



Rocks

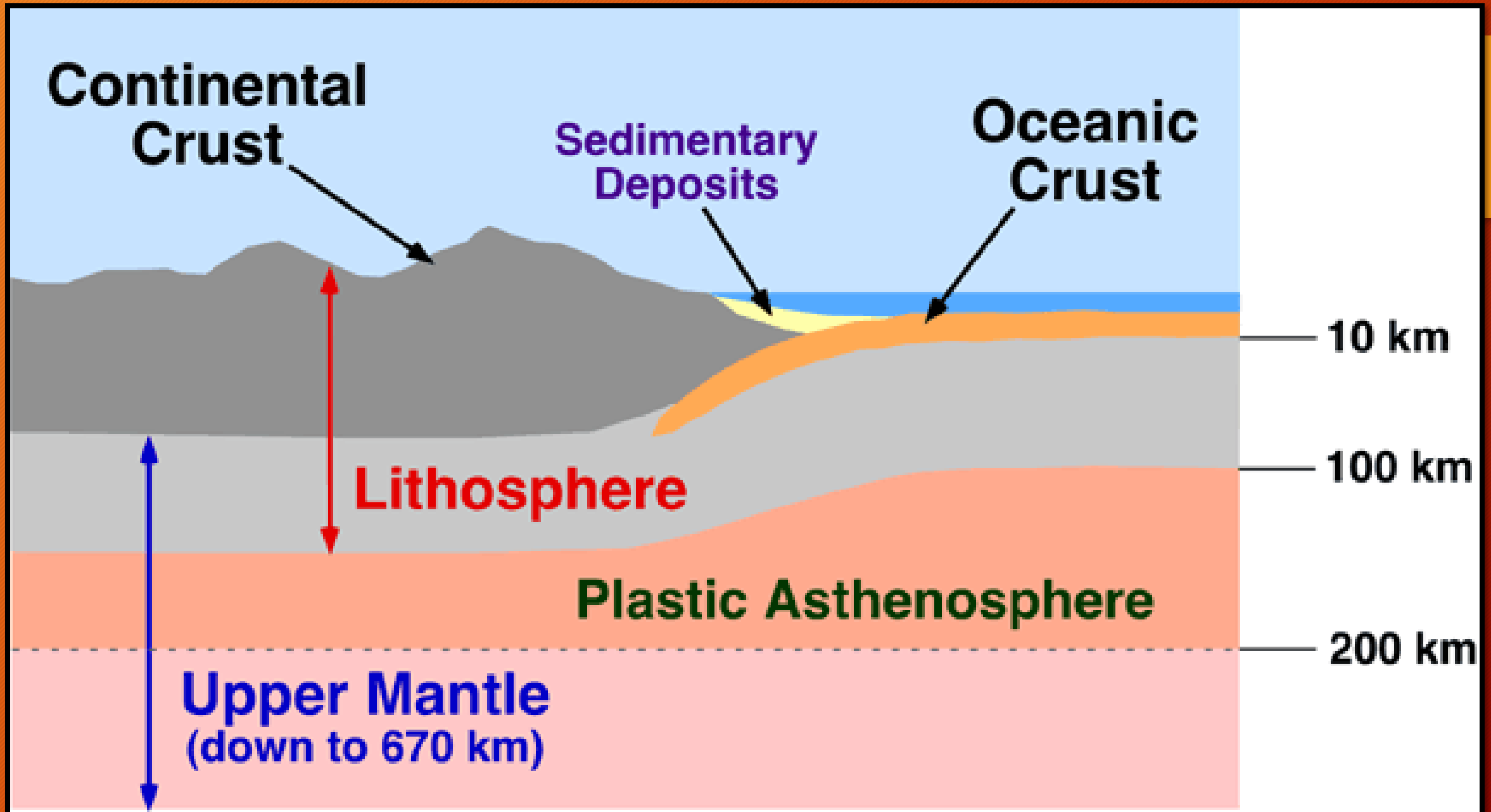
Recall: Lithosphere

The LITHOSPHERE is a rigid structure that is made up of the Earth's crust and part of the upper mantle

