

FACTS ABOUT EARTHQUAKES

- Earthquakes strike suddenly, violently, and without warning at any time of the year and at any time of the day or night.
- About 60% of India's land area is prone to earthquake. Regions along the Himalaya are the severe most. After 1993 Latur earthquake entire geographic area in India has been brought under seismic zone –II, III, IV and V.
- In Indian mythology, Earth is held in place by eight gigantic elephants, all balanced on the back of a turtle, which itself stands on the coils of a snake. If any of these animals shift or move, an earthquake occurs.
- India experienced four M8+ earthquakes between **1897 to 1950** along the Himalaya, which is rare in the world. Fortunately Indian megacities have not yet experienced any such.
- An earthquake happens somewhere in the world once every thirty seconds. You may not notice a M2 quake. You would feel the ground shake in a M3 quake. A M6 or higher can **destroy a city in developing countries**. The M7.0 Haiti earthquake (2010) killed 220,000 people, destroyed 4,000 schools, generated 19 million cubic m debris and made 1.5 million people homeless.
- A M7 or higher earthquake can oscillate the whole earth for minutes.
- In 1975 people reported in northeastern China, mice and rabbits leaving their burrows and snakes coming out of hibernation in the middle of the winter before a huge earthquake occurred. But in **1976 an earthquake** in China killed more than 200,000 without any warning sign.
- Aftershocks can follow an earthquake on and off for days or weeks. Most Earthquakes last for a minute or less. The **2004 Indian Ocean** earthquake lasted nearly 10 minutes—the longest on record.
- A magnitude 7.2 earthquake produces 10 times more ground motion than a magnitude 6.2 earthquake, but it releases about 32 times more energy. India Ocean Tsunami (2004) released **31680 times** more energy than the nuclear bomb that was dropped on Hiroshima in Japan in 1945.
- The average recurrences of an earthquake of M 3.7–4.6 every year, an earthquake of M4.7–5.5 every 10 years, and an earthquake of 5.6 or larger every 100 years.
- Earthquakes occurring at a depth of less than 70 km are classified as 'shallow-focus' earthquakes, while those with a focal-depth between 70 and 300 km are commonly termed 'mid-focus' or 'intermediate-depth' earthquakes.
- Approximately one earthquake with a magnitude of **8.0 or higher** occurs per year.
- **Japan** is one of the most earthquake-prone nations in the world.
- American scientist Charles Richter invented the Richter scale in 1935. Great Shillong (1897) and Bihar-Nepal (1934) earthquake data helped Richter a lot to confirm his findings.
- Most earthquakes happen along the edges of Earth's big plates. 4 out of 5 of the world's earthquakes take place along the rim of the Pacific Ocean, a zone called the Pacific Ring of Fire.
- Earthquakes are caused by movement of the Earth's tectonic plates, human activity can also produce earthquakes. People came to know about **Plate tectonics in 1960's**. Four types of faults are: normal, reverse, thrust and strike-slip.
- Englishman **John Milne** invented the seismograph in **1880**. There are more than 10000 seismic stations installed now across the globe.
- Some animals (dogs, snakes, fishes) may **sense tremors** and electrical signals before a quake but there are no scientific tools to understand the mind of them yet.
- Earthquakes are mostly caused by **geological faults**, but they can also be caused by landslides, nuclear testing, mine tests, and volcanic activities.
- The majority of the earthquakes and volcanic eruptions occur along **plate boundaries**.
- The **earliest recorded evidence of an earthquake** has been traced back to 1831 BC in the Shandong province of China.
- In 350 BC, the Greek scientist Aristotle stated that **soft ground shakes more than hard rock** in an earthquake.
- Earthquakes kill approximately 8,000 people each year and have caused an estimated 13 million deaths in the past 4,000 years.
- There are **500,000 detectable earthquakes** in the world each year, 100,000 of those can be felt, and 100 of them cause damage.
- The **world's deadliest recorded earthquake** occurred in 1556 in central China, killing an estimated 830,000 people.
- **Moonquakes** do occur, but they happen less frequently than earthquakes on the Earth.
- The largest recorded earthquake in the world was of magnitude **9.5 (Mw) in Chile** on May 22, 1960.
- More earthquakes happen in the **Northern Hemisphere** than in the Southern Hemisphere.
- **No building is 100% safe against Earthquake. but it can be made 100% safe for people.**

The motivation for school seismic safety is much broader than the universal human instinct to protect and love children



EARTHQUAKE AWARENESS

LUDO

nidm
Towards a disaster free India

NATIONAL INSTITUTE OF DISASTER MANAGEMENT

(Ministry of Home Affairs, Govt. of India)
IIPA Campus, 5 B IP Estate, Mahatma Gandhi Marg, New Delhi-110002 (India)
Tel. 011-23702432, 23705583, 23766146
Tele Fax: 011-23702442, 23702446
Website: www.nidm.gov.in

EARTHQUAKES: (DO'S & DON'TS)

Before

- Make your house earthquake resistant by taking expert help. Secure heavy furniture and other objects from falling during shaking.
- Pick couple of "safe" meeting places that are easy to reach. They could be under a sturdy table or desk or against an interior wall. Practise DROP, COVER, AND HOLD-ON in each safe place at least once in a month.
- Take your earthquake survival kit (fire extinguisher, a flash light, radio, water etc.) with you. It should contain all necessary items for your protection and comfort to be sufficient atleast for three days.
- Till date prediction of earthquake is not possible. Don't listen to or spread rumours.

