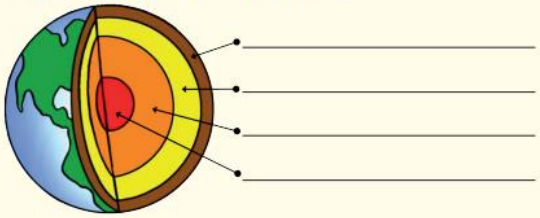
Yr 9 December Mock 2025 (43 marks) MARK SCHEME

Why is our earth restless?

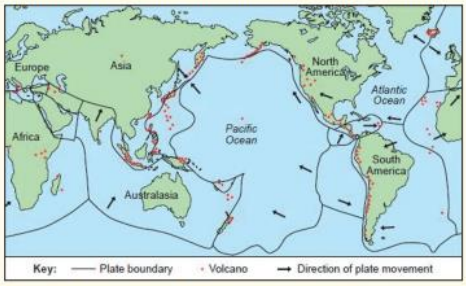
Q1. **Which one of the following events is not an example of a natural hazard?** [1]
Shade one circle only.

- ◯ **A** Tsunami
- ◯ **B** Earthquake
- ◯ **C** Volcanic eruption
- ◯ **D** Oil spill

Q2. **Label the layers in the structure of the earth.** [4]



Q3. **Study the figure below, a map showing the world's distribution of volcanoes.**



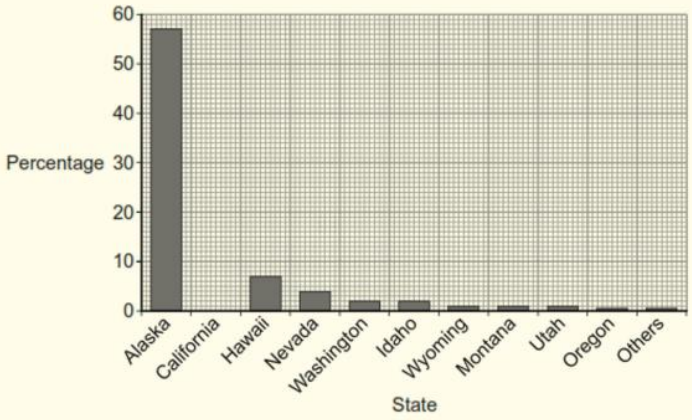
Describe the world distribution of volcanoes. (TEA) [2]

Q4. **Use the words in the box to complete the sentences on earthquakes.** [3]

The _____ is the point where an earthquake starts. The point on the Earth's surface above the start of an earthquake is the _____. The earthquake then travels through the Earth as _____.

Epicentre	Focus	Seismic waves	Fault

Q5. **Study the graph below. It shows the percentage of earthquakes that occurred in states of the USA (1974–2008).**



Complete the graph. Use the information below. [1]
California = 24%

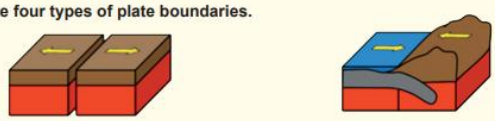
1. Oil spill

2. Crust
   Mantle
   Outer Core
   Inner Core

3. Volcanoes are located on plate margins / boundaries (1)
   Volcanoes are located around the Pacific Ocean / Ring of Fire (1)
   Along the west coast of North and South America (1)
   Along the East Coast of Asia (1)
   Around the Mid Atlantic (Ridge) (1)
   At hot spots (Hawaii) (1)
   Any two separate descriptions linked to volcanic distribution.

4. Focus, epicentre, seismic waves.
5. Accurate plot at 24% (each line represents 1%)

Q6. **Name the four types of plate boundaries.** [4]



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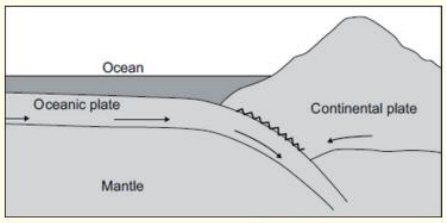
Q7. **Earthquakes occur at destructive plate boundaries. The image below shows a destructive plate margin.**



Explain how earthquakes and volcanoes occur at destructive plate margins. [4]

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6.

Constructive, destructive, conservative, collision.

7. Credit the movement of convection currents in the upper mantle as the mechanism for plate movement and subduction.

Understanding of processes causing volcanic activity at destructive margins.

Firstly two plates move towards each other due to **convection currents** in the mantle. Secondly, the **denser oceanic** plate **subducts** (sinks) below the lighter, less dense **continental plate** and melts in the s**ubduction zone.** Overtime hot magma rises through the overlying **mantle and lithosphere** (crust). Eventually,, magma eventually erupts at the surface producing a **composite** volcano. When the plates move against each other, **pressure increases**, when the pressure is released an earthquake forms.

