



G0434.A

Earthquake Safety

for Schools

Student Manual

2FWREHU



FEMA

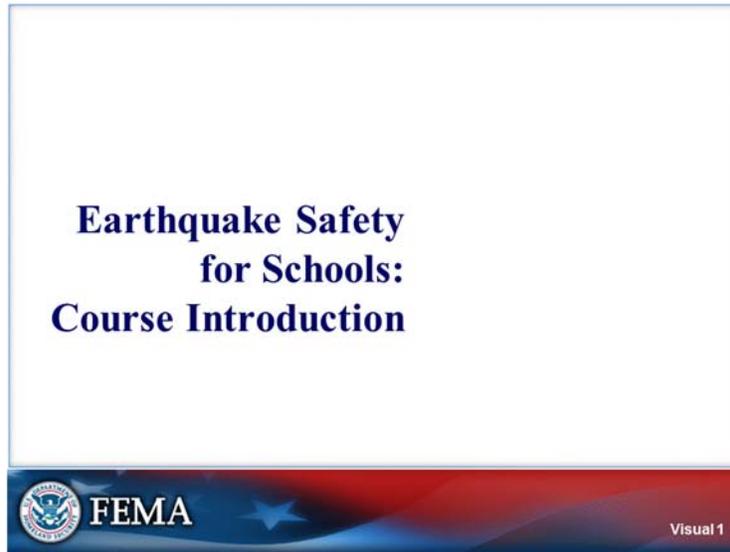
G0434.A
Earthquake Safety for Schools
Student Manual

October 2013

Course Introduction

Topic Course Overview

Display
Visual 1



Notes:

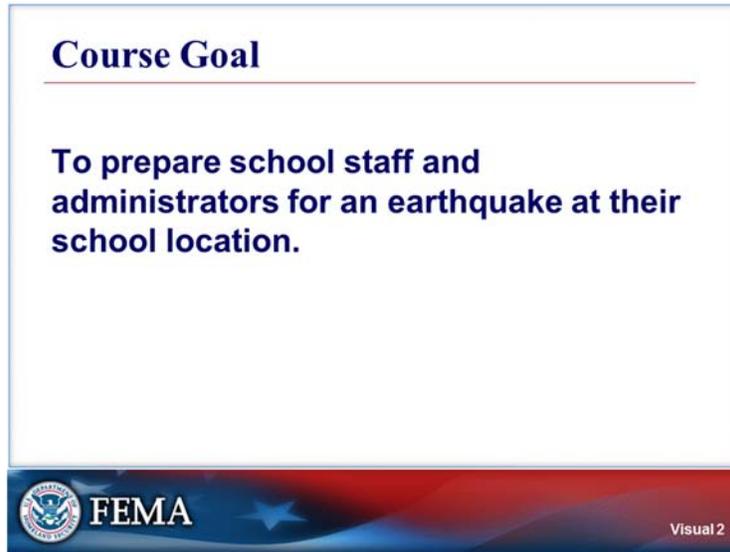
Welcome to the Earthquake Safety for Schools course.

This unit introduces the course goal, topics, and expectations.

Be prepared to introduce yourself, describing your position at the school and your role in the school's earthquake planning efforts related to mitigation, preparedness, response, and/or recovery.

Topic Course Overview (Continued)

Display
Visual 2

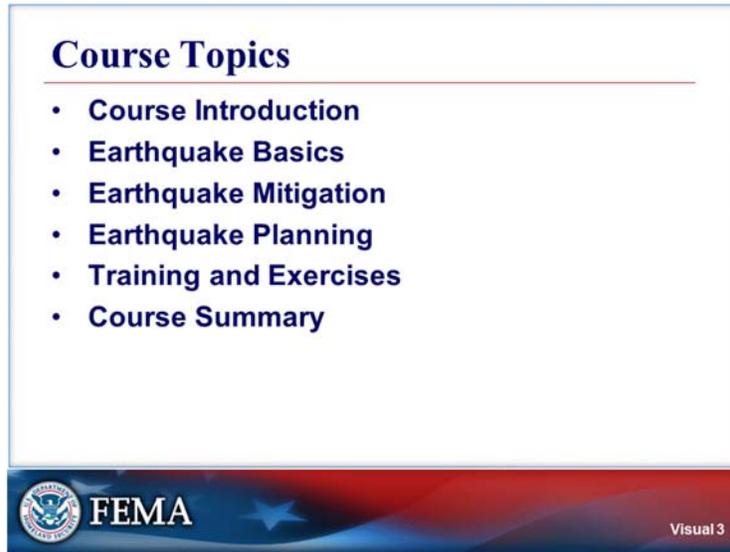


Notes:

The course goal is to prepare school staff and administrators for an earthquake at their school location.

The course is designed to describe the effects of an earthquake; explain how to mitigate those effects; state the key elements of an earthquake plan for preparedness, response, and recovery; and outline the procedures for training and exercises related to that emergency plan.

Topic**Course Topics**

**Display
Visual 3**

Notes:

To maximize flexibility for schools, this course is designed to be modular. The units may be presented all at once, or separately, as time permits. If all units are presented at once, the recommended order is:

- **Course Introduction**, provides an overview of the course goal, objectives, and expectations and includes a pretest.
- **Earthquake Basics**, defines key earthquake terms and concepts, reviews the consequences of earthquakes for schools, and provides a brief overview of an earthquake safety program. The objectives for this unit are to:
 - Describe how an earthquake occurs.
 - Describe possible consequences of an earthquake at the school.
 - Identify the actions that are included in an earthquake safety program.
- **Earthquake Mitigation**, introduces earthquake hazards and describes measures that can help reduce the risk of life and property should an earthquake occur at the school. The objectives for this unit are to:
 - Identify the earthquake hazards in and around the school.
 - Identify mitigation measures that can be taken.

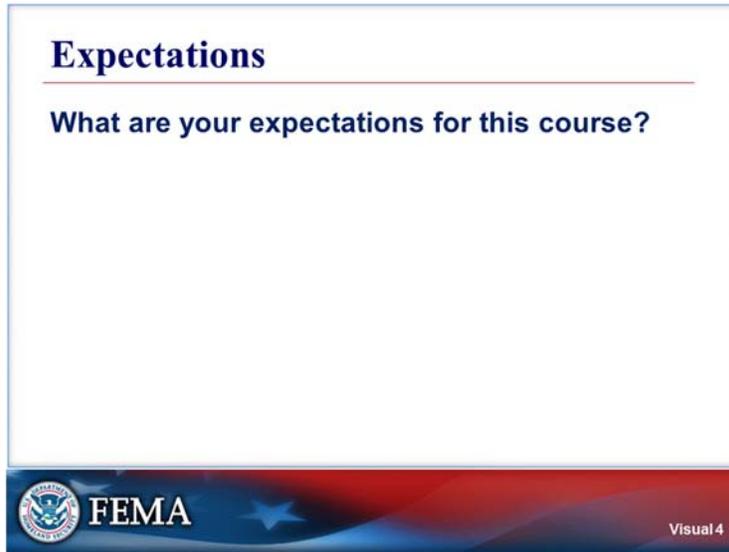
Topic	Course Topics (Continued)
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Course Units (Continued)

- **Earthquake Planning**, describes the supplies and equipment that might be needed after an earthquake, procedures to carry out critical functions following an earthquake, and strategies to help the school community recover from an earthquake. The objectives for this unit are to:
 - Explain how earthquake preparedness fits within the school's multihazard plan.
 - Identify supplies and equipment needed to prepare students, classrooms, and the entire school.
 - Describe response priorities and procedures.
 - Describe recovery techniques.
- **Training and Exercises**, introduces concepts of training and exercises and describes the types of exercises that can be used with school staff and students. The objectives for this unit are to:
 - Explain the steps involved in exercise development.
 - List the types of exercises and the purposes of each.
 - Identify the exercises required for the earthquake portion of the Emergency Operations Plan (EOP).
- **Course Summary**, reviews the key points of the training and concludes with a final exam.

Topic **Expectations**

Display
Visual 4

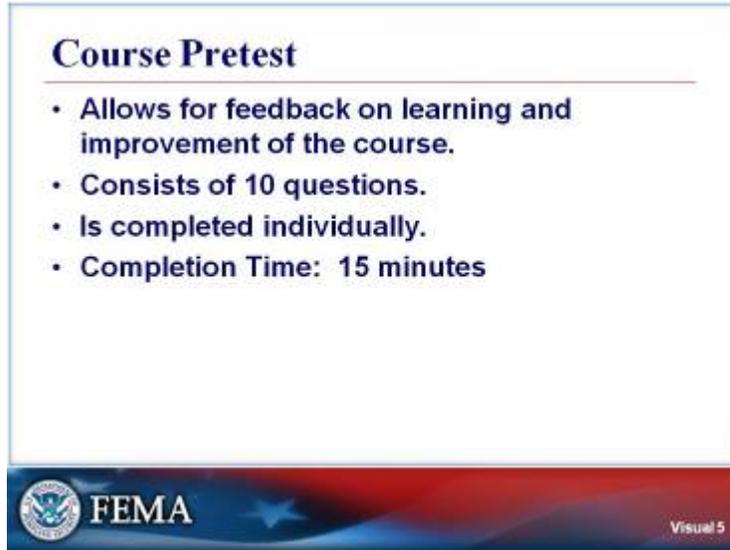


Notes:

What are your expectations for this course?

Topic Course Pretest

Display
Visual 5



Notes:

Purpose: The purpose of the course pretest is to assess how well the course enables you to achieve the learning objectives.

Estimated Time: 15 minutes

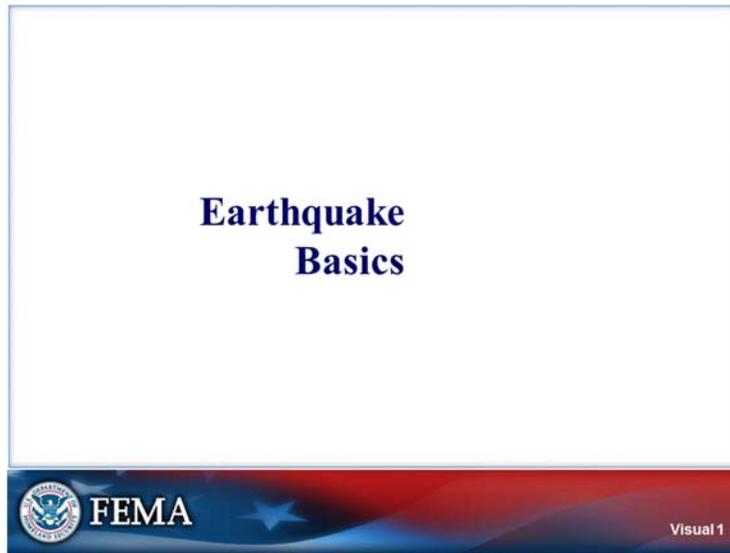
Instructions:

- Answer the 10 questions.
- You will have 15 minutes to work.
- Your instructor will score the pretest. The results will help assess how well the course enables you to achieve the learning objectives.

Earthquake Basics

Topic	Unit Introduction
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**Display
Visual 1**



Notes:

This unit provides an overview of earthquake basics and reviews the consequences of earthquakes for schools.

The unit also includes a brief overview of an earthquake safety program and provides information about additional Web resource materials.

Topic**Unit Introduction (Continued)****Display
Visual 2**

Objectives

You will be able to:

- Describe how an earthquake occurs.
- Describe possible consequences of an earthquake at your school.
- Identify the actions that are included in an earthquake safety program.

FEMA Visual 2

Notes:

When evaluating a school's earthquake safety plan, it is important to first understand the nature of the hazards or vulnerabilities.

At the end of this unit, you will be able to:

- Describe how an earthquake occurs.
- Describe possible consequences of an earthquake at your school.
- Identify the actions that are included in an earthquake safety program.

Topic**Earthquake Definitions****Display
Visual 3**

Earthquake Definition

An earthquake is:

- **The sudden slipping or movement of part of the Earth's crust, . . .**
- **That occurs along a fault, and . . .**
- **Is accompanied by shaking/vibration.**

FEMA Visual 3

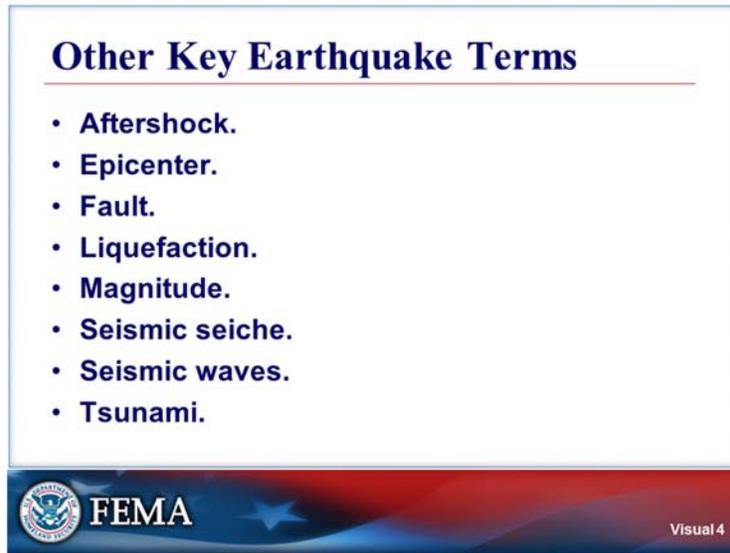
Notes:

One of the most frightening and destructive phenomena of nature is a severe earthquake and its terrible aftereffects.

An earthquake is defined as the sudden slipping or movement of part of the Earth's crust that occurs along a fault and is accompanied by shaking/vibration.

The huge plates that form the Earth's surface are in constant motion, moving over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates suddenly break free, causing an earthquake.

Image Source: www.usgs.gov

Topic**Earthquake Definitions (Continued)****Display
Visual 4**

Notes:

Other key terms associated with earthquakes include:

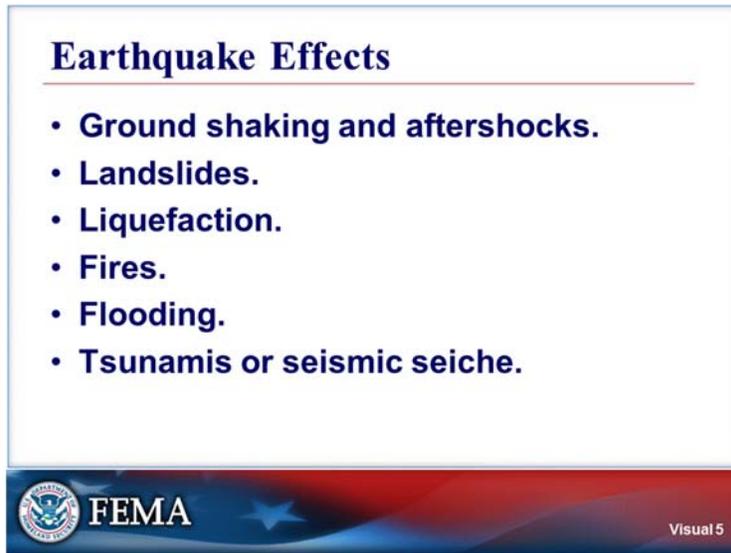
- **Aftershock:** An earthquake of similar or lesser intensity that follows the main earthquake.
- **Epicenter:** The place on the Earth's surface directly above the point on the fault where the earthquake rupture began. Once fault slippage begins, it expands along the fault during the earthquake and can extend hundreds of miles before stopping.
- **Fault:** A fracture or zone of fractures along which there has been displacement of the adjacent blocks of the earth's crust relative to one another.
- **Liquefaction:** The transformation of loose sediment or soil into a fluid state as a result of increasing the pressure of the fluid in between the grains due to strong ground shaking. Liquefaction typically occurs in poorly consolidated, water-saturated sediment. Liquefaction can cause significant earthquake-related damage because structures located on ground that liquefies can collapse or sink into the ground.
- **Magnitude:** The amount of energy released during an earthquake, which is computed from the amplitude of the seismic waves. A magnitude of 7.0 on the Richter Scale indicates an extremely strong earthquake. Each whole number on the scale represents an increase of about 30 times more energy released than the previous whole number represents. Therefore, an earthquake measuring 6.0 is about 30 times more powerful than one measuring 5.0.

Topic	Earthquake Definitions (Continued)
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Terms (Continued)

- **Seismic Seiche:** [pronounced “seysh”] Standing waves set up on rivers, reservoirs, ponds, and lakes when seismic waves from an earthquake pass through the area.
- **Seismic Waves:** Vibrations that travel outward from the earthquake fault at speeds of several miles per second. Although fault slippage directly under a structure can cause considerable damage, the vibrations of seismic waves cause most of the destruction during earthquakes.
- **Tsunami:** A sea wave caused by an underwater earthquake or landslide (usually triggered by an earthquake) displacing the ocean water.

Definition source: www.usgs.gov and www.fema.gov

Topic**Earthquake Effects (Continued)****Display
Visual 5**

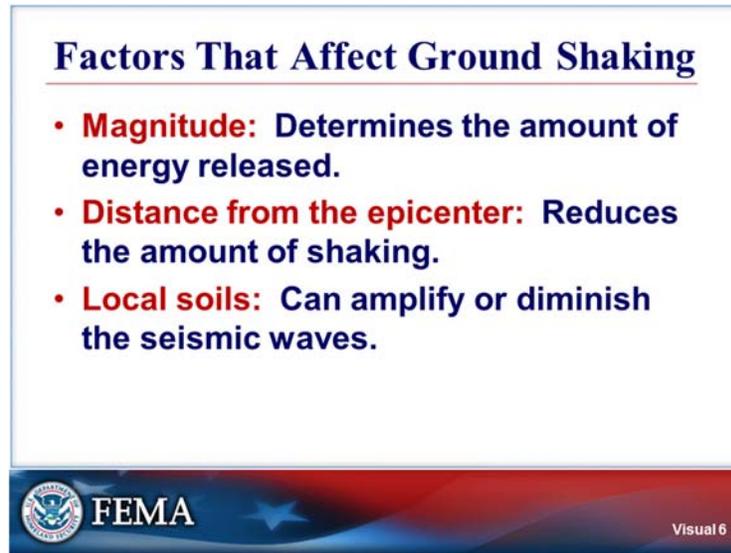
Notes:

Potential hazards during and after an earthquake include:

- **Ground shaking and aftershocks**, which may cause falling objects and structural damage. While structural damage is often the most visible effect of an earthquake, a key point to remember is that earthquake effects go beyond readily visible structural damage.
- **Landslides**, when surface soil (and anything built upon it) slides down a slope.
- **Liquefaction**, when seismic vibration causes soils to “liquefy” and lose their ability to support the weight of buildings and other structures.
- **Fires**, often caused by ruptured gas lines or downed electric lines.
- **Flooding**, often caused by water main breaks or dam or levee failures.
- **Tsunamis or seismic seiche**, when the earthquake displaces waves of water from nearby oceans, lakes, or other bodies of water.

Topic**Earthquake Effects (Continued)**

Display
Visual 6



Factors That Affect Ground Shaking

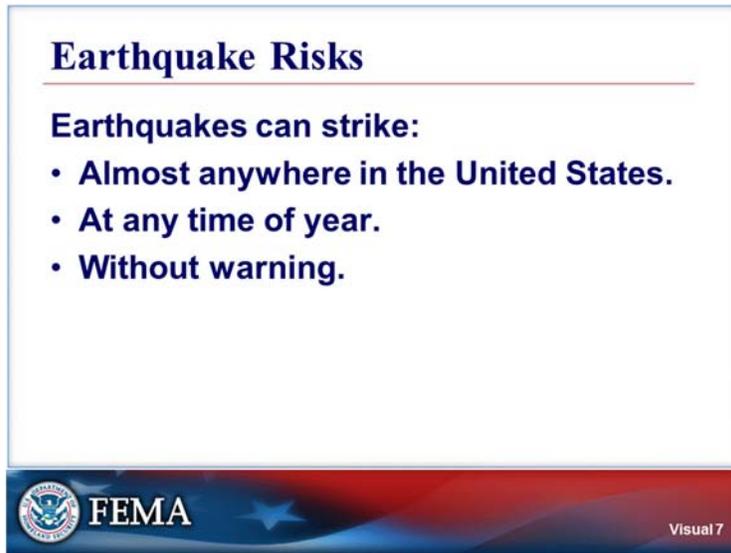
- **Magnitude:** Determines the amount of energy released.
- **Distance from the epicenter:** Reduces the amount of shaking.
- **Local soils:** Can amplify or diminish the seismic waves.

FEMA Visual 6

Notes:

The amount of ground shaking during an earthquake is determined by a number of factors.

- **The magnitude** of the earthquake determines the amount of energy released.
- **The distance** from the epicenter is also a factor. Greater distances reduce the amount of shaking.
- **The types of local soils** can either amplify or diminish the seismic waves. For instance, soft, water-saturated soil can amplify shaking. Young and fractured rocks in west coast soil cause seismic waves to die out faster than the older and more homogenous rocks of central and eastern U.S. soil.

Topic**Earthquake Effects (Continued)****Display
Visual 7**

Earthquake Risks

Earthquakes can strike:

- **Almost anywhere in the United States.**
- **At any time of year.**
- **Without warning.**

FEMA Visual 7

Notes:

It is important to remember that earthquakes can happen almost anywhere in the United States. Residents on the west coast of the U.S. are regularly educated about seismic safety. However, seismic activity is prevalent almost everywhere in the U.S. and earthquake safety should be a priority.

Earthquakes can happen at any time of year—they are equally common in cold or warm weather. There is no “earthquake season.”

An earthquake can strike without warning and poses hazards in almost every classroom and school facility (e.g., books on a shelf, chemicals in a science lab).

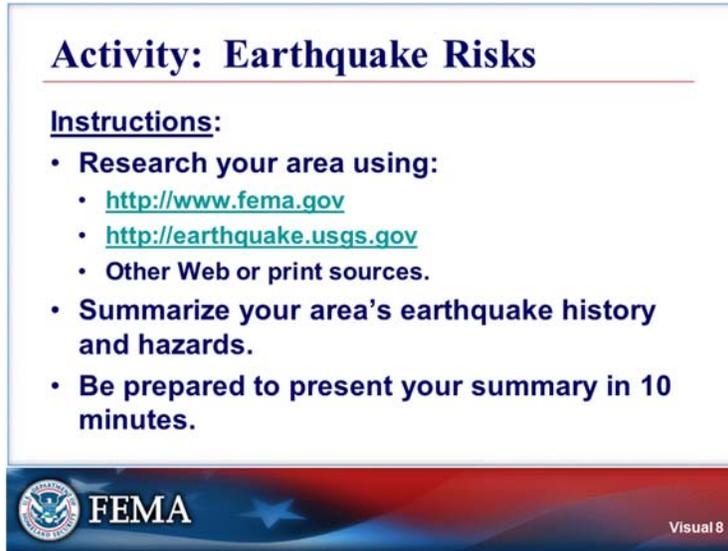
Image Source: www.usgs.gov

“This map shows the relative shaking hazards in the United States and Puerto Rico. During a 50-year time period, the probability of strong shaking increases from very low (white), to moderate (blue, green, and yellow), to high (orange, pink, and red). Map not to scale.”

Topic

Earthquake Effects (Continued)

Display
Visual 8



Activity: Earthquake Risks

Instructions:

- **Research your area using:**
 - <http://www.fema.gov>
 - <http://earthquake.usgs.gov>
 - Other Web or print sources.
- **Summarize your area's earthquake history and hazards.**
- **Be prepared to present your summary in 10 minutes.**

FEMA Visual 8

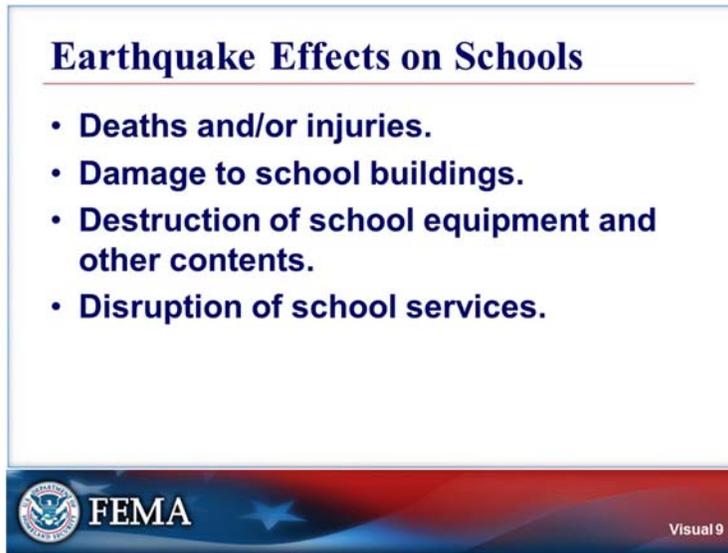
Notes:

Purpose: This activity will enable you to identify earthquake hazards in your local area.

Estimated Time: 20 minutes (10 minutes activity + 10 minutes debrief)

Instructions:

1. Research your area using:
 - The [Federal Emergency Management Agency](http://www.fema.gov) Web site (<http://www.fema.gov>).
 - The [U.S. Geological Survey](http://earthquake.usgs.gov) Web site (<http://earthquake.usgs.gov>).
 - Other Web or print sources.
2. Summarize your area's earthquake history and hazard(s).
3. Be prepared to present your summary in 10 minutes.

Topic**Earthquake Effects (Continued)****Display
Visual 9**

Notes:

School vulnerabilities during an earthquake include:

- **Death and/or injury** of students, teachers, staff, and volunteers (e.g., from structural collapse or falling objects).
- **Damage to school buildings:**
 - Structural damage may stem from ground shaking, fault ruptures under or near the building, soil liquefaction or other disruptions that weaken the soil bearing capacity, landslides, fires, or the force of water during a tsunami or seismic seiche.
 - The risk of damage is a function of each building's:
 - Type: Based on the type and construction of a building or structure, engineers can determine the likely amount of damage that could be expected during an earthquake.
 - Age: Older school structures may not meet current seismic requirements and standards.
 - Maintenance: Schools suffering from deferred maintenance will experience greater damage than well-maintained schools.
 - Location: School damage may also be a factor of its proximity to the earthquake epicenter or structures that may cause cascading events (e.g., nearby dams or chemical plants).
- **Destruction of school equipment** and other contents.
- **Disruption of school services**, including the capability to provide shelter to affected residents, a function that is frequently assigned to schools in a disaster.

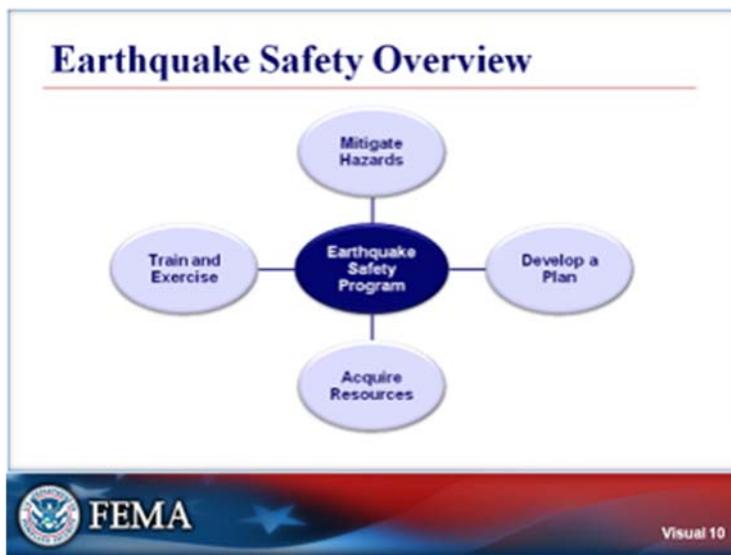
Topic	Earthquake Effects (Continued)
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Earthquake Effects (Continued)

The school's multihazard Emergency Operations Plan (EOP) should assess these vulnerabilities and outline procedures for preparedness and mitigation.

Topic	Earthquake Safety
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**Display
Visual 10**



Notes:

This course addresses the consequences of an earthquake, and actions to take at your school to reduce the affects of an earthquake and accelerate your school's recovery.

A thorough earthquake safety program includes the following components:

- **Mitigate Hazards:** Identify the structural and nonstructural hazards in your school and classroom. Take steps to mitigate the danger of these hazards during an earthquake.
- **Develop a Plan:** Review your school's multihazard Emergency Operations Plan (EOP) to ensure that it includes any policies, procedures, and resources that will be needed before, during, and after an earthquake.
- **Acquire Resources:** Follow school guidance on acquiring any resources needed to successfully implement the procedures in the EOP, such as food, water, medical supplies, and blankets.
- **Train and Exercise:** Ensure that staff, students, and parents are properly educated about the earthquake safety procedures in the EOP. Conduct regular training and exercise the plan frequently.

This process is cyclical and ongoing. After every training session or exercise, compile any "lessons learned" about new hazards that require mitigation, gaps in procedures that should be clarified in the EOP, or additional resources that must be acquired.

The other units in this course provide detailed information about how to implement each of these actions.

Topic**Earthquake Safety (Continued)****Display
Visual 11**

Earthquake Safety: China Case Study

- A magnitude 7.9 earthquake hit Sichuan Province.
- Of the 70,000 fatalities, more than 5,000 students died from school collapses.
- Many schools were damaged beyond repair.

The slide features two photographs: the top one shows a severely damaged school building with rubble, and the bottom one shows a road split by a deep crack. The slide includes the FEMA logo and the text 'Visual 11' in the bottom right corner.

Notes:

Schools are not always safe havens for children and teachers. Earthquakes can and do occur anywhere and can affect students in the classroom, on the playground, and even on the bus on the way to or from school.

For instance, on May 12, 2008, a magnitude 7.9 earthquake hit Sichuan Province. About 70,000 people were killed and 18,000 were missing. In some areas, entire towns were shattered. The quake split roads and caused massive landslides.

