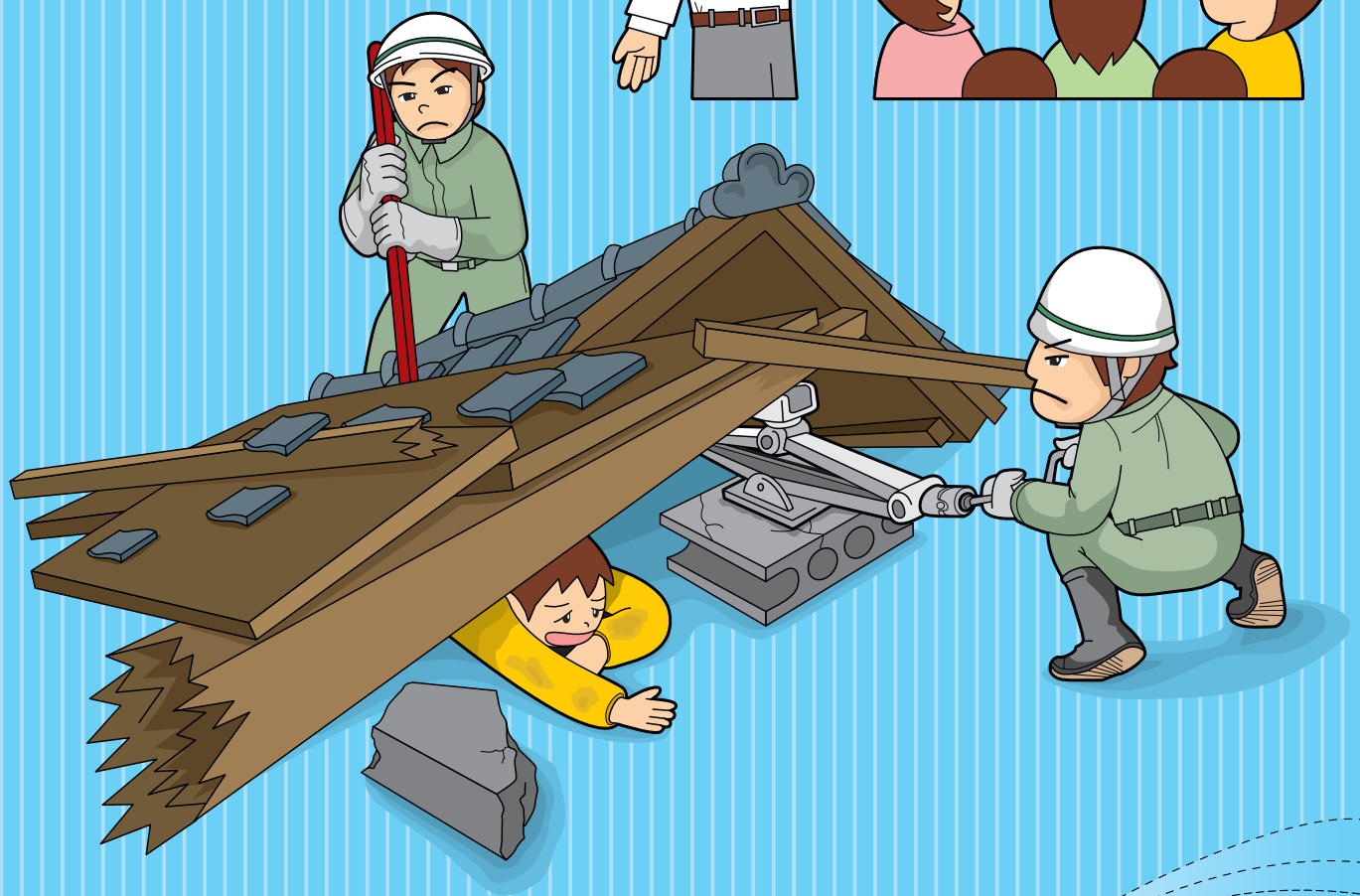
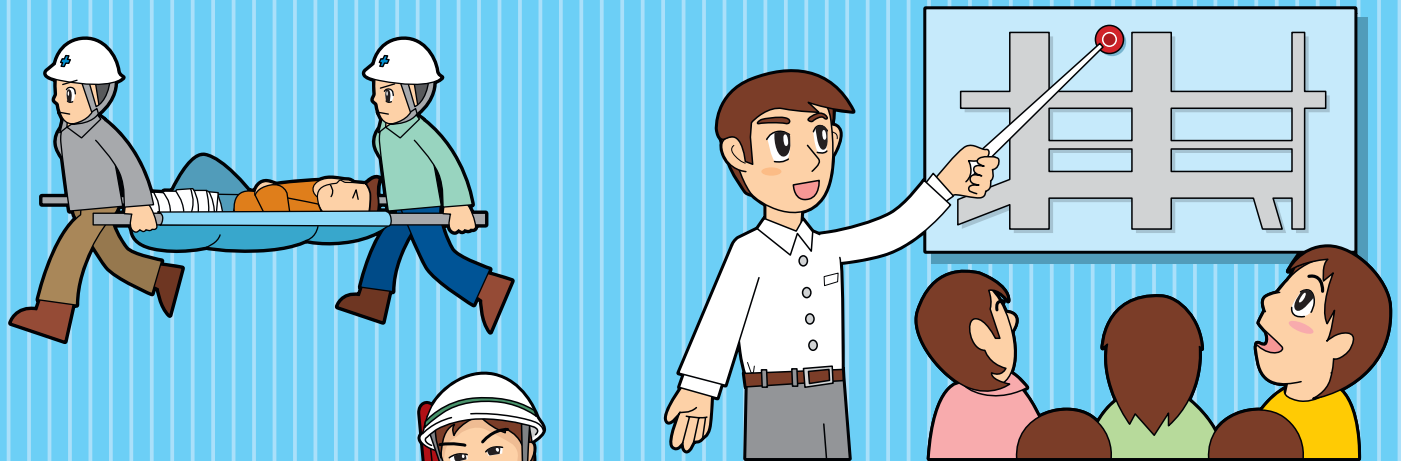


# Earthquake Disaster Prevention Guidebook



Shizuoka Prefecture

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# 1 What is the Tokai Earthquake?

