

Twelve Words for Restless Ground: Sorting, Linking and Using Hazard Terms

Learning target: I can explain how the chapter's hazard terms relate to one another and use them accurately to describe earthquakes, eruptions, forecasts and ways to reduce harm.

Vocabulary in action

About 30 min

Individual

MS-ESS3-2 · supports

independent practice

writing

Name _____

Date _____

Period _____

Directions

Read the twelve terms in the word bank. You do not need to memorize the definitions; you need to understand how the words connect. Work through the parts in order. When a question asks *why*, a full sentence is expected. You may look back at the word bank at any time.

You will need: This worksheet, Pencil

natural hazard

A natural event, such as an earthquake, eruption, landslide or flood, that can hurt people or damage what they have built. It becomes a disaster only where people or property are in its path.

magma

Melted or partly melted rock, with dissolved gases and crystals, below Earth's surface. Magma that reaches the surface is called lava.

hot spot

A place where an unusually hot plume of mostly solid rock rises from deep in the mantle and partly melts, feeding volcanoes that can be far from any plate boundary.

pyroclastic flow

A ground-hugging avalanche of hot gas, ash and rock that races down a volcano during an explosive eruption, often faster than 80 km per hour.

precursor event

A smaller, measurable change that often comes before a larger event, such as small earthquakes, extra gas or swelling ground before an eruption.

forecast

A scientific estimate of how likely an event is in an area over a span of time. A prediction would name the exact time, place and size.

frequency

How often an event happens in a set amount of time.

magnitude

A number for the size of an earthquake at its source. Each step of 1 means about 10 times more ground motion on a seismogram and about 32 times more energy.

focus

The place underground where rock first slips and an earthquake begins.

epicenter

The point on Earth's surface directly above an earthquake's focus.

seismic wave

A wave of vibration that carries an earthquake's energy through rock. Body waves travel through Earth's interior; slower surface waves travel along the ground.

mitigate

To lessen the harm a hazard causes, for example with stronger buildings, monitoring, land-use rules or evacuation plans. It does not stop the hazard itself.

Part A: Sort the terms

1. Write each of the twelve terms in the row where it fits best. Use every term once. Below the table, choose one term that could fit in two rows and explain why. 4 pts

Terms that belong here
What happens inside Earth (causes and starting points)
What scientists measure or estimate
What reaches people, or what people do about it

Part B: Which term fits?

2. Scientists gave the region a 72 percent chance of a large earthquake in the next 30 years. That statement is a _____, not a prediction. 1 pt

3. The rock first slipped 18 km below the surface, at the _____. The town on the surface directly above that point was at the _____. 2 pts

4. A volcano's side swelled by several centimeters in a month and its gas output doubled. Scientists treated these changes as _____ suggesting that magma was rising. 1 pt

