Zoom Webinar General Information

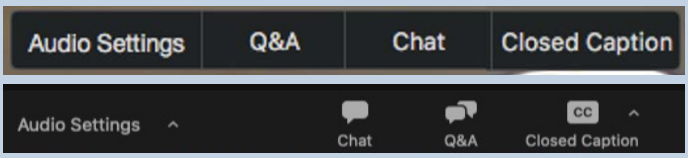
- At the top of your Zoom window: Change "View options" to *Fit to Window* and *Side-by-side mode*
- Your sound will be on mute
- Your video will not be seen
- Closed captioning is available

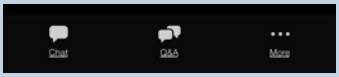
We Will Begin Shortly

1

How to Participate:

- Click "**Q&A**" to post a question for the panelists
  - There may not be time for all questions to be asked
- Click "**Chat**" to share information, ask for technical support, and to communicate with panelists
- Click "**Closed Caption**" to see live captions on desktop computers. For mobile device users, you may need to turn the option on from Zoom settings, meetings section (before joining)





2

ECA's Safer at Home Webinar Series

Step 5: Drop, Cover, and Hold On
and other Self-Protective Actions

Earthquake Country Alliance
We're all in this together.

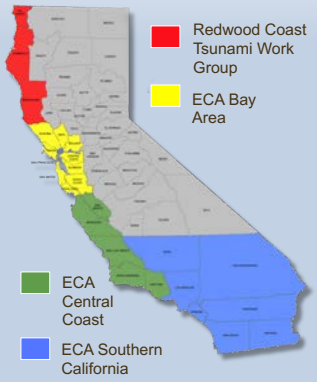
ShakeOut™

EarthquakeCountry.org/step5 Terremotos.org/paso5

3

Earthquake Country Alliance

- 1500+ *Public-Private-Grassroots* leaders
- Statewide *Sector-based committees* and *Outreach Bureaus* develop resources and deliver programs
- Local *Regional Alliances* organize meetings and outreach activities
- California's Office of Emergency Services provides FEMA funding for ECA activities
- USC's Southern California Earthquake Center administers ECA



Join Us: **EarthquakeCountry.org/alliance**

4

Seven Steps To Earthquake Safety

BEFORE

1. Secure Your Space

2. Plan To Be Safe

3. Organize Supplies

4. Minimize Financial Hardship

DURING

5. Drop, Cover, and Hold On

6. Improve Safety

AFTER

7. Reconnect and Restore

EarthquakeCountry.org/sevensteps

Terremotos.org/sietepasos

5

Safer at Home Webinar Series

Step 1 – Secure Your Space:	June 30
Step 2 – Plan to Be Safe:	August 19
Step 3 – Organize Disaster Supplies:	September 2
Step 4 – Minimize Financial Hardship:	September 23
Step 5 – Drop, Cover, and Hold On:	September 30
Step 6 – Improve Safety:	October 21
Step 7 – Reconnect & Restore:	Mid-November

EarthquakeCountry.org/SaferAtHome

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Step 5: Drop, Cover, and Hold On Webinar Team

Host

- **Shannon Mulhall** (Americans with Disabilities Act Coordinator, City of Fresno & Chair, Seniors & People with Disabilities Committee)

Presenters

- **Michele Wood** (Professor and Chair, CSU Fullerton Department of Public Health)
- **Sara McBride** (ShakeAlert Social Science Coordinator, United States Geological Survey)
- **Amanda Moyer** (Executive Officer, California Earthquake Early Warning Program, CalOES)
- **Mark Benthien** (Associate Director, So. California Earthquake Center (SCEC) @ USC & Executive Director, Earthquake Country Alliance)
- **Heidi Rosofsky** (Inclusive Planning Specialist, Global Vision Consortium & Chair, Earthquake Country Alliance Southern California)

Moderators

- **Sharon Sandow de Groot** (Director for Strategic Partnerships, SCEC @ USC & Deputy Director, ECA)
- **Jason Ballmann** (Communications Manager, SCEC @ USC & Media/Participation Bureaus Liaison, ECA)
- **Robert de Groot** (ShakeAlert® Coordinator for Communication, Education, Outreach, and Technical Engagement, United States Geological Survey & Chair, ECA EPIcenter Committee)

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Step 5 Webinar Agenda

1. Research behind self-protective action guidance
2. ShakeOut to ShakeAlert®: Research to Practice for Drop, Cover, and Hold On
3. Earthquake Warning California – Don't Get Caught Off Guard
4. Self-Protective Guidance for Various Settings
5. Self-Protective Guidance for Various Capabilities
6. Q&A after each presenter, and at the end