## 1) The Tokai Earthquake Theory

In August 1976, the Tokai Earthquake theory was presented. This theory says that in the Tokai area, focusing on Shizuoka, **It would not be surprising if a huge earthquake happened tomorrow.** This is a huge problem for society. After this theory was presented, Shizuoka prefecture began to make Tokai Earthquake countermeasures.

The surface of the earth is made up of dozens of hard plates that are laid out like a jigsaw puzzle. These plates are not fixed, but rather move around the earth's surface. Depending on the motion of the layer of the earth underneath them (called the mantle), these plates move up to 10 cm a year. It is thought that these plates bump into and slide underneath each other. At the boundaries of the plates, large mountain ranges and other landforms are created. These boundaries also produce earthquake and volcano activity.

Plates Located Near Japan



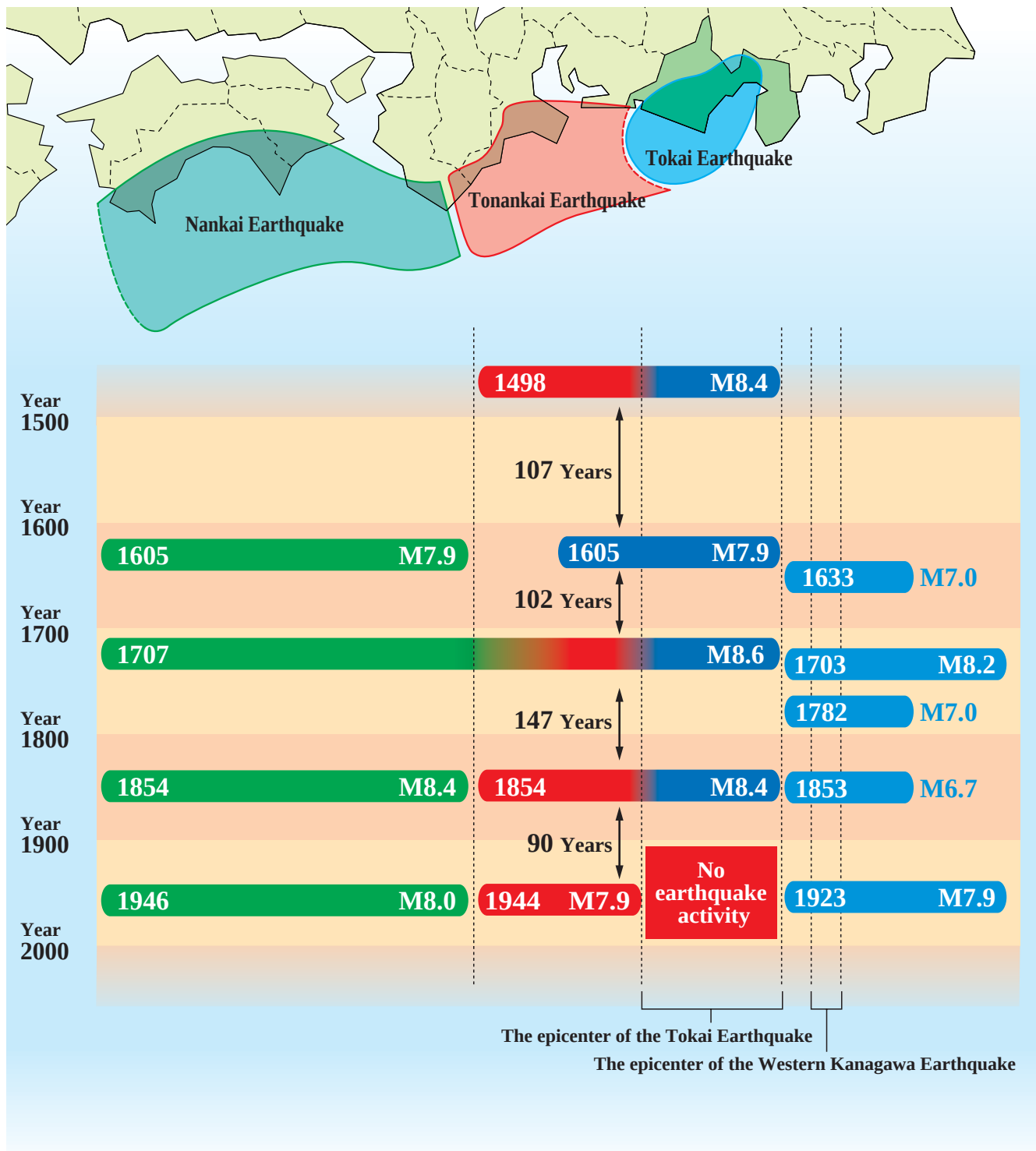
(provided by Mr. Tetsuzo Seno)

## 2) Reoccurring Big Earthquakes

Earthquakes occur over and over on the Pacific coast of the Japanese archipelago due to plates sliding under each other. In the waters that extend from the Tokai area to Shikoku, earthquakes reoccur in roughly the same place and with a similar magnitude in a cycle of about once every 100 to 150 years. After the Ansei-Tokai Earthquake in 1854, earthquakes occurred to the west of the Tokai area. During the Tonankai Earthquake in 1944 and the Nankai Earthquake in 1946, earthquake energy was released. The next earthquake in these areas is not expected to happen for quite a while.

Since 1854 an earthquake still has not happened in the area between Suruga Bay and Omaezaki off the coast of Shizuoka Prefecture. It is believed that earthquake energy is building up in this area. Since this is a region with no recently observed earthquake activity, a massive earthquake is expected to occur in Shizuoka in the near future.

## Past Earthquakes Occurring off the Pacific Coast and Their Estimated Epicenters



## Magnitude and Seismic Intensity

Magnitude represents an earthquake's overall energy and size. Seismic intensity represents the size of tremors that happen at a specific location.

To understand the differences between these two terms, think about a lightbulb. The total amount of light given off by a 40 watt or 100 watt lightbulb is its magnitude. However, whatever type of lightbulb you have, it will get darker the farther you are from it ( because less energy is reaching you ), and it will get lighter the closer you are to it (because more energy is reaching you). The light that hits at each spot is equivalent to an earthquake's seismic intensity.

