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<th>Revised</th>
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<td>Tectonic hazards become disasters</td>
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<td>Different coastal landscapes and their processes</td>
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<td>Challenges of globalisation</td>
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<td><strong>Regeneration</strong></td>
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<td>How and why places vary</td>
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<td>The need for regeneration</td>
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<td>How regeneration is managed</td>
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<td>Assessing the success of regeneration</td>
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<td>Processes operating in the hydrological cycle</td>
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<td>Changes in hydrological systems over time</td>
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<td>Water insecurity</td>
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<td>Carbon cycle and terrestrial health</td>
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<td>Consequences of increasing demand for energy</td>
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<td>Links to global climate system</td>
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<td><strong>Superpowers</strong></td>
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<td>Changing superpowers</td>
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<td>Global impact of superpowers</td>
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<td>Contested spheres of influence</td>
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<td><strong>Migration, identity and sovereignty</strong></td>
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<td>Impacts of globalisation on international migration</td>
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<td>Evolution of nations states in a globalised world</td>
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<td>Threats of national sovereignty in a more globalised world</td>
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Tectonic processes and hazards

Spatial variations in tectonic hazard risk

The global distribution of tectonic hazards

Key concepts:

- Destructive/convergent occur where two plates are moving together, where a dense oceanic plate collides with a less dense continental plate. The former is thrust under the latter forming a subduction zone. Mountain building and volcanic eruptions are the outcomes.
- Divergent/constructive the moving apart of plates causes rifts filled with new crustal material from volcanic eruptions.
- Conservative/transform two plates slide past each other the friction triggers earthquakes.
- Collision 2 continental plates collide and push up mountains.

Earthquakes – The global distribution of earthquakes is not random. Earthquake zones occur along PBs. Particularly destructive and conservative ones. Intra plate earthquakes occasionally occur in the middle of plates. Have a look at https://www.youtube.com/watch?v=8QNigxTN384

Volcanoes – There are approx. 500 active volcanoes in the world. A significant number occur around the ring of fire. There are also hotspot volcanoes – found in the middle of tectonic plates and though to be fed the mantle. They occur when the mantle is v thin and hot e.g. Hawaii.
**Tsunamis** – caused by submarine shock waves generated by earthquakes or volcanic eruptions. Most commonly experienced along the coastlines of the Pacific Ocean. A gently sloping continental shelf can allow tsunamis to build to greater heights causing devastation.

Theoretical frameworks

**Key concept:**

Plate tectonics theory sees the earth’s crust of consisting of a number of mobile yet rigid plates: thin crust underlying ocean basins, thick crust underlying continents.

Low density continental crust allows it to float on a much higher density mantle below. Heat from the core rises to form convection currents which in turn moves the plates.

Over a long period of time as the plates move relative to each other they cause:

- Continents to drift apart
- Ocean basins to change
- Formation of mountain chains and mid ocean ridges
Earthquakes volcanoes and tsunamis

The following are important elements in the theory of plate tectonics:

- The earth has a thin broken crust wrapped around a thick liquid mantle
- Convection within the mantle causes plates to move
- 4 different types of PB
- New crust formed by sea floor spread
- Crust destroyed and remoulded at subduction zones
- Slab pull is the force created by convection currents that moves plates and drags them into subduction zones
- Palaeomagnetism provides evidence of plate movements

Subduction zones are areas where plates move together. Oceanic crust descends under thicker continental crust. Fold Mountain occurs at the edges of overriding plates.

Palaeomagnetism Results from magma locking in the earth’s magnetic polarity as it moves. Scientists use this to reconstruct plates past movements.

Q2: How do tectonic plates move and what are the outcomes of these movements.

The type and magnitude of an event

The type of tectonic event is determined mainly by the type of PB. A destructive PB is most productive of earthquakes and volcanic eruptions. A conservative PB only produces earthquakes. Science has not yet discovered what causes the magnitude of a tectonic event. The Benioff zone is thought to be important this is the boundary between the subducted oceanic plate and the overriding continental plate. It is a sloping plane and stresses are built up as the cold oceanic plate sinks into the hot mantle. We don’t know however why some earthquakes are of greater magnitude.

Q3: Is event magnitude more important than event location? Give your reasons

Physical processes behind tectonic hazards

Earthquakes

Earthquakes are caused by sudden shifts in the earth’s crust usually along a pre-existing fault. The movement is from a gradual build-up of tectonic pressure and then its sudden release. The sudden movement creates seismic waves of 3 kinds: P (Fast) S (Slow) L (surface)

The hypocentre of an earthquake or focus is the point where the pressure is released. The epicentre is the point on the earth’s surface directly above the hypocentre. The overall severity of the earthquake is determined by the amplitude and frequency of the waves. S 7 L waves are more destructive than P waves. They cause ground shaking and 3 secondary hazards:

- Liquefaction where seismic waves cause the ground to lose its load bearing capacity causing buildings to sink and possibly collapse
- Landslides
- Tsunamis
Q4: What are seismic waves? What is the difference between the epicentre and the hypocentre?

**Tsunamis**

Potentially the most lethal secondary effect. Out at sea they go unnoticed but as they approach coastlines they gain in height (remember and increasing number of people want to live near the coast).

The impact of a tsunami depends on: duration, distance wave travels, depth and gradient of the offshore zone, degree of coastal protection from coral reefs or mangroves, timing of the event, early warning systems, population density.

**Volcanoes**

The primary hazards of a volcano are:

- Pyroclastic flows
- Tephra (ash fall)
- Lava flows
- Volcanic gas

Secondary hazards are:

- Lahars
- Jokulhaups

**Key point:** Volcanoes have killed far fewer people than earthquakes or tsunamis in recent times

**Revision activity:** In your notes make sure you have located recent examples of the three tectonic hazards including dates and info on the scale of the human impact.

Q5: Which of the primary hazards of volcanic eruptions is potentially the most lethal

**Tectonic hazards become natural disasters**

**Vulnerability, risk, resilience and disaster**

**Vulnerability** relates to the ability of a community to cope with a hazards event. Developed countries are less vulnerable as they have good governance, access to tech and relevant resources and effective EWS. This reduces the likelihood of a hazard becoming a disaster.

**Risk:** This relates to the probability of a hazards leading to loss of life. Risk is linked to:

- Perception of the community
- Unpredictability of hazards
- Lack of alternatives
- Benefits of living in the area outweigh hazard risks
**Key point:** Tectonic events themselves are NOT hazards. They become hazards only when they impact on people and their livelihoods.

The hazard risk formula involves the components that influence the amount of risk a community is taking with a particular hazard:

\[
\text{Risk} = \text{hazard} \times \text{exposure} \times \text{vulnerability}
\]

Manageability

The pressure and release model (PAR) adopts a slightly different approach to the assessment of the risk of a hazard becoming a disaster. See below

---

**Root causes create vulnerability and the dynamic pressures create unsafe conditions, combine these with a natural tectonic event and you can potentially have a massive disaster.**

**Revision activity:** In your notes apply the PAR to a tectonic event you have studied

Another key concept that will help determine if a hazard becomes a disaster is **resilience.** This is the ability of a community to resist, absorb and recover from the impacts of a hazard.

**Q6: What is the difference between a hazard and a disaster?**

**Q7: What is the difference between vulnerability and resilience?**

**Impacts**

The economic and social impacts of hazards vary: over time, space and from minor nuisances to major disasters.

*It is estimated that 1% of the world’s population is likely to suffer the impacts of a volcanic eruption whereas it is 5% for an earthquake.*

The economic impacts of a tectonic hazard are influenced by:

- Level of economic development (GDP per capita)
- Population
- Resilience
- Urbanisation
- Insurance

**Q8: Explain why the global impacts of earthquakes are greater than those from volcanoes**
Tectonic hazard profiles

**Magnitude and intensity** are important aspects of tectonic hazards. Observations and measurements are converted to mathematical scales:

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Scale</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Richter scale</td>
<td>earthquakes 1-9</td>
<td>Measurement of the height of the waves. This is an absolute scale – wherever an earthquake will be recorded it will be measured on the Richter scale</td>
</tr>
<tr>
<td>Mercali scale</td>
<td>earthquakes i-xii</td>
<td>Measures the impacts of an earthquake. It is a relative scale because people experience different amounts of shaking in different places.</td>
</tr>
<tr>
<td>Moment magnitude scale (MMS)</td>
<td>earthquake 0-9</td>
<td>Measures energy released. Magnitude is based on seismic movement caused by a slip in the fault, the area affected and the earth rigidity factor</td>
</tr>
<tr>
<td>Volcanic explosivity index</td>
<td>Volcanic eruption 0-8</td>
<td>Relative measure which measures the explosiveness of an eruption. Calculated by volume and height of ejecta and observations. Like Richter scale it is logarithmic so one index is 10x more powerful than the previous</td>
</tr>
</tbody>
</table>

None of the scales is perfect e.g. they don’t take into account duration, vulnerability or resilience.

Remember today we use the MMS as opposed to the Richter scale despite what the media say.

**Hazard profiles**

Which profile represents a tsunami and a minor volcanic eruption?