8

Research Behind Self-Protective Action Guidance

Dr. Michele Wood
Professor and Chair
CSU Fullerton Department of Public Health

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Evidence Supporting DCHO and Other Guidance

Entering/ Exiting Buildings	• **Whittier Narrows, Loma Prieta, Northridge**: Exiting buildings associated w injury • **Northridge:** People who tried to move had higher rates of injury; falls were leading cause of hospitalized injury (most often from exiting building) • **CA:** Residential housing largely wood-framed, less prone to collapse
Falling/ Flying/ Sliding Objects	• **1999 Kocaeli**: 85% deaths/injuries due to being struck by falling object • **Whittier Narrows, Loma Prieta, Northridge**: Falling non-structural items was most common cause of injury
Movement	• **Gölcük**: Staying put-sitting down associated w/ less injury than any other action • **2010/11 Canterbury**: Tripping/falling most common cause of injury • **Northridge**: Those who stayed in bed were less likely to be injured • **1999 Kocaeli risk**: In bed asleep < in bed awake < standing, sitting still • **2011 Christchurch**: Those who held onto something less likely to fall

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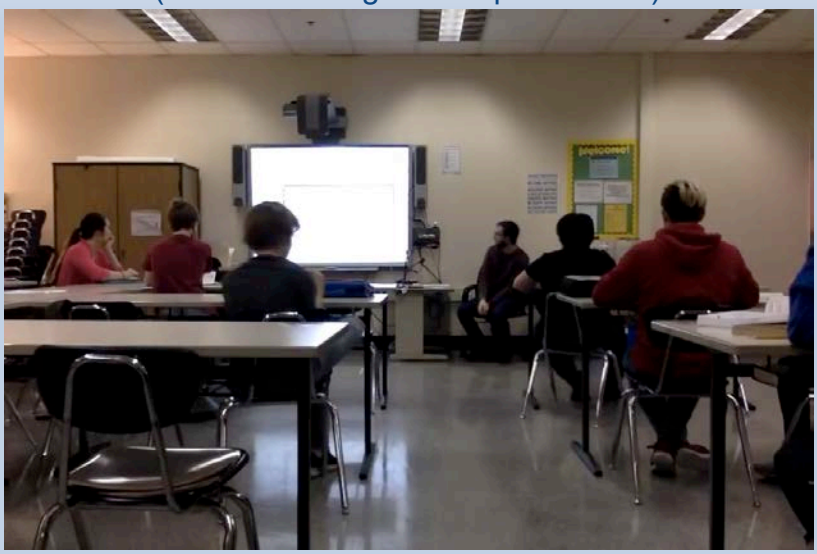
How does Drop, Cover, and Hold On work in real time?

(M7.1 Anchorage Earthquake 2018)



11

Evidence Supporting Guidance: Other Indoor Situations

- Two walls (corners) may provide more protection than one; corners may be sturdier locations; objects can fall from fewer directions
- Low-lying furniture may deflect falling/flying/sliding objects; must weigh risk of no cover against risk of movement to low-lying furniture
- Research on elevator performance suggest risks associated w/ shaking, power loss
- Fire is one of the most deadly secondary disasters that can follow an earthquake; shaking can topple stoves, ignite flames
- When current location is risky (e.g., kitchen/lab), moving may be safer than staying; controversial because of the risk associated with movement; situational awareness

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Evidence Supporting Guidance: Outdoors

General Outdoors

- Threat of death/injury from falling objects entering/exiting buildings
- Threat of injury from falling/falling objects while moving
- Downtown areas near buildings, near glass: Risk of injury/death from falling objects/glass

Driving

- **Northridge**: Driver "overcorrection" and damage to transportation infrastructure (e.g., traffic signals) led to multiple deaths
- Simulation research found over-correction and delayed response time led to inadvertent maneuvering to adjacent lanes
- Roads may be closed, damaged

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Evidence Supporting Protective Guidance: Coastal/Tsunami Areas

- Moving to high ground during earthquake shaking can lead to injuries from falling, being struck by objects
- Death/injury/damage from tsunami can surpass that from initial earthquake (so move when safe to do so)
- Length of shaking as indicator of tsunami risk not universal; timeframe between shaking and tsunami threat not universal
- Most buildings not designed to withstand tsunami; however, upper stories of strong, tall buildings may be able to provide protection if no other option available

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Evidence Supporting Guidance for Those with Disabilities / Access & Functional Needs

15

Evidence for why Certain Actions are Not Recommended

Take Cover in Doorway

- Doorways provide little/no cover, no more protection than other locations
- Moving to doorway introduces risk of falling
- Crowding in doorways

"Triangle of Life"

- US buildings do not usually suffer catastrophic collapse
- Not possible to identify structural voids in advance, even with warning
- Moving introduces risk from falling, being struck by falling/flying/sliding objects

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General Principles of Earthquake Safety

Get Low to Ground	Make Self Small	Protect Head	Turn off Flames
• Reduces likelihood of falling	• Reduces likelihood of being struck by falling/ flying/ sliding objects	• **1994 Northridge**: Head most common area injured among fatalities	• Reduces likelihood of starting gas fire

"Situational Awareness"

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Q&A

Please type your questions into the "Q&A" tool.

