EDUCATION SECTOR

ShakeAlert® Messaging Toolkit

June 2021

Because seconds matter.

ShakeAlert™

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What is ShakeAlert®?

The ShakeAlert®[1] Earthquake Early Warning (EEW) System detects significant earthquakes quickly, so alerts can be delivered to people and vital systems, potentially seconds before shaking arrives at their location. These alerts can prompt people to take a self-protective action, such as **DROP-COVER-HOLD ON**, as well as trigger automated actions to protect critical systems, equipment, and facilities.

The U.S. Geological Survey (USGS) operates ShakeAlert and issues a ShakeAlert Message[2] to Technical Partners when an earthquake has begun and shaking is imminent. ShakeAlert Technical Partners are entities that enter into a license agreement with the USGS to use ShakeAlert for alerting applications, then deliver alerts through creative implementations to warn people and initiate automated protective actions.

ShakeAlert is a collaboration between the USGS, education and research institutions, state government agencies, philanthropic organizations, and Technical Partners.

Learn more about ShakeAlert's collaborative model with FAQ: ShakeAlert Seismic Network and Its Collaborators.

Visit FAQ: How to Become a ShakeAlert Technical Partner.

See this list of ShakeAlert License to Operate (LtO) Technical Partners.

ShakeAlert is not earthquake prediction; rather, ShakeAlert detects that an earthquake has begun and shaking is imminent.

Learn more about how ShakeAlert detects earthquakes with About ShakeAlert Earthquake Early Warning: A Primer for the Education Sector.

Who is this Toolkit for?

This Education Sector ShakeAlert Messaging Toolkit is designed to be used by **ShakeAlert Technical Partners** and **End-users** who have implemented or intend to implement ShakeAlert at their facilities.

Materials in this Toolkit are designed for communicating with:

- Education and free-choice learning administrators (e.g., museums, libraries, etc.)
- Students, faculty, staff
- Parents/guardians, patrons, and visitors.

[1] The USGS ShakeAlert® Earthquake Early Warning System is a registered trademark. The ® symbol is only used in section headings and subheadings, as well as in the first instance it appears in the body of this Manual.

[2] A ShakeAlert Message (uppercase M) signifies information gathered from USGS ground sensors and sent to processing centers, where it is determined if an alert is warranted. Alerts are delivered by Technical Partners, not the USGS.

What is in the Toolkit?

This Education Sector ShakeAlert Messaging Toolkit contains a variety of materials in different formats that can be used to inform decisions, and raise awareness and understanding about ShakeAlert System technology with education sector stakeholders. The intent is to provide consistent information about the ShakeAlert System and promote the value and importance of earthquake early warning for automated and personal protective actions in education settings.

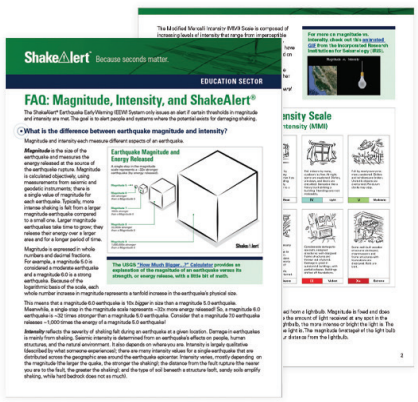
Toolkit Resources

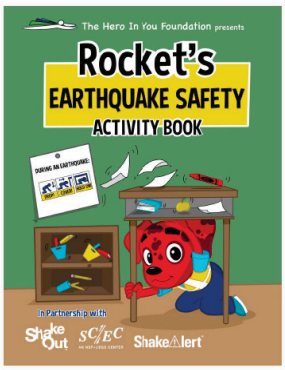
- About ShakeAlert: A Primer for the Education Sector
- FAQ: ShakeAlert Basics
- FAQ: ShakeAlert EEW System and Warning Times
- FAQ: Magnitude, Intensity, and ShakeAlert
- FAQ: ShakeAlert Seismic Network and Its Collaborators
- FAQ: How to Become a ShakeAlert Technical Partner
- FAQ: Cybersecurity and Resilience For IT Professionals
- PowerPoint Template for Training Purposes
- Graphics Library
- Photo Library

Additional links to complementary ShakeAlert and earthquake early warning-related resources can be found in the Appendix.

