Earthquakes

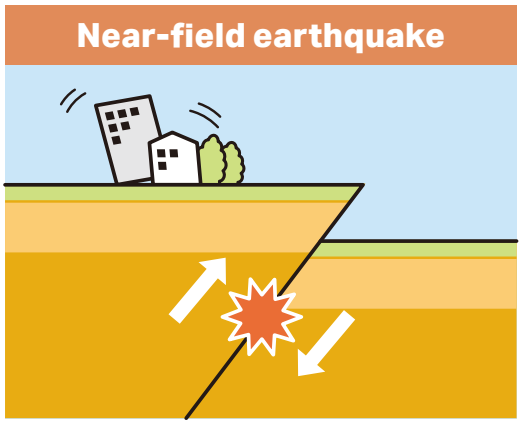
Learn about earthquakes

It is said that an earthquake of intensity 7 on the Japanese Seismic Intensity Scale could occur anywhere in Japan at any time. What kind of earthquake might occur in Kofu City?

01

Types of earthquakes

There are two types of earthquakes: near-field earthquakes, which occur at shallow epicenters due to active faults or ruptures in tectonic plates, and subduction-zone earthquakes, which occur near ocean trenches due to the sudden movement of larger continental plates.



Active faults shift,
causing earthquakes to occur

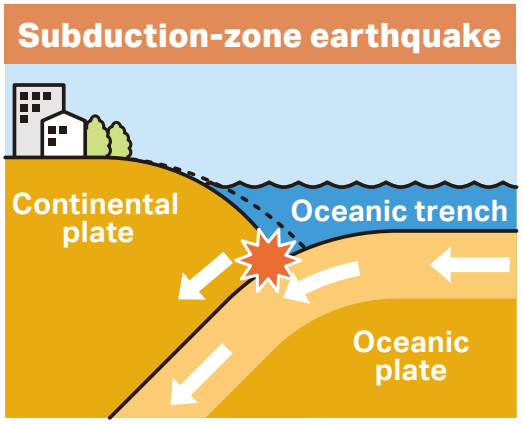


Plate boundaries suddenly shift,
causing an earthquake to occur

02

Kofu City is at risk of an earthquake registering a seismic intensity of 6 Lower or higher.

In the Great East Japan Earthquake that occurred in March 2011, the northern part of Miyagi Prefecture was hit by an earthquake registering 7 on the Japanese Seismic Intensity Scale, while Miyagi, Fukushima, Ibaraki, Tochigi, and other prefectures were hit by tremors measuring 6 Upper. A wide area spanning from northern Hokkaido to the southern Kyushu region was also hit by tremors measuring intensity 1 to 6 Lower. Numerous aftershocks followed, and the damage caused by the earthquake was enormous.

The Nankai Trough earthquake, which is expected to occur within the next 30 years with a probability of 70 - 80%, is predicted to cause tremors of intensity 6 Upper or higher in Kofu City, exceeding the intensity of 5 Lower experienced by the city during the Great East Japan Earthquake. In addition, since some areas are at high risk of liquefaction, this would cause casualties due to collapsed buildings and landslides. Furthermore, the disruption of infrastructure is expected to significantly affect the daily lives of citizens.

Damage caused by the Great East Japan Earthquake
Photo courtesy of NPO Disaster
and Disaster Prevention Volunteers Miraikai

Learn about the intensity of earthquakes

Magnitude is a measure of an earthquake's energy. An increase in just one measure of magnitude shows that an earthquake contains 32 times more energy than the level before it. In Japan, seismic intensity is classified into 10 levels (0, 1, 2, 3, 4, 5 Lower, 5 Upper, 6 Lower, 6 Upper and 7). If an earthquake of small magnitude occurs close to the epicenter, it will have a larger intensity compared to an earthquake of large magnitude occurring far from the epicenter.

Seismic Intensity 4

Most people are startled. Hanging objects such as lamps swing significantly, and unstable ornaments may fall.