It is between 70km and 150 km thick

It contains minerals the plants need

It contains several important natural resources





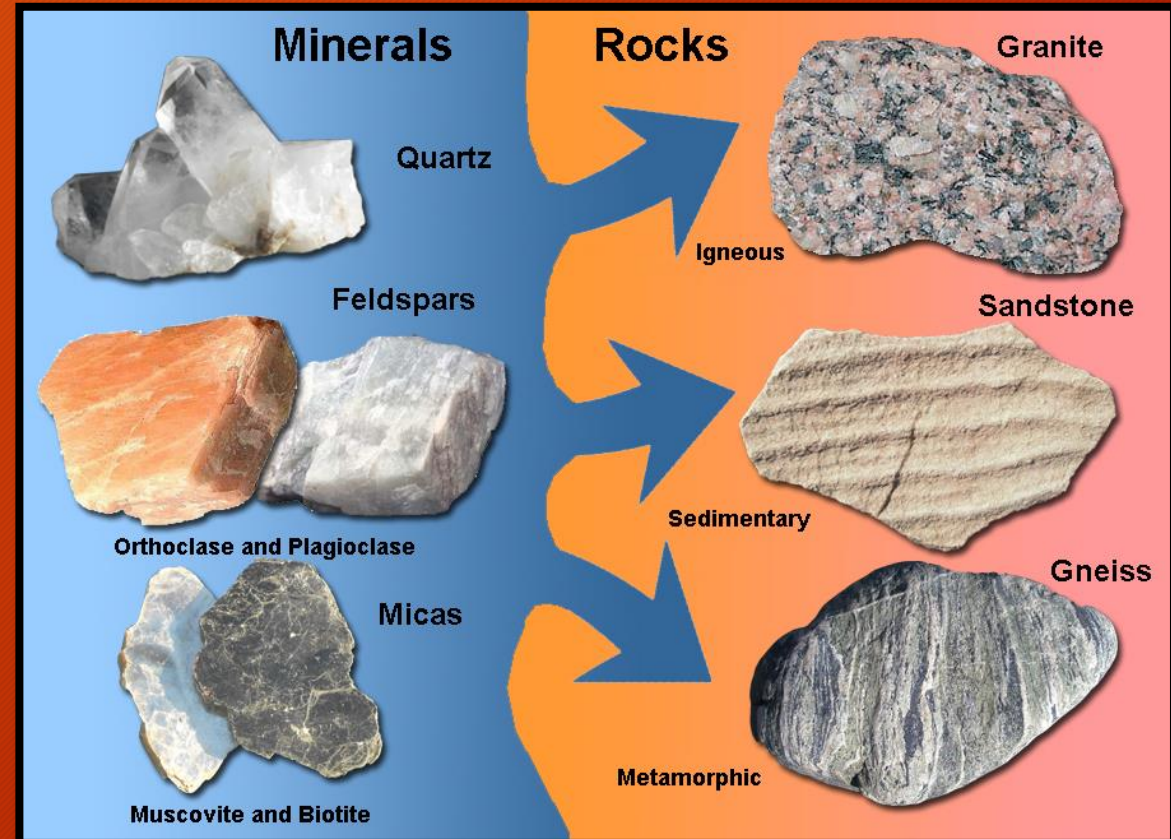
What is the difference
between rocks and
minerals?

Minerals

- **Mineral:** solid, inorganic (**non-living**), **pure** (homogeneous) substance which:
 - Occurs **naturally**
 - Has an ordered atomic structure which forms **crystals**
- There are 4000 known minerals on Earth

Rocks

- **Rocks:** are a collection of different minerals
 - A mixture (heterogeneous blend)
- They are highly **compacted** and formed through various geological processes



