# Climate change in Antarctica: essay planning

Royal Geographical Society with IBG

Advancing geography and geographical learning

### Teacher notes and specification links

The aim of this activity is to build upon knowledge and understanding of climate change by looking specifically at the effects it is having on Antarctica.

Students are encouraged to conduct their own research to deepen their understanding, then apply it to an extended examination-style question that focuses on their ability to evaluate opinions.

A structure has been included in the activity so that students can work independently to build their confidence in approaching examination questions at this level.

The raw marks and structure for an extended answer of this nature might vary depending on the examination board. However, the question has been designed to focus on areas of content within the following A Level specifications:

**AQA**

3.2.1.5.1 Antarctica as a global common.

**Cambridge International**

2.3 Global warming and climate change.

**Cambridge OCR**

4.b. The impacts of climate change are global and dynamic.

**Pearson Edexcel**

5.6 Climate change may have significant impacts on the hydrological cycle globally and locally.

**Pearson Edexcel (International)**

3.4.2 Threats to biodiversity.

**Eduqas (WJEC)**

(4)3.5.7 People, climate and the future.

## Introduction and research 

In this activity, you will learn about the effects climate change is having on Antarctica. You will use a website to find facts. Then, you will plan and write an essay.

The question you are going to explore is:

***Evaluate the extent to which climate change affects biological systems in Antarctica.***

Before you start your research, you should already have an understanding of:

- ✓ The causes of climate change.
- ✓ The role Antarctica plays in affecting global temperatures and the hydrological cycle.
- ✓ The unique ecosystems Antarctica holds, both on the land and in its surrounding seas.

**TASK:** Go to the Discovering Antarctica website, specifically here and here and look at some of the examples showing the impacts of climate change. Note down your findings below.

| Ice | Wildlife on the land | Wildlife in the Ocean | Water |
|---|---|---|---|
| | | | |

## Examination-style question: breakdown

Your first step is to find out what the question is asking you and how it should be answered. To do this, you need to understand the **command word** and **key terms** within the question.

**Task:** Look again at the examination-style question. Draw a box around the command word and underline the key term(s).

***Evaluate the extent to which climate change affects biological systems in Antarctica.***

Key components of an evaluative question could include:

- ✓ **A detailed judgment:** providing a clear, substantiated conclusion based on evidence (e.g., "To a large extent, climate change has affected biological systems in Antarctica because...").
- ✓ **Balanced argument:** exploring both points of view, such as looking at both advantages and disadvantages, costs and benefits, or successes and failures.
- ✓ **Evidence-based:** adding case studies, data, or specific examples to support your argument.
- ✓ **Relative importance:** identifying which factors are most important in a given context.
- ✓ **Critical thinking:** assessing the validity, reliability, and accuracy of arguments or data.

**Task:** Thinking about the course you are following, identify how the list above aligns with the requirements for their evaluate-style questions. Is there anything else you should add?

Now, complete the table below that looks at the **key terms** to help you think about the question you are answering.

### Building blocks

Key terms form the **building blocks** for your essay. Make sure you know them and how they link to the question.

| Key term | To consider |
|---|---|
| Climate change | What is climate change?<br><br>In what ways is it affecting Antarctica? |
| Biological systems | What is a biological system?<br><br>What types of biological systems can you find in Antarctica? |

***Evaluate the extent to which climate change affects biological systems in Antarctica.***

**Task:** Note down below what this question is asking you to do. Think about how you are going to approach it. For example, are you going to lead with examples of climate change and how they are affecting biological systems or, the different biological systems and how climate change is affecting them? Either approach is fine, but you must be consistent in your response throughout the main body of the answer.

What is the question asking me?

_____
_____
_____
_____
_____

You are going to have an idea of what you think the answer to this question is going to be. This 'prediction' will form part of your introduction.

**Task:** Write down your prediction below:

_____
_____
_____
_____
_____
_____

## Time to plan your essay

**Task:** This is where you get to think about what you want to add in each section of your answer; use the table below to summarise each section.

This is a good time to have your notes open so you can find the information you need to write the answer.

| Outline section | Points to consider | Notes |
|---|---|---|
| Introduction | What is the question asking you?<br>Definition of key terms.<br>Examples you intend to use.<br>What is your prediction? | |
| Main Paragraph 1 | What point will support your answer?<br>What example are you going to use?<br>What are the supporting statistics / facts?<br>Any critiques? | |
| Main Paragraph 2 | What point will support your answer?<br>What example are you going to use?<br>What are the supporting statistics / facts?<br>Any critiques? | |

| | | |
|---|---|---|
|  <br>Main Paragraph 3 | What point will support your answer?<br>What example are you going to use?<br>What are the supporting statistics / facts?<br>Any critiques? | |
|  <br>Main Paragraph 4 (optional) | What point will support your answer?<br>What example are you going to use?<br>What are the supporting statistics / facts?<br>Any critiques? | |
|  <br>Conclusion | What are the main points you want your reader to remember?<br>What is your decision on the answer to the question?<br>What is a lasting idea or question you want to leave with the reader? | |