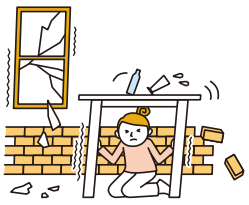
Seismic Intensity 5 Lower

Many people are frightened and feel the need to hold onto something stable. Dishes in cupboards and items on bookshelves may fall.

Seismic Intensity 5 Upper

Many people find it hard to move; walking is difficult without holding onto something stable. Unsecured furniture may topple over.

Seismic Intensity 6 Lower



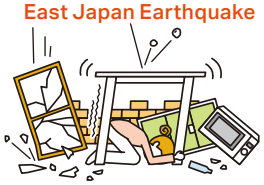
It is difficult to remain standing. Wall tiles and windowpanes may sustain damage and fall.

Seismic Intensity 6 Upper

It is impossible to remain standing or move without crawling. Most unsecured furniture moves and is more likely to topple over.

Seismic Intensity 7

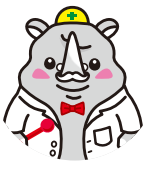
Maximum intensity seen in the Great East Japan Earthquake



It is impossible to remain standing or move without crawling. People may be thrown through the air. Most unsecured furniture moves and topples over or may even be thrown into the air.

＼ Let's check together! ／

If there is no active fault near my house, would I not have to worry about major damage if an earthquake were to occur?



Active faults sometimes appear outside of locations already known by modern scientists. There have been plenty of cases where earthquakes have occurred in places previously thought to be safe. Whilst in Japan, it is better to presume that earthquakes can happen anywhere, regardless of whether there is an active fault line in the area or not. Kofu City has repeatedly experienced major earthquakes in the past. It is important to know about earthquakes and be well prepared by taking countermeasures.

Earthquakes

Learn about the damage caused by earthquakes

Let's learn what kind of disasters can be triggered by earthquakes, think about what actions to take and how to gather information in the event of an earthquake, and apply these lessons in the form of effective countermeasures to take before an earthquake.

01

Various disasters triggered by earthquakes

There are two types of disasters caused by earthquakes: primary disasters, which are directly caused by earthquakes, and secondary disasters, which are caused by primary disasters.

The most common primary disaster is the collapse of a building or structure. The collapse of buildings and other structures is caused by large tremors and soft ground. Other primary disasters include landslides and liquefaction. Secondary disasters include fires, as well as disruptions to lifelines and infrastructure such as electricity, gas, water, telecommunication equipment, and roads.

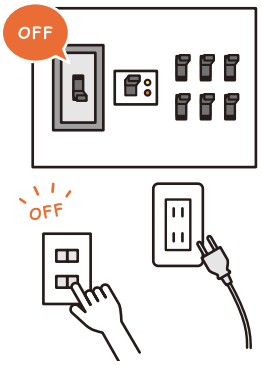
【Primary disasters】

【Secondary disasters】

02

Beware of fires caused by earthquakes

Fires, which occur as a secondary disaster to earthquakes, can cause significant damage. To prevent electrical fires that may occur after power is restored following outages due to an earthquake, switch off and unplug appliances. Also, if you are evacuating your home, be sure to turn off the main circuit breaker before leaving.



03

Let's earthquake-proof our buildings!

The collapse of buildings immediately after a major earthquake results in many casualties. To protect lives and property from disasters, earthquake-proofing buildings is a very important safety measure. The city has established a consultation service to promote earthquake-proofing measures, including seismic resistance testing and retrofitting of existing buildings, as well as preventing the collapse of block walls and other structures. There is also a subsidy system for earthquake retrofitting of wooden houses, etc.

