



San Francisco Chronicle

# HOW TO SURVIVE

What you need to do before the next fire, earthquake or flood



Illustration by John Blanchard / The Chronicle

**MORE CALIFORNIANS ARE BUYING EARTHQUAKE INSURANCE**



FROM THE **CALIFORNIA EARTHQUAKE AUTHORITY**



FROM THE EDITOR

## ***PREPARE FOR INEVITABLE***

What makes California incomparably beautiful also makes it undeniably dangerous. Raging rivers sculpted our lush valleys, wildfires renew our dense forests and fault lines created our majestic mountain ranges.

Living in California requires accepting the good and the bad, and 2017 brought us several reminders of how bad that can get. Our crippling drought collapsed in weeks because of torrential winter rains that flooded homes and washed away bridges, hillsides and Oroville Dam's spillway. A deadly heat wave over Labor Day weekend shattered records. And, most recently, terrible winds pushed devastating fires throughout Wine Country and beyond.

Reading the stories of families forced to flee their burning homes persuaded me to reconsider our family's disaster preparedness. How complacent had we become in preparing for the inevitable earthquake or other disaster? Late one night, I found myself deep in an Office of Emergency Services website, trying to figure out what more we should be doing.

That's why The Chronicle decided to create this section. If better planning increases your chances of surviving the next disaster, it will be worthwhile. We've found the best tips, dug out the most inventive ideas, and illustrated it with the most creative graphics we could muster.

In a disaster, we might not have power, cell phone service or other modes of communication. That's why we've also made this information available in a document that you can download to your phone (see right). Even if cell service is out, you'll be able to pull up the information in this section.

We hope you find this information useful and that it helps your family better prepare for the inevitable.

*Audrey Cooper*  
*Editor in Chief*  
*San Francisco Chronicle*

### **DOWNLOAD THE GUIDE**

This guide to preparing for and surviving a major regional disaster is also designed to be available "offline" as a pdf, in the event that you need to access it and are unable to get cell service. Make sure to download it now at <http://www.sfchronicle.com/survival> and follow these simple steps to find it when you need it.

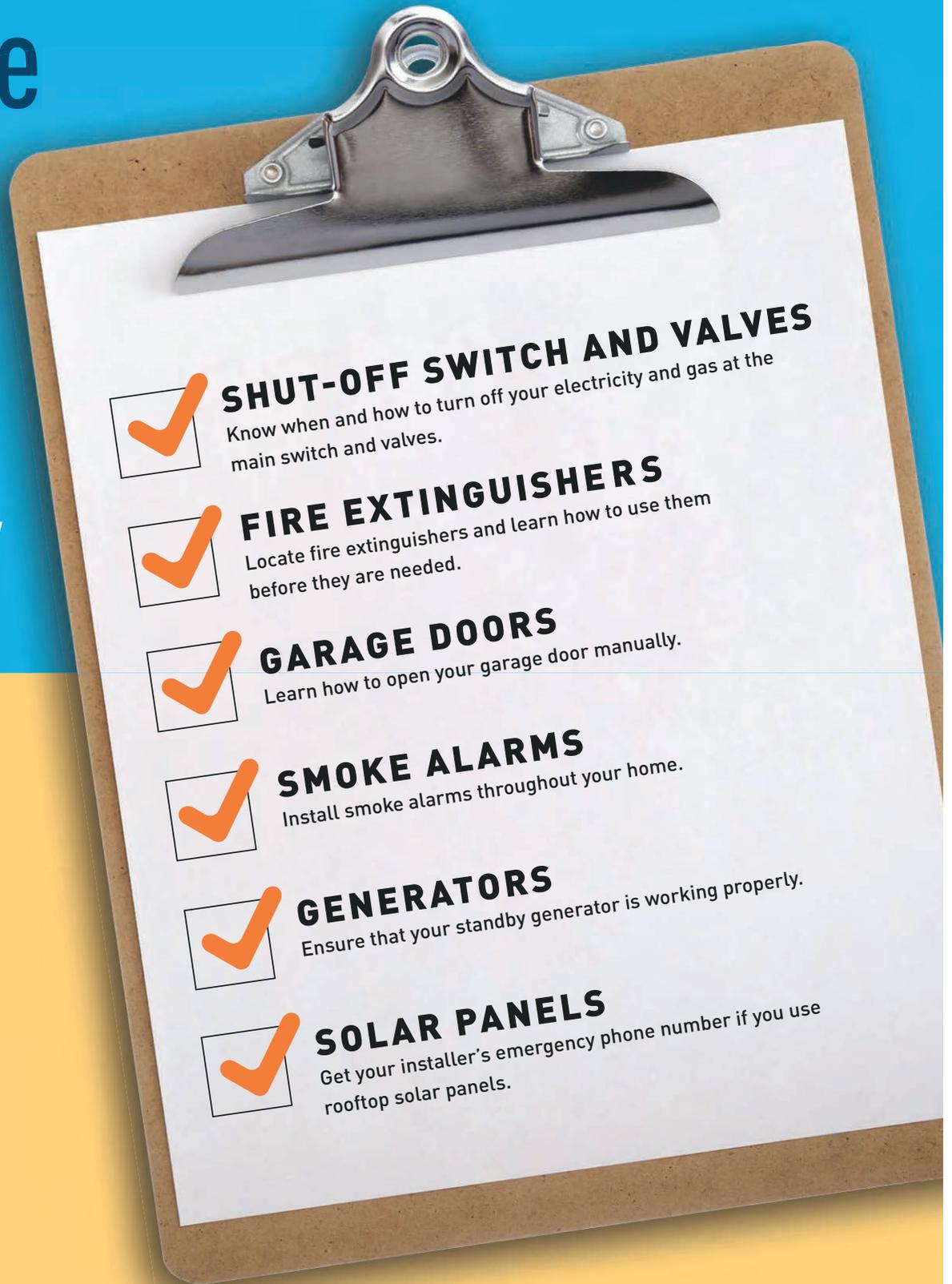
**For iPhones:** To store this guide on an iPhone, download the document and open the Files app, which is included in iOS 11. If you don't have the latest version of the Apple operating system, you can store this document in iCloud or Google Drive. Instructions for the latter are below under "Another Option."

**For Android:** To store this guide on an Android phone, you need to download a free file manager app such as ES File Explorer File Manager or use Google Drive. If you're using a file manager, the app will locate the guide once it's been downloaded onto your phone.

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# Check to see if you are prepared for an emergency

Help ensure that  
your property and  
home are prepared for  
emergencies with  
these guidelines



Find out how PG&E can help you be prepared at [pge.com/beprepared](http://pge.com/beprepared)



Noah Berger / Special to The Chronicle

# ***PLANNING FOR NATURAL DISASTERS***

**By Kevin Fagan**

When fires, earthquakes or other disasters hit us, they come with no warning, and they leave behind chaos and ruin. How ready you are and how well you react could mean the difference between life and death.

So you need to plan, and this boils down to some core principles: Prepare your home for maximum safety, map out a plan of escape, store supplies to help you live as well as you can through the aftermath.

*Planning continues on W5*



American Stock Archive / Getty Images 1906

Reread this guide occasionally to refresh your memory, and try to lay in these preparations as soon as possible. Because whether it's a wildfire or a quake, all the warning you get may be a terse text message, a horn blast or a panicky shout from a neighbor.

“The fact is that most people haven't gotten prepared for disaster — maybe 10 or 15 percent are —

**Left:** Firefighters work to save structures on Soda Canyon Road in Napa on Oct. 9. Only 10 to 15 percent of people are prepared for a natural disaster.

**Above:** A wooden cart lies in a giant crack in a cobblestone street after the San Francisco earthquake in 1906. Planning for a disaster can mean the difference between life and death.

and they only realize they have to get ready once a disaster happens,” said Michael Skyler, who for more than two decades has run the Disaster Supply Center in San Rafael, one of the few stores of its kind in Northern California.

“But thinking about it afterward is too late.”

## How to create a defensible space

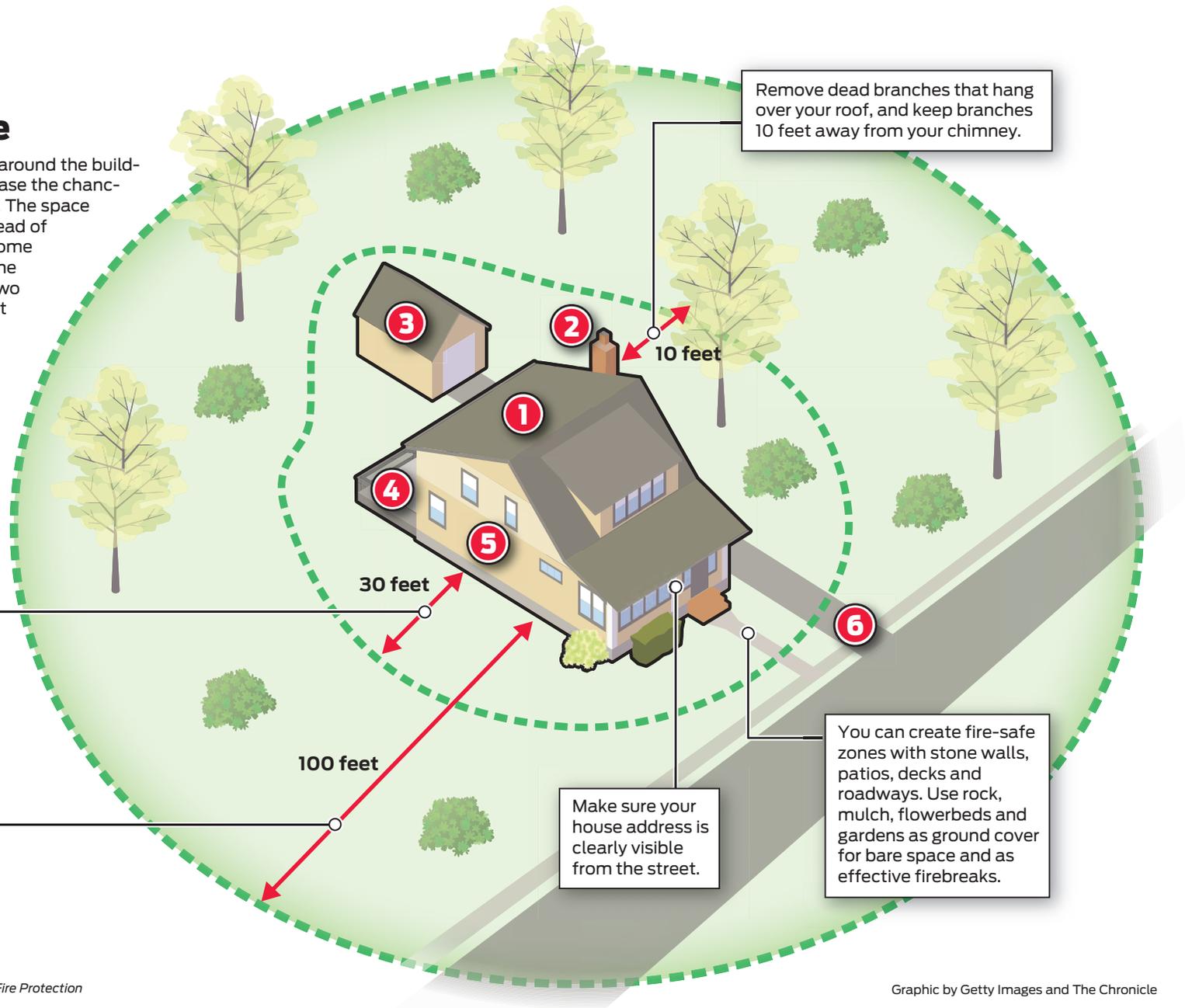
A defensible space is a buffer zone around the buildings on your property that can increase the chances of your home surviving a wildfire. The space is necessary to slow or stop the spread of wildfire, and it helps prevent your home from catching fire. It also protects the firefighters defending your home. Two zones make up the required 100 feet of defensible space. For more information on how to prepare your home and yard against wildfires, go to the Cal Fire website [www.readyforwildfire.org](http://www.readyforwildfire.org).