### 3) Levels of Seismic Intensity

Seismic intensity is measured with seismic detectors. The following explanatory chart shows what kinds of things can be expected to happen for each level of seismic intensity.

| Level    | What will we feel?                                                                                                             |
|----------|--------------------------------------------------------------------------------------------------------------------------------|
| 0        | People will not feel any tremors.                                                                                              |
| 1        | Some people who are indoors will feel a slight tremor.                                                                         |
| 2        | Most people who are indoors will feel tremors. Some people who are sleeping will be woken up.                                  |
| 3        | Almost everyone who is indoors will feel tremors. People may be frightened.                                                    |
| 4        | It will be quite scary, and some people will be concerned for their safety. Almost all people who are asleep will be woken up. |
| weak 5   | Most people will be concerned for their safety. Some people will experience difficulty moving around.                          |
| strong 5 | It will feel quite frightening. Most people will experience difficulty moving around.                                          |
| weak 6   | It will become difficult to remain standing.                                                                                   |
| strong 6 | It will be impossible to stand. People will have to crawl in order to move.                                                    |
| 7        | People will be at the mercy of the tremors. It will be impossible to control one's movements.                                  |

## 2 Predicted Damage of the Tokai Earthquake

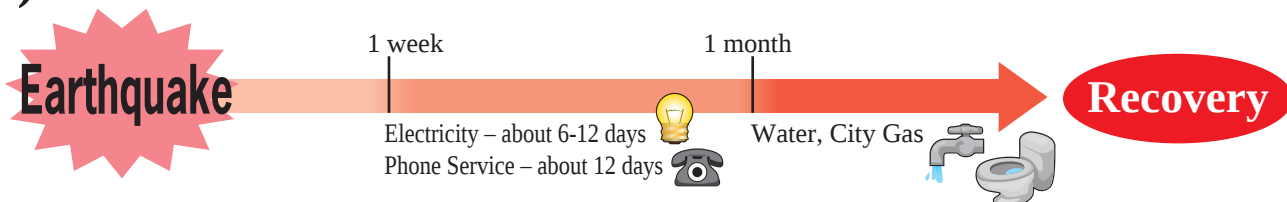
It is predicted that a Tokaido Earthquake of magnitude 8 will result in seismic intensities of between weak 6 to 7 over a broad region, including areas of reclaimed land and places with weak foundations. Depending on the area, soil liquefaction as well as tsunami attacks are predicted.

It is predicted that around 5,900 people will die in the earthquake and around 19,000 will suffer serious injuries. About 190,000 buildings are predicted to suffer severe damage.

The Predicted Epicenter of the Tokai Earthquake (from the Central Disaster Prevention Council)



### 1) Time for Restoration of Essential Utilities

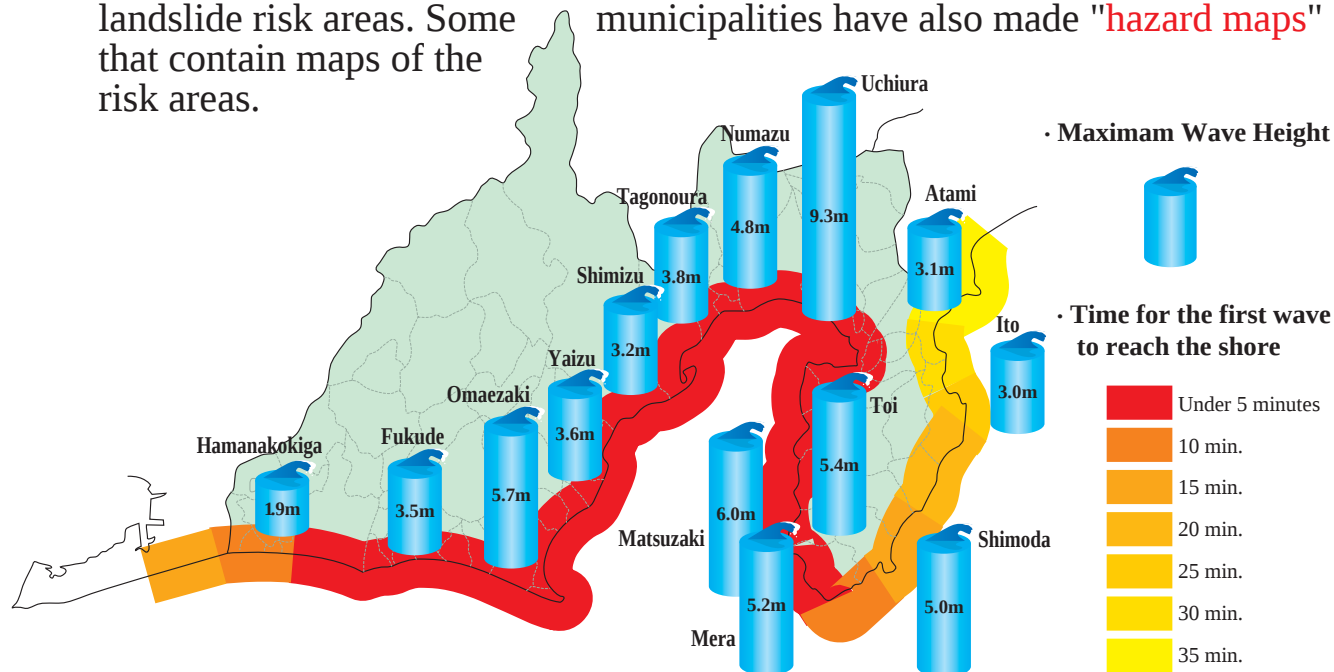


After the Kobe Earthquake in 1995, it took 7 days for the restoration of electricity, 15 days for the resumption of the phone system, and about 3 months for the restoration of gas and water in the city.

### 2) Tsunamis

#### Time for the First Tsunami Wave to Reach Land and the Maximum Wave Height

Local municipalities have information about predicted tsunami risk areas and landslide risk areas. Some municipalities have also made "hazard maps" that contain maps of the risk areas.



## With Earthquakes Come Tsunamis. Evacuate Immediately!

**When you are near the shore and feel tremors or shaking:**  
(Even when you feel slow shaking for a longer period of time)

**When a tsunami warning is issued**  
(tsunami – waves of 2 meters or more,  
large tsunami – waves of 3 meters or more)



Immediately move to high ground  
or to an evacuation building

**When a tsunami chuuihou is issued**  
(the waves will be less than a meter at the highest)



People in coastal areas must  
quickly evacuate to high ground.

**When a warning declaration is issued**



People who are in designated  
evacuation areas must immediately  
evacuate.

When an earthquake occurs suddenly, large tsunami waves will come a few minutes later.

