

a-level exam questions & answers:

water & carbon cycles (section a) >

6-mark assorted questions (AO1 & 2)



References:

[Need help? Check out our ultimate guide to A-Level Geography!](#)

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This document is available both as a pdf and editable word document – from the water & carbon cycles topic page - which can be printed.



what are ao1&2 6-mark questions?

At A-Level, you are likely to receive two types of 6 Mark Questions, involving one or multiple figures.

Questions which require you to use this data **AND YOUR OWN KNOWLEDGE** are AO1&2 Questions, as they require a relevant understanding of the topic involved.

writing tips & tricks:

With these questions, it's always valuable to **briefly think or note exactly what points you are going to make**, and how to **reference one of the figures each time**. Do this over and over consistently.

You are looking to make around 3 well explained points with reference to the figure to gain full marks or make more points and explain in less detail. On some questions you may be able to follow the **OHLAD** structure, which goes as below:

OVERVIEW > using the figure what general trends or patterns can you spot. Use your knowledge to explain them.

[DATA] HIGHS > from your previous observation, highlight an example of one extreme in data (for example if there is a map showing local deprivation, pick out some areas with the highest levels and try to suggest reasoning behind this.

[DATA] LOWS > vice versa for data which is at the bottom end of the scale, if applicable.

ANOMALIES > is there anything in the figure which doesn't look like it belongs there? If yes, then write it down and again why it may be the case.

DATA MANIPULATION > **this is how we give out the higher marks** - don't only use the data you can see in the figure – modify it. For example, use percentages, fractions, compare it to others etc... for example if you have one area of a map suggesting poverty levels are at 55% and another at 30%, you could use your calculator to quickly say that the area is 0.54 times as impoverished, or 54% (30/55.). Examiners **L O V E** this kind of thing!

Successfully mastering this helps with your understanding and application of concepts as it shows evidence of wider knowledge and is good exam practice. You have approximately 8.5 minutes on this, so make sure you don't overwrite, which is easy to do.

want to know more about how to answer 6-mark questions (and all the others for that matter) more effectively? have a look at our [geography portal ULTIMATE GUIDE TO A-LEVEL GEOGRAPHY booklet here](#) or by scanning the qr code to the right. It has loads of helpful information – and there's even one for gcse students also!



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mark scheme | 6-mark assorted questions (AO1 & 2)



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Q.:	Sp. Ref.:	Information For Markers:	B'down:	Marks:
1	3.1.1.2	<p>Using Figure 1a, b, and c and your own knowledge, explain the differences between flood hydrographs and the potential consequences of such flood events.</p> <p>AO1 – Knowledge and understanding of the concept / practice of flood / storm hydrographs as well as flood event features, such as intensity, discharge, period, and the relative impacts surrounding them. AO2 – Application of knowledge and understanding to be able to relate the figure and links between such hydrographs and potential flood event impacts.</p> <p>Mark scheme</p> <p>Level 2 (4-6 Marks) AO1 – Demonstrates clear knowledge and understanding of concepts, processes, interactions, and change. AO2 – Applies knowledge and understanding to the novel situation offering clear analysis and evaluation drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance.</p> <p>Level 1 (1-3 Marks) AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change. AO2 – Applies limited knowledge and understanding to the novel situation offering basic analysis and evaluation drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance.</p> <p>Notes for answers</p> <p>This question requires candidates to be able to well integrate three independent figure sections into a 6-mark question including their own knowledge of flood hydrographs (fig. 1a/b) as well as flood event consequences. (fig. 1c)</p> <p>AO1</p> <ul style="list-style-type: none"> Flood / storm hydrograph concept and appreciation of its application in real-world situations. The lines are measures of discharge (volume per second) of water at a specified location along the river. The higher the graph, the greater the discharge; the shorter the time period along the x-axis, the flashier or more intense the flood event. Various impacts of flood damage could include those socioeconomic & environmental – such as damage to communications / transport infrastructure, habitats as well as built-up environments, the duration of which is dependent on 	AO1= 3 AO2= 3	6