ShakeAlert in the Education Sector

The education sector is increasingly among those using ShakeAlert-powered earthquake early warning to improve their earthquake hazard mitigation. Education facilities (including free-choice learning environments) that integrate ShakeAlert offer protections to people (students, faculty, staff, patrons, visitors), infrastructure, equipment, and vital systems when shaking is expected at their location.





ShakeAlert Partnerships

TECHNICAL PARTNERS

Pilot Partners develop and internally test innovative ways to use ShakeAlert data to deliver alerts that prompt people and systems to take protective action.

License to Operate (LtO) Partners have met USGS-mandated standards for speed, reliability, and technical performance, including providing appropriate education and training for their end-users. LtO partners are approved to provide or sell their developed product to end-users.

OTHER PARTNERS

Evaluation Partners are "observe-only" partners who have access to the ShakeAlert System data feed, but cannot take action or develop products based on this ShakeAlert information. An Evaluation Partnership provides an opportunity to learn more about how the ShakeAlert System works and the products it produces, so entities can evaluate if they want to become a Pilot Partner or an end-user.

Communication, Education, and Outreach (CEO) Partners are not pursuing a technical implementation of ShakeAlert; rather, they partner with the USGS on the development of education and/or training resources for ShakeAlert.

Contact the USGS or your ShakeAlert Regional Coordinator to take your first steps toward a ShakeAlert partnership. See the Appendix for contact information.

End-users

End-users receive ShakeAlert-powered alerts from LtO Partners. End-users include people who receive these alerts directly (e.g., to their cell phones), as well as organizations that work with an LtO Partner to implement automated "machine-to-machine" actions.

Note: End-users can also receive Wireless Emergency Alerts (WEA) to their mobile devices. WEA is a partnership among the Federal Emergency Management Agency (FEMA), the Federal Communications Commission (FCC), and wireless providers.

Benefits of Automated Actions in Education Settings

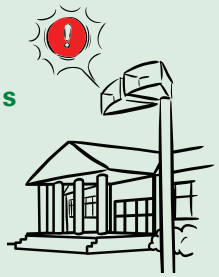
When determining how earthquake early warning can ***protect people in education facilities and settings, safeguard mission-critical systems and equipment, and mitigate earthquake damage***, those operating in the education sector may consider a variety of potential ShakeAlert-powered automated actions as part of their overall mitigation strategy. Alerts delivered directly to people or those triggering an automated action also can enhance the ability of education entities to remain operational or quickly return to normal status after an earthquake.

Each education entity – whether early childhood education, K-12, higher education, or free-choice learning organizations (museums, libraries) – should consider its overarching goals, specific risks and vulnerabilities, unique operational needs, and how ShakeAlert-powered technology can be implemented to help. What works for one may not work for another. Opportunities to implement ShakeAlert in the education sector are virtually limitless! Some examples of possible ShakeAlert implementations follow.

AUTOMATED ALERTING

ShakeAlert enables a number of potential automated ways to directly alert people in educational settings that shaking is imminent. These alerts prompt them to immediately **DROP-COVER-HOLD ON** or take other protective action adapted to each situation and environment. Free-choice learning environments, for instance, may need to consider how they would advise self-protection for patrons who use walkers, canes, and wheelchairs, and who may not be able to readily drop to the floor.

Some education facilities on the West Coast use their public address systems to issue an audible alert that says, *"Earthquake, earthquake. Expect shaking. Drop, cover, and hold on. Protect yourself now."* Education facility staff have been trained on how to react to alerts.



