U N I T S I X

Now You Know It, Can You Show It?

The concluding unit of this curriculum offers a variety of summing-up and assessment activities. Students will feel pride in their accomplishments after a pair of high-pressure simulations, a fast-paced quiz game, and finally, a reprise of the writing activity in Unit 1. The appendix to this unit provides materials from an intensive, communitywide simulation developed by Vermont teacher Sean Cox and adapted with his permission. You can use these materials to enrich your students' experience of Lesson 6.2.

Students who have developed relationships with people responsible for emergency preparedness will particularly enjoy the opportunity to role-play in the first two lessons. In the first they will enact a meeting of a crisis team charged with developing a comprehensive local earthquake preparedness plan. In the second, Earthquake Simulation, they will put that plan into practice.

How much your students and your community benefit from Lesson 2, in particular, depends on how much you and they have invested in the curriculum up to this point. With the full involvement of community disaster officials and at a locale outside the school, this activity can be incredibly realistic and dramatic, as the experience of Sean Cox and his community makes clear.

After the excitement of Lesson 2, students will welcome the purely intellectual stimulation of Lesson 3, Test Your E.Q. I.Q. The questions are designed to test attitudes as well as information, and to reinforce knowledge by repetition.

Both you and your students will be pleased to see how much information they can add to their Unit 1 compositions in the final postassessment activity. This process reinforces essential writing and thinking skills.

Now that students have completed this series of lessons, encourage them to continue to read and write about earthquakes and disaster preparedness. Some of the topics that have been introduced in these units may lead to science projects, college majors in related topics, and future careers. The information students have gained may even save their lives.

Preparing for the Worst: A Simulation

RATIONALE

When natural disasters occur, many communities are totally unprepared because they lack a comprehensive emergency management program. Coordinated planning is essential if the stricken community is to return to a normal state of affairs.

FOCUS QUESTIONS

What kind of plans need to be in place to serve a community in the event of a natural disaster?

OBJECTIVES

Students will:

1. Recognize the importance of advance planning for a community's emergency response.
2. Simulate the development of a community emergency plan for preparing for, responding to, and recovering from a natural disaster.

MATERIALS

- Transparency made from Master 6.1a, Edenton Map and Profile
- Transparency made from back of Master 6.1a, Edenton Map and Profile
- Overhead projector
- Student copies of Master 6.1a, Edenton Map and Profile (2 sides)
- Master 1.3a, Preparedness People (from Unit 1)
- Master 6.lb, Planning Roles (*optional*, for reference only)
- Self-adhesive name tags, one for each student
- Transparency made from Master 6.1c, Phases of an Effective Management Plan
- Transparency markers in four colors

PROCEDURE

A. Introduction

Begin by asking students what they would do if an earthquake struck the area where their school is located. Help them to recognize that the most important immediate response is not to panic and to seek cover as quickly as possible. The most available cover in the classroom is the protection offered by the desks and tables the students are using, so "drop, cover, and hold" is the first response. If you have not done so recently, conduct a drop-and-cover drill now, using the instructions in Unit 5, Lesson 2.

Now expand the discussion to determine what students think would happen in their community if the earthquake was powerful enough to cause both loss of life and major property damage.

- How would the community respond?
- Who would be in charge of managing the rescue operation?
- Who would be in charge of long-term recovery?
- What plans are already in place to assure that the emergency would be responsibly managed?

B. Lesson Development

1. Explain the purpose of the simulation and tell students that they will be playing the roles of community leaders charged with developing an outline for emergency management in the event of a disaster resulting from a natural or human-made hazard. They are meeting to develop a system to manage the effects of an emergency, preserve life and minimize damage, provide necessary assistance, and establish a recovery system in order to return the city to its normal state of affairs as quickly as possible. Their plan must define clearly who does what, when, where, and in what order to deal with the community crisis.

Each student will adopt the role that she or he began learning about in Lesson 3 of Unit 1. For this activity, however, they are citizens of Edenton, a mid-size city located in an area of moderate risk for earthquake activity. In the late summer and fall, brush and forest fires also pose a threat to the community. Other disaster situations could develop from terrorism, civil disorder, a major transportation accident like a bus or train wreck, or an accident involving the release of hazardous materials. When the emergency exceeds the local government's capability to respond, city officials may also call on state and federal governments for assistance.

2. Project the back of Master 6.1a, Edenton Map and Profile, and go over the information with the class. Then project the map. Distribute copies of both sides for students' reference.