		<p>the context of the storm as well as local conditions, such as development, government response etc...</p> <p>AO2</p> <ul style="list-style-type: none"> • Analysis of the first two figures in comparison with reference to the different consequences which might be observed. The two rivers are very different in typical discharge, with figure 1b being over 5x more (around 50 vs. 10m³/s.). Upstream and downstream values are also very different, with more consistent downstream values for both river flood events, and a much lower peak in both instances. The below focus on more important upstream data. • Figure 1a in 1995 shows a far flashier storm / flood event, even though the relative discharge of the river is less than 1/2 of the Kootenay River in figure 1b. This might produce more serious but shorter-term impacts and very localised, flash flooding events which can destroy infrastructure such as roads, railways as well as buildings as the sheer increase in relative water levels come as a complete surprise. • In contrast, the second flood event takes place over a far longer time period, of around 60 days of river discharge exceeding 400m³/s (over 8x the typical outflow.) These impacts would naturally be more long-term but possibly less relatively severe, compared with the 25x increase in discharge in the river in figure 1a. As the river is larger, it is more likely that it will have more capacity for flood events and will probably be better protected against such events through artificial flood barriers and defences, particularly in urban areas. • Figure 1c shows the impacts still being fairly severe in this location, with the entire flood plain being visibly impacted, though critical infrastructure such as road bridges are still standing, indicating the above point. • Additionally, if a flood event takes place over a longer period of time, and there are dips and troughs visible in the severity of the event visible in hydrograph 1b, there is far more opportunity for governmental agencies to equip the area to cope with the further worsening of the event. Notably in the case of the 1996 Kootenay Flood, for around 1 month prior to the significant increase in river outflow upstream. • Further relevant information, such as involving case study knowledge, is considered valued credit. 		
2.	3.1.1.4 	<p>Using Figure 2 and your own knowledge, assess the challenges associated with reducing greenhouse gas emissions.</p> <p>AO1 – The carbon budget and the impact of the carbon cycle upon land, ocean, and atmosphere, including global climate. Human interventions in the carbon cycle designed to influence carbon transfers and mitigate the impacts of climate change.</p> <p>AO2 – Application of knowledge to show an understanding of the challenges associated with managing climate change including emissions reductions.</p> <p>Mark scheme</p> <p>Level 2 (4-6 Marks)</p>	AO1=3 AO2=3	6

AO1 – Demonstrates clear knowledge and understanding of concepts, processes, interactions, and change.

AO2 – Applies knowledge and understanding to the novel situation offering clear analysis and evaluation drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance.

Level 1 (1-3 Marks)

AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change.

AO2 – Applies limited knowledge and understanding to the novel situation offering basic analysis and evaluation drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance.

Notes for answers

AO1

- Changes in the carbon cycle over time, human impact (including hydrocarbon fuel extraction and burning, farming practices, deforestation, land use changes).
- The carbon budget and the impact of the carbon cycle upon land, ocean and atmosphere, including global climate.
- Human interventions in the carbon cycle designed to influence carbon transfers and mitigate the impacts of climate change.
- Factors driving change the carbon cycle - combustion.

AO2

- The challenge has been around obtaining agreement in what is clearly not an equal situation. The richest countries, such as some in Europe and the USA, make a disproportionately high contribution to global warming. This is combined with the fact that USA has sought to pull out of the Paris agreement.
- If the USA or China pulled out of the agreement, the whole agreement is at risk. Many countries make little or no contribution to the global climate change and yet they are signatories. Canada and most African countries contribute very little to global climate change yet most are signatories to the Paris Agreement.
- For most countries, economic development is synonymous with increased carbon emissions. Restricting emissions to achieve a climate of below 2oC is likely to harm many developing economies. If USA were to pull out this would inevitably raise questions of fairness and place national pressure on sovereign governments to make the same decision.
- Some may argue that USA stands to gain comparative advantage. By pulling out of the Paris Agreement, the commitment to green energy production schemes and carbon emissions reduction strategies (as part of the Paris Agreement) are also likely to be dispensed with. This is likely to relieve the burden of substantial economic cost upon the USA. In this sense the biggest polluter will continue to gain economic advantage from burning fossil with none of the costs and arguably responsibility for mitigation.