Does my organization need to become a Technical Partner to implement ShakeAlert?

Not necessarily. There are two paths for organizations interested in using earthquake early warning to alert people and/or trigger automated actions to protect systems and infrastructure.

1. **Become a Technical Partner and develop your own in-house ShakeAlert application, or**
2. **Become an end-user of an existing License to Operate (LtO) Partner. Procure and implement their product. To learn more about the services current LtO Partners provide, visit www.shakealert.org/implementation/lto.**

ShakeAlert™

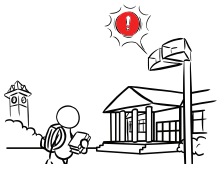
Saves lives and minimizes injuries

Reduces earthquake damage to property and infrastructure systems

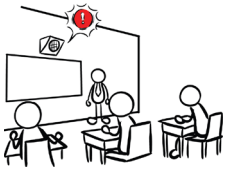
Reduces economic impacts of earthquakes

Speeds the return to normal operations and community recovery

Alerts can be delivered to **mobile devices** through Wireless Emergency Alerts (WEA), the Android Operating System, and/or purpose-built EEW applications.



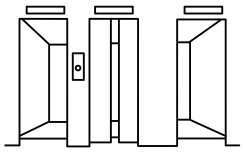
Outdoor alerting sirens or speakers can warn those on educational campuses to take protective action.



Public address (PA) systems in education facilities can provide an audible warning to alert faculty, students, and staff in education facilities.

Voice over Internet Protocol **(VoIP) phones** can broadcast an audible alert to all education facility phones or select extensions.

Automated actions can enhance safety, reduce damage, and speed return to normal status.

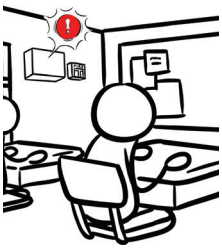


Where there are multiple floors to a facility, **elevators** can be triggered to return to a safe stopping place and open.

Draperies in classrooms and in free-choice learning environments can be triggered to close to prevent injury from broken glass.

Scientists estimate that EEW can reduce the number of injuries in earthquakes by more than 50 percent.

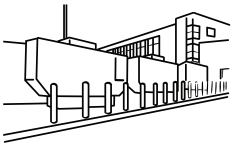
Digital message boards can display alerts throughout education and free-choice learning facilities, especially in areas with high foot traffic.



Educational institutions may consider a ShakeAlert-powered alerting system that is parallel to an existing fire alarm and offers a distinct **earthquake alarm sound** and voice instructions. While this may be useful where a public address (PA) system is not practical or reliable, its implementation may depend on local building ordinances and fire codes.

Doors can be triggered to open to enable egress once shaking stops.

Computers and other connected **electronic devices** can go to "safe mode" to mitigate equipment damage.



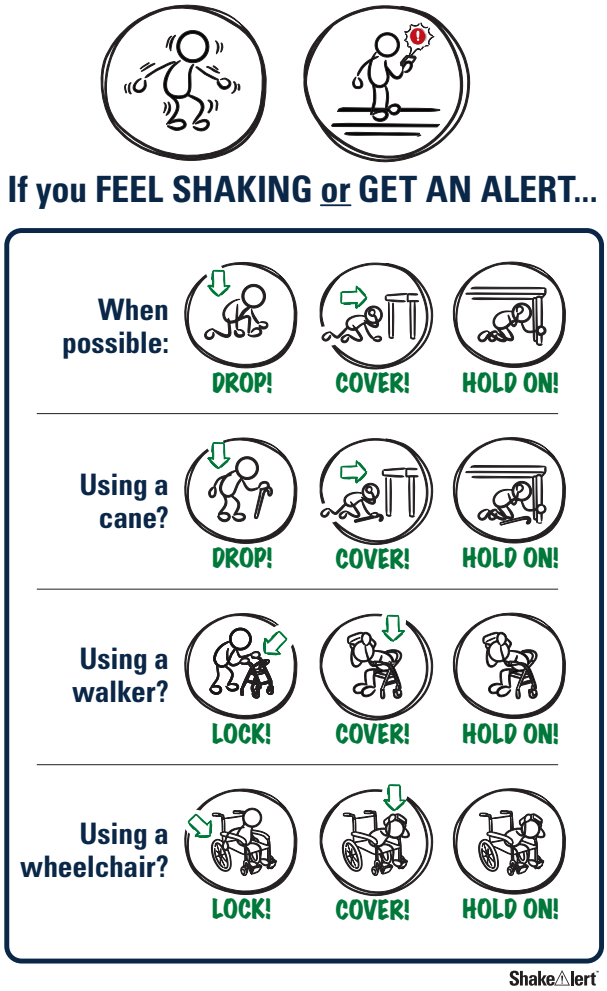
Emergency generators can be controlled to maintain essential facility operations.

