

# Earthquakes

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Although the majority of Canada's 5,000 earthquakes recorded each year are considered small, in the past 100 years there have been at least nine earthquakes in or near Canada that registered a magnitude greater than seven on the Richter scale. Albertans may be surprised to learn that the province experienced 605 earthquakes between 1985 and 2011. Most of Alberta's recorded earthquakes are distributed evenly along the foothills and Rocky Mountains.

## Earthquake Facts

- The earth's crust is composed of many large and small segments called tectonic plates. These plates are in constant slow movement. With these movements come small tremors and earthquakes.
- Shallow crevasses can form during earthquakes due to landslides or other types of ground failures.
- Buildings do not automatically collapse in earthquakes.
- Earthquakes cannot be predicted.

## What to Expect During an Earthquake

### Small or moderate earthquakes

- These can last only a few seconds and represent no emergency risk.
- Ceiling lights may move and some minor rattling of objects may occur in your home.
- You may feel a slight quiver under your feet if you are outside.
- If you are close to its source, you may hear a loud bang followed by shaking.

### Large earthquakes

- These can last up to several minutes and constitute a disaster if the epicenter is near a densely populated area, or the magnitude is sufficiently large for the region.
- The ground or floor will move, perhaps violently.
- Whether far away or close to the source, you will probably feel shaking followed by a rolling motion, much like being at sea.
- If you are far away from the source, you might see swaying buildings or hear a roaring sound.
- You may feel dizzy and be unable to walk during the earthquake.

- If you live in a high-rise or a multi-story building, you may experience more sway and less shaking than in a smaller, single-story building. Lower floors will shake rapidly, much like residential homes. On upper floors, movement will be slower but the building will move farther from side to side.
- Furnishings and unsecured objects could fall over or slide across the floor.
- Unsecured light fixtures and ceiling panels may fall.
- Windows may break.
- Fire alarms and sprinkler systems may be activated.
- Lights and power may go off.

## Before an Earthquake

Check off the items that you have completed in this list:

- Teach everybody in the family (if they are old enough) how to turn off the water and electricity.
- Clearly label the on-off positions for the water, electricity and gas. If your home is equipped with natural gas, tie or tape the appropriate wrench on or near the pipe, to turn off the gas.
- Repair loose roof shingles.
- Tie the water heater to studs along with other heavy appliances (e.g. stove, washer, dryer), especially those that could break gas or water lines if they shift or topple.
- Secure top-heavy furniture and shelving units to prevent tipping. Keep heavy items on lower shelves.
- Affix mirrors, paintings and other hanging objects securely, so they will not fall off hooks.
- Locate beds and chairs away from chimneys and windows. Do not hang heavy pictures and other items over beds. Closed curtains and blinds will help stop broken window glass from falling onto beds.
- Put anti-skid pads under televisions, computers and other small appliances, or secure them with Velcro or other such products.
- Use child-proof or safety latches on cupboards to stop contents from spilling out.
- Keep flammable items and household chemicals away from heat and where they are less likely to spill.
- Consult a professional to find out additional ways you can protect your home, such as bolting the house to its foundation and other structural mitigation techniques.
- If you live in an **apartment** or a multi-story building, work with your building manager or condominium board to decide how to best "quake-safe" your unit. Seek advice from professionals such as building engineers, emergency preparedness authorities if you are unsure about what to do.
- If you live in a **mobile home**, you can leave the wheels on the mobile home to limit its fall. Alternatively, you can install a structural bracing system to reduce the chance of your unit falling off its supports. Ensure the awning on your home is securely supported

and fastened to the unit. For information on the best way to brace your unit, contact your local mobile home dealer or a mobile home owner's association.

### Tips

- Do not shut off the gas unless there is a leak or a fire. If the gas is turned off, it must be turned on again by a qualified tradesperson.
- Discuss earthquake insurance with your insurance broker. Check your coverage; it could affect your financial ability to recover losses after an earthquake.