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EarthquakeCountry.org/SaferAtHome

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ShakeOut to ShakeAlert®: Research to Practice for Drop, Cover, and Hold On

Dr. Sara McBride

ShakeAlert Social Science Coordinator

United States Geological Survey

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So why is the recommended protective action "Drop, Cover, and Hold On" when you feel shaking?

Injury data from USA, Japan, and New Zealand indicate that people are most often injured when moving drastically during shaking (e.g. moving to reach children or evacuating from a building).

20

How DCHO protects you

- Dropping where you are is a critical component to the action because it reduced the chance of you breaking a limb.
- Getting under something sturdy, if you can, like a desk or table, will protect you from anything falling on top of you.
- Holding on ensures you are stabilized under the desk.

21

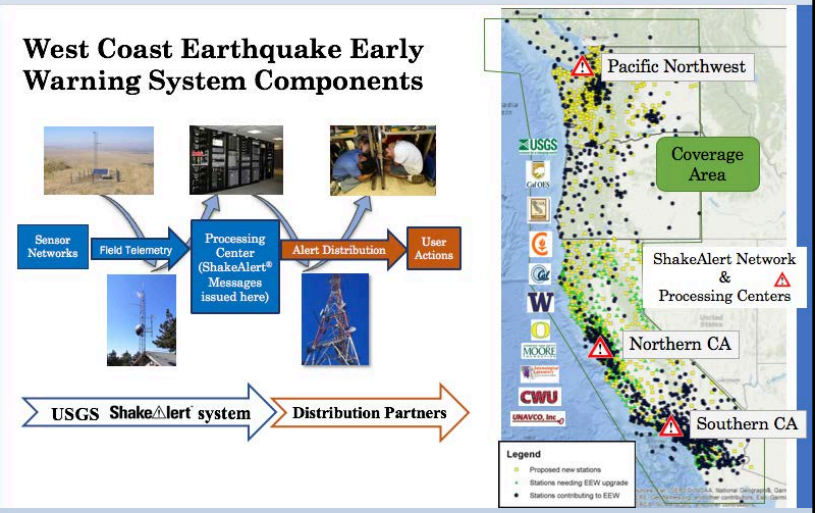
What are some barriers as to why people don't do ShakeOut?

- A study from 2012 and 2015 ShakeOut drills in New Zealand suggests that there are a variety of reasons why people don't do Drop, Cover, and Hold On.
- 9,000 observers were involved in the drills, with thousands observed. The main barriers to doing the drill were:
  - Embarrassment
  - Fragility/Aged/Disability
  - Lack of belief in the success of the actions
  - Working/busy
  - Caretakers of children e.g. parents, teachers helping children instead of helping themselves
  - And other reasons.

22

Connecting ShakeAlert® to the Seven Steps

- The USGS-managed ShakeAlert® Earthquake Early Warning System is now operational in California, Oregon, and Washington.
- ShakeAlert is one of many tools in one's earthquake risk reduction toolbox.



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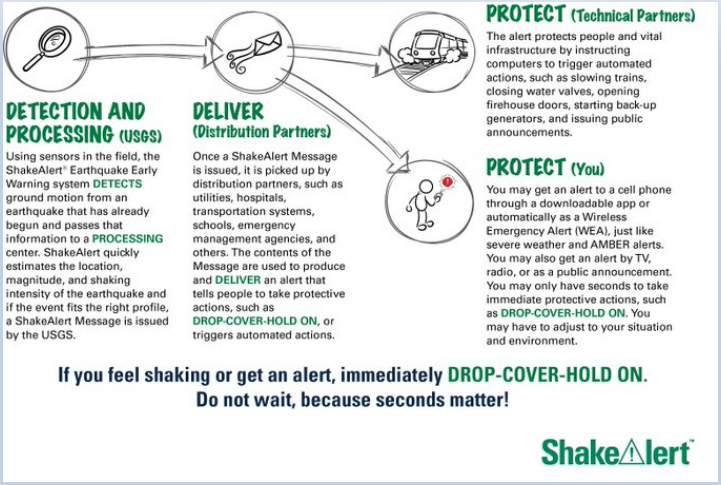
Okay but what if you get an earthquake alert?