Considerations for Implementing ShakeAlert in Education Settings

Protective Action Considerations

Education entities that use ShakeAlert-powered alerts to provide potential seconds of warning will need to consider their unique environments and how students, faculty, staff, patrons, and visitors can be protected or self-protect in a variety of situations and settings. This may include:

- Where and when **DROP-COVER-HOLD ON** is the safest protective action, or if alternative protective actions are required, based on the situation and environment;
- How people with access and functional needs might self-protect or might need to be protected;
- What an audible alert may sound like, or whether an audible alert is appropriate by location/environment;
- What a visual alert might look like, where a visual alert is most appropriate, and what protective action it might promote;
- What a flashing strobe light might look like to alert people, which can be important for those who are deaf or hard of hearing and rely on visual alerts, rather than audible ones;
- How individual areas and staff might be impacted and respond when receiving an alert, including the time needed to complete protective actions; and
- How students, faculty, staff, patrons, and visitors can be trained on and informed about protective actions to take when they receive an alert or feel shaking.



Training Considerations

Education facilities that implement ShakeAlert-powered alerts, whether by directly alerting people or triggering other automated actions, should ensure a variety of training. Students, faculty and staff members should be trained on what ShakeAlert is; the types of automated actions and alerts that have been implemented at the facility; what they can expect when alerts are received and automated actions are triggered; and how they are expected to respond in their respective roles and environments. From new employee onboarding that can include ShakeAlert-related information and practice drills, to regular refresher training, everyone should be "ready."

In addition to any regular training and drill schedules, education entities might consider conducting annual and/or refresher drills during Great ShakeOut events (held each October). Just as education facilities conduct fire, active shooter, and other hazard mitigation types of drills on a routine basis, earthquake drills that consider a facility's ShakeAlert-powered earthquake early warning solutions are crucial to build resilience. These drills should include practicing **DROP-COVER-HOLD ON** and alternative measures for protecting those who may not be able to readily drop to the floor or where "cover" is not nearby.

Lastly, it is important to provide patrons of free-choice learning facilities and visitors to all education facilities with information about what to expect and how they can self-protect when they get an alert or feel shaking when they are in these environments.

This can offer a greater sense of security and confidence in a facility-ready approach.

Instructive signage that is strategically placed throughout the facility and across campus, particularly in high traffic areas, can help ensure this information is widely presented.

Additional resources for education facilities interested in conducting trainings and drills are found in the Appendix.

Cost-Benefit Considerations

To weigh the costs and benefits of implementing ShakeAlert, each education facility should consider its **risk exposure** and how earthquake early warning could be used to protect people and reduce potential earthquake impacts to facilities and systems. Costs of implementing ShakeAlert-powered measures will depend on these facility-by-facility decisions.

According to the Federal Emergency Management Agency (FEMA), *risk exposure* refers to the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards by assessing the vulnerability of people, buildings, and infrastructure to natural hazards.

