

# Form 8 Geography

**November Exam Revision 2018**

- **Global Location**
- **OS Mapskills**
- **Landform Processes**
- **Weather and Climate**

**For Industry and Population, use your ISEB revision guide.**

# Location Knowledge

Map 9: North and Central America



Map 10: South America



# Ordnance Survey Map Work



## General Information

### BOUNDARIES

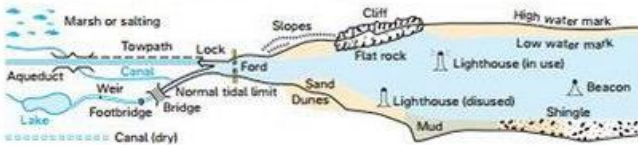
	National		County, Unitary Authority, Metropolitan District or London Borough
	District		National Park

### LAND FEATURES

	Cutting, embankment		Landfill site or slag/spoil heap
	Electricity transmission line (pylons shown at standard spacing)		Coniferous wood
	Pipe line (arrow indicates direction of flow)		Non-coniferous wood
	Buildings		Mixed wood
	Important building (selected)		Orchard
	Bus or coach station		Park or ornamental ground
	Glass Structure		Forestry Commission Land
	Helipoint		National Trust-always open
	Current or former place of worship; with tower with spire, minaret or dome		National Trust-limited access, observe local signs
	Place of worship		National Trust for Scotland - always open
	Triangulation pillar		National Trust for Scotland - limited access, observe local signs
	Mast		
	Wind pump, wind turbine		
	Windmill with or without sails		
	Graticule intersection at 5' intervals		

### WATER FEATURES

Contour values in lakes are in metres



### HEIGHTS

	Contours are at 10 metres vertical interval	Surface heights are to the nearest metre above mean sea level. Where two heights are shown, the first is the height of the natural ground in the location of the triangulation pillar, and the second (in brackets) to a separate point which is the highest natural summit.
	Heights are to the nearest metre above mean sea level	

### ABBREVIATIONS

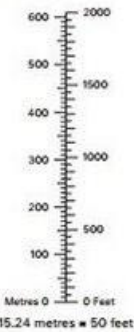
See our website for full list

CH Clubhouse	CG Cattle grid
PH Public house	P Post office
PC Public convenience (in rural area)	MP Milepost
TH Town hall, Guildhall or equivalent	MS Milestone

### CONVERSION

#### METRES - FEET

1 metre = 3.2808 feet



### ARCHAEOLOGICAL AND HISTORICAL INFORMATION

	Site of antiquity	VILL.A Roman		Battlefield (with date)
	Visible earthwork	E.Castle Non-Roman		

Information provided by English Heritage for England and the Royal Commissions on the Ancient and Historical Monuments for Scotland and Wales

### ROCK FEATURES



## Tourist Information

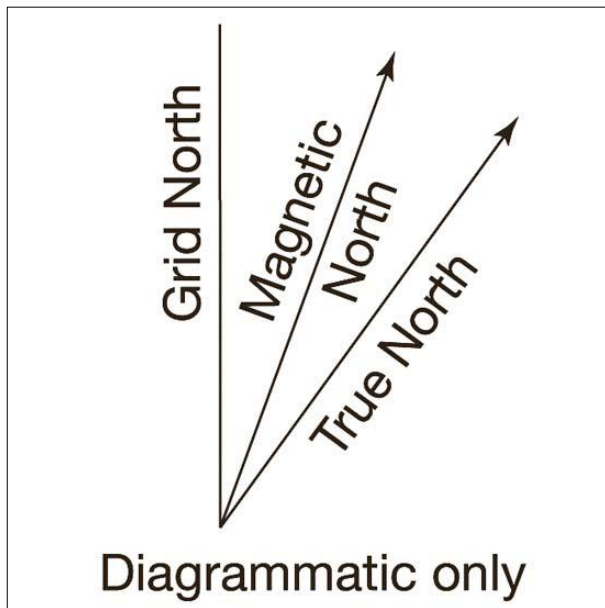
### TOURIST INFORMATION RENSEIGNEMENTS TOURISTIQUES TOURISTENINFORMATION

	Viewpoint Point de vue Aussichtspunkt		Camp site/caravan site Terrain de camping/Terrain pour caravanes Campingplatz/Wohnwagenplatz
	Visitor centre Centre pour visiteurs Besucherzentrum		Selected places of tourist interest Endroits d'un intérêt touristique particulier Ausgewählter Platz von touristischem Interesse
	Walks / Trails Promenades Wanderwege		Information centre, all year / seasonal Office de tourisme, ouvert toute l'année / en saison Informationsbüro, ganzjährig / saisonal
	Nature reserve Réserve naturelle Naturschutzgebiet		Picnic site Emplacement de pique-nique Picknickplatz
	Parking Parkplatz		Park & Ride, all year / seasonal Parking et navette, ouvert toute l'année / en saison Park & Ride, ganzjährig / saisonal
	Youth hostel Auberge de jeunesse Jugendherberge		Telephone, public / roadside assistance Téléphone, public / borne d'appel d'urgence Telefon, öffentlich / Notrufsäule
	Golf course or links Terrain de golf Golplatz		Recreation / leisure / sports centre Centre de détente / loisirs / sports Erholungs- / Freizeit- / Sportzentrum
	Garden Jardin Garten		World Heritage site/area Site du Patrimoine Mondial Welterbestätte

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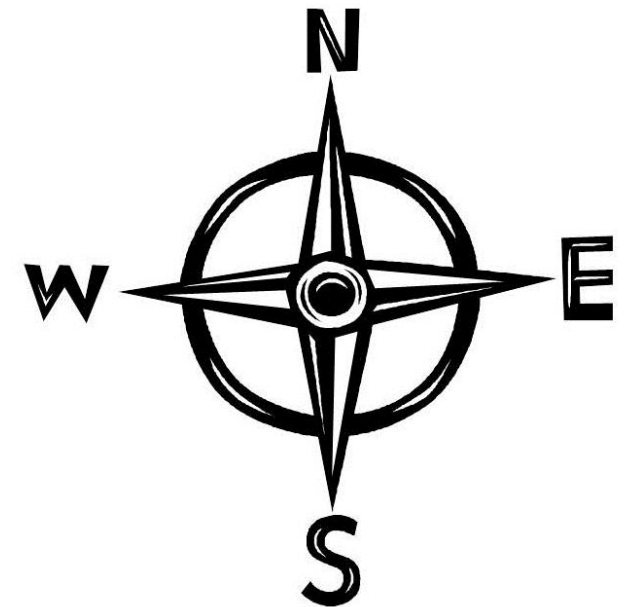
You need to be able to;

- Identify **major transport routes**: A roads, B roads, Motorways, train lines.
- Identify features using **6 figure grid** references.
- Identify grid squares using **4 figure grid** references.
- Work out **direction**.
- Use the **symbols** in key to identify features on the map.
- Work out, by looking at **contour lines**, how high the land is.
- Measure **distance** (straight line and actual distance).



# Which direction?

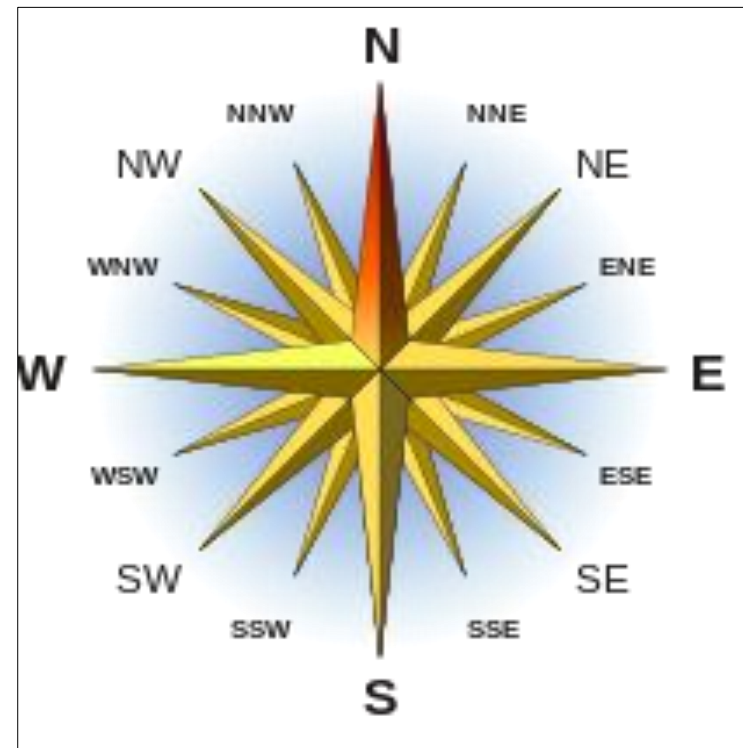
On the OS map you will see the symbol on the left. You should use Grid North as the starting point to working out the direction of a place.



You will usually only need to give a compass direction as a **general direction** and you will **not** need to use degrees.

You should give the direction in two points e.g. NE or SW.

You will not need to be too detailed so don't use NNE, WNW etc.