3. Direct students' attention to the map of Edenton on Master 6.la. On the basis of the information provided, and other knowledge of the community they have gained from the profile, ask students to identify

TEACHING CLUES AND CUES

In most parts of the country, there has not been any significant effort to coordinate community resources to respond to a major civic emergency like an earthquake. This planning scenario is intended to address an emergency resulting from an earthquake, but the process will yield procedures for dealing with other kinds of disasters as well.

all of the following. (The student who is playing the role of city manager will mark the transparency as indicated, using a different color for each type of information.)

a. at least one area where you could expect landslides, liquefaction failures, and/or fault ruptures. (These areas should be outlined and numbered.)

b. at least two groups of blocks where you could expect concentrated building damage. Include at least one commercial and one residential block group. (These areas should also be outlined and numbered, and may be referred to as Concentrated Damage Area 1,2,3, and so forth.)

c. major facilities, such as hospitals, schools, government buildings, and high rise buildings that might be rendered at least temporarily unusable by an earthquake or other natural disaster.

d. highway overpasses, roads, and other transportation facilities that might collapse or be left impassable by an earthquake.

4. As a review, and to focus students on the roles they have been learning about, ask each to prepare a brief job description. Have students exchange their job descriptions with each other and ask and answer questions until they are clear about the functions and responsibilities of each. Master 6.lb contains some sample job descriptions for your reference.

5. Once roles have been reviewed and job descriptions written, project Master 6.1c, Phases of an Effective Management Plan. Have the city manager convene the Edenton Emergency Management Planning Committee and call the meeting to order.

6. Students will work together to develop a plan. The city manager, referring to the Phases transparency, will remind the group that every plan must have three parts:

a. Before: preparations to be made before an emergency strikes, such as purchasing safety equipment, upgrading building codes, and educating the public.

b. During: strategies for emergency response during an earthquake or other crisis. Lines of communication will be particularly critical in this phase.

c. After: recovery plans for returning the community to conditions as normal as possible.

7. When the group has completed its emergency management plan, provide time for students to report the details of their plan. Help them to evaluate their plan by asking these questions:

- Is the plan realistic and timely?
- Is it comprehensive?
- Is it cost-effective?
- Do we have the resources to implement it? If not, how might we obtain additional resources?

TEACHING CLUES AND CUES

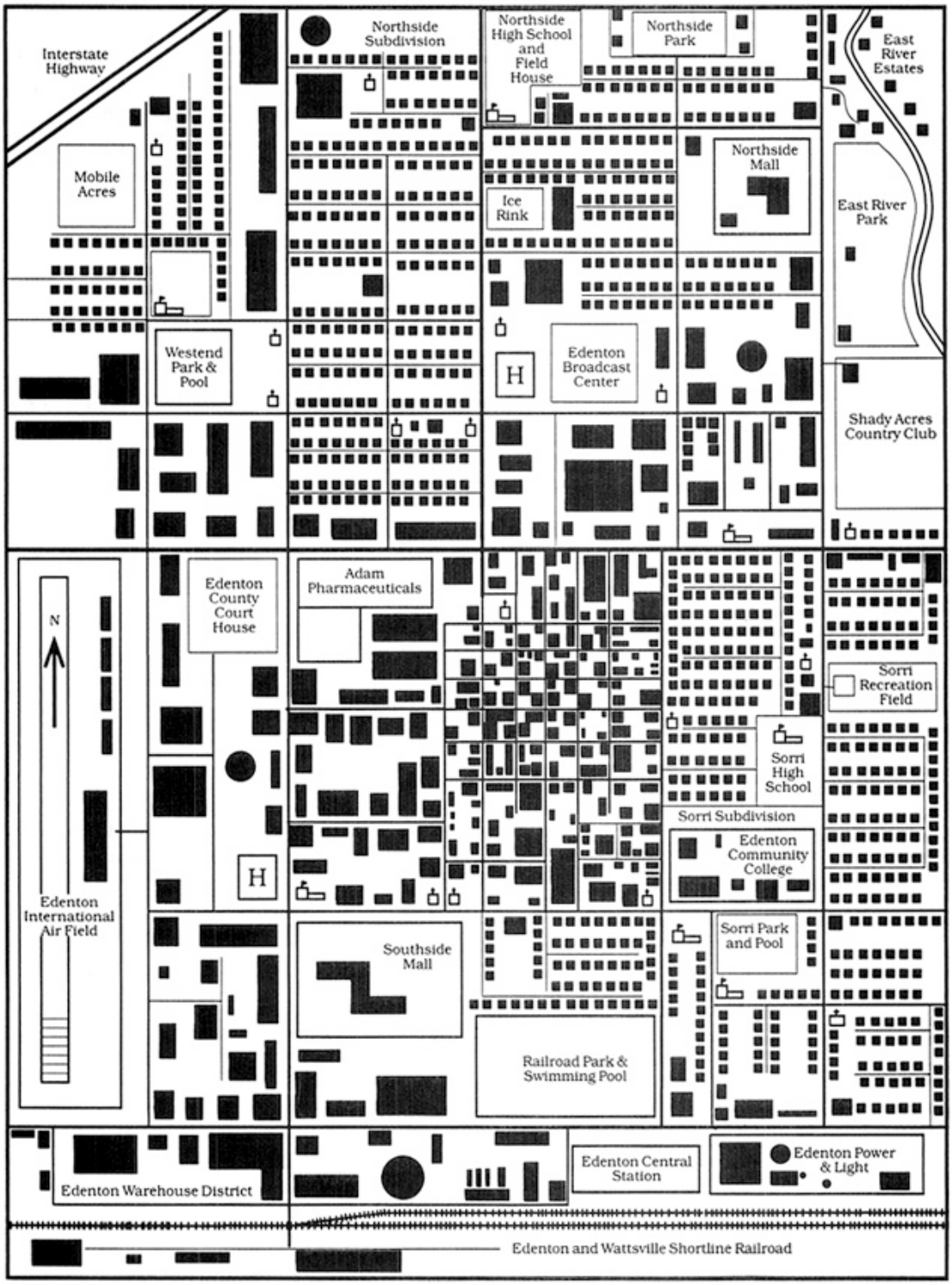
Be sure students understand that the lines they draw around these areas are only rough indications. In reality, each would be surrounded by a zone of influence, in which repercussions would also be felt.