Ore

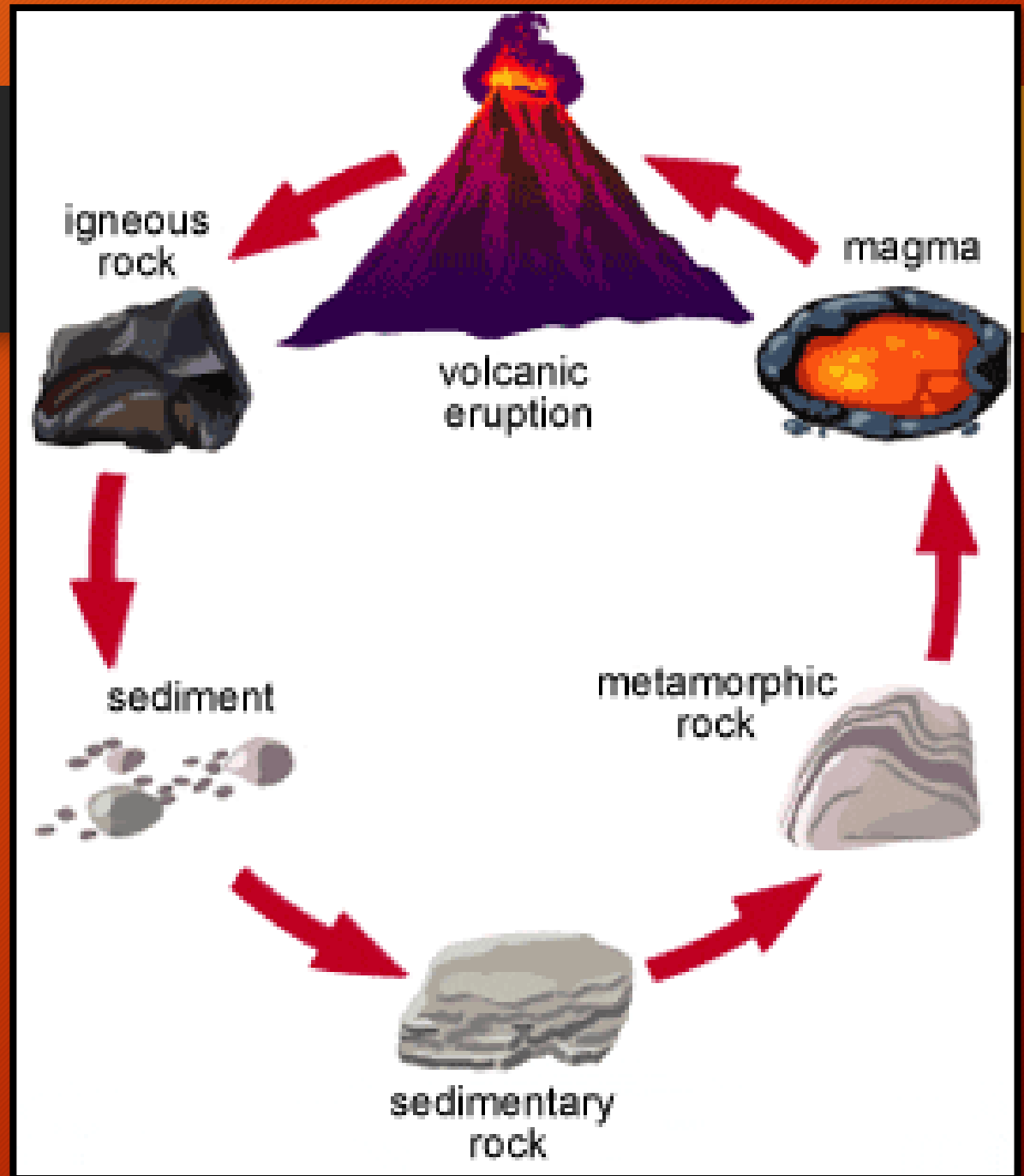
- We rarely find minerals in their pure form
 - They need to be **mined** and extracted from rock
 - When **precious minerals** are extracted from the lithosphere they are called **ore**
- **Ore**: a rock containing a mineral that is **mined for profit** (*See page 303 in textbook*)