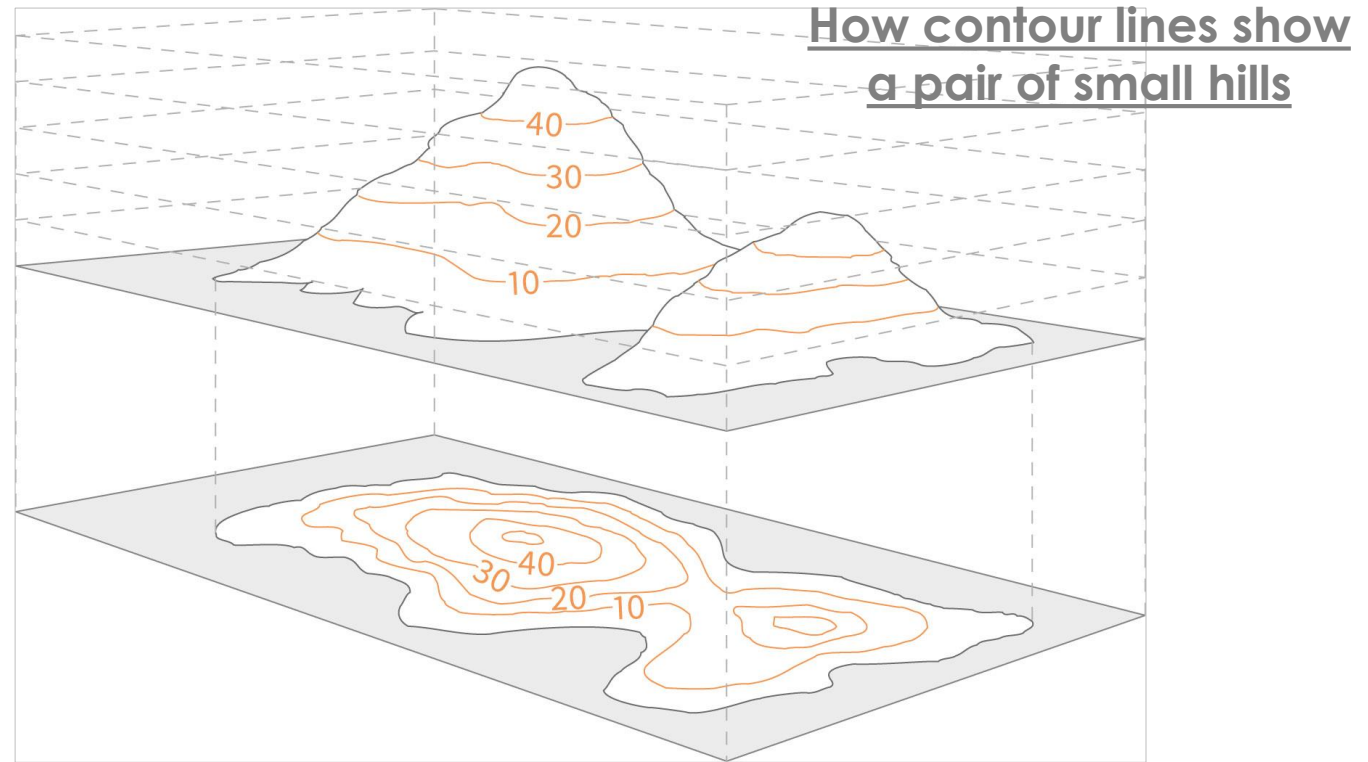


# Contour Lines

Hills, slopes and mountains are represented on a map using contour lines. By studying the contour lines you can work out lots about the surrounding terrain including gradients of hills, valleys and steepness of climbs.

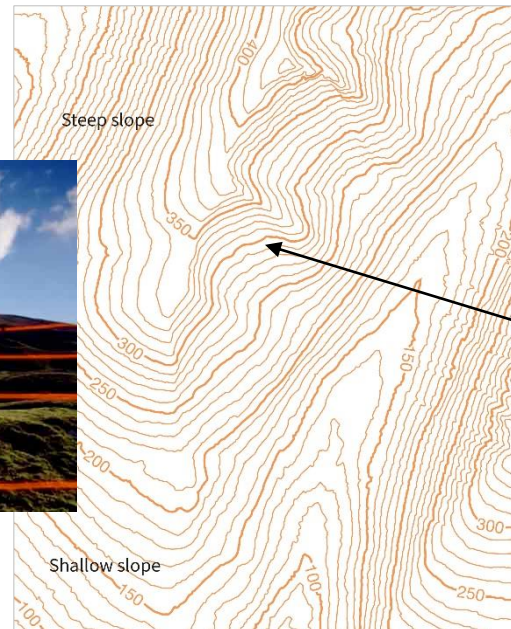
## How are hills and mountains shown on a map?

A contour is a line drawn on a map that joins points of equal height above sea level. For 1:25 000 scale maps the interval between contours is usually 5 metres, although in mountainous regions it may be 10 metres.



You can see from the picture above the link between the shape of a hill and the contours representing it on a map. Another way of thinking about contour lines is as a tide mark left by the sea as the tide goes out, leaving a line every 5 metres.

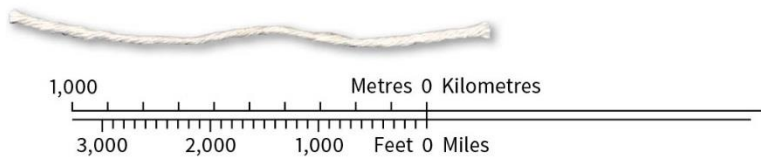
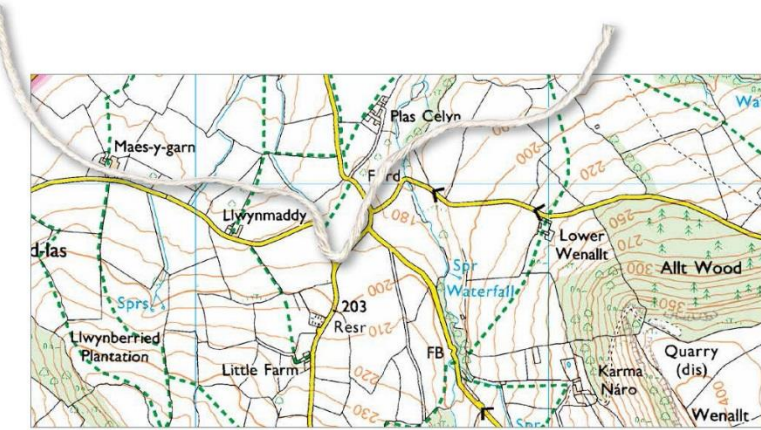
**Top tip!** Remember contour numbering reads up hill – in other words the top of the number is uphill and the bottom is downhill. Also remember the closer contour lines are together, the steeper the slope.



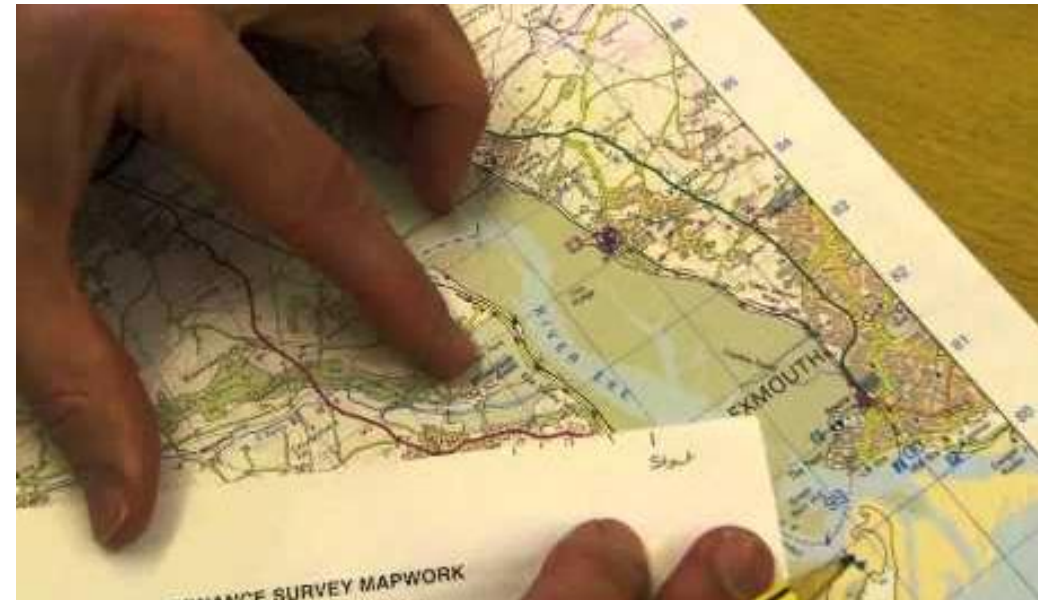
# Measuring Distance on an OS Map

You can measure **straight line distances** on a map with a ruler.

To measure **actual distances** from one place to another you can use a piece of string or a strip of paper.

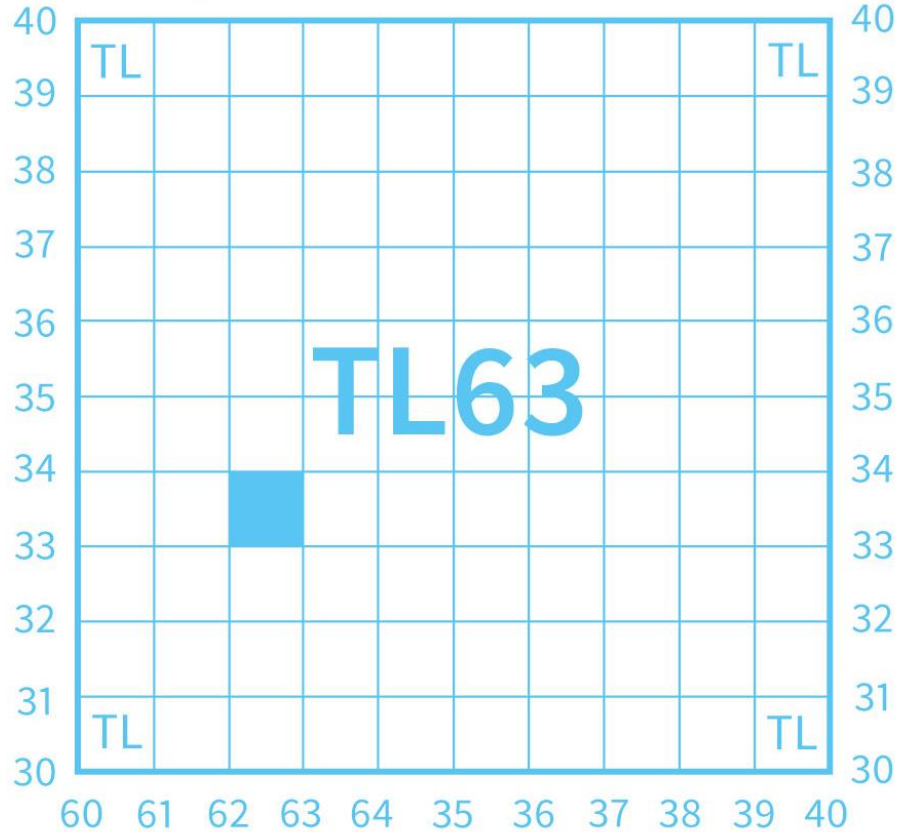


1. Take a strip of paper and place the corner edge on your starting point.
2. Move the paper until the edge follows the route you want to take.
3. Every time the route changes make a small mark on the paper.
4. Repeat this process until you reach your destination.
5. You will be left with a series of marks on your paper.
6. Now place the paper on the scale bar and measure the total distance.