Students may choose whether to work in committees for part of the planning period or to remain in one group.

C. Conclusion

Ask each student to augment her or his written job description with any particular responsibilities that will develop during a community crisis. Tell students that in the next activity they will have a chance to implement their plan. If questions arose in the planning process about how their city would function in an emergency, encourage students to contact their mentors before the next class meeting. ▲

Edenton Map


Interstate Highway
Northside Subdivision
Northside High School and Field House
Northside Park
East River Estates
Mobile Acres
Northside Mall
Ice Rink
East River Park
Westend Park & Pool
H
Edenton Broadcast Center
Shady Acres Country Club
N
Edenton County Court House
Adam Pharmaceuticals
Sorri Recreation Field
Sorri High School
Sorri Subdivision
Edenton Community College
H
Edenton International Air Field
Southside Mall
Sorri Park and Pool
Railroad Park & Swimming Pool
Edenton Central Station
Edenton Power & Light
Edenton Warehouse District
Edenton and Wattsville Shortline Railroad

Edenton Profile

Edenton, the county seat of Belle County, has a population of 150,000. The county itself has 300,000 citizens. As Belle County's only city, Edenton is the focal point of almost all services and activities. Its economy depends on a railroad repair facility operated by Amtrak and a large pharmaceutical manufacturing plant. These two operations are the city's largest employers. Because of its pleasant climate year round, its easy accessibility by interstate highways from all parts of the state, and a landscape that invites hunting, fishing, hiking, cycling, and camping, tourism in recent years has become an increasingly important part of the local economy.

Vital Statistics

Population—150,000

Schools

- 8 elementary schools
- 4 middle schools
- 2 high schools
- 1 community college

Communications

- 3 AM stations
- 1 FM station
- 1 television station
- 1 daily newspaper (The Lark)

Hospitals—2 (Mercy Hospital is a trauma center)

Police Department—150 officers/20 civilian employees

Fire Department—50 firefighters/10 civilian employees

Recreational System

- 8 city parks
- 3 swimming pools
- 4 fieldhouses
- 1 golf course

Houses of Worship—24

Airport—1 (within city limits; single runway; provides jet service)

Railroads—service by Amtrak

Highways—2 interstates converge five miles north of the city

Hotels—2 in center city, Motels—20, most in the areas served by the interstates

Libraries—Main library with 8 neighborhood branches (all single-story buildings)

Day Care Centers—10 licensed facilities

Nursing Homes—4

Retirement Communities—2

Mobile Home Parks—3

Shopping Malls—2

Power Plants—1 (oil/gas)

Water Supply—Aqueducts, pipelines, 2 pumping stations, 2 water treatment plants

Chief of Police
The police chief is responsible for protecting lives and property in the area he serves. Specific responsibilities include preserving the peace, preventing criminal acts, enforcing the law, and arresting violators. The chief is under oath to uphold the law 24 hours a day. He or she makes many of the final decisions dealing with budgets and services provided by the police force.

