructing' a new beach.

Type 2 - Destructive waves:

1. These waves are steep, and they are close together.
2. They have a weak swash and a strong backwash.
3. As a result, these waves erode and remove sand and pebbles from the beach, 'destroying' it.

Coastal erosion and weathering:

1. Coasts are constantly changing due to erosion, transportation and deposition.
2. How coasts change depends on the geology of the area. **Harder rock**, like limestone and sandstone, **erodes slowly**. **Softer rock**, like clay, **erodes more quickly.**

Name	Description
Abrasion	Eroded material is hurled or scrapes against the cliff, breaking off rock.
Hydraulic pressure	Waves compress pockets of air in cracks in a cliff, causing the crack to widen, breaking off rock.
Solution	Cliffs e.g. chalk dissolve in seawater
Attrition	Eroded material in the sea, hit into each other breaking down into smaller pieces.
Freeze-thaw weathering	Water collects in faults during the day. At night, this water freezes and expands. This makes faults bigger over time because the process repeats itself.

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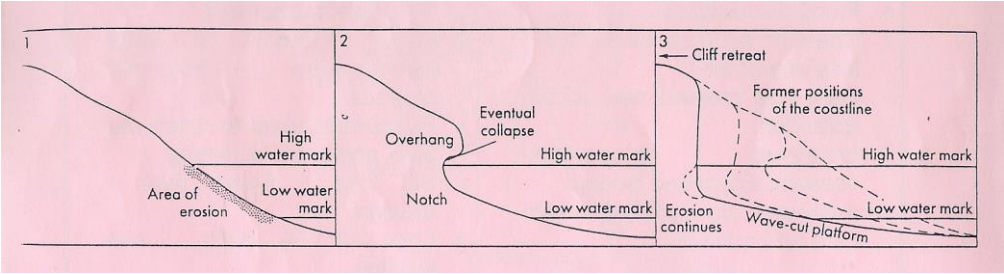
Landforms of erosion – Wave cut platforms.



A **sloping wave-cut platform** is created when the sea continually **erodes** the bottom of a cliff.

1. Erosion happens between the **high-water mark** (high tide) and the **low water mark** (low tide).
2. The base of the cliff is eroded, **undercutting** the cliff and forming a **wave cut notch.**
3. The cliff is **unsupported**, so it **collapses.**
4. The process **repeats** and the cliff **retreats.**

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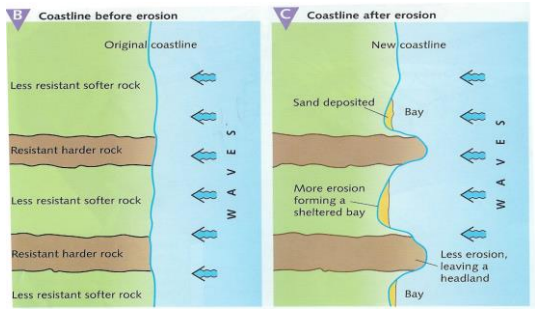
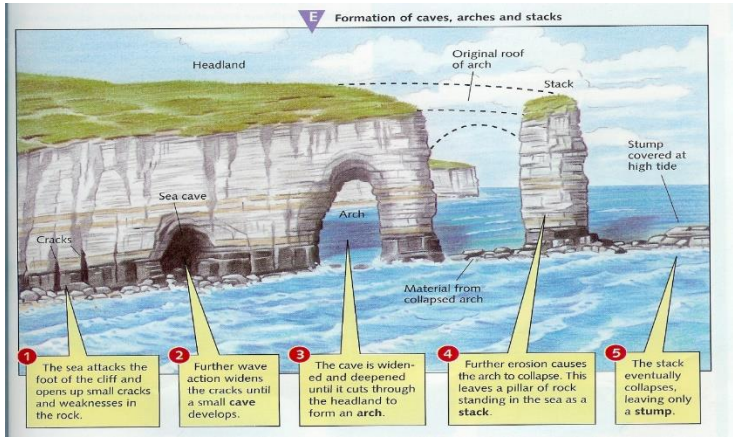
Landforms of erosion – Headlands and bays.