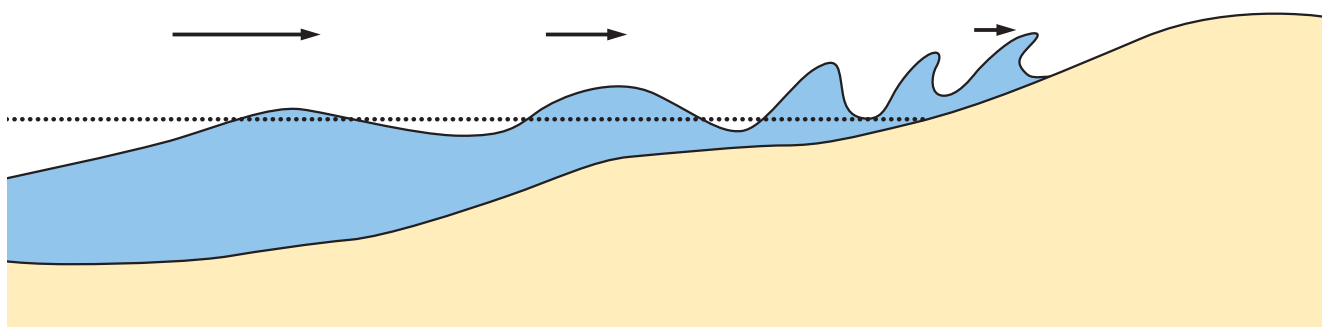
- There will be no time to wait for evacuation advice or instructions. **Get to high ground immediately.**
- Undergo night evacuation training beforehand, and find out your evacuation route and the time it will take.

(Confirm it by actually taking a walk along the evacuation route.)

(Warning)

Tsunami waves repeatedly attack the shore . The first wave of a tsunami is not always the largest.

Since the warning is necessary, do not go near the shore for a long period of time after an earthquake.



### 3 Tokai Earthquake Prediction Information and Warning Declaration

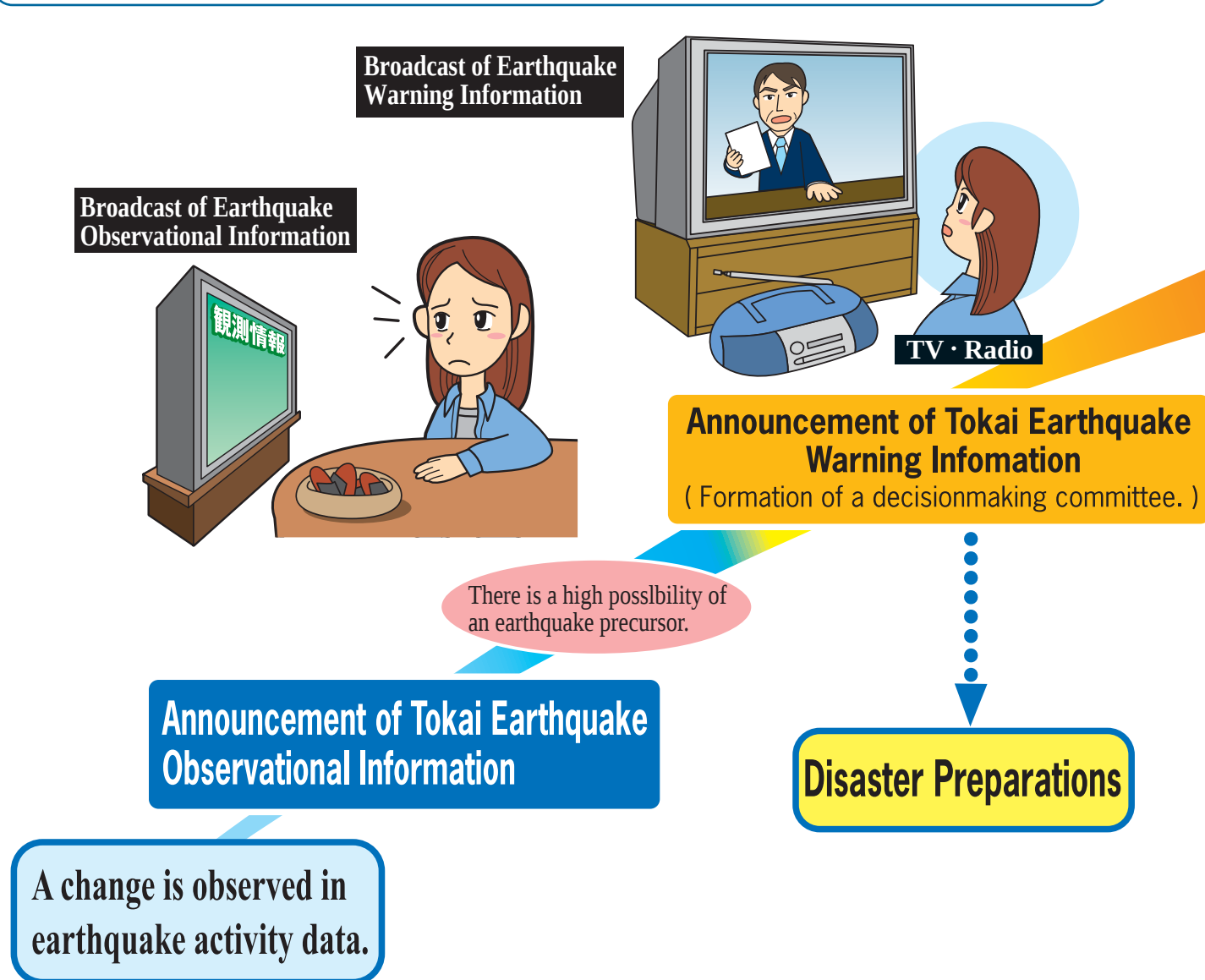
#### 1) Earthquake Prediction

In general, **earthquake prediction is extremely difficult**. A dense network of forecasting observation equipment has been set up to detect a deep-water magnitude 8 earthquake, so it is thought that in some circumstances predictions may be possible just before the Tokai Earthquake occurs.

Detectors that measure warping of the ground and other observational devices are monitoring 24 hours a day to provide a Tokai Earthquake prediction. When they detect a change in the observational data, that change is immediately examined to see whether or not it is related to the occurrence of the Tokai Earthquake.

