

## REVIEW ... Key Concepts

# Unit 5 – Planet Earth

### 1.0 Changes on the Earth's Surface

- ❖ Layers: **Crust, Mantle, Core** (Inner and Outer)
- ❖ **Earthquakes** and **Volcanoes** can suddenly change the Earth's surface
- ❖ Scientist's use a variety of tools and technologies to investigate the Earth's forces
- ❖ Wind, water and ice change the Earth's surface slowly

### 2.0 Rock Cycle

- ❖ Rocks are composed of minerals and have distinctive characteristics
- ❖ Three classes include: **igneous, metamorphic** and **sedimentary**
- ❖ Breaking down and transforming rock is explained in the **rock cycle**
- ❖ Sedimentary rocks are the most common found in Alberta

### 3.0 Landforms change

- ❖ The **Theory of Plate Tectonics** describes the huge chunks of rock called plates that move on the Earth's surface
- ❖ Continents and Ocean floors are carried on the plates which are moving on the partly melted mantle
- ❖ The collisions and rubbing together of these plates forms the mountains

### 4.0 Fossils – Evidence of Earth's Changes over Time

- ❖ **Fossils** are living or non-living things preserved in stone
- ❖ Fossil evidence is interpreted and conclusions are based mostly on inferences because the fossil remains are incomplete
- ❖ **Geological Time** divides the history of the Earth into four periods, called **Eras**.
- ❖ Determining what animals and plants looked like from fossil records is often based on inferences

## 1.0 Changes on the Earth's Surface

❖ Layers: **Crust, Mantle, Core** (Inner and Outer)

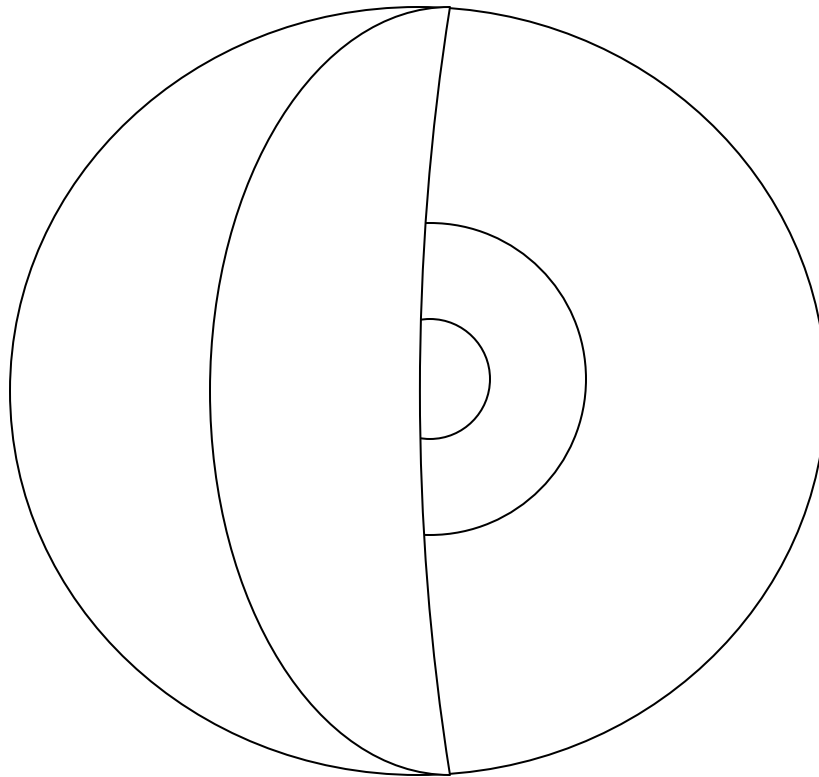
What is a **model** and when is it useful? \_\_\_\_\_

\_\_\_\_\_

Who are **geologists**? \_\_\_\_\_

\_\_\_\_\_

Illustrate, label and color the different **layers of the Earth**

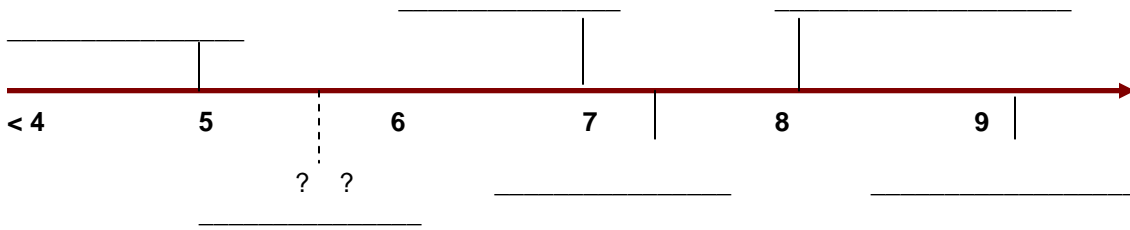


Facts about the Earth's different layers

	<b>Thickness</b>	<b>State</b>	<b>Characteristic Features</b>
<b>Crust</b>			
<b>Mantle</b>			
<b>Outer Core</b>			
<b>Inner Core</b>			