Over 5,000 students died from school collapses in Sichuan Province. Many school buildings were damaged beyond repair.

The devastating power of this earthquake reinforces the need to teach students:

- What earthquakes are and how they occur.
- What kinds of damage earthquakes cause.
- How to prepare for an earthquake.
- What to do during and after the quake ends to remain safe.

Topic	Earthquake Safety (Continued)
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Display
Visual 12

Earthquake Safety: Conclusions

Think about the China case study. What earthquake vulnerabilities does your school face?

What measures have you taken to address these vulnerabilities?

FEMA

Visual 12

Notes:

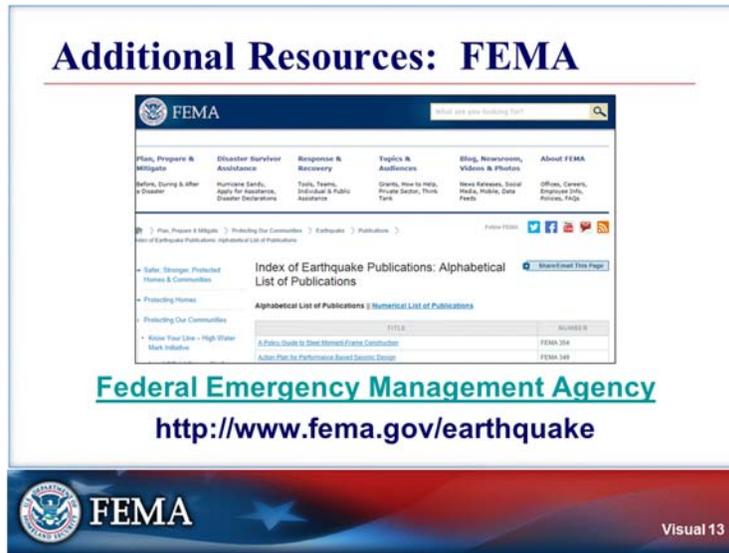
Think about the China case study. What earthquake vulnerabilities does your school face?

What measures have you taken to address these vulnerabilities?

Topic

Additional Resources

Display Visual 13



Additional Resources: FEMA

FEDERAL EMERGENCY MANAGEMENT AGENCY

Plan, Prepare & Mitigate | Disaster Survivor Assistance | Response & Recovery | Topics & Audiences | Blog, Newsroom, Videos & Photos | About FEMA

Before, During & After a Disaster | Hurricane Safety: Apply for Assistance, Disaster Declarations | Tools, Teams, Individual & Public Assistance | Grants, How to Help, Private Sector, Think Tank | News Releases, Social Media, Public Data Feeds | Offices, Centers, Emergency Info, Policies, FAQs

Home > Plan, Prepare & Mitigate > Protecting Our Communities > Earthquake > Publications

Index of Earthquake Publications: Alphabetical List of Publications

Alphabetical List of Publications | Numerical List of Publications

TITLE	NUMBER
A-Praxis, Guide to Steel Moment-Resisting Construction	FEMA 354
Action Plan for Performance Based Seismic Design	FEMA 349

Federal Emergency Management Agency
<http://www.fema.gov/earthquake>

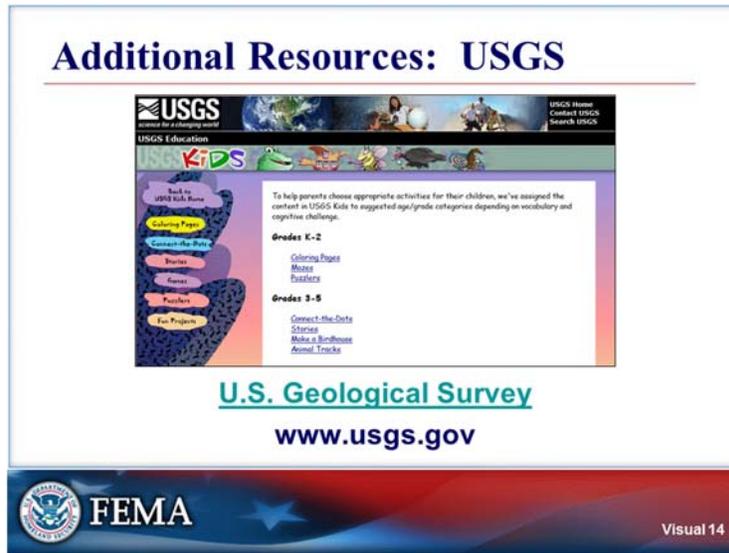
FEMA

Visual 13

Notes:

The Federal Emergency Management Agency (FEMA) Web site contains numerous resources on earthquakes, including:

- **Earthquake Terms**, providing key definitions.
- **Why Earthquakes Occur**, providing an overview of plate tectonics and faults.
- **Your Earthquake Risk**, organizing States into categories of moderate, high, or very high risk for earthquakes.
- **Earthquake Contacts**, listing points of contact in every State to learn more about programs affecting your community.

Topic**Additional Resources (Continued)****Display
Visual 14****Notes:**

The U.S. Geological Survey (USGS) Web site is another valuable resource for earthquake information, including:

- **Facts and Terms**, providing earthquake facts, FAQs, Today in Earthquake History, and a visual earthquake glossary.
- **Educational Topics**, offering information on earthquakes for kids (shown on the visual), for students, and for teachers.
- **Resources**, featuring photo collections, animations for earthquake terms and concepts, products and publications, and preparedness and response.
- **The Science of Earthquakes**, describing how and when earthquakes occur.
- **Latest Earthquakes in the World**, displaying U.S. and world maps of seismic activity over the past 7 days.
- **Recent Earthquakes**, showing the past 8-30 days.
- **Earthquake Summary Posters**, showing seismic history and hazards by region or by year.

Topic

Additional Resources (Continued)

Display Visual 15

The image is a screenshot of the FEMA/NEHRP website. At the top, it says "Additional Resources: FEMA/NEHRP". Below this, there are two main sections. The left section is titled "Index of Earthquake Publications: Alphabetical List of Publications" and lists various publications with their titles and dates. The right section is titled "National Earthquake Hazards Reduction Program" and lists various resources, including "Library", "News releases", "E-mail updates", "Grant and contract information", and "Links to additional resources". At the bottom of the screenshot, there is a banner for the "National Earthquake Hazards Reduction Program" with the website address "www.nehrp.gov". The FEMA logo is visible in the bottom left corner, and "Visual 15" is in the bottom right corner.

Notes:

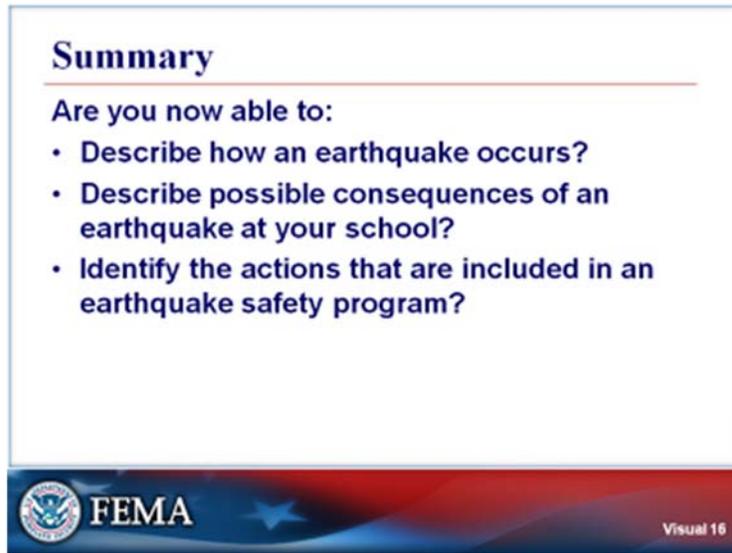
The National Earthquake Hazards Reduction Program (NEHRP) is the Federal Government's coordinated approach to addressing earthquake risks. It is a collaborative effort among FEMA, the National Institute of Standards and Technology (NIST), the National Science Foundation (NSF), and USGS.

Resources on the NEHRP Web site include:

- **Library** of resources, such as scientific data, response and recovery publications, and success stories.
- **News releases** of earthquake-related events, from State and Federal sources such as FEMA, USGS, NIST, and NSF.
- **E-mail updates and an NEHRP newsletter** of success stories.
- **Grant and contract information.**
- **Links** to additional resources.

Topic	Unit Summary
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Display
Visual 16



Summary

Are you now able to:

- Describe how an earthquake occurs?
- Describe possible consequences of an earthquake at your school?
- Identify the actions that are included in an earthquake safety program?

FEMA Visual 16

Notes:

This unit reviewed earthquake basics and how earthquakes can affect schools.

Are you now able to:

- Describe how an earthquake occurs?
- Describe possible consequences of an earthquake at your school?
- Identify the actions that are included in an earthquake safety program?

Earthquake Mitigation

Topic

Unit Introduction

**Display
Visual 1**

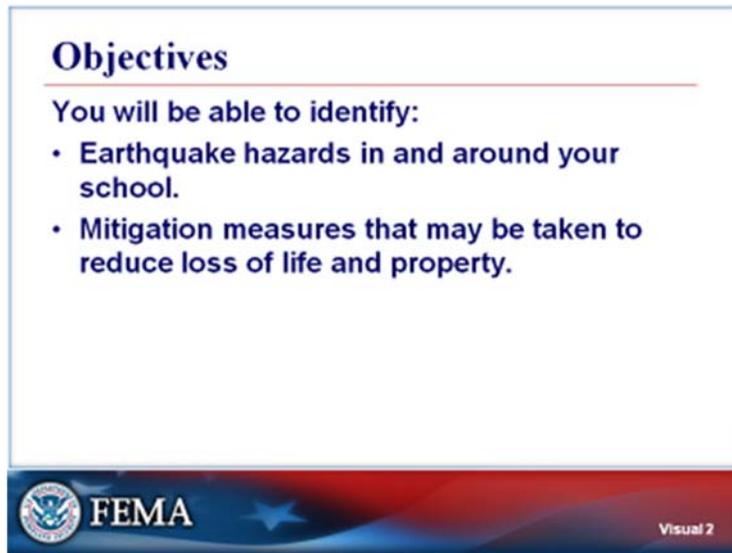


Notes:

This unit introduces earthquake hazards and the risks that are created as a result of those hazards. While some earthquake hazards can be reduced through mitigation, some may not.

The goal is to be able to identify hazards, determine if they can be mitigated or reduced, and if they can't, adjust and adapt the school response procedures so that the potential problems are addressed in school planning and training efforts.

Display
Visual 2



Objectives

You will be able to identify:

- Earthquake hazards in and around your school.
- Mitigation measures that may be taken to reduce loss of life and property.

FEMA Visual 2

The image shows a slide titled 'Objectives' with a red horizontal line under the title. Below the title, it says 'You will be able to identify:' followed by two bullet points. The slide has a blue and red decorative footer with the FEMA logo and the text 'Visual 2'.

Notes:

One key component of emergency planning is mitigating the damage that could be caused by a disaster.

At the end of this unit, you will be able to identify:

- Earthquake hazards in and around your school.
- Mitigation measures that may be taken to reduce the loss of life and property.

School Building Hazards



Structural Element:
Any component of the building whose primary function is to transfer imposed loads to the foundation.



Nonstructural Element:
Any portion of the building not connected to the superstructure.

FEMAVisual 3

Notes:

Hazards in schools can be separated into two categories: structural and nonstructural.

- **Structural elements** are any components of the building whose primary function is to transfer imposed loads to the foundation of the building against forces exerted by wind, rain, heavy snow, gravity, vibrations, and people. Other components such as cornices or balconies may be connected to or incorporated into the building structure.

A structural hazard is a building component, such as an unreinforced masonry wall, that may fail during an earthquake.

- **Nonstructural elements** are not connected to or incorporated into the building structure. Nonstructural risks relate to the danger of falling objects or other risks not associated with the building's seismic safety.

Many earthquake injuries are caused by falling objects, such as poorly secured bookcases falling in classrooms, false ceilings, light fixtures, appliances, furniture, and mechanical equipment such as heating and air conditioning units.

Topic**School Hazards (Continued)****Display
Visual 4**

School Hazards: Structural Examples

- Unreinforced masonry or cinderblock walls.
- Covered walkways.
- Portable buildings.
- Partition walls.
- Drop ceilings.
- Light fixtures.
- Large panes of glass.
- Electrical equipment.



 **FEMA**  Visual 4

Notes:

Structural hazards in and around the school may include:

- Unreinforced masonry or cinderblock walls.
- Covered walkways. Covered walkways and playground areas have less support in the middle of the structure and may be vulnerable to lateral movement.
- Portable buildings. Portable buildings are considered temporary structures and are often not secured to the ground. They may become vulnerable with ground motion.
- Drop ceilings.
- Light fixtures.
- Large panes of glass.
- Electrical equipment.

In addition, parapets, balconies, or cornices may not be considered part of the building's structure but are particularly vulnerable to ground motion and may affect the school's ability to evacuate easily.

In general, the newer the building, the more likely it will be resilient in earthquakes. While seismic building codes vary across the country, building codes are upgraded and improved as building materials and techniques change.

An evaluation of a school's structural hazards is best done by a licensed and experienced structural engineer. The age of the building, the type of soils the building is built on, the type of construction, and the building materials are just a few factors that are considered when a building is evaluated for seismic performance.

Structural Hazards (Continued)

Knowing how the school building will perform in a moderate to major earthquake is valuable information for developing earthquake response procedures.

Structural hazards take extensive time, planning, and funding to mitigate. Actions to mitigate these hazards are usually taken at the district level. Until these hazards are mitigated, a school may need to adjust response procedures to take into consideration the problems that might be caused by the hazard.

Topic**School Hazards (Continued)****Display
Visual 5**

School Hazards: Nonstructural Examples

- Bookshelves.
- File boxes and drawers.
- Furnishings.
- Portable room dividers.
- Office and classroom equipment.
- Vending machines.



FEMA

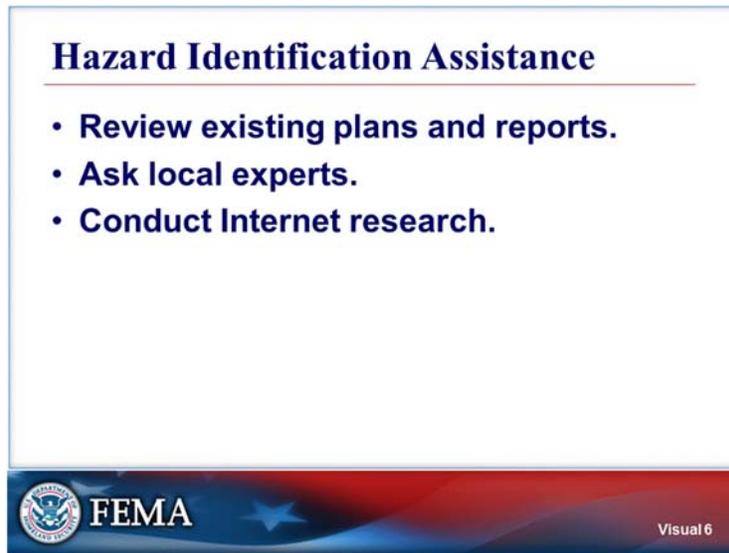
Visual 5

Notes:

The first step in mitigating nonstructural hazards is to become aware of all the items that could become earthquake hazards during ground motion.

Examples of potential nonstructural hazards include:

- Bookshelves.
- File boxes and drawers.
- Furnishings, such as desks, tables, and chairs.
- Portable room dividers.
- Office and classroom equipment, such as computers, televisions, and photocopiers.
- Vending machines.

Topic**School Hazards (Continued)****Display
Visual 6**

Notes:

When identifying hazards in your school, follow the guidelines listed on the visual.

Review existing plans and reports, such as:

- State mitigation plans.
- Local comprehensive plans.
- The school's multihazard Emergency Operations Plan (EOP).

Ask local experts, such as:

- Local emergency management staff.
- The department of public works.
- Police or fire.
- Structural engineers, architects, or soil engineers.

Conduct Internet research, beginning with the resources listed at the end of this unit.

Topic**School Hazards (Continued)****Display
Visual 7**

Activity: School Hazards

Instructions:

- Your group will be assigned one type of hazard: structural or nonstructural.
- Using the checklist in your Student Manual, identify school examples of your hazard type.
- Be prepared to share your responses in 15 minutes.



The bottom of the slide features a decorative banner with the FEMA logo on the left, the word 'FEMA' in the center, and 'Visual 7' on the right.

Notes:

Purpose: This activity will enable you to identify the earthquake hazard(s) in their school building.

Estimated Time: 20 minutes (15 minutes activity + 5 minutes debrief)

Instructions:

1. Your group will be assigned one type of hazard: structural or nonstructural.
2. Using the checklist in your Student Manual, beginning on the next page, identify examples of your assigned hazard type in the school (including this classroom and any other accessible areas).
3. Be prepared to share your responses in 15 minutes.

Checklist—Structural Hazards

- Walls are built of unreinforced masonry or cinderblocks.

- Building exit routes pass through arcades, canopies, or porch-like structures.

Columns supporting arcades or porches may fail, and roof overhangs may sag or fall.

- Building roofs have clay or slate tiles.

- The school building includes parapets, balconies, or cornices.

Roof tiles, parapets, balconies, cornices, and other facades and decorations may fall during an earthquake. If weakened, these components may fall even after the ground stops shaking.

The greatest danger exists directly outside building exits. Students should be cautioned to move quickly past these hazardous areas.

- There are one or more modular classroom buildings on the school campus.

Modular buildings may not be securely anchored to the ground.

- The building has elevators.

Elevators are extremely vulnerable to damage from earthquakes. Ground shaking may cause counterweights and other components to be torn from their connections, causing extensive damage to elevator cabs and operating mechanisms.

Post signs near elevators prohibiting their use in the event of fire and earthquakes.

Checklist—Nonstructural Hazards

Ceilings and Overhead Items:

- Suspended ceilings do not have diagonal bracing wires and tiles may fall.
- Light fixtures rest only in a ceiling grid without other support.
- Pendant light fixtures do not have safety cables.
- Enclosed hallways or stairs are lit only by electricity.
- Ductwork or large diameter pipes do not have diagonal bracing and could fall.
- Suspended items, such as displays and plants, do not have closed eye-hooks and cannot swing freely 45 degrees.
- Suspended space heaters or air conditioning units could fall.
- Masonry chimneys are not reinforced.
- Decorative ceiling panels or latticework is not securely attached.

Walls and Wall-Mounted Items:

- Windows and glass panels in hallways, doors, and display cases could shatter.
- Fire extinguishers are not secured.
- Fire sprinkler risers do not have v-braces to the wall.
- Free-standing and cubicle partitions are not secured.
- Ceiling-height walls are not secured.
- Wall-mounted televisions, monitors, and speakers are not secured.
- Wall-mounted objects such as clocks, maps, and artwork are not connected to structural framing.
- Shelving could fall.
- Lockers, bookshelves, and other storage units line hallways.

Furniture and Equipment:

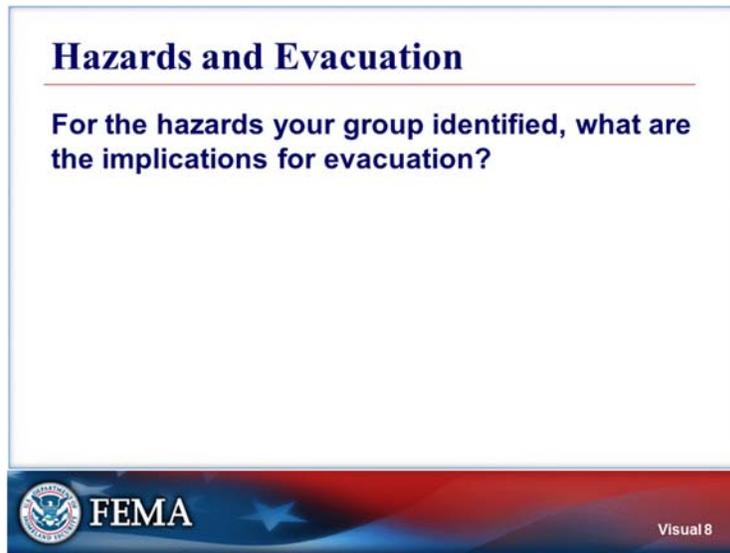
- Desks and tables may slide and block exits.
- Free-standing cabinets, bookcases, wall shelves, and office file cabinets are not secured.
- Drawers and cabinet doors do not have safety latches.
- There are heavy objects on high shelves.
- Computers and television monitors are not securely fastened.
- Aquariums and other potentially hazardous displays are unsecured and located near student seats.
- Laboratory chemicals are not isolated and restrained.
- Laboratory gas lines do not have flexible connections.
- Gas cylinders are not secured with a top and bottom strap or safety chain.
- Wheeled items, such as carts, whiteboards, or pianos, are not secured against rolling.
- Vending machines could topple.
- Shop and gym equipment could fall.
- Kitchen equipment, such as ovens, range hoods, refrigerators, and dishwashers, is unsecured.
- Appliances, such as water heaters, boilers, and furnaces, are not secured.
- Hazardous materials are stored by custodians and gardeners.
- Large, heavy equipment may fall or slide, blocking exits.

Exterior:

- Gas, sewer, or power lines are located near the outdoor assembly area.
- Decorations and statuary are not anchored.
- Fences or masonry walls are not reinforced.
- Large trees are in poor health and may fall.
- Signage is not adequately secured.

Topic	School Hazards (Continued)
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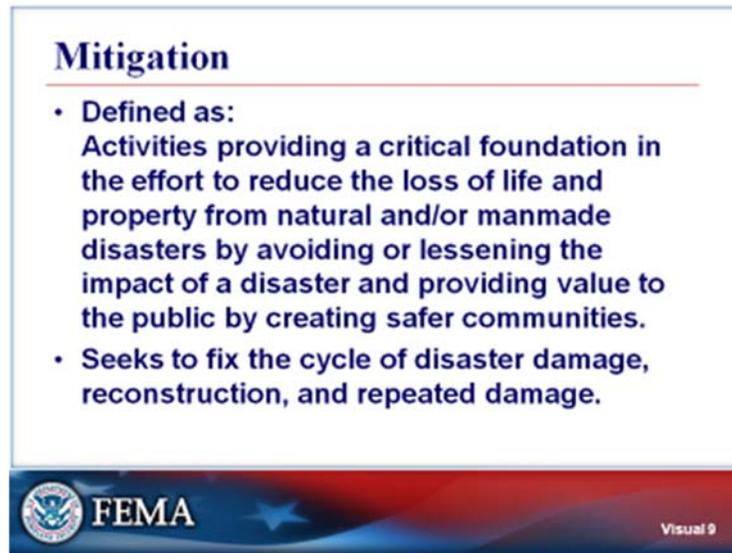
**Display
Visual 8**



Notes:

For your identified hazards, what are the implications for evacuation (e.g., blocked exits)?

Display
Visual 9



Mitigation

- **Defined as:**
Activities providing a critical foundation in the effort to reduce the loss of life and property from natural and/or manmade disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities.
- **Seeks to fix the cycle of disaster damage, reconstruction, and repeated damage.**

FEMA Visual 9

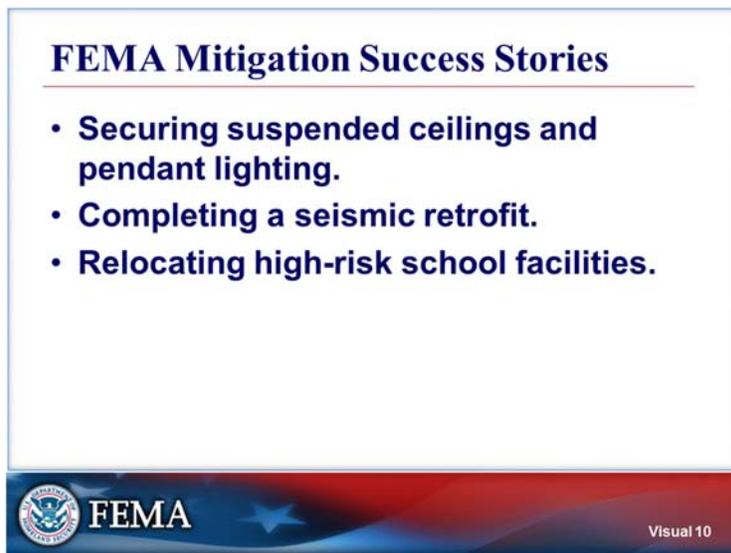
Notes:

Mitigation is defined as:

Activities providing a critical foundation in the effort to reduce the loss of life and property from natural and/or manmade disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities.

Mitigation seeks to fix the cycle of disaster damage, reconstruction, and repeated damage. These activities or actions, in most cases, will have a long-term sustained effect.

Display
Visual 10



Notes:

The FEMA Hazard Mitigation program can be instrumental in helping schools reduce the risks of damage and injury during earthquakes. The examples on the visual are described in more detail below and on the next pages.

Light Fixtures and Earthquakes: Protecting School Children

Los Angeles, CA - The Los Angeles Unified School District (LAUSD) is second in size only to the New York City School District. At present, the District is composed of over 900 schools, serving over 800,000 students, and employing 57,000 full-time and 24,000 part-time staff. The LAUSD provides public education services to a 708-square-mile area including the cities of Los Angeles, Bell, Carson, Cudahay, Gardenia, Huntington Park, Lomita, Maywood, San Fernando, South Gate, Vernon, and West Hollywood; portions of 18 other cities; and the unincorporated areas of Los Angeles County.

At the time of the 1994 Northridge Earthquake, the LAUSD facilities were illuminated with suspended ceilings and imbedded pendant lighting systems. These lights tend to fall from the ceiling when impacted by strong seismic motion. Hundreds of lighting units fell onto desks in the classrooms when the earthquake hit.

Fortunately, the earthquake occurred early in the morning when the schools were closed. As a result of this experience the LAUSD, with the support of FEMA, decided to undertake the seismic retrofitting or replacement of pendant lights to increase life safety, reduce the earthquake injury risk, and meet current building code standards.

Light Fixtures and Earthquakes: Protecting School Children (Continued)

In the Northridge Earthquake, 5,500 buildings owned by LAUSD were damaged, with total damages currently estimated at \$134 million. Under Section 406 of the Stafford Act, FEMA funded \$3.1 million for damaged, unbraced pendant ceiling and lights. In addition, \$45 million was obligated to mitigate unbraced pendant ceiling and light systems of the same design that were not damaged.

The reinforcement and/or replacement of the unbraced pendant lights in the Los Angeles Unified School District will reduce the high risk of injury to the more than 800,000 school children during the next earthquake event.

DHS Funds Seismic Retrofit For Tumwater School

Seattle, WA -- Secretary of Homeland Security Tom Ridge has approved an \$875,535 Hazard Mitigation Grant for Tumwater School District #33. According to Ridge, the funds will be used to retrofit the Littlerock Elementary School Multipurpose Building to better withstand structural damage from future earthquakes. "We know from damage sustained during the Nisqually Earthquake that the structure is susceptible to seismic stress," said Ridge. "This retrofit will strengthen the building and make children safer."

Acting Under Secretary of Homeland Security for Emergency Preparedness and Response and Director of the Federal Emergency Management Agency (FEMA), Michael D. Brown agrees. "If we needed a reminder that the Pacific Northwest is a seismically active region, the Nisqually Earthquake was that reminder. We all know it could have been much, much worse," said Brown. "No building can be made 'earthquake proof,' but hazard mitigation projects offer the peace of mind of providing school staff and school children alike, safer surroundings next time the earth moves."

Total project cost is \$875,535, with FEMA providing \$656,651, or 75 percent. The funds were made available through FEMA's Hazard Mitigation Grant Program (HMGP) administered by the Washington Emergency Management Division (WEMD). Local jurisdictions apply for grant aid through a competitive process that demonstrates high-hazard disaster risk and provides a cost-effective mitigation project that greatly reduces or eliminates the hazard.

On March 1, 2003, FEMA became part of the Department of Homeland Security, responsible for emergency preparedness and response. Regional offices are located in Boston, New York, Philadelphia, Atlanta, Chicago, Denton (Texas), Kansas City, Denver, San Francisco, and Seattle

Acquisition and Relocation from Multiple Hazards: Full Mitigation Best Practice Story

Los Angeles County, CA - After the 1994 Northridge Earthquake, the Castaic Union School District conducted a study of the earthquake-related risks. The District had 63 buildings that were a mix of permanent and portable structures with construction dating as far back as 1917, serving approximately 1,200 students and 115 staff. The San Andreas and San Gabriel fault systems, two of the most active faults in the Nation, pass through the District's area. The assessment revealed that earthquake-related damage was not the only risk.

Besides seismic damage, the study revealed two additional threats: flooding from the Castaic Dam (located only 1.7 miles upstream) and fire or explosion from a rupture in nearby oil pipelines (a 1925 gas-welded pipeline, and a 1964 modern arc-welded steel pipeline). If the dam were to fail, the 2,200-acre reservoir could release nearly 105 billion gallons of water, inundating the area below with 50 feet of water.