The hazard profile is not the only factor that determines the impacts. For example economic development will also influence vulnerability, risk and resilience.

The profile attempts to understand the physical characteristics of different types of hazard.

**Revision activity:** Note down and explain the 6 factors that influence the hazard profile. Make sure you have notes detailing the impacts of one specific tectonic hazard in a LIC, HIC and NEE.

**Tip:** Any assessment of the risks posed by a tectonic hazard must identify the nature and magnitude of the hazard, the number of people at risk, economic development and the society’s ability to mitigate and respond to the hazard impacts.
Q9: What is the value of compiling hazard profiles

The importance of development and governance

Vulnerability and reliance are strongly connected to economic development. Economic development gives communities access to resources, organisations and technology to deal with hazards. With increased income people are more likely to live in safe locations and hazard proofed property.

There are also non-economic aspects of development which area also important

- Access to education – education makes people aware of hazards and what to do in the event of a hazard
- Access to healthcare – better healthcare and health makes people more able to cope with the health and food risks associated with hazards
- Housing - poorly built housing cannot withstand shockwaves from earthquakes
- Governance – the quality of governance can be critical

Governance

Governance is the way a country, community or city is run. Good governance is transparent, has rule of law, equity, consensus and participation.

Poor governance in the form of corruption or weak political organisation is vulnerable to hazards in 2 ways:

1) Failure to invest in infrastructure that mitigate hazards such as warning systems or earthquake proof buildings
2) By being ill prepared to deal with a hazard event

Synoptic link: National, and local governments are top players their efficiency and transparency (lack of corruption) are vital

Good governance is not just political there are other stakeholders both public and private who have a role in good governance.

Q10: Why is good governance so important in the context of tectonic hazards?

Geographical factors

These can increase vulnerability such as:

- Population density – higher the density more people at risk
- Urbanisation – cities are more at risk due to higher concentrations of people and business
- Isolation and inaccessibility is crucial in the aftermath and the ability of aid to reach an area
- Community spirit – a strong community spirit makes an area more able to show a collective will to survive a hazard
Contrasting locations

The exam board require you to make a comparative study of a hazard event in 3 locations: developed, emerging and developing country.

Revision activity

Important! Make sure that in your notes you have specific details about the same type of hazard in the 3 contrasting locations. Make sure you know specific details about each one. This should show the different physical factors that caused the hazards event and the significance of context (place) in influencing the scale of the disaster. For each one you need to be able to explain why the hazard event became a natural disaster and the reasons for the differing scale in the disasters between the 3 places.

The management of tectonic hazards and disasters

Few tectonic hazards develop into natural disasters! Tectonic hazards cannot be prevented!

Revision activity_ Make notes on the trends of hazard events since 1980

Number of tectonic disasters grouped by level of development (2004 – 2013):

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Very high HDI</th>
<th>High HDI</th>
<th>Medium HDI</th>
<th>Low HDI</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthquakes and tsunamis</td>
<td>41</td>
<td>71</td>
<td>121</td>
<td>36</td>
<td>269</td>
</tr>
<tr>
<td>Volcanic eruptions</td>
<td>5</td>
<td>12</td>
<td>30</td>
<td>10</td>
<td>57</td>
</tr>
</tbody>
</table>

You can see in the table there are far fewer volcanic disasters – this reflects that earthquakes are a more frequent occurrence. As you can see it is not the case that the lowest developed countries suffer the most disasters. Medium countries suffer most disasters – could this be due to their geographic location?
We should treat all hazard data with some caution as: there is no universally agreed definition of a disaster, small events in remote locations are often not recorded, politicians may under report disasters, and mega disasters such as the Asian tsunami can distort trends.

Revision task: Make sure you have in your notes details of one mega disaster

It needs to be understood that some parts of the world are at risk form more than one hazard. Locations where they suffer multiple hazards are known as hazard hotspots. Also remember that with tectonic hazards their impacts are aggravated by climate events which make liquefaction and landslides more likely.

<table>
<thead>
<tr>
<th>Country</th>
<th>Total area exposed %</th>
<th>Population exposed %</th>
<th>Number of different hazards exposed to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taiwan</td>
<td>73</td>
<td>73</td>
<td>4</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>36</td>
<td>42</td>
<td>4</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>29</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>Philippines</td>
<td>22</td>
<td>36</td>
<td>5</td>
</tr>
<tr>
<td>Guatemala</td>
<td>21</td>
<td>40</td>
<td>5</td>
</tr>
<tr>
<td>Ecuador</td>
<td>14</td>
<td>24</td>
<td>5</td>
</tr>
<tr>
<td>Chile</td>
<td>13</td>
<td>54</td>
<td>4</td>
</tr>
<tr>
<td>Japan</td>
<td>11</td>
<td>15</td>
<td>4</td>
</tr>
</tbody>
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Prediction and management

Prediction

Predicting tectonic hazards has the potential to reduce deaths and destruction. Research has made us aware of the tell-tale signs of volcanic eruptions. Earthquakes are far more difficult to predict. However, it is beginning to look like there might be early warning signs. The key to success is being able to detect those areas in particular stress in the earth’s crust that trigger earthquakes.
Hazard management cycle

The hazard management cycle has a number of stages once the hazard has struck:

1. Emergency response
2. Initial recovery
3. Reconstruction including mitigation
4. Return to normality
5. What lessons can be learned
6. Improve preparedness

Mitigation: Action taken to reduce the long term risk to life and property from natural hazards.

Preparedness: Educating people about what to do in the event of a disaster as well as warning systems and training and equipping rescue teams

<table>
<thead>
<tr>
<th>Physical factors that affect response</th>
<th>Human factors that affect response</th>
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</thead>
<tbody>
<tr>
<td>☑ Accessibility of the region</td>
<td>☑ Number of people involved</td>
</tr>
<tr>
<td>☑ Type of hazards – scale, impact, magnitude and frequency</td>
<td>☑ Degree of preparedness</td>
</tr>
<tr>
<td>☑ Topography of region e.g. mountainous</td>
<td>☑ Technological resources</td>
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<tr>
<td>☑ Climate</td>
<td>☑ Scientific expertise</td>
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<td></td>
<td>☑ Education and training</td>
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<td>☑ Economic wealth</td>
</tr>
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<td></td>
<td>☑ Infrastructure</td>
</tr>
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<td></td>
<td>☑ Social and political framework</td>
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Parks disaster response model

This can help analyse the timeline between when a hazard strikes and when a place returns to normal life.

A Disaster Response Curve (after Park 1991)
Synoptic links:

- Key players in prediction of tectonic disasters are scientists.
- Actions are critical they need to be planned effectively by the key players

Remember that the shorter the timeline of response although can be affected by resilience and economic development is often more determined by the magnitude of the hazard event.

**Mitigation and adaptation strategies**

There are 3 ways to mitigate against a tectonic hazard:

1. Modify the event
2. Modify the vulnerability and resilience
3. Modify the potential financial losses

This action should be informed by risk assessments and hazard predictions.

**Modifying the hazards event**

There is little that can be done under this heading, yet. The only actions currently available are:

- Strengthening coastal defences against tsunamis
- Diverting or chilling lava flows
- Stabilising slopes against the risk of landslides

**Modifying vulnerability and resilience**

- Improving prediction, forecasting and warning systems e.g. scientific research into prediction methods, using technology to improve warning systems
- Improving community preparedness e.g. enforcing building codes aimed hazard proofing structure particularly public buildings such as powerlines, hospitals and police stations. Have a look at [https://www.youtube.com/watch?v=iZoHoPFHAtw](https://www.youtube.com/watch?v=iZoHoPFHAtw)
- Changing behaviours that reduce hazard risk e.g. moving people away from hazard prone areas

*Synoptic theme: key players in hazard management are planners and engineers think how important they are in the above points*

**Modifying losses**

Insurance can be used here but it is expensive. The insurance industry has to assess:

- Level of risk
- Probability of a hazard event happening
- Market value of property
- Cost of reconstruction

With earthquakes seismologists work with insurers to calculate risk and inform insurance premiums. Computer simulations estimate the probability of damage. With volcanic eruptions there is greater certainty in the assessment of risk.

**Q11. Suggest why insurance for hazard damage is so expensive**
Disaster aid is another way in which losses might be reduced. Particularly during the initial emergency stage. This has 2 sources:

- Donations by governments to inter-governmental organisations such as the UN
- Private donations to NGOs such as the red cross

Disaster aid is often criticised, primarily as local distribution systems are inefficient and corrupt. Also it doesn’t encourage self-help or a more bottom up approach which would be better in the long term.

The sendai framework has set out 4 priorities in disaster management:
1. Understand the disaster risk
2. Ensure the strengthening of government to manage the hazard risk
3. Invest in improving resilience and preparedness
4. “build back better” in the recovery and reconstruction stage

It is also recognised today that:
- The millennium development goals gave insufficient focus to risk reduction and resilience
- The distribution of international disaster relief is too complex, fragmented and disorganised

Revision activity: Make notes on how people attempt to cope before, during and after a tectonic hazard with examples.

Synoptic theme NGO are important players in reducing the burden of losses from hazards particularly as developing countries cannot afford insurance costs.