### ZONE 1

Extends 30 feet from buildings, structures, decks, etc. Remove all dead plants, weeds and leaves from this area, including the roof and rain gutters.

### ZONE 2

Extends 100 feet from buildings, structures, decks, etc. Mow grass to a maximum height of 4 inches. Create space between trees and shrubs (see diagrams on facing page).



Source: California Department of Forestry and Fire Protection

Graphic by Getty Images and The Chronicle

# PROTECT YOUR HOME FROM WILDFIRE

The Center for Insurance Policy and Research estimates that 2 million homes in California are at high risk for wildfire, or about 15 percent of all the state's housing. That's more than any other state. Taking a few precautions is well worth your time.

There are two main goals when preparing your home for a wildfire: Keep the flames as far away as possible, and fortify the house as much as possible against embers and whatever fire licks up against the walls.

Here are the steps you can take:

### DEFENSIBLE ZONE

Create a 100-foot perimeter defensible zone around your house or apartment to minimize fuel danger. This doesn't mean strip everything down to dirt.

**Step one:** Clear dead leaves and plants from within 30 feet of the home; keeping tree branches 10 feet away from the chimney and other trees; and trim limbs to at least 6 feet above the ground. Clear all dead limbs, leaves and other vegetation from the roof.

**Step two:** As part of the defensible zone, cut grass to 4 inches or lower from the 30-foot line out to the 100-foot line, and leave ample space between trees and bush so flames won't easily jump between them. Consult a landscape specialist to learn how wide that space should be — it varies from yard to yard.

**1 Roof**

The most vulnerable part of your home, it should be made of flame-retardant materials. Homes with wood or shingle roofs are at higher risk of being destroyed in a wildfire.

**2 Chimney**

Cover with noncombustible screen.

**3 Garage**

Have a fire extinguisher and tools such as a shovel, rake, bucket and hoe available for fire emergencies. Store combustible and flammable liquids away from ignition sources.

**4 Deck**

Surfaces within 10 feet of the building should be built with ignition-resistant or non-combustible materials. Remove combustible items from underneath your deck.

**5 Windows**

Heat from a wildfire can break windows even before the house ignites. This allows burning embers to enter and start fires inside. Single-pane and large windows are particularly vulnerable. Install dual-pane windows with one pane of tempered glass to reduce the chance of breakage in a fire. Consider limiting the size and number of windows that face large areas of vegetation.

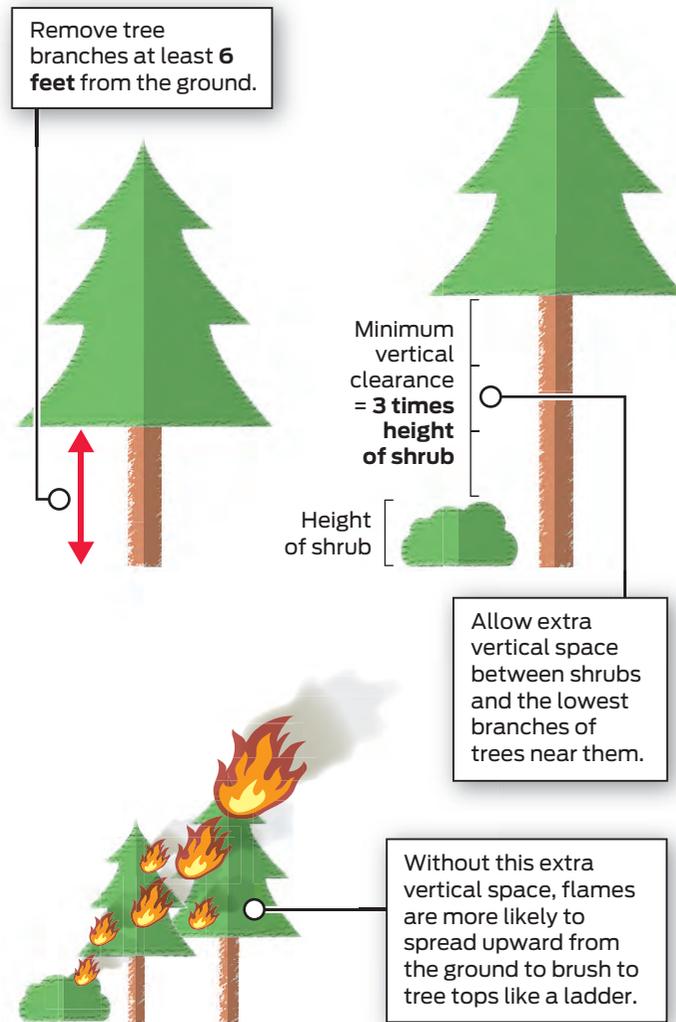
**6 Driveway**

Should be built according to state and local codes to allow emergency vehicles to reach your home. Trim trees and shrubs overhanging the road to allow vehicles to pass.

**Plant and tree spacing**

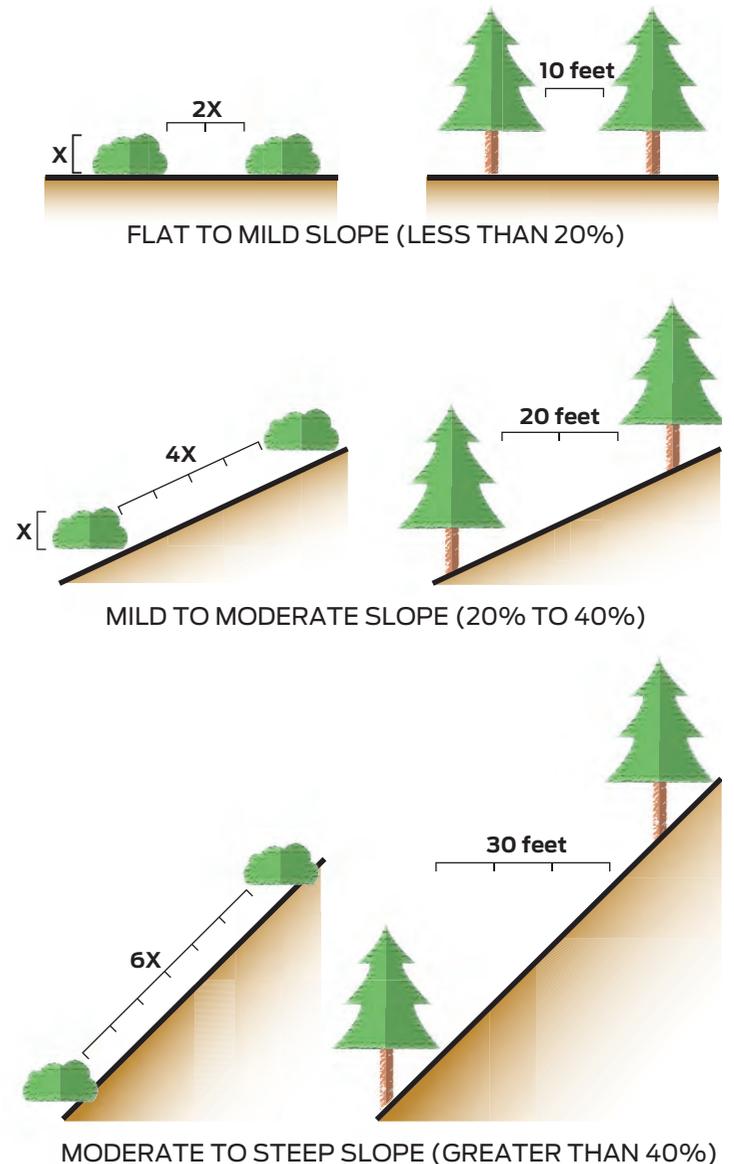
The distance between grass, shrubs and trees is critical in reducing the spread of wildfires. The spacing needed is determined by the type and size of brush and trees, as well as the slope of the land. A property on a steep slope with larger vegetation requires greater spacing between trees and shrubs than a level property that has sparse vegetation.

**MINIMUM VERTICAL CLEARANCE**



**MINIMUM HORIZONTAL CLEARANCE**

Horizontal spacing depends on the slope of the land and the height of the shrubs or trees.



**MORE ABOUT LANDSCAPING AND YARD WORK**

Avoid or pull out flammable plants, such as bamboo or the oily eucalyptus — which lights like a matchhead — and opt instead for high-moisture succulents such as aloe or fire-resistant hardwood trees such as maple.

Don't operate any power tools to trim vegetation when the weather is hot and windy because sparks can light the yard in a twinkling.

Notify Pacific Gas and Electric Co. whenever you notice power lines brushing up against tree limbs, or close enough for a strong wind to slap them together. Its crews can come trim the trees. Several big fires, including the devastating 2015 Butte Fire, were sparked by power lines hitting trees, and hitting against other power lines.

**ON AND AROUND THE HOUSE**

Roofs should be made of flame-retardant materials, such as metal, asphalt composition shingles or clay tiles. Make the overhangs as wide as possible — in the Wine Country fires, some homes fared better with flying embers when they had fire-resistant overhangs of 4 feet or more to keep them from hitting the walls.

Know where your gas shutoff valve is, and keep a wrench next to it. If you see a wildfire getting dangerously close, shut off the gas — and any propane tanks you might have around.

**HAVE A WILDFIRE PLAN**

In just two minutes, a house fire can become deadly, according to the Department of Homeland Security. In five minutes, a house can become fully engulfed in flames. Plan for the worst.

Understand your risk. Cal Fire maintains maps of areas prone to wildfire, and cities and counties are required to keep safety plans that contain procedures for evacuations and communications.

— Kevin Fagan and Kurtis Alexander

# TIPS TO PREPARE FOR A HOUSE FIRE

In a house fire, experts estimate you have a little as two minutes to get out before being overtaken by smoke and flames. The trick is to try to prevent flames from getting to that point. Here are things you can do to help with that:

- ▶▶ Double-paned windows can slow the fire's invasion, as can fire-resistant walls such as stucco.
- ▶▶ Make sure your chimney has a spark arrester, and have it inspected and cleaned annually.
- ▶▶ Check the batteries in your smoke alarms once a month, and replace them twice a year. A good rule of thumb is to replace them when you change the clocks in the spring and fall.
- ▶▶ Get rid of old paints and other flammable liquids you don't need anymore, and store those you do in well-ventilated areas.
- ▶▶ Cover all outside vents with tight mesh of one-eighth- to one-quarter-inch openings to prevent embers from floating inside and igniting furniture or inner walls.
- ▶▶ Keep a disaster kit within easy reach of the front door — see the survival kit section in this guide — and make sure valuable documents such as passports, insurance policies and deeds are in one handy place to grab quickly.

— Kevin Fagan

## HALLWAY

- ▶▶ Install smoke detectors between living and sleeping areas.

