

Oxford Revise | Geography | Answers

Chapter 15 What will you find in polar environments?

All exemplar answers given are worth full marks.

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(a) A

(b) The high latitude polar regions of the Arctic and Antarctic have desert-like conditions including long cold, dry winters, with several months well below freezing, short summers, and very strong winds.

(c) There is low net primary productivity because of limited sunlight, very low temperatures, and the areas are fairly dry, with much of the precipitation falling as snow. Nutrient cycling with small stores and slow transfers is restricted to the active layer of permafrost during the short summers. This results in limited biodiversity and so sources of food.

(d) **Plants**

Vegetation has small, waxy leaves to retain moisture.; Vegetation has stunted growth to shelter from strong winds.

Animals

Mammals such as polar bears have thick, insulating, oily fur which keeps them warm and dry.; Birds like penguins have feathers which are thick, insulating, and oily to protect from the low temperatures.

(e) Putting power, water, and sanitation services underground is impractical because they would require heating and so would thaw the permafrost and cause subsidence. Putting them above ground also allows easy maintenance.

(f) This question is level-marked:

Level	Marks	Description
3	5–6	<ul style="list-style-type: none"> • Thorough knowledge, understanding or analysis of the issue, process or concept. • Uses well-developed ideas and line of reasoning is clear and logically structured. • Information presented is relevant and substantiated.
2	3–4	<ul style="list-style-type: none"> • Reasonable knowledge, understanding or analysis of the issue, process or concept. • Uses developed ideas and line of reasoning with some structure. • Information presented is mostly relevant and supported by some evidence.
1	1–2	<ul style="list-style-type: none"> • Basic knowledge, understanding or analysis of the issue, process or concept. • Uses simple ideas with no developed points made. • Information is basic, unstructured, and supported by limited evidence.
	0	No response or no response worth of credit.

Example answer: **Arctic**

Indigenous people like the Inuits of North America have minimal impact on the Arctic ecosystem. They have inhabited parts of the Arctic for thousands of years respecting nature and so their traditional hunting, fishing and animal herding lifestyles are sustainable. Commercial exploitation of rich Arctic resources is not sustainable. The exploitation of metals, oil, and gas has caused significant ecosystem damage as the result of accidents such as oil spills and poorly maintained pipelines. One example was the damage done by the grounding of the oil tanker Exxon Valdez. Overfishing and illegal fishing in the Arctic’s nutrient-rich waters has led to collapse of fish stocks. This happened in Canada where the number of cod available collapsed. Arctic whaling since the 18th century threatened to approach extinction before international conservation measures were internationally agreed, with contemporary whaling restricted to ‘scientific research’ only. Cruise liner tourism has grown rapidly in the Arctic, threatening sensitive ecosystems with erosion and wildlife disturbance at landing sites, and marine pollution from waste discharges.

Antarctic

Commercial exploitation of Antarctica is forbidden under the terms of the Antarctic Treaty and associated environmental protocols, which include controls on fishing in the Southern Ocean. Antarctic whaling since the 18th century threatened to approach extinction before international conservation measures were internationally agreed, with contemporary whaling restricted to ‘scientific research’ only. Cruise liner tourism has grown rapidly in Antarctica, threatening sensitive ecosystems with erosion and wildlife disturbance at landing sites, and marine pollution from waste discharges. But this is not mass tourism, and numbers are limited to only the most affluent for both cruise liners and adventure tourism. Furthermore, regulation and controls on the former are now so tight that some would argue this financially exclusive sector is a powerful force promoting Antarctic conservation.

(g) This question is level-marked:

Level	Marks	Description
3	6–8	<ul style="list-style-type: none"> • Thorough knowledge, understanding or analysis of the issue, process or concept. • Uses well-developed ideas and line of reasoning is clear and logically structured. • Information presented is relevant and substantiated.
2	3–5	<ul style="list-style-type: none"> • Reasonable knowledge, understanding or analysis of the issue, process or concept. • Uses developed ideas and line of reasoning with some structure. • Information presented is mostly relevant and supported by some evidence.
1	1–2	<ul style="list-style-type: none"> • Basic knowledge, understanding or analysis of the issue, process or concept. • Uses simple ideas with no developed points made. • Information is basic, unstructured, and supported by limited evidence.
	0	No response or no response worth of credit.