# Grid References

Northings (up the stairs) ›



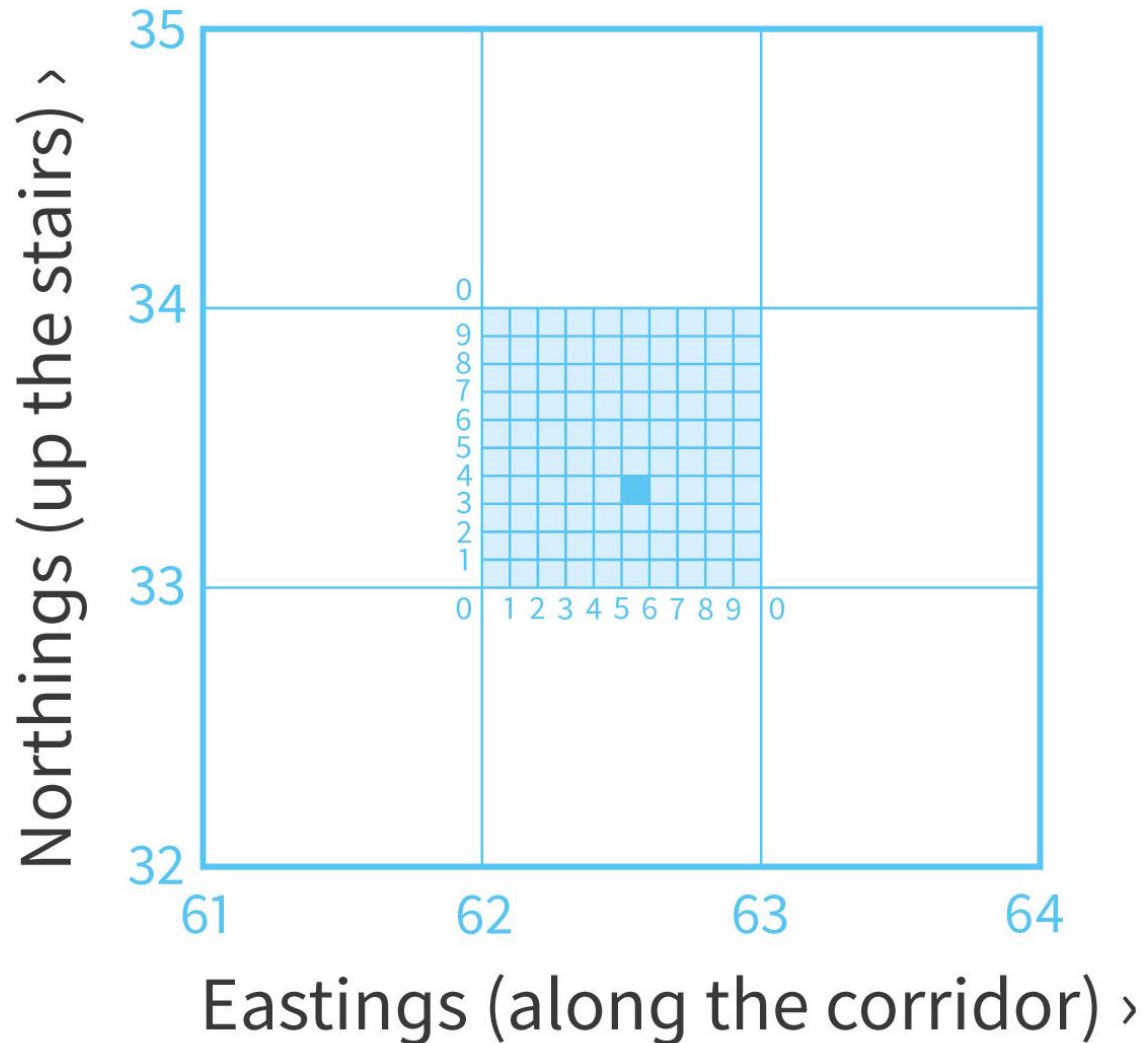
Eastings (along the corridor) ›

It is easy to find a particular place using a grid reference.

- To start, a [four-figure grid reference](#) is a handy way of identifying any square on a map.
- Grid references are easy if you can remember that you always have to go **along the corridor** before you go **up the stairs**.
- To find the number of a square first use the eastings to go along the corridor until you come to the bottom left-hand corner of the square you want.
- Write this two-figure number down.
- Then use the northing to go up the stairs until you find the same corner.
- Put this two-figure number after your first one and you now have the four-figure grid reference, which looks like the example in diagram: **6233**.



# 6 figure Grid References



- If you want to pinpoint a more exact place on a map, such as your own house, you will need to use a **six-figure grid reference**.
- First find the four-figure grid reference for the square and write it down with a space after each set of numbers, like this: **62\_33\_**
- Now imagine this square is divided up into 100 tiny squares with 10 squares along each side.
- Still remembering to go along the corridor and up the stairs, work out the extra numbers you need and put them into your four-figure grid reference like this in diagram E: **625 333**.



# Landform Processes

**What is weathering?** The **breakdown** of rocks. It is caused by water and frost, by **changes in temperature**, and by plants and animals.

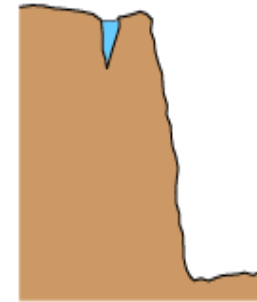
## Physical Weathering

Most rocks are hard, but despite this they can be broken by just a small amount of water getting into cracks in the rock.

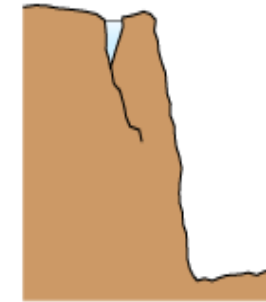
This is because water freezes as it expands. This creates powerful forces that can enlarge the cracks.

As this **freeze-thaw** process is repeated and cracks spread through the rock. Eventually small pieces of rock (called **scree**) break off altogether.

## 1. Freeze-thaw Weathering



Rainwater collects in a crack.

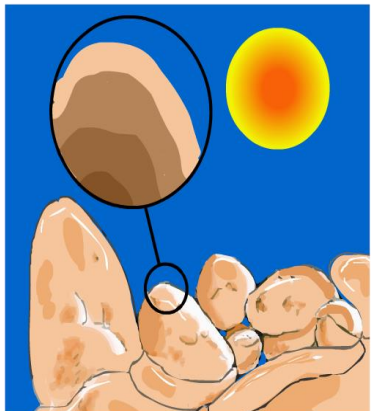


The temperature falls below 0°C. The water freezes and expands, making the crack bigger

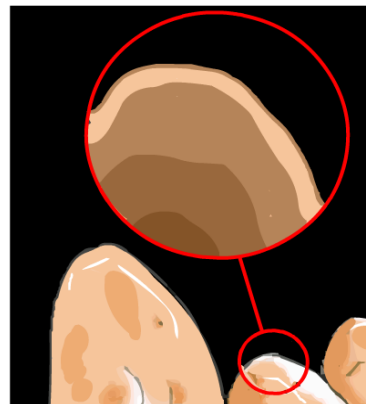


Eventually after repeated freezing and thawing, the rock breaks off.

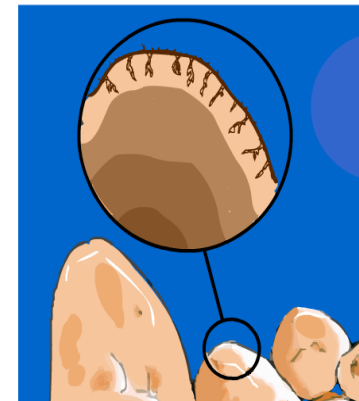
## 2. Exfoliation or onion-skin weathering



During the day the **sun heats up** the surface of the rock, causing the **rock to expand**.



During the night the rock **cools down and contracts**.



As the rock **expands and contracts** over and over again, small pieces of surface rock begin to **flake and fall off**.

# Weathering (Chemicals)

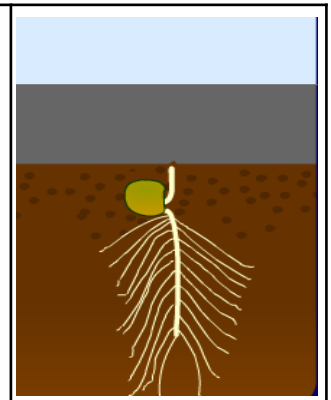


There are also acids in the rain that can chemically eat away at rocks – especially rocks consisting of metal carbonates (such as chalk, limestone and marble).

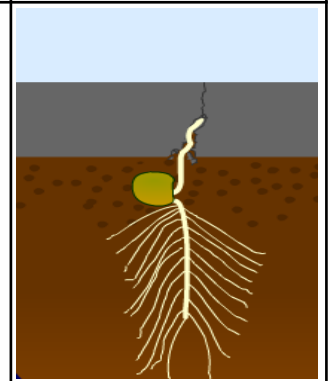
Firstly, there is **carbon dioxide gas** which dissolves in rain to form weak carbonic acid. This very slowly eats away at certain rocks. Secondly, there are **nitrogen and sulphur oxides** which produce much more acidic rain that can rapidly chemically dissolve the rocks.



