**Comparing Earthquakes: Geography Individual Assessment**

**Objectives:**

**What:** A comparison of two major earthquake events

**How:** Use a range of resources to investigate the impacts of two earthquake events

**Why:** To understand the factors that influence the severity of earthquake events

**Task:**

**Write an essay/report to compare two earthquake events (this will likely be the Japan the Haiti 2010 Earthquake and the Japan 2011 Earthquake).**

**Essay question to answer: *“Was the Haiti 2010 Earthquake a bigger disaster than the Japanese Earthquake of 2011?”***

**Introduction:**

* Start by explaining what the essay is about.
* You may like to **define** the following terms in your introduction e.g. natural hazard, natural disaster, earthquake.
* Introduce the **case studies** you will use e.g. dates/location of the events/brief **background on each country** e.g. level of development/wealth, type of government etc.

**Main body of the essay/report:**

* **What happened?** A report on the key events of both earthquakes e.g. date, time, location, magnitude, death toll, extent of the damage, effectiveness of the preparation and management of the event.
* **Compare the events to decide whether one disaster was bigger than the other.**

**Think about:**

* The size of the earthquake (magnitude), depth of the focus/location of the epicenter/time of day of the earthquake, number of aftershocks, length of the earthquake
* Severity of the impacts e.g. death toll, cost of the damage, amount of damage
* Scale of the impacts e.g. size of the area affected/number of people affected
* Quality of the preparation and management response/ability of the country to cope with the disaster.
* Duration of the impacts i.e. length of time for recovery

**Conclusion:**

* In conclusion provide a summary of your findings - **Can each of these events be considered a major disaster?** Provide reasons/evidence for your ideas.
* Was one disaster **more significant than the other?** Why do you think this?

**Mark-scheme**

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| **Level** | **Descriptor** |
| 7 | * You produce a detailed essay.
* All the key criteria are included, and you are able to both describe AND explain a wide range of impacts of both earthquakes.
* There is accurate and confident use of ways to classify the impacts e.g. 'economic', 'environmental' etc.
* You are able to compare both earthquake events in detail and you refer to a wide range of factors influencing the severity of the earthquakes e.g. magnitude, location of epicenter, depth of focus, level of economic development, effectiveness of planning and management etc
* The argument is conveyed through coherent and meaningful paragraphs leading to an effective and well-substantiated conclusion.
* The structure has been purposefully and deliberately planned to support the analysis and argument.
* The written style is mature and fluent. Spelling and use of technical terms is accurate.
* The response comes across as an original piece of work which engages the reader.
* Throughout appropriate use of annotated maps, diagrams and data, you report the events accurately and in detail.
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| 6 | * All the key criteria are included, and you are able to describe and explain some impacts of both earthquakes.
* You clearly compare the effects of earthquakes.
* The argument is conveyed through organised paragraphs leading to a conclusion that summarizes the main points/arguments.
* There is an effective and logical structure.
* The written style is fluent.
* Spelling and use of technical terms is mostly accurate.
* The report is well presented and includes annotated maps, diagrams and/or data.
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| 5 | * You make reference to most of the criteria, and describe a range of impacts of the earthquakes.
* You make limited comparisons between the 2 events the impacts in the report.
* The essay or report is well presented, but lacks a range of presentation styles (such as annotated maps and diagrams.
* The response is organized to produce a structured account, although it does not come to a develop an evaluative conclusion.
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| 4 | * You produce a simple account of the earthquakes.
* Most of the criteria are included, but the two earthquakes are not linked together or compared accurately.
* Knowledge is used to support descriptions, although there are some inaccuracies and/or it is too generic rather than specific.
* The report lacks an explanation or explanation is undeveloped.
* The organization shows some evidence of planning, although the answer is mostly narrative with only implicit links to the question.
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| Level 3 and below | Does not directly answer the question. Large sections may have been copied. There is little understanding of the question. Geographical knowledge is limited in quality and quantity. |