#### The Possibility of a Sudden Earthquake Occurrence

Earthquake prediction technologies are advancing every year. However, at the present time **it is possible that the Tokai Earthquake will occur suddenly and without warning**.



#### 2) Presentation of Information Related to Earthquake Prediction

Before the warning declaration it is thought that changes in observational data will be explained. Information that indicates a high possibility of a Tokai Earthquake precursor will be divided into the following three categories.

##### Tokai Earthquake Observational Information (Kansoku Joho)

This is announced when observed data appear abnormal but it cannot be determined whether or not it is an earthquake precursor.

( There will also be announcements if there is no longer a fear of the Tokai Earthquake occurring at that time, or if it is determined that the data have no direct relationship to the Tokai Earthquake. )

##### Tokai Earthquake Warning Information (Chui Joho)

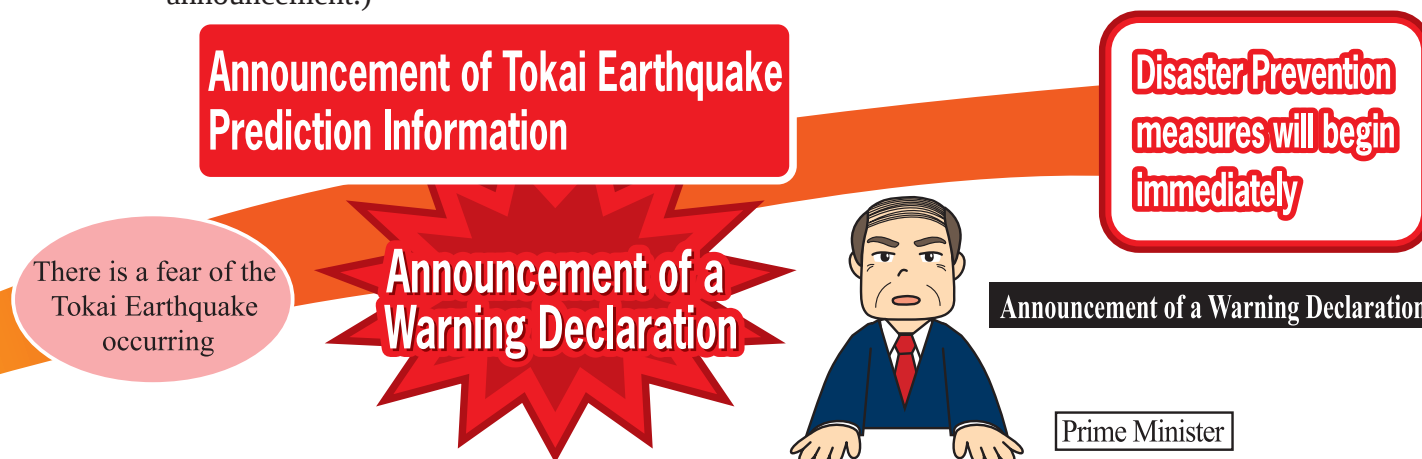
This is announced when it is recognized that the possibility of an earthquake precursor is high. After hearing this, earthquake preparations will begin.

( The formation of a decision-making committee will be announced along with this information. )

##### Tokai Earthquake Prediction Information (Yochi Joho)

This is announced when there is a fear of the Tokai Earthquake occurring. A Warning Declaration will be announced at the same time.

(In the case of Warning Information or Prediction Information being cancelled, there will also be an announcement.)



#### 3) Announcement of a Warning Declaration (Keikai Sengen)

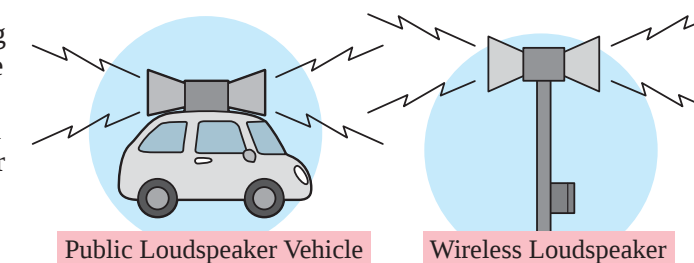
In the event of a big increase in unusual observed data that indicates a strong possibility that the Tokai Earthquake will occur, the Prime Minister of Japan will receive a report from the head of Japan's Meteorological Agency and will announce a Warning Declaration covering the Increased Earthquake Disaster Prevention Measures Region, which includes Shizuoka Prefecture.

At this time, the Meteorological Agency will announce Tokai Earthquake Prediction Information simultaneously.

Announcement of Tokai Earthquake Warning Information and the Warning Declaration will be broadcast on radio and TV.

Also, this information will be played by local government public address vehicles and speaker systems.

You should note that sirens will ring when a Warning Declaration is announced.



## 4

## What if warning information is issued? What if a warning declaration is issued?

When warning information or a warning declaration is issued, it is important to know what will happen to things around us so that we can act appropriately and safely.

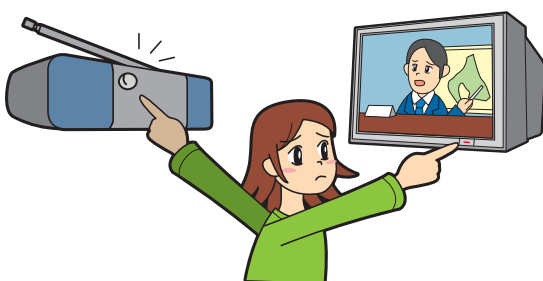
## 1) The Condition of Certain Institutions and Public Services

|                             | Issuance of Warning Information                                                                                                                  | Issuance of a Warning Declaration                                                                                 |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Electricity, Gas, and Water | Will be available as usual.<br>Try to collect tap water.                                                                                         | Will be available, but use them sparingly.                                                                        |
| Telephone Service           | Will operate as usual.<br>(However, if the number of users increases significantly, the phone lines may be overloaded)                           | Will operate as usual.<br>(There is a greater chance that phone lines will be overloaded by an increase in users) |
| Bus Service                 | Will operate as usual.                                                                                                                           | Buses will stop at the nearest safe bus stop or other location, then stop running.                                |
| Trains                      | Will operate as usual                                                                                                                            | Trains will go to the nearest safe station, then stop running.                                                    |
| Roads and Highways          | Open as usual                                                                                                                                    | In order to secure evacuation routes, use of main highways will be restricted. Drive cars at a reduced speed.     |
| Department Stores           | Certain areas or floors may be closed                                                                                                            | Will be closed. Some stores that are in earthquake-resistant buildings may continue to be open.                   |
| Convenience Stores          | Open as usual                                                                                                                                    | Some stores which have been certified as earthquake-resistant will continue to be open.                           |
| Banks                       | Open as usual                                                                                                                                    | Will be closed.<br>Some ATMs will continue to operate.                                                            |
| Hospitals                   | Outpatient admissions will be restricted.<br>Emergency patients will continue to be admitted.                                                    | Outpatient admissions will be stopped. Emergency patients will continue to be admitted.                           |
| Schools and Kindergartens   | For children's safety, students will be sent home or picked up by their parents. Students at schools for the disabled will be sent home earlier. | Schools and kindergartens will be closed.<br>(Some teachers will be on standby)                                   |

