APPENDIX A

Planning Forms

- *OVERVIEW OF PLANNING ISSUES*
- *OVERVIEW OF PLANNING STRATEGIES*
- *COMMITTEE WORK PLAN*
- *EARTHQUAKE SAFETY ACTION PLAN*
- *CLASSROOM HAZARD INVENTORY*
- *EARTHQUAKE DRILL EVALUATION*
- *EMERGENCY STATUS REPORT*

Overview of Planning Issues

☐ Hazard Assessment

☐ Earthquake Drills

☐ Response Planning

☐ Communication

☐ Care and Shelter Planning

Planning Issues/Problems	Priority	
	High	Low

Overview of Planning Strategies

PLANNING ISSUE: _____

_____

Recommendation	Cost/Time	Schedule*			
		A	B	C	D

*Schedule

A = Immediate (current school year)
B = Short-term (add to routine maintenance program)
C = Long-term (add to district budget)
D = No action.

Overview of Planning Strategies

PLANNING ISSUE: Hallway Windows are potential earthquake hazards.

Recommendation	Cost/Time	Schedule*			
		A	B	C	D
1. Replace with safety glass	$ — per 2' x 3' pane # — total cost + Labor			X	
2. Replace broken Windows with Safety glass			X		
3. Apply adhesive Sunscreen film	$ — per square foot # — total cost		X		
4. Aduise staff and students of Potenial earthquake hazard		X			

*Schedule

A = Immediate (current school year)
B = Short-term (add to routine maintenance program)
C = Long-term (add to district budget)
D = No action.

Schedule*
(circle) **A B C**

Committee Work Plan

OBJECTIVE: _____

_____

Tasks	Person(s) Responsible	Deadline

***Schedule**

A = Immediate (current school year)
B = Short-term (add to routine maintenance program)
C = Long-term (add to district budget)

Schedule* (circle) A B C

Committee Work Plan

OBJECTIVE: Apply adhesive film to hallway windows

Tasks	Person(s) Responsible	Deadline
Meet with maintenance personnel at school or district office.		
Determine whether parents can be recruited to help.		
Determine cost of materials.		
Identify possible funding sources.		
Submit report of findings.		
Establish work schedule.		
Conduct project.		
Submit progress report.		
Submit final report.		

***Schedule**

A = Immediate (current school year)
B = Short-term (add to routine maintenance program)
C = Long-term (add to district budget)

SAMPLE

Earthquake Safety Action Plan

OBJECTIVE: _____

_____

Tasks	Time Line (in months)																					
	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J

Classroom Hazard Inventory

Date: _____ **Room No.** _____

Indicate number of:

___ Unsecured bookcases

___ Unsecured wall shelves

___ Free-standing cabinets

___ Hanging plants

Check if applicable:

___ TV monitor unsecured on platform

___ TV monitor on wheeled cart

___ Classroom piano on wheels

___ Heavy objects on high shelves

List other hazards identified.

Earthquake Drill Evaluation

Date: _____

___ Are all students and staff familiar with the "drop-and-cover" procedure?

___ Have all students **demonstrated** their ability to take immediate and correct actions?

___ Do teachers take cover with students during drills?

___ Is there sufficient shelter space under tables, desks, and counters for all students?

___ Do all students know how to protect themselves if no shelter is available?

___ Are teachers and students prepared to remain in quake-safe positions for up to 60 seconds?

___ Are students encouraged to be silent during drills?

___ Are teachers prepared to maintain relative calm and reassure their students?

___ Are students evacuated from classrooms to a safe outdoor area following a simulated earthquake?

___ Does your post-earthquake building evacuation procedure consider the very real possibility that strong aftershocks may occur within minutes after the main event?

___ Do teachers remember to take class roster and response checklists to outdoor assembly area during earthquake drills?

___ Have maintenance staff and all others assigned earthquake response duties practiced their roles during your earthquake drills?

___ Have students been given ample opportunity to discuss their fears and concerns about earthquakes?

___ Have students been instructed on how they can help each other?

___ Are earthquake drills viewed as an opportunity to discuss earthquake preparedness in the home?

___ Have parents been informed about your earthquake safety procedures?

___ Have teachers and other staff members been encouraged to prepare their families to cope effectively during and after an earthquake?

Emergency Status Report

Time Report Filed: _____

IMMEDIATE ASSISTANCE REQUIRED

___ None ___ Medical ___ Fire ___ Search and Rescue ___ Support personnel

CONDITION OF STUDENTS

___ All accounted for ___ No injuries ___ No immediate help required

___ Missing (number) Names: _____

_____

___ Trapped in building (number) Names: _____

_____

___ Injured (number) ___ Number requiring immediate medical attention

Type of Injury	Name
_____	_____
_____	_____
_____	_____

CONDITION OF STAFF

___ All accounted for ___ No injuries ___ No immediate help required

___ Missing (number) Names: _____

_____

___ Trapped in building (number) Names: _____

_____

___ Injured (number) ___ Number requiring immediate medical attention

- OVER -

Type of Injury	Name

CONDITION OF SCHOOL BUILDING AND GROUNDS

E.g.: walls cracked, fallen light fixtures, shattered windows, broken water pipes, flooding, etc.

CONDITION OF NEIGHBORHOOD

E.g.: fallen power lines, debris-cluttered streets, etc.

Update

Time Filed: _____

___ Number of children remaining at school

___ Number of staff members remaining to care for children

___ Assistance required: ___ water ___ food ___ blankets

___ additional personnel (number) to assist in student care

Update

Time Filed: _____

___ Number of children remaining at school

___ Number of staff members remaining to care for children

___ Assistance required: ___ water ___ food ___ blankets

___ additional personnel (number) to assist in student care

Update

Time Filed: _____

___ Number of children remaining at school

___ Number of staff members remaining to care for children

___ Assistance required: ___ water ___ food ___ blankets

___ additional personnel (number) to assist in student care

APPENDIX B

Teacher's Package on Earthquake Drills

- *WHAT TO EXPECT*
- *QUAKE-SAFE ACTIONS*
- *CLASSROOM HAZARD HUNT*
- *OPERATION A-R-R-R!*
- *CLASSROOM EARTHQUAKE DRILLS*
- *EARTHQUAKE SIMULATION EXERCISES*
- *CLASSROOM EARTHQUAKE KIT*
- *EVALUATION*
- *FILMS AND BOOKS*
- *STUDENT TAKE-HOME ACTIVITIES*

Earthquake Drills

Of all earthquake preparedness measures, earthquake drills are the most important. Their purpose is **to help students learn how to react immediately and appropriately at the first indication of ground shaking.** Drills show students WHERE to seek shelter and HOW to protect their heads and bodies from falling objects (e.g., debris from ceilings, light fixtures, and shattered glass).