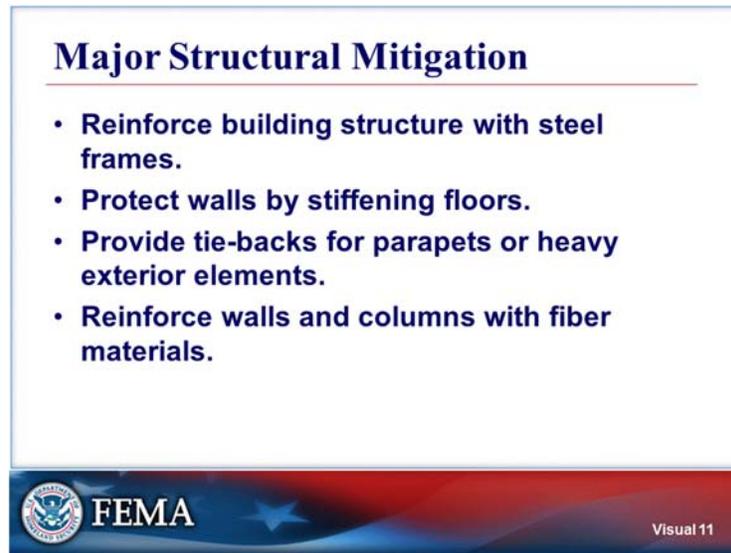
The potential economic costs from either a dam failure or an oil pipeline break following an earthquake were enormous. The first potential cost would be incurred from both building and content damage. Replacement of the school buildings would cost an estimated \$7.7 million in direct construction costs (1995 dollars). Second, if such an earthquake occurred, alternative school facilities would have to be located and rented at an estimated cost of over \$500,000 per year. Third, the community would have to absorb the costs of losing the educational services provided by the District in the time period between the actual loss of the facilities and the relocation to temporary facilities. The School District calculated the cost of the lost public services based on the operating expenses required to provide the services. The daily cost of lost educational services was estimated at \$28,601.

The District determined that the most feasible method to reduce their risks would be to condemn the structures on the old, high-risk site and relocate to a low-risk area. The location selected was completely out of the dam inundation area and far removed from the high-pressure oil pipelines, thus eliminating the risk posed by the dam and oil pipelines hazards. While the campus would still be within an active earthquake fault area, the new campus building would be constructed to fully conform to 1995 building code provisions.

The District then agreed to turn the land over to the Newhall County Water District. The old school property is located above two active wells, which the water district can use to supply their customers in Castaic. In doing so, they changed the property deed to restrict human habitation and development, and to return the site to natural open space.

The Castaic School District financed the relocation effort through a combination of the \$20 million generated by the sale of school bonds and a \$7.2 million grant through FEMA's Hazard Mitigation Grant Program for the market value of the property, including the existing structures and infrastructure. The District used this funding to rebuild the elementary and middle school, and district office, and to relocate the elementary school students into temporary buildings during the construction. The new middle school opened in the fall of 1996, and the new elementary school opened in August 1997.

Display
Visual 11



Major Structural Mitigation

- Reinforce building structure with steel frames.
- Protect walls by stiffening floors.
- Provide tie-backs for parapets or heavy exterior elements.
- Reinforce walls and columns with fiber materials.

FEMA Visual 11

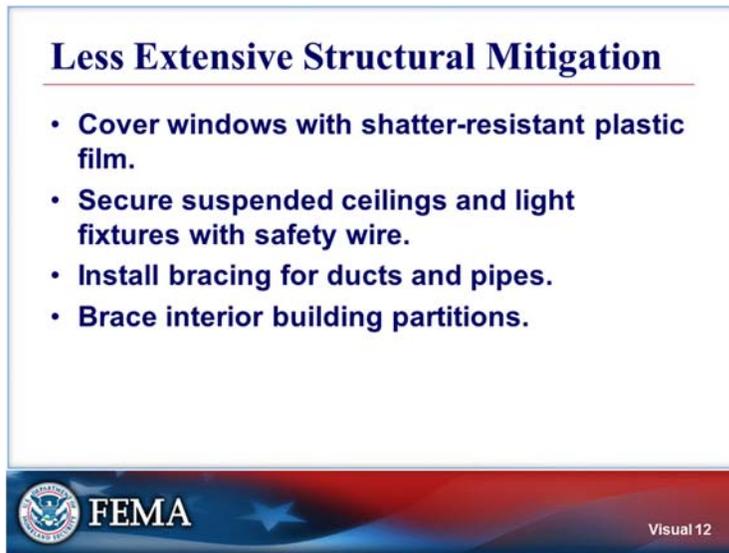
Notes:

Major structural hazard mitigation efforts are normally initiated at the district or other governmental entity level because of funding, logistical, and other constraints.

Teachers should:

- Recognize the structural hazards that affect their classrooms and evacuation routes.
- Be aware of the mitigation techniques that have been taken or are planned.
- Ensure that their preparedness measures take into account any structural hazards that have not yet been mitigated.

Display
Visual 12



Less Extensive Structural Mitigation

- **Cover windows with shatter-resistant plastic film.**
- **Secure suspended ceilings and light fixtures with safety wire.**
- **Install bracing for ducts and pipes.**
- **Brace interior building partitions.**

FEMA Visual 12

Notes:

Mitigation may include modification of smaller components of the building structure at the local or school level to minimize damage or injury. Teachers should be aware of these less extensive mitigation strategies that may have an impact directly on their classroom and/or students.

- During an earthquake, window frames can experience extreme shaking or distortions that trigger glass breakage.
 - Tempered glass is stronger than conventional glass and breaks into smaller, less dangerous fragments.
 - Adhesive film applied to existing windows can hold the glass fragments together, reducing damage and falling hazards.
- Suspended ceilings and overhead lighting fixtures typically fail where anchorage is poor, or the runners that support the panels and lights are too weak to withstand lateral earthquake forces.
 - Unbraced suspended ceilings can swing independently of the supporting floor and be damaged or fall.
 - Installing “four-way” diagonal wire bracing and compression struts can help mitigate this hazard.
- Aboveground utility pipelines and ducts are often inadequately braced or inadequately secured to their foundation structures. Like buildings and other facilities, utilities tend to be designed for vertical gravity loads.
 - The equipment anchorage and pipeline bracing may not be strong enough to carry the large lateral forces associated with earthquakes.
 - Additional bracing can help mitigate the hazard of falling pipes or ducts.

Mitigation Strategies (Continued)

- Interior building partitions, particularly non-load-bearing walls or partial walls, may not be well anchored to the building structure.
 - Additional anchors or bracing that more firmly connects partitions to the building structure can help mitigate the risk of interior partitions falling during an earthquake.

Display
Visual 13



Notes:

Nonstructural hazards can often be very easy and inexpensive to fix.

- Backup systems for vital equipment permit continued access to vital services. A Continuity of Operations (COOP) Plan is vital because it describes the staffing and resource requirements that would be needed to continue essential services and functions after a disaster.
- Moving furniture away from exits permits faster and easier evacuation because furniture does not need to be moved in order to exit the room.
- Chemical labs and custodial closets are notorious for having chemicals on shelving units. It's important to keep the contents on the shelves so that they won't fall, break open, and mix to cause an even more dangerous situation.
- Securing heavy objects and tall furniture are possible fixes and will be described in more detail on the next visuals.

Display
Visual 14



Notes:

Secure objects by bolting or strapping furnishings to the building structure.

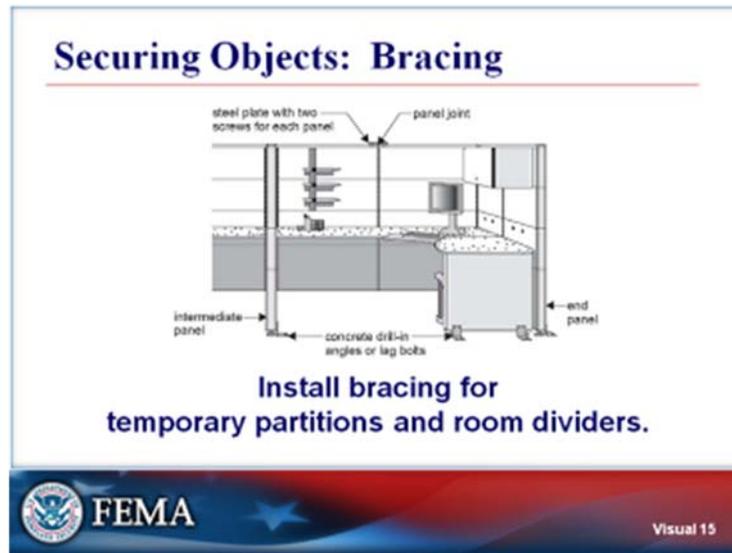
For instance, computers and small appliances can be easily tossed from a desk, table, or counter top. Other examples of dangerous loose items include:

- Televisions.
- Aquariums.
- Display cases.
- Bookcases.
- File cabinets.
- Lockers.

Gas cylinders should be strapped in place with a top and bottom safety chain.

Water heaters also need to be strapped in place. They are a common cause of fire because they are top heavy and the sloshing of the water inside the tank causes it to rock and fall over, breaking loose of the electrical or gas supply. There are strapping kits available for water heaters. In most areas prone to earthquakes, water heaters are required by building code to be strapped. Water heaters can also be an emergency source of drinking water, but only if they stay upright and secured.

Display
Visual 15



Notes:

Another means of securing loose objects is to install bracing. For instance, ensure that any temporary partitions and room dividers are secured.

Diagonal bracing should be installed for overhead ductwork or large-diameter pipes.

Florescent lighting and pendant lighting should be braced with safety wire and closed eye-hooks to allow them to swing freely 45 degrees.

Display
Visual 16



Notes:

Secure loose drawers and cabinet doors with positive latches. Positive latches prevent the drawers and cabinets from swinging open and can keep the contents from spilling out.

Spilled items can make evacuation more difficult or cause injury when falling from an overhead cabinet.

**Display
Visual 17****Notes:**

Another method to secure objects is the use of shelf lips or fences.

These items prevent the contents from sliding off the shelf. Some schools have added netting to the front of open shelving units to keep the contents on the shelves.

Display
Visual 18



Incremental Seismic Rehabilitation

- **Is a long-term plan to address earthquake vulnerabilities.**
- **Can coincide with scheduled improvements.**
- **Costs less than replacement.**
- **Allows use of the structure.**

FEMA Visual 18

Notes:

If you have identified earthquake vulnerabilities in your school structure, failure to take action is a high-risk proposition. Instead, determine whether to replace the structure or rehabilitate the structure.

The advantage of replacement is that it guarantees that the new facility will comply with the most current seismic regulations and standards. However, the high costs associated with this option are often prohibitive.

Rehabilitation is a cost-effective means to protect school buildings and, most importantly, the safety of students, teachers, staff, and volunteers.

If the rehabilitation is completed in a single stage, the risks are quickly mitigated and the benefits are quickly accomplished. However, the school structure may not be available for use during construction.

Therefore, many school districts choose an incremental approach. Incremental seismic rehabilitation is a long-term plan to upgrade structural elements. When possible, these upgrades are planned to coincide with scheduled repairs, maintenance, or improvements to help minimize additional costs. Disruption costs may be reduced if the structure can remain in use while repairs are implemented.

Display
Visual 19



Prioritizing Rehabilitation Efforts

- **Prioritize according to:**
 - **Structural benefit.**
 - **Alternate uses for the structure.**
 - **Ability to integrate with scheduled improvements.**
- **Once decided, document the overall rehabilitation plan.**

FEMA Visual 19

Notes:

The first step in an incremental seismic rehabilitation is to identify the earthquake vulnerabilities to be addressed.

Then, prioritize the rehabilitation efforts using the following guidelines:

- **Structural Benefits:** Generally, tasks should be prioritized according to their relative benefit to the overall earthquake resistance of the structures. Tasks that have the greatest benefit should be completed first.
- **Use of the Structure:** A second strategy for prioritizing rehabilitation efforts is to evaluate the use of the structures. School districts may plan alternative uses for vulnerable structures (e.g., as storage*) and expand the use of less vulnerable facilities for regular school activities.

*Note: While a non-earthquake-resistant building may be used for traditional storage, it is important to store academic records in a secure location to prevent them from being damaged or destroyed.

- **Ability to Integrate:** Another prioritization strategy is to determine which rehabilitation efforts can be integrated with standard repairs, maintenance, or improvements. This approach reduces the seismic rehabilitation costs by “sharing” some of the engineering, design, and construction expenses.

It is critical to document the stages of your incremental seismic rehabilitation. This documentation serves as a guide for implementation of the program and ensures that the school district does not lose sight of overall rehabilitation goals.

Display
Visual 20

Activity: Mitigating School Hazards

Instructions:

- **Locate the list of hazards your group identified in the previous activity.**
- **Work with your group to:**
 - **Determine the top three hazards.**
 - **Identify mitigation measures.**
- **Be prepared to share your responses in 10 minutes.**



Notes:

Purpose: This activity will enable you to determine mitigation strategies for the earthquake hazard(s) in your school building that were identified in the previous activity.

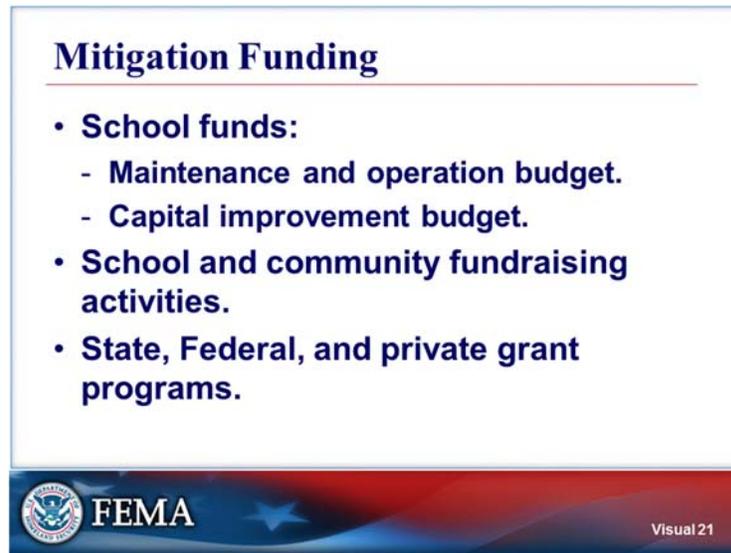
Estimated Time: 20 minutes (10 minutes activity + 10 minutes debrief)

Instructions:

- Locate the list of hazards your group identified in the previous activity.
- Work with your group to:
 - Determine the top three hazards.
 - Identify mitigation measures.
- Be prepared to share your responses in 10 minutes.

Topic**Mitigation Funding**

Display
Visual 21



Mitigation Funding

- **School funds:**
 - Maintenance and operation budget.
 - Capital improvement budget.
- **School and community fundraising activities.**
- **State, Federal, and private grant programs.**

 **FEMA**  Visual 21

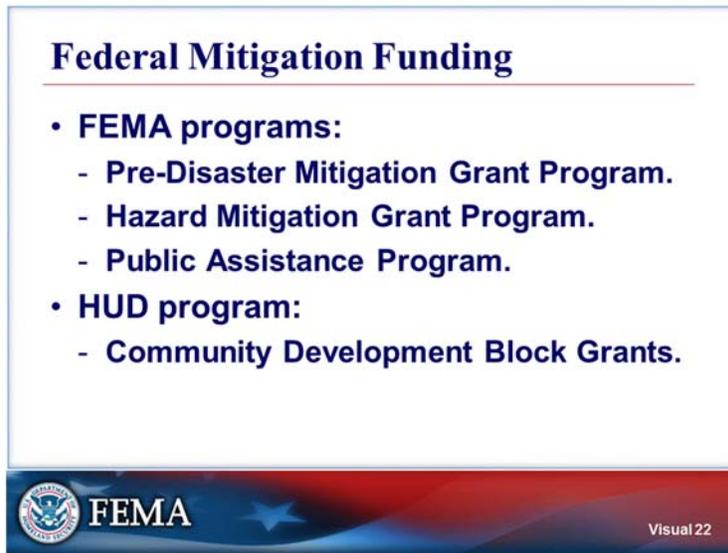
Notes:

Once your school has identified mitigation projects, the next step is to estimate the costs and identify funding opportunities.

Common funding sources are:

- The school's maintenance and operation funds for small projects, and capital improvement funds for large ones.
- School and community fundraising activities.
- State, Federal, and private grant programs.

Display
Visual 22



Notes:

Federal sources of mitigation funding include:

- **Pre-Disaster Mitigation (PDM) Grant Program:** The PDM program provides funds to States, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to State allocations, quotas, or other formula-based allocation of funds.
- **Hazard Mitigation Grant Program (HMGP):** The HMGP provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.
- **Public Assistance (PA) Program:** The PA program provides Federal aid to communities to help save lives and property in the immediate aftermath of a disaster, and to help rebuild damaged facilities. Grants cover eligible costs associated with the repair, replacement, and restoration of facilities owned by State or local governments and nonprofit organizations. The Public Assistance program is administered by FEMA.

Funding (Continued)

- **Community Development Block Grants (CDBG):** The CDBG program provides flexible grants to help cities, counties, and States recover from presidentially declared disasters, especially in low-income areas, subject to availability of supplemental appropriations. Grantees may use CDBG Disaster Recovery funds for recovery efforts involving housing, economic development, infrastructure, and prevention of further damage to affected areas, if such use does not duplicate funding available from the Federal Emergency Management Agency, the Small Business Administration, and the U.S. Army Corps of Engineers. The Department of Housing and Urban Development (HUD) provides funds for the CDBG, and the Division of Community Assistance administers the program in each State.

Topic

Additional Resources

Display
Visual 23



Notes:

FEMA's Hazard Mitigation Assistance (HMA) grant programs provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages. Information about the programs themselves and how to apply for funding can be found on this site.

The FEMA Web site also contains other mitigation resources, including:

- **Seismic Rehabilitation Cost Estimator** (online)
Use this free online program to calculate cost estimates for the seismic rehabilitation of buildings.
- **Incremental Seismic Rehabilitation of School Buildings (K-12): Providing Protection to People and Buildings** (FEMA 395, June 2003)
 - Part A: Critical Decisions for Earthquake Safety in Schools
 - Part B: Managing the Process for Earthquake Risk Reduction in Existing School Buildings
 - Part C: Tools for Implementing Incremental Seismic Rehabilitation in School Buildings
- **Design Guide for Improving School Safety in Earthquakes, Floods, and High Winds** (FEMA 424)
- **Reducing the Risks of Nonstructural Earthquake Damage, A Practical Guide** (FEMA 74)

- **Hazards-United States (Multi-Hazard) (HAZUS-HM)**
Use this risk assessment methodology to analyze potential losses from earthquakes. Potential loss estimates include physical damage, economic loss, and social impacts.

Topic Additional Resources (Continued)

Display
Visual 24



Notes:

The National Clearinghouse for Educational Facilities (NCEF) Web site is another valuable resource for mitigation information, including:

- **Mitigating Hazards in School Facilities.**

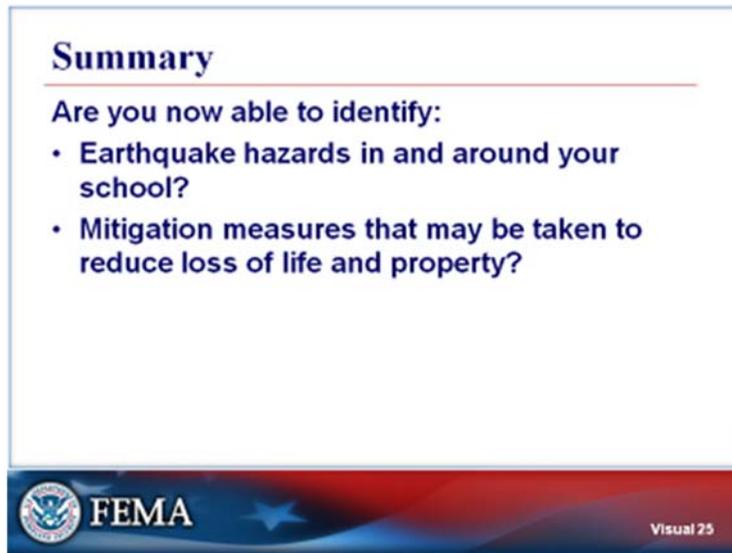
This NCEF publication describes a process for assessing the safety and security of school buildings and grounds, making a hazard mitigation plan, and implementing the plan. Steps include: select an assessment tool; assemble an assessment team; look at the record; perform the assessment; write up the results; create a standing committee on hazard mitigation; prepare a hazard mitigation plan; understand risk; weigh passive vs. active safety; select security technology with care; improve school climate; calculate costs, locate funding; seek input; coordinate hazard mitigation with crisis planning; start small, think big; justify thoroughly; meet regularly, advocate continually; and benefit mutually.

- **Safe School Facilities Checklist.**

This checklist combines the Nation's best school facility assessment measures into one online source for assessing the safety and security of school buildings and grounds. It includes over 400 measures covering school surroundings, school grounds, buildings and facilities, communications systems, building access control and surveillance, utility systems, mechanical systems, and emergency power. The checklist is updated frequently and may be used for planning and designing new facilities or assessing existing ones.

Topic	Unit Summary
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Display
Visual 25



Notes:

A structural engineer is your best resource for predicting how the building will perform in an earthquake and identifying appropriate mitigation actions.

Nonstructural hazards are easy to identify and are often easy to mitigate. Prioritize mitigation efforts based on life safety first. If you can't mitigate, revise your plan as needed to address the consequences of the hazards.

Are you now able to identify?

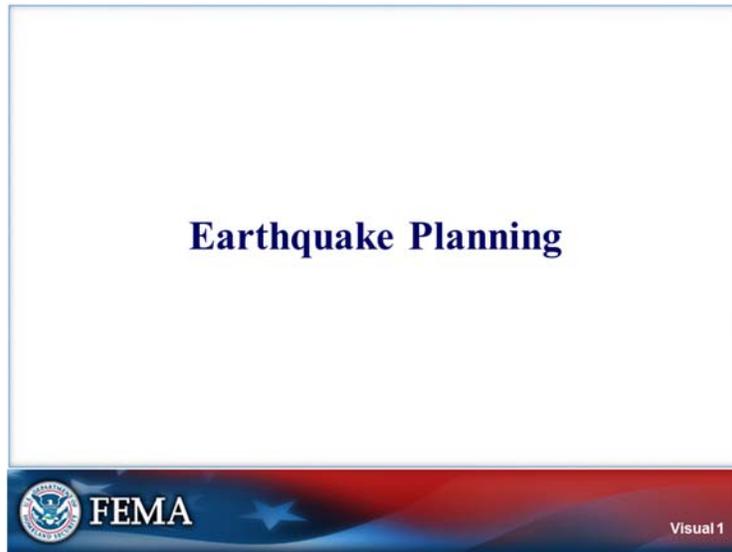
- The hazards in and around your school?
- Mitigation measures that can be taken?

Earthquake Planning

Topic

Unit Introduction

**Display
Visual 1**



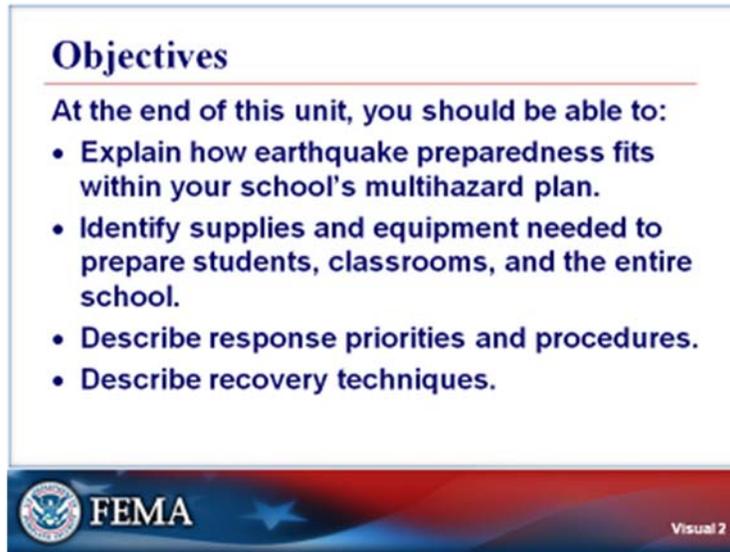
Notes:

Earthquake preparedness includes:

- Acquiring and storing supplies and equipment that might be needed after an earthquake.
- Developing procedures to carry out critical functions following an earthquake.
- Identifying strategies to help the school community recover from an earthquake.

Topic**Unit Introduction (Continued)**

Display
Visual 2



Objectives

At the end of this unit, you should be able to:

- Explain how earthquake preparedness fits within your school's multihazard plan.
- Identify supplies and equipment needed to prepare students, classrooms, and the entire school.
- Describe response priorities and procedures.
- Describe recovery techniques.

FEMA Visual 2

Notes:

Earthquake planning involves the development of strategies and procedures to be employed before, during, and after an incident.

At the end of this unit, you will be able to:

- Explain how earthquake preparedness fits within your school's multihazard plan.
- Identify supplies and equipment needed to prepare students, classrooms, and the entire school.
- Describe response priorities and procedures.
- Describe recovery techniques.

Topic**Emergency Operations Plan (EOP)****Display
Visual 3**

Your School's Emergency Operations Plan

- Your school should have a multihazard Emergency Operations Plan (EOP) that covers:
 - Natural hazards.
 - Technological hazards.
 - Human-caused hazards.
- Be prepared for multiple or cascading hazards.

CPG 101

FEMA

Visual 3

Notes:

The school, or school district, should have a multihazard Emergency Operations Plan (EOP), developed by a planning team of administrators, teachers and staff, parents, legal counsel, insurance representatives, the local/county Emergency Manager, first responders, and other community partners.

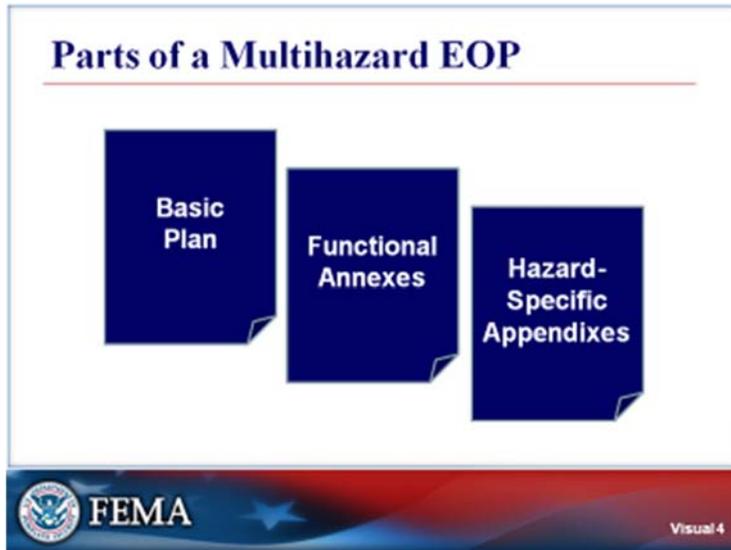
A thorough EOP covers the following types of hazards:

- **Natural hazards**, such as an earthquake, epidemic, flood, hurricane, tornado, tsunami, wildfire, or winter storm.
- **Technological hazards**, such as a hazardous materials (hazmat) release, radiological release, power failure, or urban fire.
- **Human-caused hazards**, such as civil disturbance, school violence, terrorist act, or sabotage.

The EOP should account for the fact that several types of hazards may happen simultaneously or in close succession. For instance, an earthquake may lead to power outages or looting.

For more information about the elements of a thorough EOP, review Comprehensive Preparedness Guide (CPG) 101, "Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans." This FEMA document is available online at www.fema.gov.

The general preparedness techniques outlined in this unit are for training purposes only! Refer to your school EOP and any State and local regulations for the official procedures to be followed in an emergency.

Topic**Emergency Operations Plan (EOP) (Continued)**Display
Visual 4

Notes:

A multihazard EOP contains three key components:

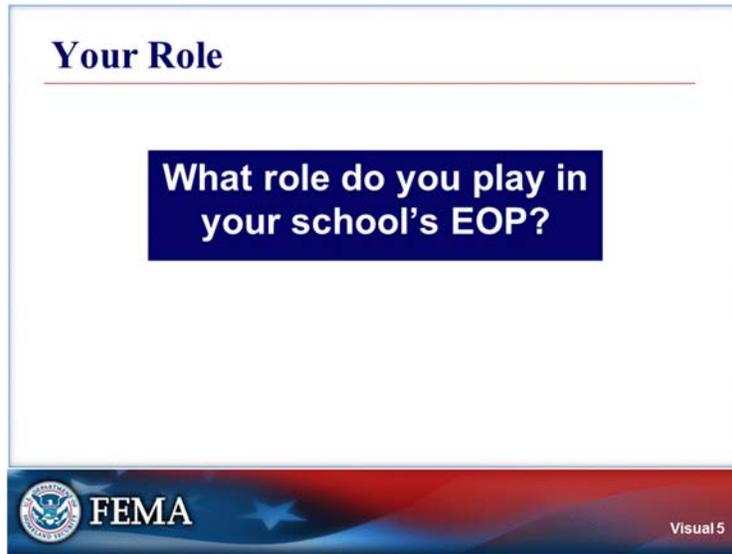
- **The Basic Plan** provides an overview of the school's preparedness and response strategies. It describes expected hazards, outlines roles and responsibilities, and explains how the school keeps the plan current.
- **The Functional Annexes** focus on the individual functions that are critical for successful emergency response. Each annex describes one function, defines the roles of the responsible parties, and addresses general strategies that can be used for any emergency incident. Examples of critical functions include direction, control, and coordination; information collection and dissemination; communications; population warning; emergency public information; public protection (e.g., evacuation, sheltering in place); mass care and emergency assistance; health and medical services; and resource management.
- **The Hazard-Specific Appendixes** describe preparedness and response activities for specific hazards. Each appendix addresses hazard-specific risks, preparedness strategies, evacuation procedures, and other protocols. These appendixes are typically attached to the end of each Functional Annex to explain procedures that are unique for that hazard type. These appendixes may be short or long, depending on the needed detail. Strategies already outlined in the Basic Plan or Functional Annex should not be repeated in the Hazard-Specific Appendix.

As a general rule, when gaps are identified, first determine if the gap can be addressed by updating the school policies in the Basic Plan or the procedures in a Functional Annex. If not, create or amend the Hazard-Specific Appendix.

This unit describes key factors to consider when creating earthquake-specific procedures.