Numerous factors will influence these costs, such as facility size; building communication infrastructure (including the number and types of devices that can receive alerts); and the systems and/or equipment under consideration for automated actions.

In addition to the capital cost of the installation and integration of ShakeAlert, education entities should consider ongoing and longer-term costs, including:

- Recurring fees from ShakeAlert License to Operate (LtO) Technical Partners (if applicable)
- Maintenance and upgrades
- Human resources
- Training.

Every education entity should conduct its own cost-benefit analysis for each automated action. This analysis should consider quantifiable costs based on its requirements, capacity, and risk exposure, among other factors. LtO Partners who are vendors of ShakeAlert-powered products can help with this analysis. A list of LtOs can be found here.

A key cost/benefit consideration is this: What costs can be avoided and what benefits can be realized by implementing EEW protective measures to mitigate injury and damage to property/systems, while speeding a return to normal status?

Regulatory Considerations

While the ShakeAlert system is secure, redundant, and well-maintained, the USGS recognizes that the education sector is subject to its own regulatory considerations in the implementation of ShakeAlert technology. The USGS does not prescribe any ways or means by which Technical Partners or ShakeAlert end-users should comply with any regulations, statutes, or legal orders that apply to them. Further, the USGS does not offer any legal advice related to statutory or regulatory requirements.

Appendix

Toolkit Development Approach

To develop this Education Sector ShakeAlert Messaging Toolkit, the USGS held a series of interview and listening sessions with Technical Partners and end-users in the education sector to identify priority education and training needs and desired resources. This Toolkit reflects their input.

Use Expectations

The materials and messaging included in this Toolkit have been carefully reviewed by the USGS for scientific accuracy and vetted among stakeholders representing the education sector in California, Oregon, and Washington. It is expected that additional materials or amendments to existing materials in this Toolkit will reflect expansion of and improvements to the ShakeAlert System, as well as feedback and lessons learned from using this content.

Technical Partners are expected to adhere to and maintain the informational integrity of Toolkit contents and the science reflected therein. Information contained in this Toolkit respects any and all confidentiality considerations related to Technical Partner intellectual property.

Please direct any questions about material use expectations to:

Robert-Michael de Groot, PhD
ShakeAlert Coordinator for Communication, Education, Outreach, and Technical Engagement
rdegroot@usgs.gov

Additional Resources

The USGS collaborates with several partners to cooperatively develop, test, and implement communication, education, and outreach products and other resources for the ShakeAlert Earthquake Early Warning System. All products, programs, training, messaging, and resources listed below align with ShakeAlert System-wide guidelines. The USGS does not directly or indirectly endorse any product or service provided or to be provided by ShakeAlert partners.

ShakeAlert System Resources

ShakeAlert Technical Partner Resource Center
The ShakeAlert Technical Partner Resource Center contains information about how to become a ShakeAlert Technical Partner (with downloadable applications), news, technical resources, implementation, research, and beyond.

ShakeAlert Messaging Toolkit
Residing on ShakeAlert.org, the ShakeAlert Messaging Toolkit is geared toward emergency management professionals, other earthquake preparedness educators, and the general public. It includes resources in multiple languages, including English, Spanish, Chinese, Tagalog, Russian, and Vietnamese.
This first Toolkit contains:

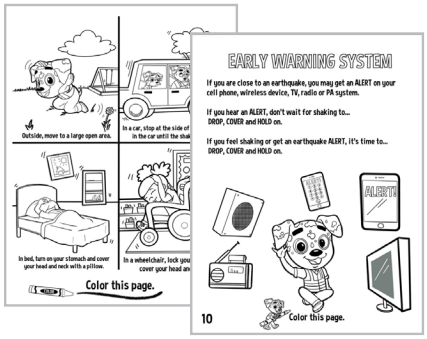
- Talking points
- Materials for digital distribution and print output
- Best practices and ways to use tools
- Demographically/geographically diverse photos
- Icons and infographics

- Presentations
- Social media content
- FAQs, flyers, bill inserts
- Ideas for messaging to a variety of audiences (businesses, elected/public officials, news media, people with limited English proficiency, people with access and functional needs, tribal communities, community and faith-based groups, non-governmental organizations).

