Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel Level 3 GCE

Tuesday 14 May 2024

Afternoon (Time: 1 hour 45 minutes)

Paper reference **8GE0/01**

Geography

Advanced Subsidiary

PAPER 1: Dynamic Landscapes

You must have:
Resource Booklet (enclosed)
Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer Question 1 in Section A **and EITHER** Section B **OR** Section C.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- Any **calculations** must show **all** stages of **working out** and a **clear answer**.

Information

- The total mark for this paper is 90.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- Calculators may be used.

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over

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Answer Section A and EITHER Section B OR Section C.

SECTION A

Tectonic Processes and Hazards

Answer ALL questions. Write your answers in the spaces provided.

You must use the Resource Booklet provided.

1 (a) Complete the missing part of the hazard risk equation.

(1)

$$\text{Risk of disaster} = \frac{\text{Event} \times \text{Vulnerability}}{\text{.....}}$$

(b) Study Figure 1 in the Resource Booklet.

(i) Compare the distribution of aftershocks between the two earthquakes.

(2)

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(ii) Suggest **one** reason for the different pattern of aftershocks shown in 2021.

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(c) Explain **two** hazards caused by volcanoes.

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(d) Explain the global distribution of earthquake hazards.

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(e) Assess the view that the most severe volcanic disasters occur on destructive plate boundaries.

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(Total for Question 1 = 28 marks)

TOTAL FOR SECTION A = 28 MARKS

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SECTION B

Glaciated Landscapes and Change

Do not answer Section B (Glaciated Landscapes and Change) if you have answered Section C (Coastal Landscapes and Change).

Indicate which question you are answering by marking a cross in the box ☒. If you change your mind, put a line through the box ☒ and then indicate your new question with a cross ☒.

If you answer Section B, put a cross in the box ☐ .

You must use the Resource Booklet provided.

2 (a) Name **one** fluvioglacial landform.

(1)

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(b) Study Figure 2a below, which shows the change in measurements of the diameter of six stone polygons between 1991–2021.

	Expansion of the diameter (mm/yr)
Polygon 1	1.00
Polygon 2	1.13
Polygon 3	2.34
Polygon 4	1.42
Polygon 5	1.08
Polygon 6	1.23

Figure 2a

Measurements of the diameter of six stone polygons

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(i) Calculate the mean expansion of the diameter of the stone polygons.

Show your working.

Give your answer to 2 decimal places.

(2)

..... mm/yr

(ii) Study Figure 2b in the Resource Booklet.

Suggest **one** reason for the formation of patterned ground shown.

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(c) Explain **two** landforms that are created by valley glacier erosion.

(4)

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(d) Explain how distinctive landforms are created by glacial deposition.

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(e) Assess the influence of different stakeholders in managing threats to fragile glaciated landscapes.

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3 (a) Study Figure 3 in the Resource Booklet.

A group of students were planning fieldwork and deciding on the best time to investigate the impact of human activity on fragile glaciated landscapes near Ambleside, in the Lake District.

They consulted a website that showed them a tourism score (calculated from 1–10), which suggested months where the likely number of visitors to the area would be high or low.

(i) Identify the month with the highest temperature.

(1)

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(ii) Describe the trend of the tourism score during the year.

(2)

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(iii) Suggest which month would be the most sensible for these students to complete their fieldwork about the impact of human activity.

(2)

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The students' investigation focussed on the impacts of human activity on the landscape.

(iv) Explain **two** factors these students should consider before choosing their fieldwork locations.

(4)

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(b) You have carried out an investigation into glaciated landscapes and change.

Assess the usefulness of ICT (Information and Communications Technology) to process and present the data and information you have collected.

(9)

Geographical enquiry question

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(Total for Question 3 = 18 marks)

Use your knowledge and understanding from across the course of study, along with the information in Figure 4, to answer this question.

4 Study Figures 4a, 4b, 4c and 4d in the Resource Booklet.

Evaluate the relative importance of physical and human factors in causing the Chamoli disaster.

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(Total for Question 4 = 16 marks)

TOTAL FOR SECTION B = 62 MARKS

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SECTION C

Coastal Landscapes and Change

Do not answer Section C (Coastal Landscapes and Change) if you have answered SECTION B (Glaciated Landscapes and Change)

Indicate which question you are answering by marking a cross in the box ☒. If you change your mind, put a line through the box ☒ and then indicate your new question with a cross ☒.