1. Destructive waves **erode** the coastline by **hydraulic action** and **abrasion.**
2. **Soft** rock erodes **quicker** and **retreats** inland, forming bays.
3. The hard rock is more resistant so **remains** and forms headlands.
4. Due to **attrition,** the eroded rock is broken down to form **sand** and is then **deposited** in the

Landforms of erosion – Caves, arches and stacks.



Coasts – subject summary

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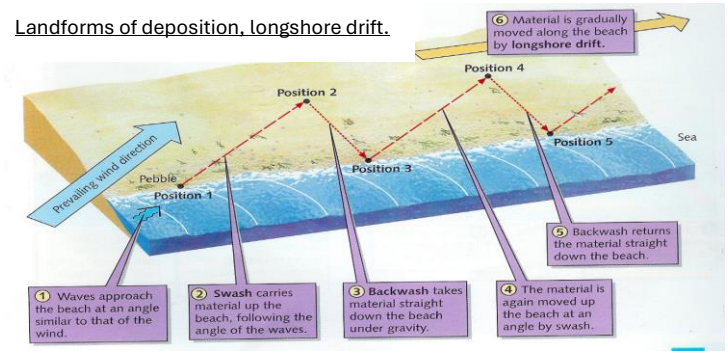
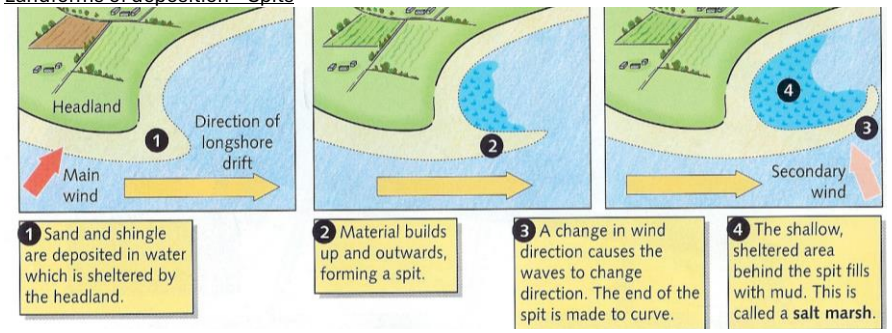
Landforms of deposition, longshore drift.



Landforms of deposition – Spits



Landforms of deposition – Bars and Tombolos

If there is **no river** running into the sea where the spit has formed, it could become a **bar** connecting two headlands. Behind the bar is a **lagoon** which in time may become a **salt marsh.**

If the material reaches an offshore island it is a **tombolo**.

Changes in sea level:

1. Sea levels change every day due to tides.
2. However, on a longer time scale, sea levels are rising due to **climate change**. The increase in the Earth's average temperature is causing the polar ice caps to melt, causing sea levels to rise.
3. This rise in sea level can increase **erosion** and can cause areas to permanently flood.
4. This affects **coastal areas** but can also affect low lying countries, such as **the Maldives** and cities such as **New York, Shanghai and London**, which will be forced to spend billions on flood defences.

Groynes 	1. Wooden or stone fences that are built at right angles to the beach. 2. They trap longshore drift, creating a bigger beach. 3. The wider beaches slow the waves. 4. They starve beaches further down the coast of sediment, causing narrower beaches and therefore increased erosion.
Sea Wall 	1. A wall made out of concrete. 2. Reflects waves back out to sea. 3. Prevent erosion and have a long life span. 4. They are ugly to look at, and are very costly.
Revetments 	1. A wall of wire cages filled with rocks. 2. They absorb wave energy and stabilise the cliffs. 3. They are cheap. 4. They are ugly, and the wire cages corrode easily meaning they have a short life span.