Incorporated Research Institutions for Seismology (IRIS)
The IRIS website contains a wealth of resources that are ideal for use and adaptation in classrooms and free-choice learning environments. Specific to ShakeAlert, IRIS offers a reservoir of a wide variety of digital, print, presentation, and animation formats. It is an ideal place to access education materials for learners of all ages. IRIS informed and helped to vet this Education Sector ShakeAlert Messaging Toolkit. This information is freely available to ShakeAlert education partners. Here are some samples of IRIS materials teachers may find useful in the classroom.

- Pasta Quake: Exploring Earthquake Magnitude (This video helps students understand the amount of energy that is released from differently sized earthquakes. It is largely geared to students in middle and high school.)
- Why is ShakeAlert Useful to Me? makes earthquake early warning relevant to students (and others) and is also available in Spanish. Be sure to check out the animated GIFs, including one titled ***If Nisqually had had Early Warning in 2001***, which may be of particular interest to students in the Pacific Northwest.

- Earthquake Early Warning for the Pacific Northwest features animation narrated by a high school student in both English and Spanish.
- Earthquake Intensity modules include a series of instructional animations.
- Buildings in Earthquakes: Construction affects the intensity animation discusses how the way a building is constructed and your position in the building can impact the shaking you feel.



Rocket's Earthquake Safety Activity Book is an engaging resource for kindergarten through fifth-grade students. The USGS, in collaboration with The Hero in You Foundation, makes these downloadable activity books available in nine languages, including: English, Spanish, Chinese, Tagalog, Vietnamese, Armenian, French, Japanese, and Korean.

Oregon Museum of Science and Industry (OMSI) features an Earth Lab that will continue to expand to offer information and displays on earthquake awareness education. Check out OMSI's Home Weekly Science Series that includes five "school days" of activities focused on learning about earthquakes (Week 21) and how scientists, engineers, and community organizers are designing systems to help people stay safe both before and after shaking occurs.

Protective Action Resources

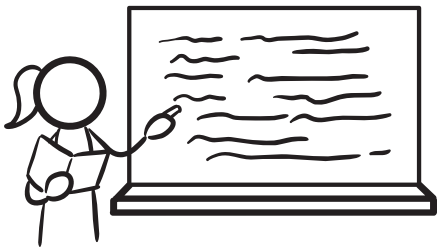
Earthquake Country Alliance (ECA) offers earthquake education materials that are suitable for older children and adults, including those with disabilities and access and functional needs. Headquartered in California, much of the ECA's content is widely applicable across all West Coast states.

The ShakeAlert Messaging Toolkit contains important graphics and FAQs that depict protective actions, such as **DROP-COVER-HOLD ON**, that can be incorporated into training. These materials, which also include guidance on protective actions for people with access and functional needs, are all available in multiple languages, including English, Spanish, Chinese, Vietnamese, Tagalog, and Russian.

ShakeAlert is now in the Pacific Northwest. What should you do now? is a video from the Washington Emergency Management Department that explains ShakeAlert and describes protective actions people should take when they receive an alert or feeling shaking.