Because earthquakes are frightening to experience and to think about experiencing, children should be encouraged to talk about their fears and concerns. Discussions about "what to do if" help to increase understanding and reduce the undesirable and life-threatening behaviors that stem from lack of knowledge.

Information in this package focuses on both physical and psychological preparedness and is intended to assist you in helping your students to:

- Anticipate WHAT may occur during an earthquake.
- Understand WHY it's important to muster self control against the desire to scream, cry, or run.
- Learn and practice HOW, WHERE, and WHEN to take quake-safe action.

STEP ONE: Learn what to expect during an earthquake and prepare students to anticipate and avoid dangers.

During a major earthquake, the greatest immediate hazard to people in or near a building is the danger of being hit by falling objects. During the ground shaking, the school population is safest finding immediate shelter under desks, tables, or counters.

What to Expect

The first indication of a damaging earthquake may be a gentle shaking. You may notice the swaying of hanging plants and light fixtures or hear objects wobbling on shelves. Or you may be jarred first by a violent jolt (similar to a sonic boom). Or you may hear a low (and perhaps very loud) rumbling noise. A second or two later, you'll really feel the shaking, and by this time, you'll find it very difficult to move from one place to another.

It's important to take "quake-safe" action at the first indication of ground shaking. Don't wait until you're certain an earthquake is actually occurring. As the ground shaking grows stronger, danger increases. For example:

- Free-standing cabinets and bookshelves are likely to topple. Wall-mounted objects (such as clocks and artwork) may shake loose and fly across the room.

- Suspended ceiling components may pop out, bringing light fixtures, mechanical diffusers, sprinkler heads, and other components down with them.

- Door frames may be bent by moving walls and may jam the doors shut. Moving walls may bend window frames, causing glass to shatter and sending dangerous shards into the room.

The noise that accompanies an earthquake cannot cause physical harm. However, it may cause considerable emotional stress—especially if students are not prepared to expect the noisy clamor of moving and falling objects, shattering glass, wailing fire alarms, banging doors, and creaking walls. The noise will be frightening, but a little less so if it is anticipated.

STEP TWO: Discuss and demonstrate "quake-safe" actions to take in various situations.

Inside or outside, when a major earthquake occurs:

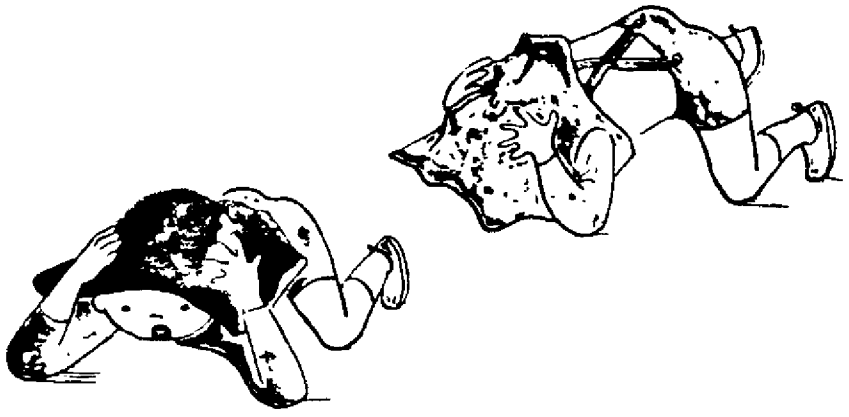
TAKE ACTION AT THE **FIRST** INDICATION OF GROUND SHAKING.

If Inside, Stay Inside

- **In classrooms or offices,** MOVE AWAY from windows, shelves, and heavy objects and furniture that may fall. TAKE COVER under a table, desk, or counter.

  If a "shelter" is not available, move to an **inside** wall or corner, turn away from windows, kneel alongside wall, bend head close to knees, cover sides of head with elbows, and clasp hands firmly behind neck.

  If notebooks or jackets are handy, hold these over head for added protection from flying glass and ceiling debris (as shown in the illustrations below).



Illustrations from a student publication produced by the Tokyo (Japan) School Board.

- **In halls, stairways, or other areas where no cover is available,** follow above advice.

- **In library,** immediately move away from windows and bookshelves and take appropriate cover.

Illustration from a student publication produced by the Tokyo (Japan) School Board.

- **In laboratories,** all burners should be extinguished (if possible) before taking cover. Stay clear of hazardous chemicals that may spill.

There are no uniform guidelines for protecting students in other areas inside the school building (e.g., gymnasium and auditorium). Determine procedures for your school with advice from experts (structural engineers and fire officials).

If Outside, Stay Outside

- **On playground or enroute to and from school,** move to an open space, away from buildings and overhead power lines. Lie down or crouch low to the ground (legs will not be steady). Keep looking around to be aware of dangers that may demand movement.

- **On the school bus,** remain on the bus. Remain in your seat and hold on. (Note: Bus drivers should be instructed to stop buses away from powerlines, bridges, overpasses, and buildings.)

More "Quake-Safe" Suggestions

Discuss with students what they should do if no adult is present in the classroom or other areas.

Determine "quake-safe" actions for disabled students and discuss them with these students and other class members.

> Disabled students should never be excused from participating in fire or earthquake drills. They, too, need to have experience and confidence in their ability to avoid dangers. It may not be possible for students with impaired mobility to get under a desk or table. They can, however, learn to react quickly and turn away from windows; move away from light fixtures and unsecured bookcases; and use their arms or whatever is handy to protect their heads.

Discuss how students can help each other. Examples of self-control are contagious. Students should be encouraged to help calm and comfort each other and to lend their shoulders to others whose knees may refuse to stop shaking.