Fire Chief
This official is responsible for protecting lives and property from the hazards of fire. Responsibilities include fighting fires, rescuing trapped individuals, conducting safety inspections, and conducting fire drills and fire safety education. The fire chief also assists in other types of emergencies and disasters in community life. He or she makes many of the final decisions dealing with budgets and services provided by the fire department. The fire chief usually comes through the ranks, starting as a firefighter.

Director of Public Works
This official is responsible for the maintenance of systems built at public expense for the common good, such as highways and dams. In some communities these responsibilities may be dealt with separately by officials responsible for highway safety and community transportation services, water and sewage, and other areas; in some, they may be combined in one office.

Director of Public Health
This official, usually a physician, is responsible for controlling the spread of communicable disease in the community and for mitigating any threats to the public safety, such as the contamination of public water supplies. He or she also engages in proactive education and advocacy to encourage positive behaviors, such as proper nutrition, and discourage negative ones, such as smoking and the abuse of alcohol and other drugs.

Coordinator of Community Transportation Services
This official is responsible for the safety of public transportation and both public and private vehicles. He or she arranges for registration, licensing, and state inspections. The coordinator inspects public vehicles and coordinates operation and maintenance of equipment, storage facilities, and repair facilities. She or he directs the recording of expenses and controls, purchasing and repair spending. This official also helps plan and direct transportation safety activities.

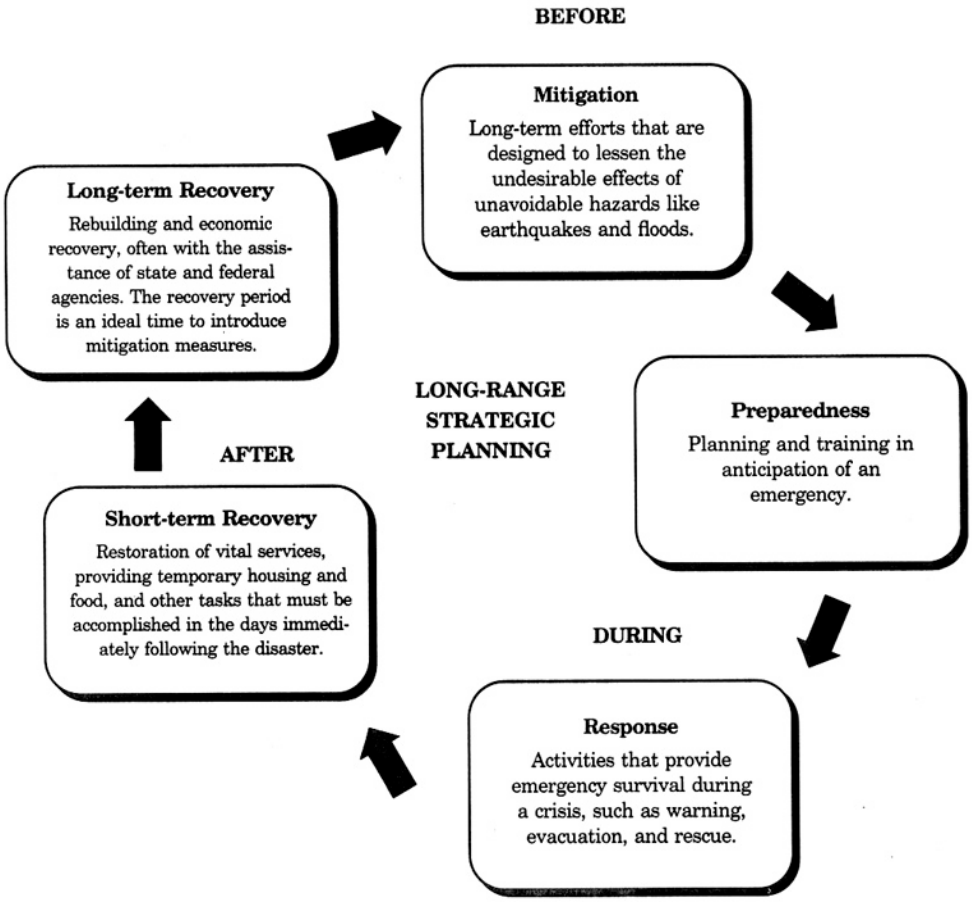
Public Information Officer
This official supervises a staff of public relations workers, directs publicity programs designed to inform the public, and directs information to appropriate groups. He or she clarifies the local government's points of view on important issues to community or public interest groups and responds to requests for information from news media, special interest groups, and the general public. In an emergency, this function assumes added importance.