Topic	Emergency Operations Plan (EOP) (Continued)
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Display
Visual 5

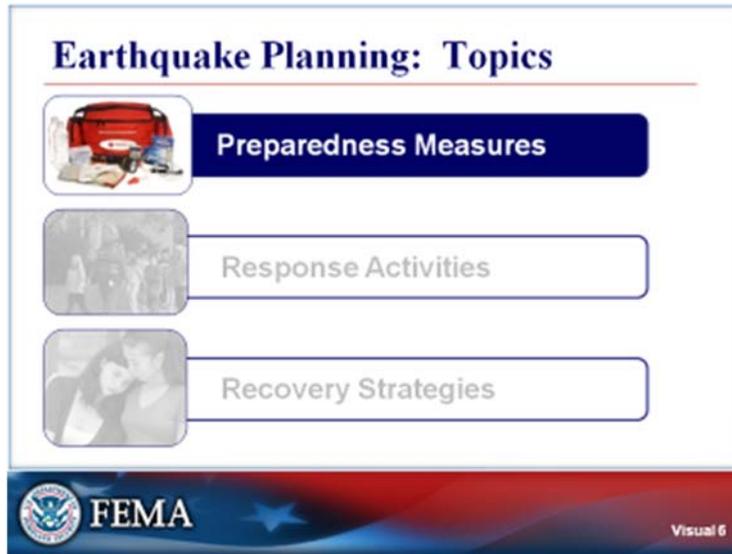


Notes:

What role do you play in your school's EOP?

Topic

Preparedness Measures

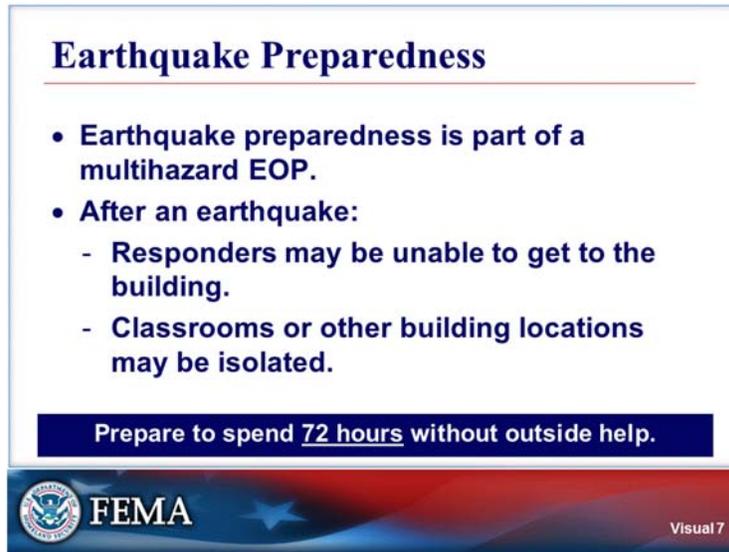
Display
Visual 6

Notes:

The topics in this unit are illustrated by the advance organizer on the visual and include:

- Preparedness measures.
- Response activities.
- Recovery strategies.

First, we will discuss the measures school districts, and individual teachers, can take to prepare for an earthquake at school.

Topic**Preparedness Measures (Continued)****Display
Visual 7**

Earthquake Preparedness

- Earthquake preparedness is part of a multihazard EOP.
- After an earthquake:
 - Responders may be unable to get to the building.
 - Classrooms or other building locations may be isolated.

Prepare to spend **72 hours** without outside help.

 **FEMA** 

Notes:

As you develop earthquake preparedness measures, you will work within the framework of your school's multihazard EOP. Earthquake-specific preparedness information should be integrated into appropriate components of the overall plan.

Remember that after an earthquake, the school must be prepared to care for students, staff, and volunteers for **up to 72 hours** without outside help. Responders may be unable to get to the building. Classrooms or other building locations may be isolated.

The checklist on the next page, adapted from the National Clearinghouse for Educational Facilities (NCEF), describes key considerations when assessing the earthquake-specific procedures in your EOP.

Mitigation and Preparedness Checklist

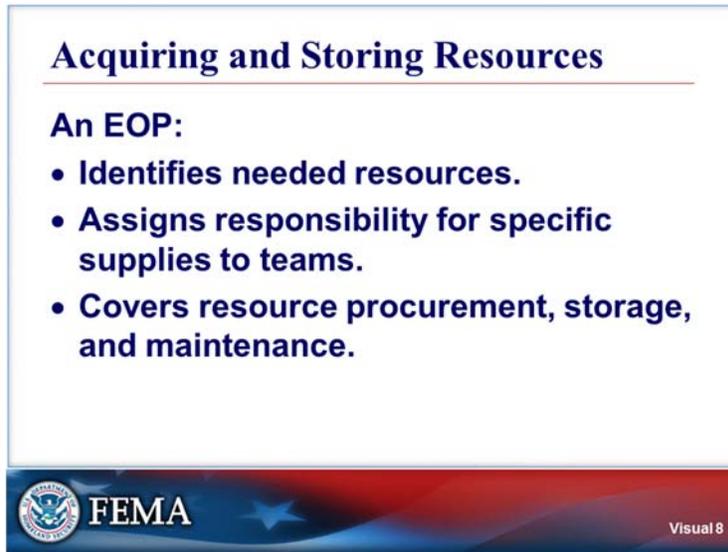
Use this checklist to determine how prepared your school is for earthquakes and to identify additional preparation that may be needed.

1. Does your school have a disaster plan? Is staff aware of roles and responsibilities? Do they know they may be responsible for students for up to 72 hours after a disaster?
2. Does staff know the location of the main gas, electricity, and water shutoff valves? Who has been instructed to turn them off if the need arises?
3. Have you prepared and distributed a map of the school and its grounds? Does it include evacuation procedures, potential earthquake hazards to avoid, and the locations and availability of emergency kits?
4. What nonstructural hazard mitigation measures have you completed?
5. Have inventories been made of hazardous chemicals (e.g., in the science building and maintenance shops)? Who is appointed to check these chemicals after an earthquake?
6. Does the school have arrangements with structural engineers or local contractors who will report to the school after a disaster to assess the damage and help determine whether to close the school?
7. Do you know if your school has been designated as a potential mass care shelter? If so, have you selected the space, determined its capacity, and planned how to obtain a post-earthquake safety inspection, how food and supplies will be provided, and how school operation will continue if space is occupied by survivors?
8. Does your school have a backup communications system to communicate with local emergency services? What will you do if cell phone service is unavailable?
9. Is there an earthquake preparedness program in your curriculum? Is it inclusive of special needs students (called "vulnerable populations" in some communities)? How is it communicated to students, staff, parents, and caregivers, including those whose primary language is not English?
10. How and where are you storing vital data and records? Do you have backups of important information stored off-site?
11. What is your plan for conducting classes if some school facilities are damaged?
12. Has a central "command post" (and alternate location) been identified for managing emergency response activities after a disaster?
13. Do classroom teachers have basic operating procedures to follow such as:
 - Knowing how to implement the basic "drop, cover, and hold" actions when an earthquake begins?
 - Having a file handy (i.e., "go kit") that contains a roll sheet, special medical information, and student release information?
 - Knowing when to evacuate or remain in the classroom after an earthquake?
 - Knowing how to triage and administer basic first aid to the injured and comfort those who are in shock, frightened, or hysterical?
 - Knowing what to do with the injured, if an evacuation is necessary?
 - Knowing the procedures for parent-student reunification?
 - Working in a "buddy system" with another teacher and class, so that if one teacher is injured the other can care for the students and get them to safety?
14. What are your immediate damage assessment procedures? To whom do you report that information?
15. Who has been designated for search and rescue, and have they received training?

Source: "Earthquakes and Schools," National Clearinghouse for Educational Facilities at the National Institute of Building Sciences (www.ncef.org), prepared under a grant from the U.S. Department of Education, Office of Safe and Drug-Free Schools.

Topic**Preparedness Measures (Continued)**

Display
Visual 8



Acquiring and Storing Resources

An EOP:

- **Identifies needed resources.**
- **Assigns responsibility for specific supplies to teams.**
- **Covers resource procurement, storage, and maintenance.**

 **FEMA** Visual 8

Notes:

An EOP identifies needed resources, such as:

- Medical supplies and equipment (e.g., asthma inhalers, epilepsy medication administered at school, equipment for special needs students).
- Tools and equipment (e.g., flashlight in every classroom).
- Drinking water and food.

Based on the needs identified in the EOP, the school or school district administration will determine what resources will be acquired or provided for each classroom and should notify teachers accordingly. If funding is limited, some school communities have organized fundraising events, worked with local businesses, or applied for grants to acquire the needed resources.

The school will then divide resources into categories and assign teams the responsibility for specific supplies and equipment. This responsibility should include procurement, storage, and maintenance of resources (including replacement, as needed, so they remain usable).

Topic**Preparedness Measures (Continued)****Display
Visual 9**

Activity: Resource Needs

Instructions:

- You will be assigned one of the following groups of students:
 - Special needs.
 - In an isolated classroom.
 - On a bus.
 - Sheltered outside.
- List resources that your assigned students may need after an earthquake.



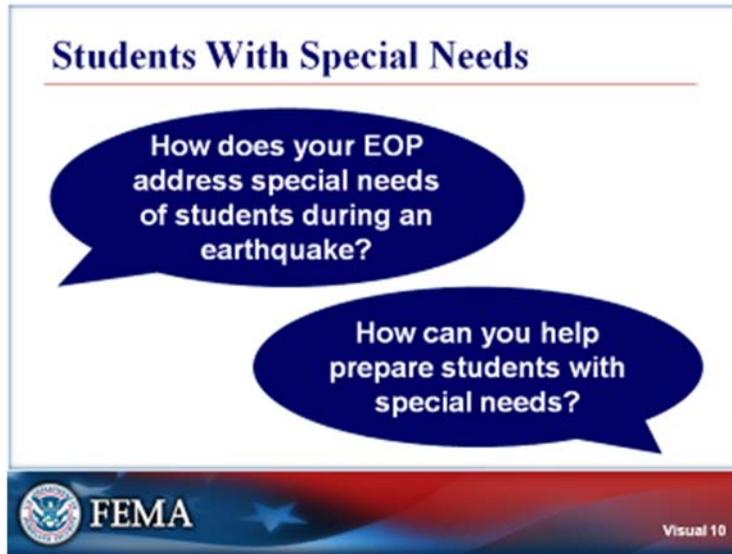
Notes:

Purpose: This activity will build awareness of needs that should be met after an earthquake.

Estimated Time: 10 minutes (5 minutes activity + 5 minutes debrief)

Instructions:

1. Work with your assigned group.
2. Review the following list of items that are commonly needed for classroom preparedness kits:
 - List of students, including a description of any special needs or medications administered at school (e.g., asthma inhalers, epilepsy medication).
 - School emergency procedures.
 - Utility turnoff procedures.
 - Food and water for 3 days.
 - Battery-operated flashlight and extra batteries.
 - Emergency communication device.
 - First aid kit with instructions.
 - Plastic sheeting and duct tape.
 - Blankets.
 - Bucket.
 - Sanitary items (e.g., towelettes, toilet paper).
 - Student activities.
3. Develop a list of additional, unique resources that may be needed for your assigned group of students after an earthquake.

Topic**Preparedness Measures (Continued)****Display
Visual 10**

Notes:

How does your school's EOP address special needs of students during an earthquake?

How can you help prepare students with special needs for an emergency, such as an earthquake?

Topic**Preparedness Measures (Continued)**

Display
Visual 11

Communicating Critical Information

Before an incident occurs, regularly inform staff, students, and parents of the following:

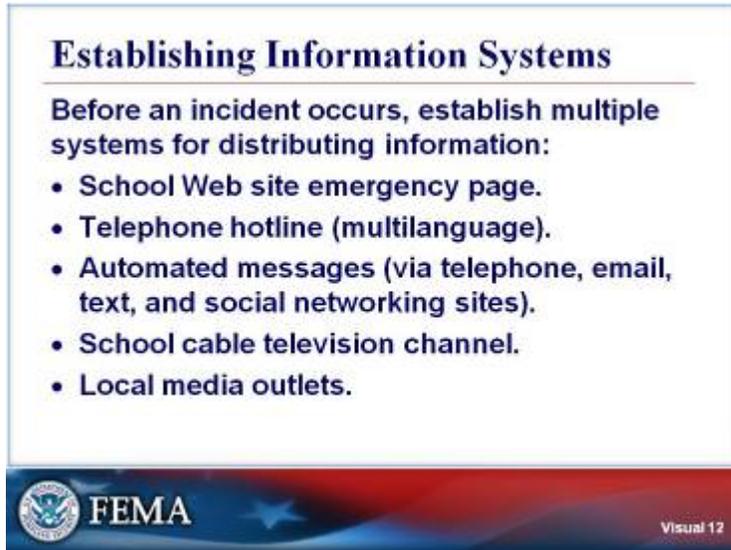
- **Emergency procedures.**
- **Reunification locations and procedures.**
- **Dates of planned practice drills.**
- **Procedures for:**
 - **Emergency contact cards.**
 - **Email notification lists.**



Notes:

Before an incident occurs, the school should inform staff, students, and parents on a regular basis about:

- Emergency procedures that the school will use in the event of an incident.
- Family reunification locations, an alternate location, and procedures that will be followed.
- Dates and time of practice drills and exercises.
- Procedures that should be used to:
 - Update emergency contact cards.
 - Subscribe to email notification lists or other means of communication.

Topic**Preparedness Measures (Continued)****Display
Visual 12**

Establishing Information Systems

Before an incident occurs, establish multiple systems for distributing information:

- School Web site emergency page.
- Telephone hotline (multilanguage).
- Automated messages (via telephone, email, text, and social networking sites).
- School cable television channel.
- Local media outlets.

FEMA Visual 12

Notes:

The EOP should establish multiple systems for distributing information during an incident because one or more of the primary methods of communication may no longer be available.

Potential communications systems include:

- The school Web site emergency page.
- A multilanguage telephone hotline.
- Automated messages including:
 - Telephone.
 - Email.
 - Text.
 - Social networking sites.
- The school cable television channel.
- Local media outlets.

Information can also be transmitted to parents and guardians via:

- "Back to school" night announcements.
- Parent-teacher conferences.
- Newsletters.
- Parent-Teacher Association (PTA) meetings.

Topic**Preparedness Measures (Continued)**

Display
Visual 13

Working With the Media

Before an Incident
Create a media plan. Identify key partners. Include public information in emergency training and exercises.

During an Incident
Follow a cycle (gather, verify, coordinate, disseminate). Disseminate only approved information. Keep the message concise and accurate. Never say, "No comment."

After an Incident
Evaluate and modify plans and training, as needed.

 **FEMA**  Visual 13

Notes:

The EOP should identify a staff member to serve as the school's spokesperson with the media. This person must understand and follow the procedures for validating emergency information with school officials, disseminating approved information, and handling requests for information.

Before an incident occurs:

- Create a plan that establishes protocols for working with the media.
- Determine who speaks for the school (e.g., Public Information Officer (PIO), school board chair).
- Develop processes to approve, disseminate (including the creation of a media list and a determination of the key languages spoken by school students and their families), track, and evaluate public information.
- Identify key partners (e.g., news media, PIOs from responder agencies).
- Include public information elements when conducting training and exercises related to the EOP.

During an incident:

- Follow a cyclical protocol: Gather information, verify information, coordinate information (internal), and disseminate information (external).
- Disseminate only approved information.
- Keep the message concise and accurate.
- Never say, "No comment." Instead, provide approved information, state that you will find an answer and report back, or refer the media to the appropriate person.

After an incident:

- Evaluate what went well and what you would do differently next time.
- Modify plans and training, as appropriate.

Display
Visual 14



Notes:

Prepare your home and family with:

- Food, water, and medications.
- Clothing and personal items.
- Important legal documents.
- Out-of-State point of contact.
- Portable radio with extra batteries.
- Money.
- Pet supplies, if applicable.
- Other items to be self-reliant for 72 hours.

Teachers play a vital role in ensuring the safety of students during and after an emergency incident, such as an earthquake. Teachers will likely be expected (and in some States or counties, legally required) to stay until the students have been safely reunited with their parents or guardians.

For peace of mind, knowing that you may not be able to return home immediately, you should prepare your own families with the items they'll need to be self-reliant during an incident.

Topic

Response Activities

Display
Visual 15



Notes:

As shown on the advance organizer on the visual, the second section of this unit will describe response activities that you should be prepared to complete during and immediately after an earthquake.

Topic**Response Activities (Continued)**

Display
Visual 16

Staff Roles and Responsibilities

The earthquake portion of your school's EOP should:

- **Establish a command structure consistent with NIMS and using ICS.**
- **Describe individual and team roles and responsibilities.**
- **Provide for checklists and access to supplies.**

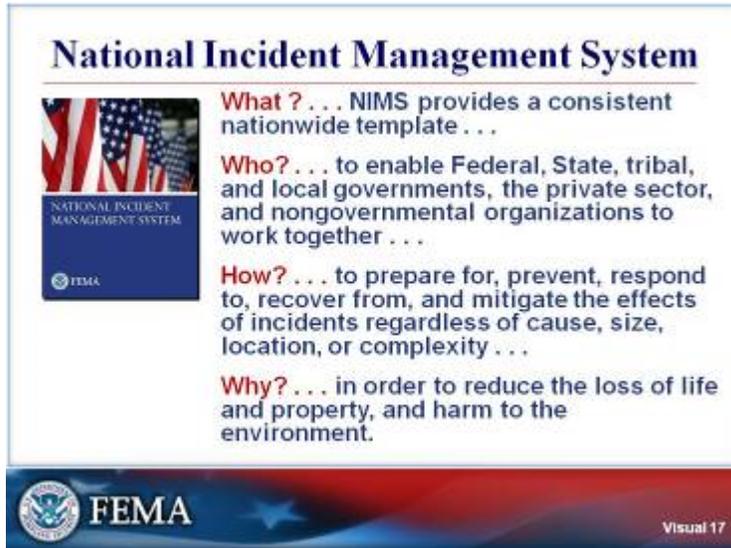


Notes:

Some portions of your school's multihazard emergency plan should specifically address earthquake roles and responsibilities.

The plan should:

- Establish a command structure consistent with the National Incident Management System (NIMS) and using the Incident Command System (ICS).
- Describe individual and team roles and responsibilities.
- Provide for procedural checklists and access to supplies and equipment needed by individuals and teams.

Topic**Response Activities (Continued)****Display
Visual 17**

National Incident Management System

What? . . . NIMS provides a consistent nationwide template . . .

Who? . . . to enable Federal, State, tribal, and local governments, the private sector, and nongovernmental organizations to work together . . .

How? . . . to prepare for, prevent, respond to, recover from, and mitigate the effects of incidents regardless of cause, size, location, or complexity . . .

Why? . . . in order to reduce the loss of life and property, and harm to the environment.

FEMA

Visual 17

Notes:

The National Incident Management System (NIMS) provides a consistent framework for incident management at all jurisdictional levels regardless of the cause, size, or complexity of the incident.

The NIMS document was developed through a collaborative intergovernmental partnership with significant input from the incident management functional disciplines, nongovernmental organizations (NGOs), and the private sector. Originally published on March 1, 2004, the NIMS document was revised in 2008 to reflect contributions from stakeholders and lessons learned during recent incidents.

The benefits of NIMS include:

- A standardized approach to incident management that is scalable and flexible.
- Enhanced cooperation and interoperability among responders.
- Comprehensive all-hazards preparedness.
- Efficient resource coordination among jurisdictions or organizations.
- Integration of best practices and lessons learned for continuous improvement.

Topic**Response Activities (Continued)****Display
Visual 18**

Collaborative Incident Management

NIMS:

- Is **NOT** an operational incident management or resource allocation plan.
- Represents a core set of doctrines, concepts, principles, terminology, and organizational processes
- Enables effective, efficient, and collaborative incident management.

The diagram shows a central box labeled "Collaborative Incident Management" with five arrows pointing towards it from the words: "Doctrines", "Terminology", "Principles", "Concepts", and "Processes".

FEMA

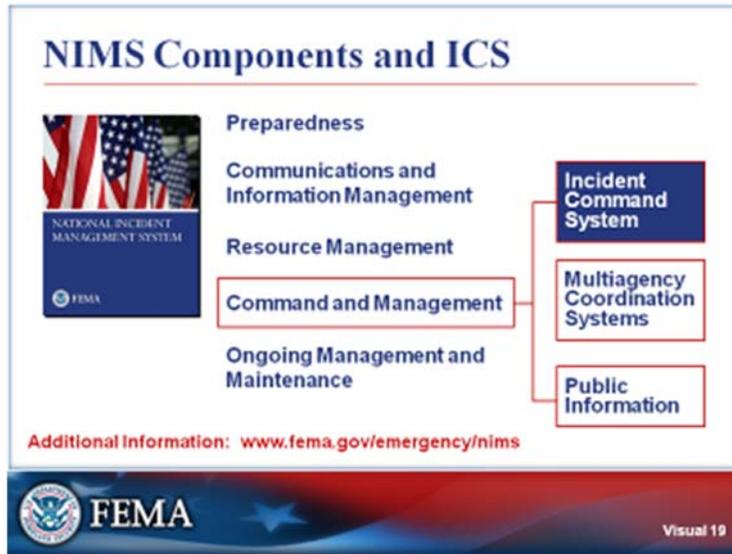
Visual 18

Notes:

NIMS is **not** an operational incident management or resource allocation plan.

NIMS represents a core set of doctrines, concepts, principles, terminology, and organizational processes that enables effective, efficient, and collaborative incident management.

NIMS is a comprehensive, national approach to incident management that is applicable at all jurisdictional levels and across functional disciplines. NIMS enables us to work together to prevent, protect against, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, in order to reduce the loss of life and property and harm to the environment.

Topic**Response Activities (Continued)****Display
Visual 19**

Notes:

- **Preparedness:** Effective emergency management and incident response activities begin with a host of preparedness activities conducted on an ongoing basis, in advance of any potential incident. Preparedness involves an integrated combination of planning, procedures and protocols, training and exercises, personnel qualifications and certification, and equipment certification.
- **Communications and Information Management:** Emergency management and incident response activities rely upon communications and information systems that provide a common operating picture to all command and coordination sites. NIMS describes the requirements necessary for a standardized framework for communications and emphasizes the need for a common operating picture. NIMS is based upon the concepts of interoperability, reliability, scalability, portability, and the resiliency and redundancy of communications and information systems.
- **Resource Management:** Resources (such as personnel, equipment, and/or supplies) are needed to support critical incident objectives. The flow of resources must be fluid and adaptable to the requirements of the incident. NIMS defines standardized mechanisms and establishes the resource management process to: identify requirements, order and acquire, mobilize, track and report, recover and demobilize, reimburse, and inventory resources.

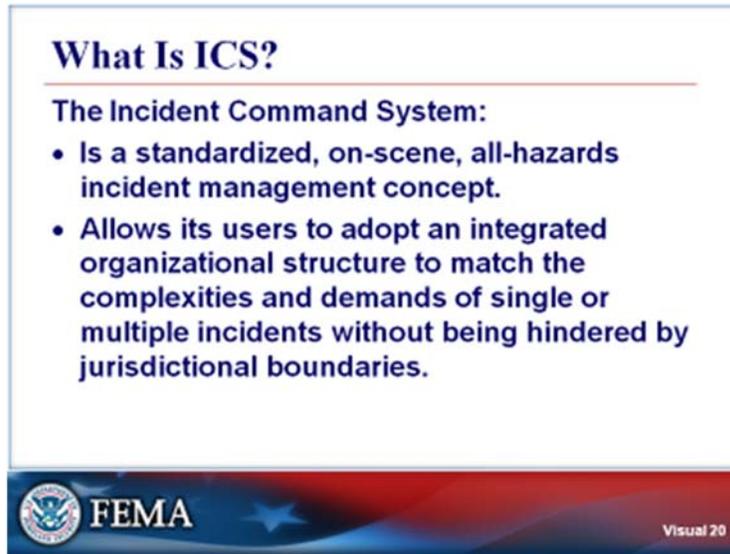
Topic	Response Activities (Continued)
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NIMS Components (Continued)

- **Command and Management:** The Command and Management component within NIMS is designed to enable effective and efficient incident management and coordination by providing flexible, standardized incident management structures. The structures are based on three key organizational constructs: the Incident Command System, Multiagency Coordination Systems, and Public Information.
- **Ongoing Management and Maintenance:** Within the auspices of Ongoing Management and Maintenance, there are two components: the National Integration Center (NIC) and Supporting Technologies.

Topic**Response Activities (Continued)**

Display
Visual 20



Notes:

The Incident Command System (ICS):

- Is based on proven incident management practices.
- Defines incident response organizational concepts and structures.
- Consists of procedures for managing personnel, facilities, equipment, and communications.
- Is used throughout the lifecycle on an incident (i.e., from threat to restoration of normal operations).

By using management best practices, ICS helps to ensure the safety of responders, students, faculty, workers, and others; the achievement of response objectives; and the efficient use of resources.

The use of ICS is mandated by NIMS.

A description of the essential ICS features begins on the next page.

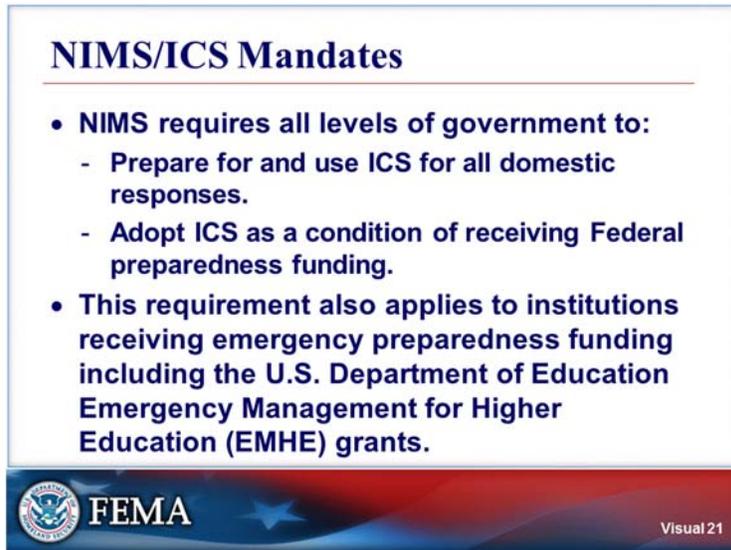
ICS Features

The 14 essential ICS features are listed below:

1. **Common Terminology:** Using common terminology helps to define organizational functions, incident facilities, resource descriptions, and position titles.
2. **Chain of Command and Unity of Command:** Chain of command refers to the orderly line of authority within the ranks of the incident management organization. Unity of command means that every individual has a designated supervisor to whom he or she reports at the scene of the incident. These principles clarify reporting relationships and eliminate the confusion caused by multiple, conflicting directives. Incident managers at all levels must be able to control the actions of all personnel under their supervision.
3. **Unified Command:** In incidents involving multiple jurisdictions, a single jurisdiction with multiagency involvement, or multiple jurisdictions with multiagency involvement, Unified Command allows agencies with different legal, geographic, and functional authorities and responsibilities to work together effectively without affecting individual agency authority, responsibility, or accountability.
4. **Modular Organization:** The Incident Command organizational structure develops in a top-down, modular fashion that is based on the size and complexity of the incident, as well as the specifics of the hazard environment created by the incident.
5. **Management by Objectives:** Includes establishing overarching objectives; developing and issuing assignments, plans, procedures, and protocols; establishing specific, measurable objectives for various incident management functional activities; and directing efforts to attain the established objectives.
6. **Reliance on an Incident Action Plan:** Incident Action Plans (IAPs) provide a coherent means of communicating the overall incident objectives in the contexts of both operational and support activities.
7. **Manageable Span of Control:** Span of control is key to effective and efficient incident management. Within ICS, the span of control of any individual with incident management supervisory responsibility should range from three to seven subordinates.
8. **Incident Locations and Facilities:** Various types of operational locations and support facilities are established in the vicinity of an incident to accomplish a variety of purposes. Typical predesignated facilities include Incident Command Posts, Bases, Camps, Staging Areas, Mass Casualty Triage Areas, and others as required.

ICS Features (Continued)

9. **Comprehensive Resource Management:** Resource management includes processes for categorizing, ordering, dispatching, tracking, and recovering resources. It also includes processes for reimbursement for resources, as appropriate. Resources are defined as personnel, teams, equipment, supplies, and facilities available or potentially available for assignment or allocation in support of incident management and emergency response activities.
10. **Information and Intelligence Management:** The incident management organization must establish a process for gathering, sharing, and managing incident-related information and intelligence.
11. **Integrated Communications:** Incident communications are facilitated through the development and use of a common communications plan and interoperable communications processes and architectures.
12. **Establishment and Transfer of Command:** The command function must be clearly established from the beginning of an incident. When command is transferred, the process must include a briefing that captures all essential information for continuing safe and effective operations.
13. **Accountability:** Effective accountability at all jurisdictional levels and within individual functional areas during incident operations is essential. To that end, the following principles must be adhered to:
 - Check-In: All responders, regardless of agency affiliation, must report in to receive an assignment in accordance with the procedures established by the Incident Commander.
 - Incident Action Plan: Response operations must be directed and coordinated as outlined in the IAP.
 - Unity of Command: Each individual involved in incident operations will be assigned to only one supervisor.
 - Span of Control: Supervisors must be able to adequately supervise and control their subordinates, as well as communicate with and manage all resources under their supervision.
 - Resource Tracking: Supervisors must record and report resource status changes as they occur.
14. **Dispatch/Deployment:** Personnel and equipment should respond only when requested or when dispatched by an appropriate authority.

**Display
Visual 21**

NIMS/ICS Mandates

- **NIMS requires all levels of government to:**
 - **Prepare for and use ICS for all domestic responses.**
 - **Adopt ICS as a condition of receiving Federal preparedness funding.**
- **This requirement also applies to institutions receiving emergency preparedness funding including the U.S. Department of Education Emergency Management for Higher Education (EMHE) grants.**

 **FEMA** Visual 21

Notes:

Adopting ICS and NIMS is a condition of receiving Federal preparedness funding and certain grants.