Credit the idea that magma becomes increasingly viscous or sticky as it rises to the surface, producing composite volcanoes which are steep sided and have violent eruptions.

Accept relevant explanations that link causes of volcanic activity.

O	No relevant information
1-2	Basic understanding of how volcanoes form. Simple sentences, may not be in order.
3-4	Clear understanding how volcanoes are formed clearly linked to a destructive plate boundary. Consistent use of **key terms** for max marks.

Q8. State one difference between shield and composite volcanoes. [1]

.....

Q9. What is the difference between lava and magma? [1]

.....

Q10. The chart below gives some information about four volcanic eruptions.

Volcano Name	Date of eruption	Number of deaths	V.E.I (Strength of eruption) max 8
Karakatoa	1883	37,000	6
Mount St Helens	1980	57	5
Nevado Del Ruiz	1985	25,000	3
Pinatubo	1991	847	6

Stronger eruptions do not always cause more deaths and there have been eruption with no deaths. Suggest some of the reasons for higher and lower numbers of deaths as a result of volcanic eruptions. [4]

O	No relevant information
1-2	Basic understanding of how wealth and / or type of eruption effects death toll from volcanic eruptions.
3-4	Clear understanding of how wealth and / or type of eruption effects death toll from volcanic eruptions.

Q11.

The photograph above shows the damage caused by an earthquake in Indonesia a Low Income Country.

Which 2 of the following statements explain why people continue to live in places affected by earthquakes and volcanic eruptions. [2]

- ☐ To stay close to family and friends
- ☐ People like to take risks
- ☐ LICs have earthquake proof buildings
- ☐ Soil around volcanoes is fertile and excellent for farming
- ☐ Earthquakes don't cause a lot of damage

. Shield = flat, found at constructive margins, gentle, frequent eruptions, runny lava.

Composite = cone shaped, destructive margins, explosive eruptions, infrequent, sticky lava.

9. Magma is stored inside a volcano, named lava when it erupts.

10. Indicative Content

Wealth: HICs better prepared, evacuation plan and routes, faster response. LICs spread of disease, damaged infrastructure, slow response.

Type of eruption i.e. Destructive plate boundary, violent composite volcanic eruptions. Constructive, gentle, shield volcanoes.

MAY REFER TO CASE STUDY KNOWLEDGE FROM LIC / HIC

11.

To stay close to family and friends

Soil around volcanoes is fertile and excellent for farming

Q12. The Number of Earthquakes Worldwide 2011 – 2021.

Magnitude	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
6.0 – 6.9	187	117	123	143	124	127	104	118	135	112	141

Using the data above calculate the mean number of 6.0 – 6.9 earthquakes between 2011 and 2021. [2]

Show your working out.

Q12. MEAN

ADD

187	117	123	143	124	127	104	118	135	112	141

=1431/11=130.1

MUST SHOW WORKING AND ANSWER FOR 2 MARKS

Q13. Earthquakes in 2021 ranked by death toll.

Rank	*Death toll*	Magnitude	Location
1	*2,248*	7.2	Haiti, Nippes
2	*105*	6.2	Indonesia, West Sulawesi
3	*27*	5.9	Pakistan, Balochistan
4	*20*	7.3	China, Qinghai
5	*13*	7.0	Mexico, Guerrero
6	*12*	7.5	Peru, Loreto
7	*10*	6.0	Indonesia, East Java offshore

Using the table above calculate the median death toll of the 7 largest earthquakes of 2021. [2]

Show your working out.

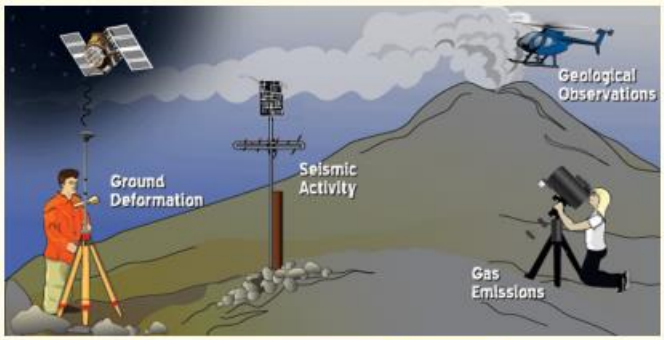
Q13. MEDIAN

Rank data (already done)

Cross off values, until middle value is reached, as above. ANSWER 20.

MUST SHOW WORKING AND ANSWER FOR 2 MARKS

Q14. The images below show examples of how tectonic activity can be managed.



Discuss how the damaging effects of volcanoes and earthquakes may be reduced through prediction, planning and protection. [6]

Reference to the photographs is not required to reach full marks.