**Earthquake key details:**

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|  | **Haiti 2010** | **Japan 2011** |
| **Location** | * Haiti – a Caribbean island that shares the island of Hispaniola, with its neighbor, The Dominican Republic. Haiti is on a conservative plate boundary, where the Caribbean and North American Plates are sliding past each other.
 | * Japan – A country in East Asia that is located at a destructive plate boundary. Japan is within the Pacific Ring of Fire – a very active zone of volcanic and earthquake activity.
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| **Background on the country** | * One of the poorest countries in the world (GDP per capita = $765)
* 50% of people lived below the poverty line before the earthquake.
* Haiti has been plagued by government corruption, brutal dictators and military regimes in its past.
* A multi-hazard location – affected by earthquakes and hurricanes.
 | * One of the wealthiest countries in the world (GDP per capita =$38,000 )
* Japan is thought to be the most technically advanced country in seismic (earthquake) monitoring in the world.
* Also a multi-hazard location – earthquakes, volcanoes, and typhoons.
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| **Earthquake key details** | * **Date:** 13th January 2010 (16.53)
* **Location of epicenter:** It occurred 25 kilometres west of Haiti’s capital Port Au Prince.
* **Depth of focus:** 13km
* **Length of earthquake event:** 35 seconds-1 minute
 | * **Date:** March 11, 2011 (14.46)
* **Epicenter:** This was an under-water earthquake event. It occurred in the Pacific Ocean, 70 kilometres off the NE coast of the Japanese island of Honshu.
* **Depth of focus:** 30km
* **Length of earthquake:** About 6 minutes
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| **Cause of the earthquake** | * Tension had been building up on a fault called the Enriquillo Plantain Garden Fault for a long time. On the 13th January 2010 the tension was released producing a major earthquake measuring 7.0 on the Richter Scale.
 | * The Pacific Plate is subducting beneath the Eurasian Plate. Tension built up between the plates. The release of tension produced an undersea megathrust earthquake measuring 9.0 on the Richter Scale.
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| **Impacts** | * 175,000-300,000 deaths
* 1 million people had to sleep on the streets
* 1/3 of the buildings in Port- au-Prince (Haiti’s capital city) collapsed.
* Widespread looting occurred
* 85% of rubble was still uncleared 6 months after the earthquake
* Government all but wiped out (presidential palace collapsed etc)
* People were housed in tented camps for more than 5 years after the earthquake.
 | * 15,000-20,000 deaths
* 40 metre tsunami inundated the coastline
* $200 billion damages (most expensive natural disaster in history)
* Meltdown at the Fukushima Daiichi Nuclear Power Plant caused a permanent exclusion zone (20 mile radius) to be set up around the area. People were permanently evacuated from their homes and 50,000 been unable to return and are living in temporary accommodation.
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| **Management** | * Haiti was completely unprepared for the earthquake.
* They didn’t have earthquake proof buildings. Much of the population lived in self-built housing (slums). Building codes were not enforced. Heavy concrete roofs collapsed during the earthquake, crushing victims.
* Haitian people had never practiced earthquake drills – they didn’t know what to do in the earthquake, resulting in chaos and panic.
* After the earthquake disaster crews did not arrive for 24 hours. The Haitian government lacked resources to cope and the country was reliant on international aid and charities such as Oxfam.
 | * Japan had the most advanced earthquake and tsunami detection systems in the world – the country is wired up to sensors that detects movement in the earth’s crust. Warnings are sent out via people’s cell phones (these alerts only arrive seconds before an earthquake).
* Japan has invested in earthquake proof building technology e.g. use of steel frames and base isolation. The earthquake itself did little damage.
* People in Japan are used to earthquakes, regular drill are carried out in schools and workplaces and people know what to do.
* Within 4 minutes of the earthquake Prime Minister Naoto Kan had set up a special disaster response unit and had assumed leadership of the relief effort. Within the first hour of the disaster, defence forces, police and other rescue workers were on their way to the afflicted area. In the first two days 50,000 personnel were mobilized.
* Japan had a tsunami flood wall that was built to withstand a 12 metre tsunami, unfortunately this mega tsunami was 40 metres!
* Japan used other methods that were intended to reduce the impact of storm surges e.g. pine forests planted on the coastline. Unfortunately the tsunami easily broke these up and the trees added to the deadly debris flow.
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