If you answer Section C, put a cross in the box ☐ .

You must use the Resource Booklet provided.

5 (a) Identify **one** landform caused by mass movement.

(1)

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(b) Study Figure 5a below, which shows the measurements taken of the volume of cliff material eroded over a six month period.

	Average volume of cliff material eroded (metres^3)
August	1
September	3
October	35
November	592
December	994
January	186

Figure 5a

Measurements of the volume of eroded cliff material

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(b) Calculate the mean volume of cliff material eroded per month.

Show your working.

Give your answer to 2 decimal places.

(2)

..... metres^3

(c) Study Figure 5b in the Resource Booklet.

Suggest **one** reason why the rate of cliff erosion varies at Porthleven.

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(d) Explain **two** parts of a coastal sediment cell system.

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(e) Explain how vegetation helps stabilise sandy coastlines.

(6)

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(f) Assess the view that storm surges are the main cause of increasing risk for coastlines.

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(Total for Question 5 = 28 marks)

6 (a) Study Figure 6 in the Resource Booklet.

A group of students were planning fieldwork and deciding on the best time to investigate the success of coastal management approaches at Whitehaven in Cumbria.

They consulted a website that showed them a tourism score (calculated from 1–10), which suggested months where the likely number of visitors to the area would be high or low.

(i) Identify the month with the highest temperature.

(1)

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(ii) Describe the trend of the tourism score during the year.

(2)

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The students' investigation focussed on the views of tourists and residents about the visual impact of different approaches to coastal management.

(iii) Suggest which month would be the most sensible for these students to complete their fieldwork about differing viewpoints.

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(iv) Explain **two** factors these students should consider before choosing their fieldwork locations.

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(b) You have carried out an investigation into coastal landscapes and change.

Assess the usefulness of ICT (Information and Communications Technology) to process and present the data and information you have collected.

(9)

Geographical enquiry question

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(Total for Question 6 = 18 marks)

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Use your knowledge and understanding from across the course of study, along with the information in Figure 7, to answer this question.

7 Study **Figures 7a, 7b, 7c and 7d** in the Resource Booklet.

Evaluate the relative importance of physical and human factors in causing the Tonga disaster.

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(Total for Question 7 = 16 marks)

TOTAL FOR SECTION C = 62 MARKS
TOTAL FOR PAPER = 90 MARKS

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Pearson Edexcel Level 3 GCE

Tuesday 14 May 2024

Afternoon (Time: 1 hour 45 minutes)

Paper reference **8GE0/01**

Geography

Advanced Subsidiary

PAPER 1: Dynamic Landscapes

Resource Booklet

Do not return this Booklet with the question paper.