- ShakeAlert® and its partners are now testing the delivery of alerts to wireless devices in California (OR and WA to follow soon).
- The System can provide seconds of alert that stronger shaking is coming.
- It is not a prediction of an earthquake; the earthquake is already in progress.



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How ShakeAlert® works with Drop, Cover and Hold On

- As with any technology, there are limitations. It takes time for the earthquake to be detected, processed, and for an alert to be delivered by a ShakeAlert partner. If you are very close to the epicenter
- Seconds matter, so it is unlikely you'll have more time to do other actions other than the DCHO suite of actions.
- In reference to Step 5, LAUSD Administrator Jill Barnes says:
  - **"ShakeAlert asks you to do what you already do, but sooner."**

25

Social Science Working Group for ShakeAlert

- Includes 12 projects across five states and four nations.
- More than 20 researchers involved in the project.
- Studies human behavior, perceptions, attitudes, and emergency preparedness in communities across the three West Coast states (WA, OR, CA).
- This work will continue to inform improvements in the ShakeAlert system and what we know about protective actions.

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Thank You!

Learn More About ShakeAlert at:
www.ShakeAlert.org
Follow us on Twitter: @USGS_ShakeAlert

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Q&A

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EarthquakeCountry.org/SaferAtHome

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Earthquake Warning California – Don't Get Caught Off Guard

Amanda Moyer

Executive Officer

Earthquake Warning California, CalOES

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Earthquake Warning California - Don't Get Caught Off Guard

Earthquake Warning California is the state's **earthquake early warning system**, which provides tools and resources to warn Californians in advance of an earthquake.

The system relies on **innovative technology** that sends warnings to smartphone applications, operating systems, and Wireless Emergency Alerts (WEA).

Earthquake Warning California can help the public, first responders, utility providers, transit systems, and other key industrial and business sectors **take actions to save lives.**

Visit www.earthquake.ca.gov to learn more.

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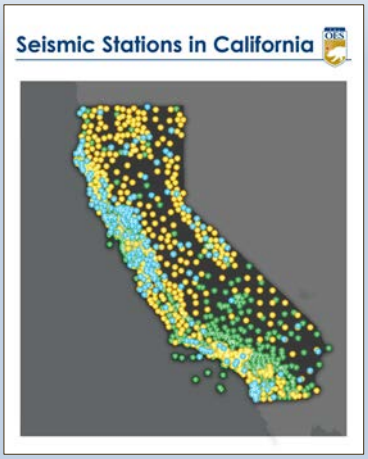
Earthquake Warning California



- How Does it Work ?
  - There are more than 700 earthquake sensors across the state.
  - When an earthquake occurs it must hit three sensors and those sensors send data to an earthquake alert center.
  - The earthquake alert center runs an algorithm that determines magnitude, shaking intensity, and location and then sends an alert directly to:
    - The Integrated Public Alert and Warning System (IPAWS) for Government Wireless Emergency Alerts (WEA),
    - An App like *MyShake*, or
    - An Android device

Cal OES | USGS science for a changing world | California Department of Conservation, California Geological Survey | Berkeley Seismology Lab | Seismological Laboratory

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How Can I Get Alerts?

- **MyShake App**
- **Wireless Government Emergency Alerts (WEA)**
- **Android Earthquake Alerts**

Visit www.earthquake.ca.gov to learn more.

MyShake™ | WIRELESS EMERGENCY ALERTS | android

32

MyShake App

- **Download the app** for free via Google Play or the Apple App store.
- **Location services** must be set to "always on" to allow the app to provide warnings. The app does not currently override "Do Not Disturb" or Silent mode.
- **Push notifications** are sent to the user's phone or mobile device when they need them.
- This is an innovative system that is being **continuously refined and upgraded**.
- The app collects data from the phones accelerometer that acts as a mini seismometer to show trends and improve app earthquake monitoring. UC Berkeley does not collect any **personal or identifying information taken from users**.

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Self-Protective Guidance for Various Settings

Mark Benthien

Associate Director

So. California Earthquake Center (SCEC)
& Executive Director, ECA

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How to Protect Yourself

In *most* situations and building types:

Drop on to your hands and knees, where you are

See **EarthquakeCountry.org/step5** for advice for a variety of settings

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How to Protect Yourself

In *most* situations and building types:




Cover your head and neck with one arm and hand.