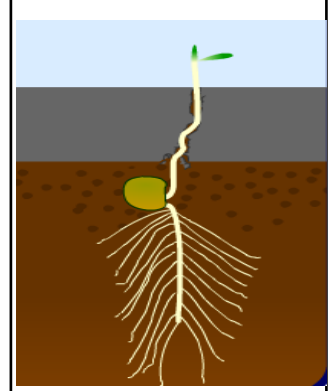
Plant roots can get into tiny cracks in rocks



As the roots push their way up to the surface of the rock, they force the crack open even further



This causes small pieces of the rock to break away. This is called **Biological Weathering**.



# Weathering (Biological)

## Abrasion

This is the process by which the bed and banks are worn down by the river's load. The river throws these particles against the bed/banks.

## Hydraulic Action

This process involves the force of water against the bed and banks.

## Solution

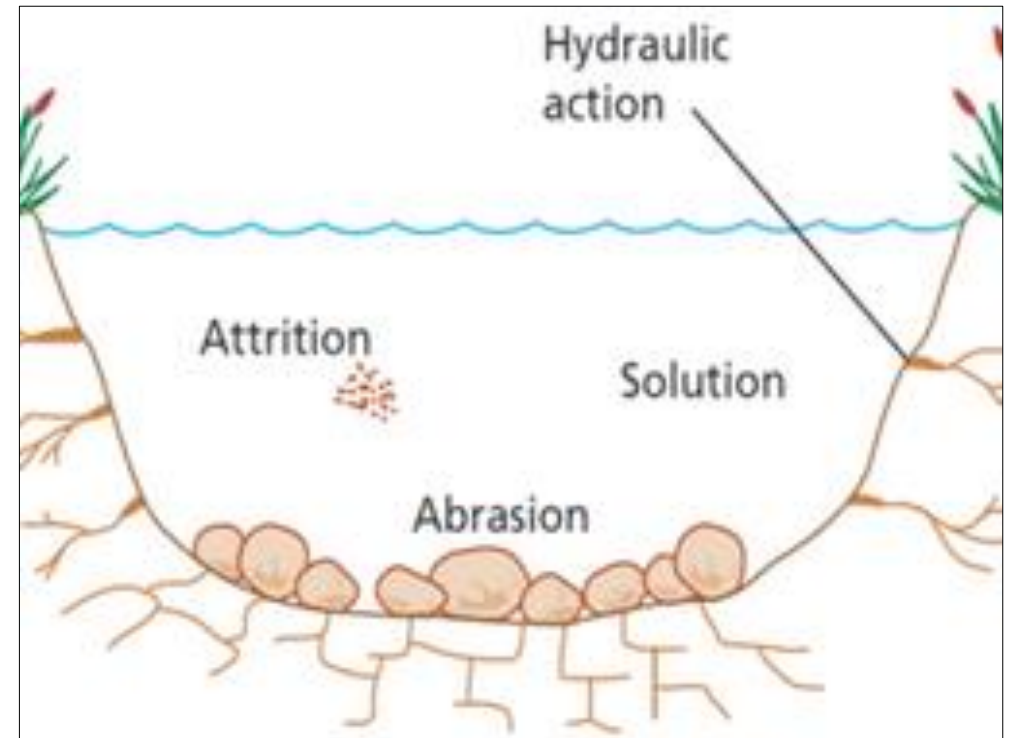
This is the **chemical action** of river water. The acids in the water slowly **dissolve** the bed/ banks.

## Attrition

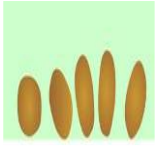
Material (**the load**) carried by the river bump into each other and so are **smoothed and broken down** into smaller particles.

# Rivers and Coasts

## Processes of River Erosion

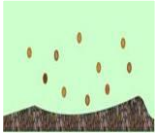


# How is material transported downstream?



## Traction

Boulders and pebbles are **rolled** along the river bed at times of high discharge.



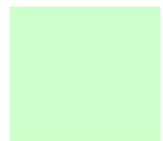
## Saltation

Sand sized particles are **bounced along** the river bed by the flow of water.



## Suspension

Fine clay and sand particles are **carried along** within the water even at low discharges.

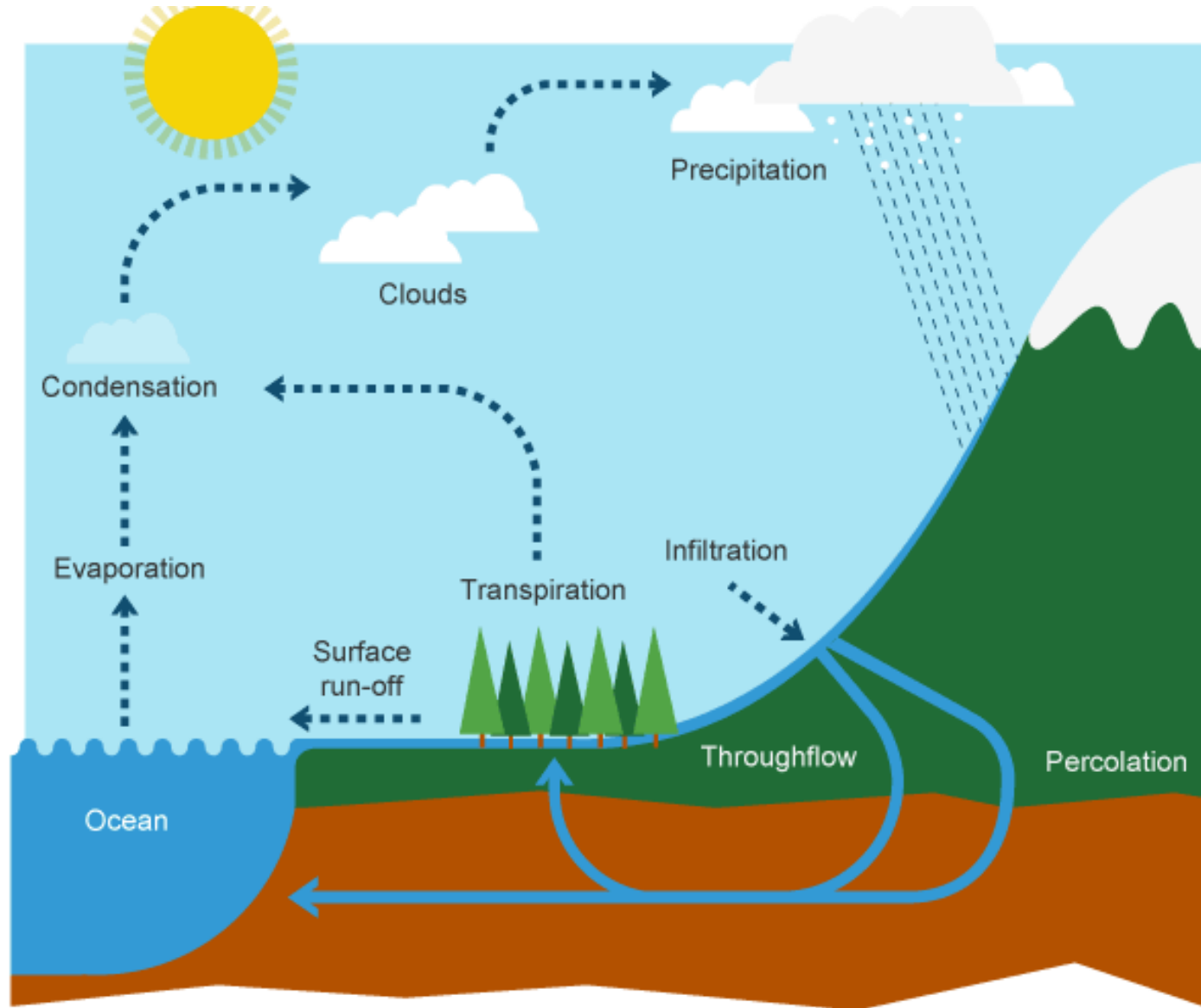


## Solution

Some minerals **dissolve** in water such as calcium carbonate. This requires very little energy.



# The Water Cycle



The water cycle describes the **continuous movement of water on, above and below** the surface of the Earth.

You need to be able to label a diagram of the water cycle and give a definition of some of the key terms.

