# Oxford Revise | Edexcel A Level Geography | Answers

## Chapter 1

**All exemplar answers given are likely to be in the top mark band.**

**Questions 1–11 are point-marked. Allow 1 mark per valid point with extra marks for development.**

**1** AO3 = 4

**(a)** 3502 (1); accept 3000-4000
VEI 2 (1)

**(b)** The plot should lie exactly on the intercept line (1) between VEI 4 and estimated casualties of 30,000 (1).

**2** AO3 = 4

**(a)** 11.17 (2)

**(b)** $1952 (1)

**(c)** $404.87 (1)
(1985–2015 = 30 years, $12,146 ÷ 30 years)

**3** AO3 = 4

**(a)** 205.5 (1); accept 206

**(b)** Award 1 mark for the calculation of $r_s$ without showing working.
$r_s = 1 - (1233 \div 990) = 1 - 1.245$ (1)
$r_s = -0.245$ (1)
accept $r_s = 1 - (1236 \div 990) = 1 - 1.248 = -0.248$, if $\Sigma D_2$ calculated to 206

**(c)** Accept (1)

**4** AO3 = 4

**(a)** 7.7 (1); accept 7.68

**(b)** 7.6 (1)

**(c)** Award 1 mark for the two quartiles:
Upper quartile Q1 = (8.3 + 7.9) ÷ 2 = 8.1
Lower quartile Q3 = (7.1 + 7.0) ÷ 2= 7.05
Interquartile range = 1.05 (1); accept 1.0

**5** AO3 = 4

**(a)** Award 2 marks for correctly completed table.

| | O | E | (O – E) | $(O – E)^2$ | $(O – E)^2/E$ |
|---|---|---|---|---|---|
| **Depth** | **Number of earhquakes over magnitude 5** | **Number of earhquakes over magnitude 5** | | | |
| 0–10 km | 7 | 11 | 4 | 16 | 3.2 |
| 11–20 km | 23 | 11 | 12 | 144 | 13.1 |
| 21–30 km | 14 | 11 | 3 | 9 | 0.8 |
| 31–40 km | 5 | 11 | −6 | 36 | 3.3 |
| 41–50 km | 6 | 11 | −5 | 25 | 2.3 |
| | | | | | Σ = |

Note: (O − E) for the 41–50 km category must be negative.
Note: $(O – E)^2$ for the 31–40 km category must be positive.

**(b)** 22.7 (1)

**(c)** Reject (1)

**6** AO3 = 4

**(a)** 248,590 (1)

**(b)** 200,000 (1); accept correct working

**(c)** Award 1 mark for the two quartiles:
First quartile Q1 = 98,862
Third quartile Q3 = 279,384.5
Interquartile range = 180,522.5 (1); accept 180,523
(Allow 1 mark for the correct use of the mathematical formula for interquartile range, but if rounding is incorrect, limit to 1 mark.)

**7** AO3 = 4

**(a)** Award 1 mark for the calculation of $r_s$ without showing working.

$r_s = 1 – (579 \div 9900) = 1 – 0.58$ (1)
$r_s = −0.42$ (1)
accept $r_s = 0.413$ if $\Sigma D_2$ calculated to 97

**(b)** Accept (2)

**Questions 8-15 are level-marked.**

**8** AO1 = 3 / AO2 = 9

| Level | Marks | Description |
|---|---|---|
| | 0 | • No rewardable material. |
| 1 | 1–4 | • Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1)<br>• Applies knowledge and understanding of geographical information/ideas, making limited logical connections/relationships. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited relevance and/or support. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to make unsupported or generic judgements about the significance of few factors, leading to an argument that is unbalanced or lacks coherence. (AO2) |
| 2 | 5–8 | • Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1)<br>• Applies knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to make judgements about the significance of some factors, to produce an argument that may be unbalanced or partially coherent. (AO2) |
| 3 | 9–12 | • Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1)<br>• Applies knowledge and understanding of geographical information/ideas logically, making relevant connections/relationships. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to make supported judgements about the significance of factors throughout the response, leading to a balanced and coherent argument. (AO2) |

**Relevant content may include:**

AO1

- Impacts can be measured in terms of social, economic, and environmental costs.
- Vulnerability is the degree to which people are exposed to risks; resilience is the degree to which they can cope following a hazard impact.
- Plate boundaries are where most tectonic events occur, and multiple hazard zones may experience a range of interacting hazards.
- Strategies to modify the impact of tectonic hazards include land-use zoning, hazard-resistant building design and engineering defences, as well as diversion of lava flows.
- Strategies to modify vulnerability and resilience include high-tech monitoring, prediction, education, community preparedness, and adaptation.