❖ **Earthquakes and Volcanoes** can suddenly change the Earth's surface

Complete the list of major **Canadian Earthquakes** in order of their magnitude (highest to lowest)



Illustrate and describe what happens during an earthquake.

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What is the difference between an **epicenter** and a **focus** in an earthquake?

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How are earthquakes measured?

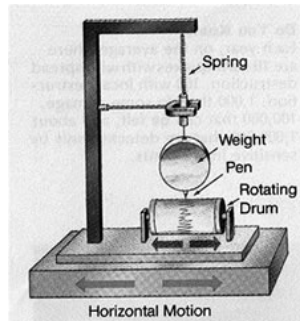
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Illustrate and identify the **process** that happens during a **volcanic eruption**.

❖ Scientist's use a variety of tools and technologies to investigate the Earth's forces

Identify the following **tools and techniques** that are used by scientists who study volcanoes (volcanologists).



❖ Wind, water and ice change the Earth's surface slowly

Describe and give examples of three different kinds of **weathering**.

Type	Description	Examples
_____	_____ _____ _____	_____ _____ _____
_____	_____ _____ _____	_____ _____ _____
_____	_____ _____ _____	_____ _____ _____

What is the difference between **weathering** and **erosion**?

\_\_\_\_\_  
\_\_\_\_\_

What is **deposition** and **sedimentation**?

\_\_\_\_\_  
\_\_\_\_\_

Describe a **fluvial landform**.

\_\_\_\_\_  
\_\_\_\_\_

What developments led to the **landslide** (mudslide) in Vancouver – in January 2005?

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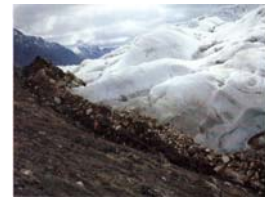
Identify the **glacial features** created - by glacial movement - using the descriptions given



A large boulder that is left behind when a glacier melts or recedes.



Small hill formed by a receding glacier.



Piles of rocks and boulders that are left behind in pits or groupings when a glacier melts



Scrapings left behind in bedrock from the action of an advancing or retreating glacier.



A hollow area that traps a large chunk of a glacier when it melts.



A snake-like hill filled with eroded rock fragments and soil, that is left behind when a glacier melts or retreats

Identify the different forces that act to shape the surface of the Earth by the speed of their action.

**Gradual Transformation of the Landscape**

**Sudden Change in the Earth's surface**


## 2.0 Rock Cycle

❖ Rocks are composed of minerals and have distinctive characteristics

Minerals are pure, naturally occurring solid materials forming the building blocks of rocks. The majority of rocks are made from combinations of five different minerals found in the Earth's crust. Identify these five minerals by their properties.

Properties	Quartz	Calcite	Feldspar	Mica	Hornblende
Color					
Lustre					
Streak					
Cleavage					
Fracture					
Hardness					

Use a relative description to identify the hardness of a mineral, referred to by Moh's Hardness Scale

<b>Moh's Hardness Scale</b>	<b>Description of the how hard a mineral is ...</b>
1	<i>very easily scratched with a fingernail</i>
2	
3	
4	
5	
6	
7	
8	
9	<i>cuts glass and scratches a steel file</i>
10	

❖ Three classes include: **igneous, metamorphic** and **sedimentary**

Describe how each type of rock is formed

**Igneous** (intrusive) \_\_\_\_\_

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**Igneous** (extrusive) \_\_\_\_\_

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**Sedimentary** \_\_\_\_\_

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**Metamorphic** \_\_\_\_\_

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Describe the **high-tech tools** used by geologists to find minerals in the Earth's crust

**Remote Sensing** \_\_\_\_\_

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**Geophysical Prospecting** \_\_\_\_\_

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**Geochemical Prospecting** \_\_\_\_\_