Turn over

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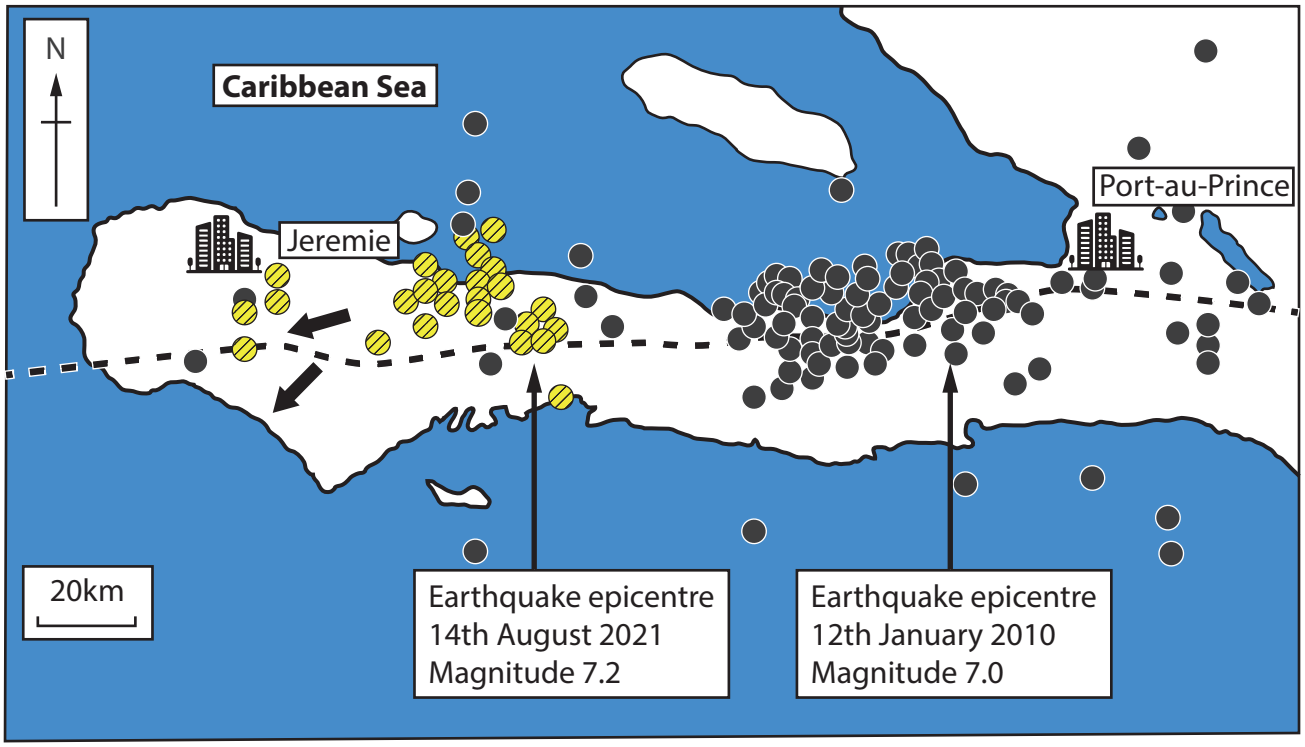
SECTION A

The following resource relates to Question 1.



Key

- Aftershocks after August 2021 Earthquake
- Aftershocks after January 2010 Earthquake
- Fault line
- Direction of plate movement
- City

Figure 1

Aftershocks reported following two earthquakes in Haiti, 2010 and 2021

SECTION B

The following resources relate to Question 2 and 3.