Q12. Why is disaster aid often criticised

Skills reminder – are you familiar with:

- Analysis of world distribution maps
- Use of block diagrams to identify features on a PB
- Analysis of time distance maps to predict the spatial impact of tsunamis
- Use of correlation techniques to link magnitude and deaths and damage
  - Statistical techniques to compare hazard profiles
  - Using data to identify trends in hazard impacts over time

Exam questions

1. Name the type of plate boundary along which the most powerful earthquakes occur. [1]
2. Explain why earthquakes are more destructive than volcanic eruptions [4]
3. Explain what might be done to improve the preparedness of a community for a hazards event [6]
4. Assess the value of Parks disaster response curve [12]
5. Assess the factors effecting the response to tectonic hazards [12]
Summary

You should now have an understanding of:

- The global distribution and causes of volcanic eruptions, tsunamis and earthquakes
- The distinction between divergent, convergent and conservative PBs
- The distributions and associated hazards of different plate boundaries
- Intra plate earthquakes and hotspot volcanoes
- The key elements of the theory of plate tectonics
- Tectonic processes at different plate boundaries
- Factors affecting earthquake magnitude and type of volcanic eruption
- Earthquake shockwaves and secondary hazards
- Volcanic emissions and secondary hazards
- Factors effecting tsunamis
- The difference between a hazard and a disaster
- Mega disasters and multiple hazard zones
- Disaster trends and differential impacts
- Predicting and forecasting tectonic hazards
- Hazard management cycle
- Parks response curve model
- Modifying tectonic events, vulnerability, resilience and losses
Landscape systems processes and change

Option B: Coastal landscapes and change

The coast is a very important component of the globe. Many of the world’s major cities are in coastal locations so large numbers of people live and work here. The coast is a critical interface between land and sea, subject to both terrestrial and marine processes and it experiences extreme events, such as tropical cyclones, tsunamis and storm surges.

Different coastal landscapes and their processes

The coast and littoral zone

All coastlines show the same littoral sub zones but not coastlines have similar landscapes. The littoral zone can be a dynamic one of rapid change.

Littoral zone: The wider coastal zone, which includes adjacent land areas, the shore, and the shallow part of the sea the offshore. It compromises of 4 sub-zones: coast, backshore, foreshore and nearshore.

Classifying coasts

Coasts may be classified in various ways:
- Geological characteristics (lithology and structure)
- The impacts of sea level change (rising or falling)
- The dominant coastal processes (erosion or deposition)

A common but simple coastal classification distinguishes between:
- Rocky or cliffed – where there is a clear distinction between land and sea, mainly because of the height of the cliffs. Exposure to the erosive forces of the sea, rain and wind creates a high energy coastline
- Coastal plains where the land slopes gently towards the sea and there is an almost imperceptible transition from one to the other. These are often maintained in a state of
**Dynamic equilibrium** between the deposition of sediment by river stems entering the sea and sediment from offshore sources and marine erosion. They are typically low energy coastlines.

Dynamic equilibrium: The balanced state of a system when inputs and outputs balance over time. If one of the inputs changes then the system is upset, by a process of feedback the equilibrium adjusts and the system is maintained.

**Rocky coasts and coastal plains**

Rocky coasts result from a geology that is resistant to forces of erosion of the sea and weather in high energy environments. Coastal plains are found in areas of low relief and depend on the supply of terrestrial sediment.

Exam tip: You need to name actual stretches of coastline (think about your coursework) that exemplify both cliff and coastal plain types – this will improve your answers.

Q14: What is the significance of the difference between high energy and low energy coastlines?

**Geological structure and the development of coastal landscapes**

Start by having a look at the geology map of the UK it’s interactive and ace! Go on look at the map and discover what rock is beneath your feet its fascinating stuff: [http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html](http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html)

Avoid this mistake: Don’t confuse geological structure and lithology, the former is about the deposition of rocks, whilst the latter is about the composition of rocks, whether they are sandstone, limestones etc.

**Key concept:**

**Geological structure** refers to the arrangement of rocks:

- Strata: Different layers of rock in location and how they relate to each other
- Deformation: the degree at which rock strata have been tilted or folded by tectonic activity
- Faulting: the presence of fractures along which rocks have moved

All 3 elements affect coastal landscapes and the development of coastal landforms.

**Concordant and discordant coastlines**

- Concordant coastlines are formed when strata run parallel to the coast. The typical coastline is smooth or dented often known as a Dalmatian coast
- Discordant: formed when different rock strata intersect the coast at an angle, so that lithology varies along the coastline. Typically one of bays and headlands also known as the Atlantic type
Cliff profiles

Cliff profiles are influenced by two different aspects of geology, the resistance of rock to erosion and the dip or angle of rock strata in relation to the coastline.

In addition to the dip of strata, other geological features influence cliff profiles and rates of erosion:

- Faults: rocks are fractured and therefore weakened on either side of a fault
- Joints occur in most rocks in potential lines of weakness
- Fissures: small cracks in rock also represent weakness that erosion can exploit

Rates of coastal recession

Geological factors

The rate of coastal erosion and recession is a critical aspect of the coastal zone. The rate is influenced by many factors but the most significant is lithology. Different types of rock erode at different rates:

<table>
<thead>
<tr>
<th>Rock type</th>
<th>Example</th>
<th>Erosion rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igneous</td>
<td>Granite, Basalt, Dolerite</td>
<td>Very slow. Rocks are resistant to erosion as they are crystalline and have few joints</td>
</tr>
<tr>
<td>Metamorphic</td>
<td>Slate, schist, marble</td>
<td>Slow. Same as igneous but can be folded and fractured making them more vulnerable to erosion</td>
</tr>
<tr>
<td>Sedimentary</td>
<td>Sandstone, limestone, shale</td>
<td>Moderate to fast. Younger rocks tend to be softer and weaker. Rocks with bedding planes and fractures are more vulnerable to erosion</td>
</tr>
</tbody>
</table>

Exam tip: The Jurassic Coast is an excellent example of the impact of geology on the coast landscape
Different rates of erosion of alternating strata in cliffs can produce complex cliff profiles. The lithology of the strata and the degree of exposure to the erosive force of the sea are the major factors influencing the rate of cliff retreat and the rate of coastal recession.

Permeability is another important factor. Permeable rocks e.g. limestone allow water to pass through. Groundwater flow can weaken the rock by removing the cement that binds the sediment this can lead to slumping.

Exam tip: Remember geological factors affecting coastal landscapes include lithology, folding, faulting, jointing, dip and orientation of rock outcrops relative to the coastline.

Q15: What distinguished metamorphic rock from igneous and sedimentary ones?
Q16: How is the resistance of rocks to erosion affected by their geological structure?

Coastal vegetation

Vegetation is an important factor influencing the coastal landscape. Many coastlines are protected from erosion by the stabilising influence of plants e.g. sand dunes, salt marshes and mangroves.

Many of the plants that grown in coastal zones are halophytes some are xerophytes. Halophytes can tolerate salt water and xerophytes can tolerate dry conditions.

Sand dunes cause coastal growth through plant succession; this is the sequential development of vegetation from bare soil to an area covered in vegetation. The succession starts with halophytes growing in salty bare sand. Once established they trap more sand leading to the formation of embryo dunes. Embryo dunes alter the environment and xerophytes begin to flourish. The succession continues and the dunes become fixed and plant cover develops into heath or woodland.
A similar process of plant succession occurs on bare mud deposited in estuaries. Salt marshes develop because of the sheltered conditions and the supply of mud and silt provided by a river. Algae starts the succession followed by halophytic grasses, then sea thrift and ending with rush and sedge.

Q17. Explain why wind is important in the formation of sand dunes?

Coastal landforms and landscapes

Marine erosion

Waves
Waves are caused by friction between wind and water. They directly influence three marine processes – erosion, transportation and deposition.
Wave size and strength depends on:
- Wind strength
- Wind duration
- Water depth
- Fetch

Remember waves and tides are different, waves are localised whereas tides are caused by the gravitational pull of the moon. Tidal range varies from place to place.

Q18: What is happening to particles within a wave?

Constructive waves are of low height and long length and have a strong swash and weak backwash. The strong swash pushes sediment up the beach and deposits it as a ridge, the weak backwash means the deposited material is not pulled back to sea.

Destructive waves are relatively high in height and short in length. They have a strong backwash which erodes beach material and carries it away.
Beach morphology

This is the shape of the beach including width and slope and features such as berms, ridges and runnels. It also includes the type of sediment forming the beach. It is strongly conditioned by the nature of the prevailing waves. But waves can fluctuate over time and bring with them changes to beach morphology

- Storm beaches the result of constructive waves during stormy weather
- Berms – small ridges built up by constructive waves during calm weather
- Cusps – the product of destructive waves eroding berms
- Offshore bars formed by persistent destructive waves

Q19. Identify the sources of beach material.

Erosion processes

Waves cause erosion. Erosion is not necessarily a continuous process it occurs mostly during storms when:

- Waves approach the beach at right angles
- Tide is high
- Heavy rainfall has weakened the rock
- Debris at the foot of the cliff has been removed and no longer protects the base of the cliff

Q20. Why does most erosion take place during storms?