STEP THREE: Conduct a classroom hazard hunt with your students.

Anything that can move, fall, or break when the ground starts to shake is an earthquake hazard if it can cause physical or emotional harm. The following checklist will help you and your students identify hazards in your classroom and generate discussion on how these hazards can be reduced or avoided.

___ Are free-standing cabinets, bookcases, and wall shelves secured to a structural support?

___ Are heavy objects removed from high shelves?

> *High shelf = shelf above head of seated student*

___ Are aquariums and other potentially hazardous displays located away from seating areas?

___ Is the TV monitor securely fastened to a securely fastened platform?

___ Is the TV monitor securely attached to a portable (rolling) cart with lockable wheels?

___ Is the classroom piano secured against rolling during an earthquake?

___ Are wall-mounted objects secured against falling?

___ Are hanging plants secured to prevent them from swinging free or breaking windows during an earthquake?

> *During an earthquake, hanging plants will behave like a pendulum.*

STEP FOUR: Identify ways to reduce classroom hazards.

Operation A-R-R-R! (Anchor, Refit, Relocate, Remove), Figure 1, is designed to increase students' resourcefulness in identifying ways to reduce potential classroom hazards. Class projects could center on students carrying out their recommendations.

Operation A-R-R-R!

(ANCHOR - REFIT - RELOCATE - REMOVE)

1. HAZARD	2. REMEDY				3. CLASS RECOMMENDATION
	Anchor	Refit	Relocate	Remove	
HANGING PLANTS		X	X		REPLANT IN PLASTIC POTS
					MOVE AWAY FROM WINDOWS
					HANG WITH CLOSED HOOKS
①		②			③

① Identify potential earthquake hazards. ② Determine remedies for reducing each hazard.

③ Recommend how each hazard could be reduced.

Anchor = secure, tie down.

Refit = add or change for safety; e.g., use plastic bottles instead of glass, use closed hooks instead of open hooks.

Relocate = move to a safer spot.

Remove = eliminate.

Figure 1. SAMPLE OPERATION A-R-R-R! FORM

Take-Home Activity

Encourage students to practice their detective skills by identifying and reducing hazards in their homes. A guide for conducting a **Home Hazard Hunt** is provided at the end of this package.

Operation A-R-R-R!

(ANCHOR - REFIT - RELOCATE - REMOVE)

1. HAZARD	2. REMEDY				3. CLASS RECOMMENDATION
	Anchor	Refit	Relocate	Remove	

① Identify potential earthquake hazards. ② Determine remedies for reducing each hazard.

③ Recommend how each hazard could be reduced.

Anchor = secure, tie down.

Refit = add or change for safety; e.g., use plastic bottles instead of glass, use closed hooks instead of open hooks.

Relocate = move to a safer spot.

Remove = eliminate.

STEP FIVE: Conduct classroom earthquake drills and simulation exercises.

The earthquake drill below is an example of standard response actions to take in classrooms. The complete earthquake drill should include post-earthquake building evacuation procedures--safety measures to take **after** the ground stops shaking.

Sample Classroom Earthquake Drill

Objective:

During an earthquake drill or at the **first** sign of ground shaking, students demonstrate their ability to react immediately and appropriately.

DROP AND COVER
TURN AWAY FROM WINDOWS
STAY UNDER SHELTER UNTIL SHAKING STOPS
LISTEN FOR INSTRUCTIONS

Following your command, students will:

1. Immediately TAKE COVER under desks or tables, and TURN AWAY from windows.

   Advise students to move with their "shelters." Desks and tables are likely to travel during strong ground shaking.

   Lightweight desks may topple, and students should try to keep them upright by holding on to desk legs.

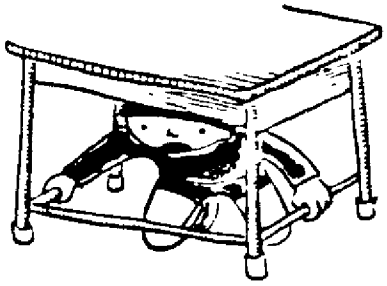


Illustration from a student publication produced by the Tokyo (Japan) School Board.

2. Remain in sheltered position for at least 60 seconds.

   The duration of ground shaking depends on a number of factors, including the severity of the earthquake. Advise students to anticipate shorter or longer episodes of ground shaking during actual earthquakes and their aftershocks.

3. Be silent and listen to instructions.

   Students should be advised to anticipate the noise that accompanies an earthquake, and they should be cautioned to remain silent in order to hear your instructions.

During the earthquake drill, you will:

1. Take cover.

   When you (and other teachers) take cover, your example reinforces the importance of earthquake drills. This positive action will also assure children that adults will be safe and able to care for them.

2. Talk calmly to students.

   Remind students to take deep breaths to help them stay calm, or encourage them to count **softly** (in whisper voice).

3. Review procedure for evacuating classroom AFTER shaking ceases.

Earthquake Simulation Exercises

The two earthquake simulation exercises below are designed to help reduce students' anxieties and increase students' confidence in their ability to take immediate "quake-safe" action. It is recommended that these exercises be carried out **before** conducting schoolwide earthquake drills. They will aid you in preparing your students for the consequences of a major earthquake.

Earthquake Simulation Exercise 1:

The purpose of this exercise is to increase and reinforce students' ability to react immediately and appropriately.

- Prepare to time students' response to your command, "DROP AND COVER!"
- Issue command: "DROP AND COVER!"
- Note response time. Most students can be safely under desks and tables within five seconds.

- Advise students to stay (freeze) where they are; then note and **immediately** correct students displaying any inappropriate behavior.

- Commend students who remembered to turn away from windows and remain silent.

- Ask students to return to their seats.

The above exercise should be conducted when students are at their assigned places **and** during mobile periods (e.g., when students are at various activity stations). The purpose of varying this exercise is to convey the idea that students should take cover under the nearest shelter.

Be prepared to expect confusion during the first exercise of the latter variation.