ICS will help you implement Federal, State, and local mandates and is a requirement for receiving emergency preparedness funding, such as the U.S. Department of Education Emergency Management for Higher Education (EMHE) grants.

According to the National Integration Center, “institutionalizing the use of ICS” means that government officials, incident managers, and emergency response organizations at all jurisdictional levels must adopt the Incident Command System. Actions to institutionalize the use of ICS take place at two levels:

- **Policy Level:** At the policy level, institutionalizing ICS means government officials (i.e., Governors, mayors, county and city managers, tribal leaders, and others) must:
 - Adopt ICS through executive order, proclamation, or legislation as the jurisdiction's official incident response system; and
 - Direct that incident managers and response organizations in their jurisdictions train, exercise, and use ICS in their response operations.
- **Organizational Level:** At the organizational/operational level, evidence that incident managers and emergency response organizations are institutionalizing ICS would include the following:
 - ICS is being integrated into functional and system-wide emergency operations policies, plans, and procedures.
 - ICS training is planned or underway for responders, supervisors, and command-level officers.
 - Responders at all levels are participating in and/or coordinating ICS-oriented exercises that involve responders from multiple disciplines and jurisdictions.

Topic**Response Activities (Continued)**

Display
Visual 22

Incident Command

The Incident Commander's role is to:

- Manage the incident at the scene.
- Keep officials informed on all important matters pertaining to the incident.

The most qualified person at the scene assumes command until a more qualified responder arrives.

 **FEMA**  Visual 22

Notes:

The most qualified person at the scene assumes command, as the Incident Commander, until a more qualified responder arrives to assume command (e.g., firefighters, emergency medical technicians (EMTs), or law enforcement officers). It is quite possible that the Incident Commander may not be the highest ranking official on scene.

The Incident Commander is the primary person in charge at the incident. In addition to managing the incident scene, he or she must keep officials in the Executive Policy Group informed and up to date on all important matters pertaining to the incident.

The ICS hierarchy of command must be maintained. Not even executives and senior officials can bypass the system.

The Incident Commander is responsible for all ICS management functions until he or she delegates the function.

Topic**Response Activities (Continued)**

Display
Visual 23

Executives

The school executives provide the following to the Incident Commander:

- Policy Direction.
- Mission Support (Resources).
- Authority To Make Decisions.

To maintain the unity of command and safety of responders, do NOT bypass the chain of command.

FEMA

Visual 23

Notes:

All incident responses begin by establishing command, and the chain of command is critical.

Chain of command is an orderly line of authority within the ranks of the incident management organization. It allows incident managers to direct and control the actions of all personnel under their supervision and avoids confusion by requiring that orders flow from supervisors.

Chain of command does not prevent personnel from directly communicating with each other to ask for or share information.

Following the ICS chain of command, the school executives (e.g., principals, superintendents, school board) provide the following to the Incident Commander:

- Policy Direction.
- Mission Support (Resources).
- Authority To Make Decisions.

Topic**Response Activities (Continued)**

Display
Visual 24

Incident Objectives

Incident objectives are established based on the following priorities:

- #1: Life Safety.
- #2: Incident Stabilization.
- #3: Property Preservation.

What additional priorities are critical for managing school incidents?

FEMA

Visual 24

Notes:

As educators, you understand the value of learning objectives. Incident objectives are used to ensure that everyone within the ICS organization has a clear understanding of what needs to be accomplished.

Priorities for incident objectives are:

- 1: Life Safety.
- 2: Incident Stabilization.
- 3: Property/Environmental Preservation.

What additional priorities are critical for managing school incidents?

Topic	Response Activities (Continued)
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Display
Visual 25

Scenario: Earthquake

Scenario:
Several minutes ago, an earthquake occurred. One teacher and an aide, who is certified in first aid and CPR, were not injured but are isolated in a damaged part of the building with students and no other faculty or staff.

Who should take command of the incident scene?

FEMA

Visual 25

Notes:

Review the following scenario:

Several minutes ago, an earthquake occurred. One teacher and an aide, who is certified in first aid and cardiopulmonary resuscitation (CPR), were not injured but are isolated in a damaged part of the building with students and no other faculty or staff.

Who should take command of the incident scene?

Topic**Response Activities (Continued)**

Display
Visual 26



Notes:

Organization Chart Description: The top of the organization chart is Incident Command. Underneath are the Command Staff: the Public Information Officer, the Safety Officer, and the Liaison Officer. Command Staff provide information, safety, and liaison services for the entire organization. Below them are the General Staff: Operations Section, Planning Section, Logistics Section, and Finance/Admin Section. General Staff are delegated functional responsibilities.

As incidents grow, the Incident Commander may delegate authority for performance of certain activities to the Command Staff and the General Staff.

The Incident Commander will add positions only as needed.

In ICS, the following personnel comprise the Command Staff:

- **Public Information Officer**, who serves as the conduit for information to internal and external stakeholders, including the media or parents.
- **Safety Officer**, who monitors safety conditions and develops measures for assuring the safety of all response personnel.
- **Liaison Officer**, who serves as the primary contact for supporting agencies assisting at an incident.

Topic	Response Activities (Continued)
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Display
Visual 27



Notes:

The **Incident Commander** is responsible for establishing incident objectives.

The General Staff includes:

- **Operations Section Chief**, who is responsible for managing all tactical operations at an incident. The Incident Action Plan provides the necessary guidance. The need to expand the Operations Section is generally dictated by the number of tactical resources involved and is influenced by span of control considerations.
- **Planning Section Chief**, who is responsible for providing planning services for the incident. Under the direction of the Planning Section Chief, the Planning Section collects situation and resources status information, evaluates it, and processes the information for use in developing action plans. Dissemination of information can be in the form of the Incident Action Plan, in formal briefings, or through map and status board displays.
- **Logistics Section Chief**, who provides all incident support needs with the exception of logistics support to air operations.
- **Finance/Administration Section Chief**, who is responsible for managing all financial aspects of an incident. Not all incidents will require a Finance/Administration Section. Only when the involved agencies have a specific need for finance services will the Section be activated.

In an expanding incident, the Incident Command first establishes the Operations Section. The remaining Sections are established as needed to support the operation.

Display
Visual 29

Earthquake-Specific Response

Your EOP should address any earthquake-specific risks during:

- **Evacuation.**
- **Reverse evacuation.**
- **Lockdown.**
- **Lockout/Modified lockdown.**
- **Shelter in place.**
- **Parent-student reunification.**

FEMA

Visual 29

Instructor Notes: Present the following key points.

If not covered in the EOP Basic Plan or Functional Annexes, any earthquake-specific procedures should be addressed in Hazard-Specific Appendixes.

For instance, ensure that the EOP addresses any unique risks associated with earthquakes for the procedures below.

- **Evacuation:** Vacating the building and accounting for students, staff, and volunteers at a designated assembly area.
- **Reverse evacuation:** Bringing all persons inside the building when outdoor conditions are more dangerous than indoors.
- **Lockdown:** Securing students, staff, and volunteers inside the building for an immediate threat to the school or its occupants (keeping students and staff in place).
- **Lockout/Modified lockdown:** Securing students, staff, and volunteers inside the building for potential threats in the area of the school (but allowing for normal classroom activities).
- **Shelter in place:** Identifying a location (indoor or outdoor) and the resources required for students and staff to stay for an extended time, including overnight.
- **Parent-student reunification:** Establishing policy and procedures for reuniting students with their parents or guardians (e.g., reunification location; requirements, such as photo identification and signatures; and procedures).

Earthquake-specific considerations for each of these procedures will be described on the next visuals.

Topic	Response Activities (Continued)
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Display
Visual 30

During an Earthquake

Indoors
Drop, cover, and hold. Avoid items that could break or fall.

Outdoors
Move to an open area, drop, and cover your face and head with your arms.

In a Vehicle
Stop and stay in the vehicle. Cover your face and head with your arms.

If Trapped
Do not move about or light matches/candles. Cover your mouth. Avoid shouting.



Notes:

During an earthquake, the first step is to remain calm. Having a plan and practicing it with your students will help them stay calm, too. Minimize your movements to a few steps to a nearby safe place and follow the recommendations below.

If Indoors:

- **DROP** to the ground, take **COVER** by getting under a sturdy table or other piece of furniture, and **HOLD** on to the furniture to keep it over you until the shaking stops. If there isn't a table or desk near you, cover your face and head with your arms and crouch in an inside corner of the building.
- Stay away from glass, windows, outside doors and walls, and anything that could fall, such as lighting fixtures or furniture.
- Stay inside until shaking stops and it is safe to go outside. Research has shown that most earthquake injuries occur when people inside buildings attempt to move to a different location inside the building or try to leave.
- Be aware that electricity may go out or the sprinkler system or fire alarm may turn on.
- DO NOT use the elevators.

If Outdoors:

- Stay there.
- Move away from buildings, streetlights, and utility wires.
- Once in the open, drop to the ground and cover your face and head with your arms. The greatest danger exists directly outside buildings, at exits, and alongside exterior walls. Many of the 120 fatalities from the 1933 Long Beach earthquake occurred when people ran outside of buildings only to be killed by falling debris from collapsing walls. Ground movement during an earthquake is seldom

Topic	Response Activities (Continued)
-------	---------------------------------

If Outdoors: (Continued)

the direct cause of death or injury. Most earthquake-related casualties result from collapsing walls, flying glass, and falling objects.

If in a Moving Vehicle:

- Stop as quickly as safety permits and stay in the vehicle.
- Avoid stopping near or under buildings, trees, overpasses, and utility wires.
- Cover your face and head with your arms.
- Proceed cautiously once the earthquake has stopped. Avoid roads, bridges, or ramps that might have been damaged by the earthquake.

If Trapped Under Debris:

- Do not move about, kick up dust, or light matches/candles.
- Cover your mouth with a handkerchief or clothing.
- Tap on a pipe or wall so rescuers can locate you. Use a whistle if one is available. Shout only as a last resort. Shouting can cause you to inhale dangerous amounts of dust.

Topic**Response Activities (Continued)****Display
Visual 31**

Evacuation After an Earthquake

- Evacuate school buildings.
- Provide first aid.
- Assemble in designated areas.
- Account for all students, staff, and volunteers.
- Provide identification tags.



Provide simple checklists

 **FEMA**  Visual 31

Notes:

Your EOP's Basic Plan and Functional Annexes should address standard evacuation procedures, such as:

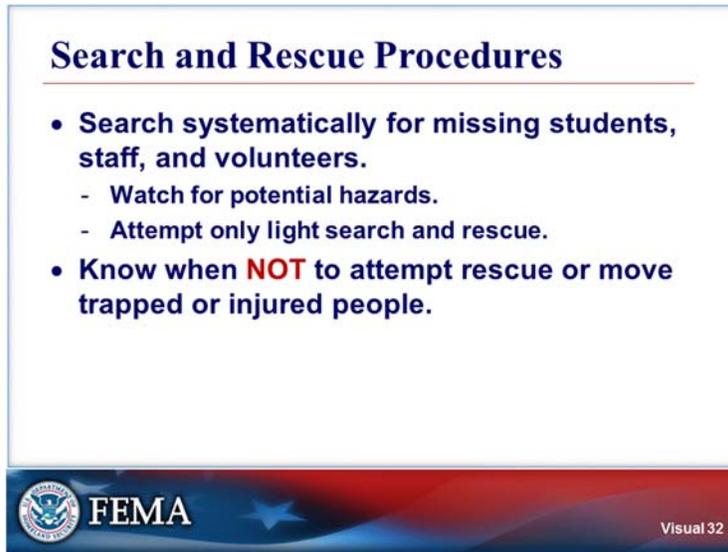
- Evacuating school buildings, unless it is not safe to do so.
- Providing basic first aid and triaging, or prioritizing medical treatment based on the nature of the injuries.
- Assembling in predesignated areas, including separate areas by class or other grouping and a designated first aid/medical area.
- Accounting for all students, staff, and volunteers.
- Providing student identification tags.

It is critical to post clear signs and simple checklists that describe evacuation procedures.

Given the structural damage that is likely after an earthquake, do your procedures adequately describe alternatives for evacuation routes and assembly areas?

Topic**Response Activities (Continued)**

Display
Visual 32



Search and Rescue Procedures

- Search systematically for missing students, staff, and volunteers.
 - Watch for potential hazards.
 - Attempt only light search and rescue.
- Know when **NOT** to attempt rescue or move trapped or injured people.

FEMA Visual 32

Notes:

If any staff, students, or volunteers are missing, a designated and trained search and rescue team should search systematically to locate them, following procedures to ensure that closets, stairwells, or other areas of the building are not overlooked.

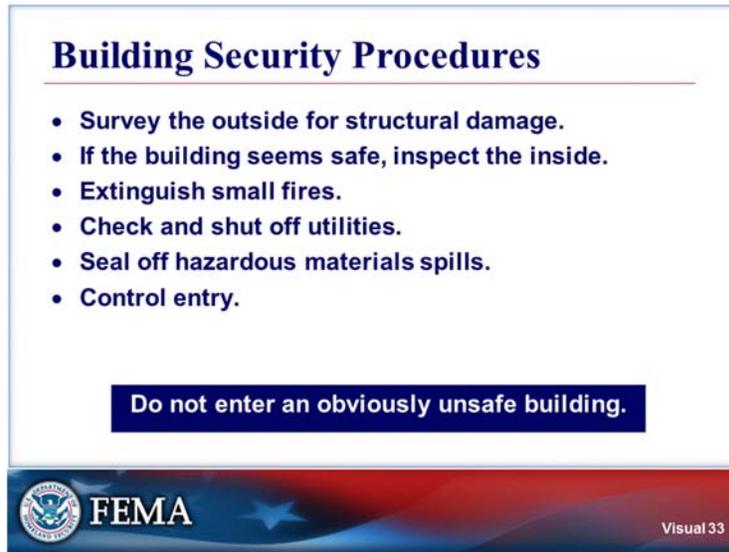
- Attempt only light rescue, and know not to attempt a rescue that endangers rescuers.
- Watch for potential hazards such as live electrical wires, flooding, tsunamis, landslides, fire, and aftershocks.

Know when not to move trapped or injured people, who might suffer further injury if moved by an untrained person. **Do not move injured people unless you have specialized training, or they are still in danger.**

As part of your school's emergency preparedness and mitigation efforts, form partnerships with the local or county Emergency Manager and emergency responders (e.g., police, fire, and emergency medical teams). Invite these partners to the school to familiarize them with the layout and learn more about potential hazards or preparedness strategies. For instance, firefighters or EMTs can demonstrate techniques to assist an injured or trapped person until trained help arrives (e.g., using a wedge to prevent further injury if someone is trapped under a bookcase).

Topic**Response Activities (Continued)**

Display
Visual 33



Building Security Procedures

- Survey the outside for structural damage.
- If the building seems safe, inspect the inside.
- Extinguish small fires.
- Check and shut off utilities.
- Seal off hazardous materials spills.
- Control entry.

Do not enter an obviously unsafe building.

 **FEMA**  Visual 33

Notes:

The safety and security of school buildings is an important concern.

To begin, survey the outside of building(s) for structural damage. No one should enter if a building is obviously unsafe. If the building seems safe, inspect the inside for signs of structural damage. EOP procedures should include instructions and diagrams for judging structural damage.

Other safety measures include:

- Extinguish small fires.
- Check and shut off utilities.
 - The EOP should include utility locations and shutoff instructions.
 - Check natural gas, water, and electrical lines for damage. Shut off these utilities if you suspect a leak. Do not use the telephone, light switches, matches, candles, or other open flame unless you are absolutely certain there is not natural gas leaking.
 - Do not touch electrical power lines or broken electrical equipment.
- Seal off hazardous materials spills.
- Control entry to the building.
 - Lock external gates and doors.
 - Be sure locked doors can be opened from the inside to prevent entrapment.
 - Station a team member at the front gate or door to deal with parents and others in the community.
 - Have the team member route fire, police, fire, search and rescue, and medical responders to areas of need.

Topic**Response Activities (Continued)**

Display
Visual 34

Communication Disruptions

- Normal means may be disrupted.
- Ensure that backup communication equipment is available.

What backup communication equipment is recommended in your school EOP?

FEMA

Visual 34

Notes:

Following an earthquake, normal means of communication may be partially or totally disrupted.

Possible backup means of communication include:

- Emergency backup power for the intercom system.
- A battery-powered bullhorn or megaphone.
- Battery-powered portable radios, or car radios, to receive information from emergency officials.
- Battery-powered walkie-talkies to communicate with groups in the outdoor assembly area and with search and rescue teams.
- Signaling devices, such as whistles.
- Satellite phones.
- Ham radio operators.

Your school may have a backup radio communications system, or may arrange communications support from ham radio operators.

What backup communication equipment is recommended in your school EOP?

Topic**Response Activities (Continued)**

Display
Visual 35

Unsafe Outdoor Conditions

If conditions inside the building are safer than outside, follow EOP procedures for:

- Reverse evacuation.
- Lockdown.
- Lockout/Modified lockdown.



 **FEMA**  Visual 35

Notes:

After an earthquake, it is possible that conditions inside the building may be safer than outside. For instance, an earthquake may have caused minimal structural damage to the building, but downed power lines on the school property.

In such cases, follow EOP procedures for:

- **Reverse evacuation** to bring students, staff, and volunteers indoors.
- **Lockdown** to secure the building and keep students, staff, and volunteers in place.
- **Lockout/Modified lockdown** to secure the building, but continue with normal classroom activities.

Topic**Response Activities (Continued)**

Display
Visual 36

Shelter in Place

The EOP should:

- Establish designated shelter areas.
- Identify alternate outdoor areas if the school building is unsafe.
- Consider needs if students stay overnight.

FEMA Visual 36

Notes:

Unlike some hazards, an earthquake is likely to affect a large portion of the community around the school. For instance, roads, bridges, and other infrastructure may be disrupted, making it impossible to release students or for parents and guardians to reach the school.

In such cases, students, staff, and volunteers may need to stay at the school for an extended period of time.

The EOP should:

- Establish designated shelter areas.
- Identify alternate outdoor shelter areas, if the school building is unsafe.
- Consider resource needs if students must stay overnight on school grounds.

Topic**Response Activities (Continued)**

Display
Visual 37

Parent-Student Reunification

What are the reunification challenges after an earthquake?

How can you address these challenges?

FEMA

Visual 37

Notes:

To reunite students with their parents or guardians, the EOP should describe specific reunification locations, any requirements (e.g., photo identification and signatures), and orderly and efficient procedures.

What are the reunification challenges after an earthquake?

How does your EOP address these challenges?

Topic	Response Activities (Continued)
--------------	--

Display
Visual 38



Notes:

What records need to be maintained after an earthquake?

Topic**Response Activities (Continued)**

Display
Visual 39

Activity: Response Procedures

Instructions:

- Review the following scenario:
Your school just experienced an earthquake. There are minor injuries, treatable with basic first aid. No one is trapped. Utilities are interrupted until further notice. The school buildings evidently suffered little damage and seem structurally sound. Emergency responders are too busy serving harder hit areas to respond to the school.
- Identify three priorities that your school's response procedures should address.



The bottom of the visual features the FEMA logo on the left, a blue star in the center, and the text 'Visual 38' on the right.

Notes:

Purpose: This activity will enable you to identify priorities that response procedures should address in a specific situation.

Estimated Time: 10 minutes (5 minutes activity + 5 minutes debrief)

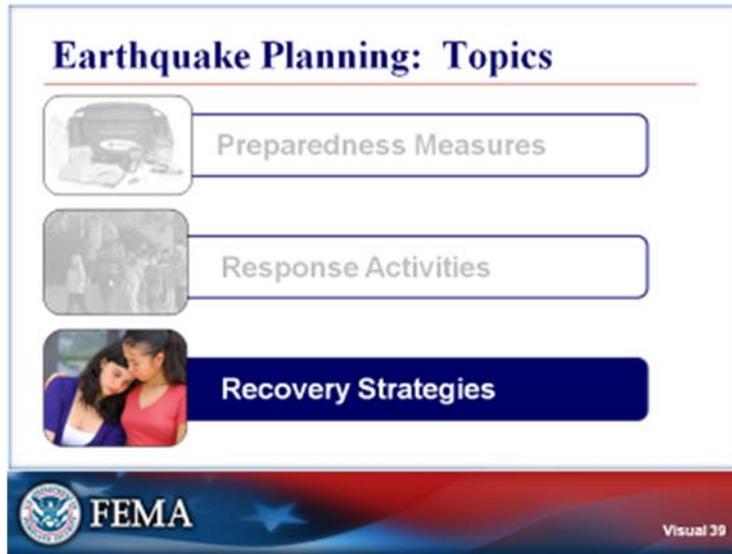
Instructions:

1. Review the scenario shown on the visual.
2. Work with your previously assigned group.
3. Identify three priorities that response procedures should address in this situation.

Topic

Recovery Strategies

Display
Visual 40



Notes:

As shown on the advance organizer on the visual, the last section of the unit will outline recovery strategies after an earthquake.

Topic**Recovery Strategies (Continued)**

Display
Visual 41

What Happens Next?

After the immediate dangers have passed, the EOP should describe the school's plan for:

- Continuity of academics.
- Repairing or replacing school facilities.
- Helping the school community to heal.

FEMA Visual 41

Notes:

After the immediate dangers have passed, the EOP should describe the school's plan for:

- Continuity of academics.
- Repairing or replacing school facilities.
- Helping the school community to heal.

Each topic will be discussed in more detail on the next visuals.

Topic**Recovery Strategies (Continued)**

Display
Visual 42

Continuity of Academics

If the school suffers structural damage, does the EOP include plans for:

- Conducting classes?
- Developing alternate teaching methods?
- Restoration of academic records?
- Other strategies to prevent the loss of the school year?

FEMA Visual 42

Notes:

If the school suffers structural damage, the EOP should include detailed plans for:

- **Conducting classes when facilities are damaged.** Possible solutions include:
 - Relocation of school operations to adjacent communities or alternative sites.
 - Portable classrooms.
 - Rotating students through half-day sessions in undamaged portions of the building.
- **Developing alternative teaching methods** for students unable to return immediately to classes. Options include:
 - Correspondence classes.
 - Web-based instruction.
 - Videoconferencing.
 - Telegroup tutoring.
- **Restoration of academic records.**
- **Other strategies to prevent the loss of the school year.**

If an earthquake necessitates a secondary location for short- or long-term operation of the school, the relocation site:

- Should be defined in the EOP, after consultation with the State/local Emergency Manager and emergency responders.
- Should not be located in the vicinity of the school.
- May be shared with other schools.

Topic

Recovery Strategies (Continued)

Display
Visual 43

Repairs and Mitigation

After an earthquake:

- Determine how the school will repair or replace buildings and equipment.
- Identify mitigation efforts that could reduce the effects of another earthquake.



Notes:

After an earthquake:

- Determine how the school will repair or replace buildings and equipment.
- Identify mitigation efforts that could reduce the effects of another earthquake.

Refer to the mitigation unit of this course for more information about specific mitigation techniques that can be incorporated into the school's post-earthquake repairs.

Topic**Recovery Strategies (Continued)**

Display
Visual 44

Psychological Healing

The psychological healing annex should address:

- Disruptions of regular school functions.
- Psychological injury to students and/or staff.
- Coping with pressure from the media.



FEMA

Visual 44

Notes:

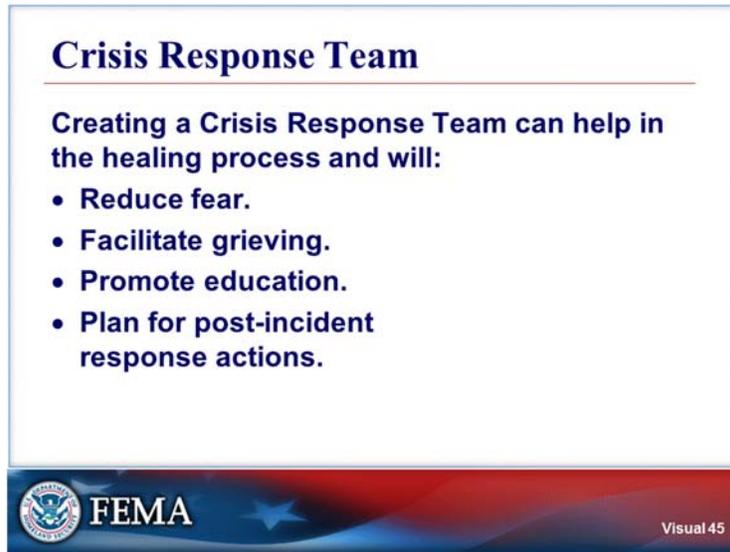
The psychological healing annex of the EOP should address:

- Disruptions of regular school functions.
- Psychological injury to students and/or staff.
- Coping with pressure from the media.

This annex should include tasks, such as providing psychological first aid services for those in need and accessing local/regional providers for ongoing crisis counseling for students, staff, and parents.

Topic**Recovery Strategies (Continued)**

Display
Visual 45



Crisis Response Team

Creating a Crisis Response Team can help in the healing process and will:

- Reduce fear.
- Facilitate grieving.
- Promote education.
- Plan for post-incident response actions.

FEMA Visual 45

Notes:

Creating a Crisis Response Team can help in the healing process and will:

- Reduce fear.
- Facilitate grieving.
- Promote education.
- Plan for postincident response actions.

School crisis response teams should include a combination of school staff and community partners, such as mental health professionals. It is important to include school staff on the team because they:

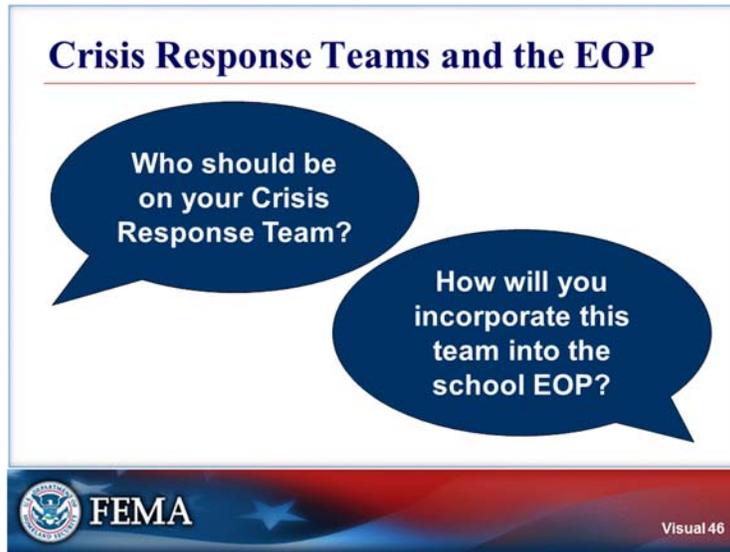
Have an ongoing relationship with students and parents, giving them:

- An understanding of students' and parents' emotional needs.
- A reputation as a trusted source of information within the school community.

Will remain in the school community throughout the recovery period and can monitor the emotional needs of the students.

All crisis team members and school administrators must understand the difficult nature of this assignment and provide adequate support for school staff, and each other, as they work.

Display
Visual 46



Notes:

Who is or should be on your school's Crisis Response Team?

How did or will you incorporate this team into the school EOP?

Topic**Recovery Strategies (Continued)**

Display
Visual 47

Maintaining the EOP

If the EOP requires additional or revised procedures, update it by:

- Dividing staff into teams with specific responsibilities.
- Keeping procedures simple.
- Providing a backup for every procedure.
- Making clear who is in charge and who makes specific decisions.
- Providing new training and drills.



Notes:

Not all teachers will be involved in the maintaining the school's EOP. However, teachers will participate in training and exercises related to the emergency procedures.

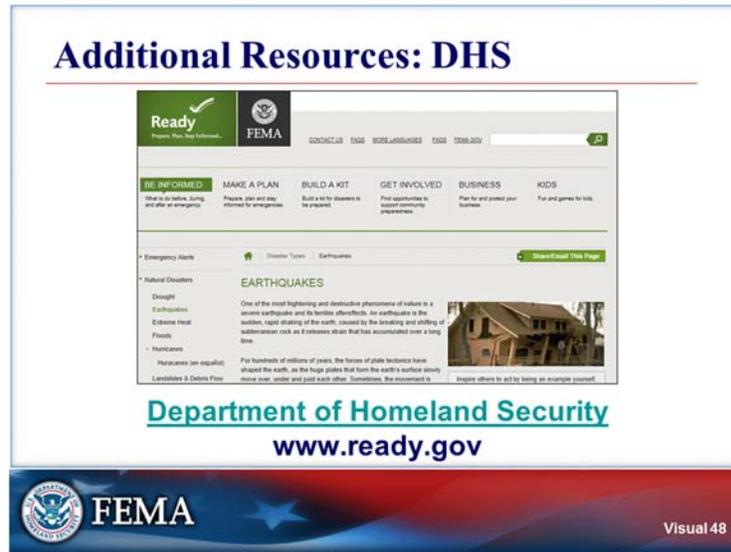
If a teacher identifies areas for improvement, he or she should forward suggestions for additional or revised procedures to an appropriate party (e.g., the department head, principal, or a member of the EOP planning team) for a revision of the EOP.

Teachers will then be involved in any re-training or exercises for the new EOP.

