GCSE Geography Unit 1

2 Core topics and 1 Optional

Answer all Core questions and those on one Optional section

Core

Theme 1 – Landscape processes

Distinctive landscapes in Wales, Snowdonia, river processes and landforms, flooding, coastal processes and landforms

Theme 2 – Rural-Urban Links

Rural changes, Counterurbanisation, sustainable communities, population change, retailing in cities, global cities

Option

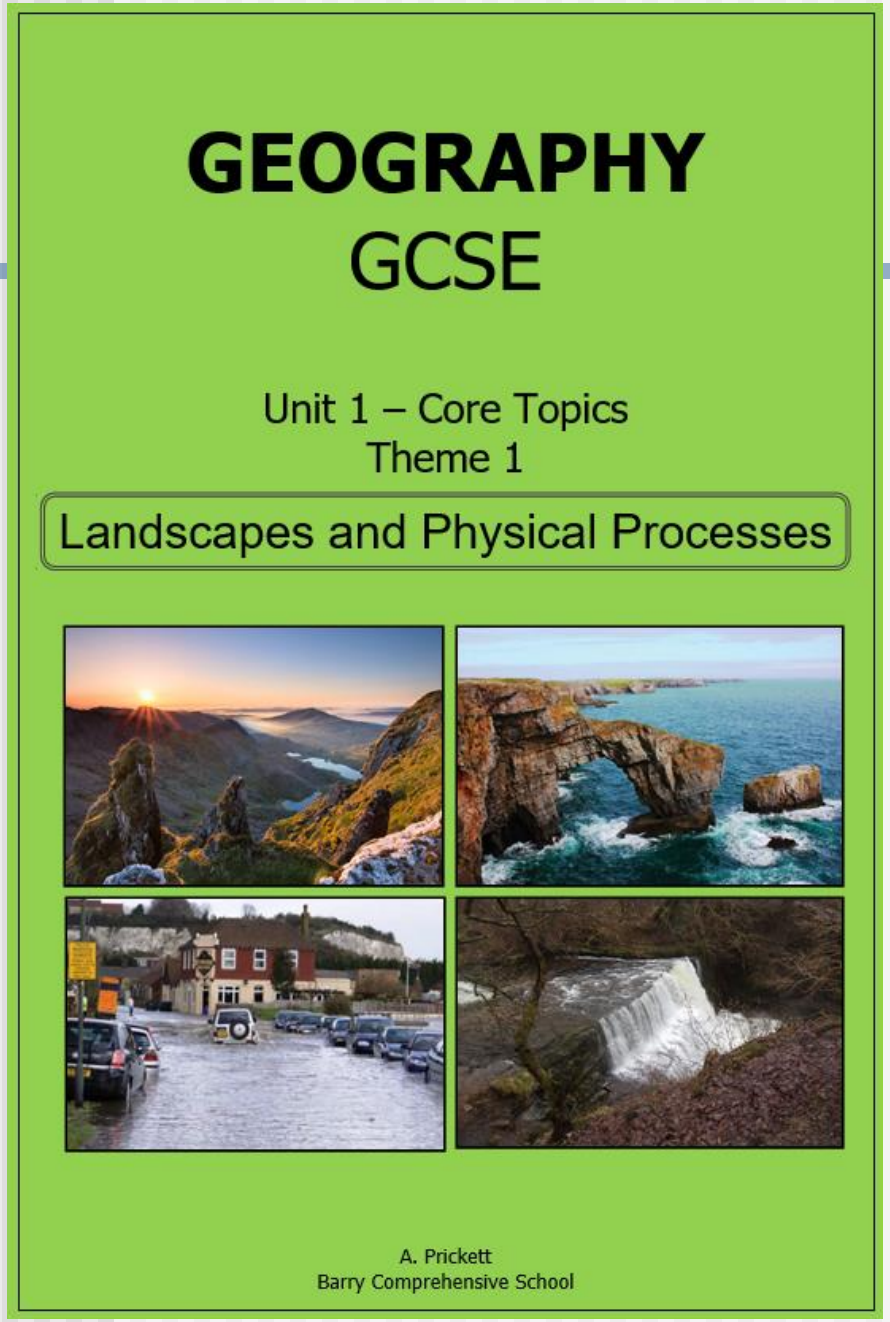
Theme 3 – Tectonic landscapes and hazards

Earth structure and plate boundaries, types of volcanoes, tectonic hazards and reducing the hazards

1 ½ hours = 30 minutes per section

Tuesday 21st May at 1pm

Core Theme 1: Landscape Processes

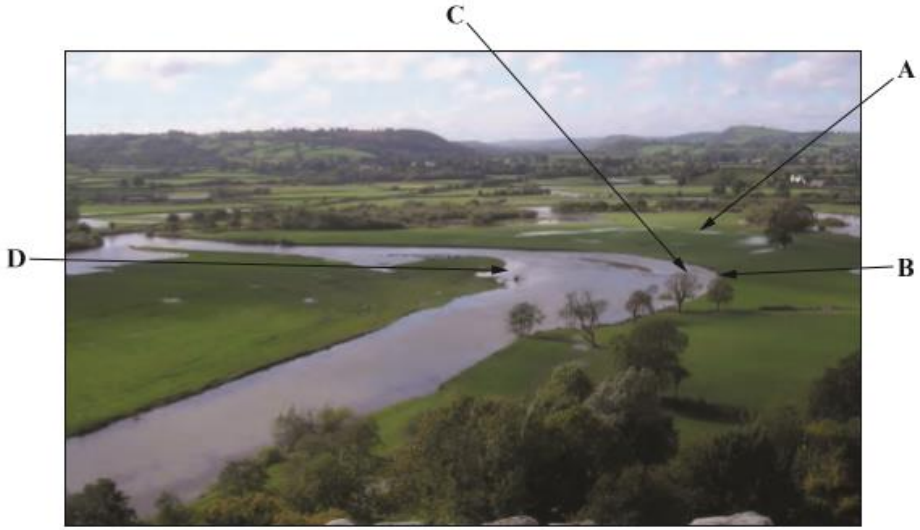


- The distinctive landscapes of Wales
- Case study of Snowdonia
  - Land use
  - Attractions
  - Management and sustainability
- River processes
- River landforms
  - Waterfalls
  - Meanders and ox-bow lakes
  - Floodplains
- River flooding (Boscastle 2004)
- Coastal processes
- Coastal landforms
  - Cliffs and wave cut platforms
  - Caves, arches and stacks
  - Spits
- Factors affecting landform change

Core Theme 1: Landscape Processes

There will be a range of shorter data response questions and longer written answers:

1. *(a)* Study the photograph below.



(i) Put the correct letter in each box to identify each of the statements below. [4]

Use each letter **once** only.

A place likely to flood after heavy rainfall.	
Where the energy level in the channel is at its greatest.	
New land being created by deposition.	
A place where erosion is most likely to be taking place.	

(ii) Name and describe one process by which a river **transports** its load.

Process: .....

Description: .....

.....

(c) Explain why named processes lead to the formation of coastal spits. [8]

(c) Describe some of the management strategies that could be used to protect settlements close to rivers from flood damage. Explain why some people think that these settlements should **not** be protected. [6]

Distinctive landscapes in Wales

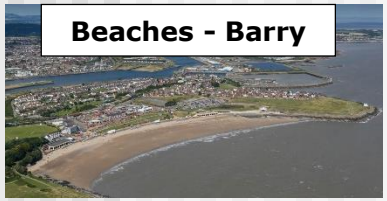
Wales, for a small country has a huge range of **distinctive** landscapes, landforms and unusual natural features. These are found in both **upland** and **lowland** areas of Wales.

Mountains - Snowdon

Glacial features - valleys

Coastal features

Beaches - Barry



Rivers – Severn, Wye

Waterfalls

Lakes - Bala

Lowlands – Gwent levels

Physical landscapes and human activity

Snowdonia is a large **National Park** (protected area of countryside for leisure and recreation) in north Wales. It has been protected since 1951. That makes it the largest, highest and oldest Welsh National Park.

Tourist numbers have increased rapidly in recent years having a number of effects:

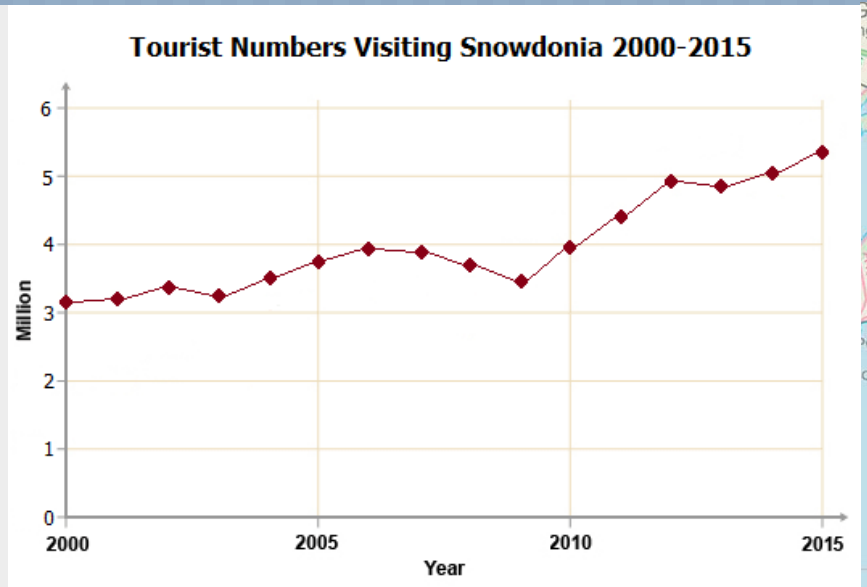
Effects of tourism (**good** or **bad**) can be:

A) Environmental – the **landscape** e.g. air pollution

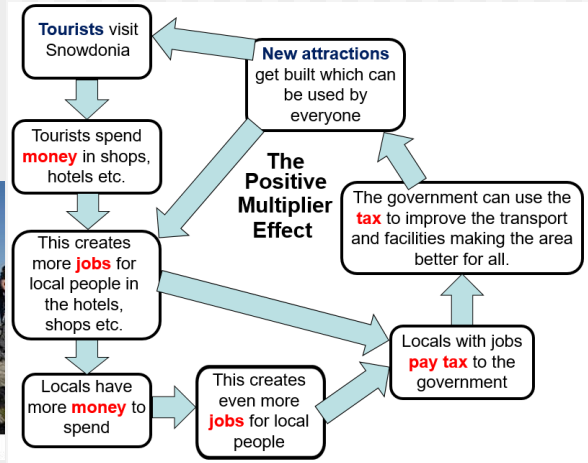
B) Social – **people's lives** e.g. traffic jams and noise

C) Economic – **jobs and money** e.g. new jobs created

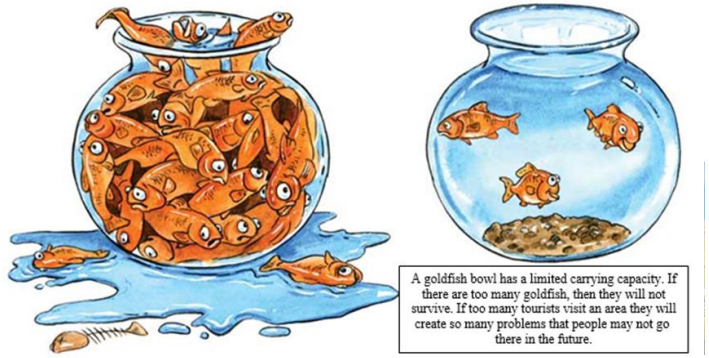
D) Cultural – the unique **local features** e.g. loss of local dance, food



The concept of the **Tourist Honeypot**: An attraction that is so popular that people swarm to it, likes bees to honey. The example shown is Mount Snowdon in August.



So it has been suggested that each location has a **carrying capacity**. This is the number of tourists that an area can cope with, without the area starting to deteriorate.



A goldfish bowl has a limited carrying capacity. If there are too many goldfish, then they will not survive. If too many tourists visit an area they will create so many problems that people may not go there in the future.

Managing landscapes and human activity

Sustainable Tourism is tourism that involves the local people and does not spoil the environment so it can continue for a long time.


Canopy tours, Costa Rica

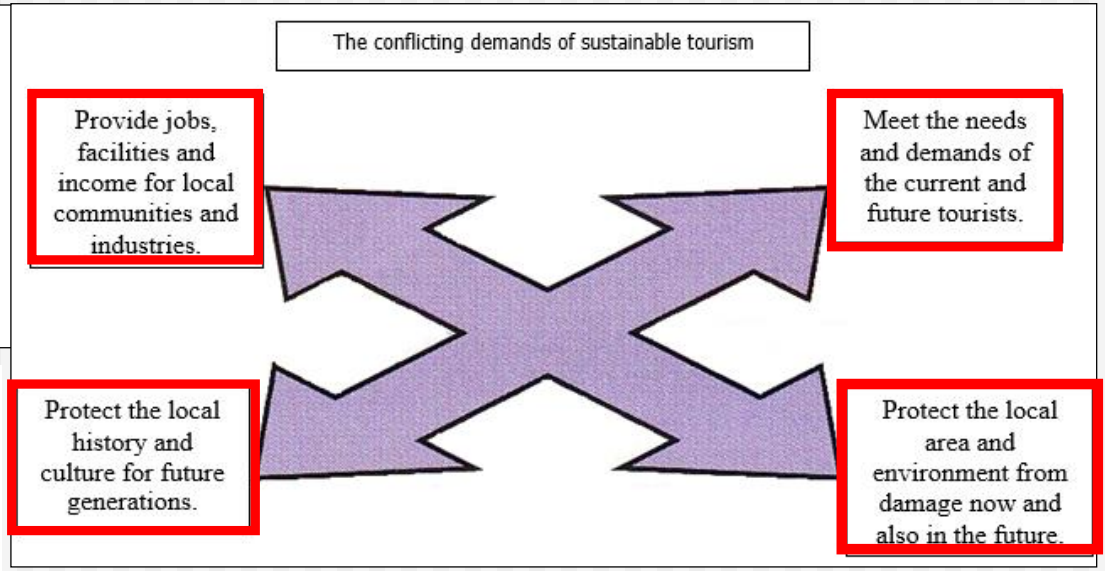

Local dance and music in Ghana


Eco-holidays, Indonesia

Staying with locals in Longsheng Pinyang, China


Renewable energy, Spain

People who try to follow these principles of caring for the environment and protecting the local culture and communities while on holiday, are known as **responsible tourists**.