## 2) What do we do when a warning is issued?

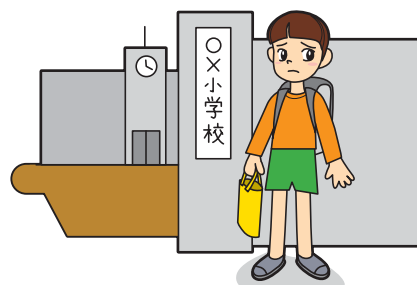
## Confirm the information by TV or radio

- It's important to get correct information
- Be wary of rumors



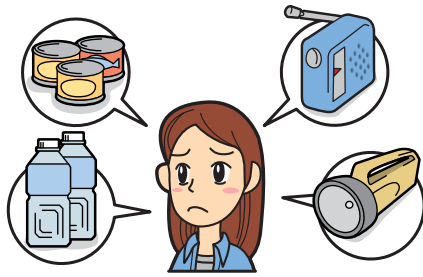
## Picking up children from school

- Contact the school beforehand



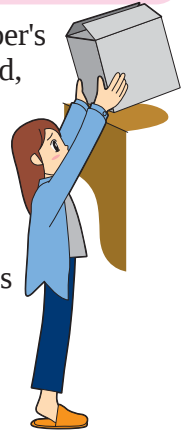
## Recheck your emergency supplies

- Use the checklist in this booklet to reconfirm your supplies see



## Recheck your house or apartment

- Decide each family member's responsibilities beforehand, and follow your plan
- Make sure you do not have things stored in high places
- Check to see that your furnishings and cupboards are securely fastened
- Don't forget to check your entrances and exits

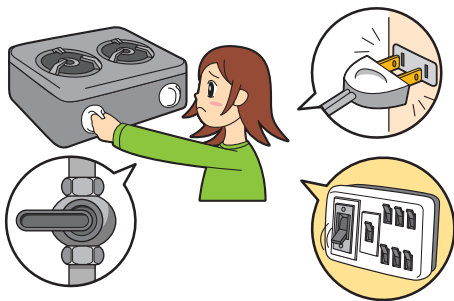


## Immediately evacuate from designated risk areas

- Evacuate as fast as possible from predicted tsunami and landslide risk areas
- In all other areas, prepare for the occurrence of an earthquake by going to a safe place inside or outside of your residence



## Take steps to prevent fires



- Do not use your gas if possible
- If you must use your gas, stay nearby and watch it closely.
- Turn off the gas main, and close the valve to the propane tank.
- Unplug unnecessary appliances. When you leave your residence, shut off the breakers. Put flammable materials in a safe place.

# Disaster Emergency Dengon Dial 171

After a disaster, NTT's Disaster Emergency Dengon Dial 171 is available when you want to confirm the safety of your friends and family.

Information recorded by disaster victims about their safety can be checked through Disaster Emergency Dengon Dial Centers that have been set up across the country.

### Directions for Message Recording and Playback

Recording time is limited to 30 seconds per message

- ◆ For Recording: **1 7 1** ... **1** ... **0 X X** ... **X X X** ... **X X X X** ... **Record your message**
- An NTT home phone number within the disaster area
- ◆ For Playback: **1 7 1** ... **2** ... **0 X X** ... **X X X** ... **X X X X** ... **Message will play**

### Times when this service will be active:

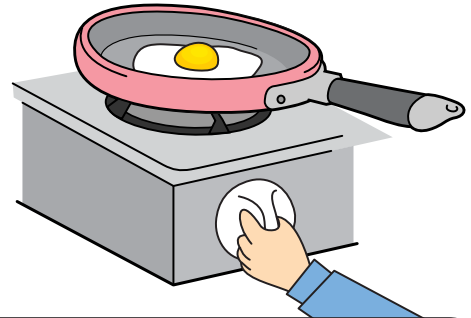
- The occurrence of an earthquake with a seismic intensity of weak 6 or greater
- Natural disasters other than earthquakes which result in the phone lines becoming overloaded (This service can be tested on the 1st day of each month, excluding January 1st)

### Additional Usage Information:

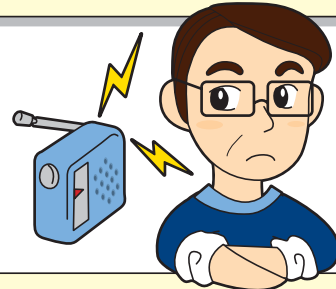
- Each message is limited to 30 seconds or less
- This service can be accessed from mobile phones as well (It cannot be accessed with some mobile service providers)

## 5 What if an earthquake occurs suddenly?

- Severe tremors will continue for about 1 minute. Don't panic and rush outside. Stay calm.
- After the initial earthquake has stopped, ensuring your own safety is the first priority!
- Aftershocks will continue to occur after the initial earthquake.
- If there are minor injuries, treat them at home.



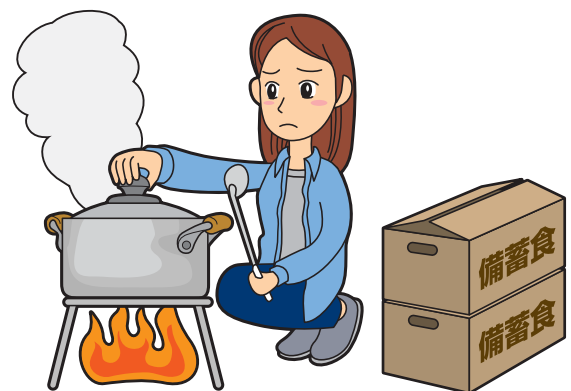
- Don't place objects near open flames.
- Even if a fire breaks out, calmly try to put out the fire. Confirm that the source of the fire is safe.
- What if a fire starts in your neighborhood? Call over your neighbors and get their help to fight fires!