> For example, some students may scramble to seek cover under their assigned desks or tables. Also, too many students may seek protection under the same "shelter."
>
> Students unable to reach a shelter space or "crowded out" from their chosen shelter may experience considerable anxiety, which may or may not be expressed. This problem should be discussed immediately. Students must realize that it may not be possible to find protection under furniture and should be instructed to assume other self-protecting positions as described under Step 2.
>
> Help your students realize the importance of taking immediate self-protecting action by revealing how much time was lost in seeking shelter during the latter variation of this exercise.

Earthquake Simulation Exercise 2*:

The purpose of this exercise is to give students more information on what to expect when the ground starts and continues to shake for up to 60 seconds.

- Prepare to keep track of time (or assign a teacher's aide or student to do so).

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*Earthquake scenario adapted from the "Hands-On Earthquake Learning Package," developed by the Environmental Volunteers, 2253 Park Boulevard, Palo Alto, CA 94306. Reprinted with permission.

- Prepare your students by explaining that you will be talking them through a hypothetical (imaginary) earthquake to help them understand what may happen when a real earthquake occurs:

  "Imagine you hear a low, rumbling, roaring sound. Then, suddenly you feel a terrific jolt . . . like a truck just rammed into the building or like the terrific noise and vibration from a sonic boom!

  "The floor starts to move beneath you, making it hard to sit in your chair. If you try to stand up, it may feel like you're riding a raft down some rapids or trying to walk on a water-bed or trampoline.

  "Now you hear someone say, 'EARTHQUAKE ! DROP AND COVER !' "

- Begin timing.

  "I want everyone to DROP AND COVER now, as quickly and quietly as possible. . . . Now listen very carefully.

  "The shaking and noise may last up to 60 seconds or longer.

> *You may wish to simulate many of the sounds mentioned below to make the effect more realistic—e.g., by dropping books, sliding chairs, shaking tables, etc.*

"The building is creaking and rattling now, books in the room are falling on the floor . . . hanging lamps and plants are swaying and some may fall . . . the windows are rattling . . . one window just shattered onto the floor . . . the desks, tables, and chairs may be sliding . . . try to stay in your quake-safe position. If your shelter starts to move, hold on to its legs and move with it.

"You hear many noises . . . dogs may be barking . . . people may be shouting . . . the fire alarm may go off. The ground is still shaking. Inside our classroom, doors are swinging and banging, wall hangings are falling to the floor . . . some ceiling parts may have shaken loose . . . the lights may be flickering or may go out." (Have someone turn off the lights.)

"The ground has stopped shaking now."

- End timing.

  "Everyone take a deep breath, remain quiet, and return to your seats."

Essential Followup Activities

Immediately following each exercise, it is imperative that students be given an opportunity to ask questions and discuss their fears and concerns. Psychologists have also recommended that other activities, such as drawing and writing about these experiences, will help to bring children's anxieties into the open for further consideration.

Recommended Followup Activities

Class Project

The **Classroom Earthquake Kit** on the following page involves making a backpack and stocking it with various emergency items, including an extra copy of the class roster. It is intended to be carried by the teacher to the outdoor assembly area during earthquake drills and following an actual earthquake **or** other emergency. The presence of this kit, hanging near the classroom exit, will increase students' appreciation of their efforts to be prepared.

Take-Home Activities

Following completion of the above classroom activity, you may wish to encourage students to prepare similar kits to keep at home or in the family car. The **Family Earthquake Drill** at the end of this package is designed to help all family members identify earthquake-safe areas in the home. The activity includes special precautions to take **and practice.**

Classroom Earthquake Kit

PURPOSE

Individual classroom earthquake kits will provide each teacher with immediate resources to account for students, care for minor injuries, and occupy students during outdoor evacuation/shelter period. Each kit is intended to be carried by the teacher when the class evacuates the building after an earthquake (or other emergency) or following a classroom earthquake drill.

OBJECTIVES

This activity will enable students to identify items to have on hand following an emergency such as an earthquake. It will also help students to:

- Recognize **their** responsibility to increase their own ability to cope with emergencies.
- Understand the importance of working together (as a class, family, or neighborhood) to prepare for emergencies and to take care of each other during the aftermath.

TASKS

Students design, make, and equip a survival kit for their classroom.

STRATEGY

Divide the class into teams: designers, manufacturers, and suppliers.

TEAM ACTIVITIES

1. Design a logo. Students may want to hold a class contest for best design.
2. Determine fabric type and color.
3. Determine construction methods. Use a sewing machine or sturdy lacing.
4. Decide on size and style.
   - The kit could resemble a backpack (see above illustration).
   - It MUST have shoulder straps because you will need free hands to assist students.
5. Obtain fabric and other materials needed to make the kit.

6. Make a pattern.

7. Cut and stitch (or lace)—paint, sew, or glue on logo.

8. Identify and obtain supplies.

9. Hang completed kit with contents near the classroom exit.

SUGGESTED CONTENTS

Essential Items

- Copy of class roll book.
- Teacher's checklist of priority response actions.
- First-aid supplies:
  - antiseptic cleanser (liquid)
  - gauze pads and two gauze eye pads
  - adhesive tape
  - small scissors
  - adhesive bandages.
- Flashlight and spare batteries.

Optional Items

- Small transister radio.
- Permanent-ink felt pen (for marking names on students).
- Small pad of paper and pens or crayons.
- Colored flag to call for aid (coordinate with Earthquake Safety Committee).
- Games.
- Hard candy.
- Lightweight, plastic trash bags to sit on or to wear as parkas—cut holes for neck.

> Request donations of remnants from fabric store and supplies from various sources. Send benefactors a photo of your kit with a note of thanks.

STEP SIX: Evaluate the effectiveness of your classroom earthquake drills.

Use the checklist below to evaluate your progress in preparing students (and yourself) to take quake-safe action.