## BEDROOM

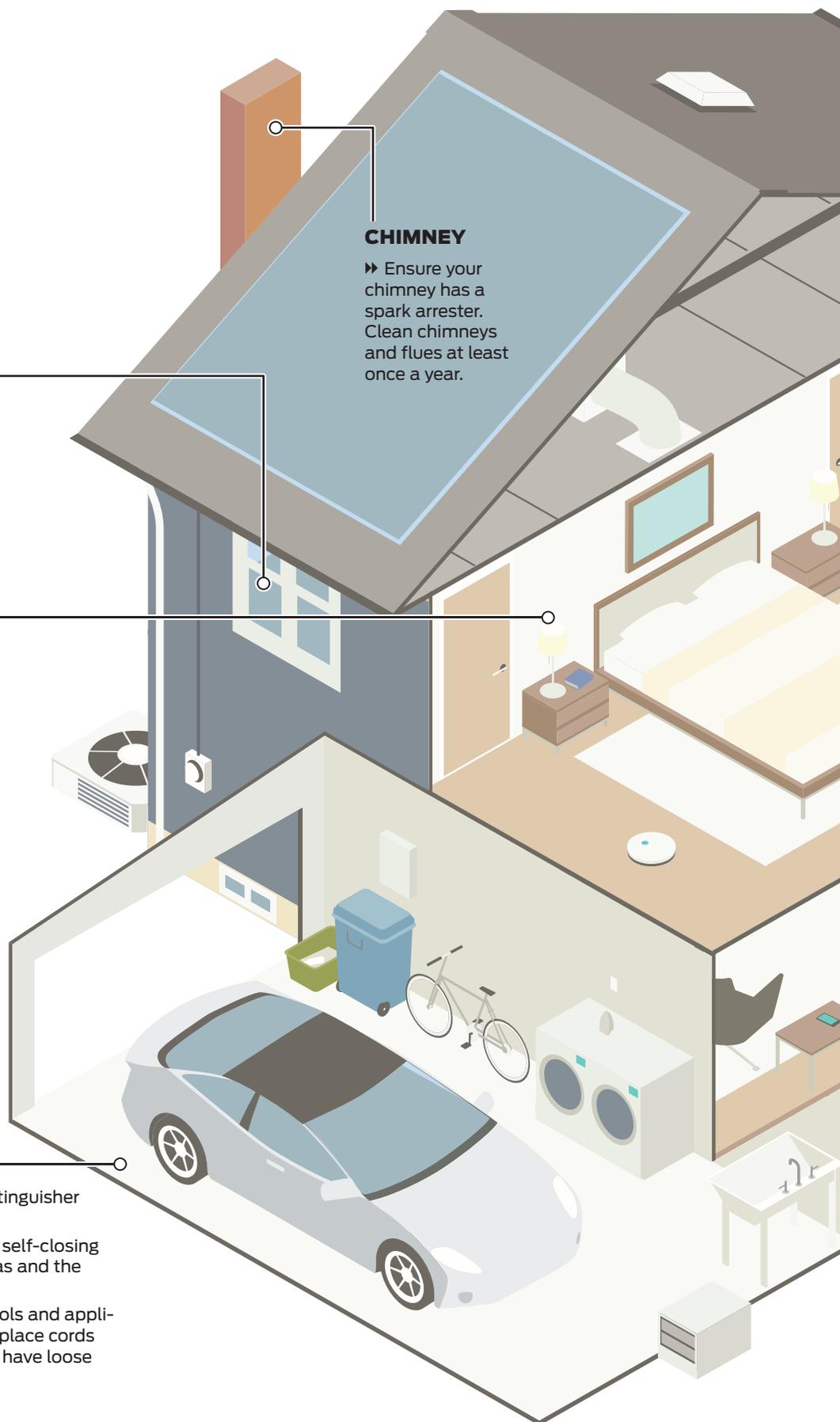
- ▶▶ If you sleep with the door closed, install a smoke detector in the bedroom.
- ▶▶ Turn off electric blankets and other electrical appliances when not in use.
- ▶▶ Do not smoke in bed.
- ▶▶ If you have security bars on your windows or doors, be sure they have an approved quick-release mechanism so you and your family can get out in the event of a fire.

## GARAGE

- ▶▶ Mount a working fire extinguisher in the garage.
- ▶▶ Install a solid door with self-closing hinges between living areas and the garage.
- ▶▶ Disconnect electrical tools and appliances when not in use. Replace cords that do not work properly, have loose connections or are frayed.

## CHIMNEY

- ▶▶ Ensure your chimney has a spark arrester. Clean chimneys and flues at least once a year.

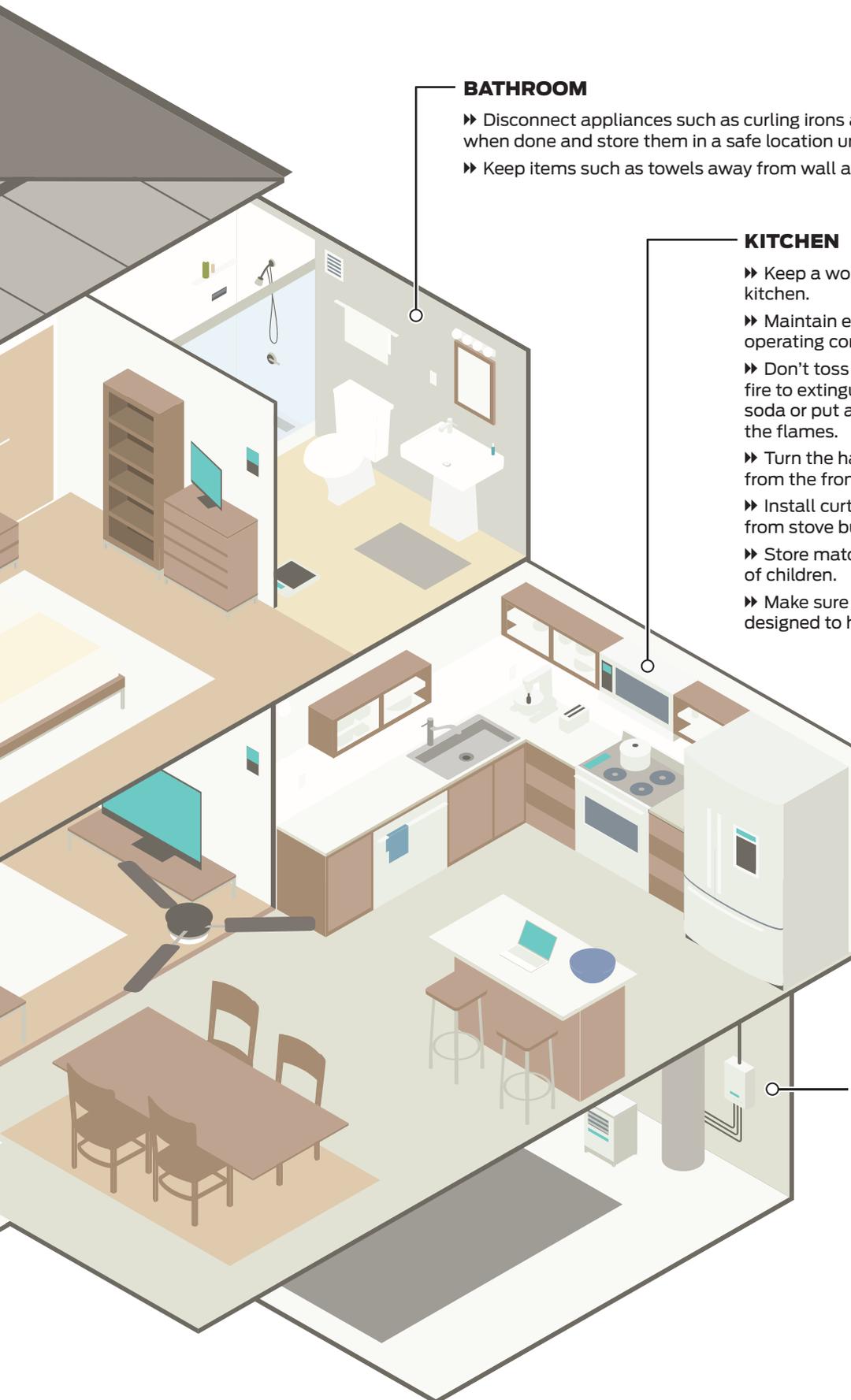


# HOME FIRE DRILLS

Preparing for a house fire, including running fire drills, can help families escape and survive if such a disaster hits. Yet few families — just 18 percent — have practiced home fire drills. Here's what you can do:

- ▶▶ Walk through your home, and identify exits and escape routes, making sure doors and windows can be easily opened.
- ▶▶ Install smoke alarms in every sleeping room.
- ▶▶ Choose a meeting place outside — say the nearest stop sign or light post.
- ▶▶ Assign someone to get the pets.
- ▶▶ Practice escape routes twice a year, making the drill as realistic as possible, according to the Red Cross. The idea is to practice, not scare children, so it doesn't need to be a surprise drill. Drills should include making sure children know not to go back for toys, not to hide and not to go near or touch the fire.
- ▶▶ Teach children to “get low and go.” Have them practice escaping each room by crawling along the perimeter to an exit and to “stop, drop and roll” if their clothing catches fire.
- ▶▶ If children are fearful about fire or fire drills at school or home make them anxious, try visiting a fire station or turning the drills into games, perhaps Simon says, “Get low and go.”
- ▶▶ For those in multistory homes or buildings, practice setting up and using escape ladders from a first-floor window.
- ▶▶ Instruct those who can't get out to insulate themselves in a room, closing doors and using towels or duct tape to seal cracks. Wave a flashlight or light-colored clothing at the window so firefighters know where you are.

— Jill Tucker



## BATHROOM

- ▶▶ Disconnect appliances such as curling irons and hair dryers when done and store them in a safe location until they are cool.
- ▶▶ Keep items such as towels away from wall and floor heaters.

## KITCHEN

- ▶▶ Keep a working fire extinguisher in the kitchen.
- ▶▶ Maintain electric and gas stoves in good operating condition.
- ▶▶ Don't toss water on a stovetop grease fire to extinguish it. Instead, use baking soda or put a lid on the pan to suffocate the flames.
- ▶▶ Turn the handles of pots and pans away from the front of the stove.
- ▶▶ Install curtains and towel holders away from stove burners.
- ▶▶ Store matches and lighters out of reach of children.
- ▶▶ Make sure that electrical outlets are designed to handle appliance loads.

## STORAGE AREAS

- ▶▶ Dispose of oily rags in metal containers.
- ▶▶ Store combustibles away from ignition sources such as water heaters.
- ▶▶ Store flammable liquids in approved containers and away from ignition sources such as pilot lights.

# 3-DAY QUAKE SURVIVAL

There are earthquakes, and then there are *earthquakes*, the kind that throw an entire region off its axis, cause buildings to crumble and people to die, and — if you survive — force you out of your home.

In the aftermath of one of those, you should be prepared to live self-sufficiently for at least three days — and though most quakes will be quickly followed by shelters and governmental aid to ease the survival struggle, you have to plan for the worst.

Experts say that under the most dire scenario for a 7.0 Hayward Fault quake — never mind the half-dozen other major faults that could rupture around here — thousands will be dead, tens of thousands of homes will be flattened, and hundreds of thousands will become refugees. Power will be out for days, and rescue efforts will be overwhelmed.

So have your earthquake survival kits ready.

You'll need one large can of supplies outside the home, and one much smaller “go bag” of supplies in your car in case that's all you are left with. Check them every six months to replace outdated food, water and batteries.

These kits, by the way, are also useful in floods, fires or other disasters.

— Kevin Fagan



## HOME EARTHQUAKE SURVIVAL CAN

People most commonly store their major survival supplies outside the home in a basic outdoor garbage can — either 32-gallon or 55-gallon. Keep it far enough away from the house or complex so that it won't be crushed if the building falls down. Seal the lid with rubber window weather sealant tape to mitigate mildew, and put anything that could get moldy or rusty in airtight plastic bags before you put them in the can.

Photos by Carlos Avila Gonzalez / The Chronicle

### Here's the minimum you need in the can:

▼ Food for three days, about 1,000 calories per person. Canned food is best outside for not attracting rodents and bugs, but it's also heavy. Some people prefer freeze-dried food, meat jerky or power bars.



▼ 1 gallon of water per person, for three days



◀ **Water purification tablets** in case you need to go beyond three days and clean water becomes scarce. Basic household bleach can be used in a pinch, six to eight drops per gallon. Also include a foldable plastic water bag to mix the water in.



▲ **1 change of clothes** per person: Shirt, underwear, pants, shoes, jacket, diapers if needed



▲ **First-aid kit**



▲ **1 blanket** per person



▲ **Sewing kit**



▲ **Toilet paper**



◀ **Feminine supplies** and other necessary personal hygiene items



▲ **Flashlight**



▲ **Battery-powered lamp**



▲ Portable radio



◀ **Enough batteries** to run every device you store in the can — and place them all in a separate bag, not in the devices, because you may forget to replace them, and they will corrode



◀ **Recharger for cell phones** and devices, powered by batteries, with cell phone recharging cord for automobile



◀ **Tools:** Screwdriver (with replaceable Phillips and flathead ends), pliers, Leatherman-style multitool or pocketknife, can opener



▲ Gas meter valve shutoff wrench



▲ 100 feet of rope (3/16-inch or bigger)



◀ **At least \$100** in small bills, with some coins. (Debit and credit card machines might not be working for days.)



