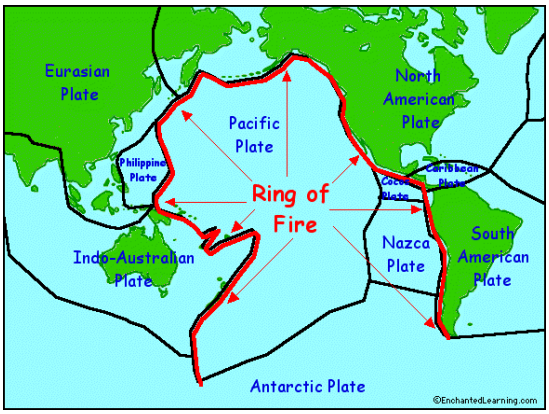
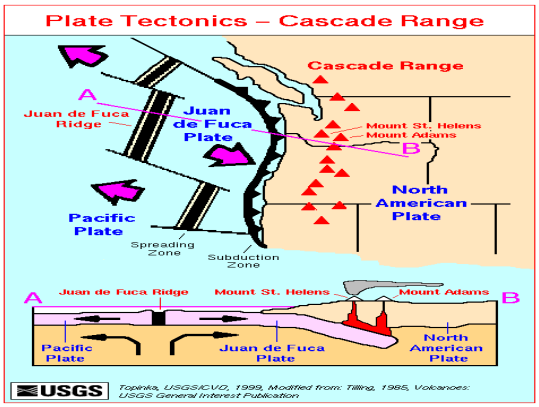
Earthquakes

1. An **earthquake** is a shaking of the ground as the result of a sudden release of energy in Earth's crust.

2. About 80 percent of earthquakes occur in a ring bordering the Pacific Ocean (Ring of Fire).

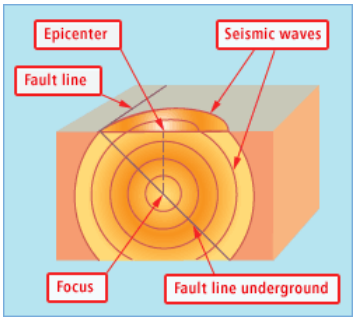
- **Local Significance:** The Juan de Fuca convergent plate boundary west of Vancouver Island has many earthquakes.





3. The **focus** of an earthquake is where the pressure is finally released.

- The **epicentre** is the point on the surface directly above the focus.



4. Earthquakes occur at various depths, depending on the plates involved (Table 12.1).

- Earthquakes at the surface tend to cause more damage.

TABLE 12.1 Classification of Earthquakes

Classification	Depth of Focus
Shallow focus	0 to 70 km
Intermediate focus	70 to 300 km
Deep focus	Greater than 300 km

Seismic Waves

Energy released by an earthquake produces vibrations called ***seismic waves.***

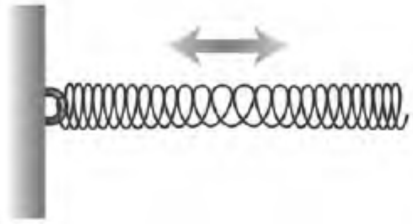
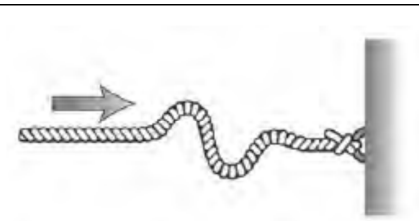
- Seismic waves reveal the source and strength of an earthquake.
- Seismic waves also help us learn about the composition and size of Earth's interior layers since the waves behave differently in different layers.

1. **Primary waves (P-waves): Compressional motion-underground**
   • P-waves travel through solids, liquids, and gases.
   • P-waves are the fastest (6km/s)

2. **Secondary waves (S-waves): Up-down or side-side motion-underground**
   • S-waves travel through solids but <u>not</u> liquids.
   • S-waves are slower and are the second waves to arrive after an earthquake (3.5km/s).

3. **Surface waves (L-waves)** are seismic waves that ripple along Earth's surface like ripples on a pond
   • L-waves usually cause more structural damage than P-waves.
   • L-waves are the slowest and the last waves to arrive after an earthquake.

Summary: Fill in the Chart

Wave	Full Name	Description	Ground Motion Sketch
P			
S			
L			

Name:_____
Pd:___**Date:**_____

Quick Check #5

1. What is the difference between the focus of an earthquake and the epicentre of an earthquake?

_____
_____
_____

2. What are three kinds of earthquake waves and how do they differ?

(a)

_____
_____

(b)

_____
_____

(c)

_____
_____

Measuring Earthquakes

Richter Scale: Scientists measure earthquakes using the Richter scale. This scale, invented in 1934 by California scientist Charles Richter, measures the magnitude of an earthquake, and the result is a number from 0 to 10, as measured on a machine called a **seismograph.**

An increase of 1 in magnitude = 10X stronger
Example: A magnitude 6 earthquake is 100× more powerful than a magnitude 4 earthquake.

RICHTER SCALE

Magnitude	Description	What it feels like	Frequency
Less than 2.0	Micro	Normally only recorded by seismographs. Most people cannot feel them.	Millions per year.
2.0–2.9	Minor	A few people feel them. No building damage.	Over 1 million per year.
3.0–3.9	Minor	Some people feel them. Objects inside can be seen shaking.	Over 100,000 per year.
4.0–4.9	Light	Most people feel it. Indoor objects shake or fall to floor.	10,000 to 15,000 per year.
5.0–5.9	Moderate	Can damage or destroy buildings not designed to withstand earthquakes. Everyone feels it.	1,000 to 1,500 per year.
6.0–6.9	Strong	Wide spread shaking far from epicenter. Damages buildings.	100 to 150 per year.
7.0–7.9	Major	Wide spread damage in most areas.	10 to 20 per year.
8.0–8.9	Great	Wide spread damage in large areas.	About 1 per year.
9.0–9.9	Great	Severe damage to most buildings.	1 per 5-50 years.
10.0 or over	Massive	Never Recorded.	Never recorded.

Earthquake-Grab-and-Go Kit

Over the weekend, create a kit for yourself and encourage family members to create one as well.

Take a picture of your kit with yourself in it and bring it in on Monday to share.

Every person in your family should have their own customized evacuation kit at home and at work. Think of what other possible items you may need in case of an emergency (ie. medication, glasses, documents, pet food for pet). Keep the kits by the front door, where they will be easy to find if you need to evacuate quickly.

Check your kits twice per year to replace any expired food, batteries, and medicine. A good reminder to check is when changing your clocks for daylight savings in the spring and fall.

- Backpack or tote bag (to carry the kit items)
- Blanket or sleeping bag
- 2 Garbage bags
- Bottled water
- Candles and matches or a lighter
- Clothing and shoes (one change, comfortable and all-season)
- First aid kit (at least some bandages and gauze)
- Flashlight and batteries
- Food that requires no cooking
- Money (including coins)
- Playing cards and games
- Radio and batteries, or crank radio (to listen to news and public advisories)
- Toilet paper and personal hygiene supplies
- Whistle