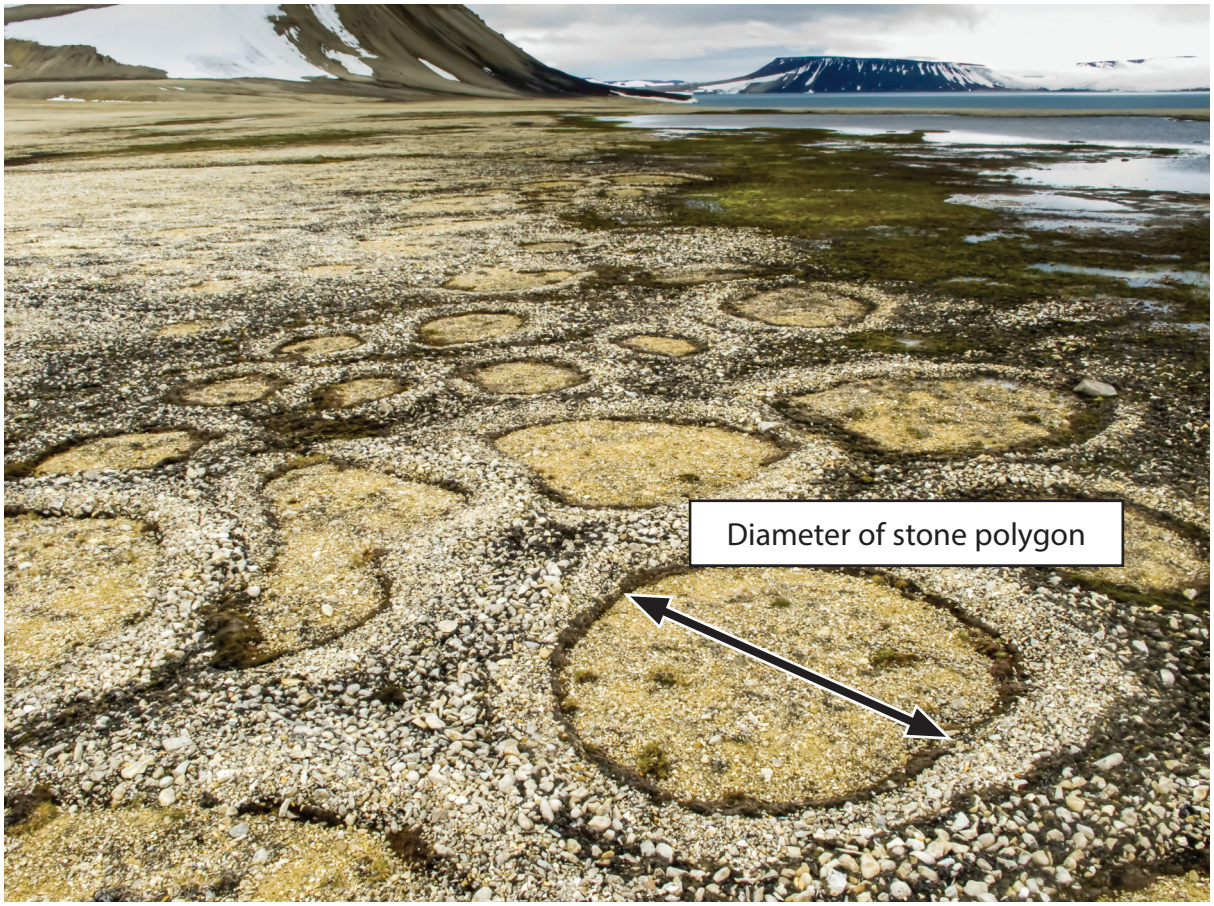


Figure 2b

Patterned ground in Norway, showing stone polygons formed by periglacial processes

