

DISTINCTIVE LANDSCAPES – YEAR 8

Processes

Transportation - The movement of sediment along the coast

- **Traction** - large material is rolled along the sea floor.
- **Saltation** - beach material is bounced along the sea floor.
- **Suspension** - beach material is suspended and carried by the waves.
- **Solution** - material is dissolved and carried by the water.

Erosion - The breakdown of sediment into smaller fragments

Hydraulic Action – The force of water into cracks helps to break it up.

Abrasion – Waves fling sand and pebbles against the rock. These wear away like sandpaper.

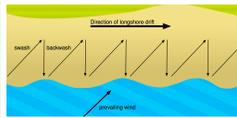
Attrition - Chunks of rock get knocked together and worn into smaller bits

Solution – Water dissolves the soluble material from the rock.

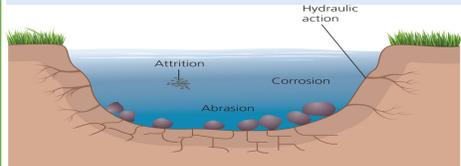
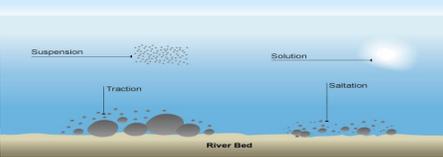
Deposition - When water loses energy it leaves behind the smaller pieces.

The energy of a river/ sea decreases, leading to deposition if:

- Friction



Longshore drift – A form of transportation that moves sediment from one end of the coast to the other.



Landforms of Erosion

Headland and Bay – form along coastlines where there are alternating outcrops of resistant (harder) and less resistant (softer) rock. The softer rock erodes faster than the harder rock.



Cave, Arc, Stack and Stump



Caves occur when waves force their way into cracks in the cliff face. Eventually it will break through to the other side forming an arch. The arch will gradually become bigger until it can no longer support the top of the arch. When the arch collapses, it leaves the headland on one side and a stack (a tall column of rock) on the other. Overtime, it will eventually collapse to form a stump.

Management of the coast



Hard engineering - using artificial structures such as sea walls to control natural processes

Groynes - wooden or stone fences that are built at right angles to the beach. They trap sediment being moved by longshore drift and enlarge the beach.

Traps material and therefore reduces longshore drift
Reduces flooding rate
Unnatural and ugly

Rock Armour - Large boulders placed along the coast. The rocks force the wave to break, absorbing their energy and protecting the coastline.

Reduces erosion
Reduces flooding.
Unnatural and ugly
In storms it can be moved

Sea Wall – A large concrete, often curved, wall that reflects the energy back from waves

Creates a promenade for people to walk along
Reduces flooding.
Unnatural and ugly
Expensive

Soft engineering is using natural processes to protect the coastline.

Beach Replenishment - The addition of sand or shingle to an existing beach to make it higher or wider.

Relatively cheap and easy to maintain
Blends in with existing beach
Needs constant maintenance

Dune regeneration - Sand dunes are effective buffers to the sea but are easily damaged and destroyed by trampling.

Maintains a natural coastal environment
Relatively cheap
Needs constant maintenance

Landforms of Deposition

Beach - Found between areas of high and low tide marks. Generally formed by constructive waves.
Sand dunes - Mounds of sand that are found behind sandy beaches. To form they require a large flat beach, a good supply of sand, strong wind and obstacles.



Spit - Sediment is carried by longshore drift. When there is a change in the shape of the coastline, deposition occurs. A long thin ridge of material is deposited.

Bar - When a spit continues to attach two headlands
Tombola - a spit connecting an island to the mainland

Waves

A wave is a movement of energy through water, not a movement of water. The size of the waves depend on 3 factors;

- The **FETCH** (the distance the wind blows over the water) – The greater the fetch, the more powerful the waves will be.
- The **STRENGTH** of the wind
- How **LONG** the wind blows for



swash ← → backwash

If the backwash has more energy than the swash you will have **DESTRUCTIVE** waves. These are tall and strong waves that take pebbles and sand away from the beach

If the swash has more energy than the backwash you will have **CONSTRUCTIVE** waves. These waves build the beach up by taking pebbles and sand to the shore. They are low flat waves.

