



Learning Grids

for A Level AQA Geography

Component 1: Physical Geography
Section B: Coastal Systems and Landscapes

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POD
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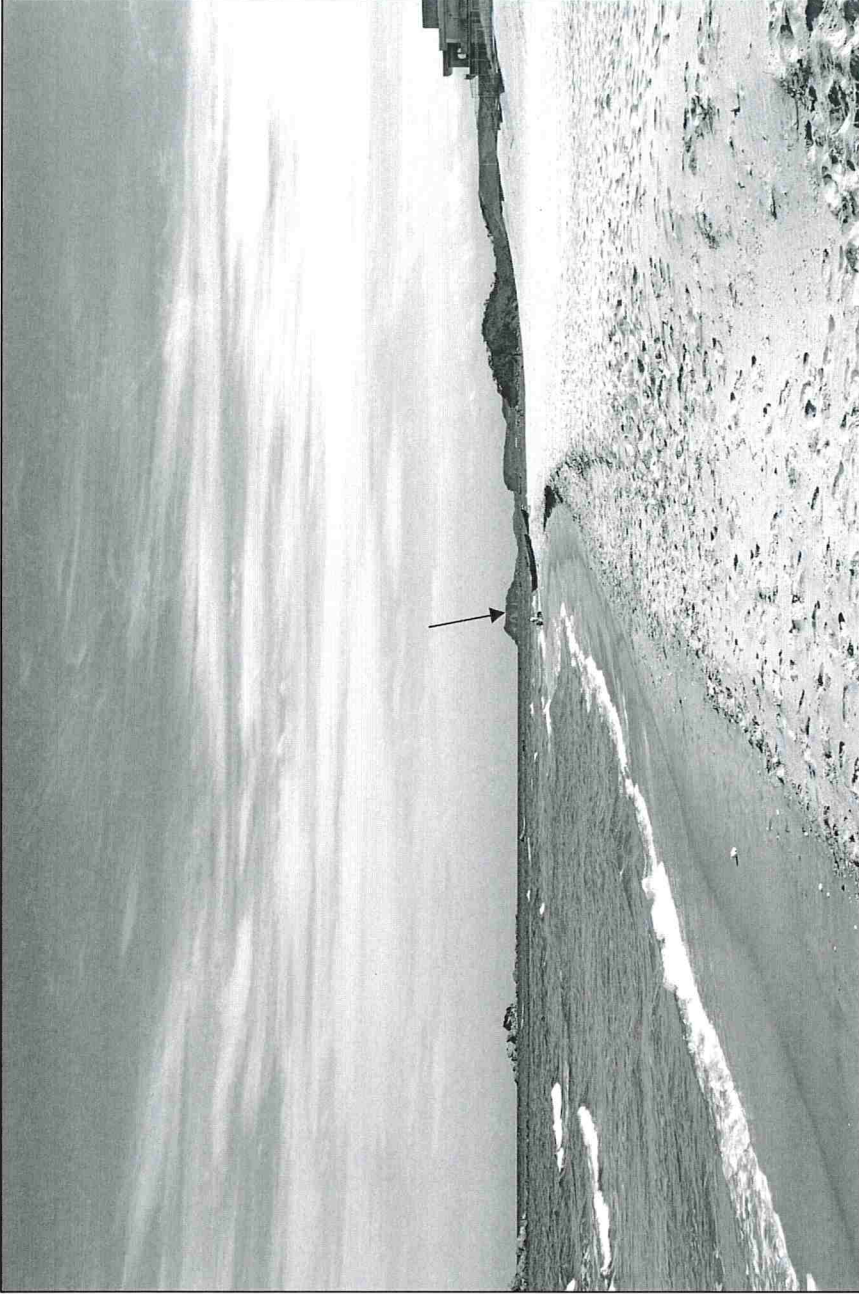
Learning Grid 1: Natural Systems

