Question(s)

Define the key terms:

- Abrasion
- Attrition



Answer(s)

Abrasion – caused by waves picking up material which is forced against the cliff face wearing it away

Attrition – where stones and pebbles in the sea knock against each other causing them to become smoother and rounded.

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Question(s)

Question(s)

- 1. Define the key terms:
 - a. Fetch
 - b. Backwash
 - c. Swash



Answer(s)

Fetch – The distance over which wind has blown to form a wave

Backwash – the movement of water back down a beach

Swash – the movement of water up a beach

Wind blows over surface of water - creates friction

transferred forward in the form of a wave

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Answer(s)

elliptical



- Describe and explain the way in which waves form
- top of the wave however unaffected by the friction becomes steeper eventually breaks

of the wave - causes the wave to slow down - shape becomes more

as a wave reaches shallow water, friction between the sea bed and the base

- Frictional drag causes water particles to begin to rotate and energy is

when it breaks - water moving up the beach in the swash and the water moving back down the beach in the backwash.

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Question(s)

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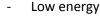
Answer(s)



- Outline the main characteristics of constructive







- Low frequency (<10/min)
- Swash>Backwash
- Deposition

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Answer(s)



- Question(s)
 - Outline the main characteristics of destructive waves

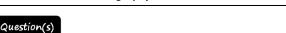


- High (>1m)
- High energy
- High Frequency (>10 min)
- Swash<Backwash
- Erosion







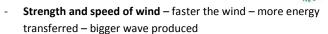


Describe 3 factors which will affect the strength of a wave

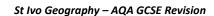


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Answer(s)



- **Duration of the wind** length of time for which the wind has blown - longer the wind blows for, the more energy is transferred to the wave.
- Fetch the distance over which the wind has blown (i.e. how far the wave has travelled) - longer the fetch the stronger



Question(s)

Outline a form of physical weathering operating at the coast



Answer(s)

Frost Shattering - water gets into cracks in the rocks - if temperatures fall below freezing at night the water freezes and expands (9-10%); puts pressure on the rock around - then thaws. Freeze-thaw cycle gradually forces the rock apart.

Salt crystal growth – sea water contains salt from spray from the waves - when evaporates leave salt behind - salt crystals growing in the cracks in the rock can force the rocks apart

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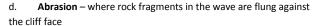


Question(s)

Name and outline four examples of erosion processes operating at the coast



Answer(s)



- Hydraulic action waves break against cliff face pressure of the breaking wave compresses air in cracks - 'mini-explosions' force
- Corrosion occurs where salt water is able to dissolves some of minerals in the rock (e.g. limestone cliffs gradually weakened).
- Attrition rock fragments carried by the waves hit against each other and gradually wear down.

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Question(s)

Outline the mass movement processes of (i) slumping and (ii) soil creep



Answer(s)

Slumping – erosion at base of cliff may lead to rotational slipping of cliff above - particularly on clay cliffs - during dry periods the clay contracts and cracks and will become saturated during wet periods - moving downslope due to gravity.

Soil Creep - slow downhill movement of soil

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Question(s)

Name 4 examples of erosion landforms at the coast

Question(s)

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Answer(s)



- Wave Cut Platform
- Cliff
- Cave
- Stack and Stump
- Arch









Answer(s)



Question(s)

Name 3 examples of deposition landforms at the coast



- **Beaches**
- Spits
- **Bars**

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Question(s)



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Answer(s)



Describe and explain the process of longshore drift



This is the movement of material along the coastline. Material is moved up the beach by the swash at an angle controlled by the prevailing wind. The backwash then carries materials back down the beach at right angle to the coastline under the influence of gravity. Gradually the material is moved along the coastline, its direction controlled by the prevailing wind direction.

Headlands and Bays (Swanage Bay and the

Wave-cut platform - Kimmeridge (Dorset

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Question(s)

Give named examples of the following features:

- Headlands and Bay
- Wave-cut platform b.
- Stack c.
- d. Arch

Question(s)

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Foreland - Dorset)

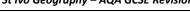
Stack - Old Harry (Dorset)

Arch - Durdle Door



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Answer(s)

Answer(s)



- Describe and explain how Headlands and Bays form
- rock outcrop at right angles to the coast) Leads to differential erosion (soft rock eroding quicker than the harder
- resistant rock) Bays (indents in coastline) form where the erosion of the soft rock is
- Headlands (hard rock outcrops) left sticking out into the sea
- The exposed headland then becomes vulnerable to the force of the destructive waves







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Question(s)

Describe and explain how cliffs and wave-cut platforms form



Answer(s)



- Erosion of cliff at base in wave-attack zone (hydraulic action and solution) - undercuts the cliff and forms a wave-cut notch
- Cliff face affected by abrasion (rock fragments hurled against cliff)
- Undercutting continues overhanging cliff eventually collapses - cliff retreats
- As cliff retreats gently sloping rocky platform (wave-cut platform) left behind and exposed at low tide.