Example from Snowdonia in North Wales:

1) The water comes from a local stream and so is free and can be used forever.

2) Electricity is produced from solar panels so does not harm the environment and can be used and is renewable.

3) The guesthouse employs local people so that they gain from the tourists coming to visit.

4) The cottage built from local materials (wood, slate and stone) so supports other local jobs.

River Features and Processes

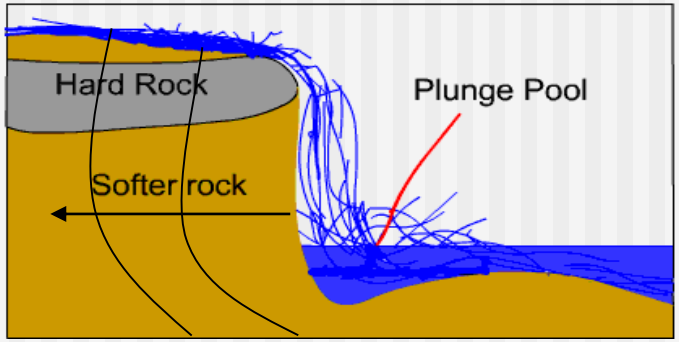
Rivers flow from their **source** in the mountains down to their **mouth**. **Tributaries** join at **confluences** to increase the **discharge**.

Erosion

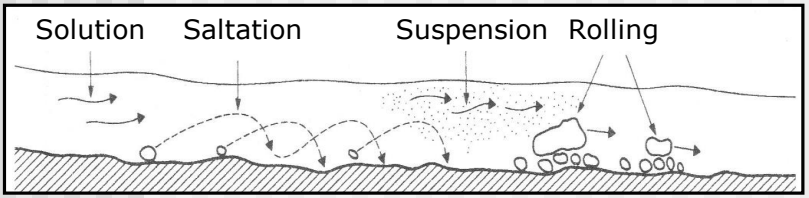
- Hydraulic action
- Abrasion
- Solution
- Attrition of rocks

Landforms

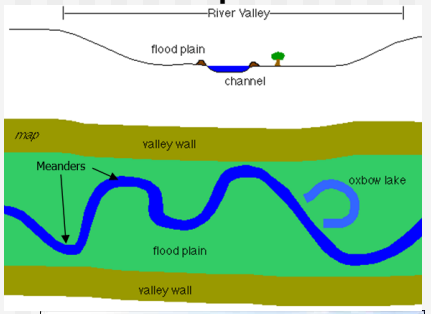
Cap rock waterfall



Transport (same as coasts)

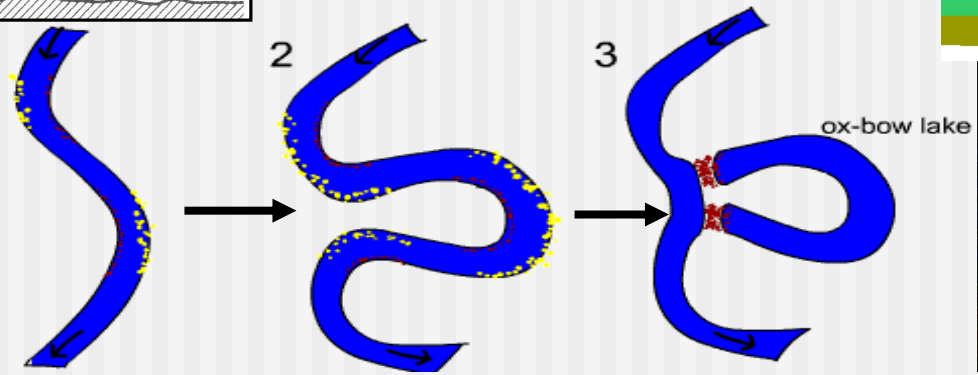


Floodplain



Deposition

Meanders and ox bow lakes



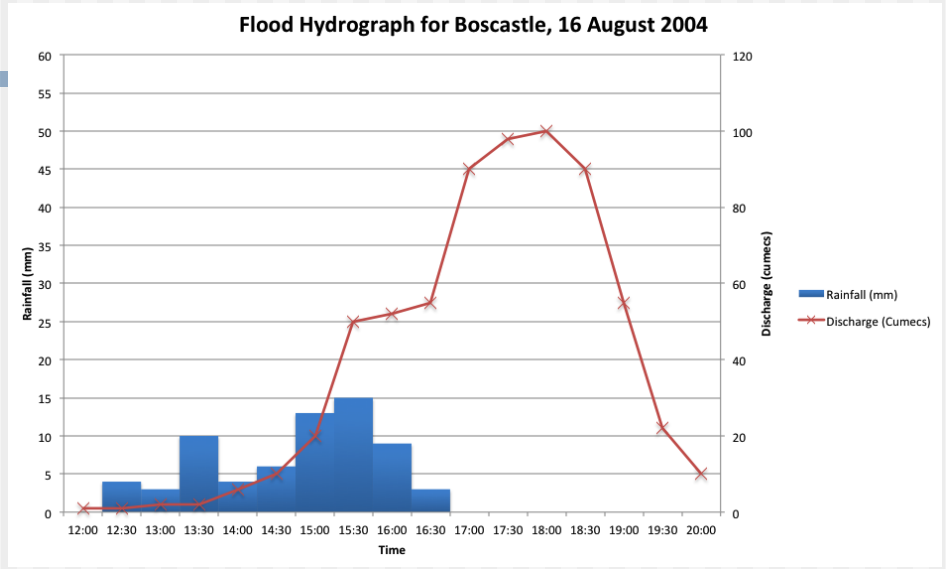
River Flooding

When a river's discharge is too great and the river overflows its banks.
Causes: Heavy, intense rainfall, deforestation, urbanisation, steep land

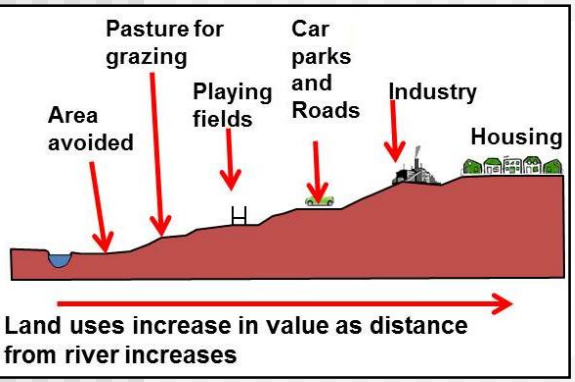
Boscastle 2004

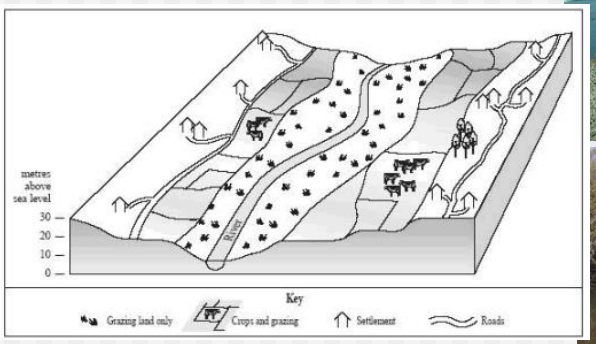
- Flash flood
- One month of rain in 24 hrs
- Only one minor injury

- Over 50 cars swept into the harbour
- Many buildings, bridges, roads damaged



Managing floods: * Dams and Levees * Digging the channel * Overflow culverts * Flood plain zoning/management





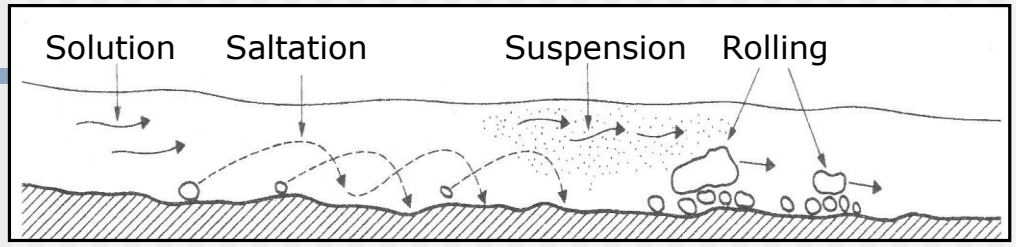
Coastal processes

The sea will erode its bed and the coastline when the energy are high during storms.

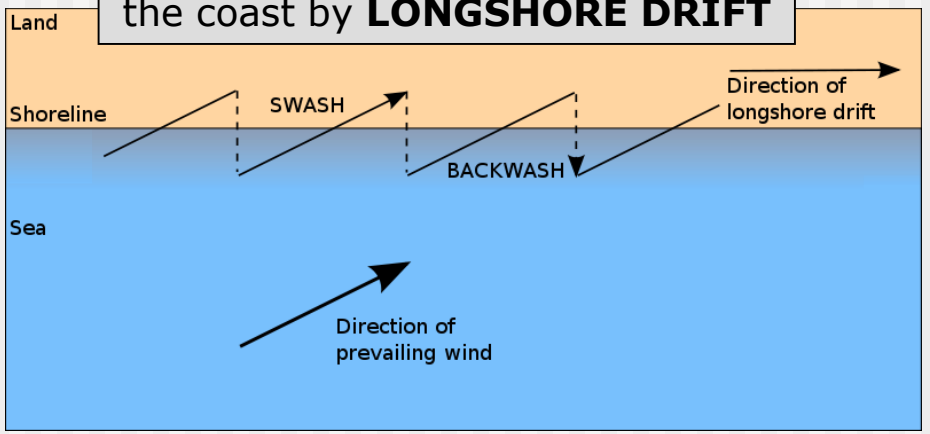
Erosion (same as rivers)

- **Hydraulic action**
- **Abrasion**
- Solution
- Attrition

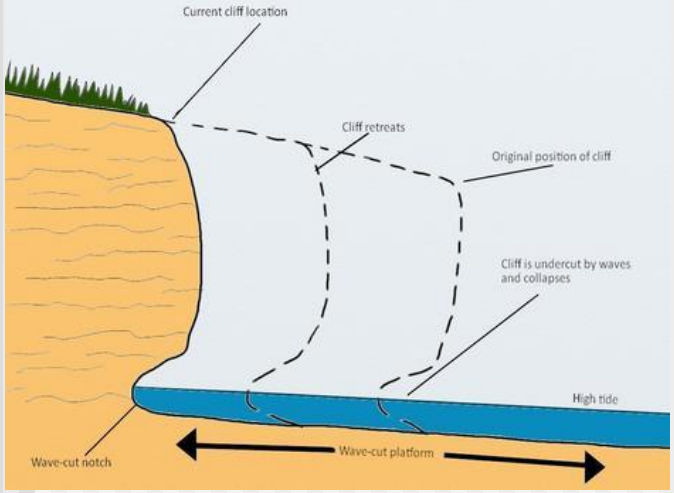
Transport (same as rivers)



However material is moved along the coast by **LONGSHORE DRIFT**

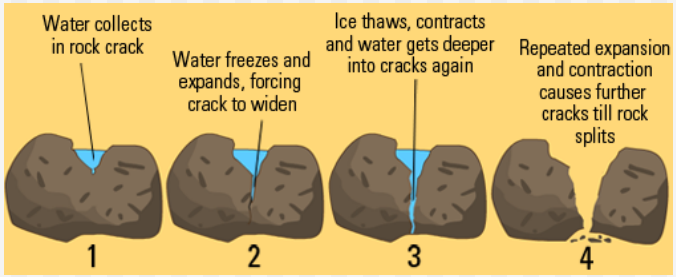


Cliffs: eroded at the base (**wave-cut notch**) and start to recede. Eventually the cliff collapse. The top of the cliff being attacked and broken apart be **weathering**.



Weathering

Physical e.g. Freeze-thaw



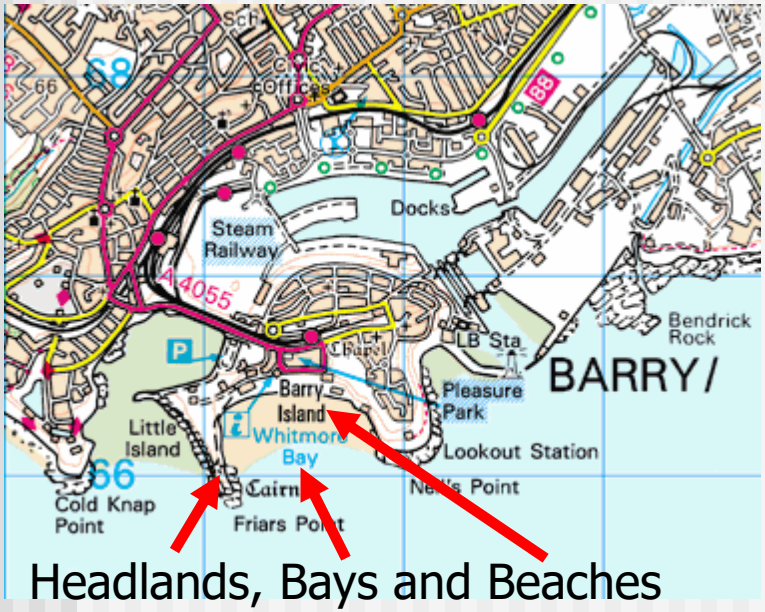
Chemical

Coastal Landforms

Features formed by erosion or deposition along the coastline.