During

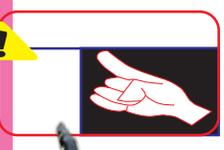
- **STAY CALM!** If you are in bed, hold on and stay there, protecting your head with a pillow.
- If you are outdoors, find a clear spot away from buildings, trees, streetlights, and power lines. Drop to the ground and stay there until the shaking stops.
- If you are in a vehicle, pull over to a clear location, stop and stay there your seatbelt fastened until the shaking has stopped. Avoid bridges, flyovers or ramps that might have been damaged by the quake.
- In a high-rise building, expect the fire alarms and sprinklers to go off. Check for and extinguish small fires, and if exiting, don't use elevators; instead take the staircase and don't rush to the exit point. Get out calmly in an orderly manner to reach open space.
- If in coastal area, move to higher ground and listen to Tsunami warning.
- If you are on a steep hillside in mountainous areas be alert and move away in case of landslides, falling rocks and other debris.

After

- Check yourself and others for injuries and don't use your telephone to call relatives and friends, call only for medical help, move cautiously and check for unstable objects around.
- Listen to Radio, TV for emergency information and safety guidance. Don't use the phone unless it's an emergency.
- Watch out for fallen power lines or broken gas lines, and stay out of damaged areas.
- Anticipate aftershocks, if shaking lasted longer.
- Stay out of damaged buildings. Strong aftershocks can cause further damage to the buildings and weak structures may collapse.

SNAKE AND LADDER GAME FOR EARTHQUAKE AWARENESS

HAVE BETTER UNDERSTANDING OF YOUR ROLES AND RESPONSIBILITIES BEFORE DURING AND AFTER EARTHQUAKES

 100	Take expert advise before making your house and follow Indian seismic codes and guidelines	Stop....!!!! get out of the vehicle and stay away from collapsing structures and debris	Keep Family Disaster Plan ready and practice it regularly	It may not be possible to make earthquake proof buildings; however, it is possible to make buildings earthquake resistant	Do not re-enter badly damaged buildings and do not go near damaged structures	Secure items that might fall (televisions, books, computers, etc.). Install strong latches or bolts on cabinets.	Evaluate the earthquake safety of your building and retrofit/strengthen if advised by experts	 92	Everyone should know what to do in case all family members are not together.
81	Take pictures of the damage, both of the house and its contents, for insurance claims or for documentation purpose.	99	98	97	96	95	94	93	90
80	Do not be Panic: Stay calm and take necessary action		Education is a human right, universal and unavoidable. This right must not disappear o get suspended because of earthquake induced disasters!!	Keep away from beaches and low banks of rivers, A huge wave may sweep it...	 85	 86	 87	Make sure to have a functional network among the Hospitals, fire station, ambulance services, police, community organisations in coherence with city municipality and schools	89
61	If you are driving or walking when earthquake happens	79	...schools built world-wide routinely collapse in earthquakes due to avoidable errors in design and construction, causing predictable, unacceptable and tragic loss of life... we must stop it by all means....	Keep away from old buildings, electricity wires, slopes and walls, which are liable to collapse during Earthquake	77	76	75	Retrofit old structures and implement building codes for new structures	73
60	Protect yourself by staying in the corner of a room, under a table or a bed.		Capacity is the resources of communities to cope with a threat or resist the impact of a hazard. Risk is the probability/likelihood of a disaster happening.	Help neighbors who may require special assistance after the shaking stops	66	65	64	 68	72
 41	Do not use elevators	59	When driving a vehicle pull to the side of the road and stop	Teach all members of your family how to turn off the electricity, water and gas supply....	55	54	53	Do not try to cross bridges/ flyovers, which may be damaged	52
40	Keep corridors of your school free from furniture or other store items	43		Place heavy or bulky objects on the floor or lowest shelves	46	45	44	 49	51
21	School bags can be used to protect head in place of desks	39	If you are in a structurally sound building, stay there	 36	47	46	45	Disasters are seen as the consequence of inappropriately managed risk. Therefore, it is important to look after disaster safe school facilities	31
20	Instead take the "staircase" to reach open space		If you are on a steep hillside, move away in case of landslide and falling rocks	Losses due to natural disasters are 20 times greater (as a percentage of GDP) in developing countries than in industrialized countries	27	26	25	Always remember!! "Earthquakes don't kill people, unsafe buildings do."	30
20	19	18	17	If you are inside an old weak structure take the fastest and safest way out	 15	14	13	During the 2001 Bhuj earthquake in India (M6.9, with a maximum MSK of IX), 971 students and 31 teachers died, and 1051 students and 95 teachers were injured	11
 1	 2	In India about 11% geographical area are in Seismic Zone-V (mostly along the Himalaya), 18% in Zone-IV, 31% in Zone-III and rest in Zone-II	 4	Are you living in a hill area that prone to earthquake, rock falls and landslides? Get your locality checked by experts.	5	Are you living within 300m from coast line? Get your locality checked by experts and take measures against Tsunami/Tidal waves.	6	Are you living in an earthquake prone area with seismic Zone -III, IV & V? Get your home checked by experts for earthquake protection	10

TOLL-FREE EMERGENCY HELPLINE

FIRE-102

AMBULANCE-102

POLICE-100

DISASTER CONTROL ROOM-1077

ORIGINAL DESIGN - ASHISH RANA, STUDENT & DR HEMANT VINAYAK, ASST. PROF., NIT-HAMIRPUR, MODERATION: PROF. C. GHOSH, NIDM