- **Transpiration**
- **Throughflow**
- **Precipitation**

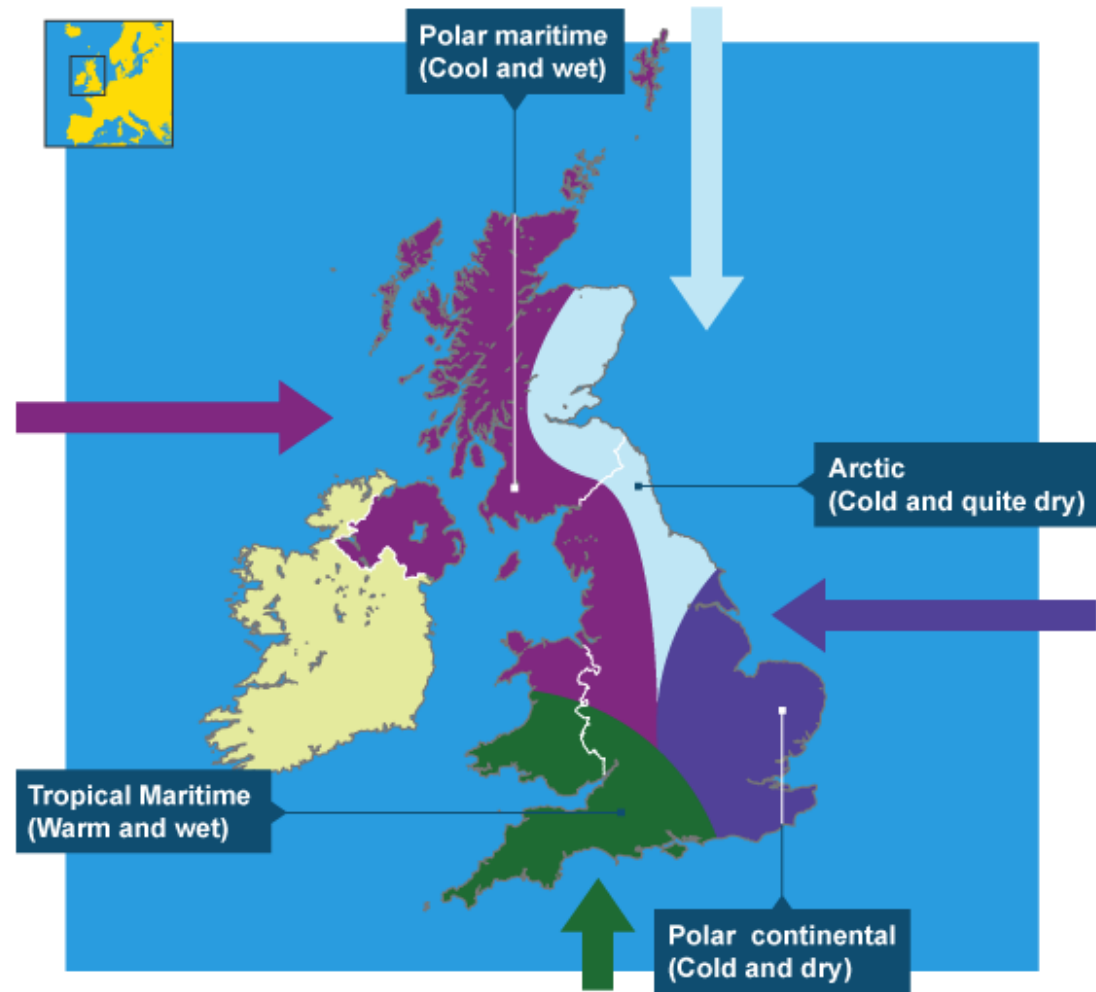
# UK Climate

The UK has a **mild** climate or **temperate** climate and the sea affects the weather. In general, this means that the UK gets **cool, wet winters** and **warm, wet summers**. The weather is also very **changeable**.

## You need to know:

What factors affect the climate of the UK?

- Latitude
- Prevailing winds
- Relief



<https://www.bbc.com/education/clips/zr7hyrd>

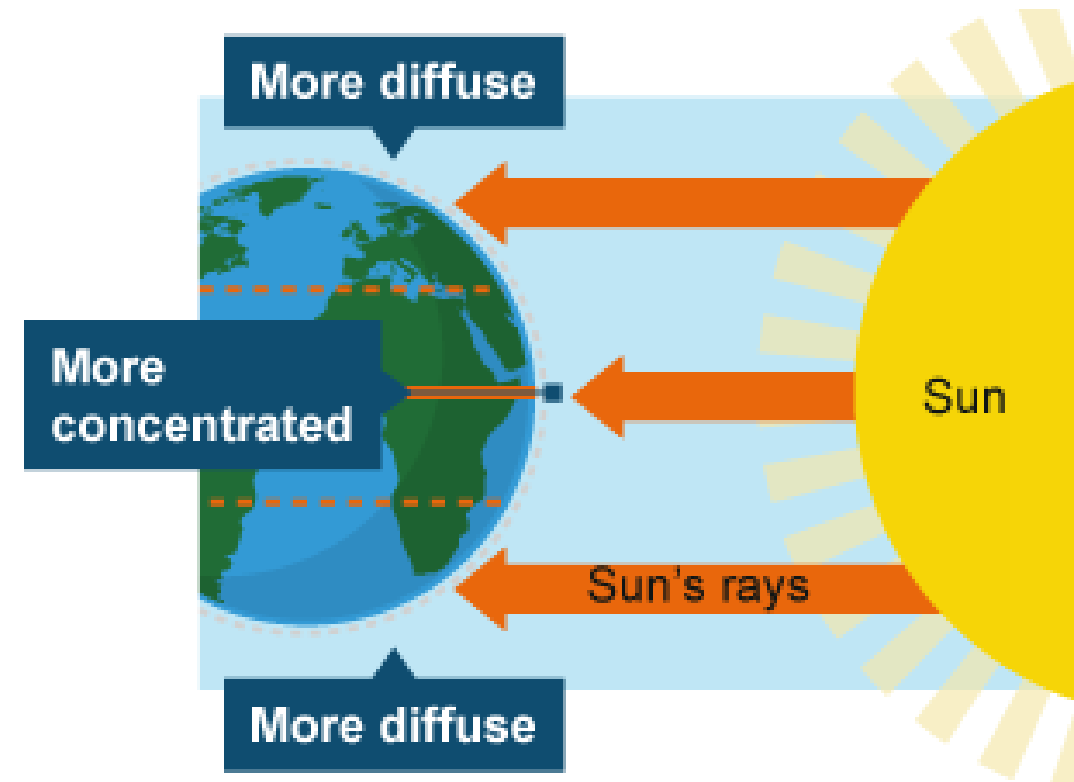
Climate Zones Basic 4:47

# Latitude

Locations that are further north receive less concentrated energy from the Sun.

The **equator lies directly underneath the Sun** and so countries that fall on the equator receive the **strongest solar energy**.

This means that in the **Northern Hemisphere**, the **Sun's energy becomes less concentrated** and therefore the temperatures become **cooler as you travel north**.



# Relief (the height of the land)

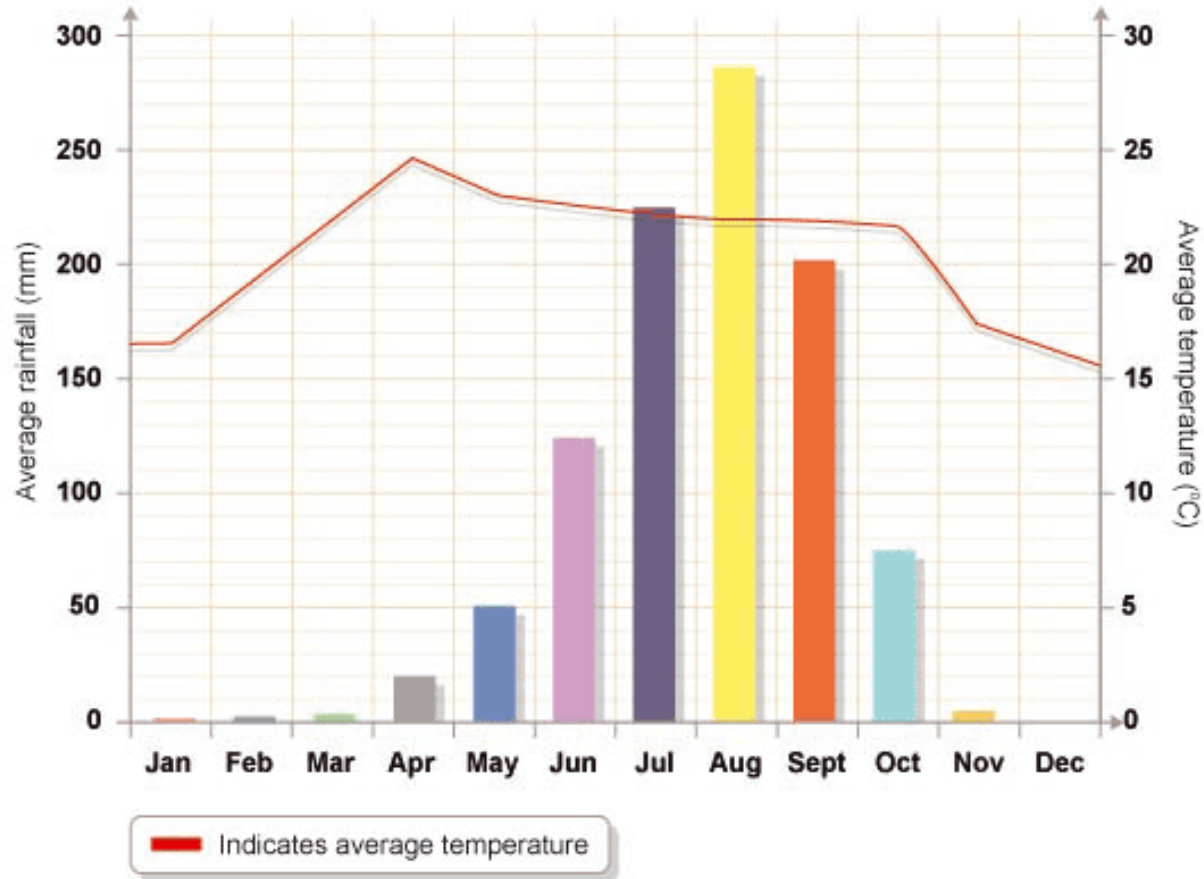
Temperatures **decrease** with **altitude (height)**. There is a 1°C drop in temperature for every increase of 100m in height. This is because air is less dense in higher altitudes.

## Prevailing Winds

The prevailing wind is the **most frequent wind direction** a location experiences. In Britain the prevailing wind is from the **south west**, which brings **warm, moist air** from the **Atlantic Ocean**. This contributes to the **frequent rainfall**.