HOD: pp. 89–91
 CAM: pp. 66–69
 ZZ-RP: pp. 2–5

Question		Answer																				
1	What is a 'natural system'?																					
2	A system can be thought of as consisting of inputs, processes, components, stores, transfers or flows, and outputs. Decide which best describes each item in the table opposite.	<table border="1"> <thead> <tr> <th>Item</th> <th>Input, process, component, store, transfer/flow or output?</th> </tr> </thead> <tbody> <tr> <td>Land-derived sediment</td> <td></td> </tr> <tr> <td>Landforms of erosion and deposition</td> <td></td> </tr> <tr> <td>Wind transport</td> <td></td> </tr> <tr> <td>Beach sand and shingle</td> <td></td> </tr> <tr> <td>Lost wave energy</td> <td></td> </tr> <tr> <td>Sediment moved above the tidal limit</td> <td></td> </tr> <tr> <td>Energy from waves/wind/tides/currents</td> <td></td> </tr> <tr> <td>Movement of energy or material through the system</td> <td></td> </tr> <tr> <td>Longshore drift</td> <td></td> </tr> </tbody> </table>	Item	Input, process, component, store, transfer/flow or output?	Land-derived sediment		Landforms of erosion and deposition		Wind transport		Beach sand and shingle		Lost wave energy		Sediment moved above the tidal limit		Energy from waves/wind/tides/currents		Movement of energy or material through the system		Longshore drift	
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3	Why are the 'relationships' between different parts of a system?																					

Question		Answer
4	What is the name for the edge of a system?	
5	Provide descriptions of the following three types of system.	1. Open system 2. Closed system 3. Isolated system
6	Which type of system is a coastal system? Briefly explain your choice.	
7	What is meant by the term 'dynamic equilibrium'?	
8	What is feedback?	
9	Feedback can be positive or negative. Circle the description of 'negative feedback'.	A change which shifts the system away from equilibrium A change which restores a system back towards equilibrium.
10	Give an example of each type of feedback which might occur in the coastal zone.	Positive feedback Negative feedback
What are natural systems?		
Equilibrium and feedback		

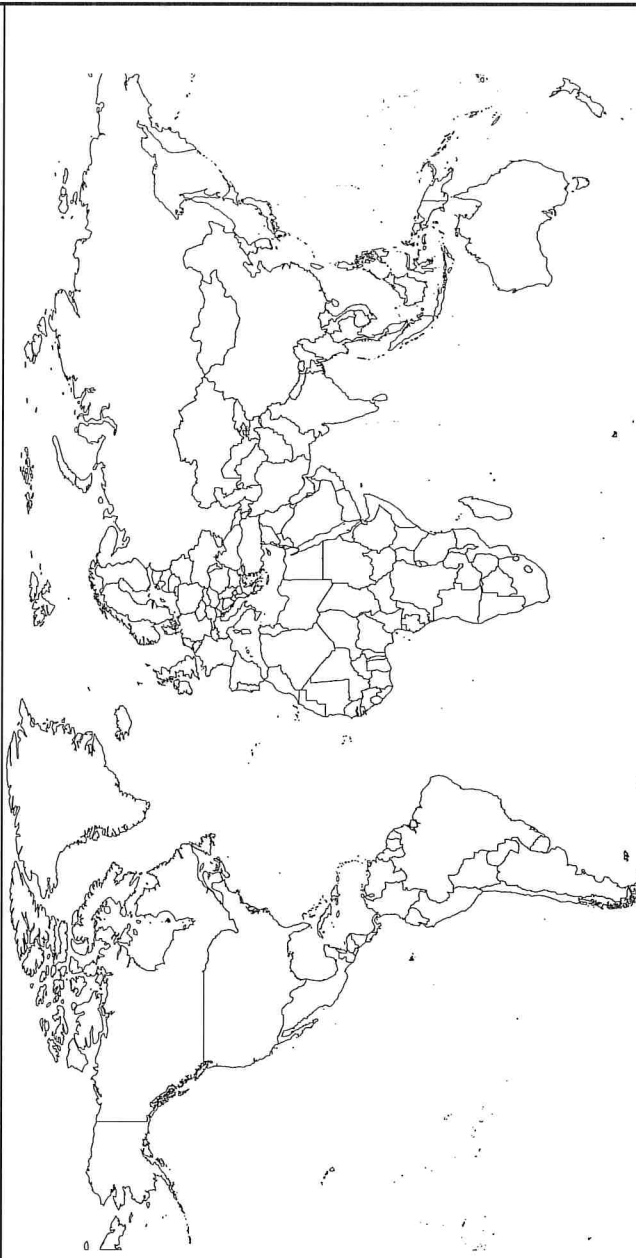
Question		Answer	
11	Give two factors which determine dynamic equilibrium.	1.	
		2.	
12	There are four major Earth subsystems. Name them. The component is named on the right.	1.	Air
		2.	Water
		3.	Rock
		4.	The living world
13	Give an example of how these subsystems are linked to form 'cascading systems'.		