There are 4 types of marine erosion:

Hydraulic action – air trapped in joints and cracks is compressed by the waves
Abrasion – sediment carried by the waves has a wearing down effect
Attrition – The wearing down of sediment by the waves
Solution – carbonate rocks such as limestone are dissolved by rain water, sea spray and seawater

Erosional landforms

The diagram above shows the classic erosional landforms produced by marine erosion with well-defined bedding planes and joints. These landforms are produced amongst more resistant rocks. Softer rocks would be too weak to form these erosive landforms.
Perhaps the most crucial feature is the wave cut notch formed by the processes of hydraulic action and abrasion. As the notch becomes deeper the rocks overhanging it become unstable and eventually collapse. As this process repeats the cliff retreat inland.

Revision activity: Be sure you know a location where erosional landforms occur.

Q21: Explain the sequence of erosional landforms that starts with a cave and finished with a stack.

Marine transport and deposition

Sediment transportation

4 ways of transportation:
Traction – heavier sediment rolls along the sea floor
Saltation – sandy particles bounce along the sea floor
Suspension – Fine sediment such as sand is carried by the water
Solution – dissolved sediment is carried in the water as solution

Currents: Flows of seawater in a particular direction driven by wind, tides, and differences in density, salinity and temperature

Most transport takes place along the coast as opposed to into and away from the shore. This is known as longshore drift.

Exam tip: Remember that wave direction is determined by the direction of the wind. This means LSD direction is determined by the prevailing wind.

Q22: Is longshore drift a current? Give your reasons
**Depositional features**

The main depositional features are:

- **Bayhead beach**: an accumulation of sand at the head of sheltered water between two headlands.
- **Spit**: a sand or shingle beach ridge extending beyond the curve in a coastline.
- **Recurved hooked spit**: a spit built out into a bay or estuary, the end of which curves landward into shallow water.
- **Bar**: a sand or shingle beach extending across a coastal indentation with a lagoon behind.
- **Tombolo**: a sand or shingle bar that attaches an offshore island to the mainland.
- **Cuspate foreland**: a triangular area of shingle extending out from a shoreline, possibly formed by LDS from opposing directions.

**Sediment cells**

Recognising sediment cells and understanding how they work is fundamental to the management of the coast, particularly at a time of climate and population change where there is much pressure on the coast. Sediment cells are long stretches of coastline that operate as almost self-sustaining physical systems. In each sediment cell there are inputs where sediment is generated e.g. eroding cliffs, transfer zones (flows), which are where sediment is moved by LSD and currents, and sinks (outputs), locations where the dominant process is deposition e.g. spits.

**Revision activity**: make notes about one of the sediment cells around the UK coast, preferably one on a stretch of coast you know about first-hand.

**Sub-aerial processes**

Weathering and mass movement are processes which affect most coastlines.

- **Weathering**: The decomposition and disintegration of rocks in situ by the combined processes of the weather, plants and animals.
- **Mass movement**: A collective term for the processes responsible for the downslope movement of weathered material under the influence of gravity.

There are 3 main types of weathering:

- Mechanical – the breakdown of rock by a physical force.
- Chemical – involving a chemical reaction and decomposition.
• Biological – the actions of bacteria, plants and animals which speed up mechanical weathering

Weathering is determined by the climate in that area – temperature and precipitation

Q23: What type of weathering prevails in hot, humid parts of the world?
Q24: Where in the world is mechanical weathering most effective? Why?

Mass Movement

Mass movement can be classified in different ways:
• Rock falls occur where rock on a cliff being undercut by the sea is weakened by weathering. Falls can be sudden and spectacular
• Rotational slides are slow downslope movements of a mass of rock or debris over a curved plane. They are particularly common where a permeable rock e.g. sandstone overlies and unstable impermeable rock e.g. clay. Water passing through the permeable rock lubricates the junction with the underlying impermeable rock, thus facilitating the sliding
• Landslides are sudden downslope surges occurring where weathered rock and soil become saturated and lubricated by water

The distinctive coastal landforms created by mass movement include scree (the product of mechanical weathering on an exposed rock face), rotational scars (the outcome of slumping) and cliff terraces (the result of rotational sliding).

Q25: What is the difference between a) rock falls and rotational slides, b) scree and cliff terraces?

Coastal risks

Sea level change

Sea levels change on a day to day basis as a result of tides, changes in air pressure and winds. Sea level changes are very short term. However, over long time scales, sea level changes are more permanent and the outcome of complex factors. Part of the complexity is that a change in sea level can bring about by a change either in land level (isostatic change) or in the volume of sea (eustatic change).
Long term changes

A marine regression results from a eustatic fall in sea level (as during glacial periods when water becomes locked up in ice or snow) and isostatic fall in sea level (when ice sheets melt and sea level rises). Both movements expose the sea bed and produce an emergent coast.

Features of an emergent coastline

Emergent and submerging coastlines

A marine transgression results from a eustatic rise in sea level (at the end of a glacial period) and an isostatic rise in sea level (when land sinks under the weight of accumulated snow and ice). In both cases, large areas of land are submerged beneath the sea, producing a submergent coast. The Ria coastline is one of the best examples of such a coast.

This animation shows the formation of a Ria

http://www.jeron.je/anglia/learn/sec/geog/coastal/page02.htm

Q26: What are barrier islands and how are they formed?

Contemporary sea level change

Sea levels are rising globally and most scientists attribute this to global warming. The current rise is about 2mm per year. This is due to:

1. Thermal expansion of the oceans as they are warmed by a changing climate
2. Ice sheet melt increasing the volume of water

In some locations coastlines are being lifted or dropped by earthquakes. E.g. 2004 Sumatran tsunami caused coastline to drop by 1 metre in some areas whilst other areas rose by 2 metres!

Coastal recession

Rapid recession

Rapid coastal recession threatens people, property and livelihoods. Caused by:

- Long wave fetch and destructive waves
- Strong LSD
- Soft geology
- Cliffs with structural weakness vulnerable to weathering and mass movement

It can also be accelerated by humans:

- Dredging the offshore sea bed for sand and gravel
- Dams reducing the supply of sediment
- Construction of groynes
Coastal recession and erosion are not constant even in areas such as Holderness or California which suffer rapid retreat. Changes in weather account for much of this variation in erosion.

**Synoptic theme:** The actions of players may alter the natural system of the coast, either deliberately by reclaiming marshes or inadvertently by constructing groynes to prevent LSD.

Remember climate change is not to blame for erosion but instead is accelerating what is already under way.

Q27: How is it that river dams constructed a long way from the coast can contribute to erosion?

**Coastal flooding**

**Factors**
Coastal flooding is another significant and increasing risk along low lying coasts. High risk areas include plains, estuaries and deltas. The risk is increased by:

- Rising sea levels
- Human actions e.g. removal of coastal vegetation such as mangroves. Building of tourist resorts and the general pressure from a growing coastal population. Asia’s 6 mega deltas are home to more than 100,000,000 “at risk” people

**Storm surges:** are short term rises in sea level caused by low pressure and are a particular hazard in low lying coastal areas

![How the storm surge happened January 30 and 31, 1953](image)

The North Sea is particularly vulnerable to storm surge

Revision activity: Be sure to have examples of islands e.g. Maldives and delta areas e.g. Bangladesh that are particularly exposed to coastal flooding
Climate change

It is important to remember that storm surges and low pressure systems have always been an issue. The concern is the magnitude and intensity of these events will be intensified by global warming. It is likely that coastal flooding will be more of a threat in the future.

Synoptic theme: The risks associated with global warming are resulting in uncertainty. This means devising mitigation and adaptation strategies is very important and these actions involve a variety of players.

Q28: What causes storm surges?

Coastal management

Risk and consequences for communities

The risks of coastal recession and flooding look set to continue into the future. The costs will fall into three areas – can you see them?

- Social costs: relocation, health, stress, hardship
- Economic costs: loss of property, loss of farmland and infrastructure damage
- Environmental costs: Loss of habitats and ecosystems

The increasing global population is going to increase these risks. In many areas of the world rising sea levels will be managed by building higher flood walls and stronger sea defences. There will be locations where the situations unmanageable. Most at risks are islands such as the Maldives. Here land will have to be abandoned this will create environmental refugees. The big question is where these refugees will go?

Q29: Do you agree that the consequences of coastal change for communities is directly proportional to the density of the population on the coastal zone?

Different approaches to managing coastal risks

Hard engineering

This involves using concrete, steel and stone to protect coastal communities:

- Sea walls made of reinforced concrete
- Rip rap huge boulders placed at the base of the sea wall
- Rock breakwaters built by huge boulders offshore
- Revetments stone, timber or concrete structures interlocking on sand dune faces or mud banks
- Groynes

Only the sea wall is widely used in the context of coastal flooding. All others are to deal with erosion. Hard engineering has advantages and disadvantages:

- It is obvious to people at risk that something is being done to protect them
- It can be a one off action that lasts for decades
- Construction and maintenance costs are high
- Hard engineering can fail
- Visually unattractive
- It can adversely affect coastal systems
- Defences in one location have an adverse affect on other areas of coast e.g. groynes affect areas further along the coast in the direction of LSD.
**Soft engineering**
Soft engineering aims to work with natural processes to reduce the risks of erosion and flooding. This gives it 2 key advantages over hard engineering it is less visually intrusive and less expensive over the long term.