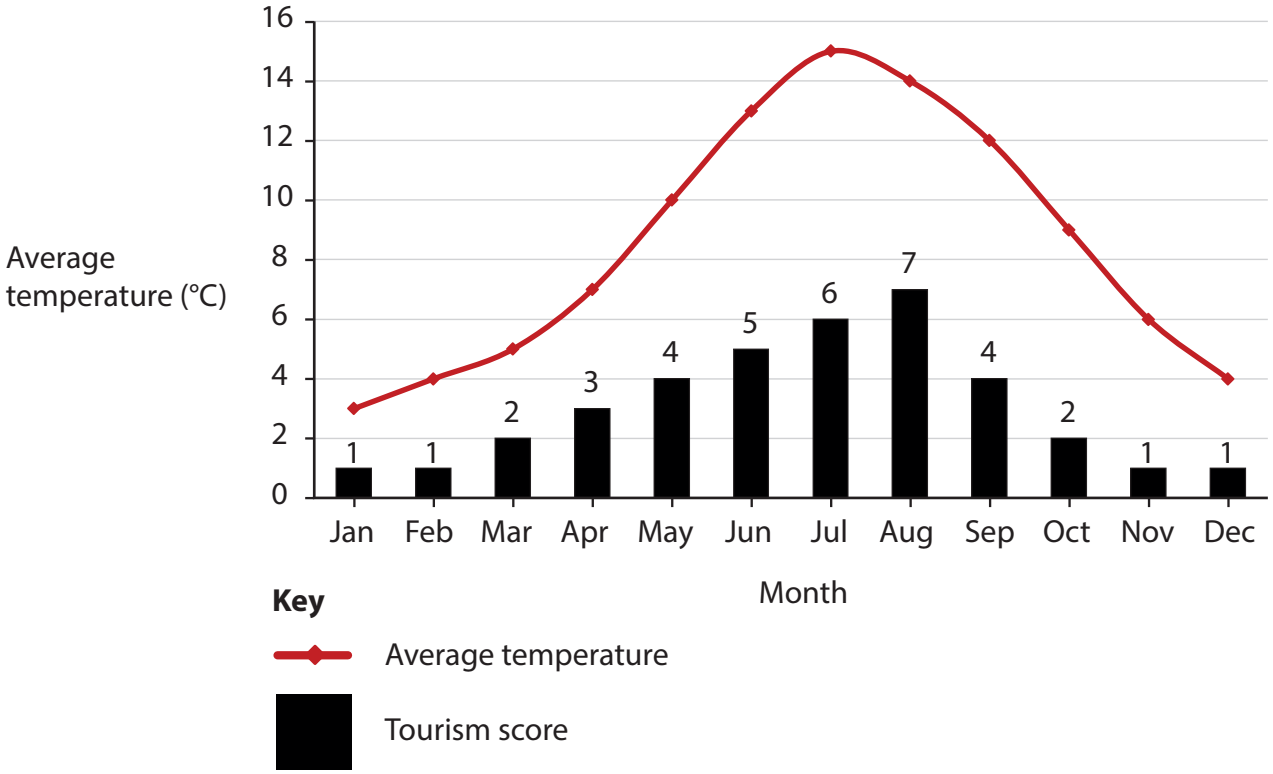


Figure 3

Temperature data and tourism score for Ambleside, Cumbria

The following resources relate to Question 4.

- The Nanda Gunthi mountain is in the Chamoli region, North India. It is a tectonically active part of the Himalayas, a collision plate boundary between the Indian and Eurasian plates.
- Satellite photos show that, over four years, a large crack developed on the side of the mountain above the Raunthi Glacier. In February 2021, a rock and ice avalanche occurred.
- This rapidly moving flow of mud, water and rocks blocked the Rishiganga river, but subsequently gave way; the material then surged down the valley destroying forests, farmland and infrastructure, including hydroelectric power (HEP) stations and reservoir dams.

Figure 4a

Information about the cause of the disaster

"This is not the first time these expensive power plants have been damaged. But HEP creates jobs and helps us find alternatives to fossil fuels."

Indian journalist

"No single event can be directly linked to climate change. However, melting glaciers uncover mountains and leave them unstable."