- *If a sturdy table or desk is nearby*, crawl underneath it for shelter
- *If no table/desk,* crawl against a wall or next to low furniture for sideways protection

See **EarthquakeCountry.org/step5** for advice for a variety of settings

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How to Protect Yourself

In *most* situations and building types:




Hold On to your shelter until shaking stops

- Be ready to move with your shelter
- *If not under a shelter*, hold on to your head/neck with both arms and hands

See **EarthquakeCountry.org/step5** for advice for a variety of settings

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Drop, Cover, and Hold On: Nearby Desk or Table

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Drop, Cover, and Hold On: NO Nearby Desk or Table

40

Other Self-Protective Actions

- Learn how to protect yourself– wherever you are: ShakeOut in Place.
- If you can't get back up– don't get down
  EarthquakeCountry.org/disability
- Guidance for many other situations–
  EarthquakeCountry.org/step5
  Terremotos.org/paso5
- Videos: **Youtube.com/greatshakeout**

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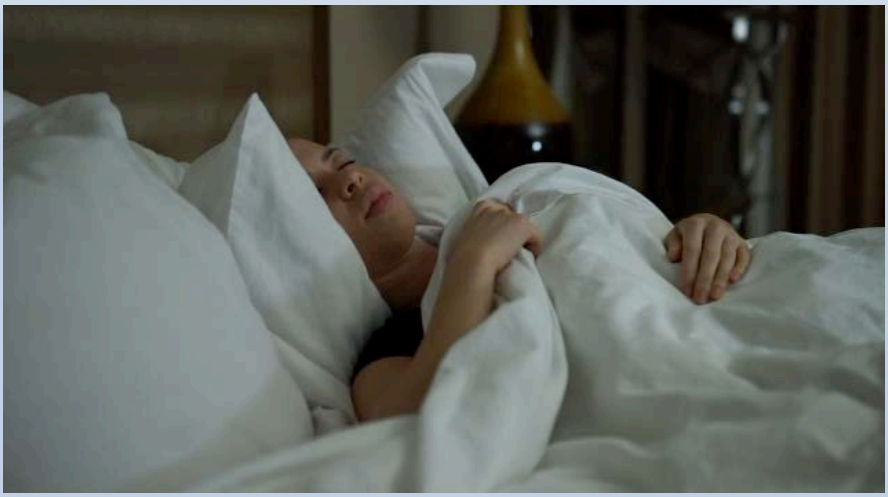
Earthquake Safety If You Are In Bed



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Earthquake Safety If You Driving

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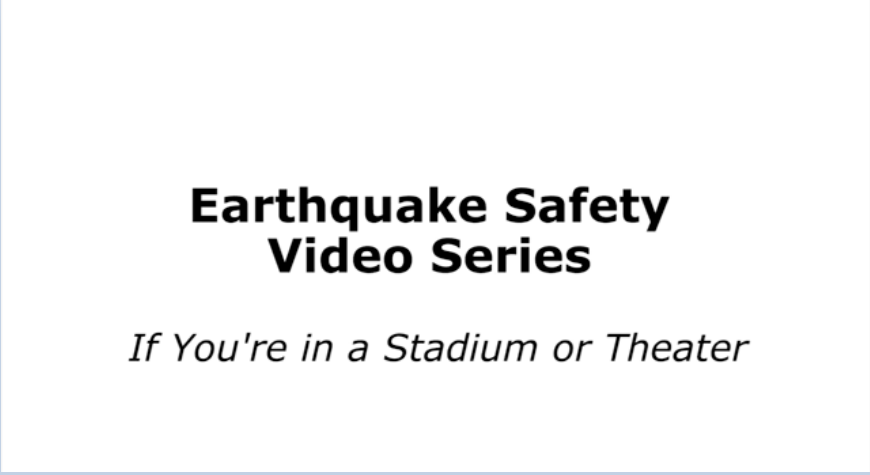
Drop, Cover, and Hold On: In a Stadium or Theater



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Earthquake Safety Near the Shore

ShakeOut™
If you are near the shore

TsunamiZone.org

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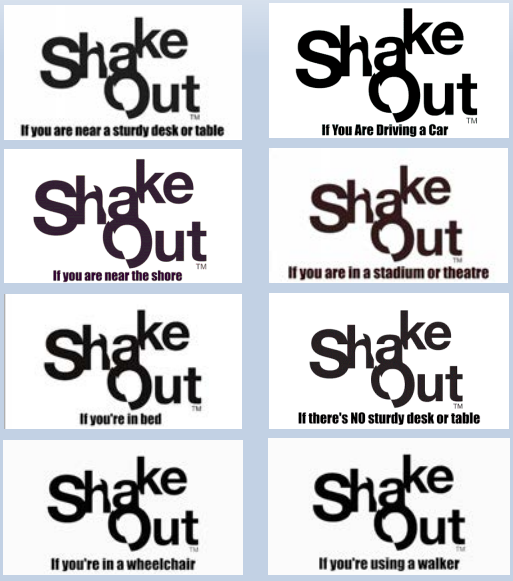
Earthquake Safety Video Series