Topic

Additional Resources

Display
Visual 48



Notes:

The Department of Homeland Security (DHS) Web site contains valuable earthquake planning information, organized into categories:

Step 1: Make a Kit

Step 2: Make a Plan

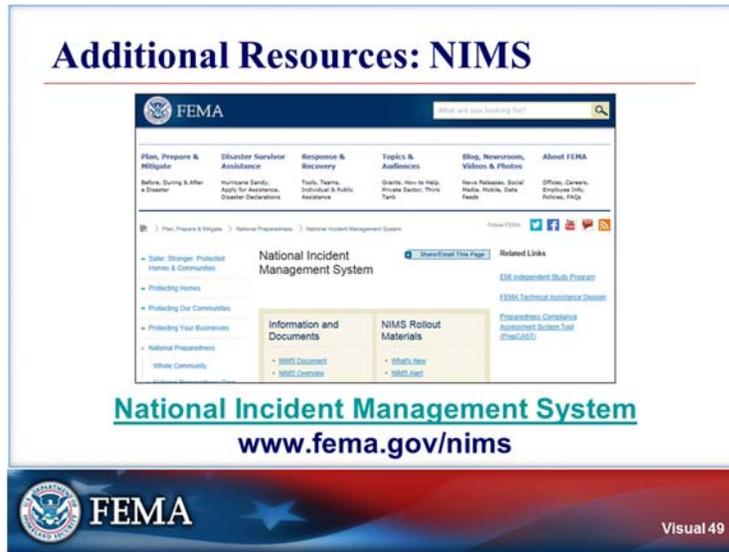
Step 3: Be Informed

It also includes documents, such as:

- **"Are You Ready?" Manual**, a 204-page, in-depth guide to citizen preparedness.
- **Preparing Makes Sense—Get Ready Now**, a list of simple steps to prepare for an emergency.
- **Emergency Supply List**, a checklist of items to keep on hand in order to survive for at least 3 days in an emergency.
- **Preparing Makes Sense—Individuals with Disabilities and Other Special Needs**, a brochure that outlines unique preparedness measures for those with special needs.
- **Deciding to Stay or Go**, a description of shelter-in-place procedures.
- **What Does It Cost**, an overview of the general costs to a business for disaster protection and a business continuity plan.
- **Insurance Discussion Form**, suggestions for discussing insurance coverage with your agent.

Topic Additional Resources (Continued)

Display
Visual 49



Notes:

The FEMA Web site also includes a NIMS resource center that includes more information about NIMS and the National Response Framework.

The site covers the following topics:

- Information and Documents.
- NIMS Components.
- NIMS Implementation and Guidelines.
- Briefings, Training, and Other Resources.

Topic Additional Resources (Continued)

Display
Visual 50

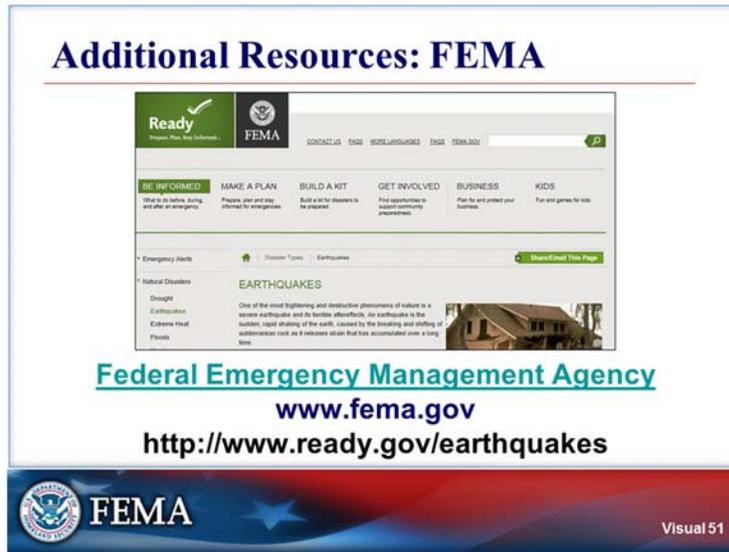


Notes:

Community Emergency Response Team (CERT) training:

- Describes techniques to help an injured or trapped person until trained, professional responders arrive.
- Is available for adults (school staff) and teens (students).

CERT training is offered through Citizen Corps, FEMA's grassroots strategy to bring together government and community leaders to involve citizens in all-hazards emergency preparedness and resilience.

Topic**Additional Resources (Continued)****Display
Visual 51****Notes:**

The Federal Emergency Management Agency (FEMA) Web site includes numerous preparedness and planning resources, including:

- **Comprehensive Preparedness Guide (CPG) 101**, “Developing and Maintaining State, Territorial, Tribal, and Local Government Emergency Plans,” which describes the elements of a thorough EOP.
- **Introduction to the Incident Command System for Schools (IS-100.SC/IS-100.SCa)** is a 3-hour web-based course that focuses on how ICS can be applied in school-based incidents and how to interface with community response personnel.
- **Multihazard Emergency Planning for Schools**
 - The EMI offering (E-361) is a 4-day course that provides school district teams with the knowledge, skills, and tools needed to review, enhance and sustain an all-hazard school Emergency Operations Plan (EOP).
 - The independent study course (IS-362) is an 8-hour, short and “easy to take” web-based course that focuses on multihazard emergency planning for schools.
- **Earthquake Preparedness.** This section of the Web site is divided into three categories: what to do before an earthquake, what to do during an earthquake, and what to do after an earthquake.

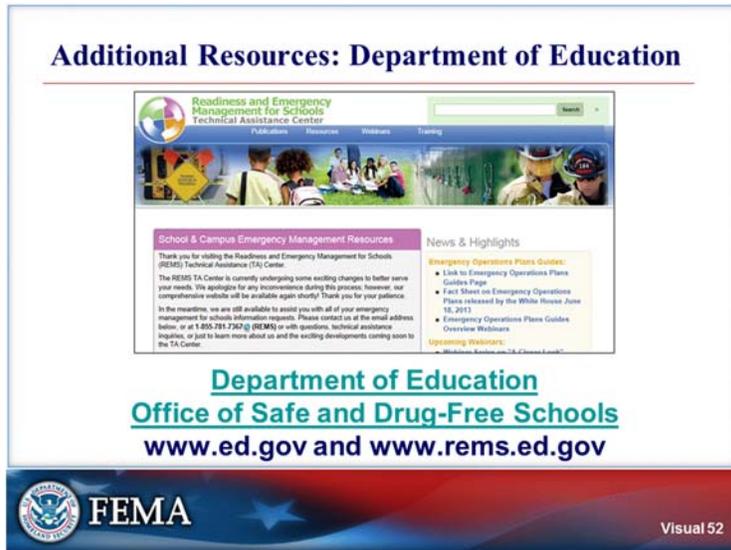
Topic	Additional Resources (Continued)
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Resources (Continued)

- **Earthquake Preparedness: What Every Child Care Provider Needs to Know.** This publication features practical and low-cost techniques to make child care facilities safer in the event of an earthquake, whether they are based in a home or a larger facility. The publication offers tips for conducting earthquake drills and includes a checklist of supplies to keep on hand in an emergency kit.
- **Are You Ready? An In-depth Guide to Citizen Preparedness (IS-22),** is FEMA's most comprehensive source on individual, family, and community preparedness. This document contains a section on earthquake preparedness and response, as well as a section on recovering from a disaster. The recovery section includes guidelines for immediate postincident actions as well as long-term recovery, such as recognizing signs of emotional distress.

Topic Additional Resources (Continued)

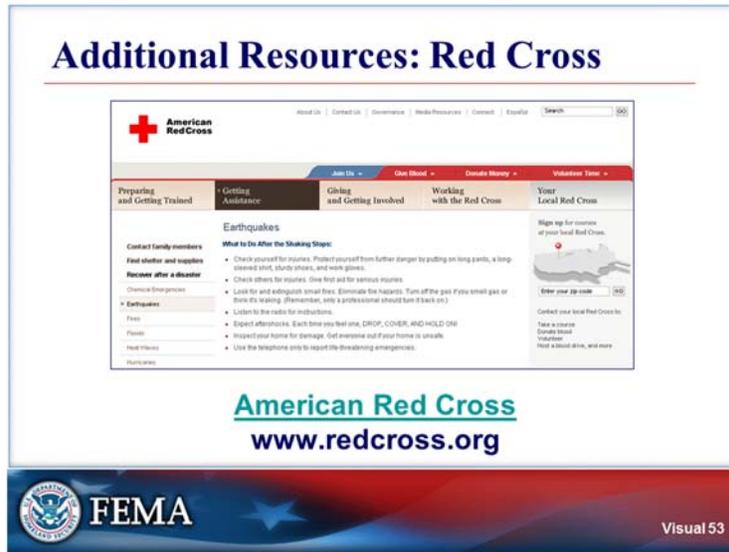
Display
Visual 52



Notes:

The Department of Education's Office of Safe and Drug-Free Schools Web site offers:

- **Emergency Management for Schools**, a collection of webcasts and training materials related to multihazard emergency prevention and mitigation, preparedness, response, and recovery.
- **Practical Information on Crisis Planning: A Guide for Schools and Communities**. This guide, with a companion brochure, provides schools and communities with basic guidelines and useful ideas on how to develop emergency response and crisis management plans.
- **Crisis Response: Creating Safe Schools**. This is a 4-day, facilitated online workshop event. However, the supporting materials are available in the Online Events section of the Department of Education Web site. Materials include "Building a School-Based Crisis Team," "Protocols for Dealing with a Crisis," "Informing Students and Staff," "Mapping Community Resources," "Identifying Seriously Traumatized Children," and "Activities to Help Students Recover from Traumatic Events."
- **Tips for Helping Students Recovering from Traumatic Events**. This brochure, which is based on discussions with some three dozen experts who work with students, provides practical information for parents and students who are coping with the aftermath of a natural disaster, as well as teachers, coaches, school administrators, and others who are helping those affected.
- **Readiness and Emergency Management for Schools (REMS) Technical Assistance Center**. This collection of resources includes general information on crisis planning, as well as information about training opportunities, education materials and resources, preparedness and mitigation, crisis planning for students with disabilities, mental health services for children following trauma, firsthand accounts of dealing with emergencies, and other recovery resources.



Notes:

The American Red Cross Web site includes information for preparing your school and students for a disaster, such as an earthquake. The information is organized into the three DHS categories:

- Get a Kit.
- Make a Plan.
- Be Informed.

The Recover After a Disaster section includes information about what to do immediately after an earthquake.

Earthquake-related information sheets include:

- **Earthquake Safety** checklist, describing tasks to complete before, during, and after an earthquake.
- **Taking Care of Your Emotional Health After a Disaster.**

The site includes an Alternative Language Materials page, with links to preparedness resources in Arabic, Cambodian, Chinese, English, Farsi, French, Hmong, Japanese, Korean, Laotian, Russian, Spanish, Tagalog, and Vietnamese.

The site also provides links to local chapters that offer training opportunities for first aid and cardiopulmonary resuscitation (CPR).

Topic	Unit Summary
-------	--------------

Display
Visual 54

Summary

Do you now know how to:

- Explain how earthquake preparedness fits within your school's multihazard EOP?
- Identify resources needed to prepare students, classrooms, and the entire school?
- Describe response priorities and procedures?
- Describe recovery techniques?



Visual 54

Notes:

This unit described resources and procedures for earthquake preparedness, response, and recovery.

Are you now able to:

- Explain how earthquake preparedness fits within your school's multihazard EOP?
- Identify resources needed to prepare students, classrooms, and the entire school?
- Describe response priorities and procedures?
- Describe recovery techniques?

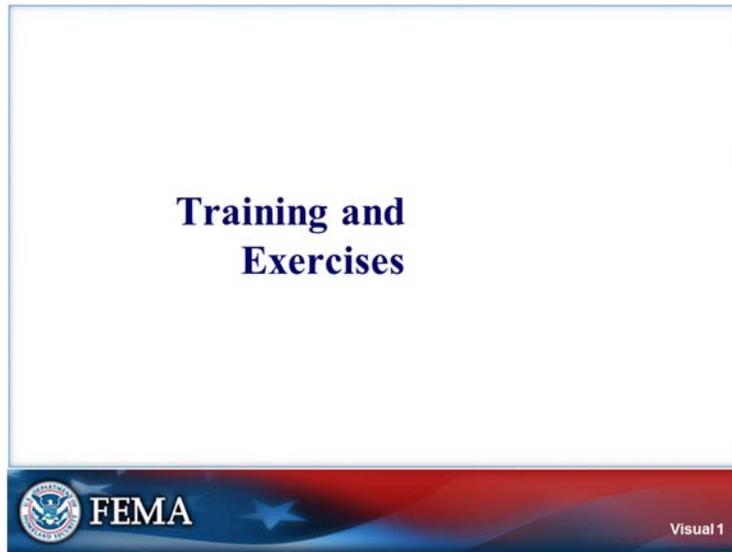
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Training and Exercises

Topic

Unit Introduction

**Display
Visual 1**



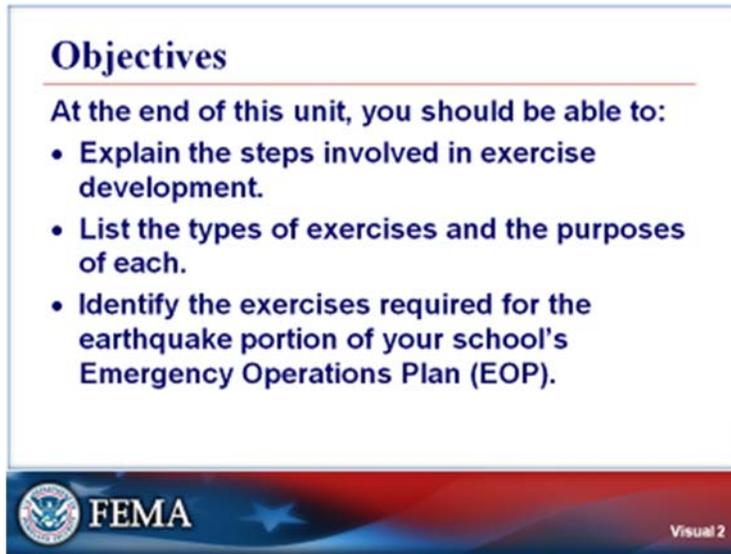
Notes:

Training and exercises are both essential to a successful earthquake response. School staff, students, and parents need to know what to do after an earthquake.

This unit introduces concepts of training and exercises and describes types of exercises that can be used with your school staff and students.

Topic**Unit Introduction (Continued)**

Display
Visual 2



Objectives

At the end of this unit, you should be able to:

- Explain the steps involved in exercise development.
- List the types of exercises and the purposes of each.
- Identify the exercises required for the earthquake portion of your school's Emergency Operations Plan (EOP).

FEMA Visual 2

Notes:

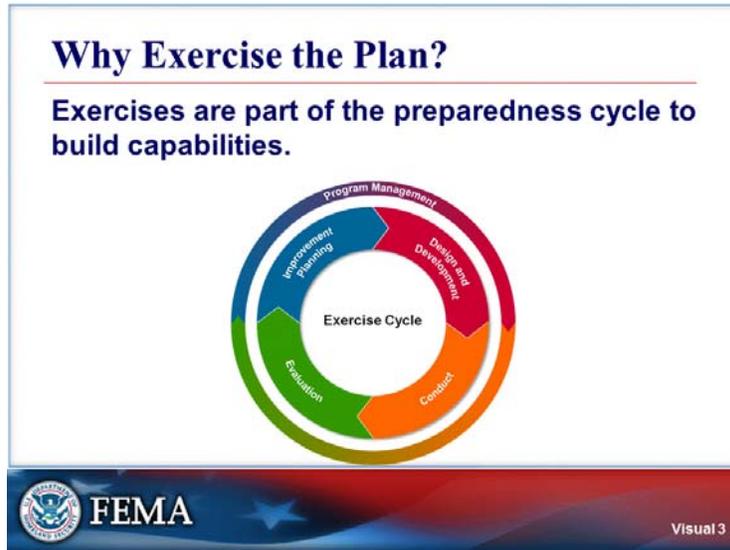
Once a school has developed an Emergency Operations Plan (EOP), teachers will participate in the education of staff, students, and parents and guardians about the emergency procedures. They will also be expected to participate in the planning and implementation of exercises to evaluate those procedures.

At the end of this unit, you will be able to:

- Explain the steps involved in exercise development.
- List the types of exercises and the purposes of each.
- Identify the exercises required for the earthquake portion of your school's Emergency Operations Plan (EOP).

Topic	Why Exercise the Plan?
--------------	-------------------------------

Display
Visual 3



Notes:

Exercises are part of an ongoing preparedness cycle:

- Create an emergency response plan.
- Organize supplies, conduct training, and equip students and staff to implement the plan.
- Exercise the plan.
- Evaluate the results and identify areas for improvement in the plan. Then, repeat the cycle.

The preparedness cycle ensures that specific capabilities that are inherent to a variety of scenarios (e.g., evacuation and lockdown) are integrated into a workable plan to safeguard the school community. Capabilities provide the means to achieve a desired outcome by performing critical tasks, under specified conditions, to target levels of performance.

Topic**Why Exercise the Plan? (Continued)****Display
Visual 4**

Notes:

- Assess and validate policies, plans, procedures, training, equipment, assumptions, and partnerships.
- Clarify roles and responsibilities.
- Improve partnership coordination and communications.
- Identify gaps in resources.
- Measure performance.
- Identify opportunities for improvement.

Training on EOP procedures is critical to the successful implementation of those procedures. Only through training can staff and students learn to follow the procedures correctly and to fulfill their roles and responsibilities. Reunification of families will occur more quickly and more efficiently if all family members are trained in what to expect, what to do, how to do it, and where to go.

Training is critical because it expands staff, student, and parent knowledge of earthquake procedures in the EOP so that:

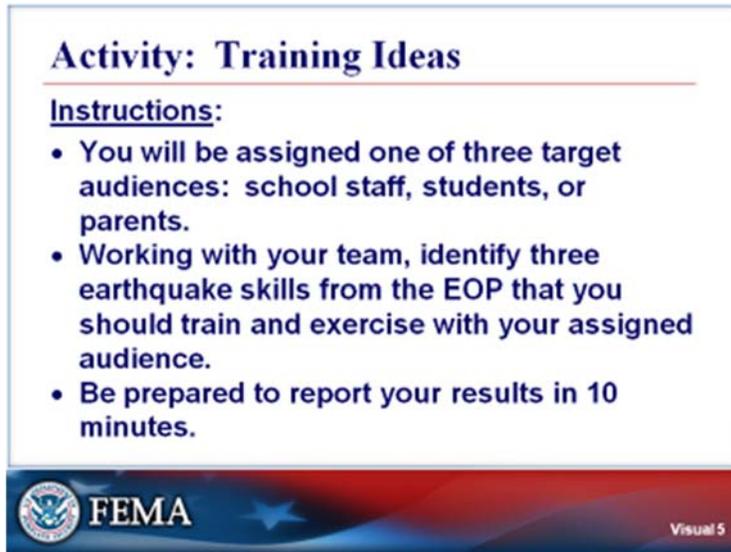
- Staff and students can follow procedures correctly.
- Staff and students can fulfill their roles and responsibilities.
- Families are reunified following an earthquake as quickly as possible.

Exercises test the school's earthquake procedures in the EOP and help to:

- Reveal training needs.
- Reveal planning weaknesses.
- Reveal resource needs.
- Improve coordination.
- Clarify roles and responsibilities.
- Improve individual performance.
- Identify a path forward.

Topic**Why Exercise the Plan? (Continued)**

Display
Visual 5



Activity: Training Ideas

Instructions:

- You will be assigned one of three target audiences: school staff, students, or parents.
- Working with your team, identify three earthquake skills from the EOP that you should train and exercise with your assigned audience.
- Be prepared to report your results in 10 minutes.

FEMA Visual 5

Notes:

Purpose: This activity will enable you to identify capabilities (procedures) in the EOP that should be trained and exercised with students, staff, and parents.

Estimated Time: 15 minutes (10 minutes activity + 5 minutes debrief)

Instructions:

- You will be assigned one of three target audiences: school staff, students, or parents.
- Working with your team, identify three earthquake skills from the EOP that you should train and exercise with your assigned audience.
- Be prepared to report your results in 10 minutes.

Topic**How To Exercise the Plan: HSEEP**

Display
Visual 6

How To Exercise the EOP: HSEEP

The Homeland Security Exercise and Evaluation Program (HSEEP) provides:

- A common exercise policy and program guidance.
- Consistent terminology that can be used and understood.
- Tools to plan, conduct, and evaluate exercises to improve overall preparedness.
- National best practices supported by training, technology systems, tools, and technical assistance.

 **FEMA**  Visual 6

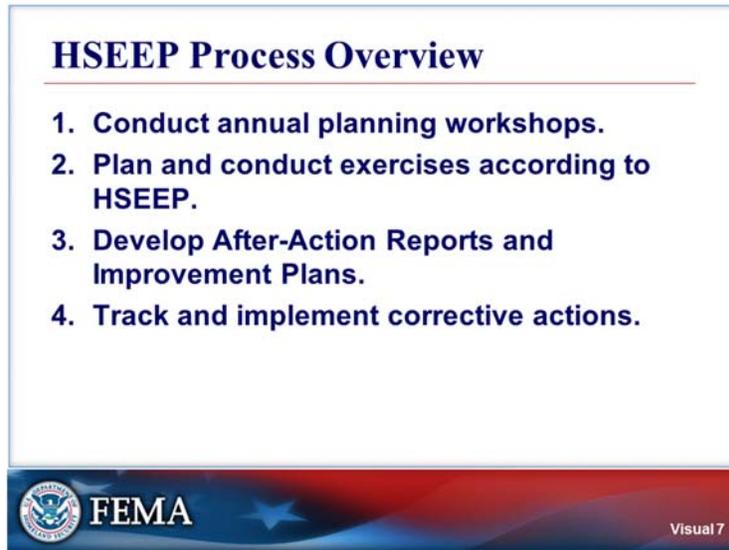
Notes:

The Homeland Security Exercise and Evaluation Program (HSEEP) is a capabilities- and performance-based exercise program.

HSEEP provides:

- A common exercise policy and program guidance.
- Consistent terminology that can be used and understood.
- Tools to plan, conduct, and evaluate exercises to improve overall preparedness.
- National best practices supported by training, technology systems, tools, and technical assistance.

It is important to use HSEEP when developing earthquake exercises for your school.

Topic**How To Exercise the Plan: HSEEP****Display
Visual 7**

HSEEP Process Overview

1. **Conduct annual planning workshops.**
2. **Plan and conduct exercises according to HSEEP.**
3. **Develop After-Action Reports and Improvement Plans.**
4. **Track and implement corrective actions.**

FEMA Visual 7

Notes:

The HSEEP program identifies the following performance requirements for exercise program management, design, development, conduct, evaluation, and improvement planning:

1. **Conduct an annual Training and Exercise Planning Workshop (TEPW), and maintain a Multi-Year Training and Exercise Plan.** The purpose of this workshop is to translate strategic goals and priorities into specific training and exercise activities and to develop a schedule for those activities.
2. **Plan and conduct exercises in accordance with the guidelines set forth in HSEEP policy.** Using a series of planning conferences, the design team ensures that the training and exercises are well documented so that all participants are aware of the objectives, purpose, roles and responsibilities, and exercise logistics. HSEEP policy guidance includes an overview of exercise planning and conduct, sample documents for all potential presentations, and manuals for all types of exercises.
3. **Develop and submit a properly formatted After-Action Report/Improvement Plan (AAR/IP),** based on observations of the relevant capabilities and tasks. Capture events as they occur during an exercise, analyze the events relative to exercise objectives, and suggest development actions to either further enhance or improve agencies' planning and response capabilities.
4. **Track and implement corrective actions identified in the AAR/IP** to monitor progress (e.g., identifying a need for additional training, equipment, exercises, coordination, or plans/procedures).

Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 8**

Exercise Planning Team

Organizes using ICS.

- **Determines exercise objectives and scope.**
- **Creates the scenario and exercise documentation.**
- **Conducts:**
 - **Pre-exercise briefings and training.**
 - **Post-exercise analysis.**

 **FEMA**   Visual 8

Notes:

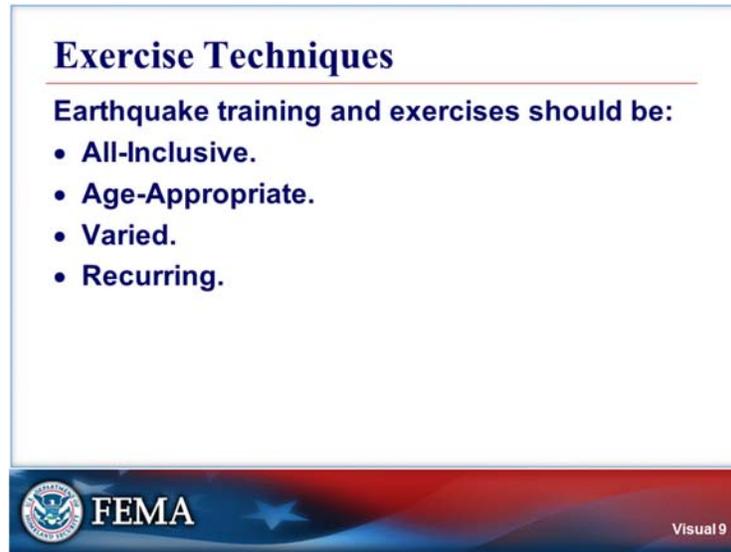
The exercise planning team develops an overall exercise plan for your school. The team lists exercises to develop and determines exercise sequence.

The exercise planning team should be kept to a manageable size, but include all stakeholders, such as:

- One or more school administrator(s).
- The local emergency manager.
- The individual with overall responsibility for the school multihazard EOP, usually a staff member.
- Persons knowledgeable in the area to be tested.

The team is organized using Incident Command System (ICS) structure and is responsible for:

- **Determining the exercise objectives and scope.** This includes identifying the section(s) of the EOP to be tested, the operations to carry out, and the skills, or Target Capabilities that will be validated.
- **Creating the scenario** using the following guidelines:
 - Exercise only the functions identified in the objectives.
 - Don't add unnecessary complications.
 - Develop any associated exercise documentation.
 - Plan for evaluation "up front," including the evaluation measures
- **Conducting any pre-exercise briefings** and training.
- **Conducting post-exercise analysis** and creating plans for ongoing improvement.

Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 9**

Exercise Techniques

Earthquake training and exercises should be:

- **All-Inclusive.**
- **Age-Appropriate.**
- **Varied.**
- **Recurring.**

FEMA Visual 9

Notes:

Like the materials you design for all aspects of the school curriculum, earthquake training and exercises should be all-inclusive, age-appropriate, varied, and recurring.

All-inclusive training is designed to include all intended target audiences. Examples include:

- Staff, such as administrators, teachers, substitute teachers, support staff (e.g., cafeteria workers, maintenance staff, custodians, bus drivers, and crossing guards), and volunteers.
- Students, including those with special needs or limited English proficiency.
- Parents and caregivers, including traditional and nontraditional family units (e.g., divorced/multiple households), and those with limited English proficiency.

Age-appropriate training presents concepts in a manner that can be easily understood and ensures that the target audience is prepared, not frightened.

Varied training helps create “new” interest in an “old” topic. Examples include:

- A formal earthquake preparedness curriculum, with prepared courses for all grade levels. Resources for earthquake-specific curriculum development are available online and are listed in the resources section at the end of this unit.
- Reminder-level training, such as posters, signs, or a “tip of the day.”
- Earthquake activities that are linked to Standards of Learning (SOLs), such as hazard hunts for school and home, storybooks, checklists, experiments, writing and drawing activities, or a themed science fair.

Varied Training (Continued)

- Guest speakers and classroom visitors, such as:
 - Emergency management personnel.
 - Search and rescue teams.
- Specialized skills training, such as Community Emergency Response Team (CERT or Teen CERT) training.
- Both small-scale and large-scale training exercises.
- Both discussion-based and hands-on training.

Recurring training ensures that the plan doesn't "gather dust" on the shelf. Periodic exercises provide reminders and refresh learning.

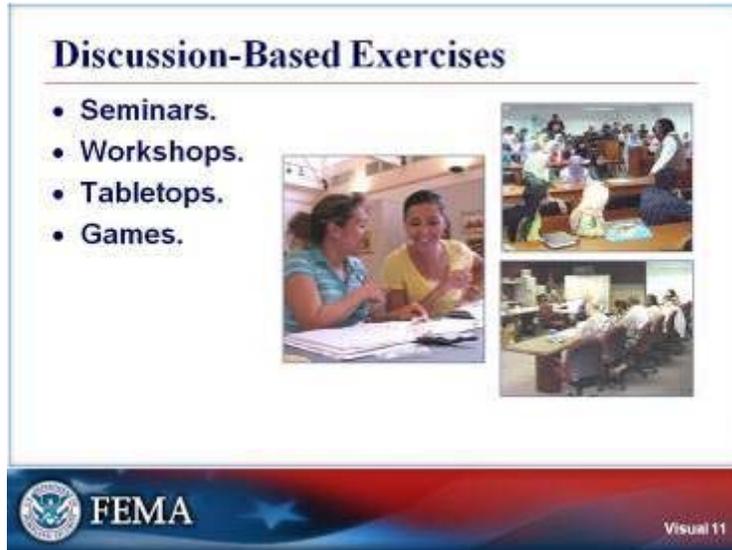
Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 10**

Notes:

HSEEP describes several types of exercises that are organized into two main categories:

- Discussion-based exercises
- Operations-based exercises

Each category will be described in more detail on the next visuals.

Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 11**

Notes:

The first building blocks of an exercise program are discussion-based exercises. Discussion-based exercises make the exercise participants familiar with current plans and procedures and may be used to develop new plans and procedures.

Types of discussion-based exercises include the following:

- **Seminars** are informal discussions, presentations, or orientations to new or updated plans, policies, and procedures. Example: A seminar to inform staff of a new evacuation procedure.
- **Workshops** resemble a seminar, but build specific products, such as a draft plan or policy. Example: A training and exercise plan workshop to develop a Multi-Year Training and Exercise Plan.
- **Tabletop exercises** involve key personnel discussing hypothetical scenarios in an informal setting. This type of exercise involves indepth discussion and is used to assess the EOP and identify strengths and shortfalls in the plan, policies, and procedures.
- **Games** use a multiplayer concept to create a dynamic decisionmaking environment. Games can be software based and competitive in nature and may involve playing against the computer or "system."