Tides

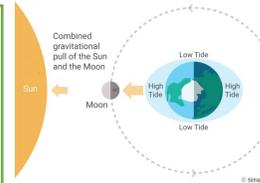
Tides refer to the rise and fall of our oceans' surfaces. They are caused by the gravitational pull of the Sun and Moon as well as the rotation of the Earth.

Causes of flooding:

These can either be **human** or **physical**



- Lots of rainfall
- Steep slopes
- **Urbanisation** – increase in cities
- **Deforestation** – cut down of trees
- **Impermeable rock** – rock that does not allow water to soak in
- Lots of **tributaries** – lots of smaller rivers leading to a big one
- **Saturated soil** – soil that is full and will not allow water to soak in

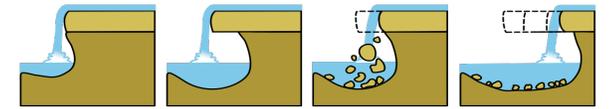


Waterfall formation

Near the source, the river flows over a steep gradient but has limited energy. The river erodes vertically, producing **V-shaped valleys**, **interlocking spurs**, and **waterfalls**.

Waterfall formation:

1. River flows over layers of more resistant and less resistant rock
2. Hydraulic action and abrasion causes a plunge pool in the less resistant rock
3. The more resistant rock is undercut, leaving the rock unsupported
4. The overhanging rock collapses and the waterfall retreats upstream, forming a gorge.



Drainage Basin:

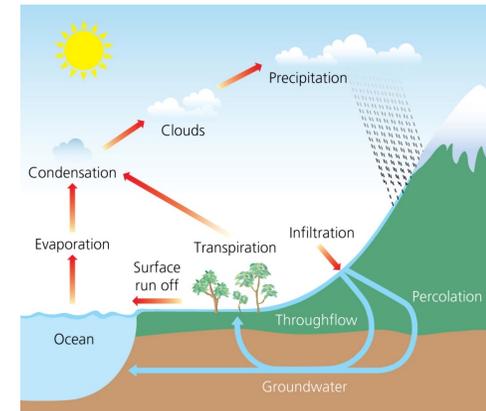
Infiltration – Water soaks into the soil from the ground

Throughflow – Water runs through the soil

Surface run off – Water that runs over the surface of the land

Groundwater flow - Water that is saturated down into the rock

Percolation – water passing through



2015 York Floods

Causes of the flood:

- Record levels of rainfall (December 2015 storm Desmond occurred)
- Changes of land use in drainage basin as peat had been removed which meant more surface run off
- Two tributaries into the River Ouse.
- Urbanisation – York has grown as a city.

Effects:

- 250 people evacuated
- 18000 properties flooded
- Shops shut before Christmas
- Insurance company increased staff
- Sewage leaked into surrounding fields
- Bridges collapsed



Responses:

- £45 million investment provided to York by the government to upgrade flood defences and install embankments, flood walls and temporary flood gates.
- Installation of pumps to pump 30% more water out the local area at a cost of £17 million
- An increase in education for local people as to what to do in a storm.

At the public consultation in York, locals expressed an opinion that protection of farmland seemed to be more important than the city and by building higher walls, it would spoil the look of the city for tourists.

Key words:

Backwash: the return of water to the sea after waves break on a beach.

Condensation – Conversion of water vapour or gas into a liquid

Cross profile – A slice taken across a river showing how wide and deep it is

Drainage basin – The area of land that is drained by a river and its tributaries

Erosion – The breakdown of sediment into smaller fragments

Fetch: the maximum distance of water over which winds can blow

Flood plain – Low-lying land either side of a river which regularly floods

Groundwater flow - Water flowing very slowly through rocks deep underground.

Hard engineering – Using artificial structures to stop a river from flooding

Hydrologist – People who solve water related problems such as finding new sources of water or managing floods

Infiltration – Water soaking into the soil

Intercepted – Water caught by leaves

Interlocking Spurs – Hillsides that a river flows between

Longshore Drift: waves approaching the coast at an angle result in the gradual zig-zag

movement of beach materials along the coast.