- Strategies to modify loss include emergency aid, short- and longer-term aid, insurance, and the actions of affected communities themselves.

AO2

- Physical location is key and determines the type, nature, and extent of tectonic hazards. Earthquakes can differ depending on the type of boundary and depth. Volcanic explosivity can vary depending upon magma type, with destructive boundaries seeing acidic magma and high explosivity eruptions on the VEI scale.
- A multiple-hazard zone may experience several hazards which interact to make an individual hazard worse. Therefore, this affects significance.
- The extent to which a hazard poses risks can be assessed using a hazard profile for different events and type of hazard.
- Vulnerability is greatly increased by low development levels and high inequality. Risks increase with high poverty rates, low education standards, unemployment, high population growth, and urbanisation, leading to huge, densely populated informal settlements without infrastructure.
- Vulnerability is also increased by poor governance. Potentially corrupt countries governed by dictators ignore the need for building controls and regulations, which leads to dangerous and poor informal settlements becoming established.
- These also affect a country's ability to modify the event, vulnerability and resilience, and the losses, all of which will affect the impacts from tectonic hazards.
- The disaster risk equation and PAR model can also be used to assess risk between different locations in accordance with human and physical factors combined.

Example answer: *Impacts can vary for numerous reasons, including (and most importantly of all) the degree to which a location is physically exposed to a hazard. Some locations are on plate margins and experience earthquakes, tsunamis, and volcanic eruptions. For example, the coast of Japan is particularly exposed to tsunamis. In 2011, the Sendai region suffered a devastating tsunami, in part because of its physical location. Also, the type of magma in a volcanic eruption determines the level of the hazard and therefore the impacts. Explosive magma, leading to a high VEI magnitude event, can devastate large areas and have huge impacts. For example, in Montserrat in 1995, two thirds of homes, including most of the capital city, Plymouth, were destroyed. This resulted in high levels of emigration.*

*However, the PAR model suggests that disasters (high impacts) are also affected by the progression of vulnerability, and so a disaster must contain a human element. Poor governance is the most significant factor to increase vulnerability and decrease resilience, as it affects all other factors. A poorly governed country greatly increases vulnerability through a lack of planning, regulations, and preparedness for disasters. In Haiti in 2010, for example, an earthquake resulted in 220,000 deaths, and the long-term social impacts affected 3.5 million people. This was due to poor governance and corruption, leading to widespread poverty, a lack of even basic infrastructure and services like water supply, and the building of informal housing which easily collapsed as there were no regulations to govern structural integrity. In contrast, vulnerability was relatively low in Japan leading up to the Tohoku tsunami in 2011. Here, good governance meant clear disaster planning, including warning sirens and phone alerts, marked evacuation routes, and strict building regulations ensuring homes were built to withstand tsunamis and earthquakes.*

*Poor governance also affects inequality directly. Unequal access to housing, education, health, and jobs increases vulnerability and reduces resilience after a disaster. In Haiti, for example, low education standards meant only 35% of residents could read. Many people did not understand how to deal with the impact of the earthquake in 2010.*

*The use of hazard-resistant design reduces impacts in more developed countries. Designs include cross-bracing and pendulum weights in high-rise blocks, shock-absorbing foundations to withstand seismic waves, and*

*reinforced roofs for volcanic ashfalls. Physical defences can also be built, such as sea walls to withstand tsunamis. Walls like this in Japan are up to 15 m high. Modification of vulnerability is also conducted in richer countries. For example, the use of high-tech monitoring and forecasting of volcanoes in Iceland, together with full-scale live evacuation practise (e.g. 2006), meant the impacts from the Eyjafjallajökull eruption in 2010 were low.*

*In conclusion, impacts vary due to many reasons, but especially physical location. This is compounded by human factors, most notably poor governance, which goes on to affect the degree of inequality and development, and therefore mitigation against natural hazards.*

**9** AO1 = 3 / AO2 = 9

| Level | Marks | Description |
|---|---|---|
| | 0 | • No rewardable material. |
| 1 | 1–4 | • Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1)<br>• Applies knowledge and understanding of geographical information/ideas, making limited logical connections/relationships. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited relevance and/or support. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to make unsupported or generic judgements about the significance of few factors, leading to an argument that is unbalanced or lacks coherence. (AO2) |
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**Relevant content may include:**

AO1

- The global distribution and causes of volcanic eruptions.