Training and Drill Resources

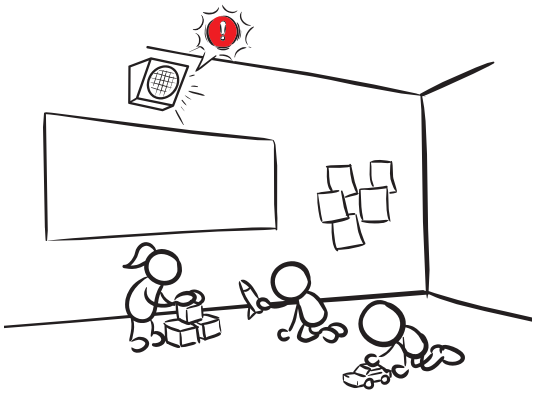
Incorporated Research Institutions for Seismology (IRIS)



The IRIS website contains a wealth of resources that are ideal for use and adaptation in classrooms and free-choice learning environments. Specific to ShakeAlert, IRIS offers a reservoir of a wide variety of digital, print, presentation, and animation formats. It is an ideal place to access education materials for learners of all ages. IRIS informed and helped to vet this Education Sector ShakeAlert Messaging Toolkit. This information is freely available to ShakeAlert education partners.

International ShakeOut Day is always the third Thursday of October; however, your educational institution can conduct a ShakeOut drill when and where it best suits. Earthquake Country Alliance offers numerous resources to help incorporate drills into a wide variety of environments. Below is a sample listing; other earthquake preparedness resources are available from ECA and can apply to all West Coast states.

- ShakeOut Drill Manuals for Non-Profits and Other Organizations
- ShakeOut event registration
- Links to resilientworkplace.org
- Audio/Video "Drill Broadcast" Recordings
- PowerPoint presentations are available to help administrators and/or teachers conduct drills online or in person (applicable for grades K-12, higher education, and community organizations)
- ShakeOut Drill Manual for K-12 schools
- K-12 Customizable Posters
- School Drill Model Templates
- Colleges, Universities Customizable Posters
- Libraries, Museums, Parks Customizable Posters



September is National Preparedness Month and is a good time to conduct training/drills on earthquake preparedness and what to do if you get an alert or feel shaking. Check out your state's website for ways to incorporate preparedness activities into classroom curriculum or staff training.

- California Office of Emergency Services

  The California Governor's Office of Emergency Services offers (Cal OES) school planning and preparedness materials. The Cal OES website also features a California Preparedness Ambassadors Program, a statewide fourth-grade disaster preparedness curriculum designed to engage fourth-grade students to develop and promote disaster preparedness guidelines for their homes, school, and local community against a variety of hazards, including earthquakes. Schools are also encouraged to check out the Cal OES School Emergency Planning and Safety web page and the Tools and Resources section.

- Oregon Office of Emergency Management

  Oregon Be 2 Weeks Ready, developed by the Oregon Office of Emergency Management (OEM), features earthquake preparedness guidance in written and video formats for a wide variety of audiences, including people with children. The Oregon OEM continues to expand this program, currently offered in English and Spanish. It is expected to include numerous other languages as this educational campaign builds out. Additionally, check out ShakeAlert materials specific to the March 2021 Oregon ShakeAlert roll-out here.

- Washington Emergency Management Division

  In Washington State, the Emergency Management Division's (EMD) Disaster Ready Washington campaign features a wide variety of earthquake preparedness and safety content (digital/print/video) for many different audiences and in multiple languages. For children, "The Adventures of Terry the Turtle and Gracie the Wonder Dog" is available in versions tailored for children in kindergarten-grade 2 and grades 3-6. Available education, training, and outreach video/audio content and publications can be found here. Other earthquake-specific information can be found here.

- Other Preparedness Resources to Educate Children

  The Save the Children organization offers video and print disaster preparedness content for children.

State Agency Resources

Earthquake Warning California, managed by the Governor's Office of Emergency Services (Cal OES), provides information and resources for California's publicly available statewide warning system, powered by ShakeAlert.

ShakeAlert in Oregon rolled out for public alerting in March 2021. This Oregon Office of Emergency Management (OEM) website provides information on how Oregonians can receive ShakeAlert-powered alerts, as well as additional information on earthquake preparedness and mitigation.

Washington's Alert & Warning Notifications website, managed by the state's Emergency Management Division (EMD), provides information on Washington's May 2021 roll-out of ShakeAlert-powered public alerting.

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