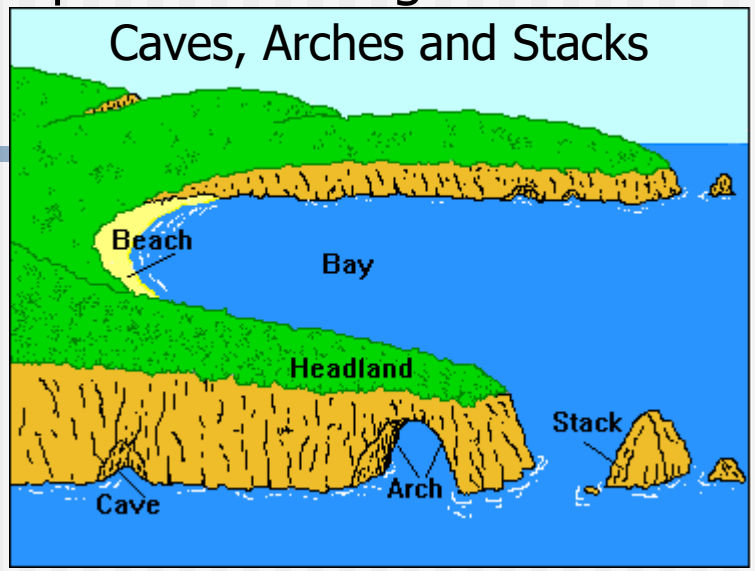
Erosional landforms

Cliffs and wave-cut platforms



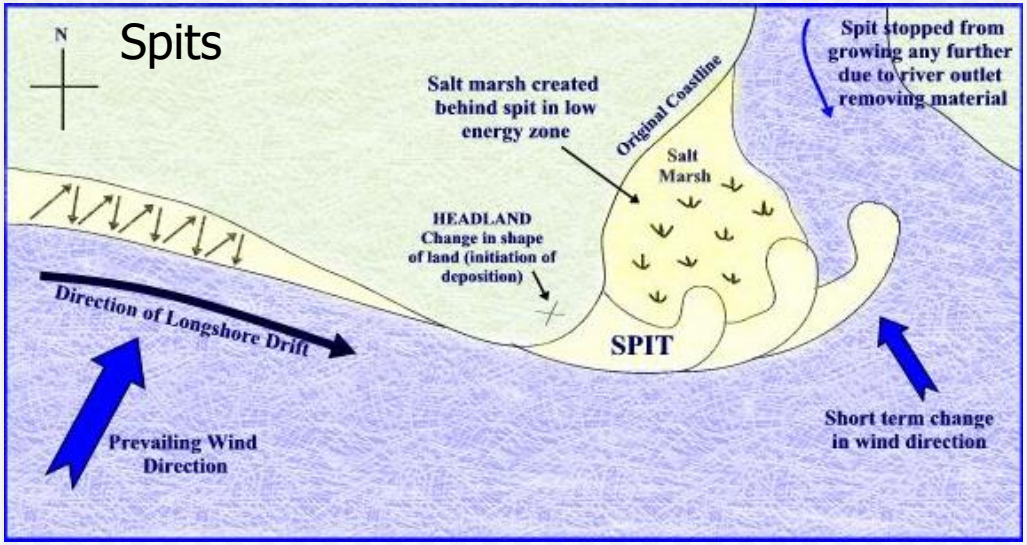
Headlands, Bays and Beaches

Caves, Arches and Stacks



Depositional landforms

Spits

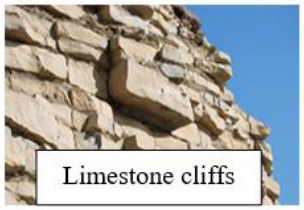


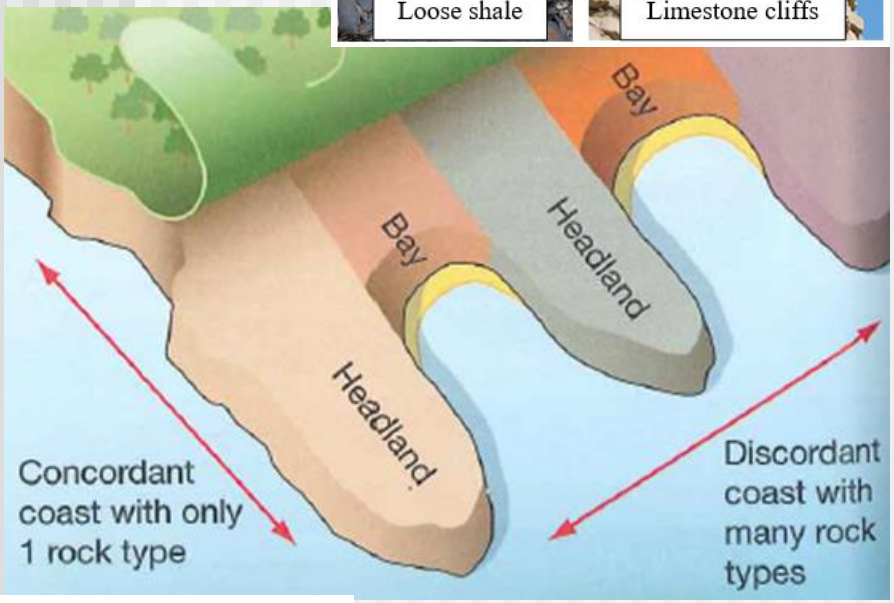
Factors affecting the rate of landform change

There are a number of factors which will affect the speed at which both river and coastal landforms will change. These include:

1) Geology


Loose shale


Limestone cliffs

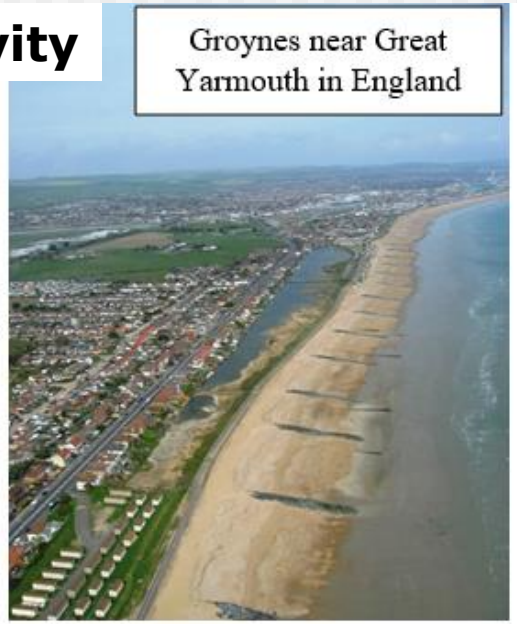


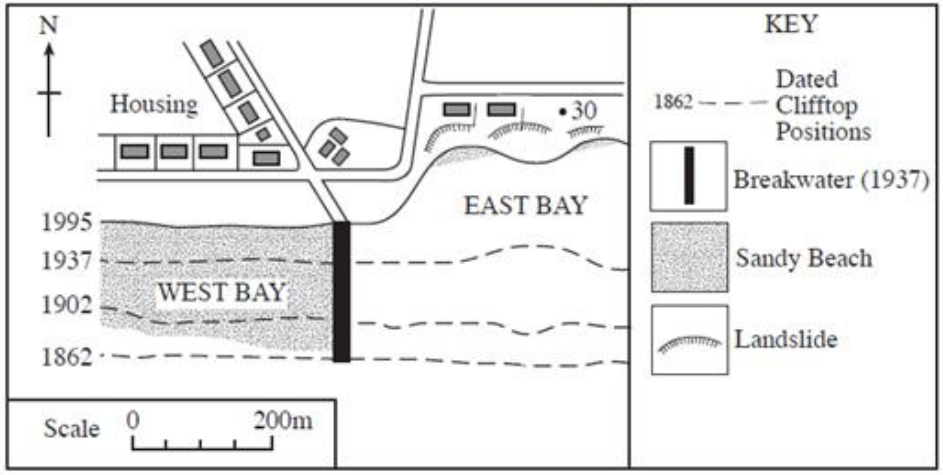
2) Climate


Scwd yr Eira waterfall in the Brecon Beacons in summer and winter

3) Human activity

Changes made along the coast will affect processes such as erosion and longshore drift. This can affect landforms and people further along the coast.


Groynes near Great Yarmouth in England



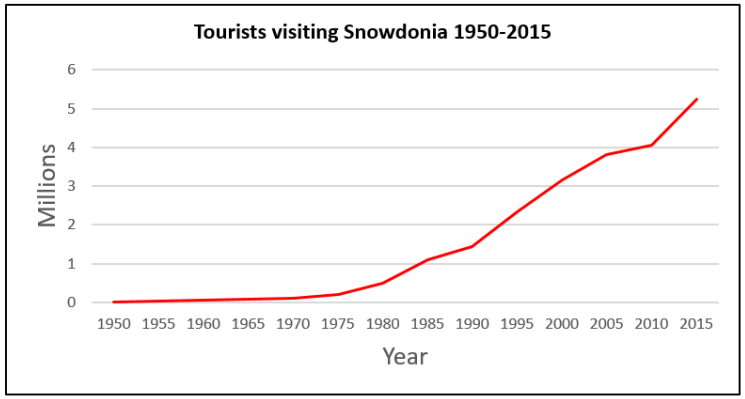
Core Theme 1: Landscape Processes

Types of question:

(a) Study the photograph below.

(i) Name the landform shown on the photograph.
Underline the correct answer below.

spit *cliff* *stack*



1) Describe the change in the number of tourists visiting Snowdonia. (3)

.....

.....

(ii) Describe how sea conditions may contribute to erosion along this coastline. [2]

.....

.....

.....

(iii) Explain how the type of rocks, shown on the photograph, can also result in rapid erosion. [3]

.....

.....

.....

.....

.....

8) Read the article below:

Many 'honeypot' tourist areas are having to think of new ideas in order to try and solve some of the problems created by the sheer number of people. These ideas should help to make tourism more **sustainable**. Snowdonia National Park has been trying many new ideas such as:

- Offering more 'off peak' holidays at discount prices.
- Running all public transport (buses, trains etc.) on gas and electricity.
- Encouraging the growth of guest houses and rural farm tourism.
- Employing local tourist guides and helpers in the city.

c) Explain how two of the ideas in the article might help to make tourism in Snowdonia more **sustainable**? (6)

Idea 1: _____

.....

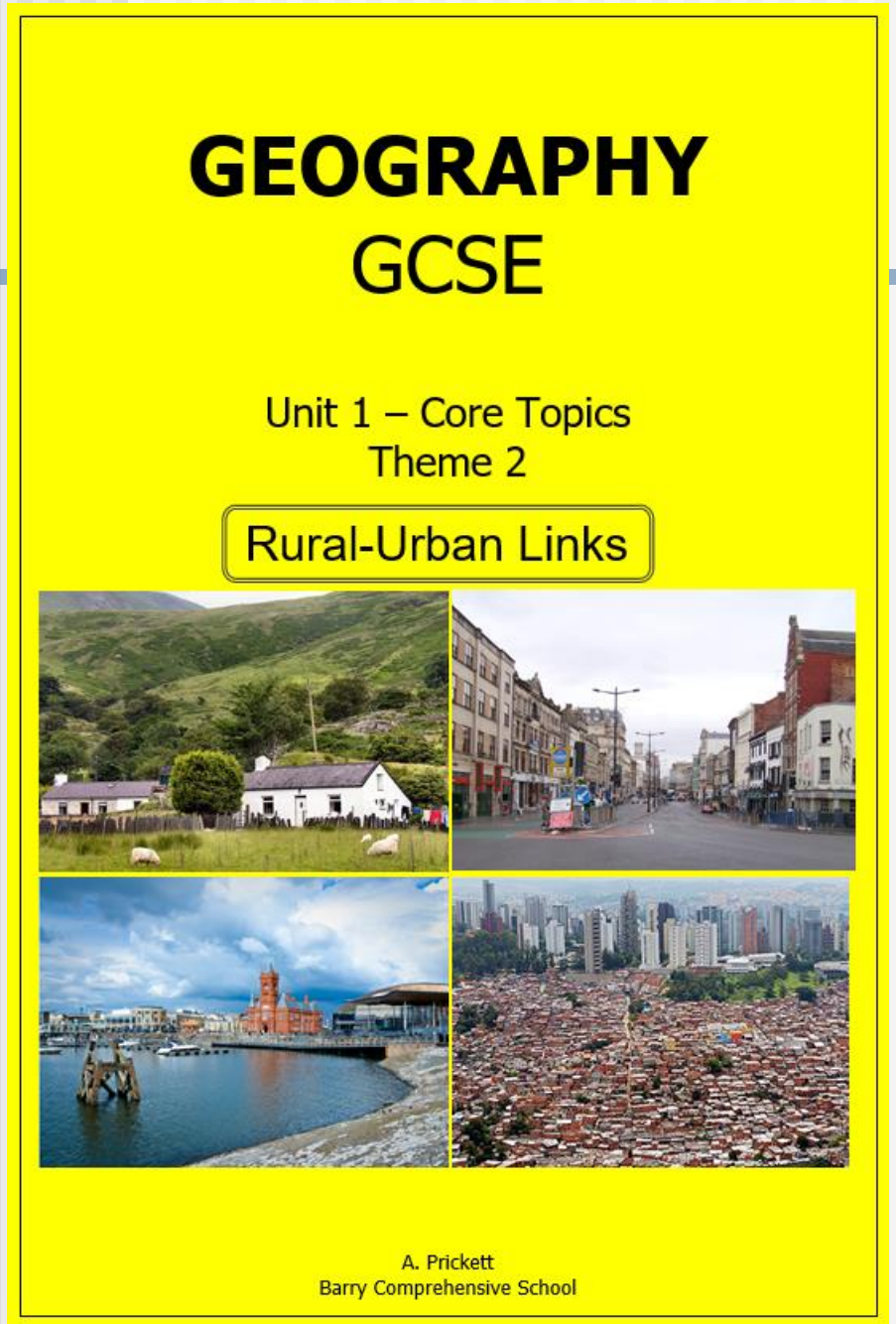
.....

Idea 2: _____

.....

.....

Core Theme 2: Rural-Urban Links

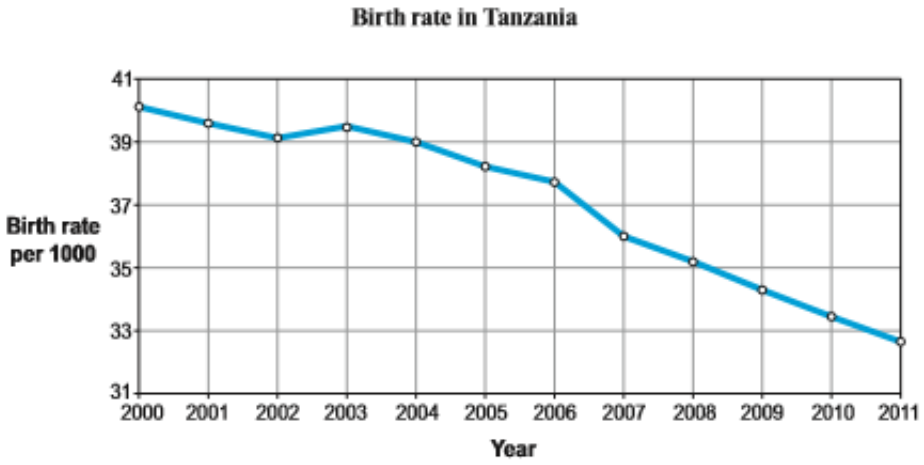


- Rural and Urban areas of Wales
- Urban-Rural Continuum
- Counterurbanisation
  - Push and Pull factors
  - Vale of Glamorgan
- Decline in Rural areas
  - Cycle of decline
  - Sustainable rural villages (Pwllglas)
- Population change
- Ageing Population
- Sustainable Urban living
  - Cardiff Bay
- Retailing in cities
- Urban issues in global cities
  - What is a global city?
  - Mumbai
  - Bhendi Bazaar redevelopment
  - Cardiff

Core Theme 2: Rural-Urban Links

There will be a range of shorter data response questions and longer written answers:

(b) Study the graph below.