- The factors affecting the magnitude and type of volcanic eruption.
- The hazards connected to an eruption: lava flows, pyroclastic flows, ash falls, gas eruptions, and secondary hazards (lahars, jökulhlaups).
- Hazard profile factors to include magnitude, speed of onset and areal extent, duration, frequency, spatial predictability.
- Factors relating to vulnerability and resilience to include hazard-resistant design and the modification spectrum.

AO2

- Physical location is key and determines the type, nature, and extent of tectonic hazards. For example, volcanic explosivity can vary depending on the magma type, with destructive boundaries seeing acidic magma and high explosivity eruptions on the VEI scale.
- Destructive boundaries generate larger magnitude volcanic eruptions than constructive boundaries or hotspots.
- The context of the plate boundary is also important, relating to plate types and specific magma, as well as the triggers for each individual eruption (e.g. Montserrat).
- The types of hazard emitted can determine the impacts, with pyroclastic flows increasing the hazard. Also, the nature of interacting hazards which may create secondary hazards, such as lahars and jökulhlaups.
- Human factors increase or decrease the impact through hazard management, including strategies to modify the impact of tectonic hazards (land-use zoning, hazard-resistant building design and engineering defences, as well as diversion of lava flows), strategies to modify vulnerability and resilience (high-tech monitoring, prediction, education, community preparedness and adaptation), and strategies to modify loss (emergency aid, short- and longer-term aid, insurance, and the actions of affected communities themselves).
- Other factors relating to vulnerability may include development levels and high inequality, with increased risks due to high poverty rates, unemployment, high population growth, and urbanisation, leading to huge, densely populated informal settlements, without infrastructure.
- Vulnerability is also increased by poor governance, possibly corrupt countries led by dictators, leading to no building controls or lax regulations, which in turn leads to dangerous and poor informal settlements becoming established.

**10** AO1 = 3 / AO2 = 9

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**Relevant content may include:**

AO1

- Prediction and forecasting are different things. Both are related to predication.
- Prediction and forecasting can be attempted for all hazards, with different levels of accuracy depending on the type of hazard and development level of the country.
- Impacts can be measured in terms of social, economic, and environmental costs.
- Strategies to modify the impact of tectonic hazards include land-use zoning, hazard-resistant building design and engineering defences, as well as diversion of lava flows.
- Strategies to modify vulnerability and resilience include high-tech monitoring, prediction, education, and community preparedness and adaptation.
- Strategies to modify loss include emergency aid, short- and longer-term aid, insurance, and the actions of affected communities themselves.

AO2

- Some hazards are easier than others to predict (forecast spatially and temporally) with different results. Earthquakes are easier to forecast spatially but not temporally, which makes prediction impossible. However, scientists have used recurrence intervals on stress points along plate boundaries (e.g. the North Anatolian Fault line) to forecast events.
- Volcanic eruptions are easier in both aspects, forecasting spatially and temporally, and can be monitored in a variety of ways to indicate stages of an eruption.
- Tsunamis relate to earthquakes. Time travel maps and models are used to indicate impact locations, which then allow communities to be warned. However, the Tohoku earthquake and tsunami in Japan in 2011 overwhelmed defences, resulting in huge impacts. This hints at the magnitude of the hazard still being the deciding factor over prediction when it comes to impacts.
- Human factors also increase or decrease the impact through hazard management, including strategies to modify the impact of tectonic hazards (land-use zoning, hazard-resistant building design and engineering defences, as well as diversion of lava flows), strategies to modify vulnerability and resilience (high-tech monitoring, prediction, education, and community preparedness and adaptation), and strategies to modify loss (emergency aid, short- and longer-term aid, insurance, and the actions of affected communities themselves).
- Other factors relating to vulnerability may include development levels and high inequality, with increased risks due to high poverty rates, unemployment, high population growth, and urbanisation, leading to huge, densely populated informal settlements without infrastructure. This also affects the level of predictive capability.
- Vulnerability is also increased by poor governance, possibly corrupt countries led by dictators who ignore the need for building controls and regulations, which leads to dangerous and poor informal settlements becoming established. This also affects the level of predictive capability.

