9. Disaster Management

Can you recall?

1. What do you mean by disaster ?
2. What are the different types of disaster?

Last year we have introduced various natural calamities/disasters. This year we are going to study about earthquake and some other natural calamities.

Can you tell? What is an earthquake ? what are the effects of earthquake ?

Earthquake

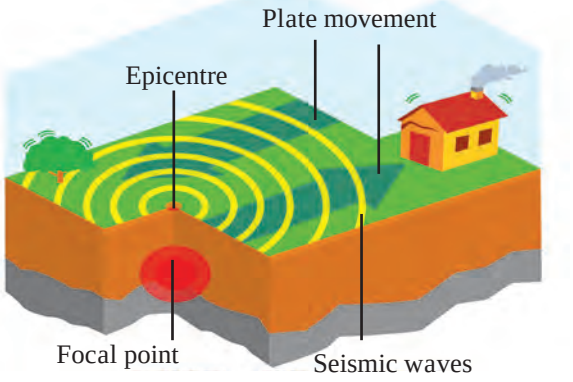
Sudden vibrations on the earth and shaking of the earth surface /ground is called an earthquake. These cause seismic waves leading to movements of the earth's surface like tremors, shaking or it goes up-down.

The shocks and waves formed in the interior of the earth spread on the surface in all directions. The central point of earthquake is the point above the epicenter on the earth surface. Strong convulse or waves at first reach to the epicenter, therefore major loss occurs near to that area.

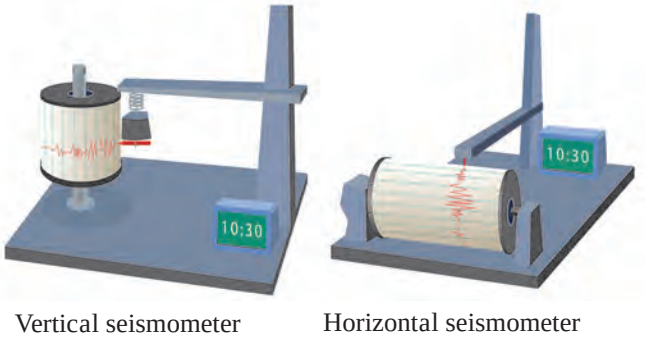
Shocks occurred due to an earthquake can be mild or intensified (acute). On the earth mild earthquakes occur in a larger number than the intensified or Runners .

Everyday, earthquakes are noticed at some or the other places on the earth. According to the observation of 'National Earthquakes information center' every year nearly 12,400 to 14,000 earthquakes occur on the earth. (Ref:- www.tris.edu.) From this it is noticed that earth is continuously vibrating.

9.1 Cracks to the buildings



9.2 Focal point and epicentre of earthquake



Vertical seismometer Horizontal seismometer

9.3 Seismometer

The machine / Instrument which records the earthquakes is called 'Seismograph' or 'Seismometer', and the accentuation (intensity) is measured in 'Richter Scale'. This is one of the mathematical measuring unit.

Effects of earthquakes are mentioned below. Study them carefully.

Internet My Friend Collect the information about Richter Scale and effects of earthquake

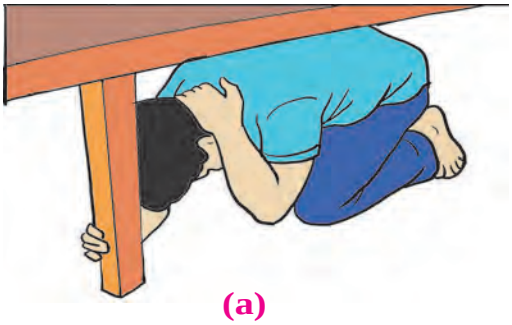
Causes of an earthquake	Effects of an earthquake
1.Volcanic eruption. 2. Stress of big dams on the earth. 3. Mining. 4. Underground atomic tests. 5. Water percolates through the cracks of the earth. Due to tremendous heat, the water converts into steam. The steam formed tries to come out from the loosened earth surface causing earthquakes.	1. Loss of human beings, wild animals and pets. 2. Economic loss at large scale (Electric poles, pipelines, houses, buildings, roads, railway tracks are destroyed.) 3. Ecosystem destruction due to the loss of Biodiversity. 4. Direction of flow of rivers, streams changes. 5. Possibility of fire in cities increases. 6. If there is earthquake at the bottom of ocean, it may create tsunami waves and thereby large scale destruction of costal region. 7. Level of water-table changes.