Superintendent of Schools
This official is responsible for managing the affairs of an entire public school district. He or she oversees and coordinates the activities of all the schools in the district in accordance with standards set by the board of education. Responsibilities include selecting and hiring staff, negotiating contracts with union employees, and settling labor disputes. He or she creates and implements plans and policies for educational programs, and, when necessary, interprets the school system's programs and policies. The superintendent is also responsible for the development and administration of a budget, the maintenance of school buildings, and the purchase and distribution of school supplies and equipment, and oversees the school's transportation system and health services.

City Manager or Mayor
This professional in public administration has general responsibility for the overall operation of the city. All department heads answer to this official, who serves as the city's chief executive officer. A city manager is hired by the city council and serves at its discretion. A mayor is elected by the voters, but holds many of the same responsibilities.

Members of the City Council (as needed)
Each member determines the needs of the ward or district he or she represents by seeking out interviews, responding to constituents' phone calls and letters, and referring persons to specific agencies for services. The member speaks before neighborhood groups to establish communication and rapport between the members of the community and the service agencies available. The members of the council also have the responsibility to help resolve problems facing the community at large, in such areas as housing, urban renewal, education, welfare, unemployment, disaster response, and crime prevention.

Phases of an Effective Management Plan



6.2

EARTHQUAKE Simulation:

Putting Plans Into Action

RATIONALE

Most emergency preparedness plans are never put into effect. In this activity students will have a chance to test the plans they have made, while also testing their own locality's state of emergency preparedness. By the end of this session, students should have a good geographic sense of their community and some understanding of how the rest of the community will react to emergencies.

FOCUS QUESTIONS

How current, comprehensive, and effective are your community's emergency preparedness plans?

OBJECTIVES

Students will:

1. Understand how a community government works and how it responds to emergencies.
2. Evaluate their locality's earthquake emergency preparedness plans.
3. Suggest changes in the existing emergency preparedness plan to reflect what has been learned.
4. Develop a personal earthquake emergency response.

MATERIALS

- Master 6.2a, Disaster Script
- Classroom community map (from Unit 1)

PROCEDURE

Teacher Preparation

Secure the cooperation of at least some of the mentors who have been working with your students throughout this curriculum. If possible, arrange for a place outside of school, such as a city government building, where students can conduct this simulation. Work with the mentors to develop a disaster script, using Master 6.2a as a

beginning. Arrange to have at least one emergency preparedness official in attendance for this exercise and the debriefing that follows.

If your class has developed the community map they began in Unit 1, they will have a strong sense of their own community's physical and social arrangements. If not, you may want to work with the class to prepare a community profile similar to the Edenton Profile in Lesson 1 of this unit.

A. Introduction

Tell students that in this last unit of the Seismic Sleuths curriculum they will have a chance to draw on all that they have learned. Agree on a place to serve as the emergency command center. This may be a room at city hall, if you have made previous arrangements; your school auditorium, or a circle of chairs in the front of your own classroom. The community map will be the focal point of this area.

B. Lesson Development

1. Have the student who is playing the role of mayor or city manager convene a meeting of the preparedness council established in the last lesson. The purpose of this meeting is to discuss the budget of each department and clarify each administrator's role in an emergency. Focus on the lines of communication and each person's response to specific emergency situations (major fire, tornado, flood, earthquake, chemical plant disaster, etc.—focus on those most likely in your community). Whoever conducts the meeting will use the large community map to plot where each person's main area of interest lies and what geographic areas are essential to maintaining the continuity of essential services, such as water treatment, sewage treatment, and electrical power.

2. After 10 minutes or more, when the main points have been reviewed, but without warning, tell the students that an earthquake is occurring. Conduct a drop, cover, and hold drill, following the instructions in Unit 5, Lesson 2. Immediately after the drill, begin reading the script. Explain the time frame of the exercise. Students should then begin to take control of the situation and implement their emergency plans.