▲ **Plastic sheeting**, at least 6-by-8 feet, or tube tent for emergency shelter



▲ Candles



▲ **Waterproof matches**



▲ Duct tape



▲ Work gloves



◀ **Paper or plastic plates, bowls and cutlery**



▲ **Small cooking pot.** Drinking cup



▲ Whistle



▲ **Soap** and bath towel



▲ 1 smoke/dust mask per person



◀ **Hatchet** for building or debris clearing



▲ Foldable shovel



▲ Handy wipes

**THESE ALSO MIGHT BE GOOD TO ADD:**

- ▶▶ Extra eyeglasses
- ▶▶ Extra medications
- ▶▶ Water filter to drink from questionable sources if you have to
- ▶▶ Assortment of plastic bags, from sandwich to trash can sizes
- ▶▶ Solar-powered or hand-crank recharger for devices
- ▶▶ Local maps
- ▶▶ 1 sleeping bag per person
- ▶▶ Fire extinguisher
- ▶▶ Books and games
- ▶▶ Copies of important documents such as insurance policies or house deeds
- ▶▶ Paper and pencil

# STOCKING A SURVIVAL KIT FOR YOUR CAR

You may be in your car when a devastating quake hits the Bay Area, making a survival kit as valuable as the one you've left at home. A small backpack is recommended, filled with the items on the the following list (which is designed for one person):

— Kevin Fagan



# GreenState

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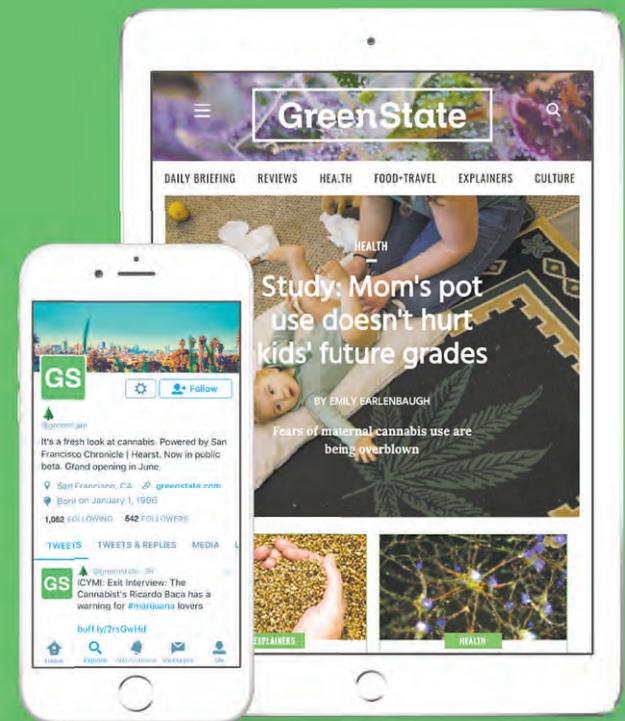
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# MAKE SURE HOME IS READY FOR A QUAKE

The most beautiful sight to greet your eyes after a devastating earthquake will be that of your house still standing, and everyone who lives in it still safe. Here's what you can do to have the best chance of that happening:

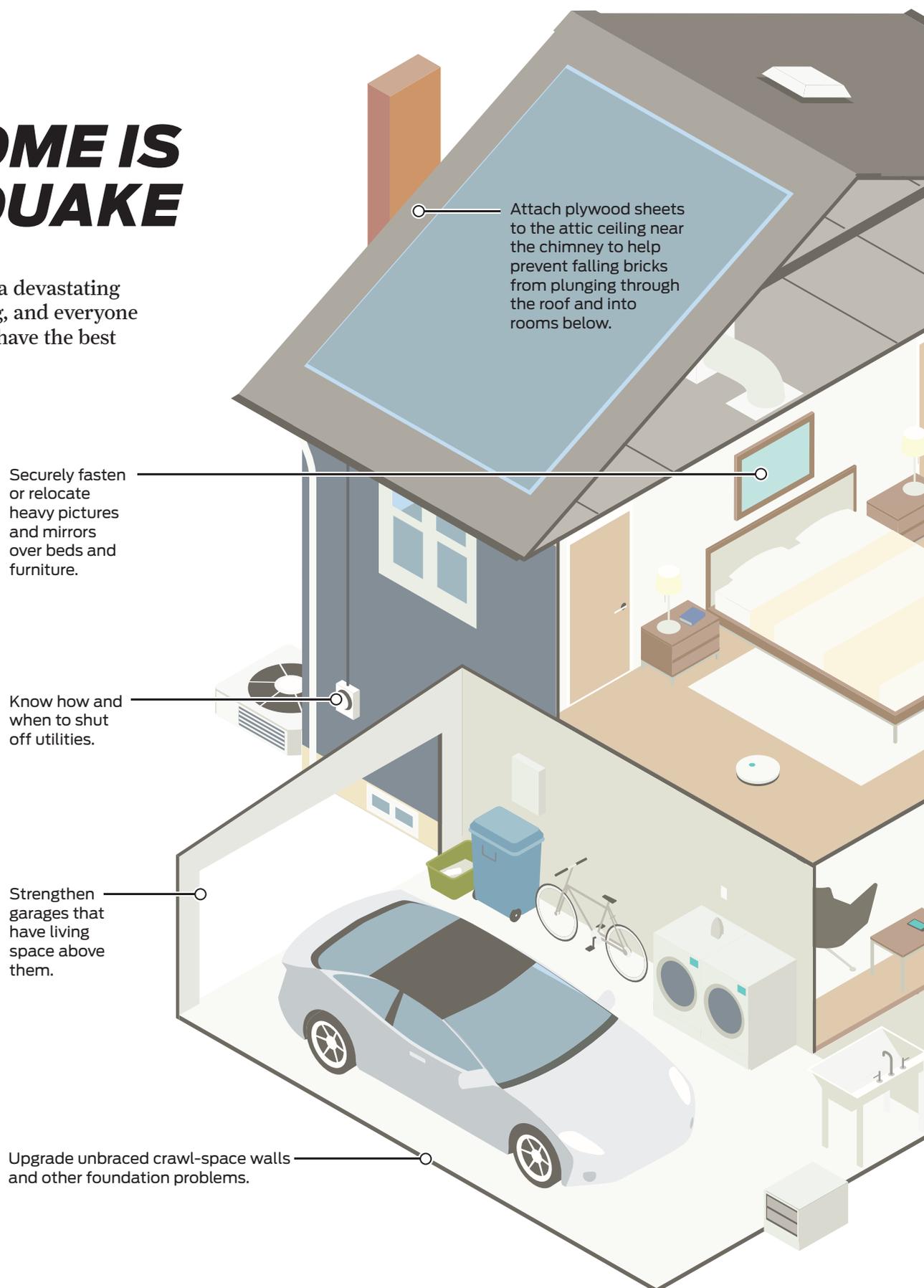
## FORTIFY YOUR HOUSE

- ▶▶ Bolting your house to its foundation with anchor bolts, if it hasn't already been done, will help prevent the house from sliding off its foundation.
- ▶▶ Installing extra wooden sheeting along the home's cripple walls — those short walls in the crawl space between the foundation and floor — will also help keep the house on its foundation.
- ▶▶ Screw plywood sheets to the attic ceiling, close to the chimney. Chimneys commonly collapse in a big quake, and this will help stop falling bricks from plunging through the roof onto you.
- ▶▶ If you live in a soft-story house, meaning the first floor is not well reinforced and will collapse in a big temblor, it's recommended to spend the considerable amount of money it will take to have it retrofitted. Or if you don't own the building, talk with the landlord about this. In some cases, the retrofit is required by local law.
- ▶▶ Install earthquake safety automatic shutoff valves for your gas lines. If you don't have an automatic valve, keep a shutoff wrench by the valve so you can turn off the gas right after a big quake.
- ▶▶ For a mobile home, install braces or a tie-down system underneath to keep it from collapsing during the shaking.

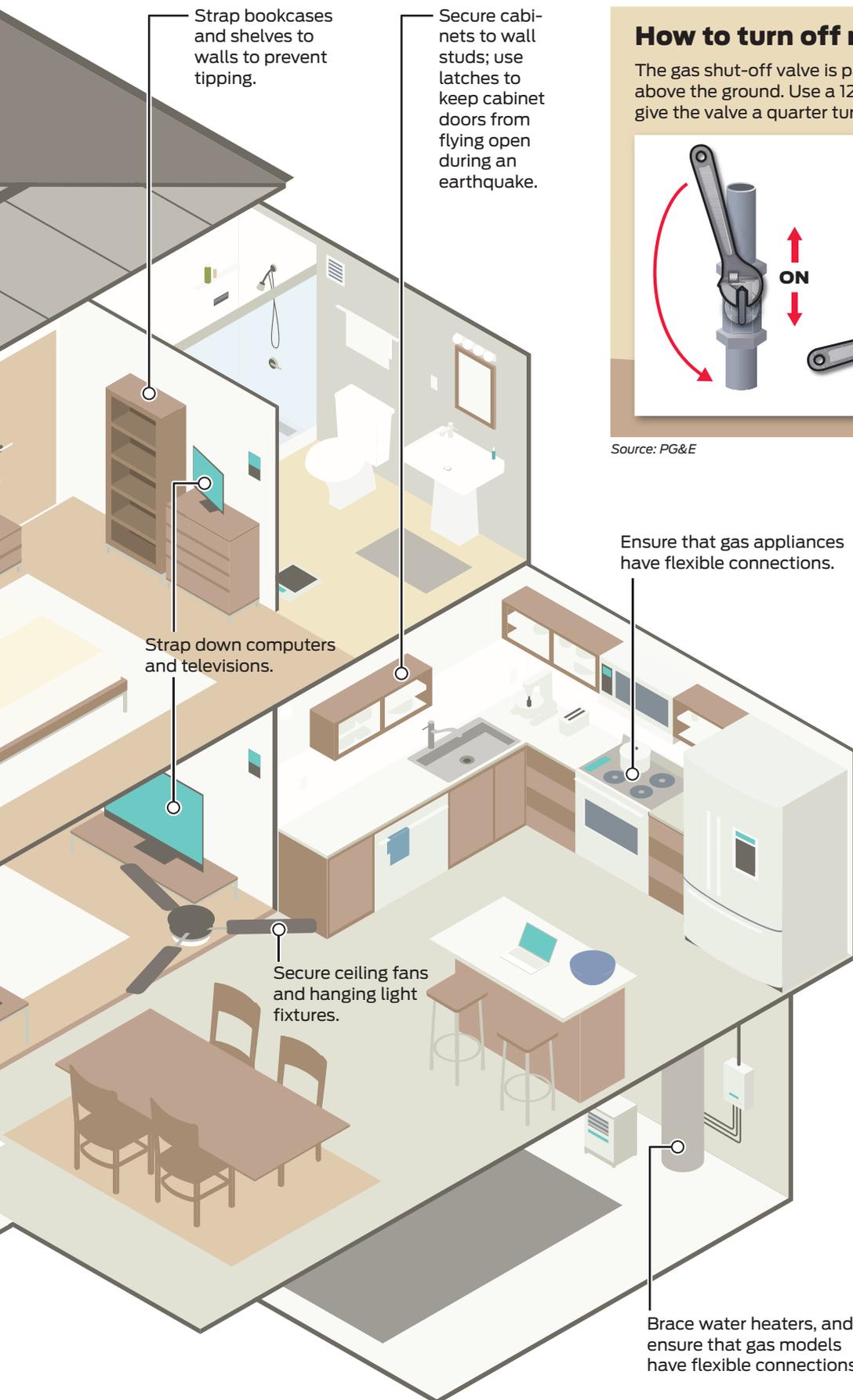
## ATTACH THINGS INSIDE

- ▶▶ Heavy hanging objects like big pictures or mirrors should be attached to walls with screws driven into studs, not sheet rock.
- ▶▶ Bookcases, china cabinets and other heavy furniture placed against a wall should be attached to that wall by L-shaped metal brackets.
- ▶▶ The doors to all cupboards and cabinets should be fitted with child-proofing latches so they don't pop open during the shaking and fling everything out at you.
- ▶▶ Brace your water heater against the wall with metal straps screwed into studs.