		Question	Answer
Components and Landforms	14	Label the photograph with the inputs, components, transfers and outputs.	
	15	What is the difference between a landform and a landscape?	


Learning Grid 2a: Coastal Systems

HOD: pp. 91–97
 CAM: pp. 70–74
 ZZ-RP: pp. 9–16

Question		Answer	
1	Arrange the coastal zones in order from furthest from shore to closest to shore: inshore, backshore, offshore, foreshore	Furthest from shore:	
		↕	
2	Decide which coastal zone is being described by each statement in the table opposite.	Closest to shore:	
		Statement	Zone
3	The nearshore is divided into three zones. Name each zone, 1 being closest to the land.	The coastal zone	
		This zone is entirely landward of the high-water mark under normal conditions.	
		This zone covers all areas below the low-water mark where waves still impact on the underlying land.	
		Changes take place in this zone only during storms.	
		Sediment deposition is the only activity in this zone.	
		Under normal conditions, this is the most important zone for marine processes.	
1.	This zone covers all areas where waves no longer impact on the underlying seabed.		
2.			
3.			

Question		Answer
4	Wind is the main energy source in coastal environments because it forms waves. How are waves formed?	
5	What is 'fetch'?	
6	Using the map, identify the areas of the world with the greatest fetch.	
7	How does wind energy impact coastlines? (excluding the direct action of waves)	
Energy sources in the coastal zone		

Question		Answer	
8	What three parameters control how much energy a wave gains?	1.	
		2.	
		3.	
9	Name and describe the movement of waves up and down the beach.		
10	What are tides, and why do they occur?	Tides are...	
		Tides occur because...	
11	Explain how this process leads to high and low tides.		
12	Explain how the tidal range influences the rate of coastal erosion.		
13	What meteorological factors combine to create high sea levels during a storm surge?		
Energy sources in the coastal zone			

Question		Answer						
14	Do constructive waves or destructive waves lead to beach erosion?							
15	For each characteristic listed opposite, a pair of descriptions is provided. Decide which description best suits constructive and destructive waves by placing a 'C' or 'D' beside each description. The first has been done for you.	Wave height:		High	D		Low	C
		Wavelength:		Long			Short	
		Wave steepness:		High			Low	
		Swash strength:		Strong			Weak	
		Backwash strength:		Strong			Weak	
		Resulting material motion:		Offshore			Up-beach	
		Resulting beach profile:		Steep			Shallow	
16	Is the beach pictured opposite the result of constructive or destructive waves? Justify your answer.	 <p>Constructive or destructive?</p> <p>Justification:</p>						

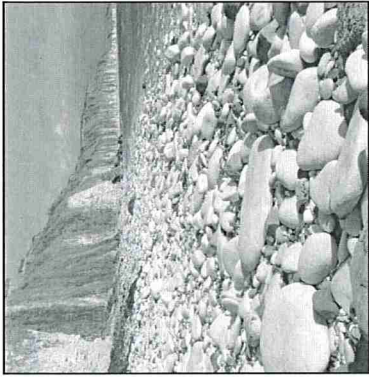
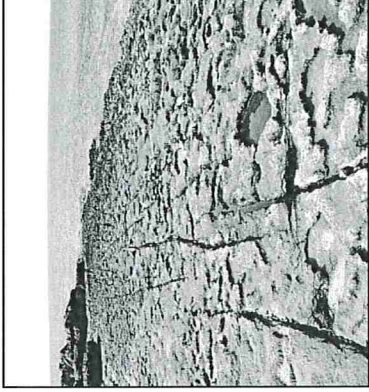

