

Lesson at a Glance

- An **earthquake** is a sudden shaking movement of the earth's surface (**crust**). An earthquake has a point of origin called the **epicentre**. The intensity of the earthquake is felt most at the epicentre. We measure the intensity of earthquake using the **Richter scale** or the **Modified Mercalli scale**.
- The earth's crust is made of massive rocks which we call **tectonic plates**. These plates float on a layer of semi-liquid **mantle**. When plates collide with each other, pressure is released which causes a **fault**. These phenomena cause earthquakes. Earthquakes do not have any **warning period** and occur without notice. It damages life and property usually in urban and semi-urban areas, where the high-rise buildings may fall thus increasing the casualties.
- About 95% of the people killed in earthquakes are killed by falling buildings.
- Earthquakes can result in other hazards also like landslides, floods, fires and tsunamis.
- Some people are usually more at risk because of their **location** or **socio-economic condition**.
- Flexible structures built on bedrock are more resistant to earthquakes than **rigid structures built on loose soil**.
- The loss of life and property may be severe enough to cripple the life of people for some time.
- The Himalayas, being the world's youngest fold mountain range, are geologically very active and so earthquake-prone.
- We describe the proneness of regions to earthquakes using **seismic zones**. Zone 5 areas are most prone (very high risk) and Zone 1 the least prone. Delhi and Mumbai fall under Zone 4. 233 of the 597 districts of India fall under the Zones 3, 4 and 5.
- The Richter scale measures the intensity of earthquakes whereas the Mercalli Scale measures how damaging the earthquake is.
- During an earthquake, it is important to help survivors quickly. If indoors, one should stay there. One should **drop** (bend down),

cover (get down under something like a table), and **hold** (stay there) till the shaking does not stop.

- One can ensure safety of buildings by **retrofitting** the existing buildings. It is done to strengthen buildings to make them disaster resistant. We should use appropriate technology in the building materials. New constructions should obey safety norms, like the Building Bye Laws.
- During the shaking, one should bend down and stay away from things that can fall. If not too far away, one should move to open fields. If living in a high building, one should move against an interior wall and protect the head with arms. Helmets can be used for protection. A lift should not be used. If one is driving during an earthquake, it is advisable to pull over to the roadside, stop and get out of the vehicle. Children, the elderly and disabled people should be allowed to leave first anywhere.
- After the tremors stop, there remains possibility of aftershocks, about which the people should be aware. At relief centres, **activity kits, sewing kits, cleaning and utilities kits** are required.

■ TEXTBOOK QUESTIONS SOLVED ■

Activities

Q. 1. *What is a seismograph? Where is it usually kept in your city? If you live in a village, can you find out where the nearest seismograph is kept?*

Ans. A seismograph is an instrument that records waves caused during an earthquake. It is usually kept at geological centres.

Q. 2. *What would you do if you find that some one is trapped inside a building under the rubble and you can hear the person, though you can't see him or her? Can you find out if your village or Gram Panchayat or Block/Taluka has specialised search and rescue teams for disasters, if you live in a rural area? If you live in a city, do you know if such teams exist?*

Ans. Attempt yourself with help from your teacher.

Q. 3. *How would you deal with a person who has lost everything in an earthquake and is shocked? Find out more about trauma counseling. Who can be a good counsellor?*

Ans. Attempt yourself with help from your teacher.

Q. 4. *How would you prevent bleeding from a wound on the arm?*

Ans. To prevent bleeding from a wound, one should apply pressure with cotton and bandage.

Q. 5. *Make posters to tell people what to do when there are tremors. Display them in prominent places in your village or area, if in zones 3-5.*

Ans. Attempt yourself with help from your teacher.

Q. 6. *Make an illustrated comic type information sheet on the DROP, COVER & HOLD routine for people or children who cannot read and explain it to them.*

Ans. Attempt yourself.

Q. 7. *What precautions should one take when one enters a building that has cracked or collapsed because of an earthquake?*

Ans. When one enters a building collapsed after an earthquake, one should keep away from walls, beware of aftershocks and save survivors quickly.

Q. 8. *Are there Ham Radio Operators in your village or area? Find out more about Ham Radio.*

Ans. Amateur radio, often called ham radio, is both a hobby and a service in which participants, called "hams," use various types of radio communications equipment to communicate with other radio amateurs for public service, recreation and self-training. Amateur radio operators enjoy personal (and often worldwide) wireless communications with each other and are able to support their communities with emergency and disaster communications if necessary, while increasing their personal knowledge of electronics and radio theory. An estimated six million people throughout the world are regularly involved with amateur radio.

Q. 9. *Draw a map of your village or area, locating your school, houses, ponds, tanks, etc., as well as open spaces and high-rise buildings. Mark an emergency evacuation route plan, for use in case of an earthquake. Take your plan to your local DMT. Do they have a community contingency plan for your village or area? Take their help to locate possible relief centres and cattle protection areas (if in a village). If your village or area does not have a DMT yet, your teachers could help you with this exercise.*

Ans. Attempt yourself with the help of your teacher.

Exercises

Q. 1. Which earthquake vulnerability zones do you live in?
(Use the map)

Ans. Students should see the map and decide their zone according to the place they live in.

Q. 2. What would you do if you were going home from school and there was an earthquake?

Ans. If an earthquake occurs while going home from school, I shall run to open areas, away from buildings.

Q. 3. Where would you go if you were in the games field and there was an earthquake?

Ans. While in a games field, I shall stay there in the event of an earthquake.

Q. 4. What activities would you do with children who have witnessed and experienced an earthquake when they come to a relief camp or shelter?

Ans. Such children should be calmed down and first aid should be provided to them.

Q. 5. List simple do's and don'ts in the event of tremors or an earthquake.

Ans. Do's:

- Use the drop, cover and hold method to protect yourself.
- Move to open areas if outdoors.
- Helmets can be used to protect the head.

Don'ts:

- Don't move near things that can fall and damage.
- Don't stay near buildings, trees, poles, etc.

Q. 6. How does preparedness help you and your community when an earthquake occurs?

Ans. Being prepared beforehand is a very significant thing in the event of a hazard. If people are prepared, the damage done by the hazard can be minimised. People can be ready to volunteer and save survivors. This reduces the damage and number of casualties.

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