Additional to AQA Specimen Mark Scheme:

- It could be argued that such programs are vulnerable to political policies across the world – Donald Trump campaigned

		strongly to exit the program on a pro-business, pro-fossil fuel platform, supported by donors and conservative voters; whilst Joe Biden's policy of immediate reinstatement is much more valued among liberal urban voters who are typically more ecologically conscious, thus could be used as a political 'football', to gain votes or influence.		
3	3.1.1.4	<p>Using the information in Figure 3a & b and your own knowledge, assess the impact of changing levels of precipitation upon life on earth with reference to climate change.</p> <p>AO1 – Knowledge and understanding of the concepts surrounding climate change and its impacts on the global process of precipitation, including the impacts of varying levels to which this process acts. Knowledge and understanding that life on earth is highly dependent on this process and small changes can have a knock-on effect on a large scale.</p> <p>AO2 – Application of knowledge to focus on the isolated geographical region bounded in figure 3a & b, linking to the concepts of climate change and precipitation, drought or flood and their impacts on life forms.</p> <p>Mark scheme</p> <p>Level 2 (4-6 Marks) AO1 – Demonstrates clear knowledge and understanding of concepts, processes, interactions, and change. AO2 – Applies knowledge and understanding to the novel situation offering clear analysis and evaluation drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident with clear relevance.</p> <p>Level 1 (1-3 Marks) AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions, change. AO2 – Applies limited knowledge and understanding to the novel situation offering basic analysis and evaluation drawn from the context provided. Connections and relationships between different aspects of study are basic with limited relevance.</p> <p>Notes for answers</p> <p>This question is a difficult one for students, as it engages with conceptual topics and hypotheticals to a large extent, whilst the figures are fairly limited in context.</p> <p>AO1</p> <ul style="list-style-type: none"> • (Anthropogenic) Climate change is one of the greatest challenges facing our world in the 21st century. There are many reasons for this. Importantly, excess carbon emissions into the atmosphere has led to the enhanced greenhouse effect and global warming, currently predicted as between 1.5 – 2.5 degrees by 2100 from 2000 levels. • One of the impacts of temperature rise is changes to precipitation (which can be rain/snow/sleet etc...) in different areas of the world. • Broadly, more land will be exposed to severe drought and water deficit – increasing levels of water insecurity / scarcity which impacts nearly 4bn people, or around 40% of our global 	AO1=3 AO2=3	6

population, and can cause significant impacts to both human activity as well as natural habitats and ecosystems which we rely on.

AO2

- Overall, it can be stated that the greater the temperature change by 2100, the more extreme on both ends of the spectrum precipitation levels will be affected.
- As illustrated by both figures in isolated regions, changes to temperature can influence air humidity and wind currents, thus bringing alternate weather patterns which in some cases will lead to increasing levels of rainfall.
- For example, particularly arid lands surrounding Somalia and Ethiopia are predicted to experience between an average of around 10% (in 3a) and 30% (in 3b) increase in levels of precipitation. This could be beneficial to communities in these regions, as they currently are some of the most drought-ridden globally. Both soil quality and arable land could be improved, and water scarcity may be reduced.
- Conversely, if managed poorly, increasing precipitation, particularly in figure 3b, could lead to increasing frequency and intensity of storm / flood events, thus putting both human life and habitat in danger. Particularly as all the countries which could experience this change are LICs with little preparedness, planning, poor housing quality and education on the dangers of storm events, or flood infrastructure. At a certain point this could also wash out vital nutrients from saturated soil & ecosystem shifts caused by flora exposed to atypical rainfall.
- However, over 80% (20/23 or similar) of countries in both figures are predicted to experience overall precipitation loss which is on average expected to be 0-10% lower with a 2-degree increase, in 3a, and 10-20% lower than 1980 in figure 3b. This exposes hundreds of millions of predominantly less-well off citizens in rural LICs, where water scarcity is already significant. This leads to drought, habitat loss etc...
- Candidates may reference of explain the concept of desertification / give reasonable examples – credit available.
- Some candidates may make reference to 'climate refugees' – this is a very high-level concept and should be considered as such in answers, if appropriately contextualised to the question.
- Acknowledgement of anomalies is also valid, such as the large drought spots in both figures of approx. 9°N/30°E (Sudan / N.E. of the map) and approx. 5°N/27°E (Democratic Rep. Congo/ centre map.). Likewise, in figure 3b, near this second location is the closest swings between precipitation increase and decrease, up to 50% +/-.
- Credit any other relevant information.