Building Guidance Section Phone 055-237-5828

Kofu City Earthquake Resistant Buildings Support Project

Let's take a look at the earthquake hazard map

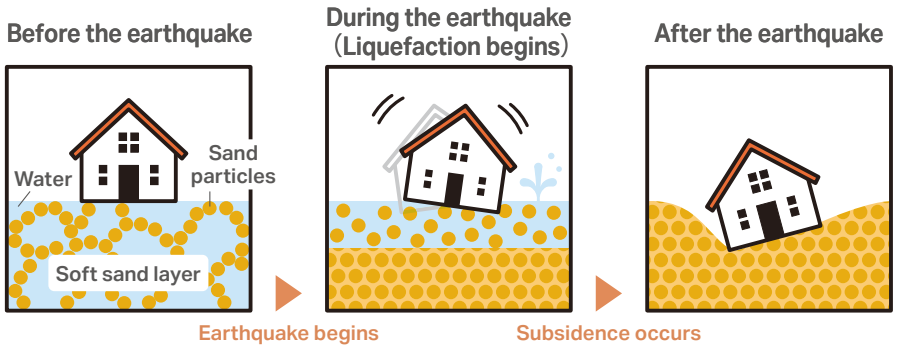
The city has published an earthquake hazard map that estimates the degree of shaking caused by earthquakes and the risk of buildings collapsing.

Kofu City Earthquake Hazard Map

What is liquefaction?

Liquefaction is a phenomenon in which the ground temporarily turns to liquid due to an earthquake. When liquefaction occurs, damage may include ground subsidence, the lifting of structures, and lateral flow of the ground as the entire subsoil tries to flow downwards. This may cause buildings to lean, underground water pipes and electric lines to break, and manholes and other structures to lift up.

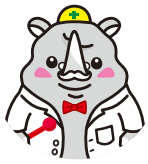
The mechanisms of liquefaction



Kofu City Liquefaction Hazard Map

＼ Let's check together! ／

Should I hurry to earthquake-proof my old house?



About 80% of the victims of the Great Hanshin-Awaji Earthquake in 1995 lost their lives due to collapsed buildings. Many of the buildings damaged at this time were built prior to May 1981, before the Building Standard Law was revised.

Buildings that survive the main earthquake may still be at risk of collapse during subsequent aftershocks. Many buildings have not yet been fully earthquake-proofed. We urge you to please have your house undergo seismic resistance testing.

Earthquake

Earthquake-proofing your home

It is said that 30-50% of earthquake injuries are caused by furniture toppling over, falling, or moving. Furniture can be a deadly weapon during an earthquake, so take countermeasures by properly securing and arranging furniture.

Fire-proofing your home

Bookshelves, refrigerators, etc.

For taller items, use L-shaped brackets or other means to secure them. Put and secure the pole-type fixture between the ceiling and the furniture.

Lighting fixtures

Instead of hanging lights solely using cords, take extra safety measures by utilizing chains or other means.