High-energy and low-energy coastlines

Question		Answer
17	What is a high-energy coastline?	
18	What types of environment are likely to be low-energy environments?	
19	What happens to transported material in such low-energy environments?	
20	What is a cell, in the context of sediment movement?	
21	What type of feature typically separates adjacent sediment cells?	
22	Give two inputs of material in the coastal zone.	1.
		2.
23	What is the coastal sediment budget?	
24	Complete the following sentences:	<p>A positive budget occurs when material is added to a sediment cell faster than it is lost. Therefore, the shoreline _____.</p> <p>A negative budget occurs when more material is removed from the cell than is gained, meaning that _____.</p>
Sediment cells and budgets		
High-energy and low-energy coastlines		

Learning Grid 2b: Coastal Processes

HOD: pp. 97–103
 CAM: pp. 74–78
 ZZ-RP: pp. 9–16

Question		Answer
Weathering	1 What is a 'subaerial' process?	
	2 Give an example of each of the three main types of subaerial weathering process that occur in coastal environments.	1. Physical
		2. Chemical
	3. Biological	
Mass movement	3 What are the four main types of sudden, mass-movement processes acting in coastal environments?	1.
		2.
		3.
		4.
	4 Do such mass-movement processes normally take place on steep-gradient or shallow-gradient coastlines?	
	5 What is a mudflow?	
6 What hydrological conditions are needed for slumping to occur?		

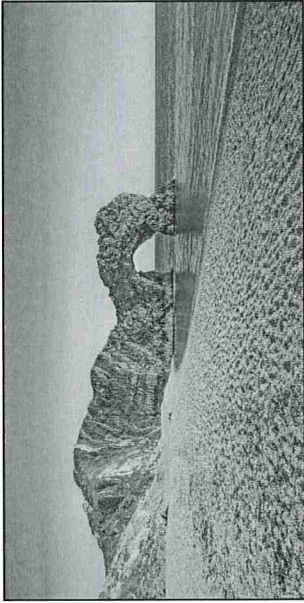
Question		Answer
Mass movement	7	What shape is the slide plane in a slump?
	8	Which type of mass movement occurs very slowly?
	9	How does run-off contribute to the coastal system?
Erosion	10	Which important marine erosion process is being described by each statement in the table opposite?
		<p>Rocks are worn down into smaller, increasingly rounded pieces.</p> <p>Water compresses air in gaps in a rock face, creating high pressures that can cause rocks to break.</p> <p>Soluble rocks, such as limestone, are dissolved by seawater chemicals.</p> <p>Material being transported in the sea grinds against rock, causing erosion.</p>
	11	Which of the main processes of marine erosion have acted on the rocks shown in each of the following photographs?
		<div style="display: flex; justify-content: space-around;">    </div> <p>Process:</p> <p>Process 1:</p> <p>Process 2:</p>

Question		Answer	
12	What natural factors influence the coastal erosion rate?		
	13 Describe the characteristics of a wave that has high erosive power.		
	14 Explain how differential erosion shapes concordant and discordant coastlines.		
15	Match up the following types of transport to their definitions. They are ordered from largest material to smallest material.	Traction	Material is bounced along the seabed.
		Saltation	Material is supported within the water, which can make the water appear cloudy.
		Suspension	Material is dissolved.
		Solution	Material is rolled across the seabed.
16	Explain the process of longshore drift.		