**11** AO1 = 3 / AO2 = 9

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**Relevant content may include:**

AO1

- A disaster relates to the interaction of human and physical elements.
- Impacts can be measured in terms of social, economic, and environmental costs.
- Governance relates to the institutions, organisations, and individuals who manage people's lives through making decisions about the economy, laws, etc., and ensuring rules are followed.
- Vulnerability is the degree to which people are exposed to risks. Resilience is the degree to which they can cope following a hazard impact.
- Disasters also occur where most tectonic events occur, and multiple-hazard zones may experience a range of interacting hazards.

AO2

- Vulnerability is significantly increased by poor governance, possibly corrupt countries led by dictators, leading to no building controls or lax regulations, which in turn leads to dangerous and poor informal settlements.
- Poor governance affects resources and infrastructure. Poor land management can lead to deforestation, increasing the risk from landslides. Building regulations may be lacking, or not be enforced, leading to informal housing. Poor accessibility and isolated communities make it harder to contact everyone after a hazard strikes. High population densities put more people in danger and increase the risk of disease.
- Governance also has an impact upon the presence of hazard management, including strategies to modify the impact of tectonic hazards (land-use zoning, hazard-resistant building design and engineering defences, as well as diversion of lava flows), strategies to modify vulnerability and resilience (high-tech monitoring, prediction, education, and community preparedness and adaptation), and strategies to modify loss (emergency aid, short- and longer-term aid, insurance, and the actions of affected communities themselves).
- Governance also relates to vulnerability and may include development levels and high inequality, with increased risks due to high poverty rates, unemployment, high population growth, and urbanisation, leading to huge, densely populated informal settlements without infrastructure.
- However, other factors include physical location, which is key, and determines the type, nature, and extent of tectonic hazards. Earthquakes can differ depending on the type of boundary and depth. Volcanic explosivity can vary depending on the magma type, with destructive boundaries seeing acidic magma and high explosivity eruptions on the VEI scale.

**12** AO1 = 3 / AO2 = 9

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**Relevant content may include:**

AO1

- Strategies may relate to adaptation and mitigation methods which reduce the impacts.
- Strategies to modify the impact of tectonic hazards include land-use zoning, hazard-resistant building design and engineering defences, as well as diversion of lava flows.
- Strategies to modify vulnerability and resilience include high-tech monitoring, prediction, education, and community preparedness and adaptation.
- Strategies to modify loss include emergency aid, short- and longer-term aid, insurance, and the actions of affected communities themselves.
- Prediction and forecasting can be attempted for all hazards with different levels of accuracy depending on the type of hazard and development level of the country.

AO2

- Strategies to modify vulnerability and resilience are key. They apply to all types of country and may have the biggest impact. Monitoring volcanoes for increased activity or ocean height following a submarine earthquake can provide prediction and forecasts. Knowledge of how to cope during a hazard event can greatly reduce a population's vulnerability. Earthquake drills are practised in many countries, including in Japan every year on 1 September, their 'disaster prevention day'. Emergency kits can also be prepared with instructions on how they can be used (e.g., water purification tablets). First-aid training can also increase resilience. Having locally designed evacuation plans and ready-made disaster kits containing food, water, and medicines improve resilience. Local knowledge of the landscape and vulnerable population means local risk factors can be prepared for, and effective evacuation routes and maps produced.
- Strategies to modify the event are vital for developing countries, especially where large populations lie next to hazardous areas. Areas at highest risk are identified and mapped by planners using technology such as GIS. These 'red zones' may have restrictions on the types and heights of buildings (i.e. residential), and include evacuation routes. Buildings are designed to withstand tectonic hazards and older buildings can be retrofitted. Designs include cross-bracing and pendulum weights in high-rise blocks, shock absorbing foundations to withstand seismic waves, and reinforced roofs for volcanic ashfalls. Physical defences can be constructed, such as sea walls (e.g. up to 15 m high in Japan) built to withstand tsunamis. Attempts have also been made by engineers to divert lava flows using earth barriers. For example, during 2001, 13 barriers were built around Italy's Mt Etna lava flows.
- Strategies to modify the loss can be useful in developing countries. These are often provided by NGOs and are especially important for less-resilient developing countries. Emergency aid provides the immediate essentials such as food, water, medical care, and shelter. Short-term aid restores essential services such as electricity supply. Longer-term aid rebuilds and supports the economy. Local people are vital for search and rescue following a hazard event, especially in remote parts of developing countries.
- Strategies to modify the loss can be useful in developed countries. Insurers provide economic cover for losses to include infrastructure, homes, and losses incurred to business.
  Some hazards are easier than other to predict (forecast spatially and temporally), with different results. Earthquakes are easier to forecast spatially but not temporally, which makes prediction impossible. Volcanic eruptions are easier in both aspects and can be monitored in a variety of ways to indicate stages of an eruption. Tsunamis relate to earthquakes. However, time travel maps and models can be used to indicate impact locations, which then allow communities to be warned.