— Kevin Fagan

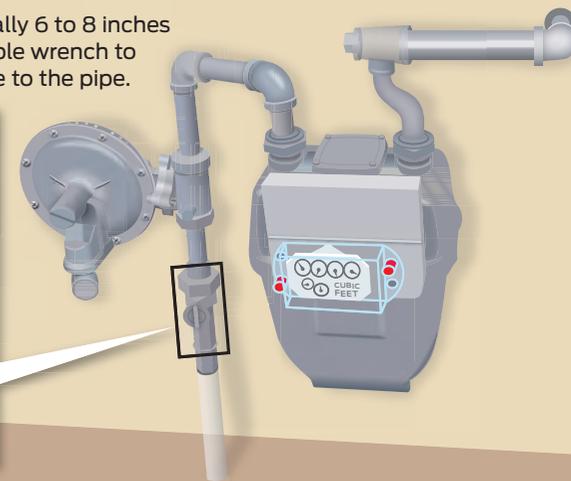
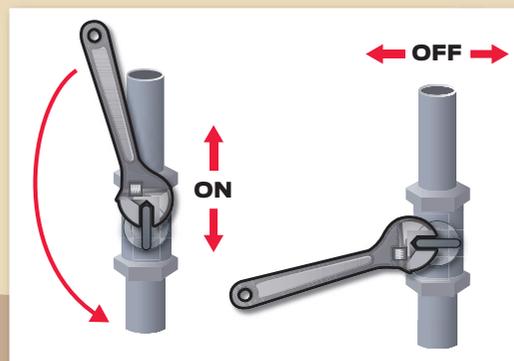


Source: Federal Emergency Management Agency



## How to turn off natural gas

The gas shut-off valve is parallel to the pipe, usually 6 to 8 inches above the ground. Use a 12-inch or larger adjustable wrench to give the valve a quarter turn so that it is crosswise to the pipe.



Source: PG&E

Todd Trumbull / The Chronicle

# PREPARE FAMILY FOR QUAKES

Earthquakes are scary. Suddenly the world shakes, the room rattles and things start to fall. To kids, it might feel like a monster has ahold of their house or school. The best way to ease the fear is to prepare. Talking to children and creating a plan can make such an emergency less scary and help calm nerves when a quake actually strikes.

Here are practical tips on what to do:

- ▶▶ Gather the family and create a plan together.
- ▶▶ Pick safe places in each room to take cover when the shaking begins — under furniture or against an interior wall away from windows, bookcases or tall furniture that could fall. Stay away from kitchens and garages, which tend to be the most dangerous because of the objects there.
- ▶▶ Practice “Drop, cover and hold on” in each safe place — and schedule drills every six months.
- ▶▶ Conduct a “hazard hunt,” looking for objects that could fall or fly through the air.
- ▶▶ Put a working flashlight and shoes next to each bed.
- ▶▶ Teach everyone to knock on something three times repeatedly if trapped.
- ▶▶ Identify a safe place outside to meet up after the shaking stops.
- ▶▶ Designate an out-of-state person for everyone to call to relay information.
- ▶▶ Assign someone to turn off the gas and to gather pets.
- ▶▶ Create an earthquake kit as a family, and include one comfort item per child, like a teddy bear or toy, as well as activities or children’s books.
- ▶▶ Talk about what to do if an earthquake happens while family members are at school or work — reassuring young children that they will be safe until picked up while also creating a meeting place for adults and older children.

Graphic by Getty Images and The Chronicle

— Jill Tucker

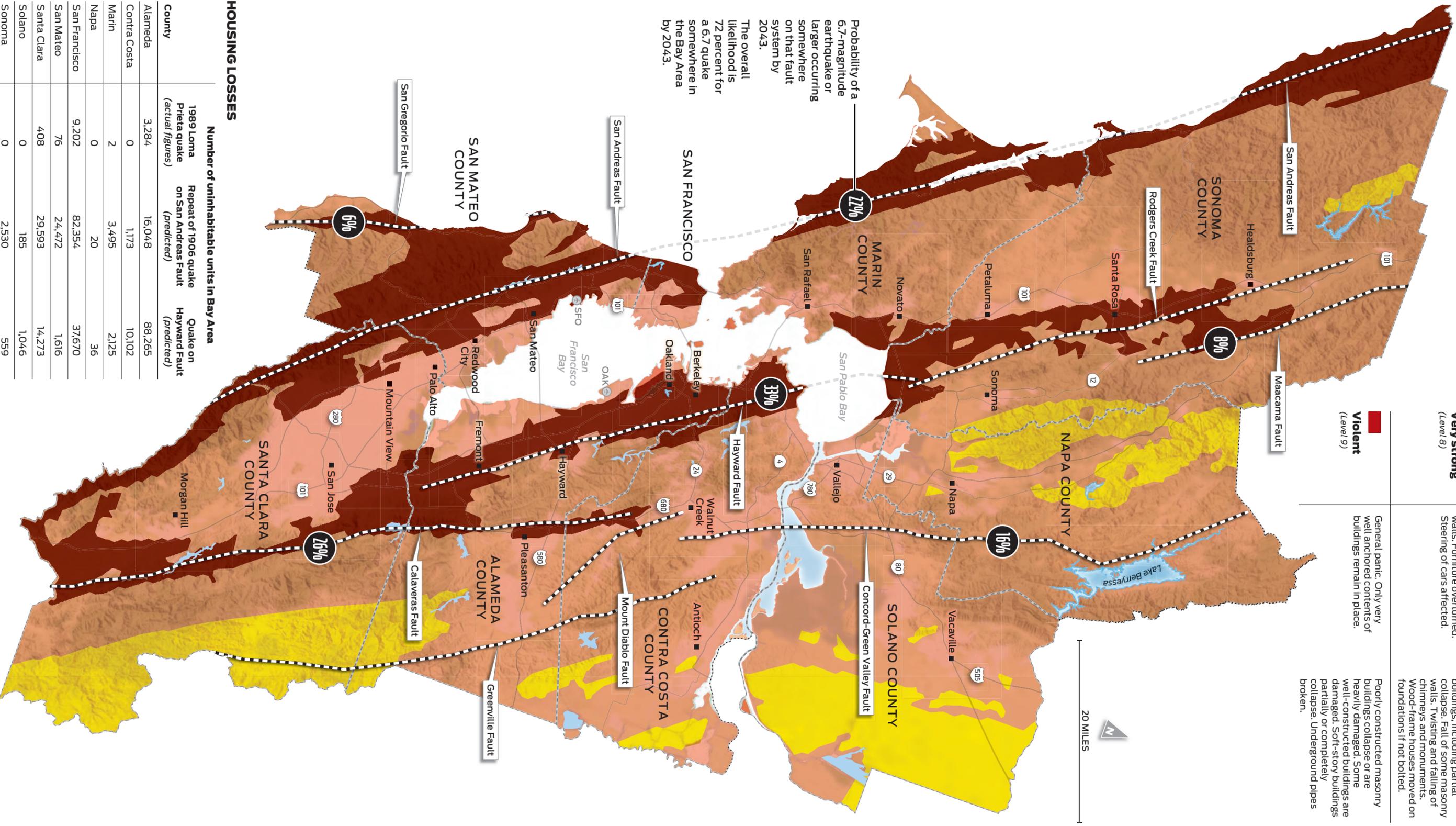
# HOW MUCH WILL THE GROUND SHAKE?

This map shows the estimated intensity of earthquake ground shaking across the Bay Area based on quake scenarios and likelihood information for all faults in the region. Developed by the Association of Bay Area Governments, the U.S. Geological Survey and the California Geological Survey, the map uses the Modified Mercalli Intensity scale, which describes earthquake shaking severity by its effects on people, objects and buildings. The amount of shaking in a particular location will depend on the type of ground underneath and how far it is from the fault that ruptured. For additional earthquake hazard information, including interactive maps for each county, go to [resilience.abag.ca.gov/earthquakes/](http://resilience.abag.ca.gov/earthquakes/).

MAP LEGEND	Effects on people and objects	Effects on structures
<b>Shaking severity</b> (MMI scale level)		
<b>Strong</b> (Level 7)	Difficult to stand or walk. Many things thrown from walls and shelves. Furniture is shifted or broken. Shaking is noticed by drivers of cars.	Damage to poorly built masonry buildings. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices, unbraced parapets and porches. Some cracks in better masonry buildings.
<b>Very strong</b> (Level 8)	Nearly everything thrown from shelves, cabinets and walls. Furniture overturned. Steering of cars affected.	Extensive damage to unreinforced masonry buildings, including partial collapse. Fall of some masonry walls. Twisting and falling of chimneys and monuments. Wood-frame houses moved on foundations if not bolted.
<b>Violent</b> (Level 9)	General panic. Only very well anchored contents of buildings remain in place.	Poorly constructed masonry buildings collapse or are heavily damaged. Some well-constructed buildings are damaged. Soft-story buildings partially or completely collapse. Underground pipes broken.

Probability of a 6.7-magnitude earthquake or larger occurring somewhere on that fault system by 2043.

The overall likelihood is 72 percent for a 6.7 quake somewhere in the Bay Area by 2043.



## HOUSING LOSSES

County	Number of uninhabitable units in Bay Area	1989 Loma Prieta quake (actual figures)	Repeat of 1906 quake on San Andreas Fault (predicted)	Quake on Hayward Fault (predicted)
Alameda	3,284	16,048	88,265	
Contra Costa	0	1,173	10,102	
Marin	2	3,495	2,125	
Napa	0	20	36	
San Francisco	9,202	82,354	37,670	
San Mateo	76	24,472	1,616	
Santa Clara	408	29,593	14,273	
Solano	0	185	1,046	
Sonoma	0	2,530	559	
<b>TOTAL</b>	<b>12,972</b>	<b>159,870</b>	<b>155,692</b>	

Sources: Association of Bay Area Governments, U.S. Geological Survey

Todd Turnbull/The Chronicle

# POWER IT UP IF PRICE IS NO OBJECT

Power and communications are two elements of modern life that we take for granted, but both can easily disappear in a disaster. If you are still able to live in your house after an earthquake or other major disaster, but you have no power, here are some relatively inexpensive steps you can take, like buying a flashlight-radio recharged by a hand crank and solar panels. It would give you some light and a one-way communications channel.

But if money is no object, here are some other options:

## WHEN THERE IS NO ELECTRICITY

**Tesla Powerwall 2** with rooftop solar panel cells

This device, sold by electric car maker Tesla, is a wall-sized lithium-ion battery that is charged and recharged with electricity generated by solar panels. The device, which can be attached to an exterior wall, is also available through Tesla's SolarCity subsidiary.

**Cost:** \$5,500 each for a Powerwall 2, which would generate enough power to cover up to a 1,100-square-foot home; two would generate enough for up to a 4,600-square-foot home. Tesla recommends adding more Powerwalls if you want to run the air conditioner and are charging an electric vehicle, which actually might come in handy if gasoline supplies are cut off.

**The catch:** You'll still need rooftop solar panels for the device to work. But look at it this way: You can use them to save on your electricity bill, even if there's not a disaster.

## POWER GENERATORS

You could choose between a portable gasoline-powered backup generator or a permanently installed generator, powered by natural gas, propane or diesel, that automatically kicks in if power is cut.

**Cost:** It varies wildly depending on what your electrical needs are. Honda has a wattage calculator to estimate what kind of power generator you might need. For example, running a house full of appliances — including refrigerator, microwave, furnace fan, flat-screen TV, washer, dryer, air conditioner, computer, monitor, garage door opener and DVD player — at one time requires a recommended wattage of nearly 23,000.

Home Depot's website lists portables starting as low as \$120, but none meet the 23,000-watt requirement. Permanent generators are available for anywhere from \$1,900 to \$17,000, although a \$10,000 model might meet the wattage you'll need to make everything work in your house.



Tesla

Tesla's Powerwall 2 is a big house battery that stores energy from solar panels.