Example answer: **Antarctic**

The Antarctic Treaty came into force in 1961 and has since been signed by 52 nations. It is widely agreed to have been very successful. It guarantees free access and research rights to all countries. Military activity, such as nuclear bomb tests and the dumping of nuclear waste, is banned. The Protocol on Environmental Protection bans all mineral resource activity. There are also now controls on fishing in the Southern Ocean and commercial whaling has been banned since 1986. The only human activities permitted are tourism and scientific research. Tourism has grown rapidly in Antarctica, threatening sensitive ecosystems with erosion and wildlife disturbance at landing sites, and marine pollution from waste discharges. This is not mass tourism, and numbers are limited to only the most affluent for both cruise liners and adventure tourism. Furthermore, biosecurity regulation and waste controls on the former are now so tight that some would argue this financially exclusive sector is a powerful force promoting Antarctic conservation. Scientific research in Antarctica has made a huge contribution to our understanding of the Earth and climate change. All these developments means that the sustainable management plan for the Antarctic has been very successful both regionally and globally.

Arctic

The Arctic Council was formed in 1996. It was important because it was signed not only by the governments of the eight countries surrounding the Arctic Ocean but also six indigenous communities living in the Arctic. It was one of the first bodies in the world aiming to protect the environment. Unfortunately, so far there is no international treaty has been signed to give a legal basis to the proposals put forward by the Arctic Council. The Council therefore has no legal powers to prevent members carrying out any harmful activities. The climate change global agreement signed in Paris in 2015 has legal powers. It aims to limit global warming to less than 2°C which would slow the rate at which the Arctic ice is melting. There are some other international treaties which could help protect the Arctic. For example, the United Nations Convention on the Law of the Sea. Greenpeace has proposed the establishment of an Arctic Sanctuary based on the successful Antarctic Treaty, which would create a marine nature reserve where any human activity would be banned. There would be no fishing, no exploitation or drilling for oil or gas, no mining on the seabed, no military activity, and there would be strict environmental controls on shipping. It is unlikely that all countries would agree to this. Russia has spent a lot of money developing and prospecting for mineral wealth. They hope as the ice melts to open a shipping exclusively for the use of Russian vessels through the Arctic to encourage trade. They argue they need to establish a military presence in the Arctic for the security of Russia. The Arctic is not very well protected.

(h) This question is level-marked:

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2	3–4	<ul style="list-style-type: none"> • Reasonable knowledge, understanding or analysis of the issue, process or concept. • Uses developed ideas and line of reasoning with some structure. • Information presented is mostly relevant and supported by some evidence.
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	0	No response or no response worth of credit.

Example answer: **Arctic**

A marine wildlife sanctuary was established in 2008 on the Clyde River, Baffin Island, in northern Canada. It was Canada's first Marine Wildlife Area and is a sanctuary for the conservation of up to 2 000 bowhead whales. Other species including polar bears, seals, geese, and ducks also benefit from protection, too. It is so successful that it has won the support of both the 1 000 indigenous Inuit population, and the global environmental campaigning group Greenpeace.

Antarctic

The Union Glacier is part of the Transantarctic mountains stretching through the centre of the continent. It is the centre for research, expeditions, and tourism operated by Antarctic Logistics and Expeditions (ALE). It uses a natural blue-ice runway for cargo planes. In the short summer between November and January, a camp is set up for walkers, cross-country skiers, bird watchers and climbers. Strict biosecurity measures and waste disposal regulations are followed so that there is minimal impact on the environment.

Questions referring to previous content

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- (a) All trees are chopped down, leading to complete destruction of forest habitats.
 (b) Only mature, full-grown trees are cut down, and trees with important ecological value are left unharmed.