Precautions to be taken at the time of Earthquake

1. **If you are at home,** then, do not get scared and instead of running here and there, stand still at one place. Either sit on the floor or below the bed or any other furniture and cover yourself until the movement of earth stops. If there is no table or any other shelter then sit in any corner of the room and cover your head by folding your hands around it.
2. **If you are in the vehicle or outside the house,** then park your vehicle at a safe place and sit inside it. Do not wait near or below tall building, trees or electric pole.

Avoid doing following things during earthquake

1. Avoid using lift in the multistoried building, instead use staircase.
2. Do not sit in discomfort for long. Do some physical movements.
3. After the earthquake there is a possibility of fire, hence, to avoid it carefully switch off the main electric supply. Do not use candles, lantern, or matchbox, instead use torch or battery.



(a)

(b)

(c)

9.4 Precautions to be taken

Earthquake Resistant / Proof Buildings : The constructions which do not get damaged due to earth movements upto a certain limit, are called earthquake resistant buildings. To construct tall buildings, 'Indian Standard Institute' has made some code of conduct . Buildings are constructed as per I.S. 456 and earthquake resistant constructions are performed as per IS 1893 (Criteria for earthquake resistant design of structure) and IS 13920 (Ductile detailing of reinforced concrete structures subjected to seismic forces). Advanced technology is used for earthquake resistant construction.

To get prior intimation about earthquake, modern equipments like laser ranging very long baseline, geiger counter, creep meter, strain meter, tide gauge, tilt meter, volumetric strain gauge etc. are used.

Fire

Can you recall? Fire is a natural calamity or man made calamity ?

Types Of Fire

1. Class A Fire (Solid substances) : Commonly flammable materials are their fuel source. (wood, clothes, coal, papers etc.) This fire can be put out with water.

2. Class B Fire (Liquid substances) : Fires caused due to flammable liquid substances (petrol, oil, varnish, solvents, cooking oil, paints etc.) All these substances are lighter than water, therefore, fire extinguishers can be used to extinguish fire.

3. Class C Fire (Gaseous Substances) : Fires caused due to acetylene, household gas (L.P.G.)

4. Class D Fire (Chemical substances) : Fires caused due to combustible metals like potassium, sodium and calcium, which react with water at normal room temperature. Magnesium, aluminum and zinc react with water at high temperature. When both these groups combine with water, it explodes.

5. Class E Fire (Electrical) : A fire caused due to electrical components is class E fire. To extinguish such fire, power is cut off and non-conductive fire extinguishers like carbon dioxide are used.

Methods of Fire Extinction : There are 3 main methods to stop the spreads of fire or to control the fire.

1. Cool Out (Use of Water) : To extinguish fire water is most common and effective solution which is easily available everywhere. If you spray water on the fire or around the fire it creates cooling effect and helps to control the fire.

2. Suppress the Fire : To control the fire which is caused due to electricity or oil, sand or soil can be used. If we spread a froth like substance on the fire, it cuts off the contact between air and fire. This method is more useful to extinguish the fire spread due to oil.

3. Keep away Flammable Substances : In this method, all flammable substances are kept away from the fire. Any wooden article or flammable substances must be kept away so that no source is left for the fire to spread. Stirr up pump is the best device to put off small fires. It sprays water in all directions around the fire.

Precautions and Safety Measures

1. Develop the habit of switching off the gas regulator when not in use specially during night. Switch off the electrical appliances when you are going out of the house.
2. To make others alert and call them for help, shout loudly.
3. Call fire brigade.
4. Provide information how to use fire extinguishers.

First Aid

Let the patient sit / sleep in a comfortable position and call the doctor immediately.