## COMMUNICATIONS

### Satellite phones

Most of us are reliant on our telephones, whether mobile or landline, and computers to communicate with friends and loved ones, and we expect them to work to summon help in an emergency. But if cell phone networks are incapacitated, landlines are down and Wi-Fi is not available, phones that connect to orbiting satellites might be the only option.

**Cost:** Iridium has the largest constellation with 66 satellites, enough to make a call from atop Mount Everest. The top-of-the-line Iridium Extreme 9575 allows voice calls, SMS texting and email messages, and costs \$1,295 on satellite phone sites like BlueCosmo.com. Other phones start in the neighborhood of \$700, but that doesn't include your monthly service plan and the charges per minute, per call.



Iridium Communications

**Satellite phones** like the Iridium Extreme could be an expensive way to prepare for the loss of phone lines.



Iridium Communications

**The Iridium Go** connects smartphones to orbiting communications satellites.

### Your smartphone

Turn it into a satellite phone with a device like the Iridium Go, which creates a Wi-Fi hotspot connecting up to five smartphones to the satellites. The connection allows only one call at a time. It also supports email and texts, but only basic web browsing.

**Cost:** \$799 for the unit, plus additional monthly service or prepaid data plans, activation fees and per-call charges.

**The catch:** Satellite phone equipment requires some form of power to charge the batteries.

— Benny Evangelista

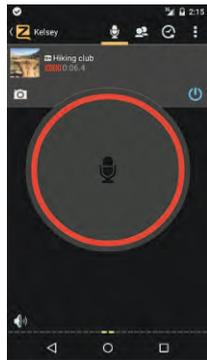
# APPS CAN HELP SAVE DAY WHEN DISASTER HITS

Several smartphone apps became extremely popular during recent disasters, according to San Francisco mobile apps analytics firm App Annie. It's best to download these free apps before you need them. Here they are:



**Disaster Alert:** Available as both a free iOS or Android app and for PC web browser, Disaster Alert from Pacific Disaster Center in Hawaii maps active warnings and advisories of the most hazardous quakes, hurricanes, cyclones, floods, wildfires, medical epidemics and other problems around the world. For an extra subscription fee, alerts can be customized by geography or type of hazard. The app uses technology from Kaazing of Santa Clara.

▶ [www.pdc.org/solutions/tools](http://www.pdc.org/solutions/tools)



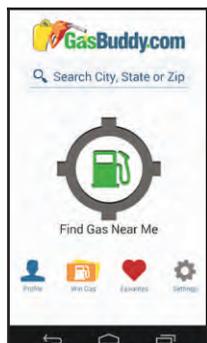
**Zello:** This app turns your smartphone, tablet or PC into a two-way radio walkie-talkie. It was credited with creating ad hoc communications networks that proved invaluable to emergency workers and community volunteers trying to help stricken Houston-area residents when Hurricane Harvey hit. It can also be useful for finding family members. The app, which topped the Apple store and Google Play download charts in September, works on Wi-Fi or even older GPRS and EDGE mobile wireless technologies.

▶ <https://zello.com/app>



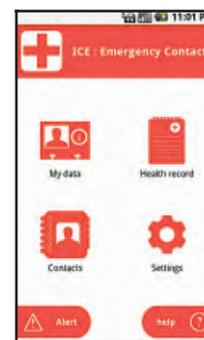
**First Aid by the American Red Cross:** This app lists first-aid techniques for a variety of medical issues, such as broken bones, burns and concussions, and recommends what to do before, during and after emergencies like quakes, fires, floods, landslides, heat waves and volcano eruptions. The app also locates the nearest hospitals. The Red Cross also has other apps for specific disasters, including earthquakes, hurricanes, tornadoes and floods, plus an all-in-one emergency app that monitors more than 35 severe weather conditions.

▶ [www.redcross.org/get-help/how-to-prepare-for-emergencies/mobile-apps](http://www.redcross.org/get-help/how-to-prepare-for-emergencies/mobile-apps)



**GasBuddy:** This crowdsourced app normally helps drivers find the cheapest gasoline in their area. Downloads of the app spiked in the weeks leading to Hurricane Irma as drivers sought to find stations that still had both fuel and electricity to run the pumps.

▶ <https://gasbuddy.com>



**ICE (In Case of Emergency):** The app lists your emergency contacts and key medical information such as blood type, allergies and medication for doctors and first responders to see on your smartphone's lock screen. App Annie said this Android-only app is popular on the Google Play store, but there are similar ones available for Apple phones.

▶ <http://bit.ly/2haPlSc>



**The Weather Channel:** The app brings you the latest weather forecasts, but also provides up-to-date tracking during severe weather events like hurricanes, tornadoes and other storms. The Weather Channel has many versions available, including those for the Apple Watch, Apple TV, iMessage, Android phones and Windows PCs.

▶ <https://weather.com/apps>



**Power Battery:** Apps like this one from LionMobi tell you what's draining battery life, to help reduce power consumption. Such apps could be crucial if you need to stretch battery life if you can't recharge. App Annie said Power Battery is one of the most popular of its type, but only works on Android. But there are similar ones available in the Apple store.

▶ <http://bit.ly/2alJWBj>

— Benny Evangelista

# TRAINING, TIPS TO KEEP PETS SAFE

Whether a home is shaking or burning, man's best friend (dogs) and man's best friend's occasional enemy (cats) need tender loving care and common sense from their caretakers. Here are tips for pet survival in a disaster:



## TAGGING

All pets should be identified with tags and, preferably, microchips.



## BEHAVIOR: EXPECT THE UNEXPECTED

In an emergency, dogs tend to bolt and cats tend to hide, as a general rule. Be prepared for unusual behavior. If your dog behaves erratically when Fourth of July fireworks go off, expect much more of the same during a quake or fire.



## FIRST AID, FOOD AND WATER

Keep a pet first aid kit, with disinfectant, bandages, tweezers and antibiotic ointment.

Keep a week's worth of pet food on hand, and periodically check its expiration date to make sure it's usable. Canned food will keep longer than dry. Make sure to have plenty of extra water, more than you think you'll need. Pets (and people) drink more when under stress.

And, of course, have bowls, leash, can opener, medicine, pet toys and plenty of cat litter, plastic bags or other cleanup gear on hand. In an emergency, with problems all around, no one wants to walk needlessly into another problem because of a thoughtless pet owner.



## TRANSPORTATION AND LODGING

Pets should be trained to ride in a car, perhaps even in a pet carrier. Remember, if you have to evacuate your home, not all hotels and motels allow pets. Make a list of those near your area that do.

— Steve Rubenstein

# SHORE UP FINANCES BEFORE DISASTER HITS

Getting ready for a disaster doesn't just mean keeping the weeds down, bracing your foundation and storing extra food and water. It also means getting your financial house in order. For example, most people don't think much about their insurance policy until they need to file a claim, and at that point it's too late to wish you had more or better coverage.

Here are some ways to shore up your finances, and what to do after disaster hits.



## SAFEGUARD YOUR DOCUMENTS

Keep a copy of your will, trust, birth and marriage certificates, Social Security cards, insurance papers, medical information, most recent tax return, receipts for high-ticket items and other important documents in a safe deposit box. You can also scan and save them to a DVD or flash drive, which you can give to a trusted friend or family member outside the region. Another option is to save them in the cloud.

**For a list of vital documents:** <http://bit.ly/2zqvZDy>



## BREAK OUT THE CAMERA

Your insurance will pay for everything you lost as a result of a covered "peril," down to aspirin in the medicine cabinet (up to your policy limits of course). It's easier to document your losses if you take photos or videos of everything in your home, garage and outbuildings. Shoot what's inside your drawers, cabinets and closets, so it will be easy to remember how many ties or wine glasses you had. Store photos/videos in the cloud for easy access from anywhere. While you're at it, consider converting old family photos and videos to a digital format that can be stored in the cloud.



## KNOW YOUR COVERAGE

Find out which perils are covered by your policy and how much the company will pay to replace your home, contents and for additional living expenses if you can't live in your home. Most policies will pay for losses from fire, smoke, wind, hail, water (excluding floods), vandalism and theft. They do not cover losses caused by earthquakes and floods. Those perils require separate policies.

Make sure you have replacement cost coverage. This will pay to replace your building and contents — up to your policy limits — with new ones of similar kind and quality. Avoid actual cash-value policies, which pay only the depreciated value of what you lost.

It's good to have extended replacement cost coverage, which will pay a certain amount — 20 percent or more depending on the insurer — above your policy limits. This can help pay for the surge in local building costs that often follow a widespread disaster. Also opt for building code upgrades, which will pay an amount over your policy limit to comply with new code requirements. A guaranteed replacement cost policy will pay to replace your house no matter what the cost, but these are not common and very expensive.

Your insurer can tell you how much coverage you will need to replace your home and structure, but for a second opinion, ask a local contractor how much it costs to build per square foot and multiply that by your home's size.



## QUAKE AND FLOOD COVERAGE

Your homeowners or renters insurance company can provide a National Flood Insurance Policy and a quake policy from the California Earthquake Authority or another company. A few companies sell stand-alone earthquake (but not flood) insurance.

— Kathleen Pender





Santiago Mejia / The Chronicle

## FLOODS A THREAT IN EVERY COUNTY

Last winter's near-record rain underscored how much of California is prone to flooding.

While some spots expect it, such as along Sonoma County's Russian River where residents buy canoes and build homes on stilts, other places are far less prepared. High water came as a surprise to many of the 14,000 San Jose residents forced to evacuate near the city's Coyote Creek in February.

Every California county has been declared a flood disaster multiple times, according to the Public Policy Institute of California. And 1 in 5 Californians and more than \$580 billion of property remain vulnerable to flooding.

Should you get caught in a flood, here's what to do:

▶▶ Seek high ground — with an emergency kit if you have one.

▶▶ If time allows, secure your home before leaving. Move valuables upstairs or to higher areas, disconnect electrical appliances, tie down outside furniture and seal basement vents.

▶▶ Consult a reliable weather source, such as a weather radio or [www.weather.gov](http://www.weather.gov), about safe places to go and safe ways to get there.

▶▶ Do not walk or drive through floodwater. Most flood-related drownings occur when someone drives into high water, according to the Centers for Disease Control and Prevention. The second leading cause is walking into high water. Turn around and go the other way.

▶▶ Should your vehicle stall out, leave it. Don't wait on the roof and become fodder for the nightly news broadcast — or worse. However, if the water is rushing, and you have a sense that you'll be swept away, stay put.

— Kurtis Alexander

**Lorin Doeleman** uses a kayak to check her flooded home in Guerneville in January after heavy winter rains.



John Storey / Special to The Chronicle 2012

# WHEN TOXIC CHEMICALS ARE RELEASED

Even amid California's greening economy, the Bay Area is still home to industrial plants, with the potential for a dangerous release of toxic chemicals.

Should a toxic material become airborne, authorities may order evacuations of nearby homes, schools and businesses, or they may ask people to shelter in place, depending on the substance and situation. Here's what you should do:

▶▶ Comply with emergency orders. Consult the fire department, a reliable media source or a public safety alert system about what to do.

▶▶ If you're ordered to evacuate, don't panic. Let others in the building know the situation, then grab your wallet, phone and keys, as well as your emergency kit if you have one, and leave.

▶▶ If you're ordered to shelter in place, close exterior doors and windows and move toward the center of the building.

▶▶ Await further instruction before returning to your normal routine.

The federal Emergency Planning and Community Right-to-Know Act, passed in 1986, requires industries to report what hazardous materials they use.

If you really want to be prepared, check out the inventory lists kept by county health agencies and local fire departments.

— *Kurtis Alexander*

**A 2012 fire at Chevron's Richmond refinery sent thousands to hospitals and forced BART to suspend service.**

# FIRE OR QUAKE MEANS MOVING QUICKLY

You've done all you can to retrofit the house, clear fire-safe space in your yard, jack the mobile home up above flood level. But that was just a start.

The real test comes when the disaster actually hits. That's when you have to wrestle down the panic and act fast, whisking yourself and your loved ones to safety or hunkering down the best way you can.

And then — dig out and carry on. Which could mean everything from literally digging yourself out of rubble and reconnecting with family to plotting how to get to work in a ravaged disaster zone. Navigating insurance agencies and construction bids to rebuild what you lost could become like a second job for you for the next two years.



