

Oxford Revise | Geography | Answers

Chapter 17

All exemplar answers given are worth full marks.

- 1.1** Hard engineering is when structures are built to prevent erosion taking place.
- 1.2** Soft engineering is when strategies are put in place to reduce erosion by working alongside natural processes.
- 1.3** Managed retreat is when land is allowed to flood and human activity is moved away from the coastline.
- 1.4** Hard engineering strategies involve trying to stop natural processes taking place by building physical structures like sea walls, whereas soft engineering does not try to prevent these processes but works alongside nature.
- 1.5** Rock armour protects the coastline by placing a physical barrier in front of the coastline. The sea then strikes the rock armour instead of the cliff behind.
- 1.6** Gabions protect the coast by creating a barrier between the coastline and the sea. The gabions absorb the sea's energy rather than the coastline.
- 1.7** Groynes help build up a beach by trapping material transported by the longshore drift. The beach then absorbs the sea's energy rather than the land behind it.
- 1.8** The ongoing maintenance costs are a cost of protecting the coast with sea walls. They weaken over time and need expensive repairs on a regular basis.
- 1.9** Rock armour makes it more difficult to access the beach. They are large boulders placed along the coastline and are dangerous and difficult for people to walk over, which can prevent beach access.
- 1.10** Gabions have to be replaced or repaired every 5–10 years. This is because they have a relatively short lifespan, with the wire cages going rusty.
- 1.11** Groynes increase erosion further along the coastline. This is because they reduce longshore drift and starve places of material that would build protective beaches.
- 1.12** This question is level-marked:

Level	Marks	Description
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound, organised and relevant throughout, using supporting evidence and examples • Communicates good knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives) • Uses geographical terms and vocabulary
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Explanations are partial • Little or no use of geographical terms and vocabulary

Level	Marks	Description
	0	No relevant content

Example answer: *The coastline is protected by a recurved sea wall and rock armour. These both protect the coastline from erosion by creating a barrier between the sea and the cliff face. The sea hits the rock armour, and its energy is absorbed by the large boulders rather than cliff face, which prevents erosion from taking place. The recurved sea wall absorbs the energy of the waves but also reflects the energy back out to sea where it slows the next wave approaching. This means that the coastline does not receive the waves' energy and is therefore protected from erosion.*

1.13 This question is level-marked:

Level	Marks	Description
3 (detailed)	5–6	<ul style="list-style-type: none"> • Thorough, detailed, organised, and relevant throughout with supporting evidence and examples • Communicates detailed, clear knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives to fully explore ideas) • Good use of geographical terms and vocabulary
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound throughout with some supporting evidence and examples • Communicates some knowledge and understanding • Communicates using linked statements and ideas (e.g. uses connectives, but needs further development) • Some use of geographical terms and vocabulary
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Communicates using simple statements that are not developed • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: *Sea defences are normally built if the cost of protecting the coastline is lower than the economic value of the land being protected. This generally means large urban areas receive coastal protection while low value farmland is rarely protected. The defences in Figure 1 are sea walls and rock armour. These are among the most expensive forms of coastal protection, so the land would have to be of very high economic value for the benefits to outweigh the costs. From the picture, there does not appear to be industrial or urban land being protected, so it is unlikely that the benefits do outweigh the costs given the high cost of building sea walls and rock armour.*

However, it is possible that important infrastructure like a power station is being protected, in which case the benefits would outweigh the costs because the cost of moving the power station would be higher than the cost of the sea defences.

2.1 This question is level-marked:

Level	Marks	Description
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound, organised and relevant throughout, using supporting evidence and examples • Communicates good knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives) • Uses geographical terms and vocabulary
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Explanations are partial • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: *One reason would be the direct economic benefit of protecting the coast compared to the cost of the defences. Figure 2 shows an area with houses and people living there. The cost of moving and rebuilding the houses might be higher than the cost of the defences. A second reason might be indirect economic benefits. For example, an area defended might have a large tourist economy that provides lots of employment.*

2.2 This question is level-marked:

Level	Marks	Description
3 (detailed)	5–6	<ul style="list-style-type: none"> • Thorough, detailed, organised, and relevant throughout with supporting evidence and examples • Communicates detailed, clear knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives to fully explore ideas) • Good use of geographical terms and vocabulary
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound throughout with some supporting evidence and examples • Communicates some knowledge and understanding • Communicates using linked statements and ideas (e.g. uses connectives, but needs further development) • Some use of geographical terms and vocabulary
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Communicates using simple statements that are not developed • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: *Areas are chosen to receive coastal defences by comparing the benefits of protecting an area with the cost of coastal defences. The area shown in Figure 2 has a lot of expensive houses and other economic activity. This suggests that there are strong benefits to protecting this area that are more than the costs of building sea walls. Figure 3 shows a caravan park. The cost of defending this stretch of coastline will be high compared to the value of the land being protected. Lyme Regis is an example of a town that received coastal defences costing £43m including sea walls, rock armour, and cliff stabilisation. However,*

Lyme Regis is a town with many people living there and a tourist economy that is worth £800m to the Dorset economy. This meant that it is worth spending £43m to protect this town from coastal erosion because of the vital role it plays in the wider economy.