Additional information about tabletop exercises will be provided on the next few visuals.

Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 12**

Tabletop Exercises

Key personnel discuss simulated scenarios to:

- Assess plans, policies, and procedures.
- Answer the question, “What if that happened here?”



 **FEMA**  Visual 12

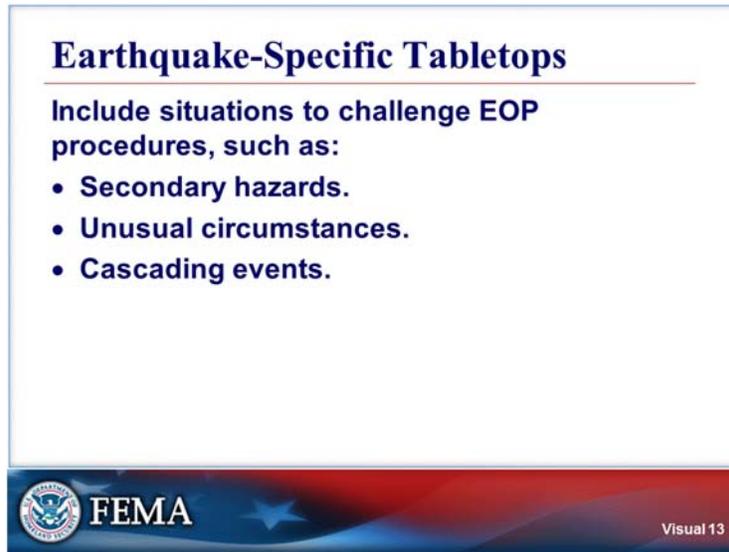
Notes:

In tabletop exercises, key personnel discuss simulated scenarios. The scenarios are often based on actual incidents at the school or recent events in the news, particularly from neighboring communities or nearby States.

Tabletop exercises evaluate plans, policies, and procedures and help answer the question, “What if that incident happened here?”

A tabletop exercise requires one or more facilitators. The exercise paints a picture by presenting a scenario. The facilitator then:

- Asks open-ended questions related to the scenario, such as “What is your school policy in this situation?”
- Encourages free-flowing discussion and avoids guiding the discussion.

Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 13**

Earthquake-Specific Tabletops

Include situations to challenge EOP procedures, such as:

- **Secondary hazards.**
- **Unusual circumstances.**
- **Cascading events.**

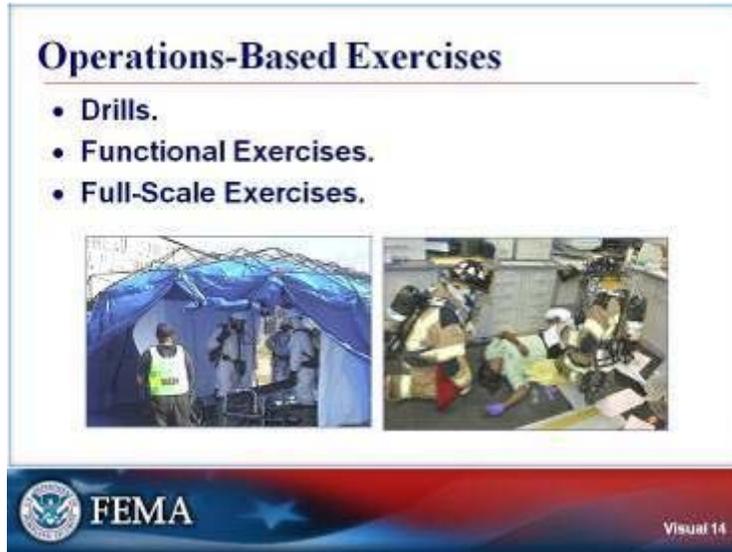
FEMA Visual 13

Notes:

An earthquake tabletop exercise should include situations that challenge the procedures in your EOP and help identify shortfalls or areas for improvement.

The exercise should include:

- **Secondary hazards** (e.g., fallen furniture and equipment, broken glass and debris, hazardous material spills, fire, communications breakdowns, transportation system breakdowns, and power outages).
- **Unusual circumstances** (e.g., an earthquake during an assembly or when students are between classes).
- **Cascading events** that increase the complexity of the incident over time, such as casualties, area residents arriving to use the school as a shelter, or parents attempting to circumvent reunification procedures.

Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 14**

Notes:

Operations-based exercises validate plans and procedures, clarify roles and responsibilities, and identify resource gaps in an operational environment.

Types of operations-based exercises include the following:

- **Drills** are designed to be limited in focus and scope, and usually test a single, specific operation or function within a single entity. Examples include a school evacuation drill or a medical team drill.
- **Functional exercises** test specific plan functions, generally one function at a time. They focus on coordination and command between agency coordination centers, but do not involve “boots on the ground” (first responders or emergency officials responding to an incident in real time). Examples of functional exercises include:
 - Shelter in place and student care (overnight retention).
 - Student accounting.
 - Parent/student reunification.
 - Medical treatment.
 - Emergency public information.
 - Logistics.
- **Full-scale exercises** are multiagency, multijurisdictional, multidiscipline exercises involving full support systems (e.g., district central offices, district and community EOCs, school command posts). These exercises are “boots on the ground” responses that actually move resources, and are very resource intensive. Such exercises also have considerable safety implications.

Additional information about drills will be provided on the next few visuals.

Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 15**

Drills

- Practice and perfect a single emergency response.
- Concentrate the efforts of a single function (e.g., evacuation or mobilizing the district command team).
- Provide “hands on” field experience.

FEMA

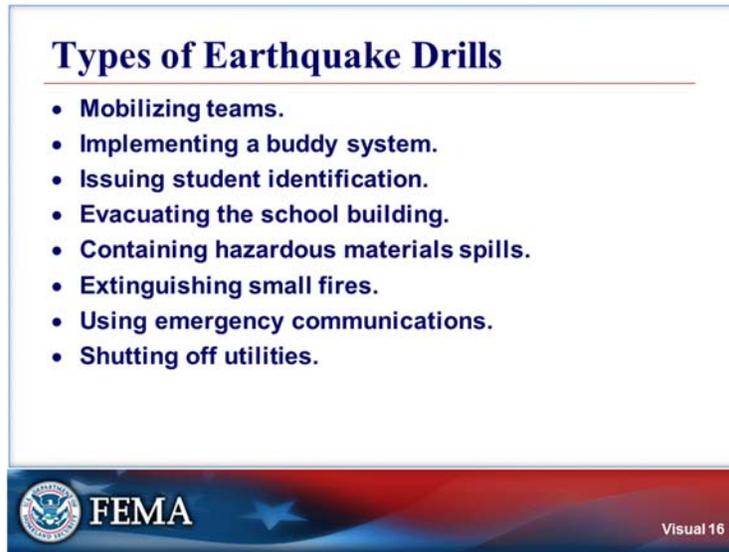
Visual 15

Notes:

Drills provide a means to practice and perfect a single emergency response. They concentrate the efforts of a single function, such as evacuation or mobilizing the district command team, and provide “hands on” field experience.

Features of a drill include:

- Coordination and supervision.
- Instant feedback.
- Narrow focus.
- Realistic environment.

Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 16**

Notes:

Most drills will focus on priority actions that are required immediately after an earthquake.

Examples of earthquake drills include:

- Mobilizing teams.
- Implementing a buddy system.
- Issuing student identification.
- Evacuating the school building.
- Containing hazardous materials spills.
- Extinguishing small fires.
- Using emergency communications.
- Shutting off utilities.*

*Note: Some utilities must be turned back on by the utility company. Coordination with the school Facility Department is extremely important.

The list is not all-inclusive. Other types of drills could be important, depending on circumstances at individual schools.

Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 17**

Activity: Sample Earthquake Drill

Instructions:

- **Review the sample Earthquake Simulation and Evacuation Drill provided, then answer:**
 - **Could you use this drill in your school?**
 - **Were the instructions complete?**
 - **Would you use a simulation script?**
- **Be prepared to discuss this drill in 10 minutes.**



Visual 17

Notes:

Purpose: This activity will enable you to review a detailed school earthquake evacuation drill.

Estimated Time: 15 minutes (10 minutes activity + 5 minutes debrief)

Instructions:

1. Read through the Earthquake Simulation and Evacuation Drill in the Student Manual, including: Content Concepts, Objectives, Procedure, Learning Links, Reminders, Vocabulary, Earthquake Simulation Script, and Drill and Evacuation Checklist.
2. Answer the questions listed on the visual.
3. Be prepared to discuss the drill in 10 minutes.

Earthquake Simulation and Evacuation Drill

Source: Earthquake Safety Activities for Children and Teachers (FEMA-527)

Content Concepts

1. Students can cope with hazards during evacuation.
2. Students are first responsible for their own safety, but also can help if others are injured.
3. After an earthquake, students can cope with the disturbed environment and their own emotional reactions.

Objectives

Students will:

- Identify hazards they might find during evacuation.
- Describe ways of helping others who are injured during earthquakes.
- Describe feelings they might have and dangers they might face after an earthquake.

Learning Links

- **Language Arts:** Writing and reading hazard descriptions, discussing hazards and coping strategies, discussing and writing (older children) about what happens after an earthquake.
- **Social Studies:** Practicing Drop, Cover, and Hold and evacuation procedures, discussing responsibility for one's own safety in an emergency, and what can be done for others.

Procedure

1. Review classroom earthquake drill procedures with students and have them practice the Drop, Cover, and Hold routine. Do the drill with or without using the simulation script.
2. Take the class to the cafeteria and school library and discuss quake-safe actions to take in each of these settings. Have the children demonstrate those actions.
3. Tell students that during an earthquake it's important to stay where they are and take immediate quake-safe action. After the ground stops shaking, it is time to evacuate the building. Explain some of the hazards that may exist even after the major quake has passed, including aftershocks, fires, live electrical wires, and fumes.
4. Walk the class through your regular fire drill route to an open area outdoors that you have chosen in advance. Ask students to make mental notes as they go along of things that might become hazards during an earthquake, and share their ideas when you reach your designated site. Write each appropriate suggestion on an index card. The list of possible hazards may include:
 - a. power failure (Is there emergency lighting available?)
 - b. halls or stairways cluttered with debris (Are there lockers or trophy cabinets along hallways that could fall and block your path?)
 - c. smoke in the hallway
 - d. an exit door that jams and will not open
 - e. an aftershock (Students should stop walking immediately and begin Drop, Cover, and Hold.)
 - f. bricks, glass, and debris outside the doorway
 - g. electrical wires fallen on the ground

Earthquake Simulation and Evacuation Drill (Continued)

Procedure (Continued)

5. Return to the classroom. Hand one of the students an index card with a description of a hazard. Discuss this hazard and its impact on evacuation. Continue handing out the cards, one at a time, until all the hazards have been discussed. Give students an opportunity to express ideas about how they can cope with the hazards and evacuate safely.

Reminders

For the Teacher

- Take cover.
- Talk calmly to students.
- Give instructions for evacuation or other emergency.

When No Shelter Is Available

Move to an inside wall. Kneel next to the wall, facing away from windows. Bend head close to knees, cover sides of head with elbows, and clasp hands behind neck. If a coat is available, hold it over your head for protection from flying glass, and ceiling debris.

Earthquake Safety Reminders for Students

If you're inside:

- Stay inside.
- Take cover immediately under a table, desk, or counter.
- Keep quiet and listen for instructions.
- Remain in safe position for at least 60 seconds, or until the shaking has stopped and your teacher tells you to leave your shelter.

If you're outside:

- Stay outside.
- Go to an open area away from hazards.
- Keep quiet and listen for instructions.

If you are in a school bus or a car when the quake starts shaking:

- The driver should stop as soon as possible away from buildings, power lines, bridges, and highway overpasses and underpasses.
- Passengers should stay in the vehicle and hold on (cars and buses have "shock" absorbers).

Vocabulary

evacuation – Evacuation is the act of emptying completely. When we evacuate a building, we want to leave it quickly, quietly, and safely.

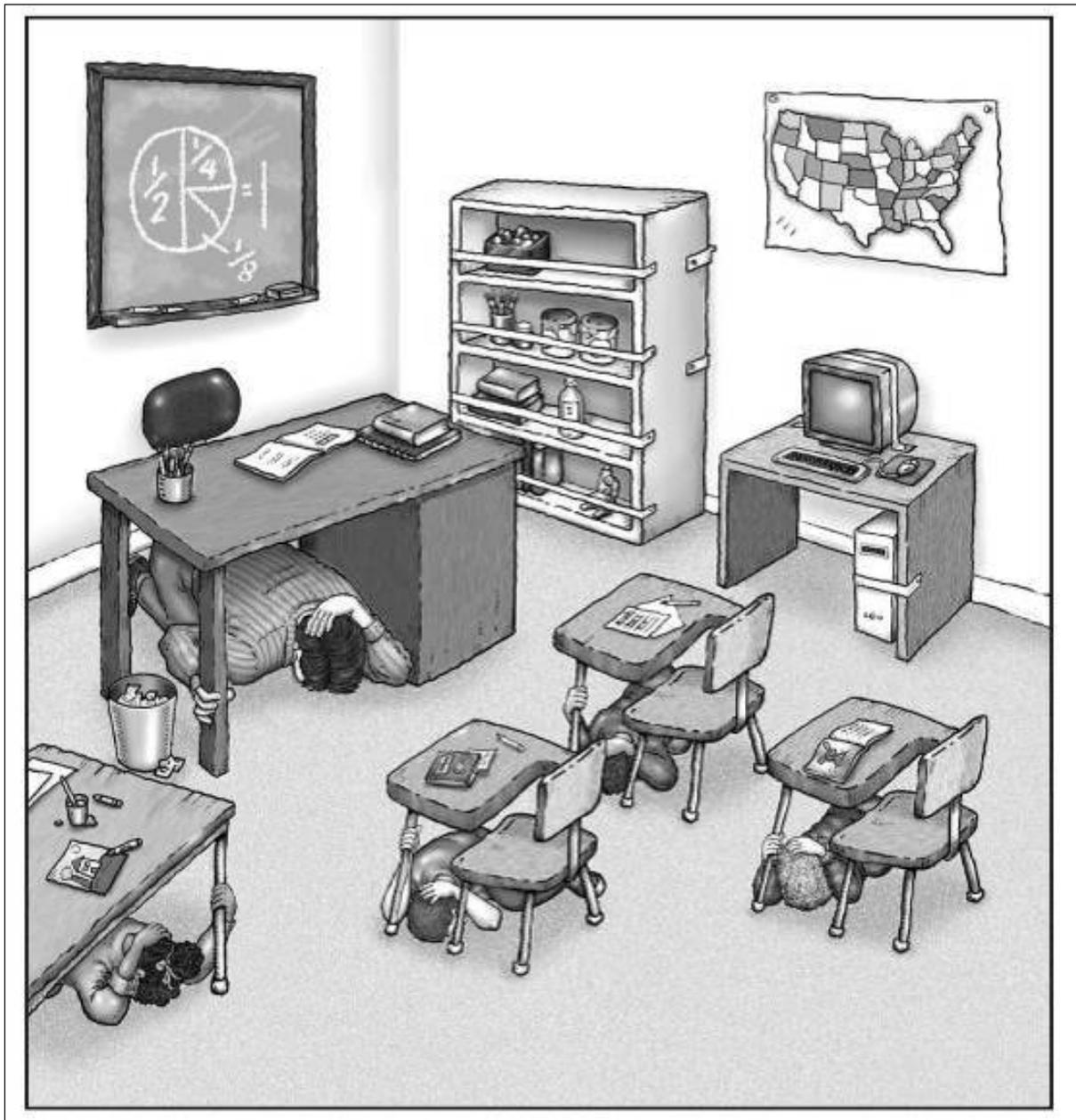
foreshock – A foreshock is an earthquake which comes before the main quake and is less severe.

aftershock – An aftershock is an earthquake which follows a major quake and is less severe.

Earthquake Simulation and Evacuation Drill (Continued)

Drop, Cover, and Hold Routine

Take cover under a study desk or table, hold on to the desk or table leg so that the desk or table stays on top of you, and keep your head down until the shaking stops.



Earthquake Simulation and Evacuation Drill (Continued)

Earthquake Simulation Script

Imagine that you hear a low, rumbling, roaring sound. The noise builds, getting louder and louder, for a few seconds. Then, Wham! There's a terrific jolt. You feel like someone suddenly slammed on the brakes in the car, or like a truck just rammed into the side of the building.

The floor seems to be moving beneath you. It's hard to stand up, or even stay in your seat. If you do stand up, you might feel like you're riding a raft down a fast river. When you walk, it's like trying to walk on a trampoline or a waterbed. You hear someone say, "Earthquake! Drop, Cover, and Hold!"

I want all of you at your desks to take cover as quickly and quietly as you can, right now. Please listen very carefully.

The shaking and commotion may last about 60 seconds or a little longer. We'll have our timer count off the seconds for as long as this earthquake lasts. [The timer may begin counting softly now.]

The building is creaking and rattling. Books are falling from the bookcase. Hanging lamps and plants are swaying. Suddenly a pot falls to the floor and smashes, and the plant spills. A window pane just shattered, and glass is falling to the floor. The table is sliding, too.

Be sure to stay in the drop, cover, and hold position under your desk. If your desk is moving, grab the legs and move with it.

You hear noises outside. Dogs are barking. Cats are meowing. A baby is crying. People are shouting and screaming. The shaking is making church bells ring. You hear crashing sounds, from brick chimneys and other loose parts of the building falling to the ground. Trees outside are swaying and scraping against the walls.

Inside the room, pictures are moving on their nails. Oh! That one just fell off the wall and crashed to the floor. The desk drawers are sliding open. The lights begin to flicker on and off... they just went out! Now the door swings back and forth on its hinges. Bang! It slams shut. There's silence now. Just as suddenly as the noise and shaking began, the room grows quiet. [The timer can stop counting now.]

Please, everyone, get back in your seats. It is important to remain very quiet and wait for instructions. When it is safe to leave the building, I am going to lead you outside to an open space. Stay together, and be ready to take cover again at any moment, because the shaking may start again. Sometimes other quakes, called aftershocks, occur after the damaging earthquake has stopped.

Source: HELP: Hands-on Earthquake Learning Package, California Edition (1983). Environmental Volunteers, Inc.

Earthquake Simulation and Evacuation Drill (Continued)

Drill and Evacuation Checklist

- Did everyone know what to do when told to Drop, Cover, and Hold?
- Did everyone follow the procedure correctly?
- In the classroom, the library, or the cafeteria, was there enough space for all the students under desks, tables, or counters?
- In the gym or in the hallways, were students able to take shelter away from windows, light fixtures, trophy cases, and other hazards?
- Do students know how to protect themselves if they are on the playground during an earthquake? If they are in a school bus or a car?
- Did everyone remain quietly in their safe positions for at least 60 seconds
- Did students with special needs participate in the drill and evacuation?
- Did we remember to take our emergency kit and class roster when we evacuated the classroom?
- Did everyone go to the safe outdoor area in an orderly way?
- If we had to change our evacuation route to get to the safe area, did we make wise decisions?

Topic**How To Exercise the Plan: HSEEP (Continued)****Display
Visual 18**

Activity: Adapting the Earthquake Drill

Instructions:

- **Adapt the Earthquake Simulation and Evacuation Drill for use in your school:**
 - In a classroom.
 - In the cafeteria, auditorium, or library.
 - On a school bus.
 - At an outside location.
- **Be prepared to review or to run the adapted drill in 30 minutes.**



Notes:

Purpose: This activity will enable you to adapt the earthquake simulation and evacuation drill reviewed in the previous activity to a different location or situation.

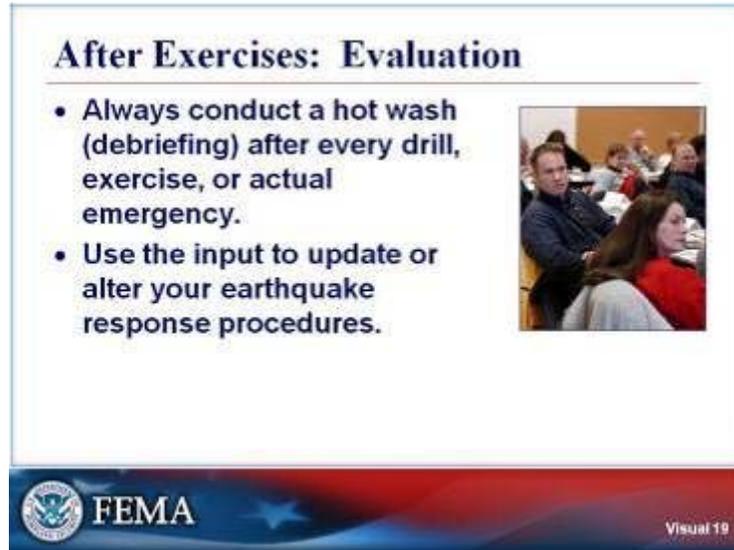
Estimated Time: 45 minutes (30 minutes activity + 15 minutes debrief)

Instructions:

1. Work in your assigned groups.
2. Revise the Earthquake Simulation and Evacuation Drill from the previous activity, including the procedure, script, and checklist, to fit the new location or situation assigned by the instructor.
3. Be prepared to discuss or run your revised drill in 30 minutes.

Topic**After Exercises: Evaluation**

Display
Visual 19



After Exercises: Evaluation

- Always conduct a hot wash (debriefing) after every drill, exercise, or actual emergency.
- Use the input to update or alter your earthquake response procedures.



 **FEMA**  Visual 19

Notes:

After an exercise, it is important to evaluate the performance during a debriefing session.

A debriefing, also known as a “hot wash,” gives all who participated in a drill, exercise, or actual emergency the opportunity to discuss results and suggest improvements.

Hot wash input can be used to update or alter your school’s earthquake response procedures.

Suggestions for collecting debrief input are provided, beginning on the next page.

Tips for Evaluating Exercise Performance

Overall Tips

- Follow the HSEEP Exercise Evaluation Guidelines that help evaluators compare the exercise objectives to the actual observations and results.
- Schedule an After-Action Review (AAR) as soon after the incident as possible.
- Keep it short and focused.
- Focus on WHAT, not WHO.
- Establish clear ground rules: encourage candor and openness (this is dialog—not lecture or debate); focus on items that can be fixed; keep all discussions confidential.
- Use a skilled facilitator to conduct the AAR.

AAR Process Steps

Use the following questions to facilitate the AAR process:

1. What did we set out to do?
 - Establish the facts.
 - Determine purpose of the mission and definition of success.
 - Identify the skills from the Target Capabilities List (TCL) on which the exercise was to focus (e.g., communications, mass care, onsite incident management).
 - Identify key tasks involved.
 - Specify conditions under which each task may need to be performed (weather, topography, time restrictions, etc.).
 - Define acceptable standards for success (explain what “Right” looks like).
2. What actually happened?
 - Continue to establish the facts.
 - Participants should come to agreement on what actually happened.
 - Pool multiple perspectives to build a shared picture of what happened.
3. Why did it happen?
 - Analyze cause and effect.
 - Focus on WHAT, not WHO.
 - Provide progressive refinement for drawing out explanations of what occurred. This will lead into developing possible solutions.
4. What are we going to do better next time?
 - Solutions will arise naturally once problems are identified and understood.
 - Focus on items you can fix, rather than external forces outside of your control.
 - Identify areas where groups are performing well and that should be sustained. This will help repeat success and create a balanced approach to the AAR.
 - Areas To Sustain/Maintain Strengths:
 - Areas To Improve Weaknesses:

Tips for Evaluating Exercise Performance (Continued)

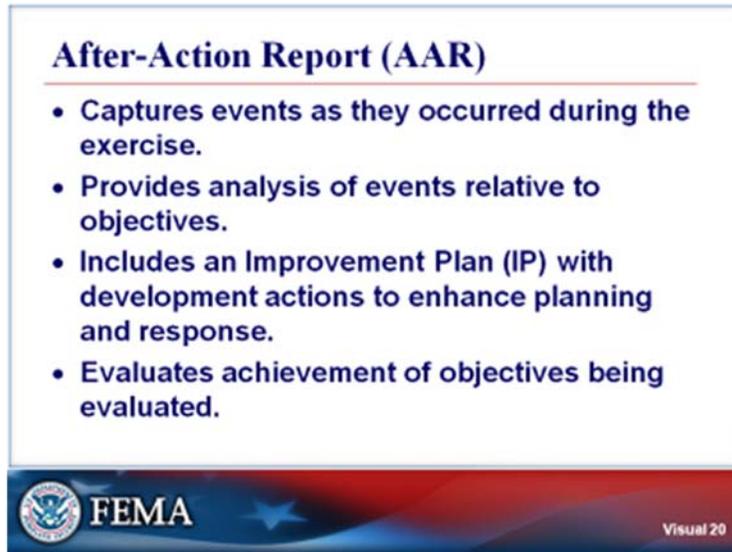
AAR Process Steps (Continued)

5. Are there lessons learned that should be shared immediately?
 - Identify the process for sharing lessons learned.
 - Option 1: Document the Issue, Discussion, Recommendation
 - Option 2: Document the Concept of the Operation, Results, Trends, Recommendation
 - Determine and describe the most notable successes from the incident.
 - Determine and describe the most difficult challenges faced and how they were overcome.

6. What followup is needed?
 - Be specific about actions, timelines, and responsibilities.
 - What changes, additions, or deletions are recommended to SOPs, plans, or training?
 - What issues were not resolved to your satisfaction and need further review?

Topic	After Exercises: Evaluation (Continued)
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Display
Visual 20



After-Action Report (AAR)

- Captures events as they occurred during the exercise.
- Provides analysis of events relative to objectives.
- Includes an Improvement Plan (IP) with development actions to enhance planning and response.
- Evaluates achievement of objectives being evaluated.

FEMA

Visual 20

Notes:

Part of the post-exercise evaluation involves the development of an After-Action Report (AAR).

The AAR is a formal reporting process that:

- Captures events as they occurred during the exercise.
- Provides analysis of events relative to objectives.
- Includes an Improvement Plan (IP) with development actions to enhance planning and response.
- Evaluates achievement of objectives being evaluated.

The After-Action Report content guidelines are designed to support both discussion-based and operations-based exercises.

The AAR begins with the following elements:

- Title Page
- Administrative Handling Instructions
- Contents
- Executive Summary

Section 1: Exercise Overview includes identifying information such as the exercise name, date, and duration.

Section 2: Exercise Design Summary includes overarching exercise purpose and goals; capabilities, activities, and tasks identified for demonstration; exercise objectives; summary of designed initiation event(s) and/or key scenario events; and planned simulations.

Topic	After Exercises: Evaluation (Continued)
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AAR Elements (Continued)

Due to the nature of certain discussion-based exercises, including seminars and workshops, Section 3: Analysis of Capabilities, may be abbreviated and additional sections may be added including:

- Overview of speaker presentations.
- Summary of discussion points, results, and recommendations.

Section 4 is the Conclusion.

Any applicable appendixes should also be added to the AAR, such as:

Appendix A: Improvement Plan

Appendix B: Lessons Learned (Optional)

Appendix C: Participant Feedback Summary (Optional)

Appendix D: Exercise Events Summary Table (Optional)

Appendix E: Performance Ratings (Optional)

Appendix F: Acronyms

The Improvement Plan is formatted in table format and includes a column for each of the elements listed on the visual. The initial draft IP is created as Appendix A in the AAR. This draft includes only the first two columns: Capability and Observation Title.

An After-Action Conference is then conducted to complete the remaining IP columns and the fully completed IP is published with the AAR. The final IP includes an identified responsible party for the implementation of the corrective action and timelines for completion of the corrective action.

Topic	After Exercises: Evaluation (Continued)
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Display
Visual 21

Determining Next Steps

Following major exercises, the exercise planning team should:

- **Develop concrete, measurable steps for improvement.**
- **Delegate responsibilities and actions.**
- **Set up a timetable for completion.**
- **Track process.**



The slide features a decorative banner at the bottom with the FEMA logo on the left, the text 'FEMA' in the center, and 'Visual 21' on the right. The banner has a red and blue wavy background with a white star.

Notes:

After an exercise, the exercise planning team should complete the following actions in order to determine the next steps:

- Develop concrete, measurable steps for improvement.
- Delegate responsibilities and actions.
- Set up a timetable for completion.
- Track process.

Topic	After Exercises: Evaluation (Continued)
--------------	--

Display
Visual 22

Track and Implement Corrective Actions

- Track corrective actions.
- Review feedback, AARs, and IPs.
- Assess progress.
- Analyze information to identify needs.
- Continue tracking and implementation as part of a corrective action program.

Visual 22

Notes:

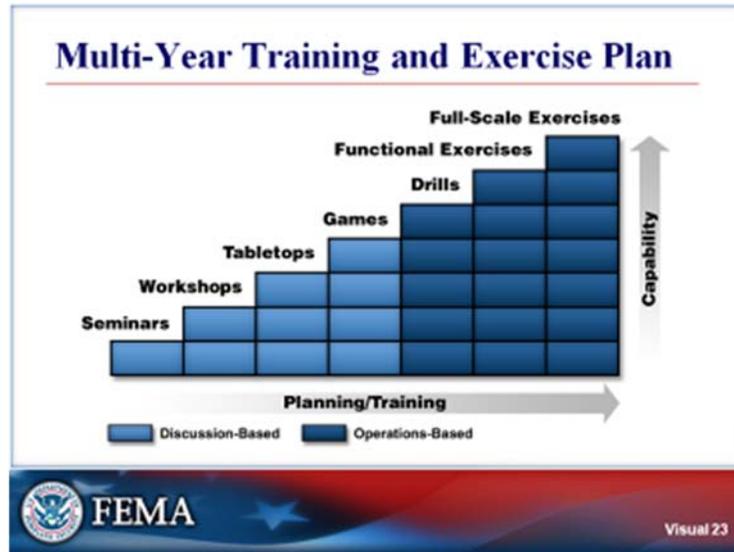
The final step in the HSEEP process is to track and implement corrective actions identified in the After-Action Report (AAR) and Improvement Plan (IP).