Rocks

Types of Rocks

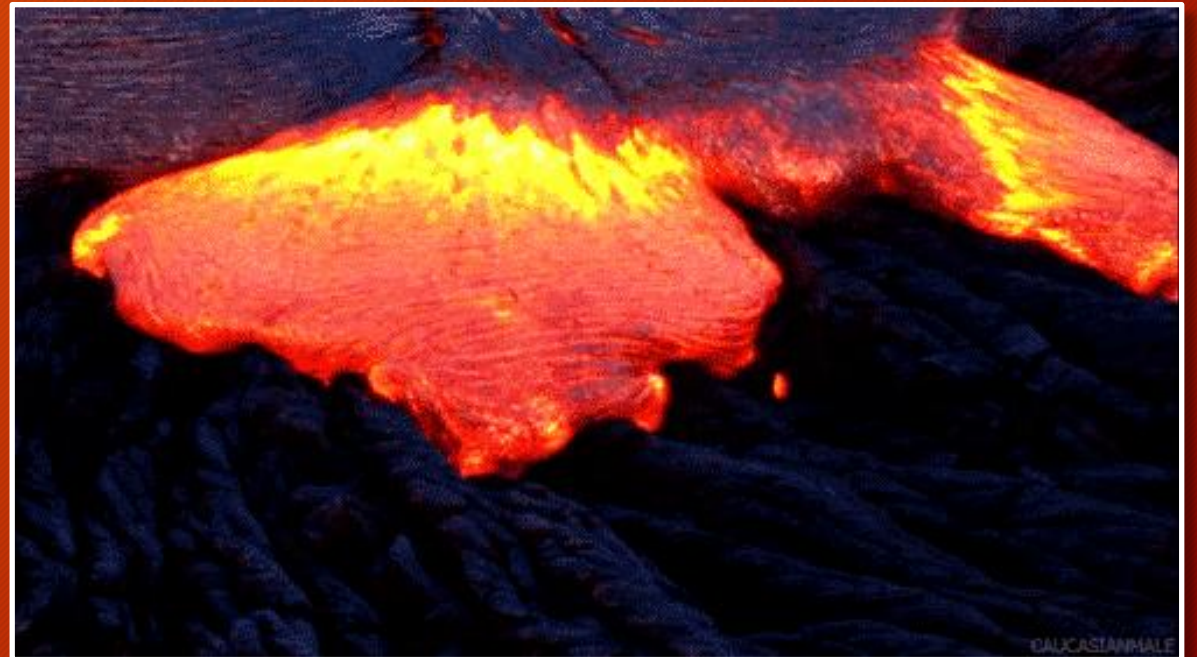
- There are 3 types of rocks:

- **Igneous**
- **Sedimentary**
- **Metamorphic**



Igneous rock

- **Igneous rock** is formed by **magma** (molten rock) being cooled and becoming solid
- Makes up approximately **90%** of the Earth's crust



Igneous Rock - 3 Types

- There are 2 main types of igneous rock:
- **Intrusive** igneous rock
- **Extrusive** igneous rock

Igneous Rock - Intrusive

Intrusive (or Plutonic) Igneous Rock

- Slow cooling of magma within the Earth's crust
- Has large crystals
- Example: Gabbro



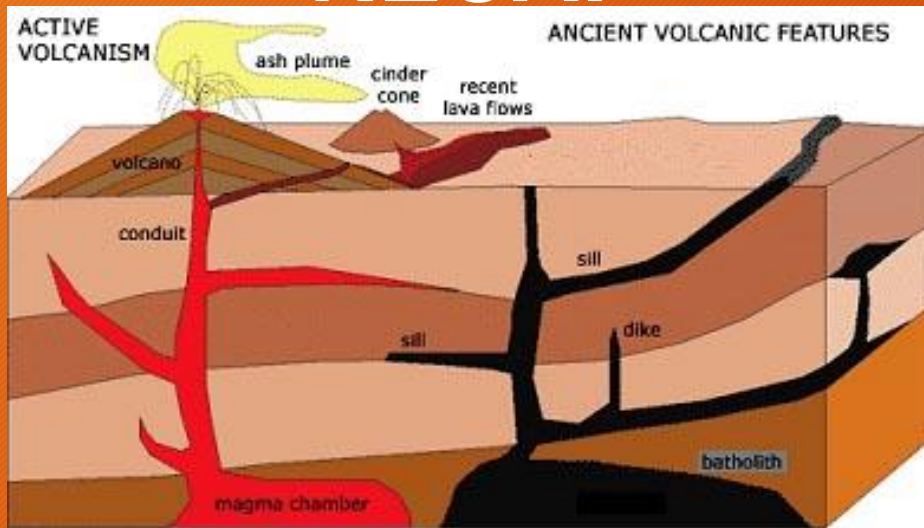
Igneous Rock - Extrusive Igneous

Extrusive or Volcanic Rock

- Formed when **lava cools** in contact with **air or water**
- Has **microscopic** crystals
- Example: Obsidian

