# Signals Beneath Us

Use seismic and volcanic data to assess risk

**ESS.6.d** "Analyze data to interpret seismic activity and assess the risk of volcanic eruptions and earthquakes in Alabama and other areas in the United States."

NAME _____ DATE _____

## 1 READ AND MARK

Read it twice

**YOUR JOB** Underline two details that help you assess earthquake risk. Circle two details that help you assess eruption risk, then number one warning that the data cannot predict exactly what will happen.

### What Can a Month of Monitoring Tell Us?

(1) In this fictional 30-day monitoring snapshot, scientists compare four U.S. sites. The numbers are invented for practice, not current forecasts. A seismometer records shaking from earthquakes. The largest magnitude shows the strongest event recorded during the period. Alabama lies far from an active plate boundary, but old faults can still slip and cause earthquakes.

(2) Earthquakes are common near plate boundaries, where moving rock stores and releases energy. A count alone does not show how strong future shaking will be. Magnitude, depth, distance from buildings, and local ground conditions also matter. The sites in the table cover different settings, so treat their numbers as clues, not guarantees.

**FICTIONAL 30-DAY MONITORING SNAPSHOT**

| Site | Recorded quakes | Largest magnitude | Volcanic observations |
|---|---|---|---|
| Central Alabama | 2 | 2.1 | No active volcano nearby |
| San Andreas area, California | 48 | 4.1 | No volcano at this site |
| Aleutian volcano, Alaska | 70 | 4.8 | Rising gas, ground swelling |
| Kīlauea area, Hawaii | 25 | 3.6 | Steady gas, no ground swelling |

(3) Volcano monitoring adds another kind of evidence. Quakes near a volcano may reflect moving magma, but quakes alone do not prove an eruption is coming. Scientists also track gas output and ground swelling. A change in several signals can raise concern, while quiet signals cannot promise safety. The table reports observations, not eruption predictions.

## 2 ANSWER WITH EVIDENCE

Use the passage

1. How does the recorded earthquake activity in the San Andreas area compare with central Alabama? Give two numbers, then name one reason those numbers cannot predict future damage.

2. Which volcanic site shows stronger evidence of increased eruption concern? Support your choice with its quake count and one other observation.

3. Central Alabama recorded only two quakes. Why does this not mean its earthquake risk is zero? Use evidence from the passage and table.

4. A resident says the 25 quakes near Kīlauea prove an eruption is imminent. Assess this claim using the table and passage.

## 3 YOUR TURN

Your own words

A town near an active U.S. volcano reports 12 quakes in 30 days, a largest magnitude of 2.7, rising gas, and no ground swelling. Write three sentences advising whether closer monitoring is warranted, comparing its signals with one volcanic site in the table, and explaining what the data cannot predict.

ANSWER KEY

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HIGH SCHOOL · ESS.6.d

## PART 1 · READ AND MARK

Underline two details that help you assess earthquake risk. Circle two details that help you assess eruption risk, then number one warning that the data cannot predict exactly what will happen. Accept any marking that follows this job and points at the right text.

## PART 2 · ANSWERS

| # | QUESTION | ANSWER |
|---|---|---|
| 1 | How does the recorded earthquake activity in the San Andreas area compare with central Alabama? Give two numbers, then name one reason those numbers cannot predict future damage. | **The San Andreas area recorded 48 quakes and a largest magnitude of 4.1, compared with 2 quakes and 2.1 in central Alabama. Depth, distance from buildings, or ground conditions also affects damage.** |
| 2 | Which volcanic site shows stronger evidence of increased eruption concern? Support your choice with its quake count and one other observation. | **The Aleutian volcano site shows stronger concern. It recorded 70 quakes, along with rising gas or ground swelling.** |
| 3 | Central Alabama recorded only two quakes. Why does this not mean its earthquake risk is zero? Use evidence from the passage and table. | **The table records two quakes, not zero, and the passage explains that old faults in Alabama can still slip.** |
| 4 | A resident says the 25 quakes near Kīlauea prove an eruption is imminent. Assess this claim using the table and passage. | **The claim is not supported. Quakes alone do not prove an eruption is coming, and the table reports steady gas and no ground swelling near Kīlauea.** |

## PART 3 · YOUR TURN (SAMPLE ANSWER)

Closer monitoring is warranted because gas is rising, even though no ground swelling was reported. Unlike the Aleutian volcano site, which shows both rising gas and ground swelling, this town has no reported swelling and fewer recorded quakes. These signals cannot predict whether or when an eruption will happen.

Accept comparisons that use the table accurately and distinguish signs of concern from a prediction. Earthquake counts alone do not establish future damage or an eruption date.