Landslides- Rift collapse

Can you recall?

1. What are the reasons for 'Malin' mishap in Pune district? What are its effects?
2. What is the landslide ?

Natural cracks and fissures present in hard rocks cause their breaking. Especially, at the time of heavy rains, water entering these cracks causes weathering of these rocks. Weight increases, these rocks slide on the sloppy region and settle at the lower side. This is called collapse of rift.

Causes of landslide

1. After effects of natural disasters like earthquake, tsunami, heavy rains, storms, floods cause landslide.
2. Unlimited cutting of trees causes soil erosion.
3. While building roads in mountains, there is a lot of digging, that makes the mountain weak.

Make a list and discuss

In Maharashtra where do the traffic jams occur due to landslides? Make a list of such places. Why do the landslide occur at those places only? Discuss in the classroom and suggest preventive measures.

Effects of landslide

1. Rivers get flooded and change their paths.
2. Displacement of waterfalls, formation of artificial water reservoirs.
3. There is live and financial loss on a large scale, as trees, buildings, rocks on sloppy area collapse on low-lying land.
4. Landslide affects the traffic.
5. Landslide destroys plant life on it.

Disaster relief – planning : If the plan is prepared, it will help any disaster relief in the school. For that prepare a chart as given below.

Main points	The things to be noted
Primary information of the school	a. Name and address of the school b. Name and residential address of the Head Master with contact number. c. Names and contact numbers of school management members. d. Total number of staff.
School Disaster Management Committee	a. Fire extinguisher b. Awareness c. Instructions d. Traffic Management e. Safety f. communication committee (2-3 members/ sub committee)
Detailed information about school building	a. Total number of rooms. b. Number of classroom. c. Classes. d. Type of roof (wooden/cement/sheets) e. Age of the building, building year.
Information about school ground	a. Type of the play ground – prayers space, kho-kho, kabaddi and other grounds etc. b. Distance of the ground from main road.
Daily routine of the school	a. Time to start, school breaks and time to leave the school. b. Daily activities taking place in the school.
Possible hazards in the school	a. Name and type (normal/ medium/ acute) of the danger. b. Destruction in the past and current planning.
Disaster management map of the school	The map must have following contents – All buildings of the school, their structure, grounds, entrances, place of probable dangers in the school, safe places at the time of disaster, nearest road. This map must be at the entrance of the school and all students must be given detailed knowledge about it.

Mock drill in the school	Every month a mock drill must be conducted in the school. It should include possible hazards and the measures taken against them. The date, time, number of students and shortfalls must be noted down.

Work of the institutes

1. The government of India in collaboration with Indian Mountaineering Institute and International center for Integrated Mountain Development has launched a program to forecast the landslides and its effects.
2. Institute of geology and world geological forum also help for this forecast.

Exercises

1. Answer the following in your own words.

a. Explain the relation between continuous rains and landslide. Give reasons.
b. Prepare a chart showing 'Do's' and 'don'ts' at the time of earthquake.
c. What are the specifications of an earthquake –proof building ?
d. Explain the effects of landslide.
e. Is there any relation between dam and earthquake ? Explain.

2. Give Scientific reasons.

a. It is safer to find shelter under things like a bed, table at the time of earthquake.
b. In monsoon, don't take shelter near hillside.
c. Don't use lifts at the time of earthquake.
d. The foundation of earthquake-proof building is separated from other land.

3. If a crowd gathers at the place of earthquake, what would be the difficulties in relief work ?

4. Make a list of the institutes and organizations who provide help for disaster management. Collect more information about their work.

5. Make a survey of your school according to the plan of disaster management and write the pointwise information.

6. Are there any possible places of landslide in your area ? Collect information from experts.

7. With the help of following picture, explain your role in the disaster management.

Project :

1. Make a collection of news, photos, and cuttings about landslides and rift collapse.
2. With the help of internet, collect information about the latest gadgets and technology to forecast earthquake .
3. Collect information about NDRF, RPF, CRPF, NCC from internet.
4. Discuss- Need of CCTV.

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