Examples of soft engineering include:
- Beach nourishment: topping up beaches with sediment transported from elsewhere
- Cliff stabilisation. Planting vegetation through a flexible membrane that holds soil and rock in place.
- Dune stabilisation: Dunes are an effective form of coastal defence but alas are easily degraded. They can be stabilised by planting marram grass and constructing dune fencing

**Revision activity:** Make a table which shows the economic and environmental advantages and disadvantages of hard and soft engineering approaches. Then rank and justify the approaches in terms of their sustainability.

**Synoptic theme:** Remember that human intervention or action in the coastal system is likely to have impacts elsewhere. These impacts may be unforeseen and have indirect consequences e.g. accelerating erosion at other parts of the coast.

**Sustainable coastal management**
The increasing threats of rising sea levels and increasing storm frequency call for a more comprehensive approach to the management of the coast. This approach needs to be sustainable in ensuring that the coast and all its inhabitants have a reasonably secure future. This requires making use of a concept called integrated coastal zone management (ICZM)
Synoptic theme: Coping with increased storm events and rising sea levels calls for imaginative mitigation and adaptation strategies to ensure the future of the present coast

Integrated coastal zone management (ICZM)

Key Concept

ICZM dates from the Rio earth summit in 1992. It has 3 key features:

1. That the entire coastal zone needs to be managed, not just the zone where breaking waves are causing erosion or flooding
2. The importance of the coastal zone to peoples livelihoods and well being
3. The need to make management of the coast sustainable

So ICZM is a joined up holistic approach to coastal management which must:
- Plan for the long term
- Involve all stakeholders and ensure they have a say in policy decisions
- Follow an adaptive approach to unforeseen changes
- Try to work with natural processes not against them

ICZM works well in the concept of littoral cells (sediment cells), which are natural subdivisions of the coastline containing sediment sources, transport paths and sinks. Each cell is isolated from adjacent cells and can be manged as a holistic unit. The coast can be divided into littoral cells and each managed as an integrated unit.

The coastline of England and Wales has 11 cells

Each cell is managed by shoreline management plans (SMP). The hard part of the ICZM is deciding what action to take and it has 4 different options:

1. No active intervention – the coast is left to erode or flood
2. Hold the line – build coastal defences that ensure the coastline remains the same over time
3. Managed realignment – allow the coastline to change but in a controlled way sometimes called managed retreat
4. Advance the line – build new defences on the seaward side of existing defences and reclaim the land.

Revision activity: Note stretch of coastline where the different options are being applied
The choice of management options is generally not straightforward and depends on a number of factors:

- The economic value of the coast
- The technical feasibility of different engineering solutions
- The environmental sensitivity
- The cultural and ecological value of the land being protected
- Pressure from local communities, developers and environmental groups

Any decisions also need to be informed by the results of investigation such as a cost benefit analysis (CBA) and environmental impact assessment (EIA).

It is clear that the ICZM rarely pleases everyone. There are embedded conflicts of interest. This conflict will be made worse by the limited funds available to councils and government. This means coastal managers have to decide which areas should be protected and which should be ignored.

In developed countries there are good frameworks for effective coastal management. The same cannot be said for developing countries, despite the risks of coastal erosion and flooding and growing coastal populations, many large cities with great economic wealth are concentrated in coastal zones!

Revision activity: Make sure you have examples which show different coastal management approaches. Make sure for your different examples you can explain who are the winners and losers from the decisions made. Make sure you can put forward a balanced and well-reasoned discussion in relation to your examples.

Synoptic theme: It is unfortunate that not all players in coastal environments share the same viewpoints. What different players seek ranges from exploitation to conservation and this creates conflicts. Players with more power will often determine the future of coastal areas.

Q30: What are sediment cells and why is it important that coastal management recognises the existence of such cells?

Skills reminder: You will have skills questions on all your exams make sure you are familiar with the following skills:

- Interpreting GIS maps and satellite imagery
  - Field sketching
- Field measurements in relation to beach characteristics and coastal vegetation
  - Measurements of central tendency
    - Students T test
    - Index of diversity
    - Cost benefit analysis
- Environmental impact assessment
Exam practice

1. Name one type of mass movement that occurs on sea cliffs [1]
2. Explain the origin of sand dunes [4]
3. Explain the causes and consequences of storm surges [6]
4. Assess the value of soft engineering approaches to the management of coastal erosion [12]
5. Explain the importance of coastal vegetation [6]
6. Explain how waves affect beach morphology [8]
7. Assess the risks and threats posed by the current rise in sea level [20]

Summary

You should now have an understanding of:

- The physical and human importance of the coast
- The physical variety of coastlines and the significance of geology
- The role of coastal vegetation
- The impacts of waves on the coast
- Coastal erosion and its landforms
- Coastal deposition and its landforms
- Sub-aerial processes at work on the coast
- Coastal risks and threats – sea levels changes, cliff recession, storm surges and flooding
- The human consequences of coastal recession and flooding
- Hard, soft and sustainable management of the coast
- ICZM
- Examples of sample stretches of coastline in the UK and developing world
Regeneration

This topic focuses on the economic and social changes affecting places, particularly within the UK and the need for regeneration that arises from these changes. Regeneration is aimed at reviving the flagging economies of these places and improving the QoL of local people. There are two key concepts running through this topic:

**Place** is a part of geographical space with a distinctive character and identity felt by local inhabitants. The sense of each and every place derives from a unique mix of external connections, natural and human features of the landscape and the people who inhabit it.

Regeneration involves positively transforming the economy of a place that has displayed the symptoms of decline, making it viable and sustainable. It frequently goes hand in glove with rebranding and reimagining.

(Rebranding is changing people’s perception of a place and reimagining is changing the reputation of a place)

**Q1: What is regeneration and why is it such an important issue in the UK**

How and why do places vary?

Places are shaped by internal and external connections (connection is any type of physical, social or online linkage between places – places may keep or change characteristics as a result).

Internal connections: between people, employment, services and housing
External connections: such as government policies and globalisation

Place identity is strongly influenced by what people do for a living. The economic function will affect what type of work on offer and that will in turn affect the type of employee. Compare for example the labour needs of a coastal resort such as Lyme Regis with those of an industrial town such as Yeovil.

**Economies vary from place to place**

Classifying economies and workers

A key factor in the creation and survival of places is their economy. This will affect important aspects such as identity, income and lifestyles, as well as the socio-economic composition of the local population.

There are 4 key employment sectors, primary, secondary, tertiary and quaternary. The emergence of the quaternary sector has been recent (1975). The UK has seen employment decline in primary and secondary sectors linked to deindustrialisation and the global shift in manufacturing. The tertiary sector now dominates employment in most places.
Deindustrialisation: The process of economic and social change due to the industrial decline in areas. A process widely displayed in the developed world with the shift of manufacturing to emerging economies.

Q2: How has sectoral employment in the UK changed in the past 150 years?

The type of employment found in all sectors can be classified in several different ways:
- Part time/full time
- Temporary/permanent
- Employed/self employed

The workers themselves can also be classified as:
- Employees with contracts permanent or fixed
- Agency staff and volunteers
- Self employed
- Skilled/semi-skilled/unskilled

Exam tip: Make sure you know all the employment sectors and types of worker and how the sectoral balance of the UK has changed

Social impacts
The different types of worker and sector have a profound impact on people lives:
- Health: e.g. long working hours in manual jobs such as construction lead to an increased risk of accidents and poor health
- Life expectancy: there is a whole range of work related factors here such as stress or exposure to risk
- Education: children from poor working class families still tend to under achieve and are less likely to go to university
- Lifestyles: higher wages means more disposable income will be spent on luxuries

Inequality: is the outcome of uneven distributions. In this topic we focus on the uneven economic and social distributions that exist in communities and societies. For example unequal distribution of wealth or social opportunities. Regeneration aims to tackle these inequalities but they are resistant to remedies.
Income inequalities

Inequalities in pay levels are linked to differences in types of employment, some types of work e.g. professional are more highly paid than others e.g. manual. There are huge disparities in income and cost of living both nationally and locally. This has always been the case but the trend is that these inequalities are increasing.

Quality of life: The level of social and economic well being experienced by individuals and communities, measured by various indicators such as life expectancy, educational achievement etc. This is closely linked to salary. This related to the fact that many of the things that contribute to quality of life are goods (e.g. housing and household equipment) and services (transport and leisure) that have to pay for.