Television

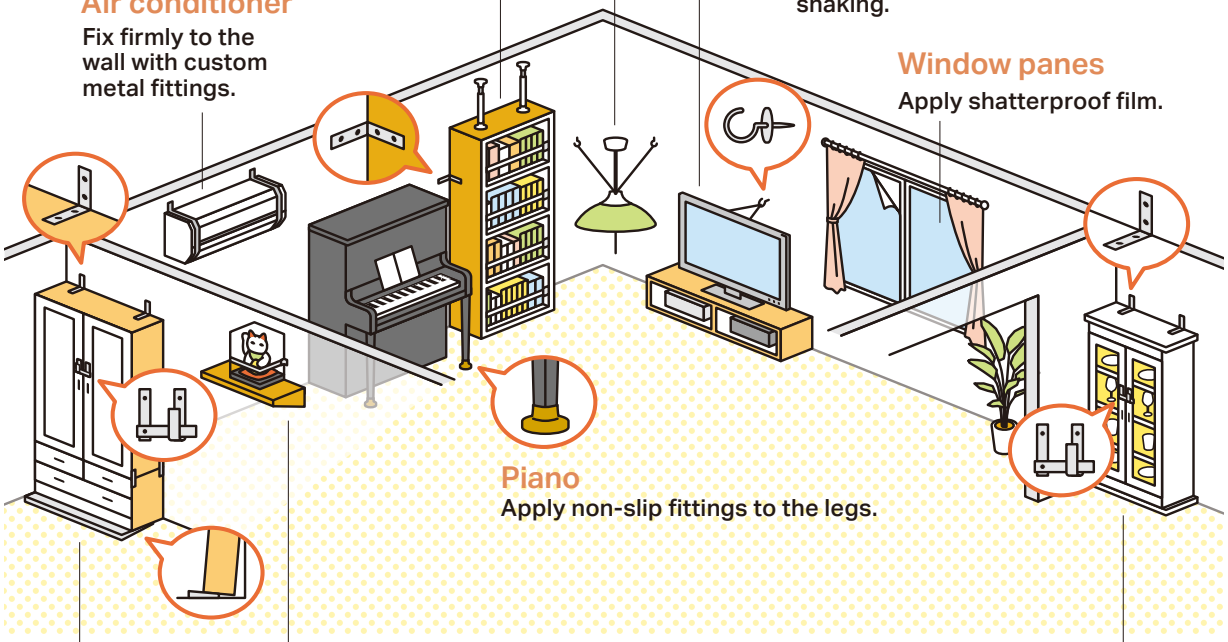
Fix to a wall or TV stand. Laying down quake-resistant adhesive mats strengthens resistance to shaking.

Air conditioner

Fix firmly to the wall with custom metal fittings.

Window panes

Apply shatterproof film.



Piano

Apply non-slip fittings to the legs.

Chest of drawers

Use L-shaped metal fittings, pole-type fixtures, and anti-slip mats to prevent tipping over.

Shelving

Avoid placing hazardous items on open shelving units. When displaying breakable items such as glass doll cases, make sure they are properly secured.

Kitchen cabinet

Use L-shaped brackets or other means to secure. Cover the shelves with a sheet or dish towel to prevent dishes from slipping. Use earthquake-proof door locks to prevent dishes and other items from flying out.

Let's double check!

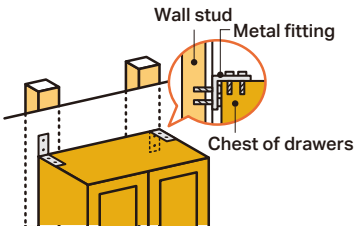
- ☐ Television
- ☐ Air conditioner
- ☐ Shelving
- ☐ Bookshelves
- ☐ Chest of drawers
- ☐ Lighting fixtures
- ☐ Window panes
- ☐ Kitchen cabinet
- ☐ Refrigerator
- ☐ Microwave
- ☐ Table and chairs
- ☐ Wall cabinet

Let's check furniture fixings

Points to remember for furniture fixings!

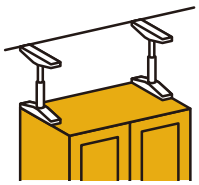
L-shaped metal brackets

- Fix the bracket at the point where there is a sturdy frame, such as a wall stud.
- Fixing to plasterboard or thin wallboards will make installation less effective.
- Attaching L-shaped metal brackets facing downward increases effectiveness.



Pole-type fixture

- Install at the far ends of the furniture.
- The shorter the distance to the ceiling, the more stable it will be.



Furniture placement

Keep living spaces free of too much furniture

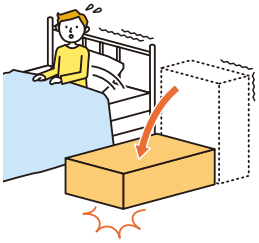
- Utilize fixed storage solutions.
- If furniture or other storage solutions are needed, place them all together in the closet or cupboard.

Secure evacuation routes

- Do not place furniture or items in room. doorways or hallways.
- Do not block doors or escape routes.