___ Are you and your students familiar with various quake-safe actions?

___ Have all students **demonstrated** their ability to take immediate and correct actions?

___ Do you take cover with students during drills?

___ Is there sufficient shelter space under tables and desks for all students?

___ Have all students **demonstrated** their ability to protect themselves if no shelter is available?

___ Are you and your students prepared to remain in quake-safe positions for up to 60 seconds?

___ Do you encourage students to be silent during drills?

___ During an actual earthquake, could you maintain relative calm and reassure your students?

___ During an actual earthquake, would you be able to think through appropriate actions to take when the shaking stops?

___ Are students evacuated from classrooms to a safe outdoor area following a simulated earthquake?

___ Would your students know what to do if an aftershock occurred while they were on stairs or in hallways?

___ Do you remember to take a class roster and response checklists during simulated post-earthquake evacuation drills?

___ Have your students been given ample opportunity to discuss their fears and concerns about earthquakes?

___ Have students been instructed on how they can help each other?

___ Do you view earthquake drills as an opportunity to discuss earthquake preparedness in the home?

Preview of Coming Attractions

Lesson plans and student activities related to the study of earthquakes for grades 3 to 6, along with suggestions for integrating earthquake units into various subject areas (e.g., math, language arts, social studies), are currently being collected. In 1987, the teaching aids will be packaged and available for distribution nationwide. If you'd like to include your name on the mailing list for these materials, write to:

Federal Emergency Management Agency
Earthquake and Natural Hazards Division, SL-NT
500 C Street, S.W.
Washington, D.C. 20472

You are also invited to contribute your efforts to this collection and to help review, edit, or field test emerging products.

Films and Books on Earthquakes

The following films and books are recommended by the staff of the Earthquake Education Project, Tennessee Earthquake Information Center, Memphis State University.

FILMS

Title	Source	Description	Length (minutes)	Free Preview	Rating	Price	Minimum Educational Level
"An Approach to the Prediction of Earthquakes" 1969	American Educational Films Attn: Jim Springer Box 8188 Nashville, TN 37207	Explains Japanese EQ prediction system through the experience of a village (Matushiro) in an EQ-prone area.	27	Yes	Very Good	$435	High School
"Earthquake Dont's and Do's" 1972	LSB Productions Attn: Leonard Berman 1310 Monaco Rd. Pacific Palisades, CA 89272	Actor John Ritter portrays a man in near-panic during an EQ, who then learns and takes appropriate actions.	11	Yes	Very Good	$225	Elementary School
"Earthquakes: Exploring the Earth's Restless Crust" 1983	Encyclopedia Britannica Educational Corp. 425 N. Michigan Ave. Chicago, IL 60611	Explains what earthquakes are and how they occur. Discusses different types of seismic waves, how they are recorded, and how they affect the earth.	22	Yes	Very Good	$430	Jr. High
"Restless Earth: Plate Tectonics"	Indiana University Audiovisual Center Bloomington, IN 47405	Explains Theory of Plate Tectonics	58 (2 reels)	Rental $20.75	Very Good	$635	Jr. High
"Tomorrow's Quake: Earthquake Prediction" 1977	American Educational Films Attn: Jim Springer Box 8188 Nashville, TN 37202	Explains various methods used in EQ prediction research; also discusses unusual animal behavior before earthquakes. Combines animation, stills, and live action footage.	16	Yes	Good	$350	Elementary School