Fred Larson / The Chronicle 1991

**Hosing down the roof**, like this Oakland resident during the 1991 firestorm, should be tried only when there is adequate time and little wind.

So it's down to this — the wildfire is rampaging toward your house or the earthquake is starting to jerk furniture across the room like ten pins. What now?

## IN THE EVENT OF FIRE

- ▶▶ Flee the minute calamity becomes imminent, and certainly if you are told the evacuate. It takes only two minutes for fire to ignite a house and five minutes to engulf it.
- ▶▶ Take your disaster kit — with important documents, first aid kit and survival supplies — with you.
- ▶▶ Back your car into an open space to load it, leaving it pointed in the direction you plan to head. While you load, leave the doors unlocked and the key in the ignition.
- ▶▶ If the fire has hit your house before you've had time to escape, check the doorknob before you open it. If the knob is hot, the fire's close on the other side of the door. Pick another exit.
- ▶▶ If you have to flee through a room on fire, crawl so you will be below the smoke level.
- ▶▶ Throw on a heavy coat to protect against burning embers.

## IF YOU HAVE TIME AND WINDS AREN'T HIGH, YOU MIGHT TRY THIS:

- ▶▶ Wet down the roof of your house with a garden hose. But emergency officials say don't try to be a hero. They don't want to waste time they could be using to fight the main fire to rescue you.
- ▶▶ Move combustible patio furniture inside, or at least on the other side of the house from where the fire is approaching, so flaming embers have less to ignite.

## AS THE EARTH BEGINS TO SHAKE

- ▶▶ "Drop, cover and hold on." That means, if you are inside, drop to the floor, find cover under a heavy table, and hold on to that table until the shaking ends.
- ▶▶ If you are outside, dash away from buildings or large trees to as open a space as you can find.
- ▶▶ If you are driving, pull over to the side of the road. Avoid overpasses, bridges, power lines and other things that could tumble onto your car.
- ▶▶ If it's an epic quake, a tsunami might follow — so get to higher elevation once the ground stops convulsing.

— Kevin Fagan



Gabrielle Lurie / The Chronicle

## ***SURVIVING AFTERMATH OF A DISASTER***

The wildfire, quake or flood has ravaged your neighborhood, and you're lucky to be alive and intact. That's the most important thing. But the danger is not necessarily over, and your next steps will be trying.

Here's what experts advise:

▶▶ If your house is livable, stay with it even if the utilities are out because shelters might become overcrowded. This is where your survival kit will prove its worth, for food, water, first aid and the rest.

▶▶ You may have turned off your gas, but if you smell or suspect a leak don't use matches, candles or turn on any light switches (turning on any electric switch can cause a spark) until you're sure the gas danger is over.

▶▶ If you're outside, never touch a downed power line.

▶▶ If your home is unlivable and a hotel or staying with relatives is not an option, go to an emergency shelter quickly so you can get situated, start reconnecting with family or work and begin applying for aid and get in contact with your home insurance agent.

▶▶ If you rent or decide not to replace your house, prepare yourself for months of relocation arrangements — signing a new lease, getting new furniture or other belongings, applying for insurance payments or governmental emergency assistance. If you are moving back into an apartment that was only partially damaged, the landlord is responsible for making it fit to live in again — but not for the loss of your personal property.

▶▶ Take care of yourself. Consider counseling, stay healthy through exercise and good diet, stay current with your friends — in other words, recognize you've gone through an emotional wringer, and let yourself process the grief. Remember: To some extent, you will be rebuilding your life, and that comes one slow step at a time.

— Kevin Fagan

**Evacuee Junior Gomez, 11,** rests with his 2-month-old puppy, Smoky, at a Red Cross shelter after evacuating his home with his parents following the Tubbs Fire in Santa Rosa.

# GETTING AROUND BAY AREA AFTER THE NEXT BIG ONE

The Bay Area's next big earthquake will undoubtedly wreak havoc with the region's transportation system. But where and how badly is a mystery. "There are so many variables," said Jim Allison, a BART spokesman. "It's not just the intensity of the quake but the location."

When Loma Prieta struck in 1989, the seismic forces snapped part of the east span of the Bay Bridge, causing a section of the roadway to fall, killing one person and closing the bridge for more than a month. The upper level of a double-deck section of Interstate 880 in Oakland, known as the Cypress Structure, collapsed, leading to the deaths of 42 people.

BART shut down after the quake while crews inspected the system. But only minor damage was discovered, and trains were running again by the next morning.

Since then, all of the Bay Area's major bridges have been bolstered, rebuilt or replaced; BART has strengthened its stations, above-ground tracks and the Transbay Tube; and a regional ferry system — designed to play a major role in a major earthquake — has been created.

Here are some things to expect from the region's transportation system after the next major earthquake:



## GETTING INFORMATION

- ▶ Transportation officials will immediately activate an emergency operations center that will coordinate and communicate information.
- ▶ Finding out which roads and rail systems are detoured, damaged, opened or closed will be important, and the 511 service will be the best source of information either by phone or website.
- ▶ If phone or Internet service is unavailable, the best source of information can be found on old-fashioned, over-the-airwaves radio.



## HIGHWAYS AND BRIDGES

- ▶ All state-owned bridges have been retrofitted to hold up against an earthquake, though they may still sustain damage requiring repairs.
- ▶ The new Bay Bridge is a lifeline span considered strong enough to withstand the largest credible earthquake forces and be usable by emergency workers within 48 hours of a quake if not sooner.
- ▶ Both ends of the Golden Gate Bridge have been retrofitted, but the suspension span in the center has not. Work is expected to begin within months.
- ▶ When retrofitting is completed, the Golden Gate will also be a lifeline span, quickly ready to carry emergency crews. Until then, it's expected to suffer some damage, though nothing that would cause loss of lives.
- ▶ Highways and roads, especially those nearest the bay — including bridge approaches — may be torn apart by the shaking and barely usable.
- ▶ Immediately after an earthquake, drivers should proceed with caution and get off the road as quickly as possible.
- ▶ On roadways that are significantly damaged, Caltrans and the California Highway Patrol will set up barricades and detours, and the information will be broadcast on local radio stations, and displayed, if they're operable, on electronic message signs and the 511 website.



## BART

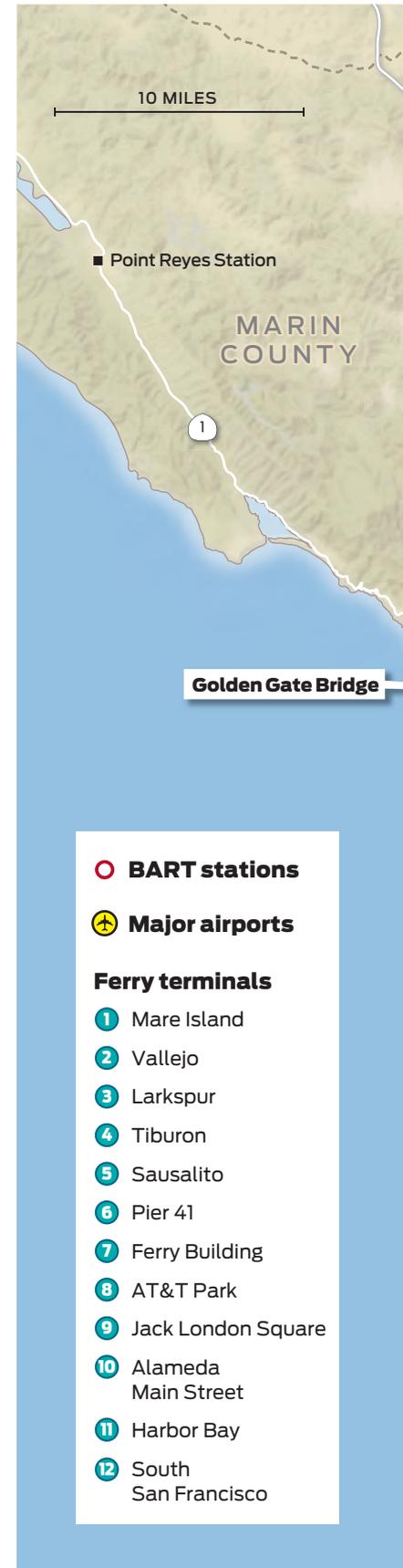
- ▶ BART will halt trains after a major quake for an undetermined length of time to assess damage. If and when it seems safe, trains will proceed to the nearest station and passengers will be let off.
- ▶ Trains in the Transbay Tube will immediately proceed to the nearest station and passengers will be evacuated.
- ▶ Downtown San Francisco stations — Civic Center through Embarcadero — will be evacuated, along with West Oakland Station.



## FERRIES

- ▶ The Bay Area's two major ferryboat operators — Golden Gate Ferry and San Francisco Bay Ferry — will play a big role after a devastating earthquake.
- ▶ San Francisco Bay Ferry is operated by the Water Emergency Transportation Authority, which is also assigned the task of coordinating how water transit responds to regional emergencies.
- ▶ The authority will help people get to their homes across the bay and work with the state Office of Emergency Services on evacuations, transporting first responders and moving supplies.
- ▶ Golden Gate Ferry plans to run "load and go" service if necessary. Boats will depart as soon as they're full and return to pick up more passengers.

— Michael Cabanatuan



● BART stations

✈ Major airports

Ferry terminals

- 1 Mare Island
- 2 Vallejo
- 3 Larkspur
- 4 Tiburon
- 5 Sausalito
- 6 Pier 41
- 7 Ferry Building
- 8 AT&T Park
- 9 Jack London Square
- 10 Alameda Main Street
- 11 Harbor Bay
- 12 South San Francisco

# UBER, LYFT, AIRBNB TO SUPPLY HELP AFTER A DISASTER

Uber, Lyft and Airbnb — the big three on-demand services — all stand ready to help when widespread disaster strikes.

## HOW WILL RIDE-HAILING WORK AFTER A DISASTER?

Uber and Lyft say they will offer free or discounted rides to those in need during a disaster and its aftermath. Lyft specified those rides are to shelters, hospitals and other designated emergency areas. The companies will suspend surge pricing, the higher rates they use to convince drivers to work when demand is high. Uber said it will provide refunds to passengers who pay full price (or surge prices before it was turned off) immediately after a disaster.

## WHAT IF BRIDGES OR FREEWAYS ARE DOWN?

Uber said it will alert its drivers and provide information from authorities about how they might be affected.

## WHAT WILL MOTIVATE DRIVERS TO WORK IF THERE ISN'T SURGE PRICING?

Uber said it will pick up the tab for a driver version of surge pricing. In other words, passengers will pay standard, discounted or free rates, but drivers will make extra money by working during disasters. Lyft did not respond.

## WHAT IF CELL SERVICE IS DOWN?

Uber requires cell service to function and would be taken out of action. Lyft did not respond.

## HOW DOES AIRBNB RESPOND TO DISASTERS?

Through a program called Open Homes, Airbnb offers its website and customer support to folks who'd like to provide free short-term housing to people displaced by disasters and relief workers. It contacts hosts in and near impacted areas to ask if they have extra space to spare. New hosts can also sign up during disasters to provide free housing. Airbnb waives its booking fees for both hosts and guests.



Todd Trumbull / The Chronicle

— Carolyn Said

# HOW TO RECONNECT WITH LOVED ONES WHO GO MISSING

Disasters aren't predictable. Fires don't follow the rules. And earthquakes shake up the best-laid plans.

That can mean family members might not be able to meet at prearranged points or call that out-of-state relative for status updates. When that's the case, the Red Cross encourages people in a disaster to use its national website or contact local chapters to check in as safe and well or to find someone who's missing.

But finding missing or displaced family and friends after a devastating event can be overwhelming and confusing.

Here are a few tips that may help:



▶▶ Parents should ask child care providers or schools what their policy is for when a catastrophic disaster hits and whom they'll need to call if children need to be moved.



▶▶ Try texting if calls aren't going through.



▶▶ Call people your missing loved ones are close to — other friends or relatives who might know where they are.



▶▶ For tracking down missing loved ones, persistence matters. There may be several roadblocks before one contact method pans out.