Consider the direction that furniture may fall

- Try to place furniture in a way that prevents it from falling on you.
- Keep as few objects as possible in the bedroom since you are more vulnerable to being hit by falling objects when sleeping.

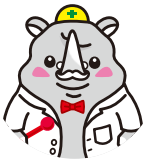


Store heavy items at the bottom

- Store heavy items as low as possible to lower the center of gravity.

＼ Let's check together! ／

In the event of a major earthquake, there are still dangers inside the house even if the building is not destroyed, right?



During a major earthquake, furniture and appliances may fly around rather than topple over! The cupboard doors also open, causing dishes to fly out and smash. Everyday items suddenly become deadly weapons. Securing furniture and appliances is a fundamental part of disaster preparedness! Let's inspect inside our houses and take countermeasures.

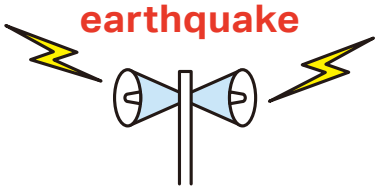
Earthquake

Keeping yourself safe in the event of an earthquake ①

An earthquake occurs! What should we do? Let's think about what you can do to protect yourself.

Earthquake Early Warning → **Earthquake begins** → **Up to two minutes**

Seconds to tens of seconds before earthquake



When an earthquake with an **intensity of 5 Lower or higher** on the Japanese Seismic Intensity Scale is expected to occur in the city, an "Earthquake Early Warning" will be broadcast from the speakers of the government emergency radio system.

Earthquake! Earthquake!
This is an earthquake early warning!
Prepare for strong tremors!

*If the earthquake epicenter is too close, the early warning alert may not arrive in time.

Protect yourself by crawling under a desk, etc.!

Safety actions in case of earthquake 1-2-3

①Get down low　② Protect your head　③Don't move

The city conducts regular shake-out drills to spread awareness of the "get down low, protect your head, don't move" 1-2-3 protocol to be taken in the event of an earthquake.

What is a shakeout?

Points to keep in mind

During the earthquake

First, protect yourself!

The first thing to do in the event of an earthquake is to ensure your own personal safety. Protect your head and body in a safe place and wait for the shaking to subside.

Immediately after the earthquake

Check fire sources calmly

If a kitchen stove or other source of fire was being used, check it after the tremors have subsided. Any action taken to extinguish a fire during an earthquake is dangerous as it may result in injury.

Be careful of indoor injuries

Furniture and appliances may have fallen or toppled over. Be careful of shards of glass and other debris.

Don't rush outside in a panic

Window glass, roof tiles, and signs may fall and hurt you.

After the earthquake

Gathering correct information

Get correct information about earthquake damage and evacuation shelters, and act calmly.

Watch out for aftershocks!

①Protect yourself

Check fire sources

- If there is a fire, perform initial fire extinguishing (using fire extinguishers and hydrant equipment)

Secure exits

- Open doors and windows

Check on family members

Prepare for evacuation

- Prepare an emergency bag
- Turn off the main circuit breaker
- Turn off the gas

②Work together with your neighbors

Check on your neighbors

- Confirm your neighbors' safety
- Help with rescue and relief efforts

Conduct a home damage assessment

Depending on the damage

③Evacuate

Temporary evacuate to an evacuation area

▶ If there is damage to your house and you are unable to stay there

① Evacuate to a designated shelter

- Display a note at your front door to say you have evacuated
- Lock your doors (beware of burglars)

▶ If there is no damage to your house

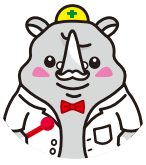
② Stay at home

- Use stockpiles of food and daily necessities
- Patrol to prevent crime

For information from the city, gather information from the Kofu City website and the Kofu City Disaster Preparedness App, etc. If you cannot use your cell phone, check the latest information at evacuation shelters.

＼Let's check together!／

How can I avoid panicking when an earthquake strikes?