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Describe and explain the erosion of a headland



Answer(s)

- The sea attacks foot of cliff erodes weaknesses such as joints / cracks (processes like hydraulic action and abrasion)
- Cracks get larger form into small caves
- Further erosion widens the cave where the fault line runs through the headland – eventually forms arch which passes through the headland
- Further wave attack at base of arch and weathering of roof of arch weakens structure - roof of arch eventually collapses - leaves a stack (free standing column of rock)
- Stack eventually collapses forming stump (covered at high tide)

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Question(s)

Give named examples of a (i) spit (ii) beach and (iii) bar



Answer(s)

- Spits Spurn Head (Holderness Coast)
- Beach Hunstanton
- Bar Slapton Sands (Devon)

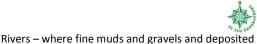
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Question(s)

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Answer(s)



- at the river mouth Give 3 main sources of beach material
 - Longshore drift (bringing material from elsewhere along the coast)
 - Constructive Waves (bringing material up the beach from the sea) and from cliff erosion

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Question(s)

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Describe 3 factors which affect the rates of coastal erosion



Answer(s)

Resistance of Rocks - limestone / chalk and granite - more resistant and less resistant rocks (e.g. clay) erode faster **Shape of the Coastline** – where discordant coastline – outcrops of hard and soft rock - resulting in differential erosion **Strength of the Waves** – longer the fetch the stronger the winds - greater the rates of cliff recession

Coastal defence – rates of cliff recession are slower where coastal defence techniques are used.

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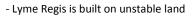
Question(s)

Describe 3 reasons why coastal management is needed at Lyme Regis





Answer(s)



- the town is exposed to strong destructive waves from the SW with a long fetch.
- it is an actively eroding coastline prone to landslips



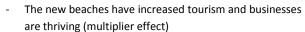




Give 4 advantages of the coastal management scheme at Lyme Regis



Answer(s)



- It is now possible to walk along the whole beach even at high tide
- Provides long term protection against coastal erosion and landslips
- New sea wall provides a promenade along the sea front and will protect 500 homes.

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Question(s)

Give 4 disadvantages of the coastal management scheme at Lyme Regis



Answer(s)

- Some think the new defences have spoilt the natural coastal landscape
- The sea wall may interfere with coastal processes and increase erosion elsewhere
- There has been an increase in visitors has caused conflict
- The area is a world heritage site famous for fossils some fossils may never be uncovered if landslips are prevented.

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Question(s)

Distinguish between hard and soft engineering in the context of coastal management



Answer(s)

Hard engineering involves the construction of man-made defences to control the natural processes (e.g. groynes and sea walls) whereas Soft Engineering works with natural processes, not involving construction. It is usually visually unobtrusive and considered more environmentally friendly

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Question(s)

Describe how a groyne works and give one advantage and one disadvantage



Answer(s)

Groynes (often wooden – but sometimes rock or concrete) are fences built across the beach, stretching from the coastline into

ADV - Prevents LSD - leads to build up of beach in front of cliff - natural defence reducing erosive power of the waves. DISADV - unattractive / access becomes difficult; looks ugly; starves areas down the coast of beach material which can increase erosion in these areas.

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Question(s)

Describe how Rock Armour (rip rap) works and give one advantage and one disadvantage



Answer(s)

Rip Rap – large resistant rocks placed in front of the cliff

ADV – absorb wave energy – protect cliffs behind, can be cheap (depending on rock type) DISADV – can make beaches inaccessible – not effective in storm conditions.

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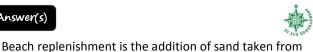








Answer(s)



Question(s)

Describe what is meant by beach replenishment and give one advantage and one disadvantage

Advantage – looks natural / quite cheap and beaches best form of natural defence

somewhere else (often offshore).

Disadvantage – gets eroded by sea (has to be replaced frequently)

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Question(s)



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Answer(s)



What is meant by managed retreat? Give one disadvantage



vulnerable areas of the coast. Disadvantage compensation has to be paid to homeowners and there is disruption and upset for those that have moved.

Moving people and activities back from the

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Answer(s)



Question(s)

Give 3 examples of coastal management used at Lyme Regis



4 phase project

£1.4 million emergency project to stabilise the cliffs

New sea wall and promenade built to east of River Lim and

- Wide sand /shingle beach created to absorb wave energy
- Rock armour at the Cobb to absorb wave energy / anchor the new beach
- 2013-2015 new 390m sea wall created and extensive nailing, piling and drainage to stabilise cliffs & protect 480 homes.

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