## Building a main paragraph

After using the table to plan out your whole essay, develop one of your main points into a strong paragraph with clear evidence and explanation. For this answer, use the **PEEL+E structure.**

**What is the PEEL+E structure?**

**Point** - what is the main idea of this paragraph? Make a statement for this.
**Evidence** - add supporting information such as facts, examples, statistics etc.
**Explain** - state using an explanation why or how the evidence supports your point.
**Link** - write a sentence which sums up the paragraph and connects it to the question being asked.
**+ Evaluation** - this gives you the opportunity to critique the point you have made. Here, you might consider another perspective, scale, or the limitations to the point.

**TASK:** Use the table below to start to plan one of the main points of your answer.

| Step and example | Details |
|---|---|
| **Point** - clearly state the main idea of this paragraph.<br>*Example: Climate change may increasingly affect Antarctic biological systems through ocean acidification.* | |
| **Evidence** - add a detail, statistic(s), or example that supports your topic sentence.<br>*Example: The Southern Ocean absorbs around 40% of global oceanic $CO_2$ uptake, increasing acidity of the water.* | |

| | |
|---|---|
| **Explanation** - how does your evidence support your main idea?<br>*Example: The increase in acidity threatens organisms such as sea snails which calcify some of their body.* | |
| **Link** - end the paragraph by connecting your idea back to your essay's main argument.<br>*Example: Weakened shells reduce survival rates, potentially disrupting marine food chains over time as sea snails are an important food source.* | |
| **Evaluate** - is there another perspective, option or opinion?<br>*Example: However, many of these impacts are projected rather than fully observed, meaning uncertainty remains about the scale of future biological change.* | |

**Task:** Using your notes from the table, write the full paragraph in the space below.

| |
|---|
| Write your answer here: |

## Review

***Evaluate the extent to which climate change affects biological systems in Antarctica.***

**Task:** Read the example answer below.

*Climate change is significantly affecting Antarctic marine food webs, particularly through declining sea ice. Satellite data shows that, since the late 20th Century, summer sea ice has declined by roughly 40% in parts of the Antarctic Peninsula. At a similar time, in some areas of the Southern Ocean, Antarctic krill populations have declined by around 70–80%. Krill depend on algae that grow beneath sea ice for food and shelter. Reduced sea ice lowers krill survival rates, and as they are a keystone species, supporting whales, seals, and penguins, it disrupts the Antarctic marine food chain. This demonstrates how climate change can filter through biological systems, altering ecosystem stability. However, krill decline is not solely caused by climate change - commercial krill fishing also contributes. Additionally, impacts are strongest around the Antarctic Peninsula rather than East Antarctica, meaning the effects are uneven.*

**Task:** Using highlighters of different colours, identify where the point, evidence, explain, link and evaluate are within the paragraph. What do you notice about this paragraph? How does this paragraph compare to the one you have written?

Now, using the example answer as a guide, re-write part of your answer to improve it. Use the space below.

| Write your answer here: |
| --- |
| |

## Conclusion 🎯

***Evaluate the extent to which climate change affects biological systems in Antarctica.***

It might feel like a small part of the essay, but a conclusion is important as it helps you draw together your thoughts and come to a decision to answer the question.

Conclusions might be roughly the same size as your introduction, so 3-4 sentences long, and could include the following:

- ✓ A summary of the main essay.
- ✓ A decision or answer to the question.
- ✓ A 'twist' or a thought for the reader to consider.

**Task:** Read the exemplar conclusion below, use coloured highlighters to show where you can see examples of the list above.

*Overall, climate change affects biological systems in Antarctica to a considerable extent, especially in marine ecosystems and along the Antarctic Peninsula, where warming and sea ice loss are most pronounced and affecting key species such as krill and penguins. However, impacts remain spatially uneven, sometimes indirect, and relatively limited in terrestrial ecosystems due to Antarctica's low biodiversity. Therefore, climate change is clearly influencing Antarctic biological systems, but the magnitude of impact varies across ecosystems and locations, making the overall effect significant but not uniform.*

**Task:** Now it's your turn to write a conclusion, use the space below to do so.

| Begin your paragraph here: |
| --- |
| |

## Reflect on your writing 

Now that you have planned your answer and written some of the parts out in full, it's time to reflect on the writing process.

**Task:** Answer the questions below to think through your writing.

1. What was the hardest part of planning your essay?

| |
|---|
| Write your answer here: |

2. What part worked for you?

| |
|---|
| Write your answer here: |

3. Next time, what might you initially do differently?

| |
|---|
| Write your answer here: |