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Soft Engineering:

1. **Beach replenishment** means adding more sand to the beach, making the beach wider.
2. **Managed retreat** allows the coast to erode naturally, people and businesses are moved. The council may give compensation to those that

KPI 8.1.4

Case study of coastal management – The Holderness Coast

Background

- The Holderness coast is in North East England.
- It suffers one of the highest rates of erosion in Europe.
- It loses around **1-2 metres of coastline per year.**
- **29 villages lost** from this coastline since Roman times.
- Mappleton was in danger of falling into the sea.
- Mappleton has many homes and businesses in the village, as well as the B1242 road running through it.

Cause

- **Soft rock**, made of **till** which contains small pebbles and clay.
- Very strong waves.

Response

- £2 million spent on **rock groynes** at Mappleton and **rip-rap**.
- They spent this money as they did not want to **re-route the Hornsea to Withensea road** (B1242), which would have been expensive to do.

Effects

POSITIVE:

- Has stopped erosion at Mappleton, as it now has a beach protecting the foot of the cliff.
- The B1242 road did not have to be moved and can still be used for trade.

NEGATIVE:

- Beaches further **south have been starved of sediment**, as the groynes have stopped longshore drift taking beach material further down the coast.
- Farmers at Great Cowden saw erosion increase from **1 metre a year to 20 metres a year** in certain places.
- Hill Top Farm needed to be demolished, and the owners had to live in a caravan. They blame the sea defences at Mappleton for causing the

Coasts

8.1.1 Explain the processes that lead to the formation of erosional landforms and the resulting features.

8.1.2 Explain the processes that lead to the formation of depositional landforms and the resulting features.

8.1.3 To be able to explain the causes and impacts of coastal erosion.

8.1.4 To assess the effectiveness

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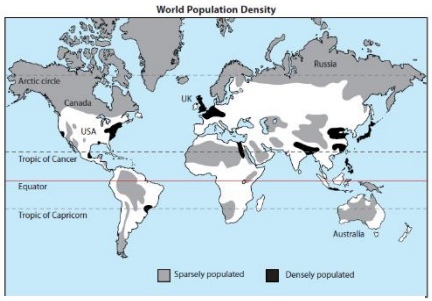
Population **subject summary**

KPI 8.2.1

Population distribution:



Sparsely Populated – Places which contain few people per km sq.
Densely populated – Places which contain many people per km sq.
Population density – The number of people per km sq.

The world population distribution map shows that the world's population is **not evenly distributed**. Some areas, such as **western Europe** are **densely** populated, whilst other areas such as **central Australia** are **sparsely** populated. **Population density** is influenced by both **human** and **physical factors**, as can be seen from the table below.

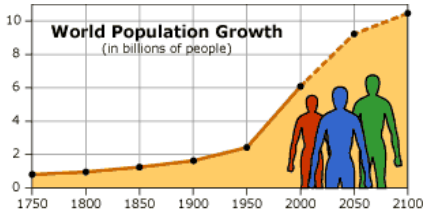
Densely populated areas (positive factors)	Sparsely populated areas (negative factors)
• Pleasant climate • Flat or gently sloping land • Good fertile soil • Good food supply • Good water supply • Money available for investment • Good communication links • Natural resources for industry • Industry and jobs	• Too hot or cold • Too wet or dry • Steep slopes • Poor soils • Dense forest • Poor water supply • Few natural resources • Poor transport links • Little industry • Lack of investment

Can you develop / explain the above points?

Red = Physical **Black = Human**

KPI 8.2.2

Population growth



The graph shows that the world population is rapidly increasing. In the past this has been referred to as an **explosion,** which started in **1950** and is predicted to peak by **2100**.