Mouth – the end of a river where it meets the sea

Plunge pool – A deep part of a river eroded by a waterfall

Precipitation – Moisture falling from clouds as rain, snow or hail

River cliff – A steep bank on the outside of a river

Saturated - holding as much water as can be absorbed

Sediment – Rocks or stones found in the river

Soft engineering – Using natural methods to stop a river from flooding.

Source - the point at which the river starts to flow

Surface run off – Water flowing quickly over the surface into rivers

Swash: forward movement of a wave up a beach.

Tombolo: a spit joining an island to the mainland.

Throughflow - Water flowing more slowly through the soil to the river.

Transportation – Water carrying sediment down a river

Waves: caused by the transfer of energy from the wind blowing over the surface of the sea.

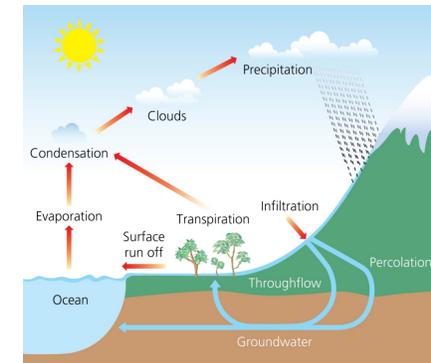
Weathering: the break-down of rock by physical or chemical processes.

Revision Tasks:

- Make a mindmap/ poster/ revision cards/notes/ presentation/ song/ answer the following questions.

1. Define deposition.
2. Define precipitation
3. True or false: attrition makes pebbles more rounded
4. Name a flood case study.
5. Give three reasons why deposition happens
6. State the causes of flooding in a case study you have studied
7. Using figure a, annotate the processes in a drainage basin.
8. What is the name given to the movement of water up the beach after a wave breaks?
9. Name a landform of deposition at the coast
10. Draw and name the four types of erosion.
11. Compare a constructive wave with a destructive wave.
12. Draw an annotated diagram of a waterfall.
13. Describe a method of soft engineering at the coast
14. Compare the physical causes and human causes of flooding
15. Using figure b, explain the effects of a flood you have studied.
16. Explain the formation of a headland and bay
17. Justify the need to manage the coast.
18. Evaluate the responses of a flood you have studied
19. Discuss the benefits of using hard engineering to manage the coast.
20. Using figure c, annotate the water cycle and explain the processes.

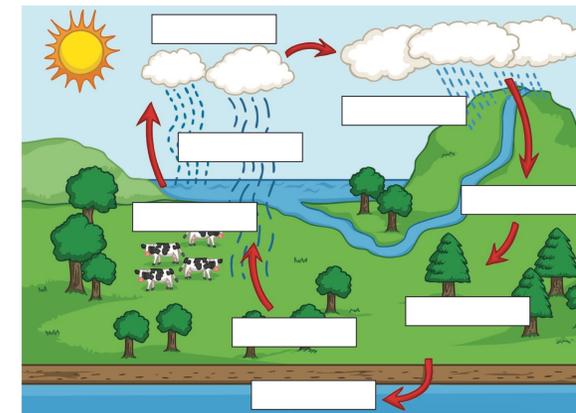
a.



b.



c.



Command Words:

Analyse - Take apart an idea, concept or statement and criticise it.

Assess - Come to a conclusion about the overall value or significance of something; discuss its positive and negative aspects to show balance.

Compare - Identify similarities and differences.

Define - State the meaning of an idea or concept.

Describe - Set out the main characteristics of something; DON'T EXPLAIN.

Discuss - Set out both sides of an argument (for and against) and come to a conclusion; there should be some evidence of balance.

Evaluate - Make a judgement about the effectiveness of something; discuss its strengths and weaknesses and come to a conclusion about its overall success or importance.

Explain - Give reasons why something happens.

Give - Produce an answer from recall.

Justify - Support an idea or argument with evidence; for the outcome chosen, the positives must outweigh the negatives.

State = name