Learning Grid 3: Landforms of Erosion

HOD: pp. 103–105
 CAM: pp. 97–80
 ZZ-RP: pp. 19–22

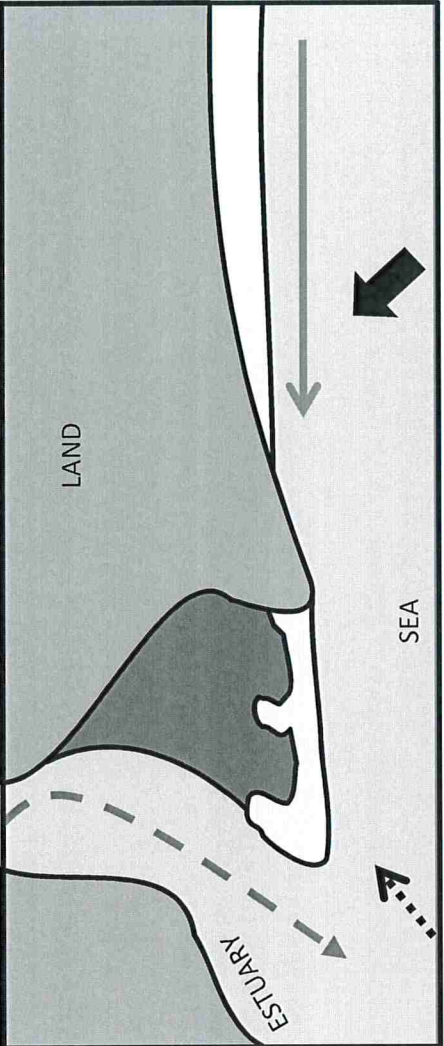


Question		Answer
Headlands and wave-cut platforms	1	Give two erosional processes which lead to the formation of cliffs.
		1.
		2.
	2	How does rock type affect the shape of cliffs?
	3	When layers of resistant rock and less-resistant rock alternate along a coast, which landforms are formed by the following?
		1. The resistant rock
		2. The less-resistant rock
	4	Why do headlands receive the highest-energy waves? Does this lead to erosion or deposition?
	5	What near-coast process bends waves in a coast-parallel direction?
6	Explain how this process works.	
7	On a concordant coastline, which features form instead of bays?	
8	How are wave-cut platforms linked to cliffs?	
9	How can wave-cut platforms reduce the rate of coastal erosion (retreat)?	

Question		Answer
10	Place the list of landforms opposite in order of formation during progressive erosion of a coastline, from earliest to latest.	1.
		2.
		3.
		4.
Stacks, arches, stumps and caves		
11	Identify the processes of erosion that are involved in the creation of this sequence.	Stack, Arch, Stump, Cave
12	What type of landform is shown in the photograph opposite? How does such a feature form?	<div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p>Landform:</p> <p>Formation:</p> </div> </div>
13	How does a stack form?	
14	What is a geo? How does a geo form?	
15	How does a blowhole form?	

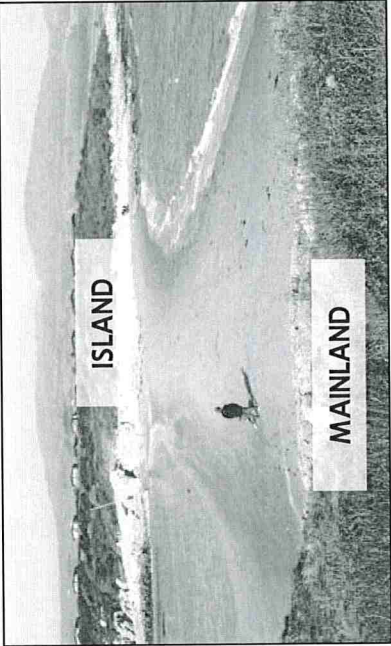
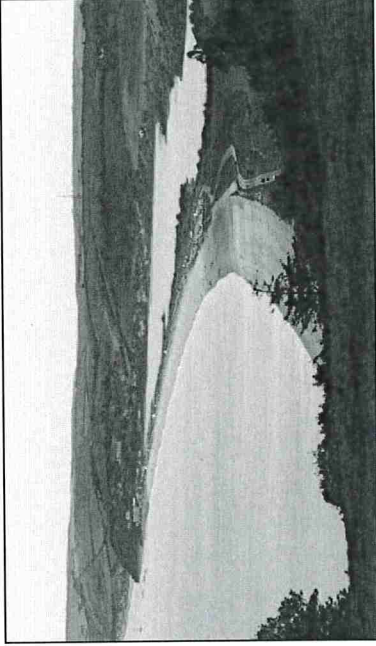
Learning Grid 4: Landforms of Deposition

HOD: pp. 106–112
 CAM: pp. 81–85
 ZZ-RP: pp. 25–29

		Question	Answer
Beaches	1	Why are sandy beaches normally gently graded?	
	2	Why are beaches that are formed of coarser material normally steeper?	
	3	What is a storm beach?	
	4	What are berms? What do they represent?	
	5	Where do cusps form?	