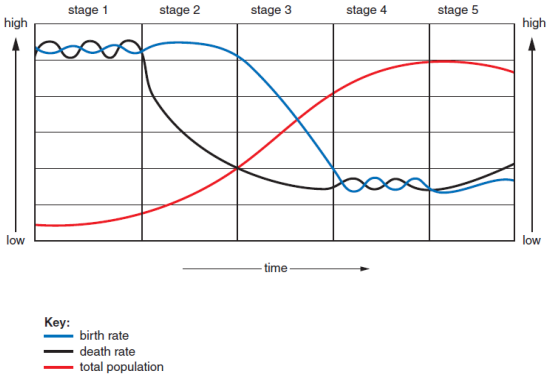
It is happening as **birth rates** are greater than **death rates** causing a **natural increase** in population.

Birth rates - number of births per 1000.

Death rates – number of deaths per 1000.

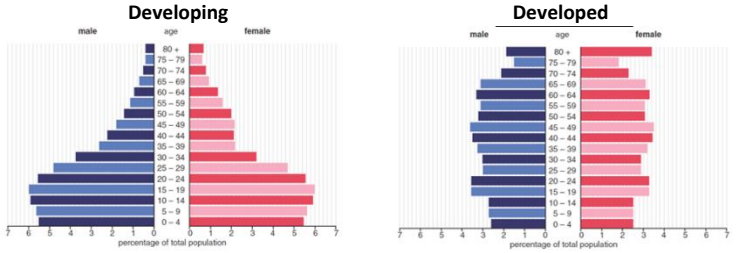
Infant mortality – the number of babies that die before their first birthday per

The demographic transition model:



1. The **demographic transition model** shows what happens to a country's population overtime.
2. In **stage one** the country is not developed so has a **high birth and death rate**, so a small population.
3. As the country moves to **stage two** medicines and hygiene improve, the **death rate falls**, but the **birth rate** remains **high**, leading to a rapid **population growth e.g.** in many developing countries.
4. By **stage three** the death rate continues to fall, and the **birth rate starts to fall**. This is because contraception is introduced and females begin to attend school and work, this means the population is **growing**, but more slowly e.g. in many emerging countries.
5. By **stage four, birth** and **death rates are low**, so the population growth **stabilizes**, but the overall population is high, such as in developed countries like the **UK**.
6. By **stage 5** the birth rate could fall below the death rate, leading to **population decline**, as has been seen in Japan.

Population structure (population pyramids):



Population structure means the number / proportion of people in **each age range**, for each **gender**. Population pyramids show the population structure of the country they represent.

There are three groups on a population pyramid:

1. **Economically active** – 16-65 age group, working age and can provide taxes.
2. **Young dependents –** 0-15 age range, rely on the working age for support via taxes.
3. **Elderly dependents** – 65+ age range, rely on the working age for support via taxes.

<u>Features of population pyramids:</u>

As can be seen from the graphs the pyramids are very different. For example:

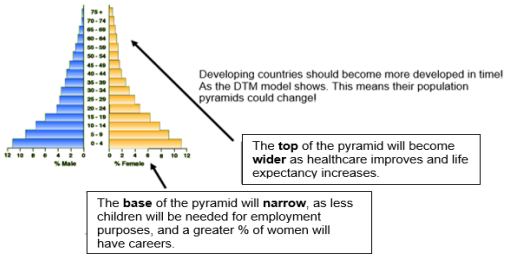
1. Many **developing countries** have pyramids with a **wide base** this shows a **high birth rate**, however the **top is narrow** showing a **lower life expectancy**. The general shape is a pyramid.
2. Many **developed countries** have pyramids with a **narrow base** this shows a **low birth rate**, whereas the **top is much wider**, showing a **long life expectancy**.

These pyramids also link to the **demographic transition model**. Countries in **Stage 3** will have pyramids like the **'developing'** pyramid above.

Countries in **stage 4** will have pyramids that look like the **'developed'** pyramid.

Life expectancy – The **average age** you are expected to live to in a **country.**

Population pyramids - changing with time!



