Earthquakes
Lesson Plan

Grade Level: 6-8	**Curriculum Focus:** Earthquakes	**Lesson Duration:** Two class periods

Student Objectives

- Discuss the experience of the Kobe earthquake.
- Research an historic or recent quake.
- Create a work of art or writing that expresses the experience of the earthquake.

Materials

- Discovery School video on *unitedstreaming*: *Our Changing Earth*
  Search for this video by using the video title (or a portion of it) as the keyword.

  Selected clips that support this lesson plan:

  - Plate Tectonics, Volcanoes, and Earthquakes

- Computer with Internet access
- Print resources about earthquakes
- Markers, glue, poster board, paint, and other art materials
- Color printer for printing Web research images (optional)

Procedures

1. The video uses images and scientific and personal accounts to illustrate the 1995 Kobe earthquake. Ask students to brainstorm words, images, and quotes that describe the destruction and express the experience of this quake. Examples might include flames, state of chaos, expressway fallen on its side, tracks twisted like spaghetti, buildings toppled over, people trapped in homes, terrifying, horrifying experience, "I thought I was going to die."
2. 2. Tell students that they will work in small groups to research an historic or recent earthquake. Through personal accounts, photographs, and newspaper reports, they will learn what it was like to live through that experience. Assign each group to research one of following earthquakes:
   - San Francisco, California (1906)
   - Loma Prieta, California (1989)

- Hebgen Lake, Montana (1959)
- Owens Valley, California (1872)
- New Madrid, Missouri (1811-1812)
- Lisbon, Portugal (1755)

3. Refer students to the Web sites below for their research. (Groups may choose to assign one Web site to each member.) As students proceed with their research, encourage them to write down the most vivid quotes from personal accounts or newspaper articles, and print out (or describe in writing) the most dramatic photographs or drawings. Give students at least one class period (and perhaps a homework assignment) to review these sites, and one class period to share their research with the rest of the group.

San Francisco, California (1906)

- http://www.sfmuseum.org/1906/06.html
- http://neic.usgs.gov/neis/eqlists/USA/1906_04_18.html
- http://www.exploratorium.edu/faultline/1906/1906_2.html
- http://www.crustal.ucsb.edu/ics/understanding/accounts/london.html
- http://www.notfrisco.com/calmem/earthquake/1906.html

Loma Prieta, California (1989)

- http://www.exploratorium.edu/faultline/loma_prieta/index.html
- http://geology.about.com/library/weekly/aa101799.htm
- http://www.sfgate.com/cgi bin/article.cgi?file=/ chronicle/archive/1999/10/12/MN41QUA.DTL
- http://www.notfrisco.com/calmem/earthquake/lomaprieta.html

Hebgen Lake, Montana (1959)

- http://www.seis.utah.edu/NEHRP_HTM/1959hebg/1959he1.htm
- http://neic.usgs.gov/neis/eqlists/USA/1959_08_18.html

Owens Valley, California (1872)

- http://www.crustal.ucsb.edu/ics/understanding/accounts/muir.html

New Madrid, Missouri (1811-1812)

- http://hsv.com/genlintr/newmadrd/index.htm
- http://www.eas.slu.edu/Earthquake_Center/SEISMICITY/Nuttli.1973/nuttli-73-app.html
- http://www.neic.cr.usgs.gov/neis/eqlists/USA/1811-1812.html

Lisbon, Portugal (1755)

- http://geology.about.com/library/bl/bllisbon1755eq.htm
- http://www.fordham.edu/halsall/mod/1755lisbonquake.htm

4. After students have shared their research with group members, ask them to recall the most memorable story, image, quote, or fact they found related to that quake. What do they think it was like to live through the earthquake or experience the destruction it caused? As a final

assignment, ask each student to create a work of art or writing that expresses the experience of the earthquake they studied. Students might write a poem or a fictional first-person journal, paint a picture, or create a collage. They may want to focus on that single striking story, image, or quote. Encourage students to title their work and include the earthquake's location and date.

5. Display students' work in a classroom earthquake exhibit.

Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- **3 points:** Students actively engaged in class discussions; shared with their group several relevant, striking images or quotes from their research; created a thoughtful, creative work of art or writing clearly based on their group's findings.
- **2 points:** Students participated in class discussions; shared with their group one or more relevant, striking images or quotes from their research; created a satisfactory work of art or writing loosely based on their group's findings.
- **1 point:** Students participated minimally or not at all in class discussions; did not share any images or quotes from their research with their group; created a simplistic work of art or writing with no relevance to their group's finding.

Vocabulary

aftershock

Definition: A minor earthquake following a larger one that occurs at or near the same place

Context: Many aftershocks may be felt after a major earthquake.

earthquake

Definition: A shaking or trembling of Earth that is volcanic or tectonic in nature

Context: The 1995 Kobe earthquake was Japan's most deadly since 1923, when an earthquake in Tokyo killed 140,000 people.

epicenter

Definition: The part of Earth's surface directly above the focus of an earthquake

Context: The epicenter of the 1995 Kobe earthquake was in a narrow strait between the city of Kobe and Awaji Island.

Richter scale

Definition: A scale for measuring the magnitude of an earthquake; for example, 1.5 indicates the smallest disturbance that can be felt, 4.5 indicates a disturbance that can cause slight damage, and 8.5 indicates a very devastating disturbance

Context: The 1995 Kobe earthquake measured 6.9 on the Richter scale.

Academic Standards

National Academy of Sciences

The National Science Education Standards provide guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K-12. To view the standards, visit http://books.nap.edu.

This lesson plan addresses the following science standards:

- Earth and Space Science: Structure of the Earth system
- Science in Personal and Social Perspectives: Natural hazards

Mid-continent Research for Education and Learning (McREL)

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit http://www.mcrel.org/.

SThis lesson plan addresses the following national standards:

- Science—Earth and Space Sciences: Understands Earth's composition and structure
- Language Arts—Viewing: Uses viewing skills and strategies to understand and interpret visual media; Writing: Uses the general skills and strategies of the writing process, Gathers and uses information for research purposes, Uses the stylistic and rhetorical aspects of writing

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Support Materials

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- http://school.discovery.com/teachingtools/teachingtools.html