C. Conclusion

At the next class meeting, set aside some time for a debriefing and evaluation. Give students class time to write thank-you letters to their mentors and other members of the community who participated in this exercise and/or in earlier lessons. Mail the letters from school.

TEACHING CLUES AND CUES

This activity can be as elaborate as you choose to make it. You may want to set aside a half day, or even a full day.

The appendix that follows this unit is a report of an actual teacher-planned community earthquake preparedness drill. This is incorporated as a framework to use in constructing such an activity for your community.

ADAPTATIONS AND EXTENSIONS

1. Encourage students who have shown particular interest to maintain contact with their mentors, perhaps through volunteer work, a part-time job, or a request for career information. This association may inspire some students' choice of a career.

2. Write your own letters of appreciation to any community helpers who have not worked directly with individual students. With encouragement, some of these individuals may maintain an interest in the school and become valuable resources for students and faculty. ▲

Disaster Script

At 10:05 a.m. today, Tuesday, September 26, 1995, a magnitude 7.0 earthquake struck the community. At noon, the following damage had been reported:

The downtown area was hardest hit. People have reported that most shelves, bookcases and display stands were knocked over. Masonry structures have sustained major damage, brick facades are collapsing, chimneys are falling, and some buildings have serious structural cracks. No fatalities have yet been reported.

The hospital reports that its three-story gerontology unit has "pancaked," causing the second and third floors to collapse on the first floor. At the time of collapse, 34 persons—29 patients and 5 staff members—were in that part of the building. Other parts of the hospital suffered nonstructural damage, some disruption to power, and an end to all but lifesaving procedures. The latest information indicates that the hospital will be at 50% operational capacity by 2:30 this afternoon.

Of the three fire stations, two have stayed operational. The downtown station has been destroyed. Fire department personnel were able to move only one pumper wagon before the building collapsed on the ladder truck, ambulance, and emergency generator truck.

This can be changed, embellished, tailored, and expanded for your community and your students. Additional effects that may be included:

- Large fire has broken out in downtown area
- Water mains are cut
- 20% of the population has sustained injuries
- Utility lines are down
- Animals in the zoo have escaped from their cages
- Looters are rampaging through downtown
- Sewers have backed up, endangering public health

6.3

What's Your E.Q. I.Q.?

RATIONALE

Students will review and solidify what they have learned in the preceding units by answering questions in cooperative teams.

FOCUS QUESTIONS

How well can students recall and apply what they have learned?

OBJECTIVES

Students will:

1. Ask and answer questions about earthquakes and earthquake preparedness.
2. Keep score.
3. Learn from incorrect responses as well as correct ones.

MATERIALS

- Master 6.3a, Earthquake Review Questions
- Back of Master 6.3a, Answer Key
- Minute timer
- Chalkboard and chalk for recording the score
- Tag board and laminating materials (*optional*)

PROCEDURE

Teacher Preparation

Copy Master 6.3a and cut the pages apart into cards. You may want to back them on tag board and/or laminate them for durability.

A. Introduction

Divide the class into teams of four or five students each and give each team a number or a name.

Give groups about 15 minutes to review the earthquake materials in their notebooks and ask each other questions as a warm-up.

TEACHING CLUES AND CUES

Students may enjoy competing in the teams they established for the unit 4 activities (SETs).

B. Lesson Development

1. Call two teams at a time to the front of the room. Instruct students to arrange chairs in two rows facing each other. Hand the deck of question cards to one team. For the first round, this team will ask and the other team will answer.

2. Asking and answering both begin with the student on the left. The first asker reads a question out loud and starts the timer. The first student on the opposing team tries to answer it. If that student cannot answer the question, play passes to the second student on the same team, then to the third, if necessary, and so on until one minute is up. The questioning team keeps score, tallying one point for each correct answer.

3. When any member of the team that is up answers incorrectly, play passes to the other team and the roles are reversed. When a member of the second team answers incorrectly, call two new teams to the front of the room.

C. Conclusion

When all the teams have had a chance to play, the team with the highest score may challenge any other team to a new round. If another team exceeds their score, they become the new challengers. The team with the highest score at the end of the period wins.

ADAPTATIONS AND EXTENSIONS

Invite students, to write questions and answers of their own to add to the deck. Be sure that all members of a group agree on the answer and the phrasing of the question before the card is put into play. ▲

TEACHING CLUES AND CUES

When all the cards have been used once, shuffle them and begin again. Repetition reinforces learning.