(i) Describe the change in Tanzania's birth rate since 2000. [2]

(ii) Suggest **two** reasons why this may have happened. [2]

Reason 1 .....

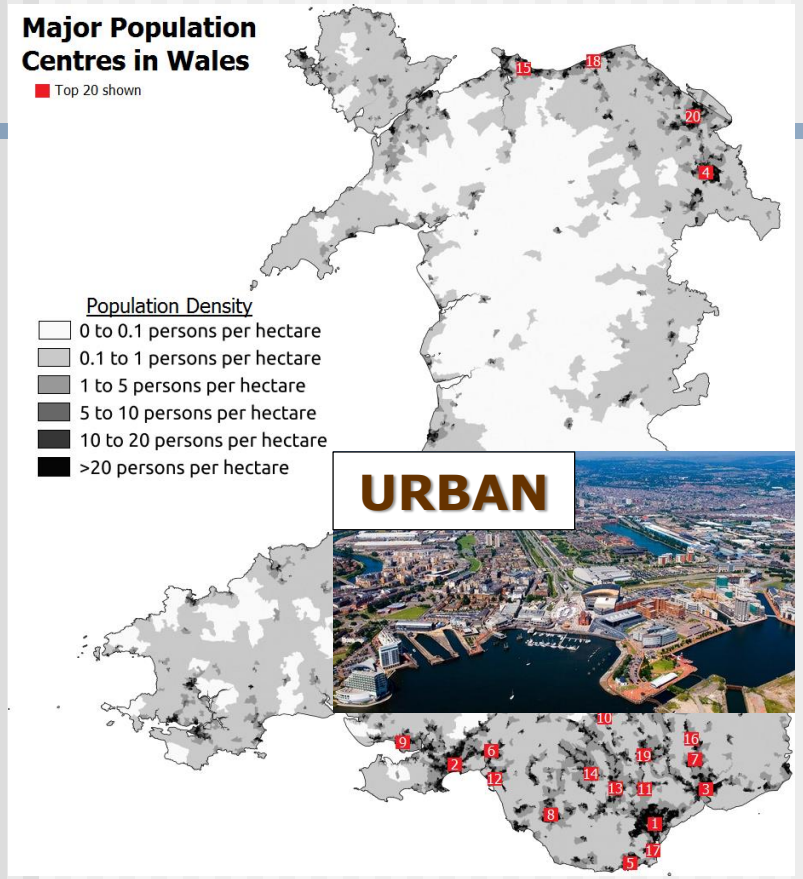
Reason 2 .....

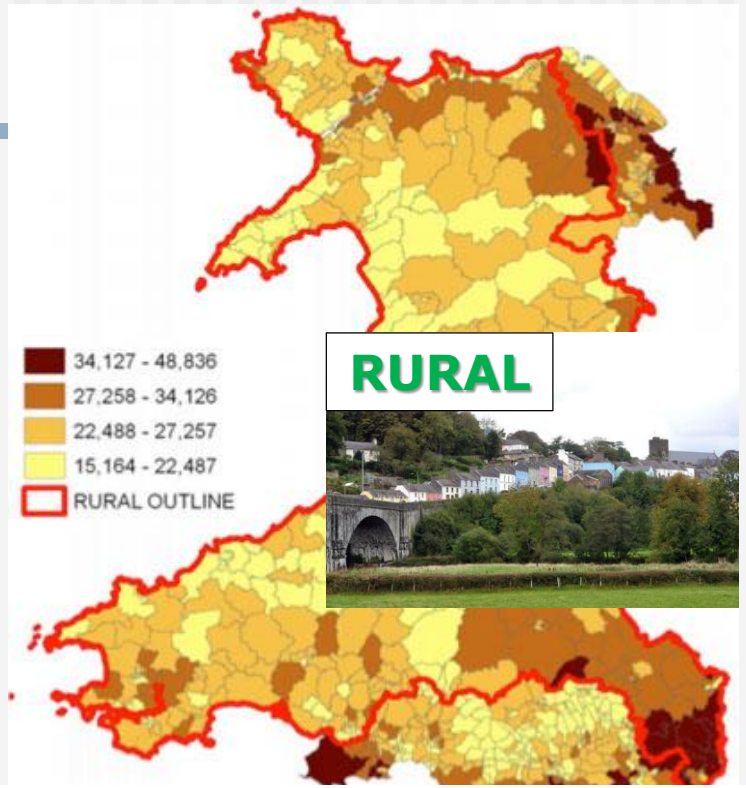
(b) Study the photograph below which shows a pedestrianised zone in a city centre.

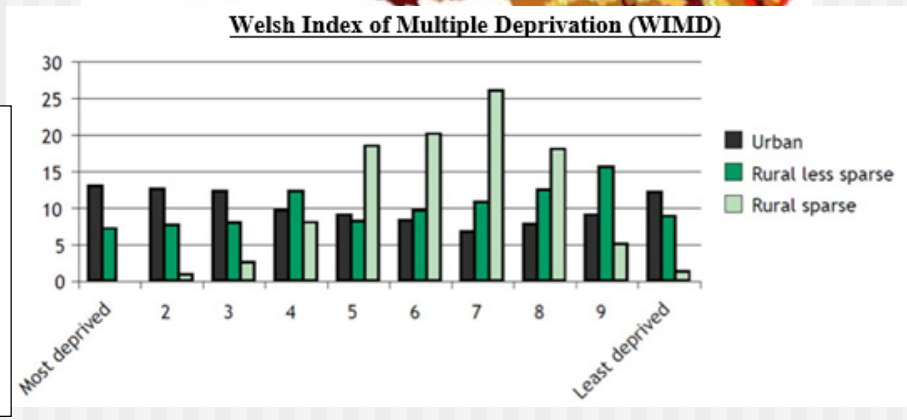
Explain why pedestrianisation and other **named** recent changes have attempted to make city centres more attractive to shoppers. [6]

Rural and Urban areas of Wales

Wales has a variety of both Urban (built-up) and Rural (countryside) areas.



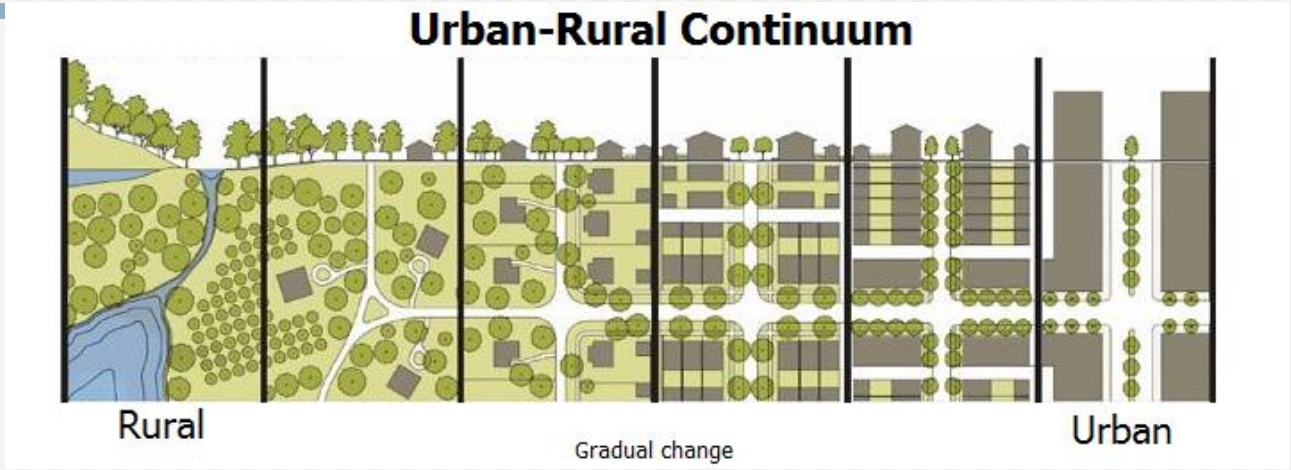




The Welsh Index of Multiple Deprivation looks at housing, income, unemployment and access to services such as healthcare. This clearly shows us that overall **rural** areas suffer less deprivation than **urban** areas today.

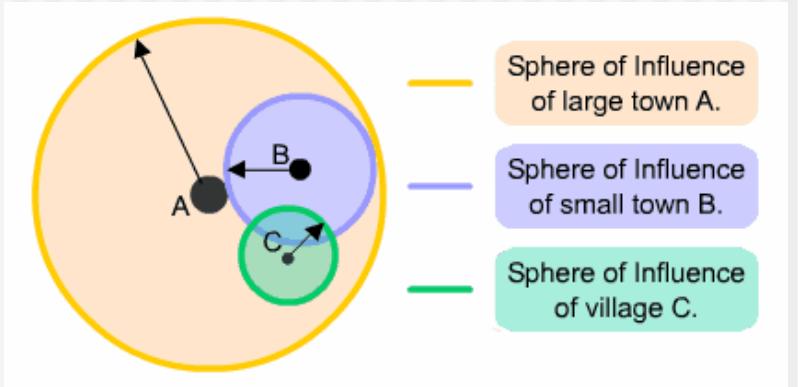
Urban-Rural Continuum

Today the boundary between **urban** and **rural** areas has become much less clear and there is now a gradual change between the two. This is known as the **urban-rural continuum**.



Sphere of Influence

The **urban-rural continuum** has happened as people have become more able to travel long distances, **commuting** to work in the city, while living in the countryside. Cities have a bigger influence on the surrounding countryside with big shopping centres, hospitals and colleges attracting people from a wider area.



Core Theme 2: Rural-Urban Links

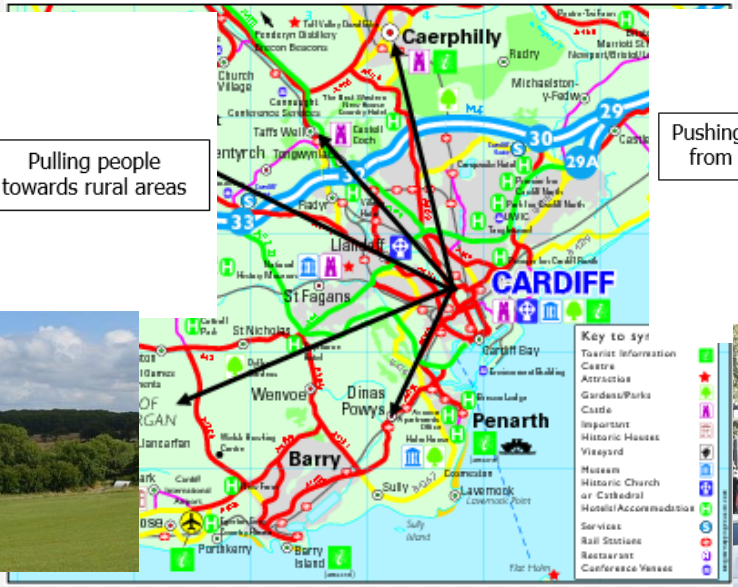
Counterurbanisation

In the UK people are often choosing to leave the cities (**urban**) and **migrate** (move) into countryside areas (**rural**). This is called **Counterurbanisation**.

PULL Factors

* More open space
* Quieter environment
* Less traffic
* Better quality housing
* More relaxed lifestyle
* Nice area to retire

Pulling people towards rural areas



Pushing people away from urban areas

PUSH Factors

* Noise pollution in cities
* Traffic problems
* Overcrowding
* House prices
* Crime
* Air pollution
* Lack of open space

Traffic Issues

Increased **commuting** has led to an increase in traffic congestion in cities such as Cardiff.

BBC NEWS

Last Updated: Wednesday, 7 June 2006, 05:24 GMT 06:24 UK

E-mail this to a friend Printable version

City traffic 'worse than London'

Rush-hour motorists in Cardiff are spending more than half their time stationary during their morning commute to work, a survey has revealed.

St Mary Street is one of the busiest roads in Cardiff city centre

Of six cities studied by Citroen, including London, Cardiff jams were worst, with drivers spending more than 30 minutes at a standstill in an hour.

Possible solutions

- Introducing flexible working to spread the traffic through the day.
- Improving public transport e.g. tram or metro system, bendy buses.
- Creating bus and cycle lanes and park & rides schemes.
- Introducing congestion charging as in London.

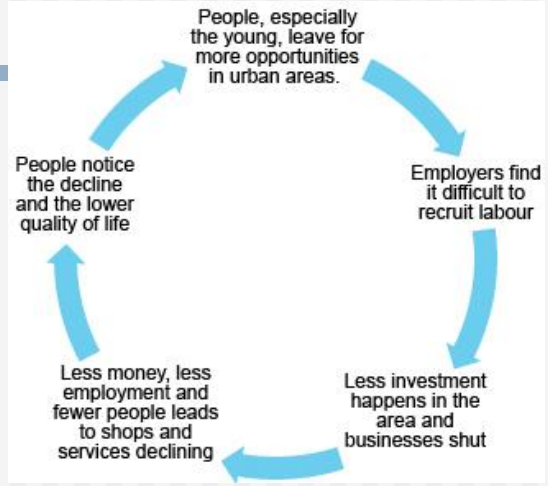
Core Theme 2: Rural-Urban Links

Rural Decline and Sustainability

Rural areas in Wales are changing in many ways:

* Loss of traditional jobs
* Rural de-population
* Decline in services
* Second homes increasing house prices

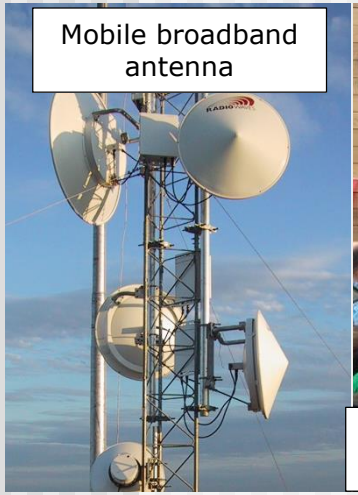
These changes hit the less accessible (remote) rural areas more and lead to a **cycle of decline** and ultimately to rural **poverty** and **deprivation**.



