EARTH SCIENCE Lesson Plan

Quarter 3, Week 6, Day 1

Outcomes for Today

Standard Focus:

PREPARE

1. Background knowledge necessary for today's reading.

The severity of an earthquake can be expressed in terms of both magnitude and intensity. Magnitude refers to the amount of energy released at the earthquake's focus. The Richter magnitude scale was developed in 1935 by Charles Richter of the California Institute of Technology. It expresses magnitude in whole numbers and decimals.

The effect of an earthquake on Earth's surface is called its intensity. Currently the most used scale is the modified Mercalli intensity scale developed by two American seismologists in 1931. It relies on observed effects and is composed of 12 increasing levels of intensity.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

Magnitude Richter scale moment magnitude scale modified Mercalli scale

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch. 19.3, pp. 505-508

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RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- More than 90% of earthquakes are not felt and cause little, if any, damage.
- The Richter scale measures the magnitude or the amount of energy released by an earthquake.
- The modified Mercalli measures the intensity or type of damage that results.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: 1906 vs. 1989: A Comparison of Two Major Earthquakes

Procedure: Students use maps and data to compare the two earthquakes

Discussion: Discuss the Richter and Mercalli scales and the locations of the two quakes

Key question: What determines the intensity of an earthquake?

Source:
http://www.teachingboxes.org/earthquakes/lessons/lesson5_activity1.jsp

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world

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EARTH SCIENCE Lesson Plan

Quarter 3, Week 6, Day 2

Outcomes for Today

Standard Focus

PREPARE

1. Background knowledge necessary for today's reading.

Locating an earthquake refers to determining the focus or hypocenter. When an earthquake occurs, it generates expanding waves from its focus at a speed of several kilometers per second. As the waves expand they reach a network of seismometers and are recorded electronically. To determine the location, records are needed from at least three stations. Information from more stations give improved precision as to the time of origin, the latitude and longitude of the epicenter and the focal depth.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

seismic belts

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall**.**

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch. 19.3, pp. 508-510

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RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Catastrophic earthquakes with high intensity values almost always have a shallow focus.
- The majority of the world's earthquakes occur in narrow seismic belts.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Where Did the Quake Hit?

Procedure: Students use data to locate the origin of an earthquake

Discussion: Discuss P- and S-waves and their speeds

Key question: Can you locate the epicenter?

Source:
http://cse.ssl.berkeley.edu/lessons/indiv/davis/inprogress/Where.html

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world

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EARTH SCIENCE Lesson Plan

Quarter 3, Week 6, Day 3

Outcomes for Today

Standard Focus

PREPARE

1. Background knowledge necessary for today's reading.

While earthquakes themselves pose little danger to an individual, most of the hazards to people result from their effects on man-made structures and the land beneath us. The main earthquake hazard is the effect of ground shaking. Building s and other structures can be damaged by the shaking or by the ground beneath them settling to a different level. In many parts of the world the building materials used contribute to the amount of damage since there may not be building standards in regards to earthquakes. Buildings can sink into the ground as a result of liquefaction. The shaking ground can also cause landslides, mudslides, and avalanches on slopes. Flooding can result if dams or levees are ruptured. Fires can be started by ruptured gas lines, downed power lines, or tipped over wood or coal stoves.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

pancaking **soil liquefaction** **fault scarps**

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch. 19.4, pp. 511-513

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RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Prolong surface waves are responsible for most earthquake damage.
- Construction materials and structural reinforcements affect the amount of damage from surface waves.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Liquefaction

Procedure: Students observe a demonstration of liquefaction

Discussion: Discuss the structural damage that can result from earthquakes

Key question: Why some areas susceptible to liquefaction?

Source:
http://www.exploratorium.edu/faultline/activezone/liquefaction.html

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world

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EARTH SCIENCE Lesson Plan

Quarter 3, Week 6, Day 4

Outcomes for Today

Standard Focus

PREPARE

1. Background knowledge necessary for today's reading.

The word tsumani is a Japanese word represented by to character "tsu" meaning "harbor" and "nami" meaning "wave". During an undersea earthquake the vertical movement of the seafloor changes the sea surface. The wave heights and the direction of the waves is determined by the vertical displacement of the water and geometry of the adjacent coastline. A system of seismometers and coastal tidal gauges have monitored earthquake activity and the passage of tidal waves since the late 1940s. However, because of the uniqueness of each earthquake, neither provides the data that allow accurate predictions of the impact of a tsunami at a particular coastal location.

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

tsunami

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch. 19.4, pp. 513

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RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Tsunamis are generated by undersea earthquakes.
- Tsunamis may have open ocean speeds of between 500-800 kilometers per hour.
- When the waves reach shallow water the form huge breakers.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Tsunami

Procedure: Students perform an experiment to discover how wave patterns are created in the ocean and a fjord

Discussion: Discuss the causes of tsunamis and what students know about them

Key question: Why do tsunamis occur more frequently in the Pacific Ocean that in the Atlantic or Indian Oceans?

Source:
http://school.discoveryeducation.com/lessonplans/programs/tsunami

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world

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EARTH SCIENCE Lesson Plan

Quarter 3, Week 6, Day 5

Outcomes for Today

Standard Focus

PREPARE

1. Background knowledge necessary for today's reading.

Living in earthquake country makes it imperative that individuals know what to do before, during and after an earthquake strikes. Before an earthquake is the time to insure that home and workplace are as safe as possible to reduce the danger of serious injury or worse. Have disaster supplies on hand and accessible, know where safe places are inside and outside, having an emergency communication plan for your family are all things that can be done in advise. After an earthquake, help anyone who needs first aid, lesson to the radio for emergency instructions, check for damages, and use the telephone only for emergencies.

Check http://www.fema.gov.hazards/earthquake for more detailed recommendations

2. Vocabulary Word Wall.

Introduce 3-5 important words from today's reading

seismic gaps

- Show, say, explain, expand, explode or buzz about the word briefly
- Show, say, define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

4. Read directions for investigation/activity.

5. Read text.

Ch. 19.3, pp. 513-515

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RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events/concepts to the billboard

Students might mention:

- Scientists measure accumulated strain in rocks to aid predictions.
- Seismic gaps refer to sections of active faults that have long periods of inactivity without significant earthquakes.
- The history of earthquakes in an area affect the probability of an earthquake.

7. Post information on the billboard. Add new information to ongoing projects on the wall.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Prediction or Prevention?

Procedure: Students work cooperatively in teams to solve issues regarding prediction and prevention of earthquakes

Discussion: Discuss earthquake preparedness in home, school and community situations

Key question: Was the group able to come to consensus and backup their position?

Source:
http://cse.ssl.berkeley.edu/lessons/indiv/davis/inprogress/Prediction.html

EXTEND

11. Prompt every student to write a short product tied to today's reading.

12. Close with a short summary.

Extend the reading to the students' lives or to the world