Factors affecting QoL and inequality

<table>
<thead>
<tr>
<th>Factors and processes</th>
<th>Possible measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic inequality.</td>
<td>Employment/unemployment rates and types</td>
</tr>
<tr>
<td>Employment opportunities</td>
<td>Average incomes</td>
</tr>
<tr>
<td>work and income</td>
<td>Purchasing power</td>
</tr>
<tr>
<td></td>
<td>Pound shop and loan shop surveys</td>
</tr>
<tr>
<td></td>
<td>Land use surveys</td>
</tr>
<tr>
<td>Social inequality.</td>
<td>Age, gender, health, disability and educational data from the ONS (census)</td>
</tr>
<tr>
<td>Segregation of people and</td>
<td><a href="http://www.police.uk">www.police.uk</a></td>
</tr>
<tr>
<td>marginalisation or exclusion of sub groups</td>
<td>Zoopla</td>
</tr>
<tr>
<td></td>
<td>Village community centre activities e.g. play groups or elderly groups</td>
</tr>
<tr>
<td></td>
<td>Place check</td>
</tr>
<tr>
<td>Service inequality.</td>
<td>Functional surveys of services (e.g. high/low order etc)</td>
</tr>
<tr>
<td>Health facilities, public</td>
<td>Bus timetable survey</td>
</tr>
<tr>
<td>transport, food access</td>
<td>Supermarket and shop location surveys</td>
</tr>
<tr>
<td>Environmental inequality</td>
<td>ONS (census) – central heating provision</td>
</tr>
<tr>
<td>Pollution levels, derelict</td>
<td>Building quality surveys</td>
</tr>
<tr>
<td>land and access to open</td>
<td>Environmental quality surveys</td>
</tr>
<tr>
<td>space have impacts on</td>
<td></td>
</tr>
<tr>
<td>people's well being</td>
<td></td>
</tr>
</tbody>
</table>

Q3: Distinguish between social and service inequalities

Q4: What economic factor most affects quality of life justify your choice

Changing function and characteristic

Functional and demographic changes
Over time the functions of a place change and therefore their economies change also. Traditionally urban places have been involved in one or more of four key functions: administrative, commercial, industrial and services. Historically high order functions such as banks and council offices have been located in larger settlements whilst low order functions such as post offices can be found in smaller settlements.

However commercial functions are now changing rapidly because of the internet and broadband speed. Retail functions have changed massively due to online shopping.
Whilst places change what they do so do their populations. Usually the function change influences the population change. Typical demographic changes include:

- Trends increasing or decreasing populations
- Rates of change
- Increasing ethnicity
- Age and gender imbalances
- Socio-economic structure changing in response to processes such as deindustrialisation, gentrification, deprivation and studentification

Gentrification: The movement of middle class people into rundown inner city areas, resulting in an improvement in housing stock and image

Deprivation: A condition when a person’s wellbeing generally falls below what is regarded as a reasonable minimum.

Studentification: Social and economic and environmental change brought about by a concentration of students in areas close to universities.

Measuring change

Changes in places can be measured by:

- Land use conversions
- Employment changes
- Demographic changes
- Changes in deprivation

The last of these is very important and can be measured using the IMD (index multiple derivation). You can find out how deprived where you live is at http://imd-by-postcode.opendatacommunities.org/

Q5: Which employment trends would best show how a place has changed?

Places and their connection

For this part of your revision you need examples:

- NE England
- M4 corridor
- London
- Bristol
- Somerset

Revision activity: Create a mindmap using the heading below which realtes to specific changes in these places. The changes should focus on:

- Regional and national connections
- International and global connections

<table>
<thead>
<tr>
<th>Physical environment</th>
<th>Heritage</th>
<th>Buildings</th>
<th>Spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural change</td>
<td>Local customs</td>
<td>Socio-economic groups</td>
<td>Population</td>
</tr>
<tr>
<td>Politics</td>
<td>Services</td>
<td>Employment</td>
<td>Ethnicity</td>
</tr>
</tbody>
</table>

Your mind map should address to what extent these connections have brought about change in your places and how these changes have impacted upon people?
**Synoptic theme:** Places in the UK and elsewhere in the world are increasingly being influenced by two major players: TNCs and IGOs. This is part of globalisation.

Your place investigation in the previous revision activities should be guided by 4 groups of questions:

- Those that establish the initial identities of your chosen place
- Those about how their economic and social characteristics have been shaped by regional and national connections
- Those about how their economic and social characteristics have been shaped by international and global connections
- Those about how economic and social change has influenced the identities of people living in those places.

**Revision activity:** Now turn your mind map into a table

<table>
<thead>
<tr>
<th>Place identity</th>
<th>Place 1 e.g. Bristol</th>
<th>Place 2 e.g. Somerset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional and national influences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>International and global influences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peoples identities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Synoptic theme:** Attitudes towards places change and can very polarised by those who view change as bad as damages heritage and those who see it as good as it enriches people’s lives.

**Q6:** To what extent have the connections of your two places changed?

**The need for regeneration**

Remember regeneration is an exercise in economic improvement. The hope is that improvement will attract investment and create jobs. From this there will hopefully be spin off social benefits. There are two particular challenges associated with regeneration:

**Challenge 1:** Persuading people that regeneration is needed
**Challenge 2:** Agreeing what would be the most appropriate and effective form of regeneration.

Both challenges are made more difficult by the fact that people differ in so many ways, particularly in their lived experience, their attachments to a place and their perceptions of place.

**Inequalities and perceptions**

**Key concept:**

**Lived experience** is the experience of living in a particular place. This can have a profound effect on people perceptions, values and identity. The length of time someone lives in an area can influence their place attachment and then how they will involve themselves in regeneration.
The economic and social inequalities that lie rooted in employment and different levels of income effect people’s perception of a place. Place has a huge impact on us all.

**Successful places**

Places deemed as successful tend to be characterised by:

- High rates of employment
- High rates of in migration
- Low levels of deprivation

Such places can be self-sustaining as more people and investment are drawn to the opportunities created. However there are negatives (known as externalities):

- Increased property prices
- Congestion
- Overburdened services such as health and education

The perception of residents in such places may differ:

- Younger people in high earning jobs will enjoy the fast pace of life and opportunities
- Unskilled people, lower earners and the long term unemployed will have more negative views
- Retirees may view them as too busy and look to other perhaps less successful places with a slower pace of life and improved access to healthcare

REMEMBER: Different people will have different views on what makes a successful place. London is a successful place for some but not for others!

**Revision activity:** Make notes on our successful place which is the M4 corridor:

Where is it?

Key facts

What factors have made it successful?

What problems does it have?

**Less successful places**

Economic inequality and technological change breed less successful places. The example of a less successful place we studied is Middlesbrough in North East England. Less successful places have:

- High levels of unemployment and deprivation
- Derelict buildings
- Graffiti
- Crime

Less successful places are perceived less favourably. The lived experience is often poor and people do not have as many strong attachments to their place. Less successful places often get drawn into a spiral of decline
**Revision activity:** Make notes on North East England as an example of a less successful place. This should include facts which show it is less successful, the factors which caused it to be less successful.

In areas that are less successful we can often find **sink estates** these are housing estates characterised by high levels of poverty, deprivation and crime, such as domestic violence, drugs and gangs.

**Priorities for regeneration**

Economic and social inequalities create the need for regeneration. There are significant variations in different places and this impacts the need for regeneration. Gate

<table>
<thead>
<tr>
<th>Priorities for regeneration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sink estates</strong></td>
</tr>
<tr>
<td><strong>Declining rural settlements</strong></td>
</tr>
<tr>
<td><strong>Commuter villages</strong></td>
</tr>
</tbody>
</table>
Q7: Suggest three priorities for regeneration

The lived experience of place and engagement

Levels of engagement
One aspect of the lived experience that affects place attachment is the level of engagement. This is the degree in which a person participates in their local community and the degree in which they feel they belong to a place. It can be indicated by:

- Number of people who vote in local elections
- Membership and participation in local societies
- Having a circle of local friends

The opposite of engagement is marginalisation. This is the social process of being made to feel excluded from the rest of society which can lead to the development of an underclass. The factors that can affect engagement can also affect the degree of marginalisation e.g. age, gender, and ethnicity.

Q8: What makes people feel marginalised and excluded?

Lived experience and place attachment
Lived experience and place attachment vary from person to person.

Conflicts
Conflicts often occur within groups in a community, largely because they hold differing views about the priorities for regeneration. These can be caused by:

- Lack of involvement in politics
- Ethnic tensions
- Social inequality
- Lack of economic opportunities

Synoptic theme: Players may vary in their differing approaches to urban regeneration and favour contrasting approaches. These attitudes are influenced by degree of attachment.

Q9: What factors influence a person’s place attachment?
Evaluating the need for regeneration

It is quite possible for people living in the same place to have contrasting views about the need for regeneration. In the places you have studied consider the degree to which this is evident?

With regards the two places you have investigated. You should have:
- Used statistical evidence to determine the need for regeneration
- Used different methods to question the need for regeneration
- Identified the factors that influence the perceived need for regeneration

Key point: The most powerful factor is unemployment the environmental and social criteria are spin offs from this

Revision activity: Research the proposed third runway at Heathrow and HS2 and make notes on pros and cons of each one.

Exam tip: Make sure you have examples to support your answers. A Level exam questions require examples

How is regeneration managed?

