

## EARTHQUAKE PREVENTIONS

### WHEN AN EARTHQUAKE STRIKES:

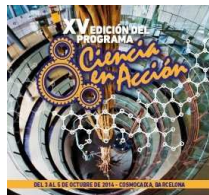
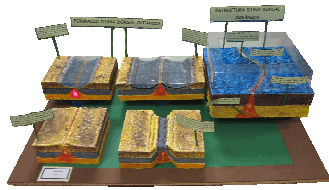
- Keep calm, do not shout. Go to safe areas.
- Stay away from windows, doors, soft objects and any object that can fall.
- If you are on the street, try to go to open areas.



### AFTER AN EARTHQUAKE:

- Issue a complete report of potential damage.
- Don't light matches or electronics.
- Avoid stepping on or touching wires which fell down.
- Listen to the warnings and recommendations of the authorities.

## DEVELOPMENT OF MODELS



## EARTHQUAKES

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<http://www.cordemariavalls.cat/cienciaenaccion2014/terratremols>



## GEOLOGY AND SEISMOLOGY

Geology is the science that analyzes the Earth. It is also the study of the materials which the Earth is built of, and how it works. In the geology group we can find SEISMOLOGY; that's the study of earthquakes and seismic waves.

## WHAT IS AN EARTHQUAKE?

Earthquakes are sudden movements of the superficial layers of the earth, caused by the fracture and displacement of large masses of rock within the crust.

## SCALES: THEY DEPEND ON TWO CONCEPTS

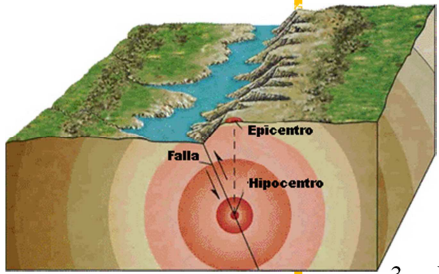
❖ The intensity indicates the effects produced by the earthquake on people, objects, buildings and terrain. The most used scale is called, the **Mercalli** scale. This scale is written with Roman numbers and it consists of twelve degrees.

❖ The magnitude indicates the size of the earthquake, which also indicates the energy released. The best-known one is the **Richter** magnitude scale. It has no limits.



Source: <http://jadonceld.blogspot.com.es/2011/11/construir-frente-terremotos-desafiando.html>

## PARTS OF AN EARTHQUAKE



Source: <https://auladenaturales.wordpress.com/tag/tectonica-global/>

1. **HYPOCENTER:** it is the point inside the earth where the earthquake takes place. The hypocenter is where the breaking of the rocks and the energy release develop.
2. **SEISMIC WAVES:** these are the quakes that from the hypocenter conduct the movement to all directions. There are 3 types of seismic waves:
  - ✦ **P WAVES OR PRIMARY:** these are the fastest, and the first ones to be recorded in seismograms.
  - ✦ **SECONDARY OR S WAVES:** they are slower than the primary ones. They are caused in the hypocenter.
  - ✦ **SURFACE WAVES OR L:** when P and S waves reach the surface they generate the L waves. These waves are transmitted only to the surface and although they move at a low speed they are the most destructive ones.
3. **EPICENTER:** it is the point on the surface where seismic waves reach the top and show the intense effects of the earthquake.

## MAJOR TECTONIC PLATES AND THE RING OF FIRE

- ✓ Pacific plate
- ✓ Nazca plate
- ✓ South American plate
- ✓ North American plate
- ✓ African plate
- ✓ Antarctic plate
- ✓ Indo-Australian plate
- ✓ Euro-Asian plate
- ✓ Philippine plate

The tectonic plates are huge plates or blocks that form the outer layer of the solid Earth. These blocks are in constant motion and they can form convergence, divergence and passive areas. These processes are the responsible of the earthquakes.

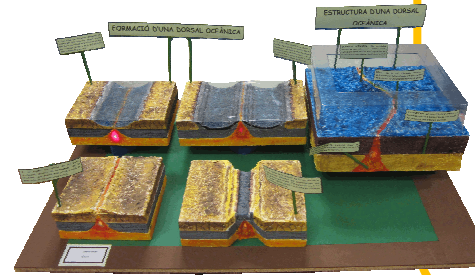
Lithospheric plates can originate three types of boundaries:

- ✦ **DIVERGENT BOUNDARIES.** When plates separate from each other.
- ✦ **CONVERGENT BOUNDARIES.** When plates collide.
- ✦ **PASSIVE LIMITS.** When the plates move laterally.

Source: <http://meioambiente.culturamix.com/blog/wp-content/gallery/terremotos-longe-de-limites-das-placas/terremotos-longe-de-limites-das-placas-02.png>

The Ring of Fire is an area where a large number of earthquakes and volcanic eruptions occur in the basin of the Pacific Ocean.

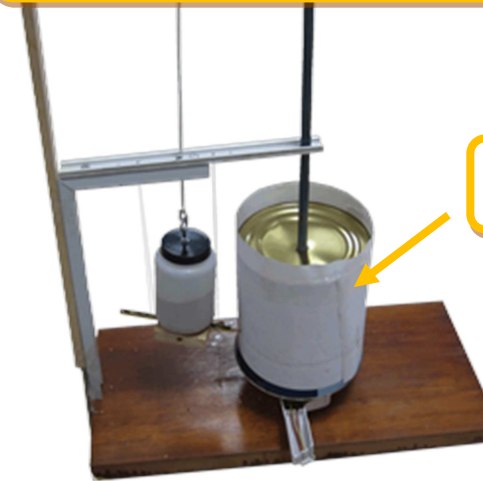
## DIVERGENT LIMIT - A MID-OCEAN RIDGE STRUCTURE



1. **OCEANIC RIDGES:** these are underwater mountains that appear in the limit between two plates that are being pulled apart.
2. **RIFT:** the valley is long, narrow and bounded by faults located in the center part of the ridge.
3. **LITHOSPHERE:** pushes the materials that are around it and it separates causing an ocean expansion.
4. **ASTHENOSPHERE:** the melted material goes out of the earth.

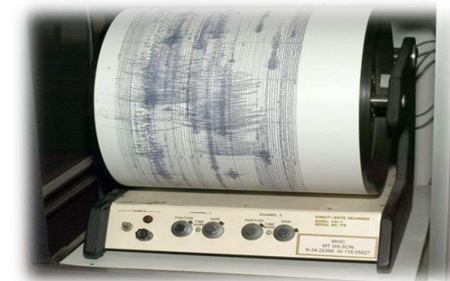
## SEISMOGRAPHS

A seismograph is an instrument used to detect and record earthquakes. The graphs produced by seismographs are called seismograms. Thanks to the seismograms we are able to know the intensity and location of the earthquake.



SEISMOGRAM

SEISMOGRAPH



Source: <http://www.abcradiopro.com/slider/alerta-nueva-replica-sismica-de-5-7-grados-el-norte-de-chile/>