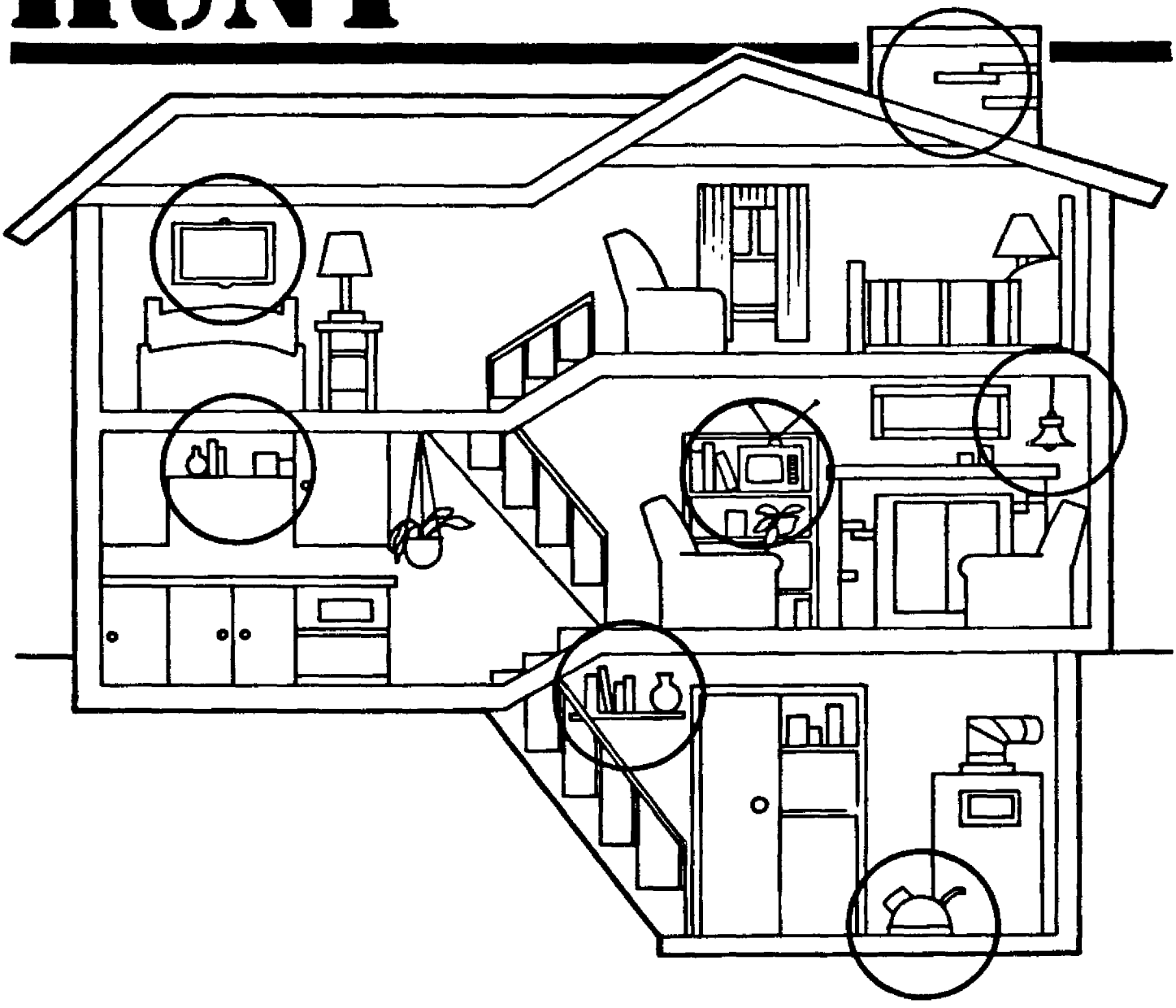
BOOKS

Title	Author	Grade Level	Source	Rating	Price
Earthquakes & Volcanoes	Imelda & Robert Updegraff	4-8	Penguin Books 625 Madison Ave. New York, NY 10022	Very Good	$3.50
The Earth in Motion: The Concept of Plate Tectonics 1978	R. V. Fodor	7-11	William Morrow & Co. 105 Madison Avenue New York, NY 10016	Excellent	$9.95
Earthquake 1982	Time-Life "Planet Earth" Series	7-10	Time-Life Books 541 N. Fairfax Ct. Chicago, IL 60611	Excellent	$14.95
Earthquakes: A Primer 1978	Bruce Bolt	11-college	W. H. Freeman & Co. 4419 West 1980, South Salt Lake City, UT 84104	Excellent	$12.95
How did we find out about Earthquakes 1978	Isaac Asimov	5-10	Walker & Company 720 Fifth Street New York, NY 10019	Excellent	$8.95
Inside the Earth 1982	Bruce Bolt	11-college	W. H. Freeman & Co. 4419 West 1980, South Salt Lake City, UT 84104	Excellent	$12.95
Volcanoes	Franklyn Branley	4-8	Harper Jr. Books Group 10 E. 53rd Street New York, NY 10022	Very Good	$11.50

Student Take-Home Activities

- *HOME HAZARD HUNT*
- *FAMILY EARTHQUAKE DRILL*
- *EARTHQUAKE SAFETY CHECKLIST*

HOME HAZARD HUNT



HOME HAZARD HUNT

Anything that can move, fall, or break when your house starts to shake is a home earthquake hazard.

Falling objects and debris are the most common causes of injury during an earthquake. You and your family can reduce the risk of being injured in your home by reducing earthquake hazards. A **Home Hazard Hunt** will help you identify potential hazards that can be reduced or eliminated with little effort and little or no cost.

All family members should participate in the Hunt. Foresight and common sense are all that's required as you go from room to room and imagine what would happen when the earth and house start shaking.

1. Imagine what would happen when your house starts to shake.

An earthquake may introduce itself with a violent jolt or a mild shaking. The first thing you may notice is the swaying of hanging plants or light fixtures, or you may hear the sound of objects wobbling on shelves.

As the shaking grows stronger, hanging plants may swing free of their hooks, bang against walls or windows, or crash to the floor. Objects will fall from shelves, furniture will move about or may topple over, ceiling plaster may fall, and windows (particularly large window panes and glass doors) may shatter.

All this commotion occurs because not all parts of your home and its contents move together during an earthquake.

2. Look for potential hazards in each room and discuss how you can reduce or eliminate these hazards.

- Do any rooms contain tall bookcases or bookshelves? How many things are likely to fall? Maybe the whole works, if it's not fastened properly to the wall. Which items are heavy enough to cause injury? During a moderate shake, objects may topple from shelves and fall in a vertical path. During a violent shake, heavy objects may be propelled to fall in a diagonal path.

What should you do?

Anchor bookcases and other top-heavy furniture to wall studs using metal angle braces ("L" brackets) and lag screws. Be sure that shelf brackets are fixed to shelves. Additional safety measures include applying strips along the front edge of shelves to hold light-weight objects in place. The easiest thing to do is remove all heavy objects from shelves above head level of shortest family member.

- Do you have hanging plants or hanging light fixtures? How are they fastened? Could they swing and hit a window? Could they swing free of their hooks?

  As a minimum precaution, transfer hanging plants from heavy clay pots to lighter plastic ones and use closed hooks on all hanging items.

- Where do you sit or sleep? Is there a heavy picture frame or bookshelf over your bed? Do a little rearranging to ensure a sound sleep and safe awakening.

- What kind of latches are on the kitchen cabinets? Consider replacing magnetic "touch" latches with ones that will hold the cabinet door shut during an earthquake.

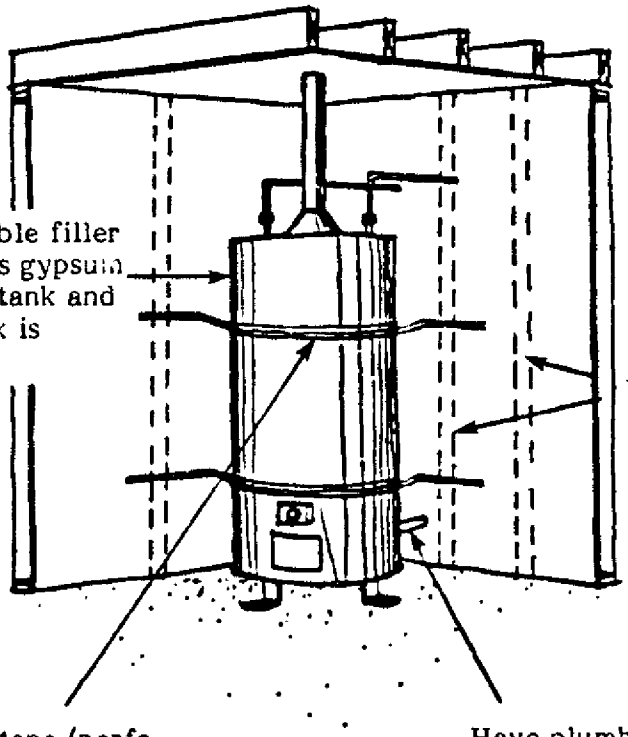
- Are there glass bottles in your medicine cabinet or above or around the bathtub? Replace with plastic containers or relocate to low cabinets (use child-proof latches if toddlers are about).

3. Look for potential hazards in your garage or basement.

- Where do you keep flammable products? These items should be located far away from any heat sources.

- Is your hot water heater secured for earthquake country? To do so is simple and inexpensive. Thin metal tape, known as "plumber's tape," can be used to fasten your hot water heater to the wood studs of the nearest wall.