Factors which could cause a low birth rate	Factors which could cause a high birth rate
• More women have careers • Sex education widely available • Contraception • Later marriage • Children perceived as expensive e.g. childcare costs • Low infant mortality	• Children needed for work e.g. farming • Children needed to look after their parents when they are older • Sex education not widely available • Marriage happens at a younger age • High infant mortality

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KPI 8.2.2

Population **subject summary**

KPI 8.2.3

The UK's population problem.

In the UK the population is **ageing**. This means there are **more elderly dependents** than ever before. The main reasons for this are…

1. **Better health care** so illnesses are treated with some success.
2. **Better diet** means heart attacks and diseases related to unhealthy eating are on the decline.
3. **Fitness;** the elderly are looking after themselves better than ever before, e.g. attending the gym etc.

The consequences of an ageing population.

Suggested negatives:

1. **2/3s of hospital beds** taken by those over the age of 65, this can increase **waiting times,** putting pressure on the NHS.
2. Treating the elderly can be expensive, this means **less taxes** for other things such as education.
3. They receive a **state pension** causing a significant cost for the government.
4. **Carers needed**, which requires taxes, which could be spent on other things.
5. **Housing pressure,** as houses are not passed on to the next generation, meaning house **prices increase.**

Suggested positives:

1. Many elderly people have more **disposable cash** as they have paid off their mortgages and their children have left home. This means shops and restaurants can make more money as they have a larger population who are willing to spend. This can increase employment opportunities.
2. Industries such as **seaside resorts stay busy** throughout the year, keeping people in such areas employed throughout the year, meaning more local tax revenue.
3. The elderly often **look after grandchildren**, this means that parents do not have to pay

Migration is the movement of people, from one place to another.

International migration is when people move from **one country (the source)** to **another country (the host).**

People migrate due to **push** and **pull factors**:

A **push factor** is something which is **not good** in your country and **forces you to leave**, for example: a **lack of medical care** meaning illnesses go untreated; **no clean running water** leading to diseases; **low wages** due to poor employment opportunities causing people to have little money for food and medicines; **poor schools** leading to poor education standards and little chance of getting a job.

A **pull factor** is something which **attracts people** to another country. It is basically the push factors reversed. For example, a pull factor could be that a country has **excellent medical services**, so people move there as they know illnesses and diseases can be treated, improving life expectancy.

Migration to the UK (a host country)

Effect (suggested benefits)

1. Workers are hardworking, so **more profit** for businesses who employ them.
2. **Workers pay tax** this improves schools and hospitals.
3. **New shops and restaurants**, leading to more jobs and taxes. New businesses have opened e.g. supermarkets.
4. The migrants **work in jobs that English people are not choosing to fill** e.g. working on farms. Without the migrants some businesses would struggle to operate effectively.

Problems (suggested negatives – evidence proves otherwise)

1. Some people have been concerned that migration could put **pressure on the NHS**, this could cause waiting times to increase (however evidence does not support this).
2. It has been suggested that some schools now have many languages, this **may require** more support staff.
3. *Some locals say* that **jobs are harder to get**, this is because migrants work for less. It has been *suggested* that this could cause **unemployment for locals** (however evidence does not support this).

NB: The points made above are not facts. They are points to inform the debate around migration which is a case study that students investigate at both KS3 and 4.

What happens to countries where migrants migrate from, also known as the source country?

Positive impact:

1. **Money** can be **sent back home**, improving the quality of life for locals e.g. they can spend money on medicines, home improvements etc.
2. Less people meaning **less population pressure** on food and water, as well as services such as doctors.
3. **Trade links** set up, **creating jobs** in the local area.

Negative impact:

1. **Families split up**; this can result in male role models not being about.
2. **No men left** to do jobs such as farming, building etc.
3. **Local businesses** forced to **close** as half the population / customer base has left.
4. **Less taxes,** as the workforce is outside of the country, meaning the government cannot invest in

KPI 8.2.4

KPIs:
8.2.1 Describe and explain the factors that influence the distribution of population at a variety of scales.
8.2.2 To understand the factors affecting population growth and structures within countries.
8.2.3 Describe and explain the factors which people consider when migrating.