**13** AO1 = 3 / AO2 = 9

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**Relevant content may include:**

AO1

- The vulnerability can be the result of the tectonic setting of the location affecting the nature of the physical hazards presented.
- Vulnerability is also influenced by population density, isolation and accessibility, and the degree of urbanisation.
- Vulnerability is also influenced by socio-economic factors such as inequality of access to education, housing, healthcare, and income opportunities.
- Governance is key to understand the vulnerability of communities.
- Strategies to modify the impact of tectonic hazards include land-use zoning, hazard-resistant building design and engineering defences, as well as diversion of lava flows.

- Strategies to modify vulnerability and resilience include high-tech monitoring, prediction, education, and community preparedness and adaptation.
- Strategies to modify loss include emergency aid, short- and longer-term aid, insurance, and the actions of affected communities themselves.

AO2

- Physical location is key and determines the type, nature, and extent of tectonic hazards. Earthquakes can differ depending on the type of boundary and depth. Volcanic explosivity can vary depending on the magma type, with destructive boundaries seeing acidic magma and high explosivity eruptions on the VEI scale.
- Most tsunamis are recorded in the Pacific Ocean, making this region's communities more vulnerable than communities situated elsewhere.
- However, vulnerability is determined in part by development levels and associated high inequality, with increased risks due to high poverty rates, unemployment, high population growth, and urbanisation, leading to huge, densely populated informal settlements without infrastructure.
- Closely connected to this is poor governance, which is more likely in developing nations (cause of effect or both), with corrupt countries led by dictators who ignore building controls and regulations, which in turn leads to dangerous and poor informal housing becoming established. This also affects the level of predictive capability.
- Development levels affect the degree to which hazards can be modified. Strategies to modify the impact of tectonic hazards (land-use zoning, hazard-resistant building design and engineering defences, as well as diversion of lava flows), strategies to modify vulnerability and resilience (high-tech monitoring, prediction, education, and community preparedness and adaptation), and strategies to modify loss (emergency aid, short- and longer-term aid, insurance, and the actions of affected communities themselves).
- Development also has an impact on predictive capability, with some hazards being easier than others to predict (forecast spatially and temporally). Earthquakes are easier to forecast spatially but not temporally, which makes prediction impossible. Volcanic eruptions are easier in both aspects and can be monitored in a variety of ways to indicate stages of eruption. Tsunamis relate to earthquakes. However, time travel maps and models are used to indicate impact locations, which then allows communities to be warned.

**14** AO1 = 3 / AO2 = 9

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**Relevant content may include:**

AO1

- The hazard management cycle includes:
  - ‘Response’ following a disaster. Victims receive immediate help in the form of search and rescue to save lives, and aid to keep people alive, including food, water, and emergency shelter.
  - ‘Recovery’ includes the reconstruction of homes and essential services, as well as the rehabilitation of the injured and those who have been socially and economically impacted.
  - ‘Mitigation’ starts to look forward to the next disaster and includes land-use zoning and hazard-resistant buildings and infrastructure.
  - ‘Preparedness’ looks to increase resilience through community education and prediction, and warning and evacuation technology and systems.

- These components follow one another in preparation for the next event. They can be associated with the stages of Park's model of disaster response and the modification of tectonic loss, events, and vulnerability.
- Strategies to modify the events of tectonic hazards include land-use zoning, hazard-resistant building design and engineering defences, as well as diversion of lava flows.
- Strategies to modify vulnerability and resilience include high-tech monitoring, prediction, education, and community preparedness and adaptation.
- Strategies to modify loss include emergency aid, short- and longer-term aid, insurance, and the actions of affected communities themselves.