Creating sustainable rural communities

Bus services re-introduced

Old primary school converted to small sports and community hall



Mobile broadband antenna

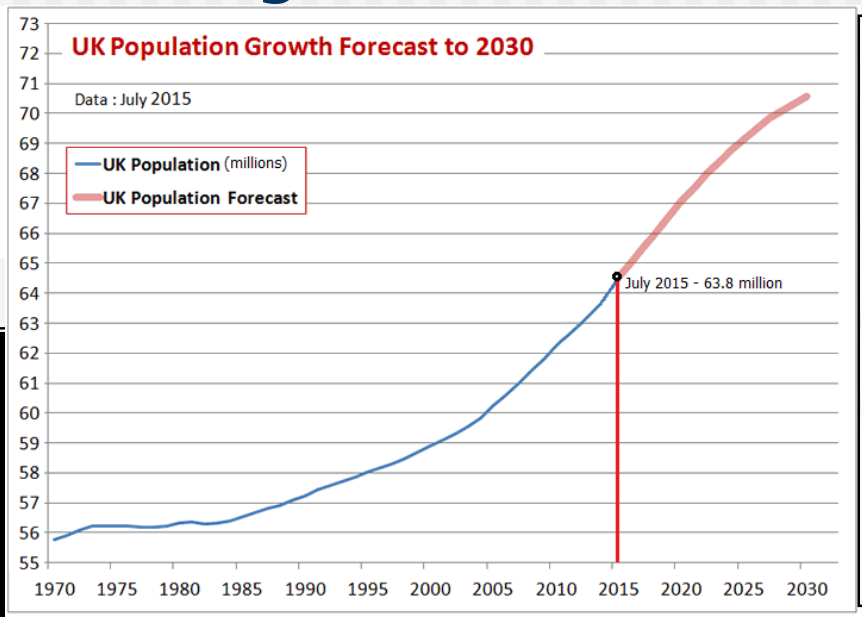
Community shop and café set up selling local farmers' produce

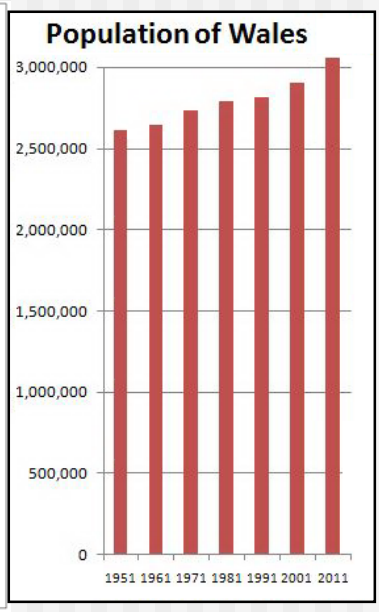
The shop and café are now a centre for local events and employ 12 local people

Local pub re-opened

Population Change and its Issues

The population of both Wales and the UK have increased and are predicted to continue to do so.





Why does population change?

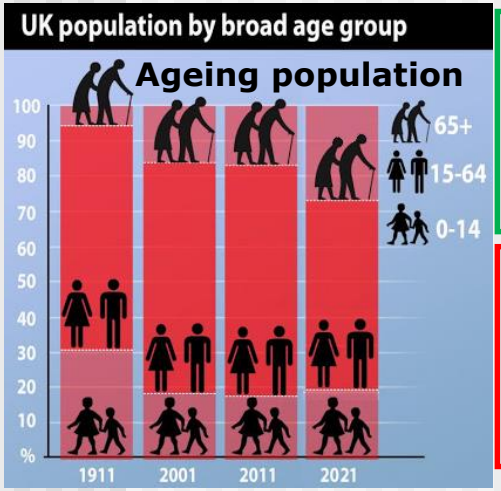
Birth rate = Number of births per year per 1000 people

Death rate = Number of deaths per year per 1000 people

Natural increase:

Birth rate – Death rate

* **Migration** in/out of a country



Challenges of population changes

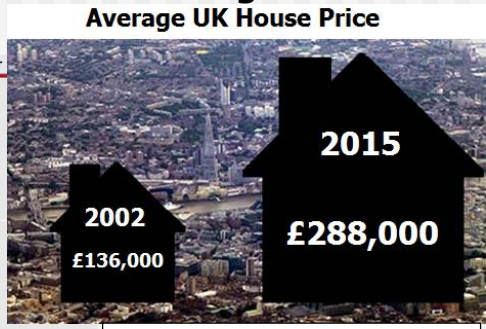
Possible benefits:

* Older people could work longer
* Can use skills to train others
* Act as carers for grandchildren

Possible problems:

* Lack of taxpayers in the UK
* More strain on healthcare
* Pension costs rising

Lack of housing

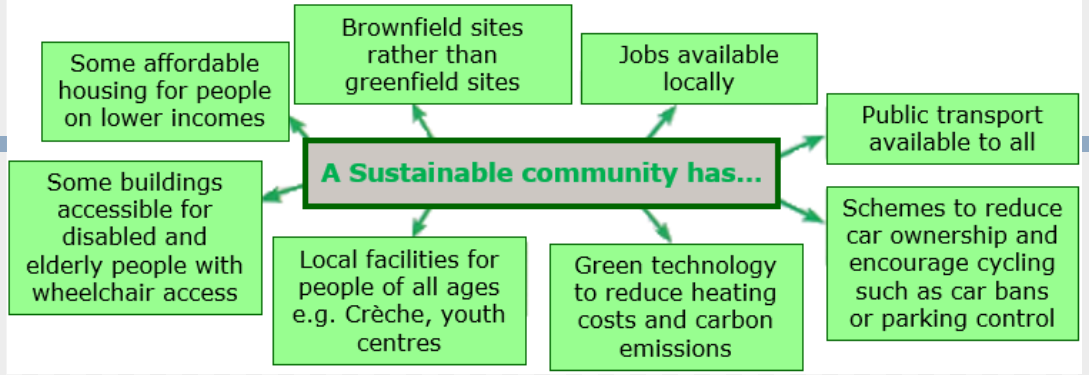


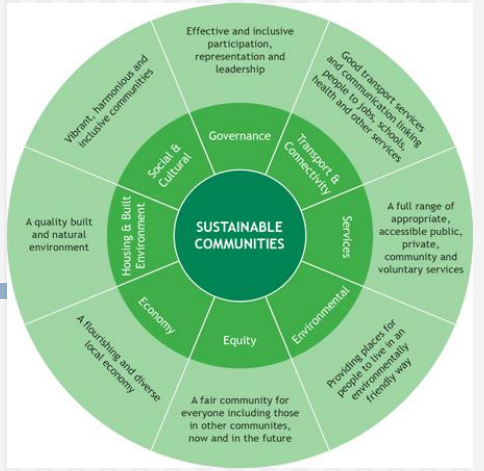
More houses need to be built and land made available. Use **Brownfield** sites and build new sustainable towns.

Core Theme 2: Rural-Urban Links

Sustainable Urban living

A sustainable community is illustrated by Egan's wheel:

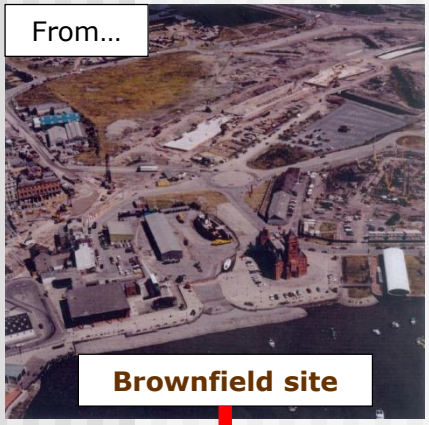




e.g. BedZED

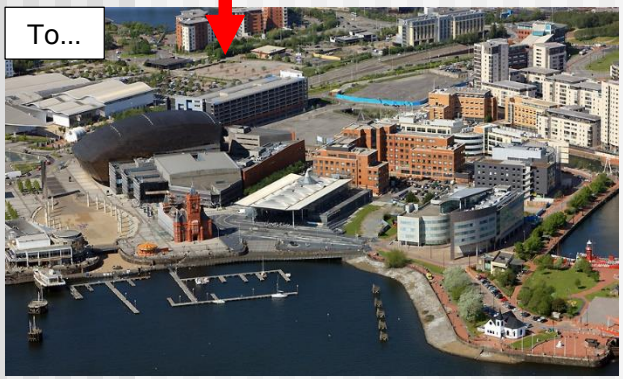
Cardiff Bay Redevelopment

From...



Brownfield site

To...



<u>Improvements made:</u>

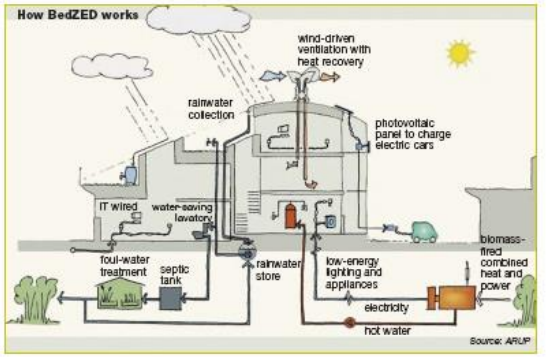
Economic: 1,000s of jobs, wages increased, new businesses move in.

Environmental: Parks and green areas created, old buildings replaced, nature reserve created, barrage created lake.

Social: New flats and houses built, better facilities, reduced crime and littering.

<u>Has it been successful?</u>

Not all! – some former residents forced to move or couldn't get new jobs. Less social housing available for poorest. Not all developments are sustainable.

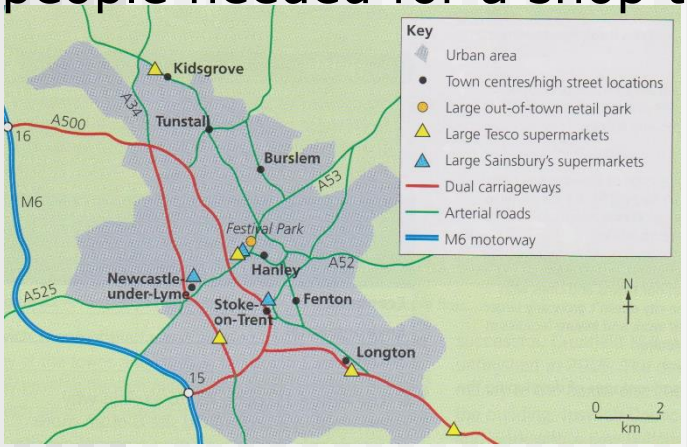


Latest development: **Porth Teigr** - **Sustainable**

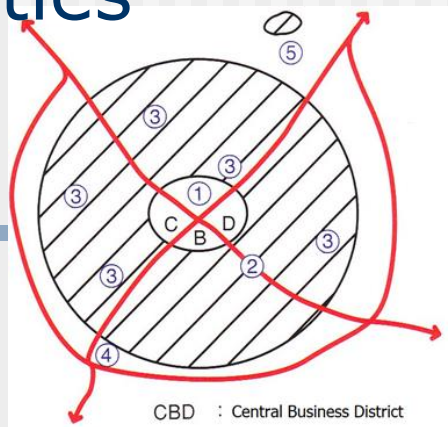
Retailing in Cities

Retailing (the buying or selling of goods or services) is changing, but is still found in certain locations within a city.

Threshold population is the number of people needed for a shop to be successful.



Online retailing is putting huge pressure on traditional shops and shopping areas. Many stores are closing.




1 – Central Business District


2 – Shopping parades


3 – Corner shops


4 – Out-of-town stores


5 – Village shops

How can towns fight back?

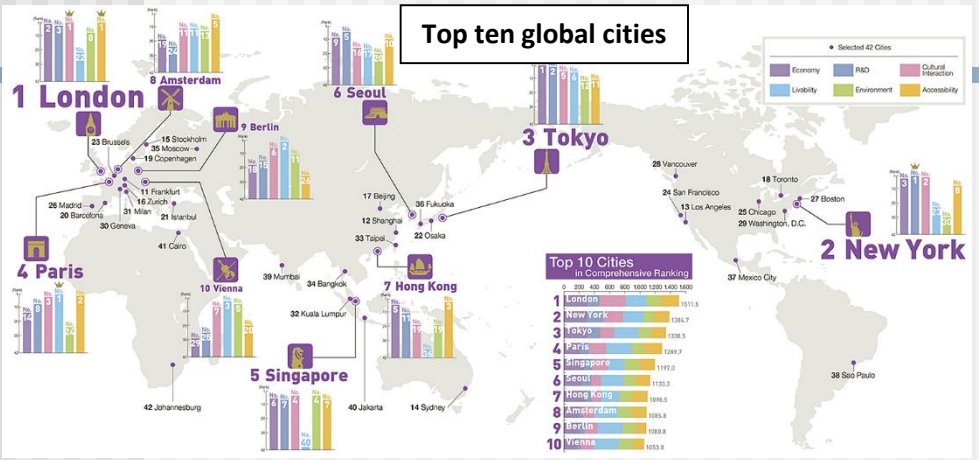
- Pedestrianise roads to make it safer and cleaner
- Improve public transport and parking (park & ride)
- Improve environment – plant trees add benches
- Entertainments and events such as market days
- More cafes, restaurants and indoor shopping

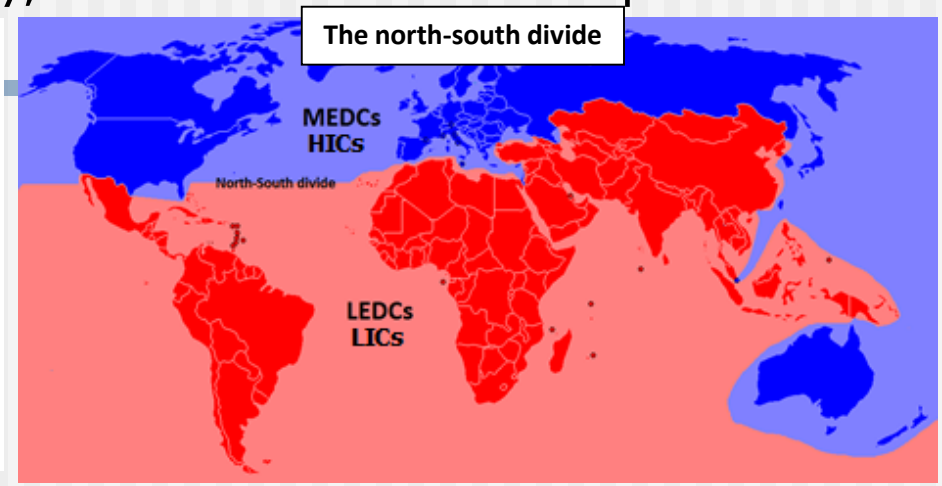
Out of town developments e.g. Culverhouse Cross

Cheap land on Greenfield sites

Urban issues in Global Cities

Global cities are cities with a global reach and influence due to their trade, tourism, culture, history, infrastructure or transport.