# Weather and Climate



You need to be able to read a climate graph:

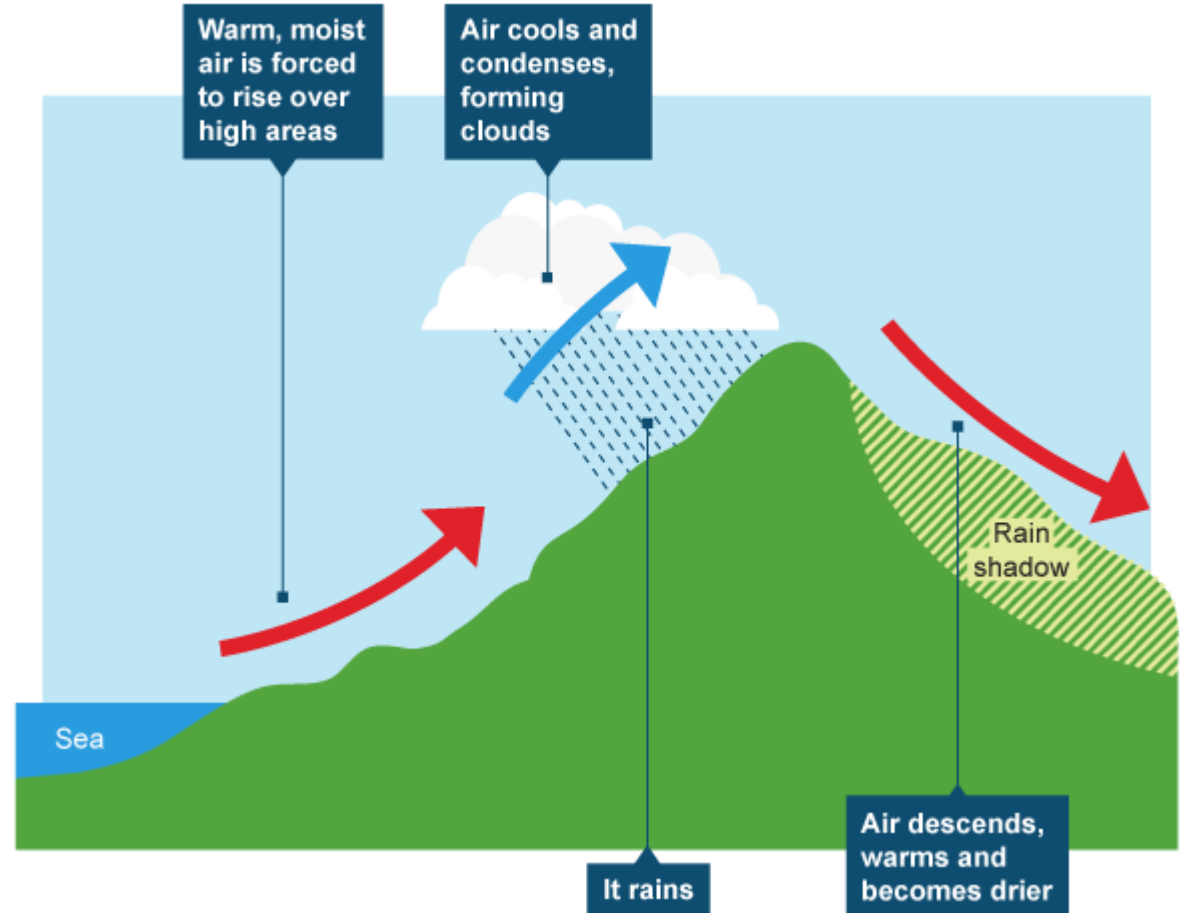
**Climate graphs** are a combination of a bar graph and a line graph.

**Temperature** is shown on a **line graph**, with the figures being shown on the right side of the graph. **Rainfall** is shown by a **bar graph**, with the figures being shown down the left side of the graph.

# Which types of rainfall commonly affect Britain?

## Relief rainfall

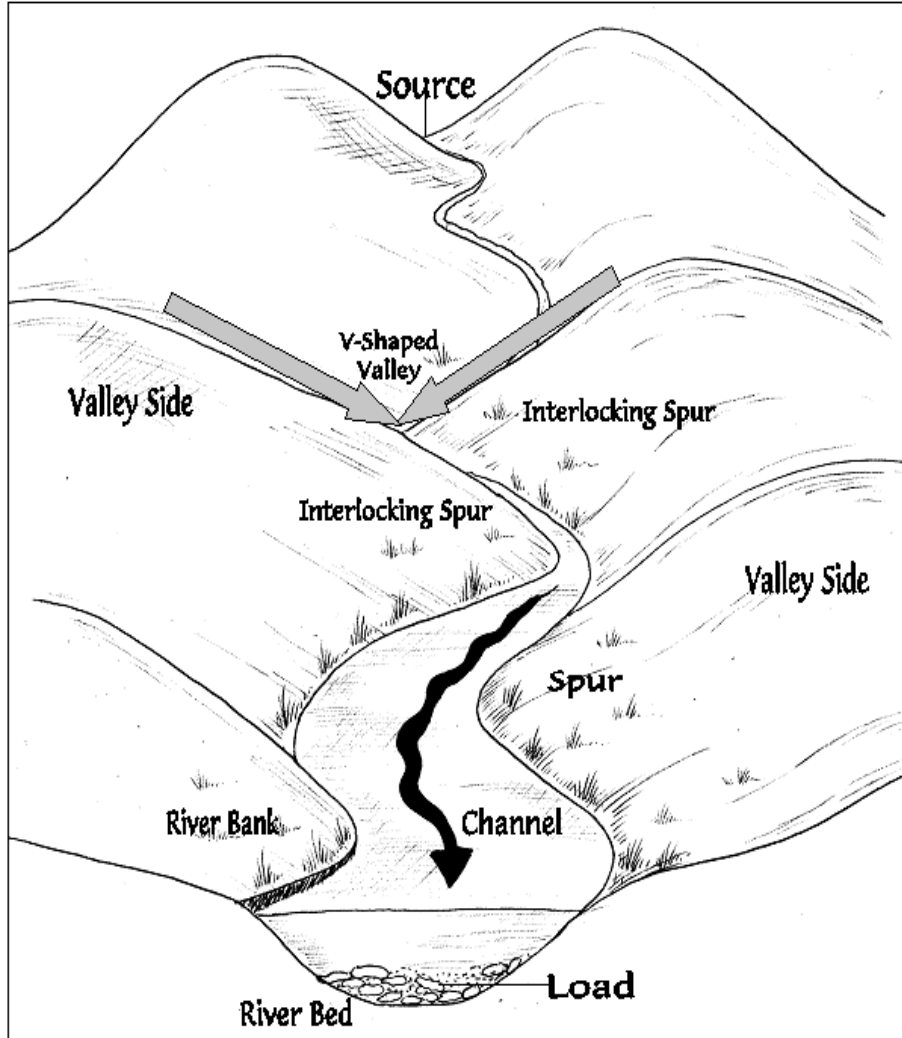
- Prevailing winds bring **warm, moist air** to the western British Isles.
- **Air is forced to rise** over high areas.
- Air **cools** and **condenses**.
- **Clouds form** and it **rains**.
- **Air descends** on the other side of the mountains.
- It warms up and therefore becomes drier.



# What landforms occur in the upper course of the river? (1)

## V-shaped Valleys

Rivers near their source are a long way above sea level. This means they have a high gravitational potential energy. So they erode mainly downwards (vertically). That makes the steep valley sides. The slopes stay vertical because that's not stable, so the soil and rock on the slopes slide down and that makes the V-shape.



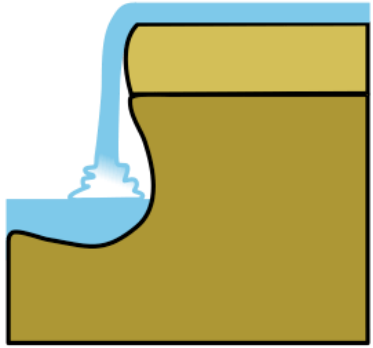
- In the upper course the river does not have a huge amount of **energy** to erode as it does not have a **high discharge** and it has to transport large pieces of sediment.
- When the river meets areas of harder rock that are difficult to erode it winds around them. A series of hills form on either side of the river called **spurs**. As the river flows around these hills they become **interlocked**. So, a series of **interlocking spurs** are often found in the upper course of a river valley.



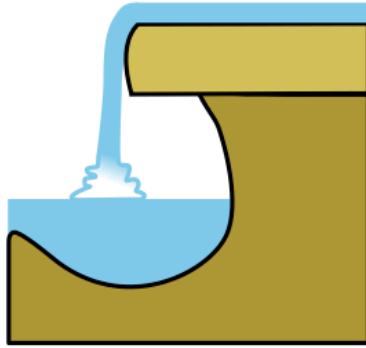
## Interlocking Spurs

These are alternate hills that stick out like the teeth of a zip in the river's path. The river in the upper course doesn't have enough energy to erode the spurs, so it has to flow around them.

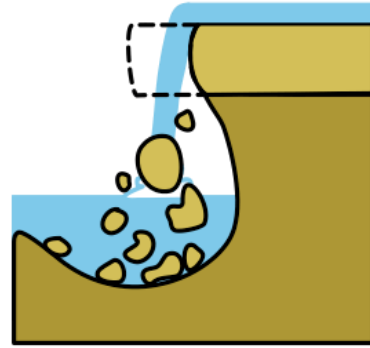
# What landforms occur in the upper course of the river? (2)



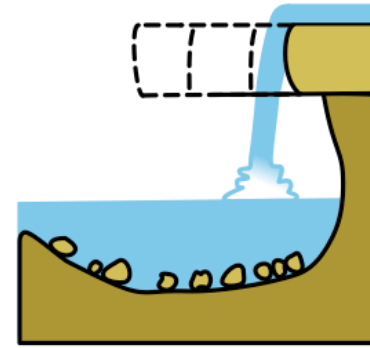
1. Waterfalls typically form in the upper stages of a river. They occur where a band of hard rock overlies a softer rock. Falling water and rock particles erode the soft rock below the waterfall, creating a plunge pool.