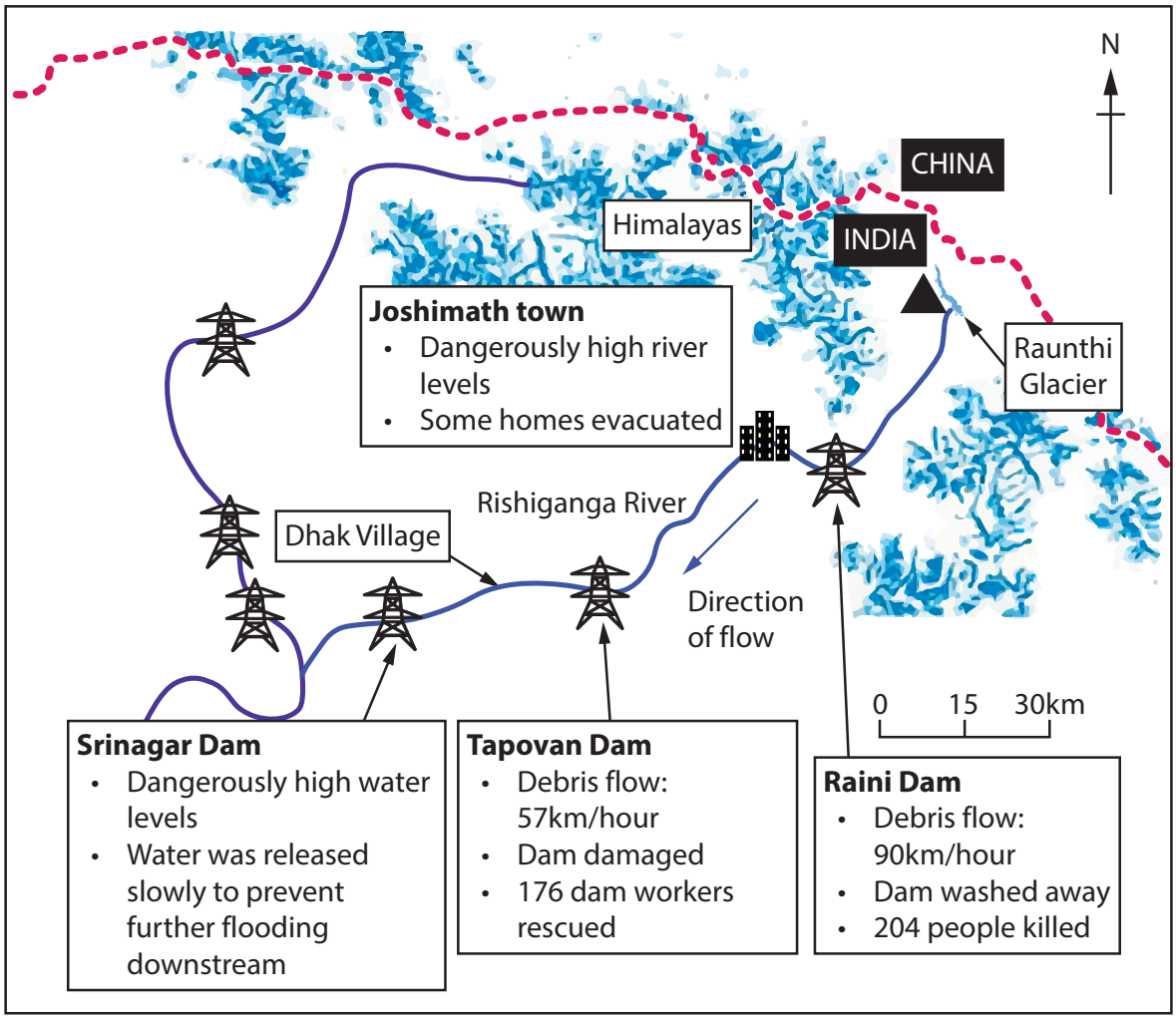
UK landslide scientist

"The amount of falling rock and ice created enough friction and heat to rapidly melt the glacier – all together creating the mudflow."

International scientist

Figure 4b

Three viewpoints about the Chamoli disaster



Key

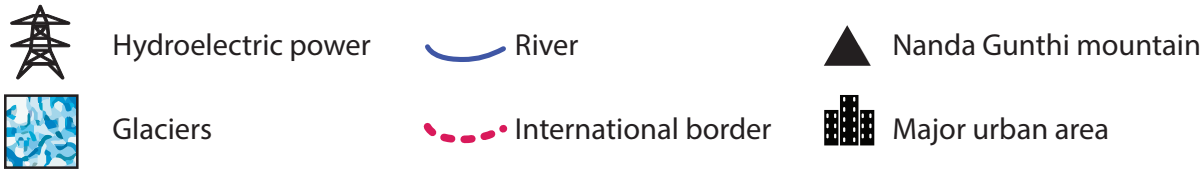


Figure 4c

Selected impacts of the Chamoli disaster in February 2021

Nanda Gunthi Mountain

- A wedge of ice-covered rock more than 500m wide and 180m thick collapsed.
- 2.7 million m^3 of material fell downwards onto the glacier below.

Tapovan Dam

- Debris including rocks over 10 metres in diameter destroyed very expensive infrastructure, including HEP stations.
- This is not the first time that HEP stations have been damaged by earthquakes and catastrophic floods in these mountain valleys.

Dhak Village

- Early warning systems allowed many workers to seek shelter in time.
- Helicopters transported aid from nearby villages, and helped to evacuate people trapped in the narrow valleys.

Figure 4d

Three scenes from the Chamoli region, February 2021

SECTION C

The following resources relate to Questions 5 and 6.