Guidelines for this step include:

- Track corrective actions to completion.
- Review exercise feedback, AARs, and IPs.
- Assess progress.
- Incorporate analysis and information into the process to identify the need for additional equipment, training, exercises, coordination, plans, or procedures.
- Continue tracking and implementation as part of a corrective action program.

Topic	After Exercises: Evaluation (Continued)
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Display
Visual 23



Notes:

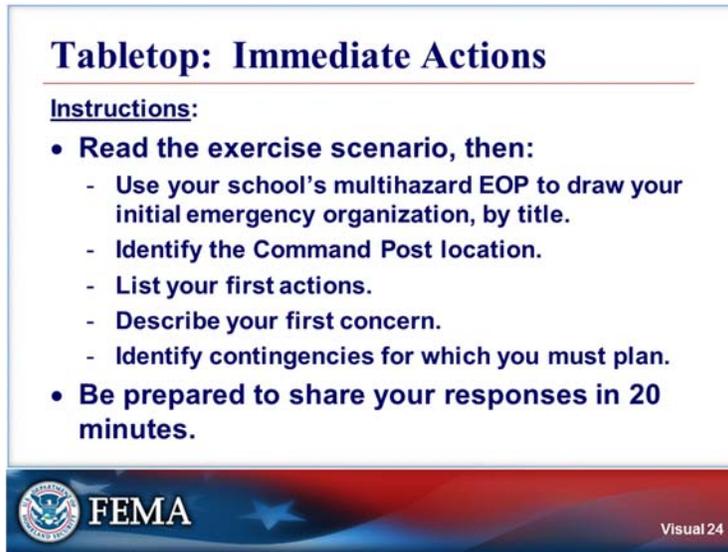
Exercises should be conducted on a regular basis, according to a Multi-Year Training and Exercise Plan.

When developing this plan:

- Use a cycle of increasingly complex exercises.
- Build upon lessons learned from previous exercises or actual incidents.

Topic**Tabletop Exercise**

Display
Visual 24



Tabletop: Immediate Actions

Instructions:

- **Read the exercise scenario, then:**
 - Use your school's multihazard EOP to draw your initial emergency organization, by title.
 - Identify the Command Post location.
 - List your first actions.
 - Describe your first concern.
 - Identify contingencies for which you must plan.
- **Be prepared to share your responses in 20 minutes.**

 **FEMA** Visual 24

Notes:

Purpose: The purpose of this activity is to plan the immediate actions to take during an earthquake response. The activity is divided into three parts: Immediate Actions, Update #1, and Update #2.

Estimated Time (for Part 1): 30 minutes (20 minutes activity + 10 minutes debrief)

Instructions:

1. Review the scenario:

Hillside School is located in a suburb of a major city. In addition to the principal, the school has 46 faculty members, 2 full-time counselors, a nurse, 3 secretaries, 7 cafeteria workers, and 3 custodians. On any given day, 8 to 10 parent-volunteers are also in the building.

This morning at 9:45 a.m., your community was struck by a severe earthquake. The earthquake has caused extensive damage to a large part of the community. All utilities are out. The school is currently lit by emergency lighting only. The area around the school office appears to have sustained only minor damage. Damage to the remainder of the building is undetermined as yet, but one custodian has radioed that a storage area wall has collapsed. You know from experience to expect multiple aftershocks, some of which may be severe. You also know from attending meetings with local officials that, in the event of a severe quake, it could take up to 2 days before first responders reach the school. You must organize to help yourselves and protect the students.

2. Complete the tasks listed in the visual.
3. Be prepared to share your responses in 20 minutes.

Topic**Tabletop Exercise (Continued)**

Display
Visual 25

Tabletop: Update #1

Instructions:

- Read the update to the scenario, then:
 - How does the new information change your plan?
 - Choose the location of the medical area.
 - Describe how you will communicate with first responders and others who need information.
 - Given staffing and known damage, identify contingencies to include in planning.
 - Describe what you would need if any students stay overnight.
- Be prepared to share your responses in 20 minutes.

**FEMA**Visual 25

Notes:

Purpose: The purpose of this part of the activity is to plan to take action for contingencies that may occur as the earthquake response continues.

Estimated Time (for Part 2): 30 minutes (20 minutes activity + 10 minutes debrief)

Instructions:

1. Review the update to the scenario.

The area has experienced several aftershocks of moderate intensity. The aftershocks have caused additional collapse in the gymnasium area. Those who could evacuate the building have assembled in the designated area, and student accountability procedures are underway.

The gymnasium has collapsed, and a class that was in the gymnasium at the time has not evacuated. There has been no communication with either the students or their teacher as of this point. Several students were injured when they were struck by falling debris. One teacher was struck by flying glass and is seriously injured. A custodian has suffered what appears to be a heart attack. Several students who are asthmatic are reporting difficulty breathing, and the school nurse left the building without bringing student medications. These injuries and illnesses are overwhelming the staff members who are assigned to the Medical Group.

There are no reports of fires as of yet. The phone system is out because of the electricity interruption. You can see that a water main two blocks from the school has ruptured. Damage to the community that is visible from the campus looks severe.

Topic	Tabletop Exercise (Continued)
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Instructions: (Continued)

2. Complete the tasks listed in the visual.
3. Be prepared to share your responses in 20 minutes.

Topic**Tabletop Exercise (Continued)**

Display
Visual 26

Tabletop: Update #2

Instructions:

- Read the update to the scenario, then:
 - Determine what to do with the fatalities.
 - Identify staff to help the special education teacher.
 - Describe how to calm the distraught parent.
 - Describe overnight arrangements for students and staff.
 - Determine how to staff the Command Post overnight.
- Be prepared to share your responses in 20 minutes.



Visual 26

Notes:

Purpose: The purpose of this part of the activity is to plan to take action for more contingencies that may occur as the earthquake response continues.

Estimated Time (for Part 3): 30 minutes (20 minutes activity + 10 minutes debrief)

Instructions:

1. Review the update to the scenario.

It is getting late in the day, and aftershocks are continuing. A few parents have arrived but because of the obvious damage in some areas of the community, it is becoming apparent that at least some students will have to spend the night.

An aftershock has caused further collapse of the building, including the area designated as the pickup point for parent/student reunification. A few parents have arrived and are unsure about what to do. One mother has a child trapped in the gymnasium collapse, and she is crying hysterically.

The custodian has died, as has one of the asthmatic students. The teacher who was injured is unconscious and has only a faint pulse. Also, there is still no word on the students and teacher who are in the collapsed gymnasium. Friends of the trapped students are crying.

The aftershocks have caused panic among the special education students who are not entirely aware of everything that is going on and why. Their teacher has sent an aide to the Command Post asking for assistance—quickly. You have contacted the 9-1-1 dispatcher, but all response personnel are currently deployed in other areas. The dispatcher is unsure when trained responders will arrive.

Topic	Tabletop Exercise (Continued)
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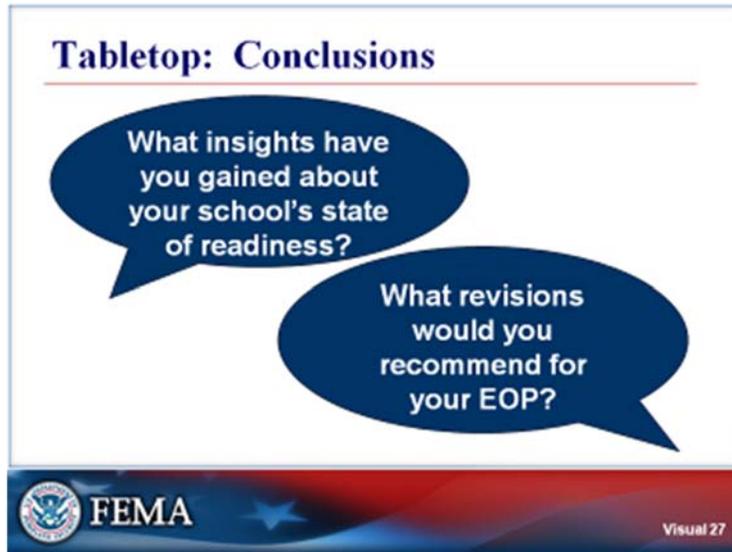
Instructions: (Continued)

2. Complete the tasks listed in the visual.
3. Be prepared to share your responses in 20 minutes.

Topic

Tabletop Exercise (Continued)

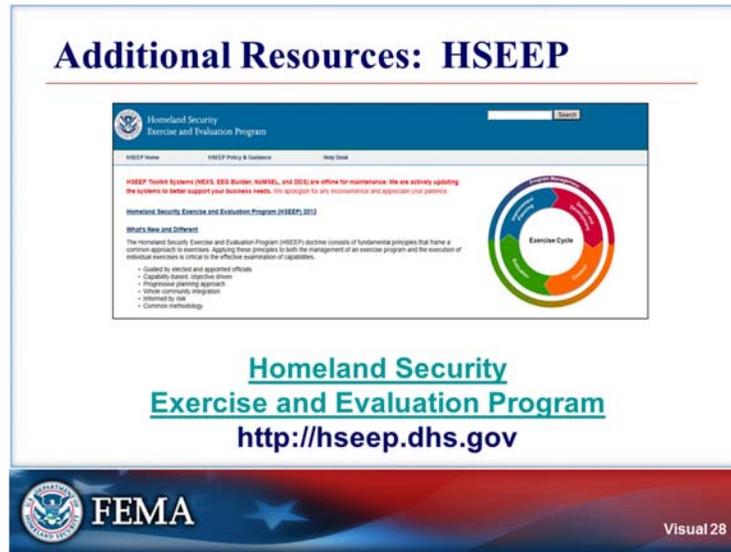
Display
Visual 27



Notes:

What insights have you gained about your school's state of readiness?

What revisions would you recommend for your EOP?

Topic**Additional Resources****Display
Visual 28****Notes:**

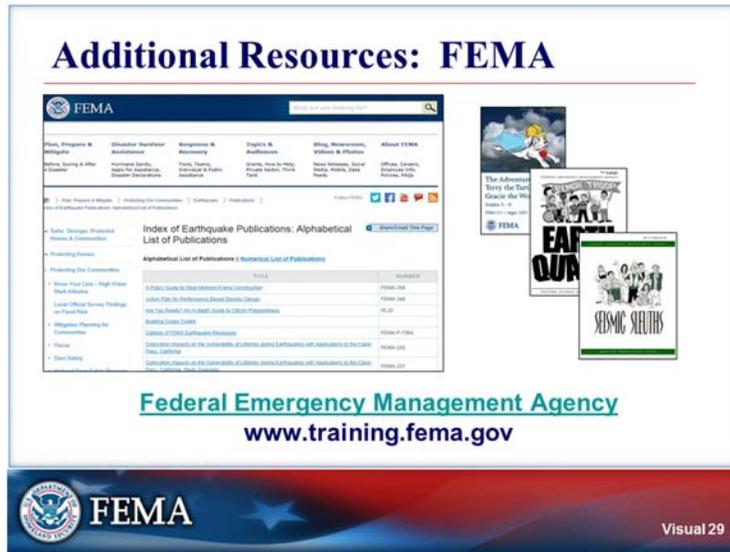
The Homeland Security Exercise and Evaluation Program (HSEEP) is a capabilities- and performance-based exercise program that provides a standardized methodology and terminology for exercise design, development, conduct, evaluation, and improvement planning.

The HSEEP Web site contains documents relating to the development of training and exercises to evaluate your school's EOP, including:

- **HSEEP Policy and Guidance:** An overview of HSEEP guidance, including HSEEP 101, Volume I: HSEEP Overview and Exercise Program Management, Volume II: Exercise Planning and Conduct, Volume III: Exercise Evaluation and Improvement Planning Exercise Evaluation Guides (EEG), Volume IV Library: Sample Exercise Materials, and HSEEP Prevention Exercises
- **HSEEP Compliance Job Aid**
- **Training and Exercise Planning Workshop User's Handbook**
- **HSEEP AAR-IP Template 2007**
- **Draft template for a Multi-Year Training and Exercise Plan**
- **HSEEP Toolkit:** An interactive, online collection of systems and tools for exercise scheduling, design, development, conduct, evaluation, and improvement planning.

Topic Additional Resources (Continued)

Display
Visual 29



Notes:

The Federal Emergency Management Agency (FEMA) Web site offers many training resources, including:

- **FEMA EMI Independent Study Classes:**
 - An Introduction to Exercises (IS-120.A)
 - Exercise Evaluation and Improvement Planning (IS-130)
 - Exercise Design (IS-139)
- **FEMA EMI Resident/Field Classes:**
 - Master Exercise Practitioner (MEP)
 - Homeland Security Exercise Evaluation Program (HSEEP)
- **Integrated Emergency Management Course (IEMC).** Offered at FEMA's Emergency Management Institute (EMI), this 4½-day exercise-based training activity involves an entire community in a response exercise, under realistic crisis situations, within a structured learning environment.
- **Training materials and publications,** such as Earthquake Safety Activities for Children and Teachers (FEMA 527), Tremor Troop (FEMA 159, for Grades K-6), Gracie the Wonder Dog (FEMA 531, for Grades 3-6), Seismic Sleuths (FEMA 253, for Grades 7-12), and many more.

Topic**Additional Resources (Continued)**

Display
Visual 30

Additional Resources: State and Local

- **State Emergency Management Agency:**
 - State Training Officer
 - State Exercise Officer
- **Local (City/County) Emergency Management Agency:**
 - Emergency Manager
 - Operations/Training Officer

FEMA Visual 30

Notes:

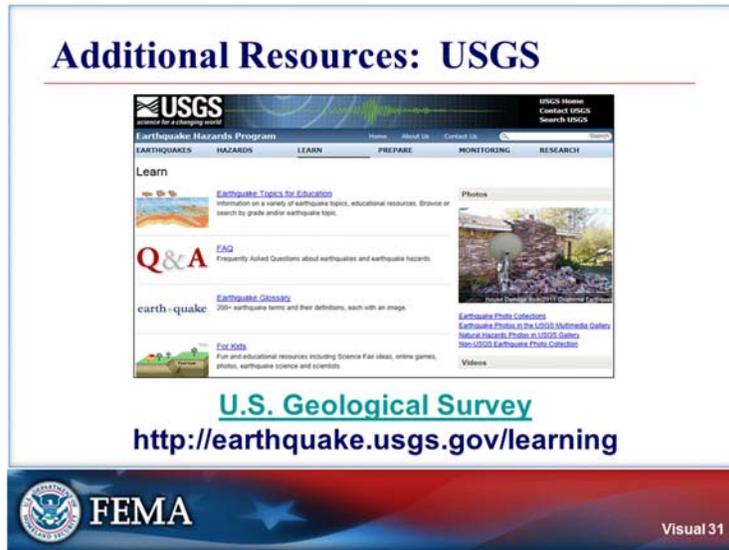
Contact your State Emergency Management Agency to request assistance from the State Training Officer or State Exercise Officer.

The city or county Emergency Management Agency is another valuable resource. Contact the Emergency Manager or Operations/Training Officer for assistance.

These resources can provide information about earthquake hazards in your area and community emergency response procedures that may affect your school.

Topic	Additional Resources (Continued)
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Display
Visual 31



Notes:

The U.S. Geological Survey (USGS) Web site provides numerous training resources.

Site resources include earthquake terminology (including animations that can be downloaded) and a PowerPoint presentation explaining earthquakes.

Other resources include:

- **For Teachers** is a portal that includes educational resources for teachers and their students. Browse all the links, or search by grade and/or earthquake topic. It includes links to lesson plans, interactive Web sites, learning activities, and more.
- **Earthquake for Kids** contains information specifically targeted toward younger children.
- **For Students** includes resources for students in elementary, middle, and high school, and in college.
- **Learning Links** is a database of educational materials related to earthquakes and plate tectonics that includes lesson plans, interactive Web sites, learning activities, and more.

Topic**Additional Resources (Continued)**

Display
Visual 32

Additional Resources: Resource Centers

- [Arkansas Center for Earthquake Education and Technology Transfer](http://quake.uar.edu/schools/):
<http://quake.uar.edu/schools/>
- [Mid-America Earthquake Center](http://www.nsf.gov/pubs/2000/nsf00137/nsf00137o.htm):
<http://www.nsf.gov/pubs/2000/nsf00137/nsf00137o.htm>
- [Public Earthquake Resource Center](http://www.ceri.memphis.edu/perc):
<http://www.ceri.memphis.edu/perc>

The slide features three logos: the Arkansas Center for Earthquake Education and Technology Transfer logo, the Mid-America Earthquake Center logo, and the Public Earthquake Resource Center logo. At the bottom left is the FEMA logo, and at the bottom right is the text 'Visual 32'.

Notes:

The [Arkansas Center for Earthquake Education and Technology Transfer](http://quake.uar.edu/schools/) (http://quake.uar.edu/schools) site provides a wide variety of earthquake education and preparedness resources. It includes lesson plans for all age groups, including preschool. The site also has a review page for their extensive, downloadable school teacher and administrator preparedness and mitigation guidebook.

The [Mid-America Earthquake Center](http://www.nsf.gov/pubs/2000/nsf00137/nsf00137o.htm) (http://www.nsf.gov/pubs/2000/nsf00137/nsf00137o.htm) site provides links to earthquake informational sites, lesson plans, and activities. This site compiles several sources of information to assist teachers. Resources include detailed lesson plans for elementary, middle, and high school on what an earthquake is, how to prepare, and what to do during an earthquake. This site includes information about the New Madrid earthquake and the Mississippi valley.

The [Public Earthquake Resource Center \(PERC\)](http://www.ceri.memphis.edu/perc) (http://www.ceri.memphis.edu/perc) is an education and outreach program developed by the Center for Earthquake Research and Information (CERI) at the University of Memphis. The site contains K-12 resources for children to explore and resources for teachers, including links to lesson plans and activities.

Topic**Additional Resources (Continued)****Display
Visual 33**

The screenshot displays a webpage titled "Additional Resources: Red Cross". It features a section for "Masters of Disaster® (K-8 students)" which includes a photograph of two children and a text description of the curriculum. Below this is a "Materials" list. At the bottom of the page, the American Red Cross logo and website URL "www.redcross.org" are visible. A FEMA logo is also present in the bottom left corner of the page, and the text "Visual 33" is in the bottom right corner.

Additional Resources: Red Cross

Masters of Disaster® (K-8 students)

Masters of Disaster® is a disaster education curriculum centered on a series of ready-to-go lesson plans to help youth learn disaster safety and preparedness information. The Masters of Disaster® Family Kit contains fun activities that help everyone in the home learn preparedness. The Masters of Disaster® Educator's Kit contains lessons, activities, and demonstrations on disaster-related topics that meet national educational standards and are specifically tailored for lower elementary (K-2), upper elementary (3-5) and middle school (6-8) classes.

Materials

- Purchase Masters of Disaster® Family Kit
- Purchase Masters of Disaster® Educator's Kit

American Red Cross
www.redcross.org

FEMA

Visual 33

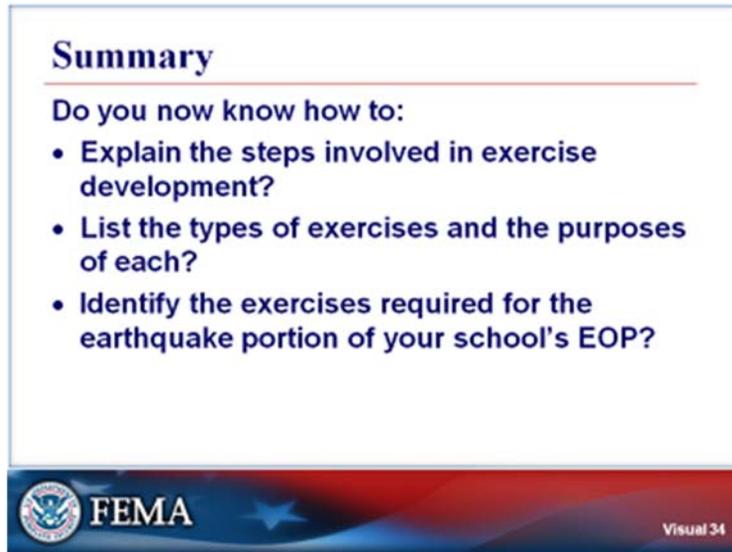
Notes:

The American Red Cross Web site includes a "Tools for Teachers and Parents" page, with valuable disaster-related resources.

- **Masters of Disaster** is a curriculum for teachers to use to integrate hazard safety into regular academic lesson plans in math, science, social studies, and language arts. The curriculum is available in three complete kits for teachers of Grades K-2, Grades 3-5, and Grades 6-8. The site also includes materials for Grades 9-12 on the topics of "Facing Fear" and "In the Aftermath." The materials are available through your local Red Cross chapter.
- **Be Ready 1-2-3** is an 8-page workbook (with an accompanying Instructor Guide) that helps children ages 5-8 learn about earthquakes through activities and demonstrations led by an "expert," Disaster Dog. This publication is available online (in English, Spanish, or Vietnamese) or in print through your local Red Cross chapter (stock number A5017).

Topic	Unit Summary
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Display
Visual 34



Summary

Do you now know how to:

- Explain the steps involved in exercise development?
- List the types of exercises and the purposes of each?
- Identify the exercises required for the earthquake portion of your school's EOP?

FEMA Visual 34

Notes:

This unit reviewed training and exercises to test an earthquake response plan.

Are you now able to:

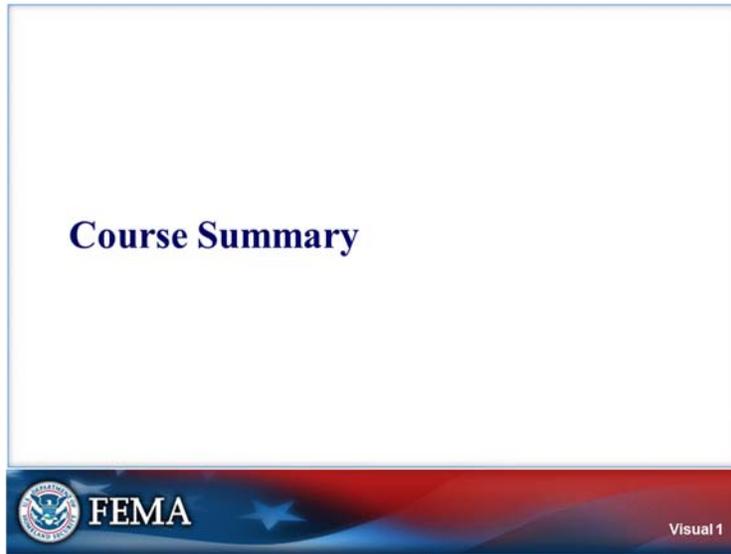
- Explain the steps involved in exercise development?
- List the types of exercises and the purposes of each?
- Identify the exercises required for the earthquake portion of your school's Emergency Operations Plan (EOP)?

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Course Summary

Topic Unit Introduction

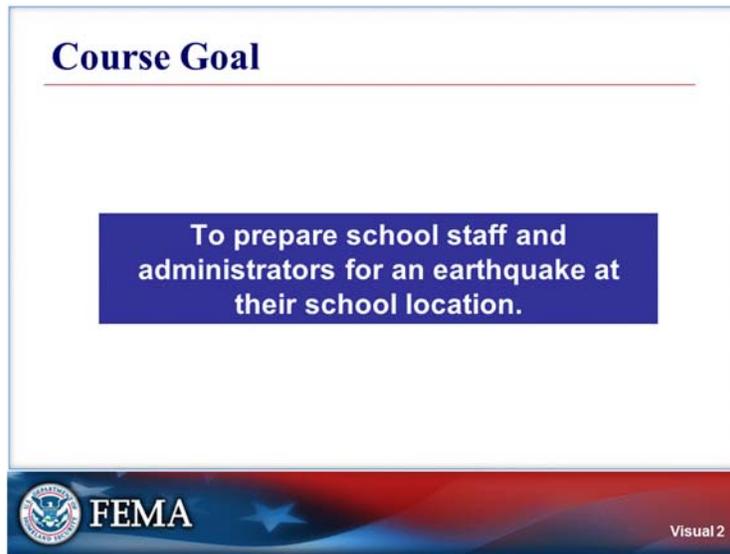
Display
Visual 1



Notes:

This unit summarizes the course content and offers you an opportunity to ask remaining questions.

Display
Visual 2



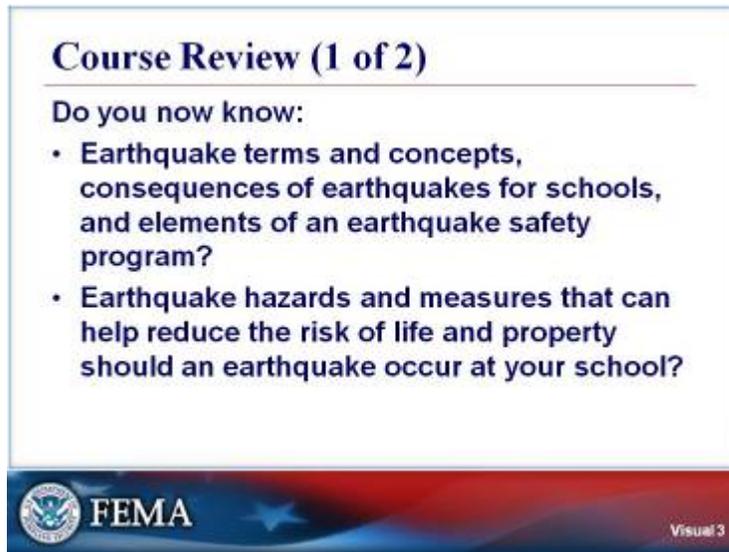
Notes:

The goal of this course was to prepare school staff and administrators for an earthquake at their school location.

The course was designed to describe the effects of an earthquake; explain how to mitigate those effects; state the key elements of an earthquake plan for preparedness, response, and recovery; and outline the procedures for training and exercises related to that emergency plan.

Was the course goal achieved?

Display
Visual 3



Course Review (1 of 2)

Do you now know:

- Earthquake terms and concepts, consequences of earthquakes for schools, and elements of an earthquake safety program?
- Earthquake hazards and measures that can help reduce the risk of life and property should an earthquake occur at your school?

FEMA Visual 3

Notes:

Do you now know earthquake terms and concepts, consequences of earthquakes for schools, and elements of an earthquake safety program?

Do you now know earthquake hazards and measures that can help reduce the risk of life and property should an earthquake occur at your school?

Display
Visual 4

Course Review (2 of 2)

Do you now know:

- Supplies needed after an earthquake, response procedures, and recovery strategies?
- Concepts of training and exercises and the types of exercises that can be used with staff and students?

FEMA

Visual 4

Notes:

Do you now know the supplies needed after an earthquake, response procedures, and recovery strategies?

Do you now know concepts of training and exercises and the types of exercises that can be used with staff and students?

Display
Visual 5

Lessons Learned

What have you learned about your school's earthquake planning measures?

What changes would you suggest for your school or classroom as a result of this course?



The image shows a slide with a blue and red wavy banner at the bottom. On the left is the FEMA logo, which includes the text 'FEDERAL EMERGENCY MANAGEMENT AGENCY' around a central emblem. To the right of the logo is the word 'FEMA' in large, bold, white letters. Further right is a single white star on a blue background. On the far right of the banner, the text 'Visual 5' is written in a small, white font.

Notes:

What have you learned about your school's earthquake planning measures?

What changes would you suggest for your school or classroom as a result of this course?

Topic Final Exam

Display Visual 6

Course Final Exam

- Assesses how well the course enabled you to achieve the learning objectives.
- Consists of 10 questions with a passing score of 8 items.
- Is completed individually and scored by the instructor.
- Completion Time: 15 minutes



Visual 6

Notes:

Purpose: The purpose of the final exam is to assess how well the course enabled you to achieve the learning objectives.

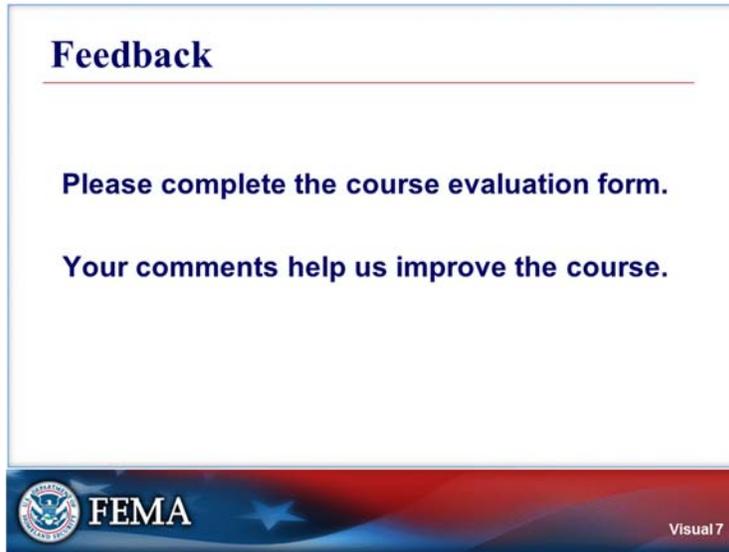
Estimated Time: 15 minutes

Instructions:

- The purpose of the final exam is to measure learning and at the same time determine how well that course promoted learning.
- There are 10 questions; you must answer at least 8 correctly to pass.
- You will have 15 minutes to work.
- Your instructor will score the final exam and provide feedback.

Topic Course Conclusion

Display
Visual 7



Notes:

Feedback is valuable when updating and/or revising this course. Please take the time to complete the course evaluation form.

Topic Course Conclusion (Continued)

Display
Visual 8



Notes:

Thank you for attending the course.