Various disruptions can be expected immediately after a major earthquake. Therefore, it is important for us to be aware of the importance of "protecting ourselves and our family members" in case of a major earthquake. If the epicenter is close, the earthquake early warning system alert may not arrive in time, so it is important to act fast to protect yourself as soon as you feel any tremors. Furthermore, families should thoroughly discuss evacuation sites and stockpiles.

Earthquake

Keeping yourself safe in the event of an earthquake ②

We never know when an earthquake may strike. Let's take a look at what to do when you see or hear an Earthquake Early Warning alert or feel a tremor.

Indoors

Living room

Get under a sturdy desk or table, protect your head, hold on to the table legs, and wait for the shaking to subside. You may also protect your head with a cushion.

Kitchen

Stay away from cupboards and refrigerators. Check fire sources only after the tremors have subsided. If a fire breaks out, extinguish it with a fire extinguisher. If the fire reaches the ceiling, quickly evacuate the building.

Bedroom

Get under bedding or beds to ensure your own safety. Keep a flashlight, slippers, helmet, whistle, etc. at your bedside on a daily basis.

Bathrooms and restrooms

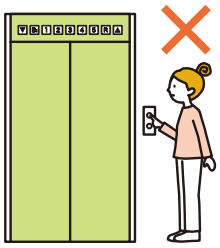
Move to a safer place if you feel a tremor, as bathrooms may pose various threats in terms of injury or you could become trapped in the restroom.

Commercial facilities

In supermarkets and convenience stores, protect your head with a shopping basket, move away from windows and shelves, and huddle up against a pillar or wall. Do not rush towards the exit in crowded facilities.

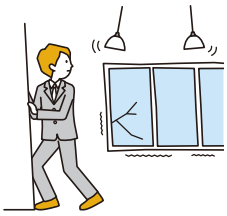
Apartment complexes

In apartment buildings and other housing complexes, do not use the elevator when evacuating.



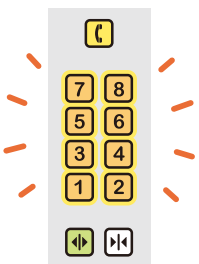
Buildings

The upper floors of a high-rise building will sway more than the lowerfloors. Move away from objects that are likely to fall, such as window panes and light fixtures. Do not use escalators or elevators when evacuating.



Elevators

Press all buttons and get off at the floor where the elevator stopped.
If you are trapped, press the emergency button or use the intercom and wait for rescue.



Outdoors

Sidewalks

Evacuate to an open space or park while protecting your head with items such as a bag or rucksack. Be careful of falling building and other walls, billboards, and broken glass. If there is a building that looks sturdy, take shelter in it. Stay away from vending machines, block walls, utility poles, etc., and watch out for broken and hanging power lines.

Mountains and hills

Stay as far away as possible from places where there is danger of falling rocks and landslides, etc.

While commuting

On a train or bus

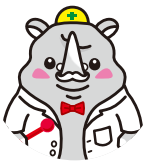
Protect your head with a bag or rucksack, and grab onto a handrail or hanging strap. Always follow the instructions of the driver and other staff members.

While driving

Do not brake suddenly. Turn on your hazard lights and gradually slow down to a stop on the left side of the road or in an open space, then turn the engine off. When leaving the car to evacuate, do not lock the doors and leave the keys in the ignition.

＼ Let's check together! ／

Is it safe to rush to turn off the gas stove when a big earthquake strikes? Also, what can we do on a regular basis to ensure our safety in an earthquake?



Both propane gas and city gas supplies are equipped with a 'microcomputer meter', meaning gas stops automatically when an earthquake with an intensity of 5 or above occurs. If there are no problems with gas supply after the earthquake, gas can be used again by resetting the microcomputer meter yourself. Check how to reset the meter in advance. It is also important to routinely check for hazards at home, at work, and on our daily commutes and consider what to do about them if an earthquake were to strike.