O	No relevant information
1-2	Basic understanding how earthquakes or volcanoes can be managed. Simple sentences. SPaG errors common
3-4	Clear understand of how earthquakes or volcanoes can be managed**. Explanation ok for level 2 without discussion / evaluation.** May cover all the 3P's briefly or some in more detail. May start to link the management to how it reduces the effects. **May use case study examples to prove their point – not a requirement.** Limited development Some SPaG errors
5-6	Detailed understanding of how earthquakes or volcanoes can be managed. Needs to cover all the 3P's but some may be more detailed than others, clearly linked to how they reduce the effects of the hazard. **May use case study examples to prove their point – not a requirement.** An element of discussion. Limited SPaG errors

The 3 Ps:

Planning:

Fasten furniture down, to prevent them toppling over

Turn off gas and water supplies to prevent fire hazard or flood risk

Have an evacuation pack ready – clean water, tinned food, first aid kit, blankets etc. in case you need to evacuate your home.

Practice Earthquake Drills e.g. Japan 1st Sept – practice what to do in the event of an earthquake so that people are prepared.

Prediction:

Seismographs to monitor foreshocks in order to evacuate people if necessary from volcanoes.

Observe unusual animal behaviour, may a sign of an imminent eruption. Evacuate people.

Cannot predict an earthquake so challenge this if a student writes this.

Protection:

EQ proof buildings:

Shutters over windows to prevent glass shattering and hitting passers by.

Reinforced lattice foundation and rubber shock absorbers to make building more flexible and prevent collapse.

Rolling weight on roof to counteract shock waves and stabilise building.

NOT AN EXTENSIVE LIST, ACCEPT ANY SUITABLE SUGGESTIONS

Q15. Assess the impacts and responses of tectonic hazards for a HIC and a LIC you have studied. [6]

O	No relevant information
1-2	**Basic** understanding of impacts and responses to tectonic hazards**.** **No reference to examples. Likely to explain rather than assess +/-** Simple sentences. SPaG errors common
3-4	**Clear** explanation of impacts and responses to tectonic hazards. **May make reference to examples studied with evidence e.g. New Zealand / Nepal. (Not a requirement)** Limited development Some SPaG errors
5-6	**Detailed assessment** +/- of impacts and responses to tectonic hazards**.** **Reference to examples studied with evidence e.g. New Zealand / Nepal.** Simple conclusion Limited SPaG errors

Can use any case study to compare but needs to be the same type of tectonic hazards.

Indicative Content IMPACTS

New Zealand 2016 7.8 magnitude	
Primary	**Secondary**
• 2 people died • 50 people were injured • 100,000 landslides occurred • A tsunami was triggered which flooded the land leaving debris up to 250m inland. • Homes and buildings were destroyed • landslides blocked major road and rail routes.	• 60 people needed emergency housing. • 10 farms were evacuated after a landslide caused the Clarence River to flood. • Total cost of the damage was $8.5 billion.

Nepal 2015 7.9 magnitude	
Primary	**Secondary**
• 9000 people died and 22,000 people were injured . • Temples and key buildings in the UNESCO World Heritage Area were damaged and destroyed. • Landslides were triggered	• 4 million people were left homeless • Many mountain roads were blocked by landslides, this prevented emergency aid to remote areas • An outbreak of typhus due to a lack of clean water killed 13 people. • Total cost of the damage was $5 billion

Indicative Content RESPONSES

New Zealand	Nepal
Planning: Residents knew how to get to higher ground – they were educated, New Zealand is a HIC so can do this. Tsunami warning – technology was used before the hazard. New Zealand has the money to invest and people knew how to respond to a tsunami (link to HDI) As an earthquake New Zealand was not 100% prepared as don't know exactly when they will strike. Pre-trained emergency services to get power restored. They had emergency food, water, shelter already prepared before the hazard so could respond quickly to save lives. **Protection:** Earthquake proof buildings this led to less buildings collapsing therefore causing less death / injuries. Buildings also stood during the aftershocks. By March 2017, a permanent water main had been laid in Kaikoura. the new pipe was designed to move with any future earthquakes, so it won't break. **Extra:**	**Planning:** None – Nepal is a LIC and relied on international help e.g. ½ million tents provided, $1 billion in aid. As an earthquake Nepal was not 100% prepared as don't know exactly when they will strike. Earthquake struck 60 km northwest of the capital where population density is high, so more people were affected. People were stranded in remote areas e.g Mount Everest which spread rescue efforts thinly. 4 million homeless, Nepal didn't have any rescue resources to help. Typhoid spread as no clean water was available. **Protection:** 130,000 homes destroyed; they were not earthquake proof.

Hazard cost more money than Nepal, $3.5 billion. 10,000 landslides slowed down rescue efforts	**Extra:** Rescue efforts were slowed due to 1000's of landslides this made roads impassable and broke communications. Earthquake focus was only 8km deep, so a lot of the earthquake energy was felt on the surface which caused more damage.