2.3 This question is level-marked:

Level	Marks	Description
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound, organised and relevant throughout, using supporting evidence and examples • Communicates good knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives) • Uses geographical terms and vocabulary
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Explanations are partial • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: Hard engineering strategies can cause conflicts because they often increase erosion on other land. For example, building groynes reduces longshore drift, which means that places further along the coastline have less material for protective beaches increasing erosion in these places. Hard engineering like sea walls or rock armour also looks unnatural and makes access to the beach difficult. This would cause conflict with people who prefer the area to maintain its natural appearance.

2.4 These strategies protect the coastline by building a protective beach in front of the coastline. This means that the wave energy is absorbed by the beach rather than the cliff face.

2.5 Managed retreat protects the coastline by moving economic activity away from the coast. The land is then allowed to flood and a natural equilibrium is reached. Managed retreat does not disrupt natural coastlines further along the coast, so processes like longshore drift continue to build protective beaches.

2.6 Beach nourishment is not permanent and needs to be repeated on a regular basis because longshore drift will eventually remove material added to the beach.

2.7 Sand dune regeneration takes a long time to stabilise and build the dunes. This means that land is not fully protected until the dunes are regenerated.

2.8 Managed retreat does not stop land being eroded. This means that people who live on the land allowed to flood will lose their houses.

3.1 This question is level-marked:

Level	Marks	Description
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound, organised and relevant throughout, using supporting evidence and examples • Communicates good knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives) • Uses geographical terms and vocabulary

Level	Marks	Description
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Explanations are partial • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: *Figure 4 shows two soft engineering strategies: beach nourishment and sand dune regeneration. These both protect the coast in similar ways. Beach nourishment builds a protective beach in front the coastline. This both slows the waves approaching the coast and absorb the wave energy which reduces erosion of the land behind the beach. Sand dune regeneration builds protective dunes in front of land. These dunes will prevent the sea encroaching inland and protect the land behind the dunes from erosion.*

3.2 This question is level-marked:

Level	Marks	Description
3 (detailed)	5–6	<ul style="list-style-type: none"> • Thorough, detailed, organised, and relevant throughout with supporting evidence and examples • Communicates detailed, clear knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives to fully explore ideas) • Good use of geographical terms and vocabulary
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound throughout with some supporting evidence and examples • Communicates some knowledge and understanding • Communicates using linked statements and ideas (e.g. uses connectives, but needs further development) • Some use of geographical terms and vocabulary
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Communicates using simple statements that are not developed • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: *The benefits of protecting the coastline are that coastal erosion is reduced and property and land is protected from the sea. For example, the beach that is being nourished in Figure 4 will absorb the sea's energy and protect the houses and infrastructure on the coast behind the beach. Likewise, the sand dunes might be protecting agricultural land or land used for recreation like golf courses.*

The costs of this include the economic cost of using the defences. Beach nourishment will cost a lot of money and cause disruption while it is taking place. The costs will also include ongoing costs. The sea will continue to remove beach material, so the beach will eventually need more sand added to it in the future. This is less likely with sand dunes because grasses once established will hold the dune together; however, it is likely that people will be restricted from accessing the dunes while the vegetation becomes established.

3.3 This question is level-marked:

Level	Marks	Description
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound, organised and relevant throughout, using supporting evidence and examples • Communicates good knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives) • Uses geographical terms and vocabulary
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Explanations are partial • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: *One benefit is that managed retreat does not have ongoing costs. Once the initial cost of relocating economic activity is paid for, there are not any ongoing costs because the land is allowed to flood and there is not any valuable infrastructure or activity on this land. A second benefit is that natural processes are not interrupted. This means that places further along the coastline do not suffer from increased erosion, which might have been the case if the transportation of material along the coast had been reduced after using hard engineering strategies.*

3.4 People who own property or land which will be allowed to flood might not be in favour of managed retreat because they would suffer economically and emotionally from this strategy.

3.5 This question is level-marked:

Level	Marks	Description
3 (detailed)	5–6	<ul style="list-style-type: none"> • Thorough, detailed, organised, and relevant throughout with supporting evidence and examples • Communicates detailed, clear knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives to fully explore ideas) • Good use of geographical terms and vocabulary
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound throughout with some supporting evidence and examples • Communicates some knowledge and understanding • Communicates using linked statements and ideas (e.g. uses connectives, but needs further development) • Some use of geographical terms and vocabulary
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Communicates using simple statements that are not developed • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: *Lyme Regis is a small coastal town in Dorset that is popular with tourists. The town had lost several properties to coastal erosion as the existing defences were inadequate and had been breached*

many times. Despite being a small town, Lyme Regis is worth £800m to the Dorset tourist economy, making it an important place to defend from coastal erosion.

To solve the problems of coastal erosion, the cliffs were drained, stabilised, and nailed together. This removed the danger of cliff collapse and protected many properties on the cliffs. A new sea wall and promenade was built along the sea front. The sea wall protects the town from erosion by absorbing the power of the waves and combining this with a promenade created a recreational space and gave a boost to businesses located in the town.