Question		Answer
6	What is a spit?	
7	The sketch opposite shows the formation of a spit. Complete the legend by identifying each of the processes shown by the arrows on the sketch.	 <p>LEGEND</p> <p>   </p>
8	Briefly describe how a spit forms using the image above. Include in your answer a discussion of the controls on the geometry of a spit.	

Spits, bars and tombolos

Question		Answer									
9	Does the spit in the diagram show a 'simple spit' or a 'compound spit'? Explain your choice.	Type of spit:									
10	What is a bar?	Explanation:									
11	When can a bar form?										
12	Decide whether each image opposite depicts a bar or a tombolo. Place an 'X' in the correct boxes.	 	<table border="1" data-bbox="608 255 703 667"> <tr> <td>Bar</td> <td></td> </tr> <tr> <td>Tombolo</td> <td></td> </tr> </table> <table border="1" data-bbox="1011 255 1107 667"> <tr> <td>Bar</td> <td></td> </tr> <tr> <td>Tombolo</td> <td></td> </tr> </table>	Bar		Tombolo		Bar		Tombolo	
Bar											
Tombolo											
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Spits, bars and tombolos

Question		Answer
14	What is a sand dune?	
15	What transport process moves sand from beaches into dunes?	
16	Why do coastal winds normally blow in an inland direction (from the beach to the dunes)?	
17		<i>Dune ridge, climax vegetation, embryo dune, foredune, dune heath</i>
		1.
		2.
		3.
		4.
		5.
18		Statement
		Dunes that have grown upwards above the reach of most storm tides.
		The first dunes to develop; these are low and hummocky.
		These dunes develop a nutrient- and water-rich organic layer, and become more permanent features.
		These dunes are initially yellow due to a lack of organic matter.
		Dunes of this type in the UK will be covered in woodland.
		Dune type

Sand dunes

Question		Answer
19	What is a salt marsh?	
20	Where do salt marshes form?	
21	What is the name of a succession that develops in salt marshes?	
22	What must a plant species be able to tolerate if it is to be a pioneer in a salt marsh environment?	1.
		2.
23	How do pioneers alter the salt marsh, allowing further colonisation?	
24	Why do salt marshes rise in height?	
25	What is the difference between a salt marsh and a mudflat?	

Salt marshes and mudflats

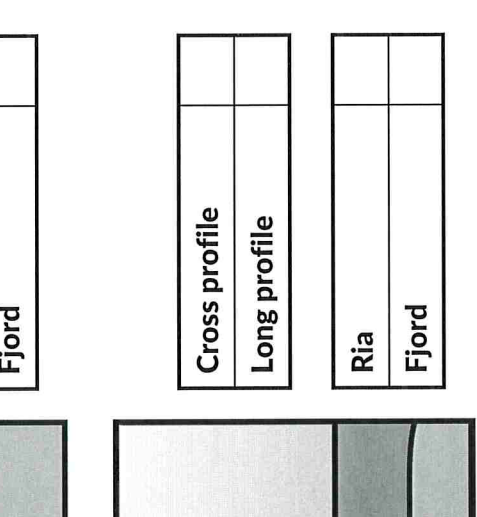
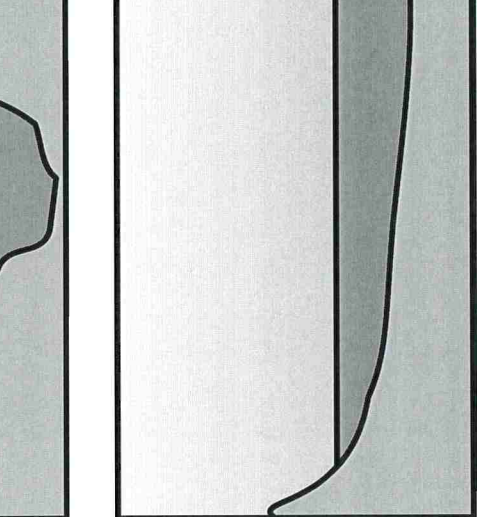
Learning Grid 5: Sea Level and Climate Change