Mumbai is growing because:

Natural increase (high fertility rate)

Rural-Urban migration from poorer states in India

PUSH from poorer states

* Poor farming regions
* Few different jobs
* Poor education/health care
* Poor living conditions

PULL of Mumbai

* Variety of jobs
* Good health care and education
* Opportunities
* Better facilities (water, electricity)

Core Theme 2: Rural-Urban Links

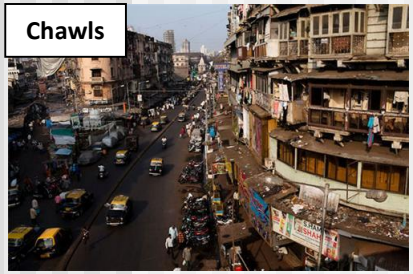
Urban issues in Mumbai

Transport – Mumbai has over 7 million daily commuters and under developed roads and railways leading to huge overcrowding and congestion.

Employment – Many people in India work in **informal** jobs, unlike the UK where most jobs are **formal**.

Formal and **informal** jobs in Mumbai.
1) Call centre workers are university graduates who all speak fluent English.
2) A young rag picker in Dharavi (one of the largest slums) sorting recycled plastics for sale.
3) Men clean and recycle old oil drums on the street. These will be used for food and water storage.

Housing – There are three main housing types:



Bhendi Bazaar sustainable redevelopment

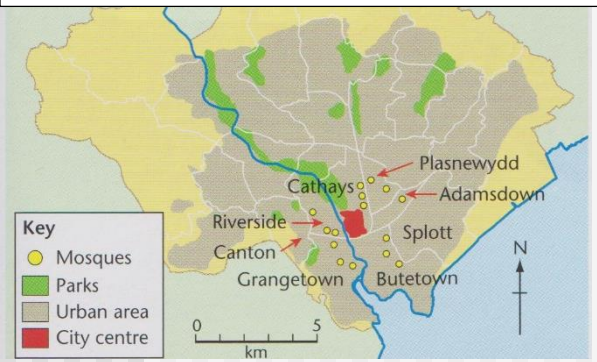
Taking an area of chawls and rebuilding modern flats for families with up to date facilities and a mix of shops and open space. All have toilets, showers and are solar powered.

Core Theme 2: Rural-Urban Links

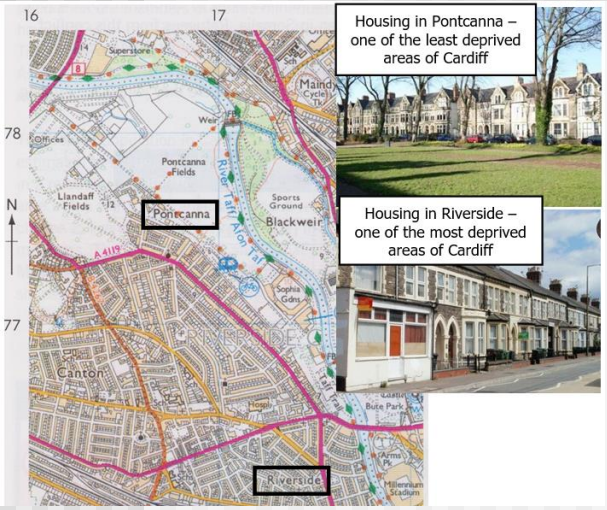
Urban issues in Global Cities

Cardiff is considered a global due to its tourism, culture, history, sport and being the seat of the Welsh Assembly

Ethnic minorities – Cardiff has a large, vibrant ethnic minority community. Mainly centred around the Grangetown, Riverside and Butetown areas.



Wealth/Poverty – Cardiff has a big gap between its wealthiest and poorest communities. There are pockets of **deprivation** within the city.



Think back to the work on the Cardiff Bay redevelopment scheme. This was an attempt to develop a deprived area of Cardiff and improve the housing (**social**), environment (**environmental**), employment and transport there (**economic**).

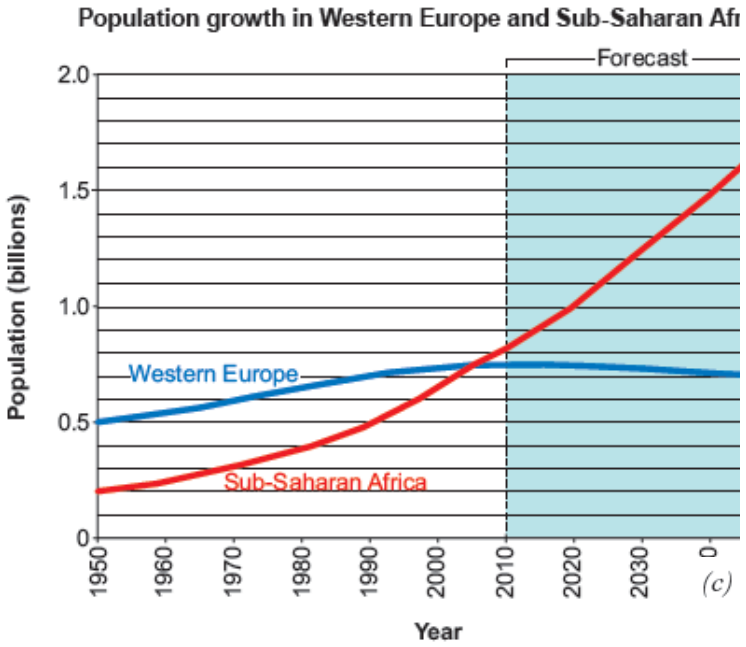
Did everyone benefit?

Who were the winners and losers?

Core Theme 2: Rural-Urban Links

Types of question:

4. (a) Study the graph below.



(c) Study the photograph below which shows a rural area in the UK.

Explain why many Western European countries face an increasingly **ageing population**. Use one or more examples to illustrate your answer. [6]

(c)

(i) Complete the paragraph below by adding answers from the box

higher	*slower*	*1.75 billion*	*0.75 billion*	*fa*
ten billion	*one billion*	*lower*		

The graph shows that in 1950 the population of Sub-Sal
0.3 billion ..... than Western Europe
it has grown at a ..... rate than
population. Population in the two regions was the same in 2(
levelled out in Western Europe. It is forecast that population in S
will continue to rise rapidly, reaching .....

Options Theme 3: Tectonic Landscapes and Hazards

GEOGRAPHY
GCSE

Unit 1 – Optional Topic
Theme 3

Tectonic Landscapes and Hazards

A. Prickett
Barry Comprehensive School

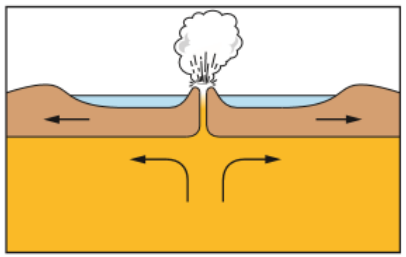
- The structure of the Earth
- Plate movement
- Types of plate boundary/margin
  - Constructive (rift valleys, shield volcanoes)
  - Destructive (subduction, fold mountains)
  - Volcanic hotspots
- Smaller scale volcanic features
- Vulnerability and Risk
- Earthquake hazards
  - Primary: Ground shaking, liquefaction
  - Secondary: Fires, tsunamis
- Volcanic hazards
  - Lava, ash, pyroclastic flows and mudflows
- Reducing the risk from hazards
  - Short term – recovery and control
  - Longer term – building, planning, monitoring, prediction and preparation

Options Theme 3: Tectonic Landscapes and Hazards

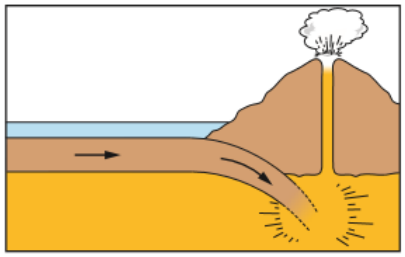
There will be a range of shorter data response questions and longer written answers:

3. Study the two diagrams below.

Constructive margin



Destructive margin

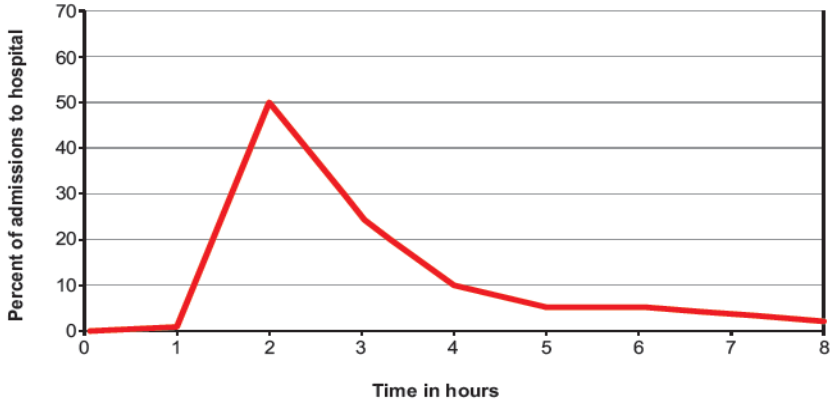


(a) Complete the following paragraph by using the words in the word box below. [4]

volcanoes	*crust*	*rift valleys*	*energy*	*magma*
destructive	*core*	*conservative*	*constructive*	

(b) Earthquakes occur on destructive plate margins. Study the graph below.

Predicted hospital admissions following an earthquake



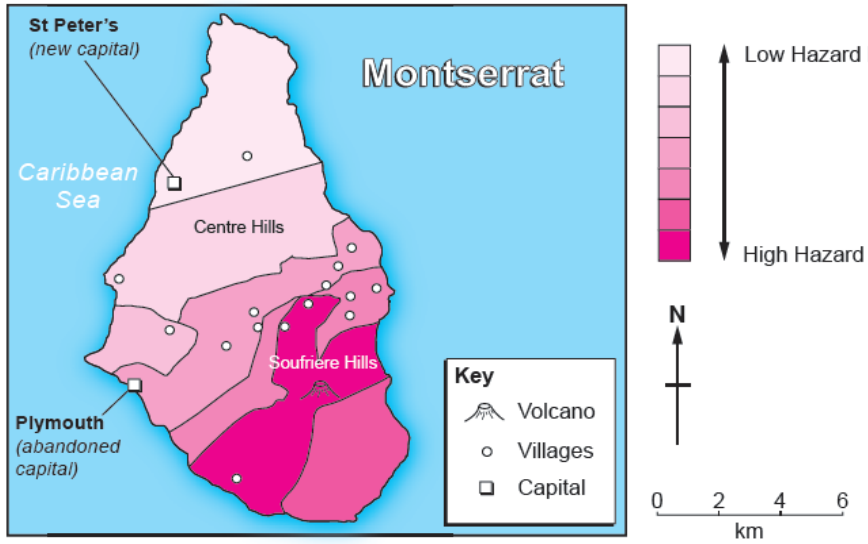
(i) Describe how the percentage of admissions to hospital changes during the eight hours after the earthquake. [2]

(b) Explain how the impact of earthquakes on people's lives may be reduced. Use one or more examples to illustrate your answer. [6]

(c)

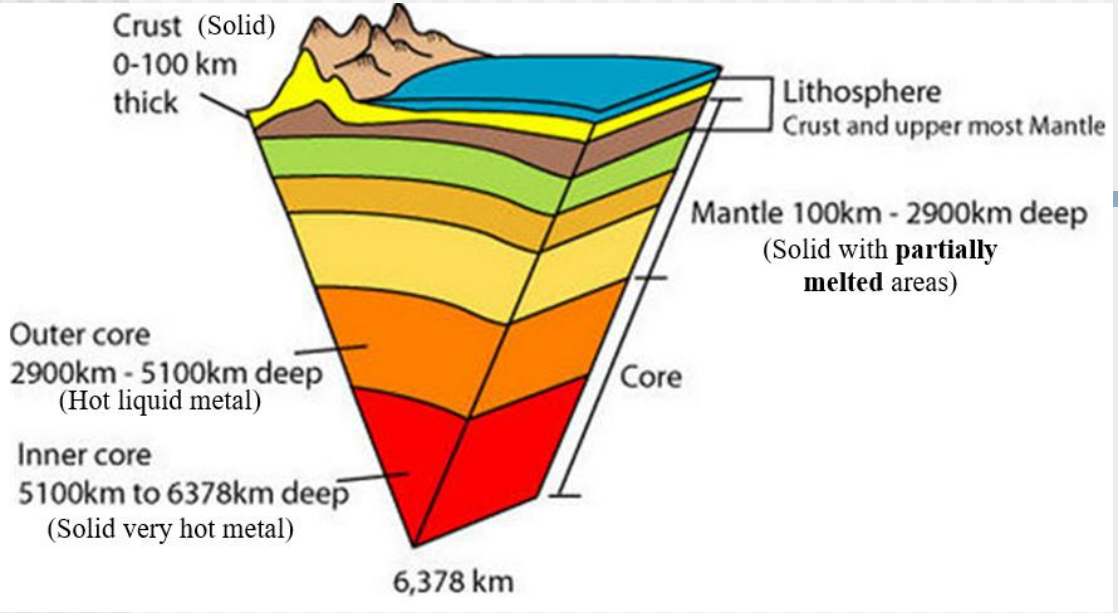
A hazard map shows the level of risk to people and their property from a volcanic eruption.

Study the Hazard Map for the Soufriere Hills Volcano on the island of Montserrat



(i) Use the map to suggest why the capital of Montserrat has been moved. [2]

Structure of the Earth



Solid Crust split into oceanic (thin, dense) and continental (thick, lighter) plates.

Solid Mantle with partially melted areas with **convection currents** driving the crust above.

Liquid Outer Core and Solid Inner Core both made of metal.

The crust is split into large pieces or plates and at the **margins** or **boundaries** of theses there are **active zones**.