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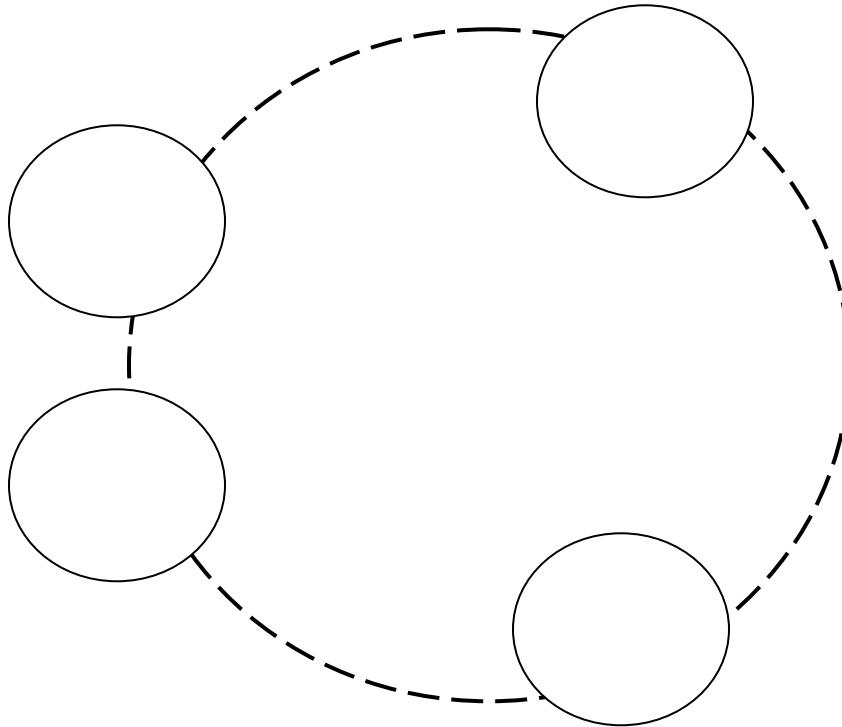
**Exploration** \_\_\_\_\_

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❖ Breaking down and transforming rock is explained in the **rock cycle**

Illustrate and label the rock cycle and the processes that occur within it.



❖ Sedimentary rocks are the most common found in Alberta

What is below the **overburden** in Alberta?

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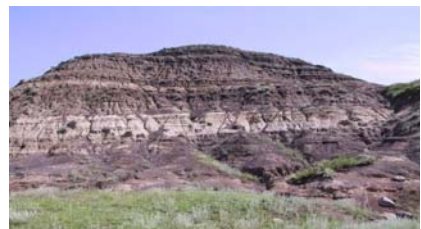
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What does this picture tell you about the types of rocks found here.

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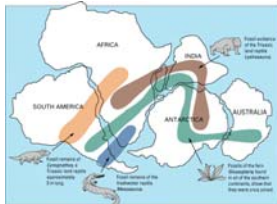
### 3.0 Landforms change

Briefly describe what **Alfred Wegener**

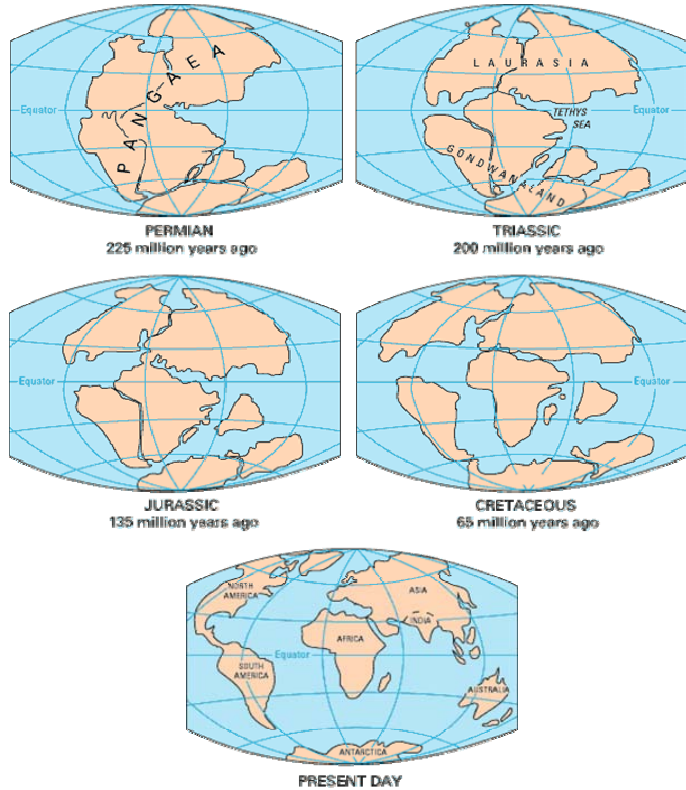


tried to prove in his **Theory of Continental Drift**. Include reference to the evidence he collected to prove his theory:

❖ Fossils



- ❖ Mountains
- ❖ Glaciers
- ❖ Coal



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- ❖ The **Theory of Plate Tectonics** describes the huge chunks of rock called plates that move on the Earth's surface. Animation: <http://www.ucmp.berkeley.edu/geology/anim1.html>

What technologies helped to prove Wegener's theory about Continental Drift, and laid the framework for the new **Theory of Plate Tectonics**?