## During an Earthquake

### If you are indoors: "DROP, COVER, HOLD ON"

- Stay inside. Do not run outside; you could be hit by flying debris or glass.
- **Drop** under heavy furniture such as a table, desk, bed or any solid furniture.
- **Cover** your head and torso to prevent being hit by falling objects.
- **Hold** onto the object that you are under so that you remain covered.
- If you cannot get under something strong, or if you are in a hallway, flatten yourself or crouch against an interior wall.
- If you are in a shopping mall, go into the nearest store.
- Stay away from windows, and shelves with heavy objects.
- If you are at school, get under a desk or table and hold on. Face away from windows.
- If you are in a wheelchair, lock the wheels and protect the back of your head and neck.

### If you are outdoors

- Stay outside.
- Go to an open area away from buildings and power lines.
- If you are in a crowded public place, take cover where you will not be trampled.

### If you are in a vehicle

- Pull over to a safe place where you are not blocking the road. Keep roads clear for rescue and emergency vehicles.
- Avoid bridges, overpasses, underpasses, buildings or anything that could collapse.
- Stop the car and stay inside.
- Listen to your car radio for instructions from emergency officials.
- Do not attempt to get out of your car if downed power lines are across it. Wait to be rescued.
- Place a "HELP" sign in your window if you need assistance.

- If you are on a bus, stay in your seat until the bus stops. Take cover in a protected place. If you cannot take cover, sit in a crouched position and protect your head from falling debris.

### **AVOID the following in an earthquake**

- Doorways. Doors may slam shut and cause injuries.
- Windows, bookcases, tall furniture and light fixtures. You could be hurt by shattered glass or heavy objects.
- Elevators. If you are in an elevator during an earthquake, hit the button for every floor and get out as soon as you can.
- Downed power lines. Stay at least 10 meters away to avoid injury.
- Coastline. Earthquakes can trigger large ocean waves called tsunamis.

## **After an Earthquake**

### **Stay calm. Help others if you are able.**

- Be prepared for aftershocks.
- Monitor for alerts from the [Alberta Emergency Alert](#) app.
- Listen to the radio or television for information from authorities. Follow their instructions. Place telephone receivers back in their cradles; only make calls if requiring emergency services.
- Put on sturdy shoes and protective clothing to help prevent injury from debris, especially broken glass.
- If you suspect your home is unsafe, do not enter. Rely on the professionals to clear your home for re-entry, if you are unsure.
- If you have to leave your home, take your [emergency kit](#) and other essential items with you. Post a message in clear view, indicating where you can be found. Do not waste food or water as supplies may be interrupted.
- Do not light matches or turn on light switches until you are sure there are no gas leaks or flammable liquids spilled. Use a flashlight to check utilities and do not shut them off unless damaged. Leaking gas will smell.
- If tap water is still available immediately after the earthquake, fill a bathtub and other containers in case the supply gets cut off. If there is no running water, remember that you may have water available in a toilet reservoir (not the bowl) and a hot water tank (make sure water is not hot before touching it).
- Do not flush toilets if you suspect sewer lines are broken.
- Carefully clean up any spilled hazardous materials. Wear proper hand and eye protection.
- Check on your neighbours after looking after members of your own household. Organize rescue measures if people are trapped or call for emergency assistance if you cannot safely help them.

- If you have pets, try to find and comfort them. If you have to evacuate, take them to a pre-identified pet-friendly shelter and do not forget to bring their carrier.
- Place a “HELP” sign in your window if you need assistance.
- Beware of secondary effects. Although ground shaking is the major source of earthquake damage, secondary effects can also be very destructive. These include [landslides](#), saturated sandy soils becoming soft and unstable, [flooding](#) of low-lying areas and tsunamis washing over coastlines.

## Be Informed

- Download the [Alberta Emergency Alert](#) app to receive current information about disasters or emergencies impacting your community.
- Refer to [Alberta Energy Regulator earthquake monitoring](#).
- Earthquakes Canada provides up-to-date information on [earthquake activity](#) in your area.

*For more information on hazards in Alberta, contact your municipality or community’s Director of Emergency Management or the Alberta Emergency Management Agency at 780-422-9000 (Dial 310-0000 for toll-free access outside Edmonton). You can also visit [www.aema.alberta.ca](http://www.aema.alberta.ca).*