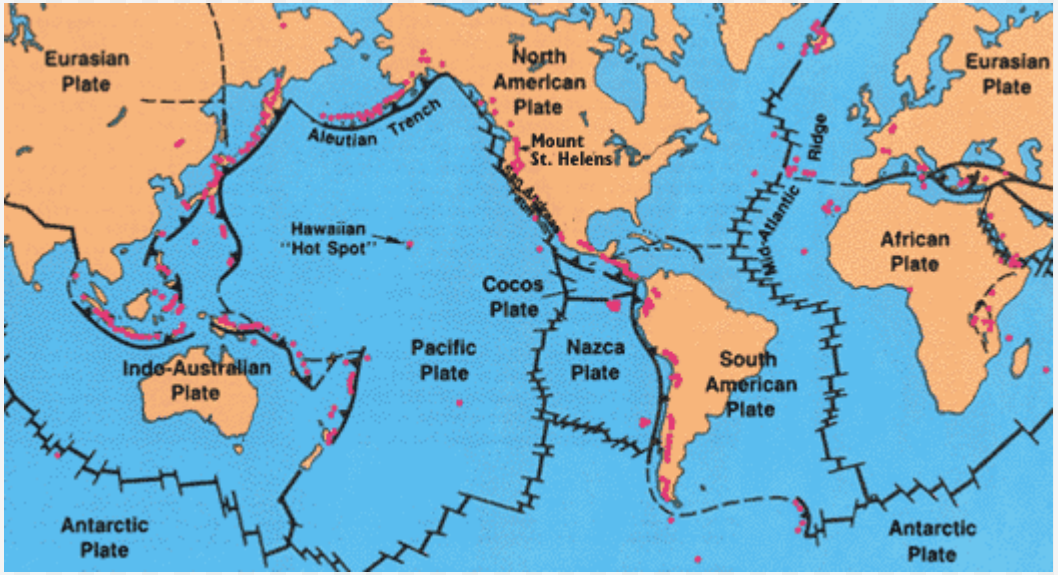
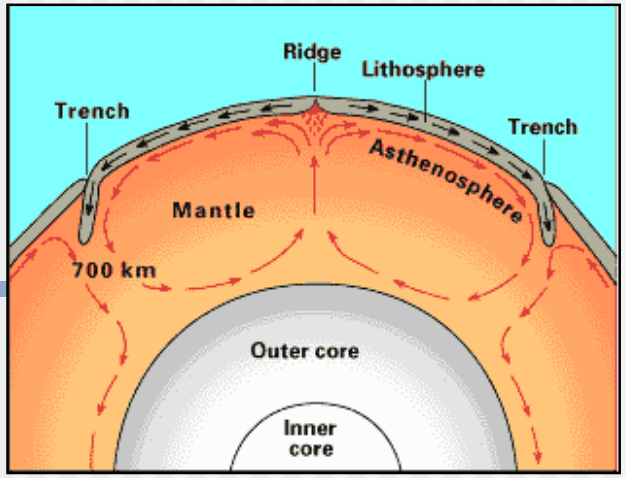
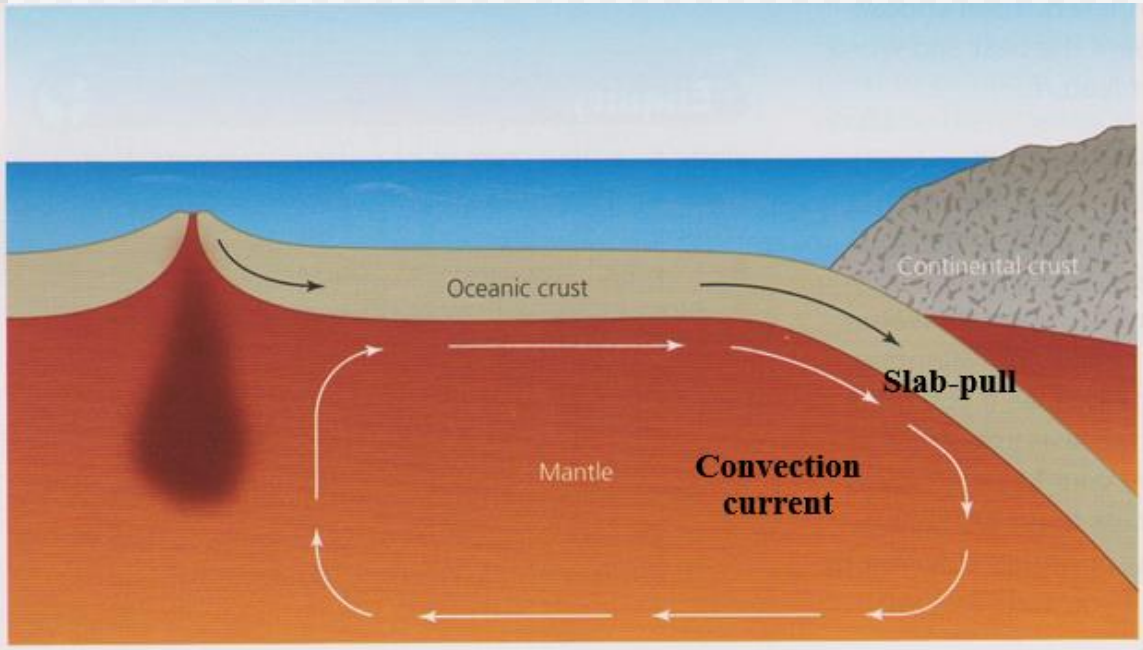


Plate Movement

Scientists believe that the movement of the plates is either being driven by **convection currents** in the mantle or by a process known as **slab-pull**. These processes create the active zones.





A plume of hot magma rises through the mantle

The oceanic crust is warmed and forced upwards by the magma, creating a mid-ocean ridge

The ocean crust cools, becomes denser and slides away from the ridge under gravity

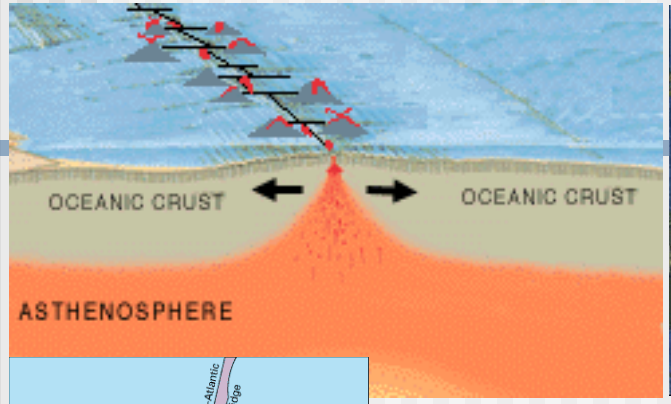
A deep ocean trench is formed where the oceanic crust flexes downwards under the continental crust

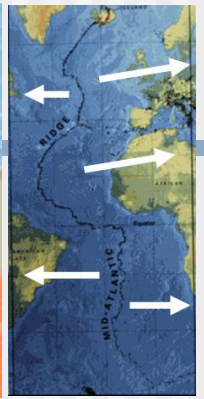
The immense weight of the oceanic crust pulls the plate as it subducts into the mantle

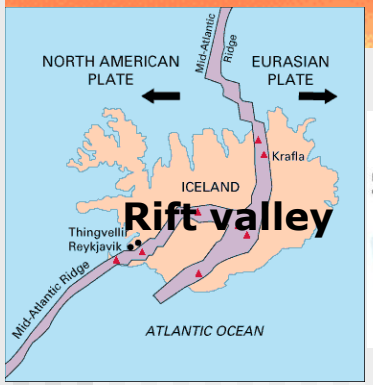
The processes driving plate movement

Plate Boundaries/Margins

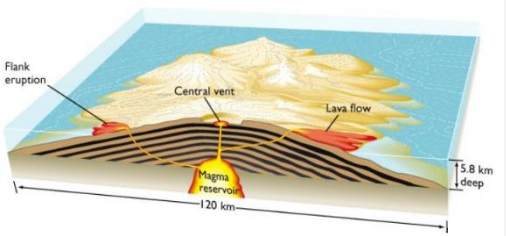
CONSTRUCTIVE





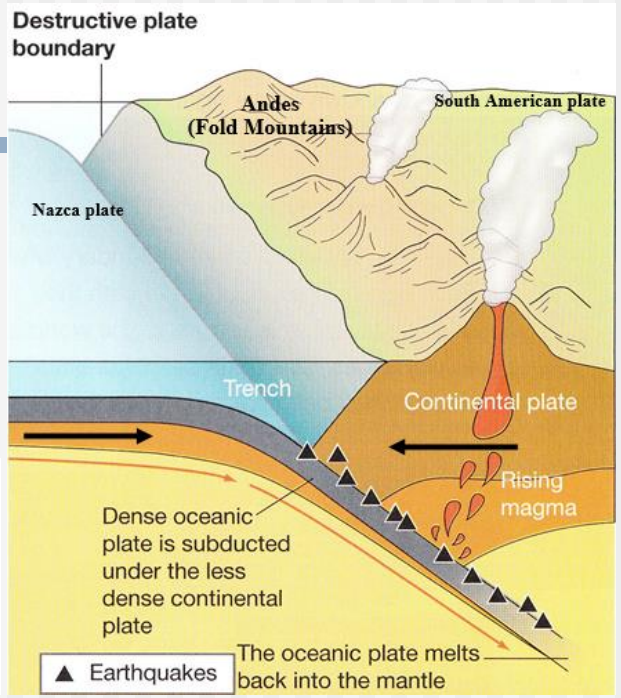


Shield volcano



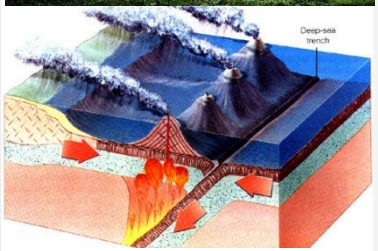
- Plates spread apart
- New plates made from rising magma
- Lots of gentle volcanoes (**shield**)
- Mid-Atlantic ridge
- Some small earthquakes
- Iceland's **rift valley** found on land

DESTRUCTIVE



Stratovolcano

Caldera

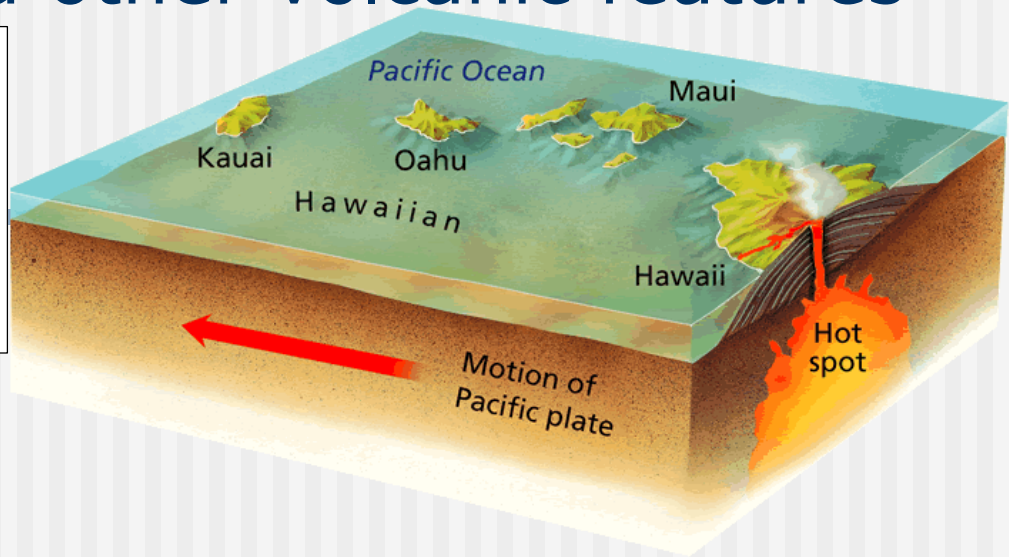


Island arc

- Oceanic plate meets continental
- Ocean plate is subducted (gassy magma)
- Explosive volcanoes (**stratovolcano**)
- Can explode to form huge **caldera**
- Lots of friction = strong earthquakes
- If oceanic/oceanic volcanic **island arc**

Volcanic Hotspots and other volcanic features

Hotspots are areas of the world with stronger than normal and stable convection currents. One location that sits on a hotspot is the island of Hawaii (USA).



Other volcanic features

Cinder cones – small ash volcanoes

Geysers – where water superheated by magma in volcanic areas is forced up to the surface and erupts.

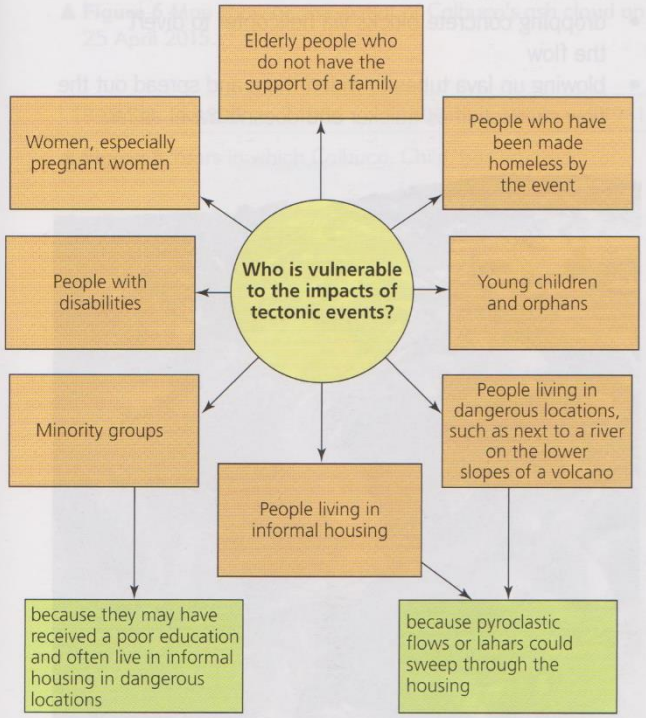
Lava tubes – where lava previously flowed underground

Vulnerability and Risk

Why are some countries more vulnerable to tectonic events (volcanoes and earthquakes) than others?

Level of risk – This is related to three main factors:

1) The strength (magnitude) of the event
2) The population in the area
3) The vulnerability of the people in the area (development)



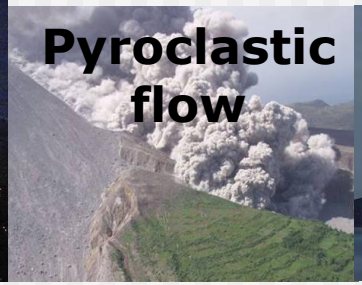
Why are some groups of people more vulnerable than others to natural disasters?

To reduce vulnerability…

1) Reduce the impact of the hazard: This can achieved by monitoring and predicting the hazards.
2) Build capacity to cope with a hazard: Educate people and emergency services on what to do in the event of a disaster.
3) Tackle the causes of vulnerability: Governments need to reduce poverty so that everyone has the same level of protection.