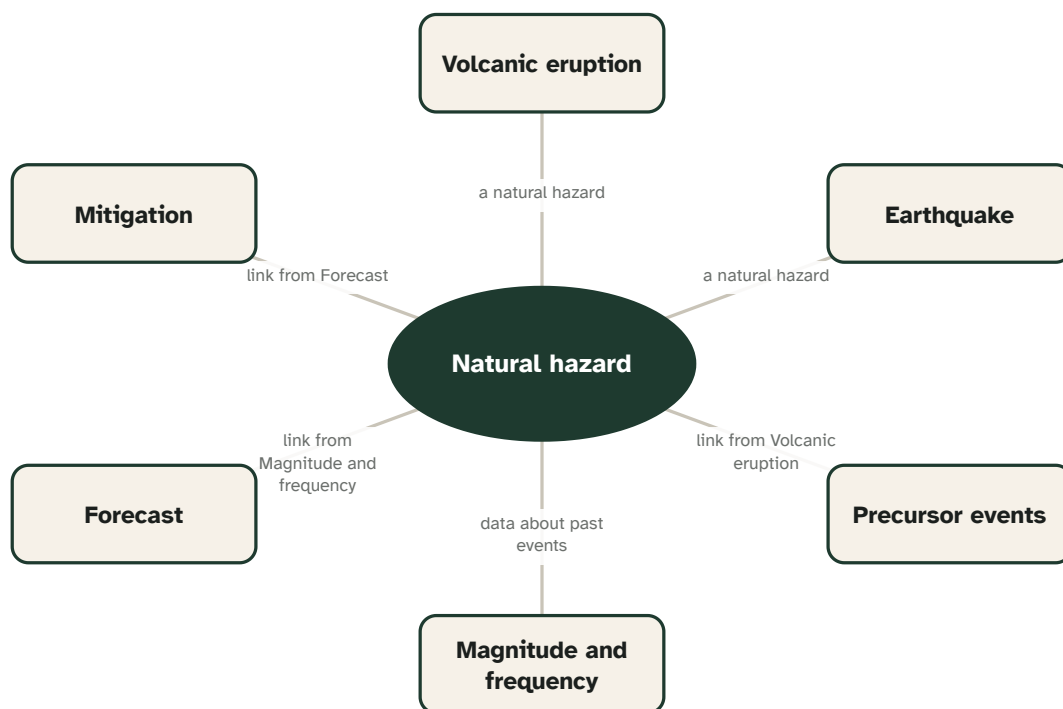
5. Near the gorge, magnitude 5 quakes happen about twice a decade, but magnitude 7 quakes come only every few centuries. 'Twice a decade' describes the quakes' _____; the 5 and the 7 are their _____.

6. The Hawaiian volcanoes erupt in the middle of the Pacific Plate because they sit above a _____. 1 pt

7. Requiring public schools to be built to stronger earthquake standards is one way California tries to _____ earthquake harm. 1 pt

Part C: Link the ideas

How hazard ideas connect



A concept map with the links left blank. Each arrow needs a short verb phrase so that 'box, phrase, box' reads as a true sentence.

8. Write a linking phrase for each pair. Example: 'Seismic waves → **carry energy away from** → the focus.' Careful: one of the pairs needs a phrase with *not* in it. 5 pts

Linking phrase that makes a true sentence
Volcanic eruption → precursor events
Earthquake → precursor events
Magnitude and frequency → forecast
Forecast → mitigation
Volcanic eruption → pyroclastic flow

Part D: Odd one out

9. In each set, pick the term that does not belong with the other three and explain the connection the other three share. 3 pts

Odd one out	Why it does not belong
Set 1: focus, epicenter, seismic wave, pyroclastic flow	
Set 2: magma, hot spot, pyroclastic flow, frequency	
Set 3: forecast, precursor event, magnitude, mitigate	

Part E: Use the words

10. A news report says: 'The epicenter was in the Santa Cruz Mountains, but some of the worst damage happened about 100 km away.' Explain why this is not a contradiction. Use *epicenter*, *focus* and *seismic wave* correctly. 3 pts

11. Port Alba is a fictional coastal town 20 km from an active volcano and 5 km from an active fault. 5 pts
- Write a paragraph for the town's website explaining what scientists can and cannot tell residents about each hazard and what the town is doing about them. Use at least **six** word-bank terms correctly and underline each one.

Three questions to ask about any term

For each term ask: Is it a thing (magma, hot spot), a place (focus, epicenter), a measurement (magnitude, frequency), a kind of statement (forecast) or an action (mitigate)? Does it belong to volcanoes, earthquakes or both? Does it happen before, during or after the event? Sorting by these questions helps with Parts A and D.

One more word: intensity

Seismologists use *intensity* for how strongly the ground shook and how much damage happened at one particular place, rated in Roman numerals on the Modified Mercalli scale. One earthquake has one magnitude but many intensities. Explain, with an example from the Loma Prieta earthquake, why a single magnitude cannot tell you how much damage a particular town suffered, and add *intensity* to your concept map with two arrows.