The role of national government

Investment in infrastructure
Infrastructure is the basic physical systems of a place. Economic infrastructure includes: roads; energy distribution, water and sewage facilities and telecommunications. Social infrastructure includes: schools, housing and hospitals.
In the UK the government plays a key role in regeneration through investment in national transport infrastructure. The idea is that accessibility is key to successful regeneration. Not only is it likely that investment will flow to places with improved infrastructure, good transport infrastructure is also
important for the sustainability of that investment. A current example is HS2 a high speed rail link that will help regenerate parts of northern England.

Factors affecting regeneration policy

**Domestic policies**
Government policy can also help stimulate regeneration in other ways:
- Relaxing planning laws on developing greenfield sites
- Providing incentives for house building
- Allowing fracking in the hope that it might play a part in the regeneration of rural areas

**International policies**
The government can also pursue policies at an international level that have an impact on regeneration:
- Deregulating capital markets to encourage foreign and private investment in regeneration schemes
- Immigration: There is tension here between the job generating focus of regeneration and the availability of migrant workers – who can both create jobs for local people but also take jobs from local people and suppress wages

**Key point:** National governments invest in large infrastructure projects because of the perceived benefits they may have for places

**Synoptic theme:** National governments are influential players in regeneration but they must encourage and involve investors and developers to make sure regeneration is self-sustaining. They have the power to override the views of some of the players involved.

**Q10: How does the UK government play a key role in regeneration?**

**The role of local government**

**Local plans**
The main task for local government is to create an environment sympathetic to the needs of business which will then support regeneration. One of the most obvious ways is to have a local plan that clearly designates areas for redevelopment, e.g. retail, science or industrial parks. This is perhaps the most important decision local government has to make. What should be the lead activity heading up regeneration? Retail? Tourism? Sport? Leisure and recreation?

**Regeneration strategies**

<table>
<thead>
<tr>
<th>Regeneration strategy</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology led regeneration to attract new investment and economic opportunity</td>
<td>Bristol temple quarter, Cambridge science park</td>
</tr>
<tr>
<td>Sport and culture led regeneration to attract investment and create green spaces and leisure facilities</td>
<td>Olympic park London</td>
</tr>
<tr>
<td>Retail led regeneration</td>
<td>Liverpool ONE, Cabot’s Circus</td>
</tr>
<tr>
<td>Heritage tourism</td>
<td>Titanic quarter in Belfast</td>
</tr>
<tr>
<td>Themed events such as music festivals</td>
<td>Notting Hill carnival, Harbour festival in Bristol, Glastonbury</td>
</tr>
<tr>
<td>Improving building stock</td>
<td>Bristol Harbourside</td>
</tr>
<tr>
<td>New settlements</td>
<td>Milton Keynes</td>
</tr>
<tr>
<td>Sustainable communities</td>
<td>BedZED</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>HS2, Heathrow 3rd runway</td>
</tr>
</tbody>
</table>

Revision activity: You need to have 3 examples from above in your notes; these should have detail in terms of how the regeneration was managed and also potential impacts.

**Local support**
Local governments will hope to receive local support for their regeneration schemes, as for example the local chamber of commerce or trade unions. However, everyone knows that such schemes will not be acceptable to everyone. Some local groups will inevitably prefer preservation and things staying the same whilst others will welcome change and this can create tension and conflict.

**Synoptic theme:** The success of regeneration schemes hinge on the actions of local authorities. But their attitudes to regeneration may clash with other players and lead to conflict. Make sure you have an example of this taking place.

**Q11. Describe ways local governments can try to attract inward investment**

**Rebranding**

**A new look**
The process or rebranding and re-imaging attempts to make areas look attractive to potential investors, clients and local people. This involves changing the appearance of a place as well as people perception of a place.

**Rebranding deindustrialised places**
Rebranding often focusses on the attractiveness of a place. This is possible even for places bearing the scars of deindustrialisation either by comprehensive redevelopment and giving a place totally new identity e.g. London Docklands or capitalising on a places industrial heritage e.g. Telford. An added possibility is using the regenerated places for prestigious national and international events.

**Rural rebranding strategies**
The 21st century has seen a new rural economy develop, with rural areas becoming more like urban areas with their activities. A wide range of tried and tested strategies have emerged to rebrand rural areas:

- Capitalising on heritage or literary associations e.g. Bronte country in Yorkshire
- Farm diversification e.g. specialised agricultural products such as buffalo meat or converting to other uses such as farm buildings becoming tourist accommodation or farmland becoming campsites
- Outdoor sports
- Adventure tourism
- Telecottage

Revision activity: Make sure you have notes on both urban and rural examples of rebranding. Create mind maps which show the strategies used and any evidence of success and problems.

Q12: What evidence do you have of rebranding in your place studies?

Assessing the success of regeneration

Possible measures

| The aim of regeneration is to create a legacy of increased employment and income and reduced poverty and deprivation. |

Economic measures

The term regeneration indicates a long running process rather than a quick fix. Despite the political pressures for speed.

Possible economic measures are:

- Employment, not just number of jobs but types of jobs
- Income – average earnings, business profits, number of households on benefits
- Poverty a declining incidence of the number of households on benefits

These and other measures may be used to assess the performance of regeneration in two different ways:

1. To compare the same measures before and after regeneration
2. To compare the results of regeneration projects with similar projects elsewhere

Social progress

Social progress relates to how an individual and community improve their relative status in society.

It can be measured by:

- Reduction in inequalities between and within areas
- Reductions in deprivation (see IMD)
- Improvements in education and healthcare

Quality of the living environment

Regeneration targeted at the built environment attracts more people to live there. Hopefully, it will have positive knock on effects on health. General improvements in aesthetics, security and safety are often common components of regeneration programmes. The effect of these can be seen through lowering pollution levels and reductions in the amount of derelict land.

One final and important point is to remember that not all regeneration projects are intended to be quick fixes. For this reason, assessments of success or otherwise should not be attempted before the regeneration has had time to bed down and reveal its strengths and weaknesses. This will take years.
Q13: Check that you understand the three main measures of regeneration success and provide examples of each.

**Evaluation by urban stakeholders**

**Stakeholders generally**

In this section you need an example of urban regeneration. You must be specific to the actual place. For this place you need to focus on the following:

- The contested nature of the regeneration proposal including stakeholders for and against and their particular views
- The impact of national and local strategies in determining the nature of regeneration
- The evaluation of the regeneration by specific stakeholders

Making judgements about the success of regeneration in any place involves not just the actual decision makers but also those of the stakeholders. In most situations the stakeholders fall into four categories:

1. Providers could be landowners, investors or contractors
2. Users those who stand to gain or lose
3. Governance, local and national government
4. Influencers – action groups or political parties

**Factors influencing the perception of success**

**The above mind map** shows that each particular stakeholder will have their own perception and opinion on what makes success and failure. They will have their own interests and agendas. They will have their own ideas for what makes a successful scheme. Each stakeholder will arrive at their own verdict.

The table on the next page shows the factors that influence these views.

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Key concept: **stakeholder** an individual or group with a particular interest in the outcomes of a project.
<table>
<thead>
<tr>
<th>Viewpoints</th>
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<tr>
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<td>Small regeneration schemes</td>
</tr>
<tr>
<td>Tackling inequality in their area</td>
<td>Soft management helping</td>
</tr>
<tr>
<td>Make local planning decisions</td>
<td>regeneration e.g. alcohol free zones</td>
</tr>
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<td></td>
</tr>
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<td><strong>Developers</strong></td>
<td>Funding of schemes</td>
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<tr>
<td>Profit above all else</td>
<td></td>
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<td>Invest in schemes</td>
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<tr>
<td>Views will vary based upon how the regeneration will affect their customer base</td>
<td>Lobby councils</td>
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<td><strong>Local communities</strong></td>
<td>Lobby councils</td>
</tr>
<tr>
<td>The silent majority may be</td>
<td>Vote for political parties</td>
</tr>
<tr>
<td>represented by a few willing to give up their time to be involved in a pressure group. Broadwater farm is an example of many players working together</td>
<td>Form pressure groups</td>
</tr>
</tbody>
</table>

Different stakeholders have different levels of power and influence they are NOT all equal

**Q14:** Check you understand the difference between the four types of stakeholder.

**Revision activity:** Make notes on an urban regeneration scheme under these three headings:
- Contested nature (conflicts between stakeholders)
- Impact of national and local policies
- Evaluation by different stakeholders

**Evaluation by rural stakeholders**

**Stakeholders in a rural regeneration project**
As with the last section you also need an example of rural regeneration. Again you must be specific to the actual place. For this place you need to focus on the following:
- The contested nature of the regeneration proposal including stakeholders for and against and their particular views
- The impact of national and local strategies in determining the nature of regeneration
- The evaluation of the regeneration by specific stakeholders

Making judgements about the success of regeneration in any place involves not just the actual decision makers but also those of the stakeholders. In most situations the stakeholders fall into four categories:
5. Providers could be landowners, investors or contractors
6. Users those who stand to gain or lose
7. Governance, local and national government
8. Influencers – action groups or political parties

**Factors influencing the perception of success**
The above mind map shows that each particular stakeholder will have their own perception and opinion on what makes success and failure. They will have their own interests and agendas. They will have their own ideas for what makes a successful scheme. Each stakeholder will arrive at their own verdict.