Don't rely on pipe lines to support hot water heaters. These appliances must be strapped to a solid wall to restrict their movement in an earthquake. Even a moderate earthquake could cause sufficient movement to rupture gas or electrical lines and topple heaters.



Fit noncombustible filler material (such as gypsum board) between tank and wall so that tank is tightly braced.

Wood studs

Wrap plumber's tape (perforated metal strapping) around water heater, criss cross tape in front of heater, and attach tape directly to studs with large screws (such as 1/4" diameter lag screws) penetrating several inches into stud.

For concrete walls, substitute 1/4" expansion bolts for screws.

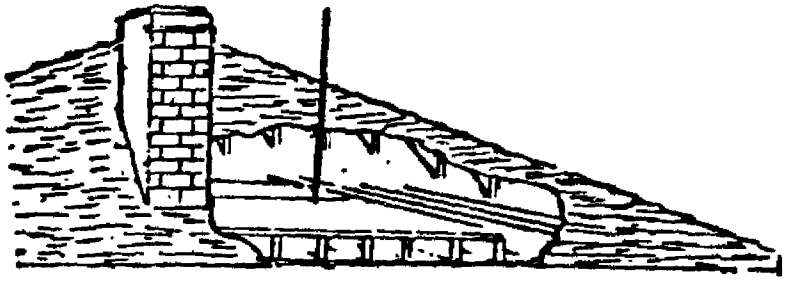
Have plumber replace rigid gas line with flexible connection.

4. Check the outside of your home.

- Masonry chimneys are highly susceptible to earthquake damage. If you have a chimney, determine where those bricks are likely to fall. Through your roof and into a bedroom or family room?

  Consider adding a plywood shield to ceiling joists to protect occupants in the room below.

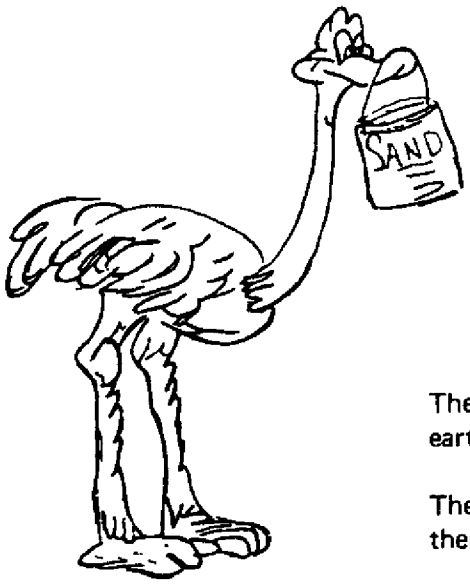
Plywood (at least 1/2" thick) placed over ceiling joists prevents a collapsing chimney from falling through ceiling.



With your powers of perception now finely tuned, conduct your own hazard hunt at your place of work. If you have little or no control over your work environment, at least check to determine if your company has an earthquake safety plan.

When family members are separated during an earthquake or any disaster, each needs to hold on to the assurance that other members can cope and keep safe.

FAMILY EARTHQUAKE DRILL



The most frightening thing about an earthquake is not knowing what to do.

The next frightening thing is to believe there is nothing you can do.

It is normal and natural to be afraid of earthquakes. However, fears and anxieties can be lessened by planning and practicing what to do BEFORE an earthquake occurs. You and your family CAN learn to react correctly and automatically when the first jolt or shaking is felt.

FAMILY EARTHQUAKE DRILL

Where will you go for protection when your house starts to shake -- and you're in the living room, the bedroom, the bath, or the kitchen? What if you're in one part of the house and other family members are in another? During a violent earthquake, you won't have time or steady legs to reach them. Will they know what to do to protect themselves? Will you?

Because earthquakes occur without warning, it's important that you and your family learn to take appropriate actions at the first sign of ground shaking. You won't have time to think, you'll only have time to REACT.

In a major earthquake, you may experience a shaking that starts out to be gentle and within a second or two grows violent and knocks you off your feet.

Or, you may be jarred first by a violent jolt -- similar to a sonic boom. Or, you may hear a low (and perhaps very loud) rumbling noise. A second or two later you'll feel the shaking; and, as in the first example, you'll find it very difficult (if not impossible) to move from one room to another.

These examples should give you a clue that you and your family may have only one or two seconds to take safe shelter INSIDE your home.

EARTHQUAKE DRILLS will help you and your family plan and remember where to seek shelter and how to protect yourselves.

1. **Identify safe spots in each room.**

The first step is to acquaint each family member with safe places in each room of your home.

- Under a sturdy table, desk, kitchen counter, or wood-framed doorway.
- Against an inside corner or wall. Take extra protection measures in these locations by covering your head with your arms or with whatever is handy (e.g., pillow, sofa cushion).

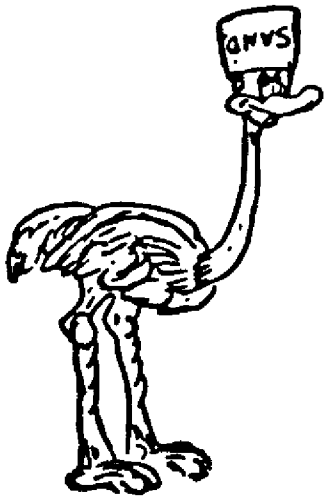
Reinforce this knowledge by physically placing yourselves in these locations. This is a very important step for your children. Acting out what they are taught will help them remember what to do in case you're not beside them at the critical time.

2. **Beware of danger zones.**

Next, identify danger zones in each room. During an earthquake, each family member should:

STAY CLEAR OF

- Windows that may shatter;
- Heating units, stove, fireplace, and areas where bricks from the
- chimney may fall; and
- Bookcases, cabinets, and furnishings that may topple.



3 . **Practice quake-safe actions.**

Hold surprise earthquake drills in the days that follow this initial exercise. Call out "EARTHQUAKE" from wherever you may be in your home. Each family member should respond by moving to the nearest safe place.

Once a month (for a few months, at least) let a child call a surprise earthquake drill and follow through with what you've learned. Test each other. Was David's choice the safest? Did Sally realize that the closet door could be sealed shut? Did the person in the kitchen remember to turn off the stove?