Figure 5b

Two images showing the coast at Porthleven, at different times of year

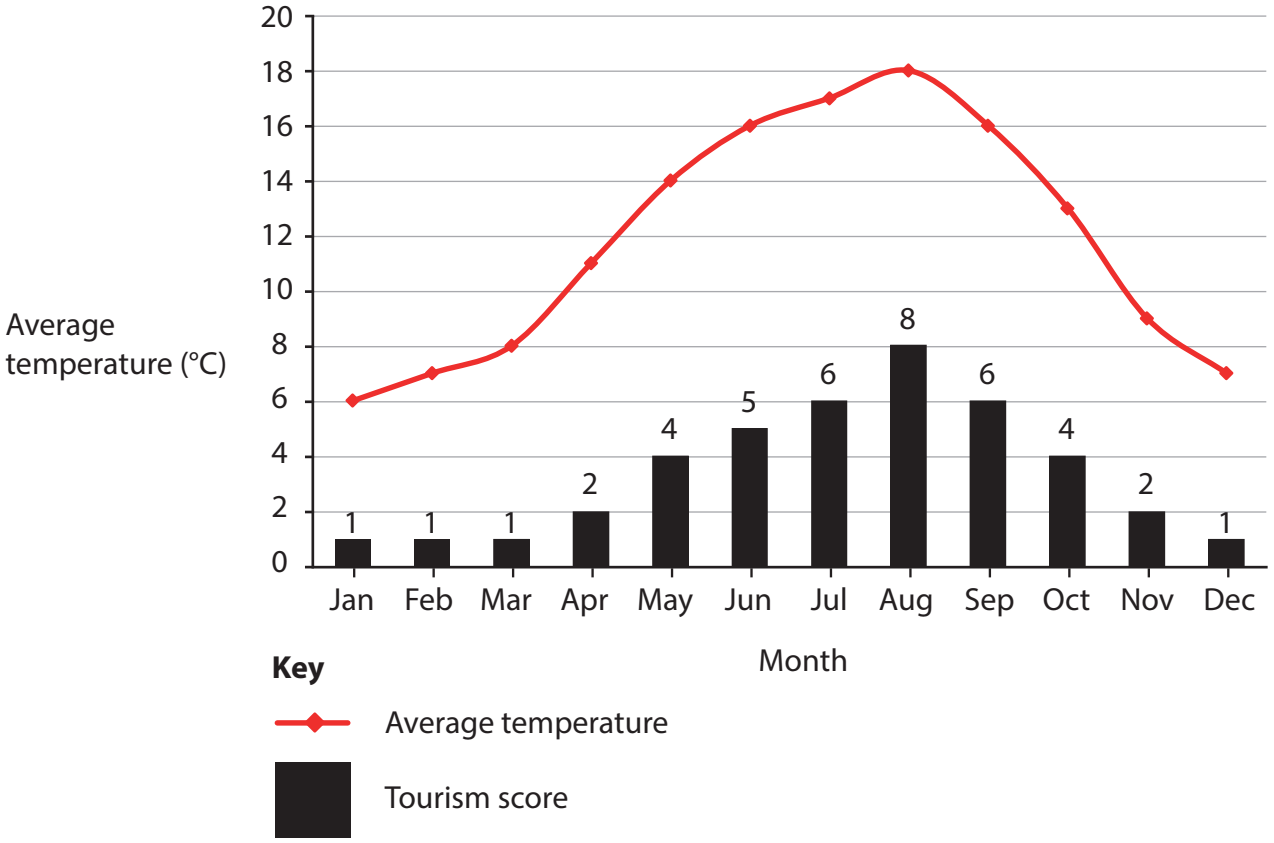


Figure 6

Temperature data and tourism score for Whitehaven, Cumbria

The following resources relate to Question 7.

- The country of Tonga is made up of a group of 170 Pacific Islands, on a convergent plate boundary between the Indian and Australian plates. 35 of them are inhabited.
- An underwater volcano began to erupt in December 2021, allowing good time for some to evacuate. However, the shockwave from a powerful explosion on 15th January 2022 triggered a tsunami, destructive waves and temporarily raised the sea level.
- Tonga's economy relies on tourism and agriculture. It was already vulnerable to tropical cyclones. Restrictions to International visitors also slowed down the arrival of aid and therefore recovery.

Figure 7a

Information about the causes of the disaster

"Gas, smoke and ash from the VEI 6 eruption reached 20km into the sky. The eruption could be heard 2,300km away in New Zealand."

International scientist

Many islands in Tonga are flat leaving people with nowhere to evacuate to. Some villages are completely underwater."