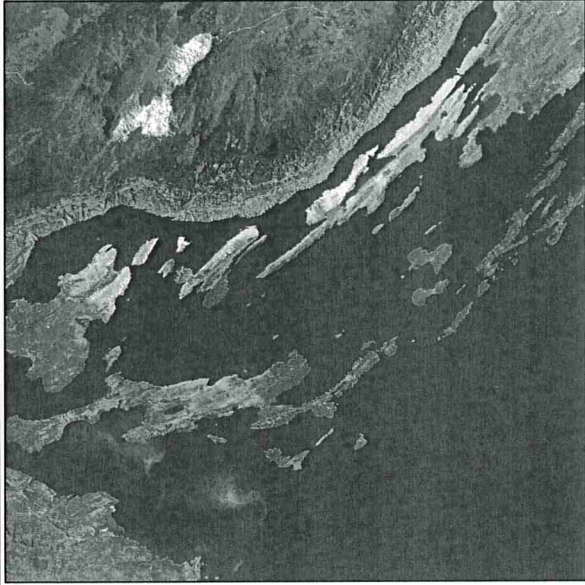
HOD: pp. 112–116
 CAM: pp. 86–92
 ZZ-RP: pp. 33–38

Question		Answer		
1	Describe how and why sea level has changed over the last 10,000 years.	How?		
		Why?		
2	Briefly define eustatic and isostatic sea level change.	Eustatic:		
		Isostatic:		
3	Sea level change occurred during the last glaciation. For each statement in the table, decide whether localised sea levels would 'rise' or 'fall', and whether the sea level change is 'eustatic' or 'isostatic'.	Statement		
		As the climate cools, increasing amounts of water are stored as ice and snow.	Rise or fall?	Eustatic or isostatic?
		The weight of ice causes the land to sink in some areas.		
		The climate warms, melting ice and snow.		
		Land begins to rebound now that the weight of the ice has been removed.		

Eustatic, isostatic and tectonic change

Question		Answer	
Eustatic, isostatic and tectonic change	4	How can tectonic changes affect the volume of the oceans?	
	5	What is the term for when the surface height of a land mass rebounds following ice melting?	
	6	How is the above process affecting the UK presently?	
	7	How could the sea level in a certain area fall at the same time as the global sea level is rising?	
	Emergent and submergent features	8	Sea level was once higher in some areas relative to the land than it is today. This has resulted in 'relict features' – landforms that are no longer affected by coastal processes. Name one of these features.
		9	If the sea levels have risen, how are such features possible?
		10	What is a ria?
11		What is a fjord?	

Question	Answer																
<p>Emergent and submergent features</p> <p>12</p> <p>Decide whether each sketch is a cross profile or a long profile, and whether the sketch depicts features typical of a ria or a fjord. Put an 'X' in the relevant boxes.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <table border="1" style="margin: 0 auto;"> <tr><td>Cross profile</td><td></td></tr> <tr><td>Long profile</td><td></td></tr> </table> <table border="1" style="margin: 0 auto;"> <tr><td>Ria</td><td></td></tr> <tr><td>Fjord</td><td></td></tr> </table> </div> <div style="text-align: center;">  <table border="1" style="margin: 0 auto;"> <tr><td>Cross profile</td><td></td></tr> <tr><td>Long profile</td><td></td></tr> </table> <table border="1" style="margin: 0 auto;"> <tr><td>Ria</td><td></td></tr> <tr><td>Fjord</td><td></td></tr> </table> </div> </div>	Cross profile		Long profile		Ria		Fjord		Cross profile		Long profile		Ria		Fjord	
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Ria																	
Fjord																	