- Separate short (1-8 min) videos:
  - indoors, nearby table/desk
  - indoors, no table/desk
  - theater/stadium
  - near the shore
  - in a car
  - in bed
  - people with mobility disabilities
- View full videos at **Youtube.com/greatshakeout**
- Download full videos and these GIFs at **www.ShakeOut.org/messaging**

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Some Other Settings

- **In a high-rise:** *Drop, Cover, and Hold On.* Avoid windows and other hazards. Do not use elevators. Do not be surprised if sprinkler systems or fire alarms activate.
- **In a classroom:** *Drop, Cover, and Hold On.* Laboratories or other settings may have special safety considerations. Students should also be taught what to do at home or other locations.
- **In a store:** *Drop, Cover, and Hold On.* Getting next to a shopping cart, beneath clothing racks, or within the first level of warehouse racks may provide extra protection.

EarthquakeCountry.org/Step5

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Be Safe During Earthquakes, Just like Rocket!

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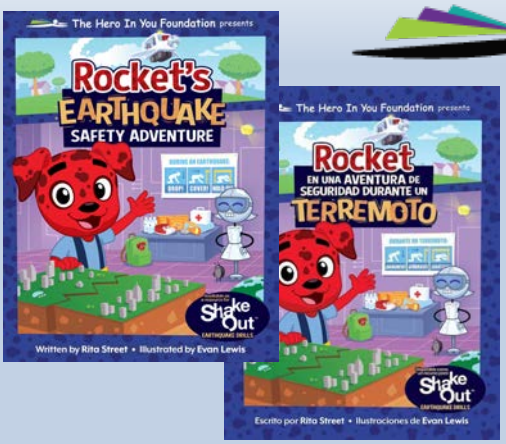
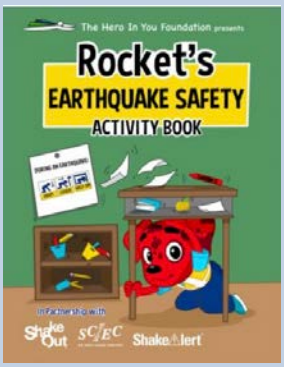
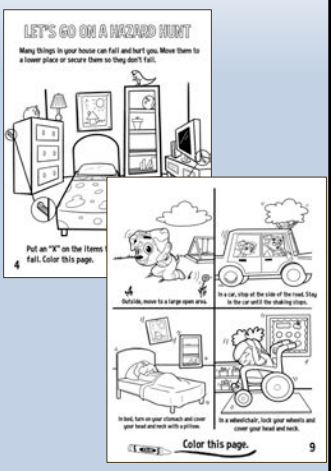
RocketRules.org: New materials for children age 5-9



English and Spanish Story Books

The Hero In You foundation





English, Spanish, Vietnamese, Chinese, and Tagalog

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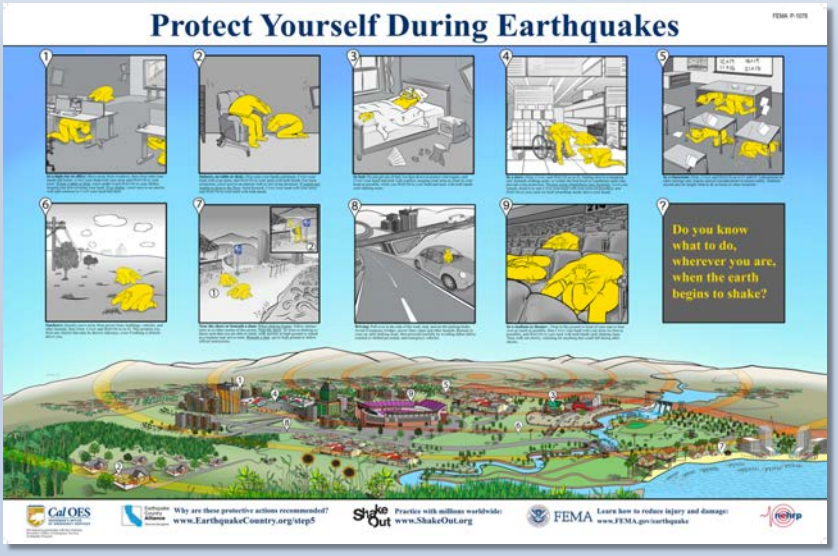
FEMA P-1078: Free Poster



Send the following to femapubs@gpo.gov:

- Publication **FA-P-1078**
- # of copies
- Shipping address
- Phone number

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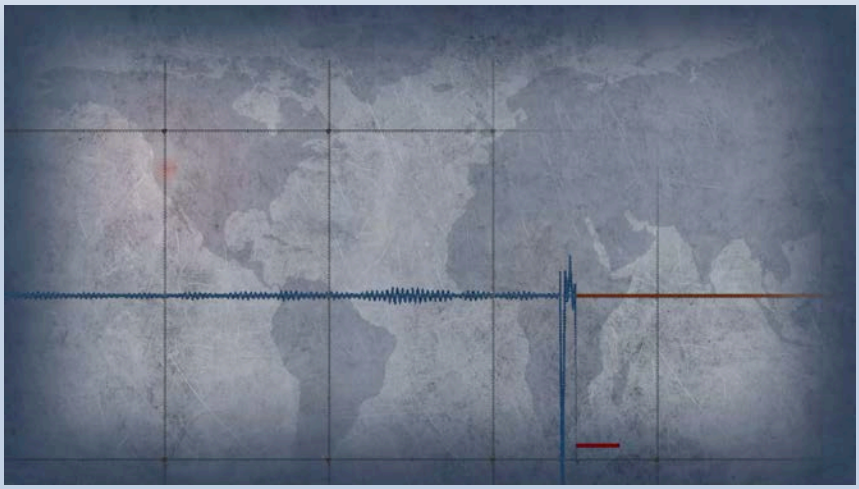
Be Safe During Earthquakes, Just like Mario!



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ShakeOut.org ShakeOut.org/espanol

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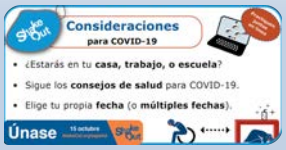
ShakeOut.org/COVID-19 & ShakeOut.org/espanol/COVID-19



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Self-Protective Guidance for Various Capabilities

Inclusive Planning Specialist

Global Vision Consortium

&

Chair, ECA Southern California

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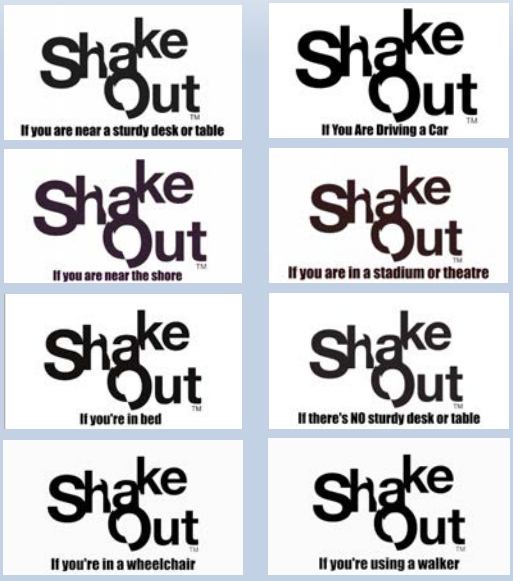
Earthquake Safety Video Series



- Separate short (1-8 min) videos:
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  - theater/stadium
  - near the shore
  - in a car
  - in bed
  - **people with mobility disabilities**
- View full videos at **Youtube.com/greatshakeout**
- Download full videos and these GIFs at **www.ShakeOut.org/messaging**

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Earthquake Safety for Various Mobility Devices

For an individual who uses a:	
Wheelchair	0:22
Power Wheelchair	1:22
Cane or Single Crutch	2:12
Double Crutches or Arm Braces	3:09
Walker	4:14
Rollator-Style Walker	5:43
Or has:	
Limited Upper-Body Movement	06:51

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Person Using a Wheelchair, Near a Table

For an individual who uses a:

Wheelchair

When a Table Is Nearby

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Person Using a Power Wheelchair

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Person Using a Power Wheelchair: Move to Corner

60

Person Using a Power Wheelchair: Lock Wheels

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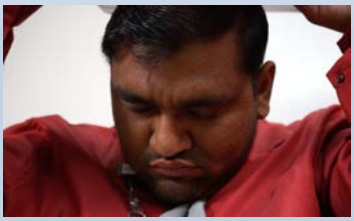
Slide Title



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Person Using Double Crutches or Arm Braces

For an individual who uses a:

Double Crutches or Arm Braces

63

Person Using a Cane

64

Person Using a Walker and a Nearby Chair

65

Person Using a Walker and a Nearby Chair

66

Person Using a Walker and a Nearby Chair

67

Person Using a Walker, No Nearby Chair

68

Person Using a Walker/Rollator

69

Person with Limited Upper Body Movement

70

Person with Limited Upper Body Movement

71

Person with Limited Upper Body Movement

72

For Everyone

- Look around for hazards
- Check body for areas of pain or reduced sensation
- Connect with Personal Support Team