- If you leave your house, put up a sign or leave a written message so that people can know your family's safety and where you are going.
- Don't forget to lock your doors.



- Be wary of rumors. Try to get up-to-date, correct information.
- Limit phone use as much as possible. For information on other people's safety, use the 171 Emergency Message Service.



- The evacuation area is a communal living area. Obey the rules, and cooperate by helping out.
- Provide assistance to people with physical disabilities or injuries.



- Relief supplies will not be expected to arrive for several days after the earthquake. This is when we will understand how much we rely on everyday conveniences. We will have to live using our emergency supplies and food during this time.

# 6

## Emergency Supplies and Items to Stockpile

Prepare necessary emergency supplies by considering your family's situation. Make a "Family Emergency Supply List" and regularly check it. Put your supplies into a bag and leave the bag in a place where you can easily get to it. Separate these emergency supplies from stockpiled items that you will take out later.

### 1) Emergency Supply Checklist (Example)

-Put your Emergency Supplies into a bag and leave it in a convenient location.

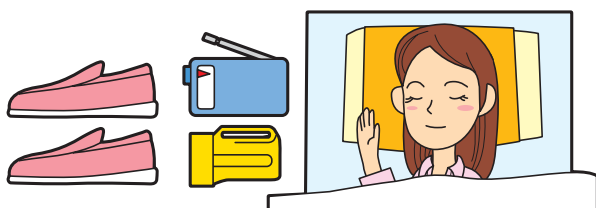


### 2) Stockpile Item Checklist (Example)



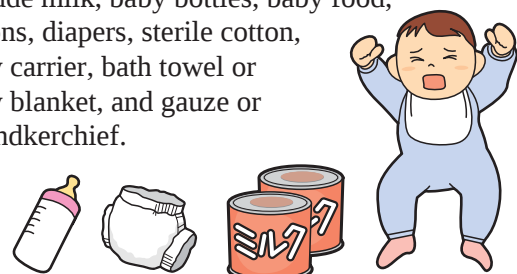
#### Even while you are sleeping...

Put a flashlight, radio, and shoes or slippers near your bed. (If you are barefoot, you can cut your feet on broken glass)



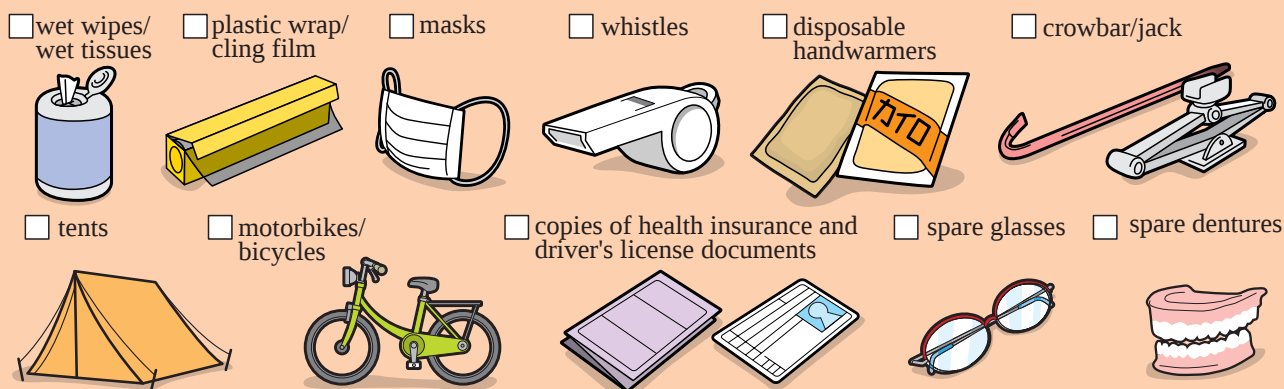
#### For families with babies...

Include milk, baby bottles, baby food, spoons, diapers, sterile cotton, baby carrier, bath towel or baby blanket, and gauze or a handkerchief.



### 3) Other useful items

During the extended stays at evacuation centers after the Hanshin Earthquake, a wide variety of goods were in demand



## 7 Things to do in the event of an earthquake / Making an evacuation map

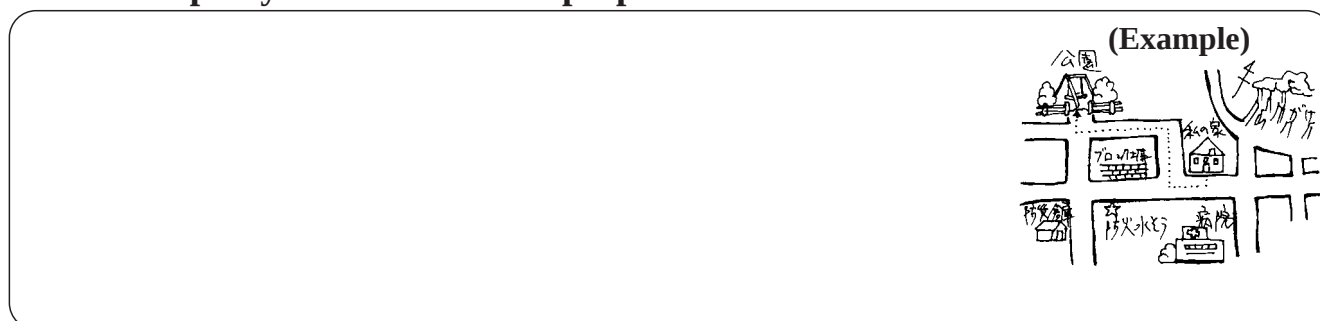
### List of Duties and Things to Do

| Name | Place most likely to be during the day | Family meeting place | Evacuation place |
|------|----------------------------------------|----------------------|------------------|
|      |                                        |                      |                  |
|      |                                        |                      |                  |
|      |                                        |                      |                  |
|      |                                        |                      |                  |
|      |                                        |                      |                  |

### ★ Family Responsibilities

| Description                             | Name | Description                        | Name | Description                                   | Name | Description                                               | Name |
|-----------------------------------------|------|------------------------------------|------|-----------------------------------------------|------|-----------------------------------------------------------|------|
| Confirm information on the radio and TV |      | Put tape on the window panes       |      | Unplug electric appliances                    |      | Check the emergency supplies                              |      |
| Turn off the stove                      |      | Secure the entrances and exits     |      | Take items down from shelves                  |      | Write down messages if anyone can't come home immediately |      |
| Turn off the gas                        |      | Prepare buckets/fire extinguishers |      | Secure furniture so that it doesn't fall down |      | Help elderly family members and children                  |      |
| Move dangerous items to a safe place    |      | Collect drinking water             |      |                                               |      |                                                           |      |

### Make a map of your local disaster preparedness facilities



## 8 Keeping Furniture from Falling

During an earthquake injuries and death can result from falling furniture, items falling from shelves, and breaking glass. You can help protect against this by preparing your home in advance.