▶▶ Check social media — Facebook, Twitter, Instagram — to see if they are online.



▶▶ Check in with their neighbors, employer, school or church — anywhere they usually hang out or spend time.



▶▶ Try calling the people you're searching for during off-peak hours, when the working lines are less clogged.



▶▶ Email. Even if a phone is gone, those who are missing might still be able to log on to a computer.



▶▶ For those in distant locations, try sending a snail-mail letter that has a good chance of getting forwarded if the person missing has relocated.

— Jill Tucker

# PLACES TO TURN FOR ASSISTANCE

So your life has been upended by a disaster. There are plenty of places you can turn for help, but it pays to act as soon as you can. Here are some avenues you can take:



## FEDERAL ASSISTANCE

See if you qualify for individual assistance from the Federal Emergency Management Agency. You could be eligible if your loss is part of a presidentially declared disaster. FEMA can provide grants and low-interest loans to cover uninsured losses, up to certain limits. For more information: [www.fema.gov/individual-disaster-assistance](http://www.fema.gov/individual-disaster-assistance)



## MORTGAGE RELIEF

If you have a mortgage, contact your loan servicer. You can usually get at least a 90-day moratorium on payments, temporary relief from foreclosure activity and other possible assistance.



## DON'T DELAY

Contact your insurance agent as soon as possible to start a claim. If you have to move out of your house, most policies will pay for living expenses up to a certain amount of money and time. You can usually get an advance to cover temporary housing, food and other immediate needs.

If you believe your insurance company is not treating you fairly, file a complaint with the California Department of Insurance and consider hiring a public adjuster to represent you. If the treatment is egregious, consider hiring an attorney.



## TAX RELIEF

If your home is damaged or destroyed, you may be eligible for property tax relief. File a claim with your county assessor's office within 12 months. The assessor can reappraise the property in its current condition and potentially refund some taxes. When you rebuild, the value of your property before it was damaged will be restored. Also check with the IRS and California Franchise Tax Board to see if they have extended tax-filing deadlines for disaster victims.



## UNEMPLOYMENT BENEFITS

If you lose your job as a direct result of a presidentially declared disaster area and are not eligible for regular state unemployment benefits, you could qualify for up to six months of unemployment benefits from a federally funded program called Disaster Unemployment Assistance. For more information: <http://bit.ly/2A73NCO>

— Kathleen Pender

# VITAL RESOURCES

For those who want to dig further, here's where to find supplemental disaster preparation and safety information:

## WILDFIRES

- ▶ [www.readyforwildfire.org/Prepare-Your-Family](http://www.readyforwildfire.org/Prepare-Your-Family)
- ▶ <http://bit.ly/2yWc3Ek>
- ▶ [www.readyforwildfire.org/Defensible-Space](http://www.readyforwildfire.org/Defensible-Space)
- ▶ Understand your risk. Cal Fire maintains maps of areas prone to wildfire, and cities and counties are required to keep safety plans that contain procedures for evacuations and communications.
- ▶ [www.fire.ca.gov/fire\\_prevention/fire\\_prevention\\_wildland\\_zones\\_maps](http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones_maps)

## FAMILY FIRE SAFETY

### Preparation

- ▶ [www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/fire](http://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/fire)
- ▶ <http://sparkyschoolhouse.org/app/uploads/2017/07/FPW17ParentLetter1.pdf>

### Information for children, parents and teachers

- ▶ [www.firefacts.org](http://www.firefacts.org)

### Preschooler fire safety

- ▶ [www.naeyc.org/tyc/article/fire-safety](http://www.naeyc.org/tyc/article/fire-safety)

## EARTHQUAKES

### Living in earthquake country

- ▶ <https://pubs.usgs.gov/gip/2005/15/gip-15.pdf>

### Survival kits

- ▶ [www.sf72.org/supplies](http://www.sf72.org/supplies)
- ▶ [www.ready.gov/build-a-kit](http://www.ready.gov/build-a-kit)
- ▶ <http://bit.ly/2LYtJxJ>

### Preparing your home

- ▶ <http://resilience.abag.ca.gov/housing/homeowners/steps>
- ▶ [www.earthquakebracebolt.com/HomeownerRegistration](http://www.earthquakebracebolt.com/HomeownerRegistration)

### Family resources

- ▶ "Trinka and Sam: The Day the Earth Shook," a children's book: [www.nctsn.net.org/products/trinka-and-sam-day-earth-shook](http://www.nctsn.net.org/products/trinka-and-sam-day-earth-shook)
- ▶ Sesame Street Emergency Preparedness Toolkit: [www.sesamestreet.org/toolkits/ready](http://www.sesamestreet.org/toolkits/ready)
- ▶ Family Earthquake Preparedness Checklist: [www.uclahealth.org/workfiles/emergency/eq\\_familyprep.pdf](http://www.uclahealth.org/workfiles/emergency/eq_familyprep.pdf)

### Pet safety

- ▶ [www.aspc.org/pet-care/general-pet-care/disaster-preparedness](http://www.aspc.org/pet-care/general-pet-care/disaster-preparedness)

## DURING AND AFTER A FIRE, QUAKE OR OTHER DISASTER

### Wildfires

- ▶ [www.readyforwildfire.org/Evacuation-Steps](http://www.readyforwildfire.org/Evacuation-Steps)
- ▶ [www.readyforwildfire.org/What-To-Do-If-Trapped](http://www.readyforwildfire.org/What-To-Do-If-Trapped)

### Fire recovery

- ▶ <http://anrcatalog.ucanr.edu/pdf/8386.pdf>
- ▶ [www.usfa.fema.gov/downloads/pdf/publications/fa\\_46.pdf](http://www.usfa.fema.gov/downloads/pdf/publications/fa_46.pdf)
- ▶ [www.apa.org/helpcenter/residential-fire.aspx](http://www.apa.org/helpcenter/residential-fire.aspx)

### Quakes

- ▶ [www.earthquakecountry.org/dropcoverholdon](http://www.earthquakecountry.org/dropcoverholdon)
- ▶ [www.ready.gov/earthquakes](http://www.ready.gov/earthquakes)
- ▶ [www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/earthquake#Before](http://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/earthquake#Before)
- ▶ [www.conservation.ca.gov/index/Earthquakes/Pages/qh\\_earthquakes\\_what.aspx](http://www.conservation.ca.gov/index/Earthquakes/Pages/qh_earthquakes_what.aspx)

### Regrouping

- ▶ Check in as safe and well with the Red Cross: <https://safeandwell.communityos.org/zf/safe/add>
- ▶ Search for a family member via the Red Cross: <https://safeandwell.communityos.org/zf/safesearch/search>
- ▶ Family finder phone apps: [www.life360.com/family-locator](http://www.life360.com/family-locator)
- ▶ <http://mamabearapp.com>

## OTHER USEFUL TECHNOLOGY

- ▶ [www.amazon.com/dp/B06XCY92JV](http://www.amazon.com/dp/B06XCY92JV)
- ▶ [www.tesla.com/powerwall](http://www.tesla.com/powerwall)
- ▶ [www.tesla.com/solarpanels](http://www.tesla.com/solarpanels)
- ▶ <http://powerequipment.honda.com/generators/wattage-calculator>
- ▶ <http://powerequipment.honda.com/generators/wattage-calculator>
- ▶ [www.bluecosmo.com](http://www.bluecosmo.com)



Carlos Avila Gonzalez / The Chronicle

# HOW TO STAY INFORMED

A major disaster may knock out power, and Internet and phone service along with it, leaving you with little access to the outside world. That was the case for much of Sonoma County during the recent wildfires. In these situations a battery-powered radio is your best way to get information on what's going on.

**Tune in to AM radio.** In the Bay Area, KGO 810, KCBS 740 and KNBR 680 carry regular news updates, and each is set up to run emergency information broadcasts from local authorities. During a disaster, the city of San Francisco will sound its warning sirens, which is a cue to listen in to the emergency info. (The sirens are tested at noon every Tuesday.)

**Consider buying an emergency radio.** The radio includes channels that regular AM-FM radios don't get, including essential weather and disaster broadcasts from the National Oceanic and Atmospheric Administration. To find your local NOAA station, visit: <http://www.nws.noaa.gov/nwr/coverage/stations.php?State=CA>

## If you've managed to maintain Internet service, a few websites may be helpful:

U.S. Geological Service for earthquakes:  
▶ <https://earthquake.usgs.gov/earthquakes/map/>

Cal Fire for wildfires:  
▶ [www.fire.ca.gov/current\\_incidents](http://www.fire.ca.gov/current_incidents)

Nixle for local public safety details:  
▶ [www.nixle.com/](http://www.nixle.com/)

Social media sites for information on friends and family.

And reliable news sources, such as  
▶ [www.sfchronicle.com](http://www.sfchronicle.com) and  
▶ [www.sfgate.com](http://www.sfgate.com)

— Kurtis Alexander

# NUMBERS TELL STORY OF DEATH, SURVIVAL

## FIRES



**2** The number of times per year a family should practice a fire escape plan.



**7** The number of people who die in house fires in the U.S. every day.



**5** The number of minutes it can take for a house to become fully engulfed once a fire has broken out.



**10** The frequency in years that your smoke detectors need to be replaced.



**90** The percentage of U.S. wildfires started by humans.

## QUAKES



**2 to 3**

The average number of earthquakes in California per year large enough to cause some property damage.



**8** The number of significant earthquake-producing faults in the Bay Area: the Hayward, Calaveras, Concord-Green Valley, Greenville, Rodgers Creek, San Andreas, Mount Diablo, and San Gregorio.



**9.2**

The magnitude of the largest recorded earthquake in U.S. history. It struck Prince William Sound, Alaska, on March 28, 1964.



**72%**

The probability, or likelihood, of at least one earthquake of magnitude 6.7 or greater striking somewhere in the Bay Area before 2043. Earthquakes of this magnitude are capable of causing widespread damage.



**3**

The number of days of food, water and medical supplies you should have stored to survive after a major quake.

San Francisco Chronicle

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# ***DISASTER CHECKLIST***

Things you should do before and after a disaster strikes

## **BEFORE**

- Download this guide as a PDF (see page 2 for instructions)
- Download apps that will be useful during an emergency (page 19)
- Research where to find emergency information, including radio stations, social networks, websites and public safety alerts
- Microchip your pets
- Take photos of your belongings
- Review and update your insurance coverages
- Make copies of your important documents and store them in a safe place or on the cloud
- Replace the batteries in your smoke detectors at least twice a year
- Replace your smoke detectors at least once every 10 years
- Check your fire extinguishers and make sure they and other firefighting tools are easily accessible
- Pack emergency survival kits for your home and car — don't forget items for your pets (pages 10 and 12)
- Plan and practice family escape routes from your home, including a meeting place (page 9)
- Have family discussions about safe places in the home in case of an earthquake
- Assign family members responsibilities during an emergency, such as contacting other family members, turning off the gas and gathering pets
- Know where your gas shutoff valve is and have necessary tools easily accessible
- Maintain a defensible zone around your home (page 6)
- Notify PG&E if you notice unsafe power lines
- Identify combustible building materials and avoid or replace them if possible
- Prepare your home to survive a massive quake (page 14)
- Consider buying alternate power and communication devices

## **AFTER**

- Contact your insurance provider and start a claim as soon as possible
  - Seek federal assistance, mortgage relief, tax relief and unemployment benefits
  - Never touch downed power lines
  - Consider counseling as you rebuild your life
  - Reach out to family — for your sake and theirs
- 

# MORE CALIFORNIANS ARE BUYING EARTHQUAKE INSURANCE

FROM THE CALIFORNIA EARTHQUAKE AUTHORITY



**MORE**  
Coverage  
Choices

CEA offers expanded earthquake coverage choices, so you can insure what matters most to you.



**MORE**  
Deductible  
Options

CEA never makes you pay out of pocket to receive a claim payment. Choose deductibles ranging from 5 to 25 percent.



**MORE**  
Flexible  
Policies

You choose how to build your policy, with the options that meet your needs and budget.

Get financial protection from earthquakes for yourself and your family, before the next **damaging earthquake** strikes.