EARTHQUAKE
Review Questions

SEISMIC SLEUTHS

1. According to geologic studies, approximately how old is the Earth?

[a] 2 thousand years
[b] 7 thousand years
[c] 2 million years
[d] 4.54 billion years

SEISMIC SLEUTHS

2. All of the following people made major contributions to our knowledge of the Earth's physical history and structure except:

[a] Alfred Wegener
[b] Inge Lehmann
[c] Anna Maria Alberghetti
[d] Andrija Mohoroviçic

SEISMIC SLEUTHS

3. Earthquakes are caused by:

[a] strain energy that builds up and is suddenly released
[b] tides
[c] bad vibrations
[d] the Richter scale

SEISMIC SLEUTHS

4. Approximately how many earthquakes large enough to be rated significant by the U.S. Geological Survey occur worldwide during a calendar year?

[a] More than 20
[b] More than 100
[c] More than 1000
[d] More than 15,000

SEISMIC SLEUTHS

5. Although earthquakes occur almost everywhere, strong, damaging quakes are especially common in the:

[a] Eastern United States
[b] Pacific Ring of Fire
[c] Mediterranean Region
[d] Great African Rift

SEISMIC SLEUTHS

6. Which of these statements best describes the relationship between earthquakes and volcanoes?

[a] Earthquakes cause volcanoes.
[b] Volcanoes cause earthquakes.
[c] Volcanoes and earthquakes both occur along the margins of Earth's tectonic plates.
[d] Volcanoes only occur in hot countries.

SEISMIC SLEUTHS

7. Scientists can accurately predict earthquakes in the short range by studying:

[a] the behavior of animals
[b] changes in radon emissions
[c] Rayleigh waves
[d] none of the above

SEISMIC SLEUTHS

8. The Richter scale measures an earthquake's:

[a] magnitude
[b] amplitude
[c] pulchritude
[d] intensity

Answer Key

b	d
c	c
d	a
a	d

SEISMIC SLEUTHS

9. How much greater is the amount of energy released by a magnitude 7 earthquake than the amount released by a magnitude 6 quake?

[a] twice as great
[b] 10 times as great
[c] about 30 times as great
[d] 100 times as great

SEISMIC SLEUTHS

10. The method architects and structural engineers use to quickly assess a building's earthquake resistance is called:

[a] eyeballing
[b] sedimentation
[c] rapid visual screening
[d] estimating

SEISMIC SLEUTHS

11. The earthquake waves that are the first to arrive at the epicenter are called:

[a] P waves
[b] A waves
[c] First waves
[d] Love waves

SEISMIC SLEUTHS

12. About how long does the violent shaking last in a typical earthquake?

[a] 20 seconds
[b] one minute
[c] five minutes
[d] 30 minutes

SEISMIC SLEUTHS

13. In which one of these states are strong and potentially damaging earthquakes relatively frequent?

[a] Texas
[b] Florida
[c] Wisconsin
[d] Alaska

SEISMIC SLEUTHS

14. If a strong earthquake struck while you were inside a building, what would you do to protect yourself?

[a] run outside
[b] dial 911
[c] drop, cover, and hold
[d] freeze

SEISMIC SLEUTHS

15. How much damage a building suffers in an earthquake depends upon:

[a] how close it is to the fault
[b] what it is build of and how it is built
[c] what kind of soil it is built on
[d] all three

SEISMIC SLEUTHS

16. To make a room safer in an earthquake, you would:

[a] fasten all unsecured heavy objects
[b] remove all pets
[c] turn on the radio
[d] lock the doors and windows

Answer Key

SEISMIC SLEUTHS d	SEISMIC SLEUTHS c
SEISMIC SLEUTHS c	SEISMIC SLEUTHS c
SEISMIC SLEUTHS d	SEISMIC SLEUTHS a
SEISMIC SLEUTHS a	SEISMIC SLEUTHS a

SEISMIC SLEUTHS

17. A break in the Earth's crust along which earthquake movement has occurred is called:

[a] a gap
[b] a fault
[c] an epicenter
[d] an isoseismal

SEISMIC SLEUTHS

18. A gigantic ocean wave caused by an earthquake is called:

[a] a samurai
[b] a sand boil
[c] a tsunami
[d] a surface wave

SEISMIC SLEUTHS

19. All of the following are structural elements except:

[a] windows
[b] bearing walls
[c] braces
[d] horizontal beams

SEISMIC SLEUTHS

20. All of the following are good sources of earthquake information except:

[a] United States Geological Survey
[b] The National Enquirer
[c] Federal Emergency Management Agency
[d] National Earthquake Prediction Evaluation Council

SEISMIC SLEUTHS

21. Resonance is buildup of amplitude in a physical system that occurs when the frequency of an applied oscillatory force is close to the natural frequency of the system.