Question		Answer
Emergent and submergent features	13	<p>Study the aerial photograph. Identify the type of coast, and explain how it was formed.</p> 
		<p>Type:</p> <p>Formation:</p>
Sea level rise	14	How has sea level changed more recently (in the last 100 years), and how might sea level change over the next century?
	15	Mean global temperatures are currently rising. In what way is this likely to affect the sea level?
	16	What undesirable coastal effects are likely to occur as a result of sea level rises?
		<p>1.</p> <p>2.</p>

Question		Answer
17	What parts of the UK are likely to be subject to the greatest levels of relative sea level change in the coming decades? Why?	
18	Suggest how rising sea level will affect people living in coastal areas.	
19	How can sea level rise alter the availability of freshwater resources?	
20	How does the insurance industry influence whether people choose to settle in areas of high flood risk?	
Sea level rise		

Learning Grid 6: Coastal Management

HOD: pp. 116–124
 CAM: pp. 93–105
 ZZ-RP: pp. 41–47

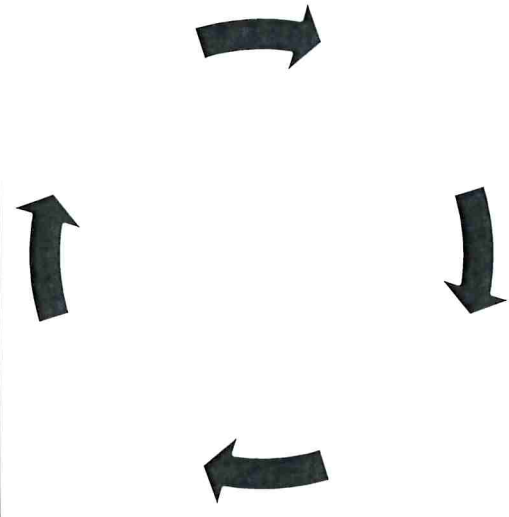
Question		Answer
1	What are the two main aims of coastal protection schemes?	1.
		2.
2	What is hard engineering?	
3	What is soft engineering?	
4	Decide whether each method in the table opposite is a 'hard' or 'soft' engineering method.	Method
		Barrages
		Revetments
		Dune regeneration
		Sea walls
		Managed retreat
		Do nothing
		Groynes
		Offshore reefs
		Beach nourishment
Gabions		
Rock armour		
Cliff fixing		

Hard and soft coastal protection

Hard or soft engineering?

Question		Answer	
Hard and soft coastal protection	5	<p>Answer the following questions regarding sea walls:</p> <p>a. How do sea walls protect the coast?</p> <p>b. Why are sea walls built in a recurved shape?</p> <p>c. Why do sea walls need to be fitted with drains?</p>	
	6	What is the goal of rock armour, gabions and revetments?	
	7	How do groynes prevent beach erosion?	
	8	How are cliffs strengthened during cliff fixing?	
	9	How do offshore reefs protect cliffs located behind them?	
	10	What is a barrage?	
	11	What are the disadvantages of hard-engineering schemes?	
	12	What is beach nourishment / beach feeding?	
	13	Briefly outline the kind of processes involved in dune nourishment.	
		a.	
		b.	
		c.	

Question		Answer
14	What is managed retreat?	
15	What are the main advantages of soft-engineering schemes?	
16	What economic justifications can be given for doing nothing to stop coastal erosion?	
Coastal management policies		<p>The diagram illustrates three coastal management strategies in response to rising sea levels. On the left, 'Do nothing' shows a house being eroded by the sea. In the middle, 'Managed realignment' shows a house being moved inland. On the right, 'Hold the line' shows a house protected by a seawall. A 'Water level rise' arrow points to the sea level.</p>
17	Explain how each of the policies shown in the diagram is a form of coastal management.	
18	How can the concept of 'sustainable development' be applied to coastal management?	

Question		Answer
19	What is the name of the series of coastal management systems in England and Wales (there are 22)?	
20	What period is the longest time considered for the system?	
21	What is the purpose of the management?	
22	What is ICZM an abbreviation of?	
23	When was ICZM developed?	
24	What is the purpose of ICZM?	
25	How does the management cycle of ICZM work? Fill in the gaps.	
Coastal management policies		