Answers will vary based on the coastal management scheme studied.

3.6 This question is level-marked:

Level	Marks	Description
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound, organised and relevant throughout, using supporting evidence and examples • Communicates good knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives) • Uses geographical terms and vocabulary
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Explanations are partial • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: *Coastal management at Lyme Regis included beach feeding to maintain a wide sandy beach. This was good because it has reduced erosion but also kept a beach for visitors to enjoy. Also, the new beaches increased visitor numbers, which benefitted seafront business in the town. A second benefit was the rock armour protecting the harbour. This made it easier and safer for fishermen to use the harbour, especially when wave energy was high.*

Answers will vary based on the coastal management scheme studied.

3.7 This question is level-marked:

Level	Marks	Description
3 (detailed)	7–9	<ul style="list-style-type: none"> • Thorough, detailed, organised, and relevant throughout with supporting evidence and examples • Communicates detailed, clear knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives to fully explore ideas) • Good use of geographical terms and vocabulary
2 (clear)	4–6	<ul style="list-style-type: none"> • Sound throughout with some supporting evidence and examples • Communicates some knowledge and understanding • Communicates using linked statements and ideas (e.g. uses connectives, but needs further development) • Some use of geographical terms and vocabulary

Level	Marks	Description
1 (basic)	1–3	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Communicates using simple statements that are not developed • Little or no use of geographical terms and vocabulary
	0	No relevant content

3-marks: SPaG (spelling, punctuation, grammar, and specialist terminology)

Marks	Description
3	<ul style="list-style-type: none"> • Accurate spelling and punctuation • Rules of grammar followed • Effective control of meaning • Uses wide range of specialist terms
2	<ul style="list-style-type: none"> • Generally accurate spelling and punctuation • Most rules of grammar followed • General control of meaning • Uses good range of specialist terms
1	<ul style="list-style-type: none"> • Reasonably accurate spelling and punctuation • Some rules of grammar followed – errors do not hinder meaning • Some control of meaning • Limited use of specialist terms
0	<ul style="list-style-type: none"> • Writes nothing • Does not relate to question • Basic grasp of spelling, punctuation, and grammar prevents clear meaning

Example answer: *Coastal management schemes often cause conflict because different stakeholders might be impacted in different ways by the scheme. At Lyme Regis in Dorset, the coastal management scheme included cliff stabilisation, a new sea wall and promenade, and beach feeding to maintain a wide sandy beach to be used by tourists.*

Some stakeholders benefitted from these strategies. The promenade and wide beach protected the town from erosion but also brought more tourists into the town. This was beneficial to local business but conflicted with the interests of residents, who did not like the increased traffic congestion and problems with parking. The cliff stabilisation benefited people with property on the cliff but prevented fossils from being revealed, which conflicted with the interests of people who look for and study fossils.

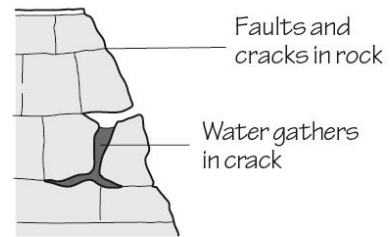
Answers will vary based on the coastal management scheme studied.

4.1 This question is level-marked:

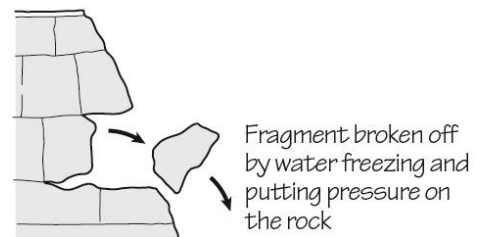
Level	Marks	Description
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound, organised and relevant throughout, using supporting evidence and examples • Communicates good knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives) • Uses geographical terms and vocabulary

Level	Marks	Description
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Explanations are partial • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: *Freeze-thaw weathering takes place when water gets into a crack in the rock. When the temperature drops and the water freezes, it expands, putting pressure on the rock. Over many cycles of freezing and thawing, eventually fragments of rock break away.*



To receive full marks, students must use a diagram in their answer.



4.2 This question is level-marked:

Level	Marks	Description
2 (clear)	3–4	<ul style="list-style-type: none"> • Sound, organised and relevant throughout, using supporting evidence and examples • Communicates good knowledge and understanding • Communicates using developed statements and ideas (e.g. uses connectives) • Uses geographical terms and vocabulary
1 (basic)	1–2	<ul style="list-style-type: none"> • Basic throughout with limited supporting evidence and/or examples • Communicates limited knowledge and understanding • Explanations are partial • Little or no use of geographical terms and vocabulary
	0	No relevant content

Example answer: *A bar is a sand or shingle beach that extends across a bay. It is formed through the process of longshore drift transporting sand along a coastline. When the coastline suddenly changes direction, deposition takes place in the sheltered water. Over time, the deposited material builds up into a small beach. Longshore drift then continues to transport sand across the mouth of the bay with deposition also continuing to take place. Eventually a bar is formed, stretching across the mouth of the bay.*