73

Remain Connected: Personal Support Team

AT LEAST 3 PEOPLE

Who can come to your assistance immediately

Practice:

- How to assist you
- Use of assistive devices
- Evacuating you with your supplies
- Emergency Drills/Exercises

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Keep Exits and Pathways Clear

Secure Furniture, TVs, and other Objects to Prevent Damage, Injury, and Blocked Exits

75

Service Animal Considerations

- Keep animal close, under table or next to chair
- Service animal may be frightened or injured
- May not be able to work immediately
- Increased risk of injury to paws from broken glass or debris on the ground
- Be prepared to use alternate equipment if your animal cannot provide its normal services.

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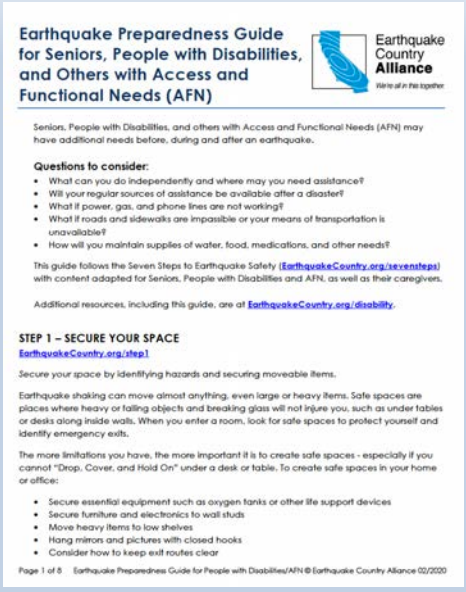
Seniors and People with Disabilities Resources

- Earthquake Preparedness Guide for People with Disabilities and Other Access or Functional Needs
- Adapts messaging from ECA's *Seven Steps to Earthquake Safety*
- **EarthquakeCountry.org/disability**



Earthquake Preparedness Guide for Seniors, People with Disabilities, and Others with Access and Functional Needs (AFN)

Earthquake Country Alliance

Seniors, People with Disabilities, and others with Access and Functional Needs (AFN) may have additional needs before, during and after an earthquake.

Questions to consider:

- What can you do independently and where may you need assistance?
- Will your regular sources of assistance be available after a disaster?
- What if power, gas, and phone lines are not working?
- What if roads and sidewalks are impassible or your means of transportation is unavailable?
- How will you maintain supplies of water, food, medications, and other needs?

This guide follows the Seven Steps to Earthquake Safety (EarthquakeCountry.org/sevensteps) with content adapted for Seniors, People with Disabilities and AFN, as well as their caregivers.

Additional resources, including this guide, are at EarthquakeCountry.org/disability.

STEP 1 – SECURE YOUR SPACE

EarthquakeCountry.org/step1

Secure your space by identifying hazards and securing moveable items.

Earthquake shaking can move almost anything, even large or heavy items. Safe spaces are places where heavy or falling objects and breaking glass will not injure you, such as under tables or desks along inside walls. When you enter a room, look for safe spaces to protect yourself and identify emergency exits.

The more limitations you have, the more important it is to create safe spaces - especially if you cannot "Drop, Cover, and Hold On" under a desk or table. To create safe spaces in your home or office:

- Secure essential equipment such as oxygen tanks or other life support devices
- Secure furniture and electronics to wall studs
- Move heavy items to low shelves
- Hang mirrors and pictures with closed hooks
- Consider how to keep exit routes clear

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Q&A

Please type your questions into the "Q&A" tool.

We will try to answer all questions, either in writing or via discussion "live"

The recording or today's webinar will be available by early next week at:

EarthquakeCountry.org/SaferAtHome

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Safer at Home Webinar Series

Step 1 – Secure Your Space:	June 30
Step 2 – Plan to Be Safe:	August 19
Step 3 – Organize Disaster Supplies:	September 2
Step 4 – Minimize Financial Hardship:	September 23
Step 5 – Drop, Cover, and Hold On:	September 30
Great ShakeOut Earthquake Drills	October 15
Step 6 – Improve Safety:	October 21
Step 7 – Reconnect & Restore:	Mid-November

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ECA's Safer at Home Webinar Series

Step 5: Drop, Cover, and Hold On
and other Self-Protective Actions

Earthquake Country Alliance
We're all in this together.

Thank you!

ShakeOut

Please take our webinar survey:
surveymonkey.com/r/YWY36SW

Questions?
info@earthquakecountry.org

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RocketRules.org Earthquake Safety Video (excerpt)

The Hero In You foundation

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