[a] true
[b] false
[c] sometimes
[d] don't know

SEISMIC SLEUTHS

SEISMIC SLEUTHS

SEISMIC SLEUTHS

Answer Key

SEISMIC SLEUTHS b	SEISMIC SLEUTHS b
SEISMIC SLEUTHS a	SEISMIC SLEUTHS c
SEISMIC SLEUTHS	SEISMIC SLEUTHS a
SEISMIC SLEUTHS	SEISMIC SLEUTHS

6.4

HEY, Look at Me Now!

RATIONALE

This activity is designed to serve students and teachers as a gauge of what they have learned from this curriculum.

FOCUS QUESTIONS

What have you learned about earthquakes and earthquake preparedness?

What will you do differently as a result of these lessons?

OBJECTIVES

Students will correct, elaborate, and refine their earlier writings by applying information they have gained from this curriculum.

MATERIALS

- Writing paper and pens or computers and printers

PROCEDURE

A. Introduction

Explain that in this postassessment activity each student is to complete the same task he or she did in the preassessment activity. In rewriting each of the three passages, however, students are urged to draw upon what they have learned from the unit. Remind the students to focus on how their new knowledge has changed their way of thinking about earthquakes and earthquake preparedness.

B. Lesson Development

As they did in Unit 1, students will invent a specific quake. Each of their three accounts will describe the same earthquake, but the styles of the three will vary.

New Reporter—a short, concise article describing the who, what, where, why, and when of the earthquake.

Scientist—a scientific account stating what is objectively known about the earthquake: its causes, its Modified Mercalli and Richter ratings, and the possibility of aftershocks or more large earthquakes.

Eyewitness—a personal letter to a friend telling about being in an earthquake. This will describe what happened during the earthquake to the student, the building in which the student was, family members and pets, and the family home. Describe what you had done before the earthquake to be prepared, how effective your preparations were, and what you would do differently in preparation for the next earthquake. Also describe what life was like in the two weeks following the earthquake.

C. Conclusion

After collecting the papers, pair each student's postassessment writings with the same student's preassessment writings, and hand them out to a different student. Assign students the task of reading both sets and commenting on what the writer has learned from the unit. Follow with a class discussion of these comparisons, either the same day or the next. ▲

Books

Davis, James F.; Bennett, John H.; Borchardt, Glenn A.; Kahle, James E.; Rice, Salem J.; and Silva, Michael A. (1982). *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in the San Francisco Bay Area*. San Francisco: California Department of Conservation, Division of Mines and Geology. Although the maps and much of the discussion are specific to California, the sections on transportation, communications, water and waste, electrical power, natural gas, and petroleum fuels would be helpful for planning in other areas.

Federal Emergency Management Agency. *Central City: A Model Community.* Integrated Emergency Management Course. Emmitsburg, MD: Federal Emergency Management Agency, 1988. (SM 171.1)

Plafker, G., and Galloway, J.P., eds. (1990). *Lessons Learned from the Loma Prieta, California, Earthquake of October 17, 1989.* (U.S. Geological Survey Circular 1045). Reston, VA: U.S. Geological Survey, 703-648-6891.

Steinbrugge, Karl V.; Bennett, John H.; Lagorio, Henry J.; Davis, James F.; Borchardt, Glenn A.; and Topozada, Tousson R. (1987). *Earthquake Planning Scenario for a Magnitude 7.5 Earthquake on the Hayward Fault in the San Francisco Bay Area*. San Francisco: California Department of Conservation, Division of Mines and Geology. Although the maps and much of the discussion are specific to California, the sections on hospitals, schools, transportation, communications, water and waste, electrical power, natural gas, and petroleum fuels would be helpful for planning in other areas.

Watson, R.W.; Poda, J.H.; Miller, C.T.; Rice, E.S.; and West, G. (1990) *Containing Crisis: A Guide to Managing School Emergencies.* Bloomington, IN: National Educational Service.

Non-Print Media

Silent Quake: Preparedness for the Hearing-Impaired. A videotape using American sign language, captioning, and voice-overs. Developed by the American Red Cross, Los Angeles, CA, available on loan from BAREPP, Oakland, CA; 415327-6017.

Note: *Inclusion of materials in these resource listings does not constitute an endorsement by AGU or FEMA.*