4 . **Discuss what to expect following a damaging earthquake.**

- Be prepared to take care of injuries. Emergency personnel may not be able to respond to individual calls for assistance for several hours, or even days.

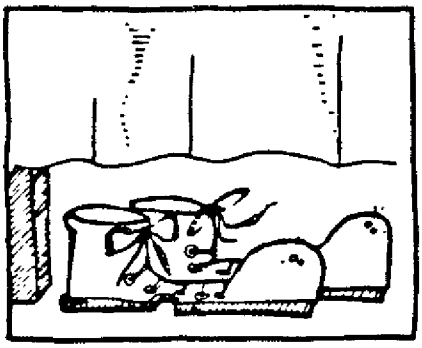
- Be prepared to check for gas leaks and learn where and how to turn off gas, water, and power at main valves and switches.

- Be prepared for aftershocks which may be nearly as strong as the initial earthquake. Do not remain in or near a building that might be further damaged by aftershocks.

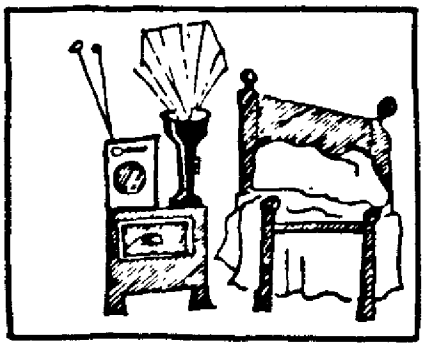
- Be prepared to deal with the emotional needs of family members.
- Remember to stay close enough to touch and comfort each other.
- Remember to talk about what happened and be sure to encourage your children to talk about how they felt – how afraid and how brave they were.

EARTHQUAKE SAFETY CHECK LIST

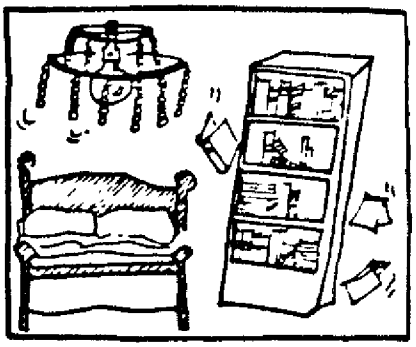
EARTHQUAKE PREPAREDNESS AND SAFETY BEGIN WITH THE FAMILY



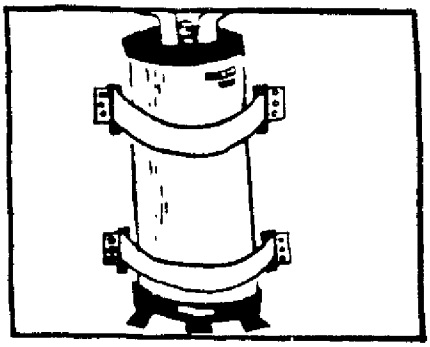
Make sure everyone has a pair of closed toe shoes or slippers under the bed.



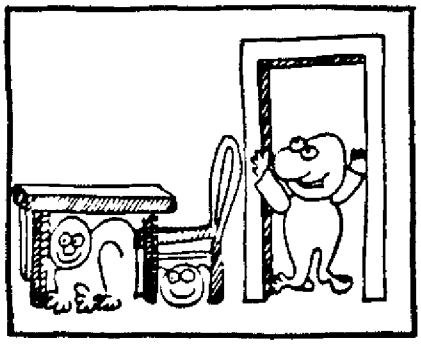
Put a working flashlight and a battery operated radio next to your bed Check the batteries. Listen to this radio for information following a disaster



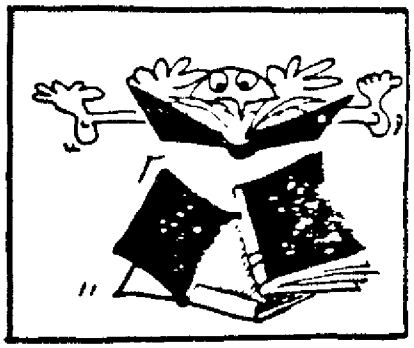
Check all bedrooms to make sure that nothing heavy or breakable is hanging over any beds.



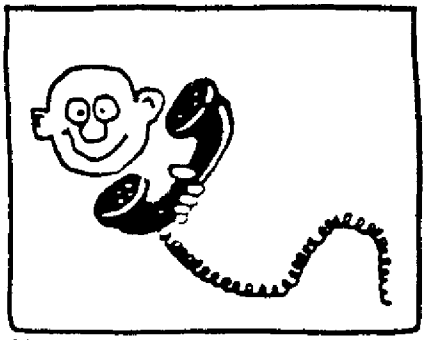
Check with your family to see if the water heater is strapped to the wall. This prevents fires and provides a good source of drinking water



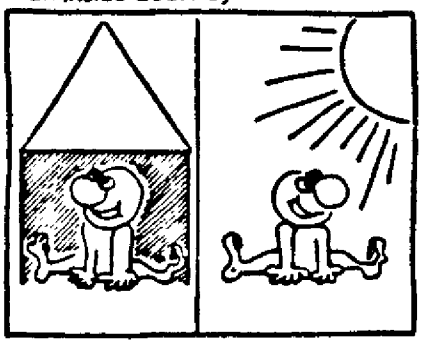
Have your family practice protecting themselves by dropping under a heavy table or chair, or standing in an inside doorway



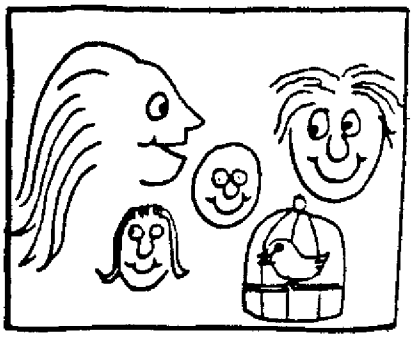
Stay away from bookshelves and windows during an earthquake.



Have your family decide who you would call outside the area in case of a disaster Make sure everyone knows the phone number.



If you are inside during an earthquake, stay there If you are outside, stay there, but move away from buildings.



Tell your family to stay calm Being prepared helps keep people calm

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