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Illustrate what is happening along the Mid-Atlantic ridge that has helped scientists develop this theory of plate tectonics (moving plates).



❖ Continents and Ocean floors are carried on the plates which are moving on the partly melted mantle

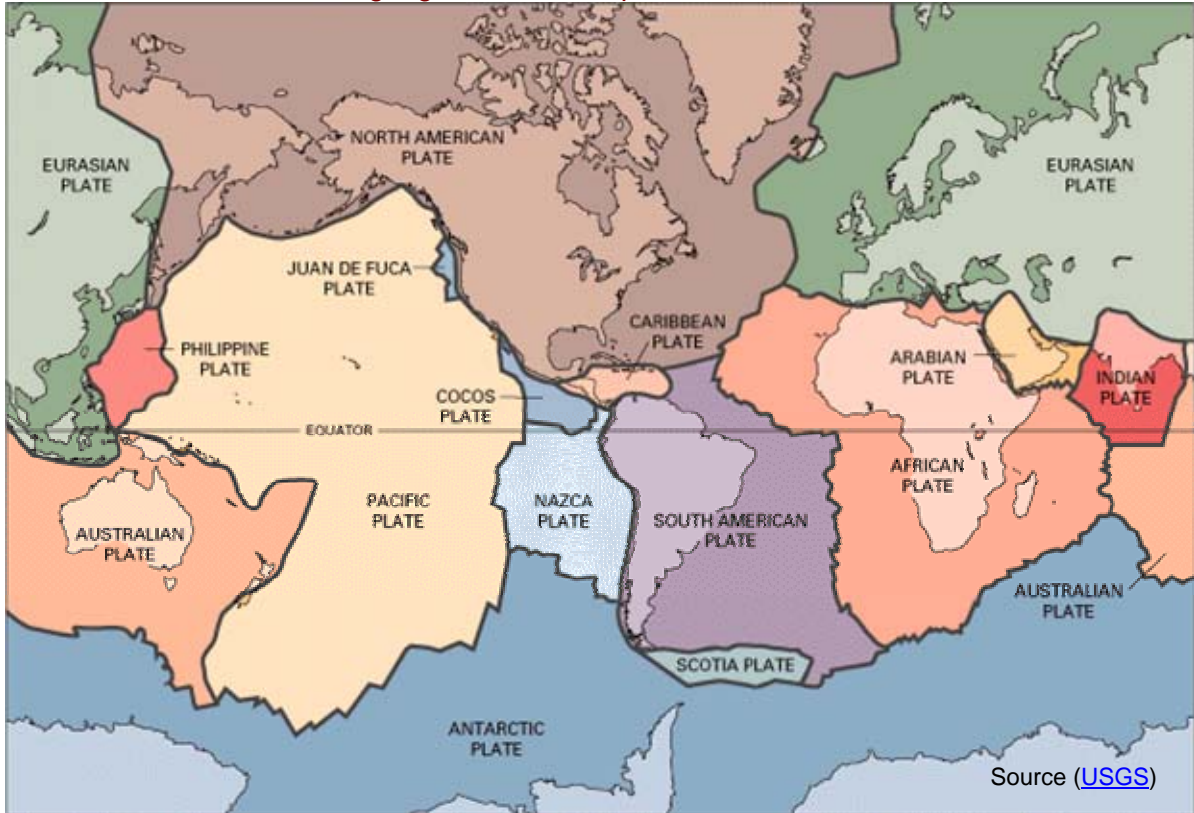
Illustrate the different types of plate boundaries showing how they interact with each other.

**Diverging  
Boundaries**

	<b>Subduction</b>	<b>Collision</b> (up and over)
<b>Converging Boundaries</b>		

**Transform  
Boundaries**

❖ The collisions and rubbing together of these plates forms the mountains



Using your knowledge of plate tectonics, describe the various types of mountains formed on the Earth's surface.

**Folded Mountains**

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**Thrust Fault Mountains**

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**Fault Block Mountains**

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## 4.0 Fossils – Evidence of Earth’s Changes over Time

❖ **Fossils** are living or non-living things preserved in stone



How are fossils formed?

