Warnings and Walls

Compare hazard warnings and ways to protect a community

E.8.9B "Students will demonstrate an understanding of natural hazards (volcanic eruptions, severe weather, earthquakes) and construct explanations for why some hazards are predictable and others are not..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline what each monitoring tool measures, circle statements about what warnings cannot tell people, and write 1 and 2 beside two different ways the town reduces harm. Use your marks to compare prediction with protection.

Planning for Danger in Harbor Bend

1. Harbor Bend sits beside the ocean, near a fault and an active volcano. Each September, emergency workers watch storms forming over warm water. Satellites show cloud patterns, and radar tracks rain and wind as a storm moves toward shore. Forecast models use these measurements to estimate a storm's path days ahead. The path can shift, so officials update warnings as new data arrive. Even an uncertain forecast gives residents time to leave low coastal streets before dangerous water rises.

2. Earthquakes behave differently. Stress can build along the fault for years, but scientists cannot reliably name the day or place a fault will break. Ground sensors detect shaking only after a quake begins. An early warning system may send an alert before strong shaking reaches Harbor Bend, leaving seconds to take cover, not days to evacuate. At the volcano, sensors measure small quakes, ground swelling, and gases. These changes can suggest moving magma, yet they do not guarantee when, or even whether, an eruption will occur.

3. Harbor Bend's council uses hazard maps to keep new homes off low coastal blocks that have flooded before. For older buildings on the fault, engineers add braces to help walls resist shaking. They test model walls on a shaking platform, compare damage, and change the brace design before installing it. These choices serve different needs: storm forecasts support early evacuation, while stronger buildings protect people when an earthquake starts without advance notice. A volcano alert may also support evacuation, but officials must weigh uncertain signals against the cost of leaving home.

2 ANSWER WITH EVIDENCE

Use the passage

1. Why can Harbor Bend plan an evacuation days before a storm but not days before an earthquake? Use evidence about both hazards.

2. Volcano sensors detect small quakes, swelling, and gases. Why do those measurements not prove an eruption is about to happen?

3. How is an earthquake early warning different from a prediction made before an earthquake begins? What can a person do with that warning?

4. Why does the council keep new homes off low coastal blocks but add braces to older buildings on the fault? Match each choice to the harm it reduces.

3 YOUR TURN

Your own words

A new Harbor Bend school needs its water supply or power to work after a storm or earthquake. Choose one hazard and design a protection not named in the passage. Explain how it works, how you would test and improve it, and one limit of a warning for that hazard.

ANSWER KEY

Warnings and Walls

GRADE 8 · E.8.9B

PART 1 · READ AND MARK

Underline what each monitoring tool measures, circle statements about what warnings cannot tell people, and write 1 and 2 beside two different ways the town reduces harm. Use your marks to compare prediction with protection. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why can Harbor Bend plan an evacuation days before a storm but not days before an earthquake? Use evidence about both hazards.	**Satellite and radar measurements help models estimate a storm's path days ahead, though it can shift. Scientists cannot reliably say when or where a fault will break.**
2	Volcano sensors detect small quakes, swelling, and gases. Why do those measurements not prove an eruption is about to happen?	**The changes can suggest moving magma, but they cannot show exactly when an eruption will occur or whether one will occur at all.**
3	How is an earthquake early warning different from a prediction made before an earthquake begins? What can a person do with that warning?	**Ground sensors detect a quake after it begins and may send an alert before strong shaking arrives. The person may have seconds to take cover.**
4	Why does the council keep new homes off low coastal blocks but add braces to older buildings on the fault? Match each choice to the harm it reduces.	**Keeping homes off low blocks avoids building where flooding has occurred. Braces help walls resist earthquake shaking in existing buildings.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

For earthquakes, I would install flexible joints in the school's water pipes so shaking is less likely to break them. I would shake a model pipe system, check for leaks, and strengthen any joint that fails. Ground sensors can send an alert after a quake begins, but they cannot tell us the day it will happen.

Accept other feasible protections for water or power if the response explains how the design reduces harm, describes a test and improvement, and states an accurate warning limit for the chosen hazard.