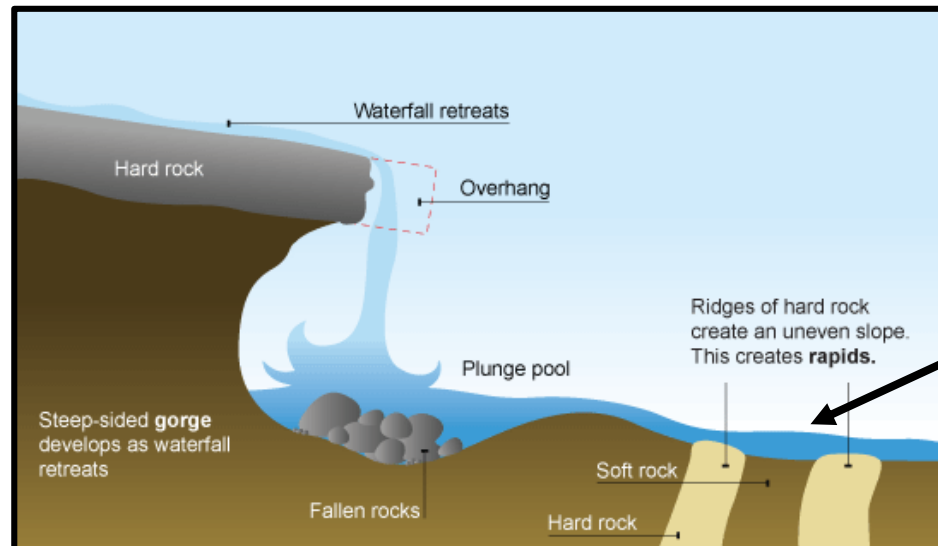
2. The soft rock is undercut by erosional processes such as hydraulic action and abrasion creating a plunge pool where water and debris swirl around eroding the rock through corraision further deepening it and creating an overhang.



3. Hard rock overhang above the plunge pool collapses as its weight is no longer supported.



4. Erosion continues and the waterfall retreats upstream leaving behind a gorge.



## Key Ideas

- **Erosion** is the main process operating in the upper course of a river.
- The direction of erosion is **vertical**.
- There are **four** main types of erosion – hydraulic action, attrition, abrasion and corrosion.
- Valleys are **v-shaped** with **interlocking spurs**.
- **Waterfalls** are formed where a river meets a band of less resistant rock. **Plunge pools** and **gorges** are features associated with the formation of waterfalls.
- **Rapids** are smaller scale features formed where finer bands of varying resistance of rock are found.



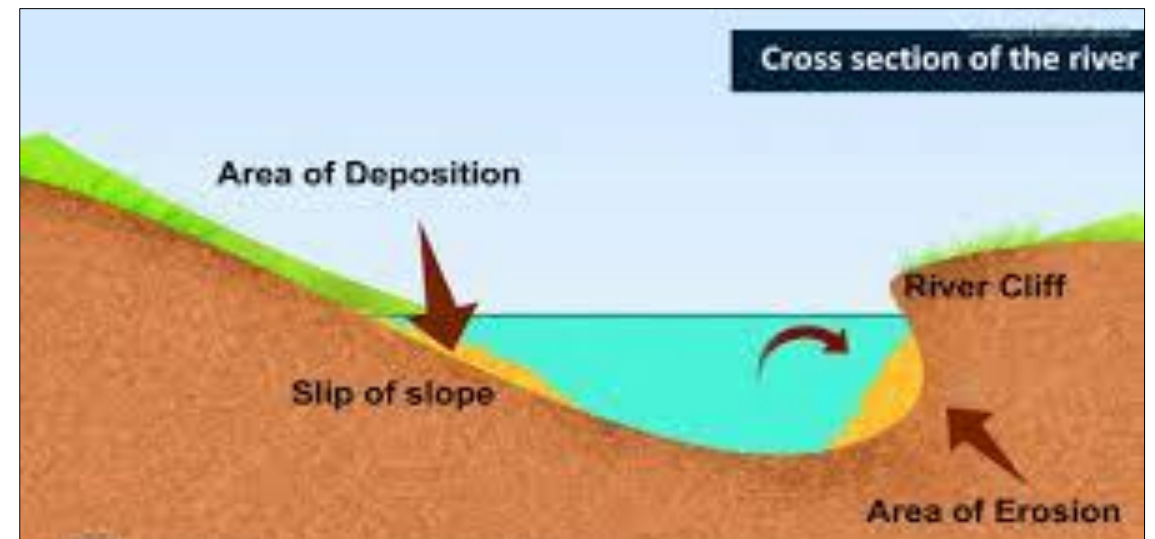
# What are the main processes that operate in the middle and lower course of a river?

Erosion is still an important process. The river is now flowing over flatter land and so the dominant direction of erosion is **lateral** (from side to side). The river has a greater discharge and so has more energy to transport material. Material that is transported by a river is called its **load**. **Deposition** is also an important process and occurs when the velocity of the river decreases or if the discharge falls due to a dry spell of weather.

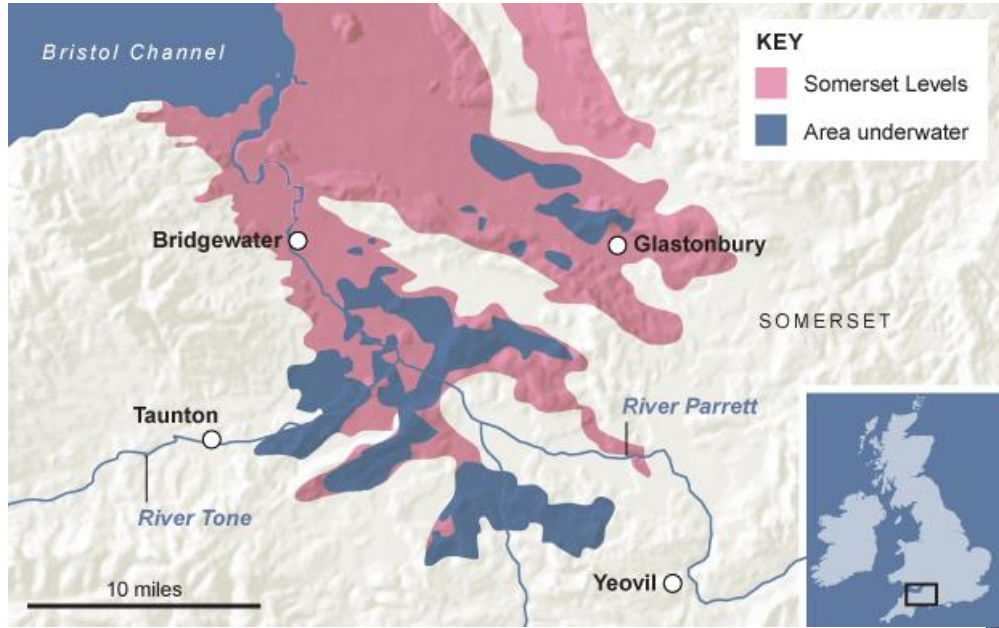
## What happens on a river bend?



A meander is a **bend in the river**. Meanders usually occur in the middle or lower course, and are formed by **erosion and deposition**. As the river flows around a bend, the water flows **fastest** around the outside of the bend forming a **river cliff**. This creates erosion on the outside. The **slower flow** on the inside of the bend causes deposition and a **river beach (slip-off slope)** to form.



# Flooding Case Study – Somerset Levels Dec 2013 to Feb '14



## Location

- The Somerset Levels and Moors is a large area of **low-lying farmland** and **wetlands** in Somerset.
- It is drained by several rivers mainly **The Tone** and **The Parrett**, which **flows to the Severn Estuary** via Bridgewater.
- Much of the area lies at, or just above **sea level** so it is a **natural wetland** and **prone to flooding**.

## Causes of the flooding

- **Extremely wet weather** (most rainfall since records began).
- **Saturated** the ground and rivers burst their banks.
- **High tides** and **storm surges** swept water up rivers from the Bristol Channel.
- River hadn't been **dredged** for 20 years and was full of **silt** so couldn't hold as much water.



**Silt** – Fine material carried in the river.  
**Dredged** – Digging out the bottom of a river channel to make it deeper so it can hold more water.

## Effects

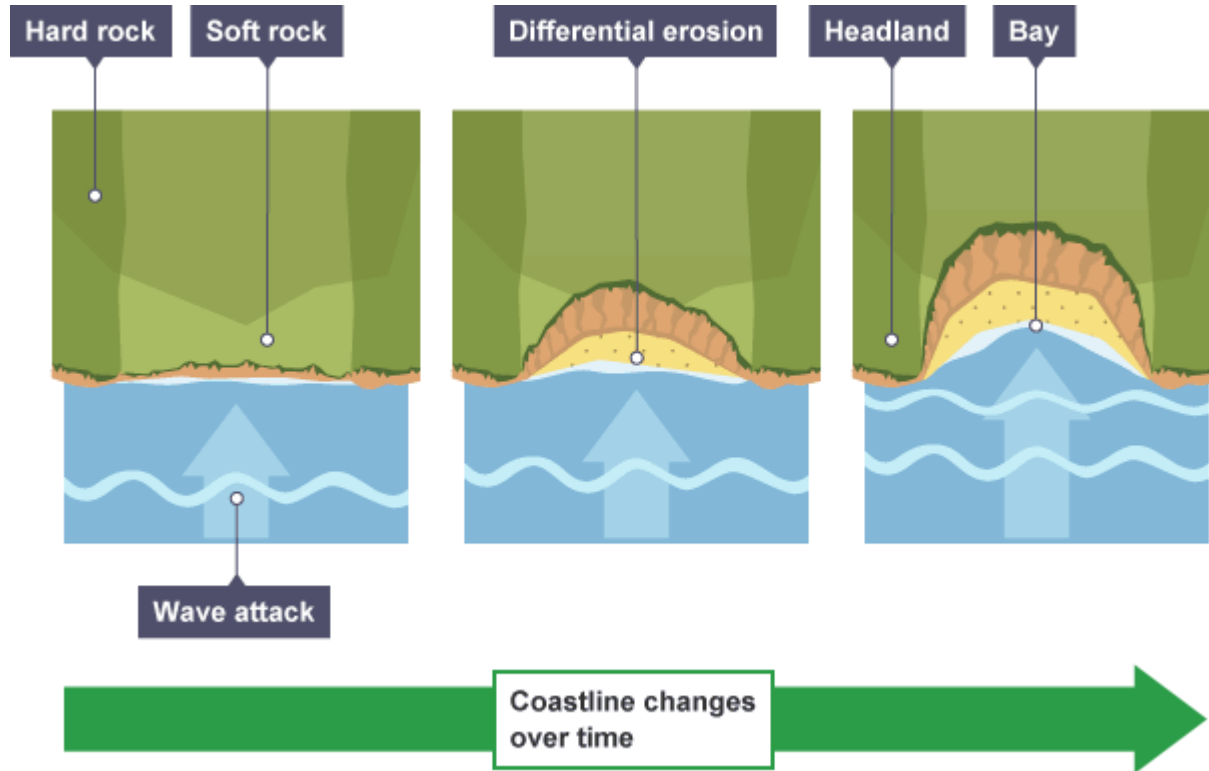
- Villages **cut off**
- Farms flooded and **crops ruined**
- Water full of **Sewage** flooded homes
- People **evacuated** for weeks.