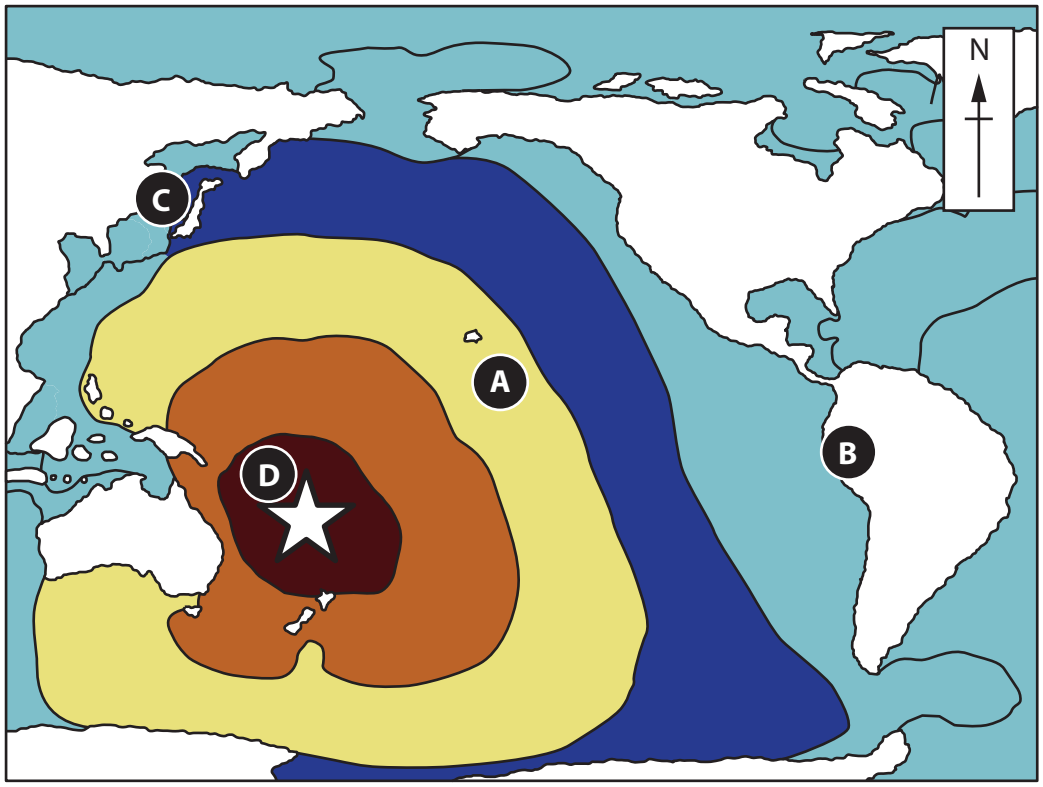
Tongan resident

"It will take several days to reach Tonga and make sure people get the resources they need; we haven't been able to establish communication."

New Zealand Prime Minister

Figure 7b

Three viewpoints about the Tonga disaster



Key

Location of the eruption

Time taken for the tsunami wave to travel

- 0–2 hours
- 3–5 hours
- 6–8 hours
- 9–11 hours
- 12+ hours

A

Hawaii – 5,000km away
- Tsunami wave: 0.7m high
- Some local flooding

B

Peru – 10,000km away
- Tsunami wave: 2m high
- 2 people were killed by the wave striking their car on the beach
- A ship delivering oil to a refinery was damaged resulting in an oil spill that covered almost 2,000km of coastline

C

Japan – 7,700km away
- Tsunami wave: 1m high
- 10 boats capsized
- 230,000 people evacuated to higher ground

D

Tonga
- Tsunami wave: 15m high
- 5 dead, 18 injured
- Underwater internet cable damaged
- 100 houses destroyed, 50 damaged
- Ash fall covered a large area

Figure 7c

The impact of the Tongan tsunami wave around the Pacific region

Nomuka Island

- Many of the coastal communities of the inhabited Tongan islands were not protected by hard engineering and were flooded by the tsunami wave.
- Ash from the eruptions now covers most of the islands.

Aid from Australia and New Zealand

- Aid flights and fresh water arrived after five days, but repairs to the damaged internet cable took months to begin.
- Damage to houses and infrastructure has left some islands uninhabitable.

Beach resort on Tongatapau (the main island)

- Water supplies gathered from rainwater have been contaminated by ash.
- The World Bank estimates damage to the islands will cost US$90 million, including US$21 million of damage to agriculture and US$63 million to tourism and infrastructure.

Figure 7d

Three scenes from Tonga

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Acknowledgements

Pearson Education Ltd. gratefully acknowledges all following sources used in the preparation of this paper:

Figure 1: adapted from https://temblor.net/earthquake-insights/are-the-2021-and-2010-haiti-earthquakes-part-of-a-progressive-sequence-13132/

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