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| Different stakeholders have different levels of power and influence they are NOT all equal

**Revision activity:** Make notes on an urban regeneration scheme under these three headings:

- Contested nature (conflicts between stakeholders)
- Impact of national and local policies
- Evaluation by different stakeholders
The Egan wheel can be used to help evaluate the success of regeneration. A regeneration project can be scored on the various components of the Egan wheel. This will help determine if the project is self-sustaining which is vital if regeneration is to be successful in the long term.

Q15: Check that you are able to provide examples of stakeholders and their views drawn from your own place investigations.

Skill reminder – you should be familiar with the following skills

- Using GIS to investigate places
- Interpret oral accounts of lived experience
- Use of IMD
- Use social media to interpret people’s perceptions of the place in which they live
- Scatter graphs and spearman’s rank to test the strength of relationships
- Investigate newspaper resources to investigate contrasting views
- Use media images to show how a place has changed
- Use photographic and map evidence to show the before and after of a place
- Interrogate blogs to assess the success of regeneration
Exam practice

1. In which sector is retail [1]
2. Suggest one reason for the decline in the secondary sector in the UK [3]
3. Explain how economic restructuring had triggered social decline in places [4]
4. Explain the role of the UK government in the regeneration of places [6]
5. Assess the extent to which rebranding attempts to represent areas as being more attractive
6. Suggest how a national infrastructure project can benefit different parts of the UK [6]
7. Explain why different stakeholders have different views for judging the success of urban regeneration [6]
8. Assess the extent to which the success of regeneration can lead to social progress and an improvement in the living environment [20]

Summary
You should now have an understanding of:
- How economies can be classified and vary from place to place
- The way in which places change their functions and characteristics over time
- Past and present connections that shape the economic and social characteristics of a place
- Economic and social inequalities that affect people’s perception of an area
- The significant variations in lived experience and places and the level of engagement with them
- A range of ways to assess the need for regeneration
- UK government policy decisions which play a key role in regeneration
- Local government policies which aim to represent areas as being more attractive for investment
- Rebranding attempts to represent places as being more attractive by changing people’s perceptions of them
- How a range of measures is used to assess the success of regeneration: economic, demographic, social and environmental
- The fact that urban stakeholders have different criteria for judging the success of regeneration
- The fact that rural stakeholders have different criteria for judging the success of regeneration
Globalisation

Globalisation is the process by which places and people become more connected with each other than they used to be.

The causes and acceleration of globalisation

The acceleration of globalisation

Globalisation is the latest chapter in a long story of how people and states have become more connected in 4 main ways:

- Economic globalisation – through the growth of TNCs and ICT
- Social globalisation – through international migration, global improvements in education and health and social interconnectivity
- Political globalisation – through the growth of trade blocs, free trade agreements and global organisations
- Cultural globalisation – through “successful” Western cultural traits dominating some areas, glocalisation and hybridisation and the acceleration of circulation of ideas and information

TNCs – Business whose operations are spread across the world operating in many nations as both makers and sellers of goods and services

Glocalisation – The changing of the design of products to meet local tastes or laws

Global connections, flows and interdependence

Modern globalisation differs from historic globalisation by:

- A lengthening of connections between people and places with products sourced from further away than ever before
- A deepening of connections, with a sense of being connected to other people and places now penetrating more deeply into almost every aspect of life
- Faster connections, with people able to talk to each other in real time, using new technologies, or traveling quickly between continents using jet aircraft

Globalisation involves building up networks of places and their populations. The connections between places represent different kinds of network flow. The flows are the movements of:

- Capital – at a global scale, major capital (money) flows are routed daily through the world’s stock markets
- Commodities – valuable raw materials such as fossil fuels, food and minerals have always been traded between nations
- Information – the internet has brought real time communication between distant places, allowing goods and services to be bought at the click of a button
- Tourists – budget airlines have brought a pleasure periphery of distant places within easy reach of rich tourists
- Migrants – the permanent movement of people still faces the greatest number of obstacles due to border controls and immigration laws

Developments in transport and trade
We have seen massive improvements in transport which have facilitated a global growth in trade. Some countries have maintained their competitive edge through continued transport innovation.

Important innovations in transport have included:
- Steam power enabling the movement of goods and armies quickly along trade routes into Africa and Asia
- Railways
- Jet aircraft making international travel quicker and cheaper
- Containerisation which is the backbone of trade with 200,000,000 individual container movements taking place each year

These innovations have resulted in a shrinking world with distant places feeling closer and taking less time to reach.
ICT and mobile phone use in the 21st century

Technology is used by different players in a vast array of ways that contribute to globalisation:

- Telephone and the telegraph are core technologies for communicating across distance
- Broadband and fibre optics allow enormous amounts of data to be transferred via undersea cables across the ocean floor
- GIS and GPS: satellites continuously broadcast position and time data around the world
- The internet has connected people across the globe

Q1: How have developments in transport and trade contributed to a shrinking world?

The politics and economics of globalisation

The work of international organisations

Synoptic theme. 3 important intergovernmental organisations (IGOs) are major players in the promotion of a global economy: World Bank, IMF and WTO. Other important players are TNCs and national governments.
<table>
<thead>
<tr>
<th>IMF</th>
<th>World Bank</th>
<th>WTO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Role in globalisation</strong></td>
<td>Based in USA. Channels loans from rich nations to countries that apply for help. In return the recipients must agree to run free market economies that are open to outside investment. As a result TNCs can operate more easily. The USA and EU exert a lot of influence over IMF policy. Lends money on a global scale and has HQ in USA. In 2015 $470 million was loaned to the Philippines for a poverty reduction programme. The world bank also gives grants to developing countries to kick start economic growth.</td>
<td>Based in Switzerland the WTO advocates free trade and the removal of tariffs. It encourages countries to ban protectionist trade policies.</td>
</tr>
<tr>
<td><strong>Evaluation</strong></td>
<td>IMF rules and regulations can be controversial especially the strict financial conditions imposed on borrowing governments which may be forced to cut back spending on health and education at a time of poor literacy rates and low life expectancy.</td>
<td>In total the world bank distributed $65 billion in loans and grants in 2014. Like the IMF it also imposes strict neo-liberal rules for countries wanting to access these loans and grants. All world bank presidents have been US citizens.</td>
</tr>
</tbody>
</table>

**Q2: How have IGOs contributed to globalisation?**

**The attitudes and actions of national governments**

National governments are also players in globalisation and help promote the growth of the global economy by:

- Promoting trade blocs which are voluntary agreements that encourage free trade between member countries e.g. EU.
- Free market liberalisation for example lifting restrictions on the way companies and banks operate
- Encouraging business start-ups and allowing TNCs to grow in size
- Privatisation allowing private companies to take over important national services such as railways and energy

**Exam tip: You need to know that the growth and spread of TNCs has been encouraged by national governments**

**The spread of globalisation into new global regions**

Special economic zones (SEZs). An industrial area often near a coastline where favourable conditions are granted to TNC’s e.g. Shenzhen

Foreign direct investment (FDI) a financial injection made by a business into another countries economy either to build and invest or merge with a firm already located there.
SEZs and FDI have played important roles in accelerating globalisation. This is well illustrated by the case of China. Its open door policy has allowed urbanisation to fuel the growth of low wage factories. These in turn have enabled China to become the “workshop of the world”. The world’s largest TNCs were quick to establish plants or trade relationships with Chinese owned factories in newly established SEZs. Today China is the world’s largest economy and this shows that free trade can sometimes cure poverty.

*Exam tip: Economic growth in China didn’t just happen it was carefully planned by the government*

The effects of globalisation

Uneven globalisation

Globalisation has affected some places more than others. The unevenness is due to variations in the policies and attitudes of governments – not all governments favour globalisation – physical factors such as the availability of resources and accessibility, and TNC assessments of where the best business opportunities are.

Uneven levels of globalisation can be assessed using a variety of measures and indicators. The KOF index uses data as diverse as involvement in the UN and number of TVs owned. The AT Kearney ranks cities by their business activity, cultural experience and political engagement to determine how well connected.

Most and least globalised places according to KOF index

TNCs and globalisation

TNCs want to build global business through:

- Offshoring or moving parts of their business to other countries to reduce costs
- Outsourcing contracting another company to produce the goods and services they need rather than do it themselves
- Global production networks: setting up chains of connected suppliers that contribute to the global assembly of a product

However some parts of the world have benefited far more from TNCs and FDI because not all places are suitable places for the production of goods and services. In order to maximise profits many TNCs have adapted their products to suit local tastes through a process of glocalisation. An example of this would be McDonalds who sell a chicken big mac in India as beef is not eaten by people of the Hindu faith.

*Q3: List the ways that TNCs are important players in globalisation*

A few of the very poorest nations remain very switched off from globalisation. This is due to a range of political, physical and environmental reasons. A prime example would be North Korea or Sudan.
Q4: Why are some places switched off from globalisation?

Revision activities:

1. Give an example of a switched off and switched on place. You must explain why each place is switched off or on to globalisation.
2. Make sure you understand why globalisation has accelerated in recent decades