AO2

- Each stage is important and contributes to mitigating the degree of impact from a tectonic hazard. The types of impact may be affected by different stages, with health impacts being more pressing during the response stage, and economic impacts being more important later on.
- Aid and immediate responses are key in the short-term, but do not mitigate future impacts.
- The development level of a country will determine which components of the hazard management cycle are most effective.
- More developed countries may regard all stages as important, but especially the mitigation and preparedness stages, where strategies to modify the impact of tectonic hazards (land-use zoning, hazard-resistant building design and engineering defences, as well as diversion of lava flows), strategies to modify vulnerability and resilience (high-tech monitoring, prediction, education, and community preparedness and adaptation) are seen as key preparations. The response stage is usually well-prepared for, and previous mitigation should have made the need for search and rescue and aid less vital.
- Developing countries may find 'mitigation' difficult due to costs, expertise, and existing infrastructure, and so rely on lower-cost methods to engage in community education and mitigation. Aid may be more important, as poor mitigation may have left the population at a high risk to hazards. Poor governance in developing countries may exacerbate these issues.
- Expect arguments that underlying vulnerability may be more important than any stage of management, as vulnerability is associated with high inequality, with increased risks due to high poverty rates, unemployment, high population growth, and urbanisation, leading to huge, densely populated informal settlements without infrastructure.
- Expect arguments that the underlying physical location may be more important than any stage of management, as the physical location is key, and determines the type, nature, and extent of tectonic hazards. Earthquakes can differ depending on the type of boundary and depth. Volcanic explosivity can vary depending on the magma type, with destructive boundaries seeing acidic magma and high explosivity eruptions on the VEI scale.

**15** AO1 = 3 / AO2 = 9

| Level | Marks | Description |
|---|---|---|
| | 0 | • No rewardable material. |
| 1 | 1–4 | • Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1)<br>• Applies knowledge and understanding of geographical information/ideas, making limited logical connections/relationships. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited relevance and/or support. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to make unsupported or generic judgements about the significance of few factors, leading to an argument that is unbalanced or lacks coherence. (AO2) |
| 2 | 5–8 | • Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1)<br>• Applies knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to make judgements about the significance of some factors, to produce an argument that may be unbalanced or partially coherent. (AO2) |
| 3 | 9–12 | • Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1)<br>• Applies knowledge and understanding of geographical information/ideas logically, making relevant connections/relationships. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2)<br>• Applies knowledge and understanding of geographical information/ideas to make supported judgements about the significance of factors throughout the response, leading to a balanced and coherent argument. (AO2) |

**Relevant content may include**:

AO1

- Disaster trends suggest that although tectonic hazards are relatively steady over time, the number of people affected seems to fluctuate and is possibly falling, although this is unclear.
- The amount of economic damage is increasing, and this can be seen as part of the impacts on people. The increases are highest in developed countries.
- Deaths seem to be falling yet are skewed by mega-disasters.
- Mega-disasters, such as the Tohoku tsunami in Japan in 2011, are high-impact, low-probability events which can play a significant role in affecting the trend.

AO2

- Increasing populations and increasingly risky locations of urban areas have placed populations at greater risk from earthquakes, volcanic hazards, and tsunamis, especially in developing countries where poor governance and population pressures have led to the growth of informal urban settlements and developments on more peripheral land.
- Populations are also arguably more vulnerable due to rising inequality, with increased risks due to high poverty rates, unemployment, high population growth, and urbanisation, all leading to huge, densely populated informal settlements with low education standards and without infrastructure.
- Vulnerability is also increased by poor governance, possibly corrupt countries led by dictators, leading to no building controls or lax regulations, which in turn lead to dangerous and poor informal housing.
- Expect critical evaluation of disaster trend data. Disaster trends may be incorrect due to poor collection, political and NGO bias, and differences in measuring and recording impacts, alongside the increased technology that allows increased monitoring and reporting of tectonic disasters and events.
- Single events may skew the data and give a false impression of more people being affected, notably the Haiti earthquake of 2010 and Tohoku tsunami in Japan the following year. The Eyjafjallajökull eruption in Iceland in 2010 affected a large number of people (although with little risk) due to the type of eruption, yet was a single, rare, mega-disaster event.
- An increasing over-reliance on technology and the ability of predictive capability may lead to people settling in riskier areas. Some hazards are easier than others to forecast spatially and temporally with different results. Earthquakes are easier to forecast spatially but not temporally, which makes prediction impossible. Volcanic eruptions are easier in both aspects and can be monitored in a variety of ways to indicate stages of an eruption.