Earthquake and Volcanic hazards

Volcanoes



Case studies: Basic knowledge of one or two examples – Etna, Pinatubo, Merapi*, Montserrat*. What were the hazards and main effects? (* In booklet)

Earthquakes

Case studies: Basic knowledge of one or two examples – Sichuan, Kobe, Nepal*, Tohoku*. What were the hazards and main effects? (* In booklet)

Reducing the risk from hazards (Earthquakes)

Short term

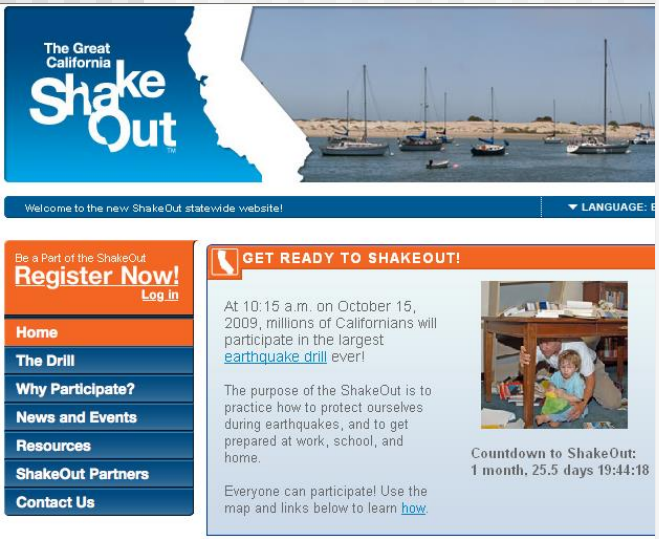
Prediction: Limited (strain meters, monitoring ground)

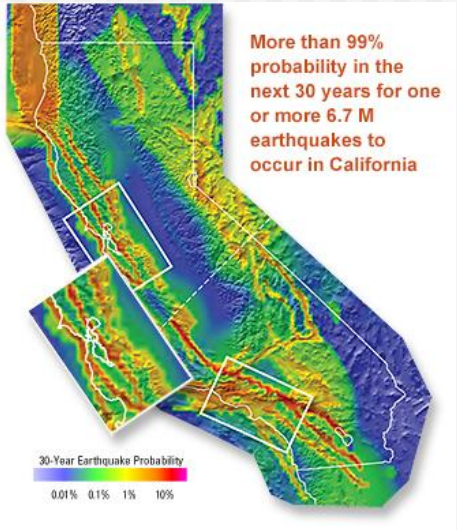
Rescue and recovery: rescue efforts, emergency services, food, water and medicine

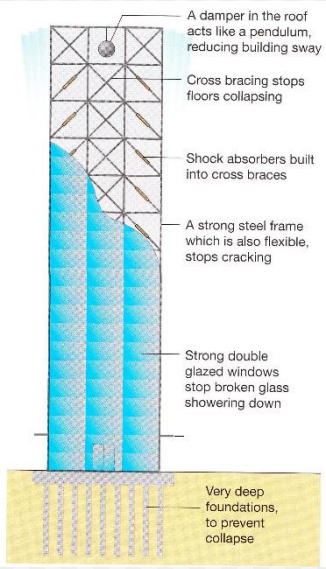
Longer term

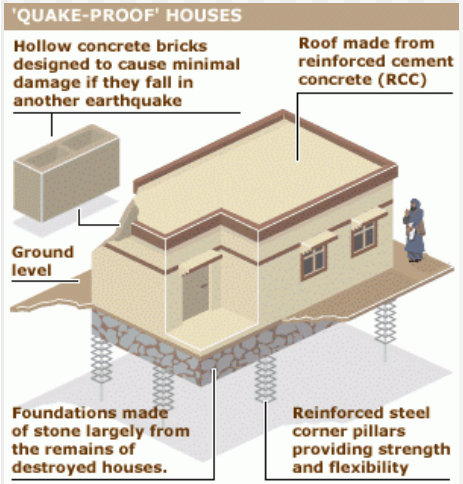
Protection: Earthquake proof buildings (both high and low-tech)

Preparation: Education, drills, hazard mapping and planning where to build





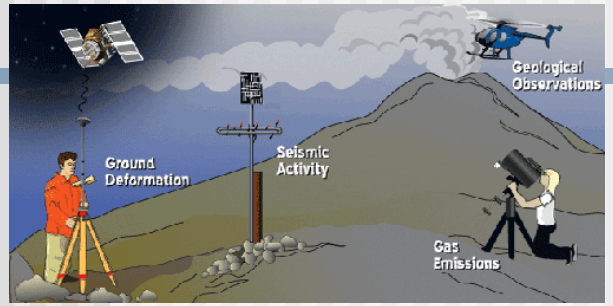


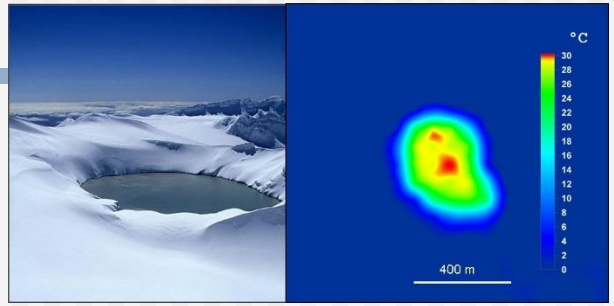


Reducing the risk from hazards (Volcanoes)

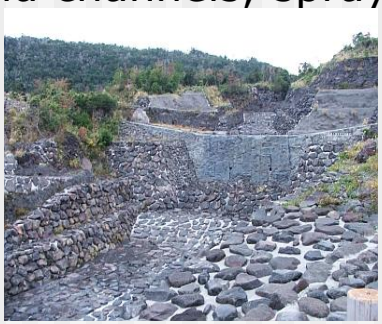
Short term

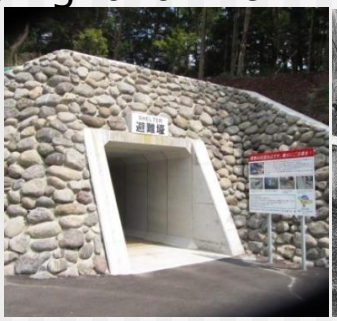
Prediction: Gases, earthquakes, heat sensing, ground movement





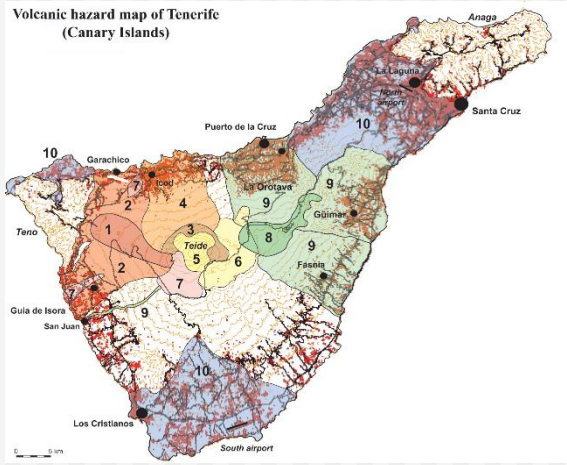
Protection: Shelters, barriers, and channels, spraying lava with water





Longer term

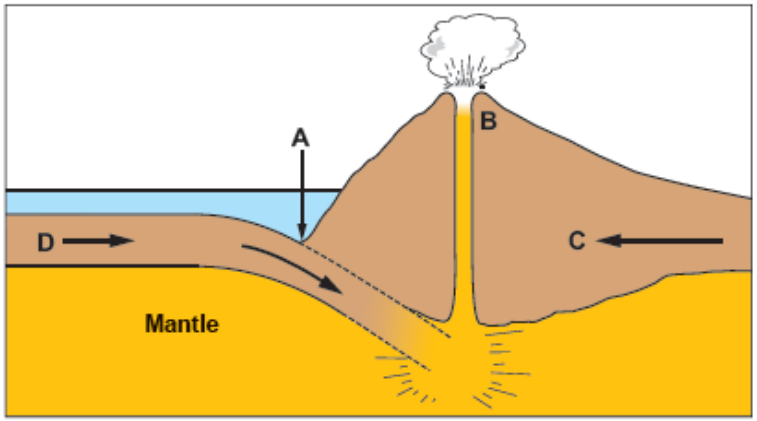
Preparation: Education, drills and hazard mapping



Options Theme 3: Tectonic Landscapes and Hazards

Types of question:

(ii) The diagram below shows the plate boundary at **X** on the map.



Put the correct letter from the diagram in the box below to identify each featur

Feature	Letter
Continental Plate	
Ocean Trench	
Volcano	
Oceanic Plate	

(iii) Explain how the feature at B is formed. Add to the diagram to help your ar

.....

.....

.....

.....

(b) Describe how **one** of the following volcanic hazards can affect people. Use an example you have studied to help. [4]

Pyroclastic Flow **Lahar** **Lava Flow** **Ash**

My choice of hazard .....

.....

.....

(d) Explain why some people are more vulnerable to the effects of volcanoes than others. [4]

(c) Explain why the effects of earthquakes may vary in countries at different levels of development. [6]
Use examples to illustrate your answer.

.....

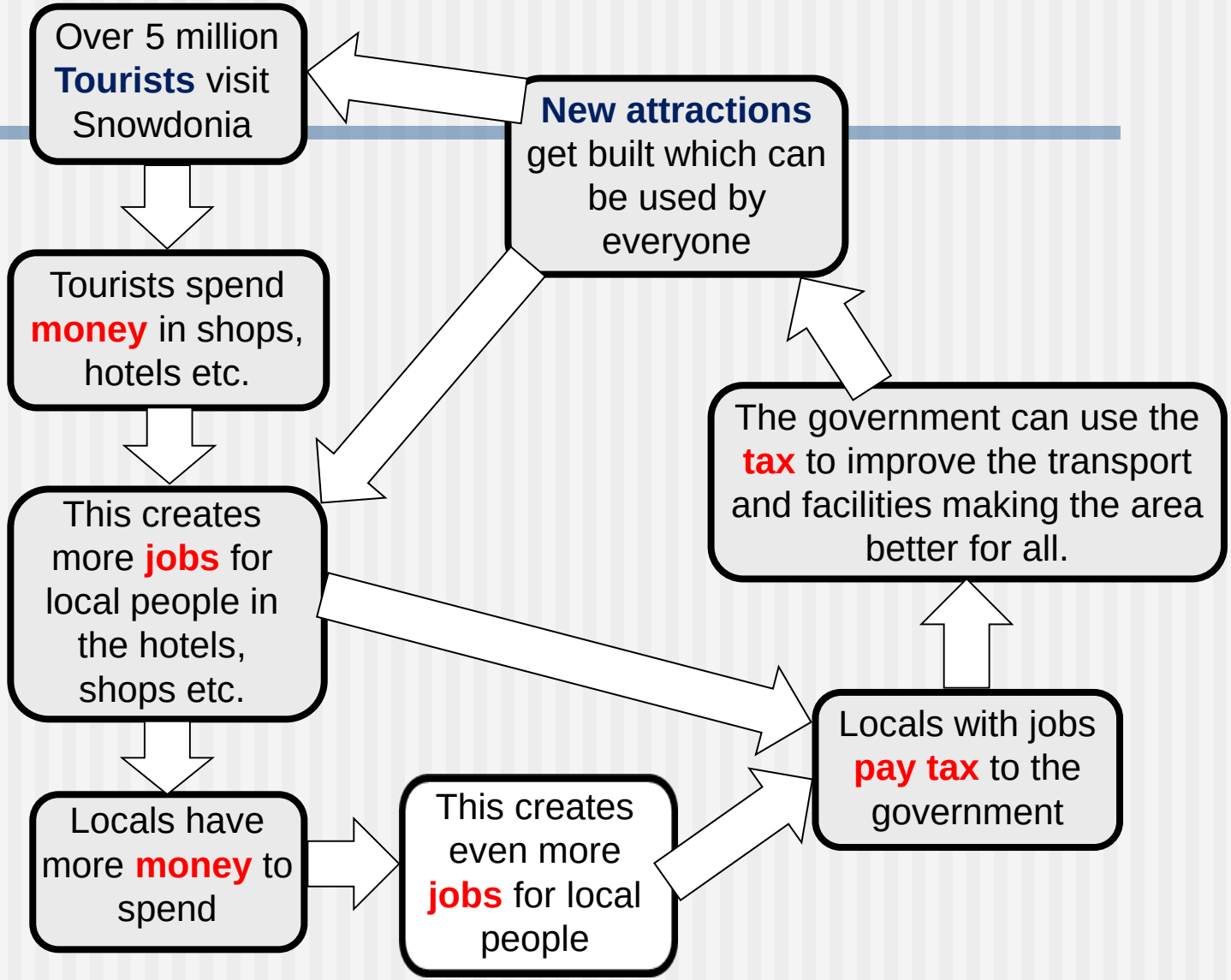
.....

.....

.....

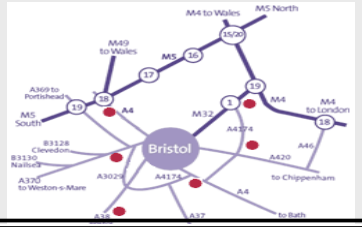
For any case study discussing benefits:

The Positive Multiplier Effect (can be negative too)



Command Words

- **Describe** = Say what you see (from a graph, map or picture)



Describe the location of the Park and Ride sites in Bristol

*The Park and Ride stations are all outside the CBD (all directions)

*They are all along main roads that lead to the centre

*They are spread out around Bristol at major road junctions

Be specific – explain your points and don't just say 'good climate', 'lots of jobs' or 'more money'.

*The whole waterfall moves back to leave a steep sided gorge

- **Label** = Add to a map or picture (easy to miss)

Always give named examples of places that we have studied or places that you know of.

- **Justify** = Back up your points with reasoned arguments/facts

- **Evaluate** = Give the good and bad points, come to a decision

Remember!

On longer questions: **RUMBA!**

- **Read** at least twice
- **Underline** the key words in the question
- **Marks** – look at the marks awarded
- **Break it down** into the number of points you need
- **Answer** using words from the question to help

(c) With reference to one or more examples that you have studied, explain how technology has been used to reduce the impact of volcanic eruptions on people. [6]

- Three methods (3) well explained (3)
- Prediction – gas, bulging, earthquakes (Mt. Pinatubo)
- Protection – barriers, channels (Mt. Etna)
- Preparation – drills, evacuations (Japan, Mt. Pinatubo)

Read, read and read the information and questions: RTFQ and ATFQ