Depending on how you choose to secure your furniture, it may be necessary to put nails in the walls of your home. If you are renting your residence, please discuss the different methods of securing furniture with your landlord beforehand to avoid any problems.

### 1) Put your furniture in safe locations.

Do not put large furniture in bedrooms if possible. One way is to gather furniture in the room with the fewest exits so that other exit paths will not be blocked in an earthquake. Try to make it so that even if the furniture falls in an earthquake, there will be a low chance of death or injury.

To avoid injuries due to falling objects, don't put heavy items on top of cupboards, wardrobes, or other high places.

### 2) Prevent furniture from falling.

Secure large items like cupboards, wardrobes, refrigerators, and TVs with sturdy metal fasteners to keep them from falling.

### 3) Use protective film to prevent flying glass.

After an earthquake, foot injuries can occur indoors due to broken glass on the floors. Stick protective film on windows and other items with glass like cupboards. Take these steps to prevent flying glass.

### 4) Don't leave objects in hallways or near exits.

In preparation for an emergency where it becomes necessary to secure an exit route, try not to leave items in hallways or near exits. You will not be able to evacuate your home in an earthquake if fallen furniture is blocking the exitway.

## 9 Fire Prevention Measures

We need to take measures to prevent fires by thinking every day about what would happen if a fire breaks out and by checking places in the house where a fire could start. Fires can be successfully put out early as a result of daily preparation. Make sure to participate in local fire prevention training and work together with your neighbors to create fire prevention measures.

- **Get a fire extinguisher. Read and understand how to use it beforehand.**

Dry chemical fire extinguishers can be used for any type of fire. Put fire extinguishers and other fire prevention equipment in easy to see and easy to reach places.

- **Keep several bucketfuls of water ready in case of a fire.**

- **Don't put easily burnable things on or around open flames.**

- **Secure gas canisters and kerosene tanks to prevent them from falling.**

- **Make sure that everyone in your family knows how to turn the main gas line and electric circuit breakers off and on.**



## 10 Participate in Local Fire Prevention Activities

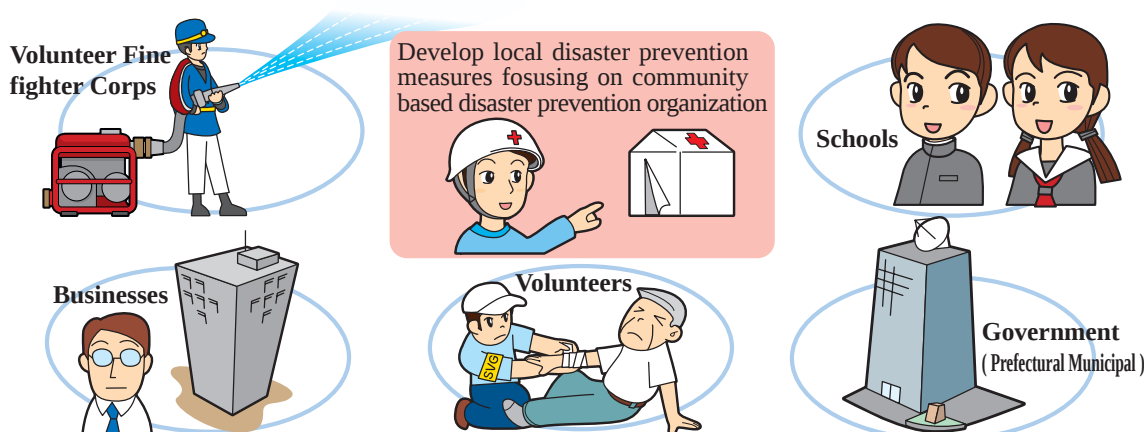
Protecting your life is your responsibility. Protecting your community is everyone's responsibility. Each of us is a member of a community-based disaster prevention organization.

- **Participate in disaster prevention training with everyone in your family.**

- July 1st – July 10th, 10-day Tsunami Countermeasure Promotion ..... Tsunami evacuation training in coastal areas
- August 30th – September 5th, Disaster Prevention Week ..... General disaster prevention training will be on September 1st, "Disaster Prevention Day".
- November, Earthquake Disaster Prevention Month ..... Disaster prevention exhibitions and lectures will be held throughout the prefecture.
- The first Sunday in December, Local Disaster Prevention Day ..... Training that assumes a sudden, large-scale earthquake.
- January 15th – January 21st, Disaster Prevention and Volunteer Week ..... January 17th is "Disaster Prevention and Volunteer Day".

- **If there is a large-scale disaster, be actively involved in putting out fires in the initial stages and in helping to provide first aid.**

- **In your community there are a variety of people who are involved in disaster prevention. In an emergency, cooperate with each other and work as a group on disaster prevention activities.**



## 11 Community-Based Disaster Prevention Organizations

In order to for you and your family to survive a huge disaster like the Tokaido Earthquake, it is vital to make a variety of preparations in advance. However, there is a limit to how much you and your family can do by yourselves. It's necessary to deal with disaster prevention activities in an organized way by cooperating with your neighbors.

In an emergency situation we have no choice but to rely on each other. A community-based disaster prevention organization lets everyone in a neighborhood work together on a daily basis on disaster prevention activities.

### Everyday Activities / Activities when there is a Disaster

#### Before the Disaster

- Make a Safety Check
- Spreading Disaster Prevention Knowledge
- Disaster Prevention Training

#### After the Disaster

- Initial Firefighting
- Aid / Rescue
- First Aid / Patient Transport
- Collecting & Broadcasting Information
- Directing Evacuation
- Evacuation shelter Management