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Briefly describe and illustrate (sketch) 4 different types (classifications) of fossils found by paleontologists.

Sketch	Type of Fossil	Description
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- ❖ Fossil evidence is interpreted and conclusions are based mostly on inferences because the fossil remains are incomplete

Describe how scientists are able to reconstruct plants and animals from millions of years ago and show the environmental interactions that were going on at that time, just from fragments of evidence.

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Explain the significance of the following fossil discoveries ...

*Burgess Shale* \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

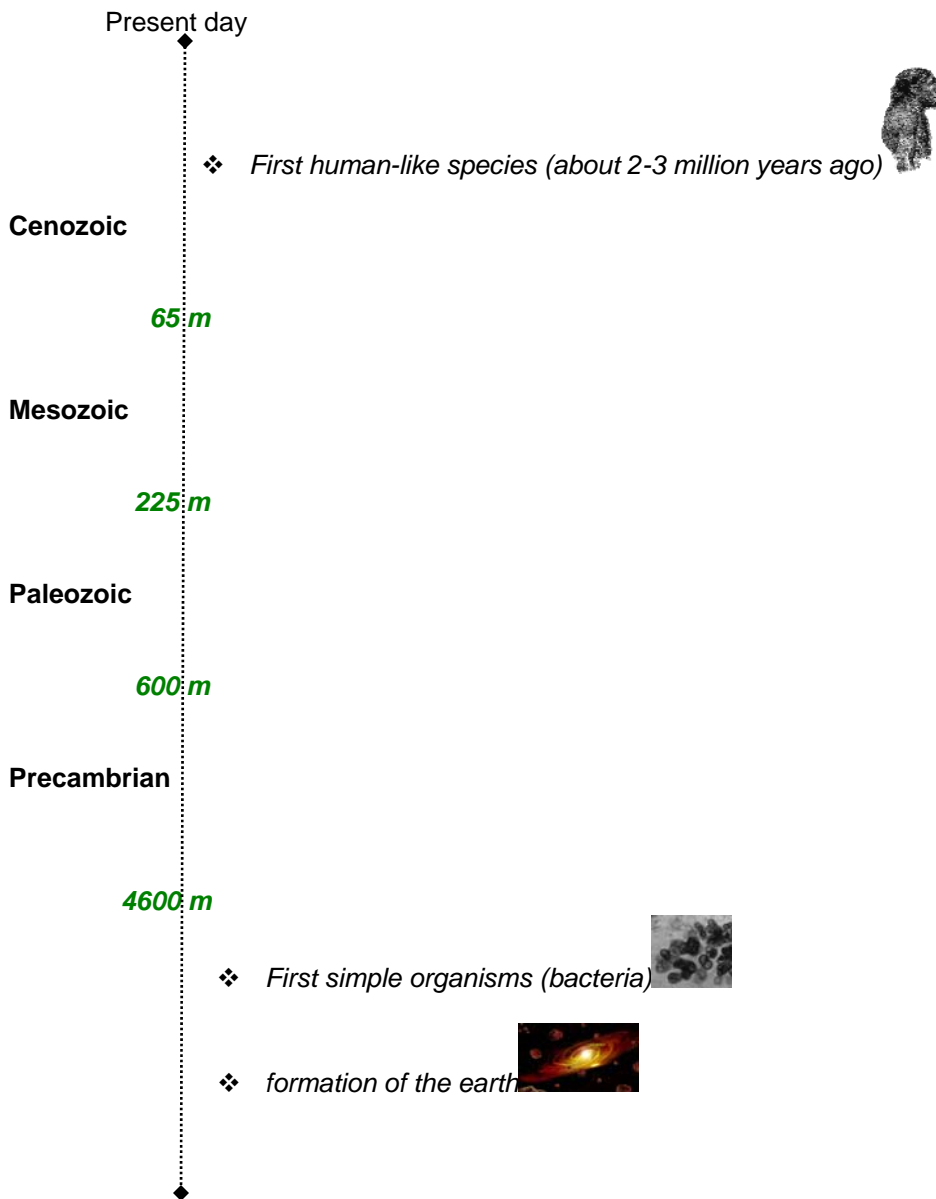
*Albertosaurus* \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- ❖ **Geological Time** explains the history of the Earth

Illustrate the evolution of the Earth



Use the **Geological Timeline** to illustrate and list important developments in different **ERAS**



❖ **Determining what animals and plants looked like from fossil records**

What do scientists rely on to recreate the past from fragments of fossils found in rock?

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