## Response

- A **flood action plan** to **dredge** the rivers and increase their capacity to hold more water.

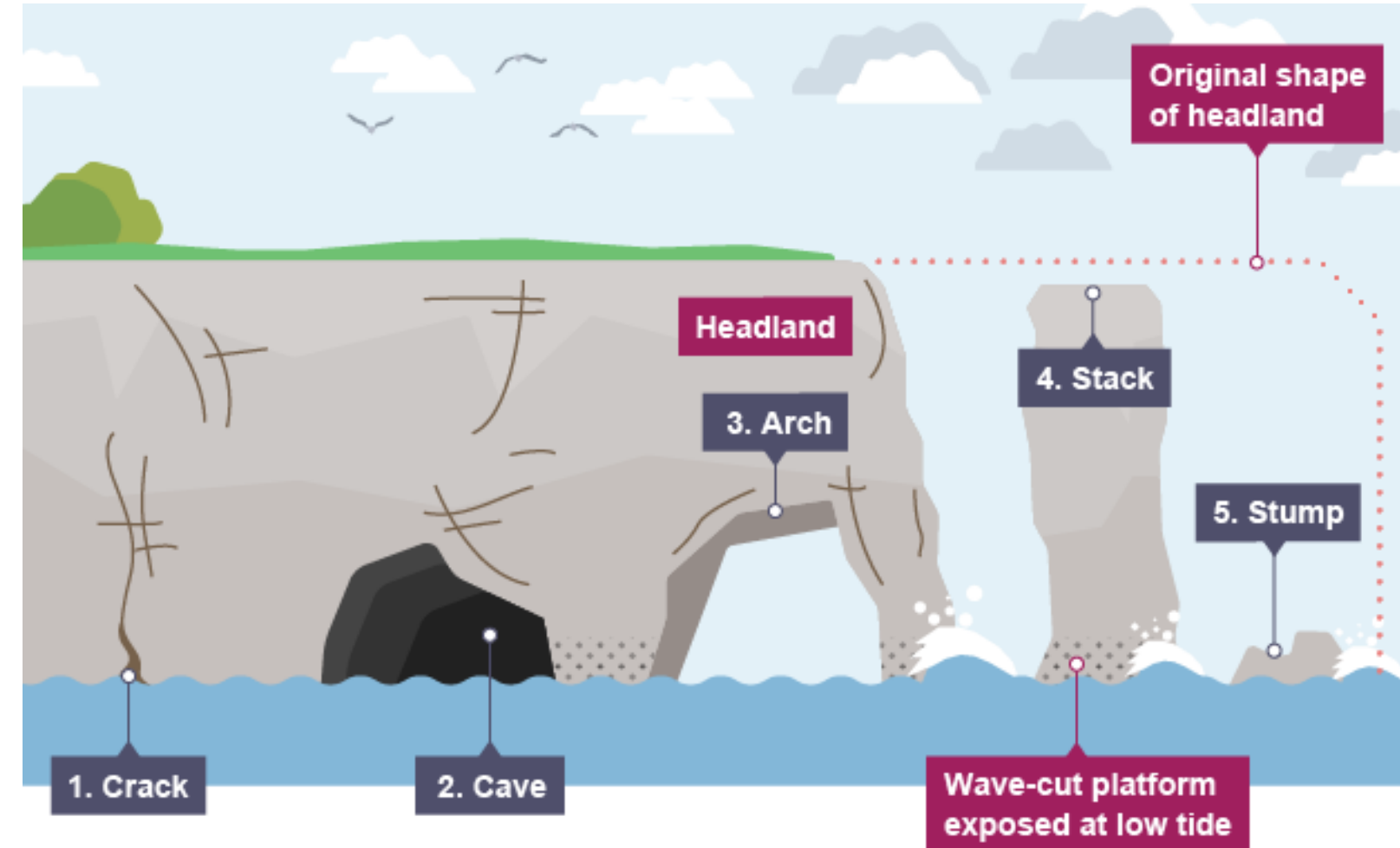


# Coasts – Erosion of a Headland



**Headlands** are usually formed of more **resistant rock** types than **bays**. If there are different bands of rock along a coastline, the **weaker** or **softer rock**, such as clay, is **eroded fastest**. This leaves more resistant rock types, such as granite, **sticking out**.

# Erosion of a Headland



1. **Cracks** are widened in the headland through the erosional processes of **hydraulic action** and **abrasion**.

2. As the waves continue to grind away at the crack, it begins to open up to form a **cave**.

3. The cave becomes larger and eventually breaks through the headland to form an **arch**.

4. The base of the arch continually becomes wider through further erosion, until its roof becomes too heavy and collapses into the sea. This leaves a **stack** (an isolated column of rock).

5 The stack is undercut at the base until it collapses to form a **stump**.



# Coastal Deposition Landforms.

## How is sediment moved along a beach?

- Waves approach a beach at an angle of 45 (swash)
- This is due to the prevailing **wind** direction
- Waves return at right angles (**backwash**)
- This process moves sediment along a beach until there is a barrier or a break in the coastline.
- The process is called **Longshore Drift**.

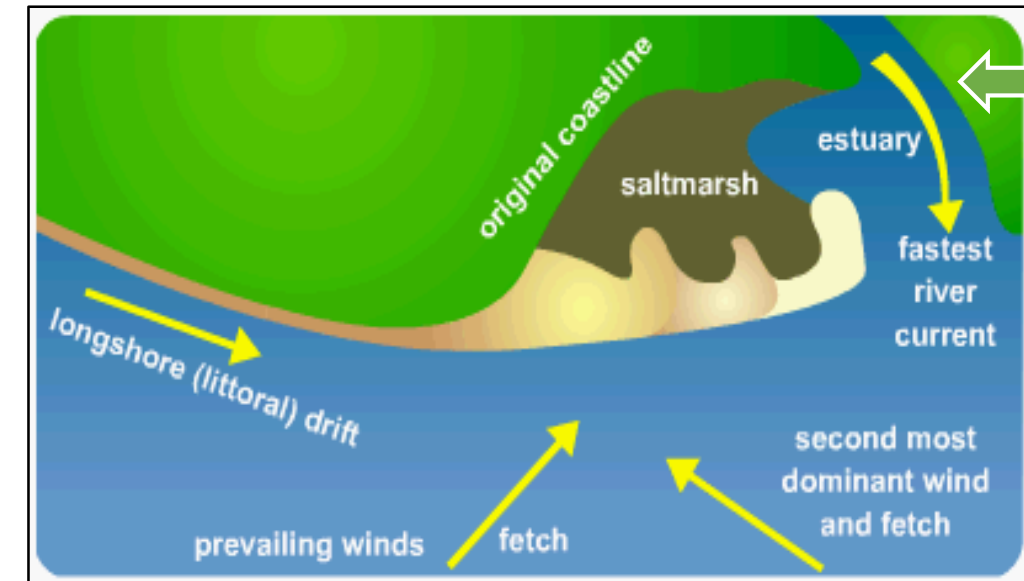
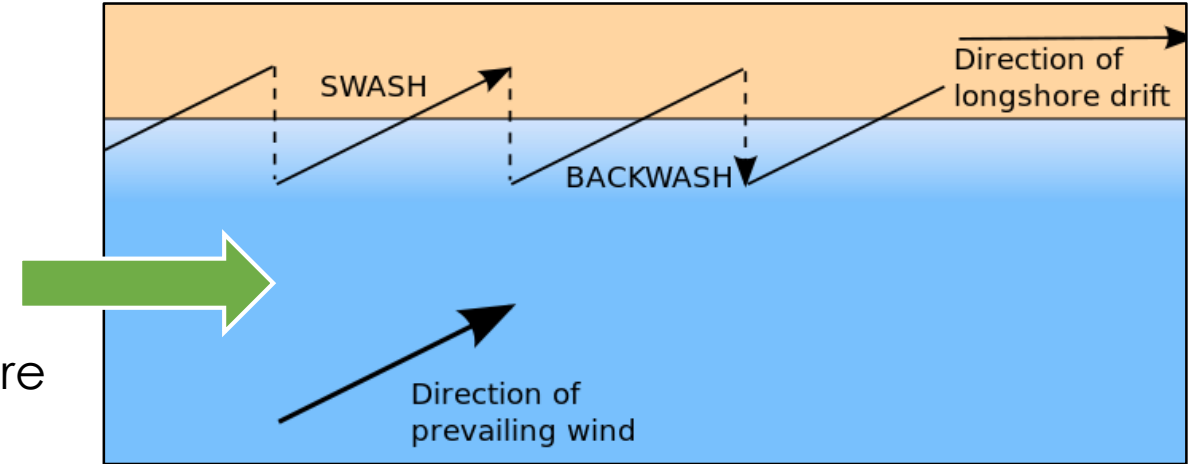


Diagram to show how a sand spit forms.

- **Longshore drift** moves sand along a beach
- When it reaches a break in the coastline it starts to be **deposited** and a **spit** forms
- The spit continues to grow outwards and may form a **hooked end** if the wind direction changes
- Behind the spit in the calm water a **salt marsh** may form
- **The spit will never grow over the estuary due to the moving river water**

Hurst Castle spit is a shingle spit which developed as a result of longshore drift along the Hampshire Coast. The sudden change of the shape of the coastline at Milford on Sea resulted in the development of a spit that reaches over 2km into the Solent.