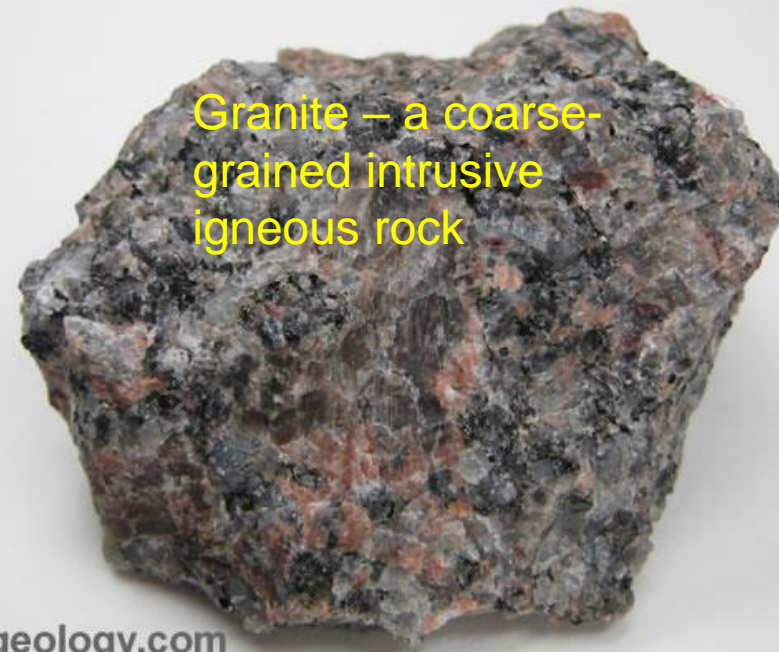


RECAP



Intrusive – rocks made by the freezing of magma **underground**.

Extrusive – rocks that form above ground, after lava spills out and extrudes **on the surface** of the Earth.



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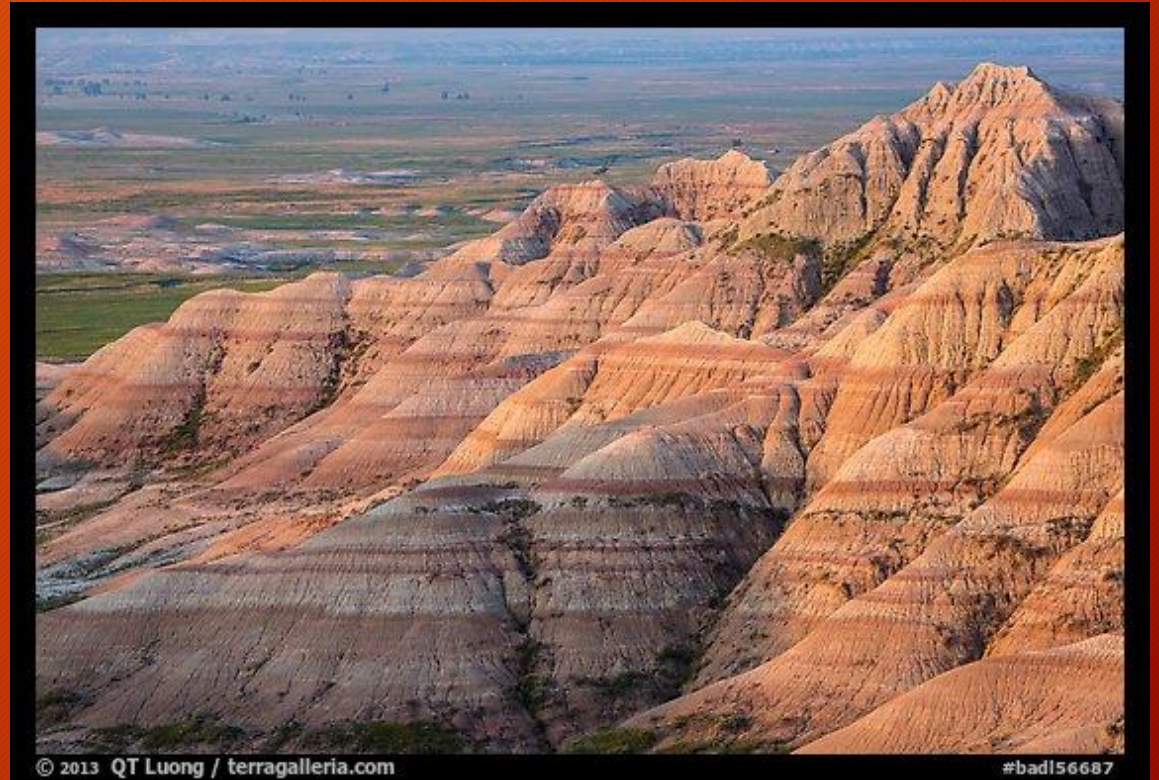
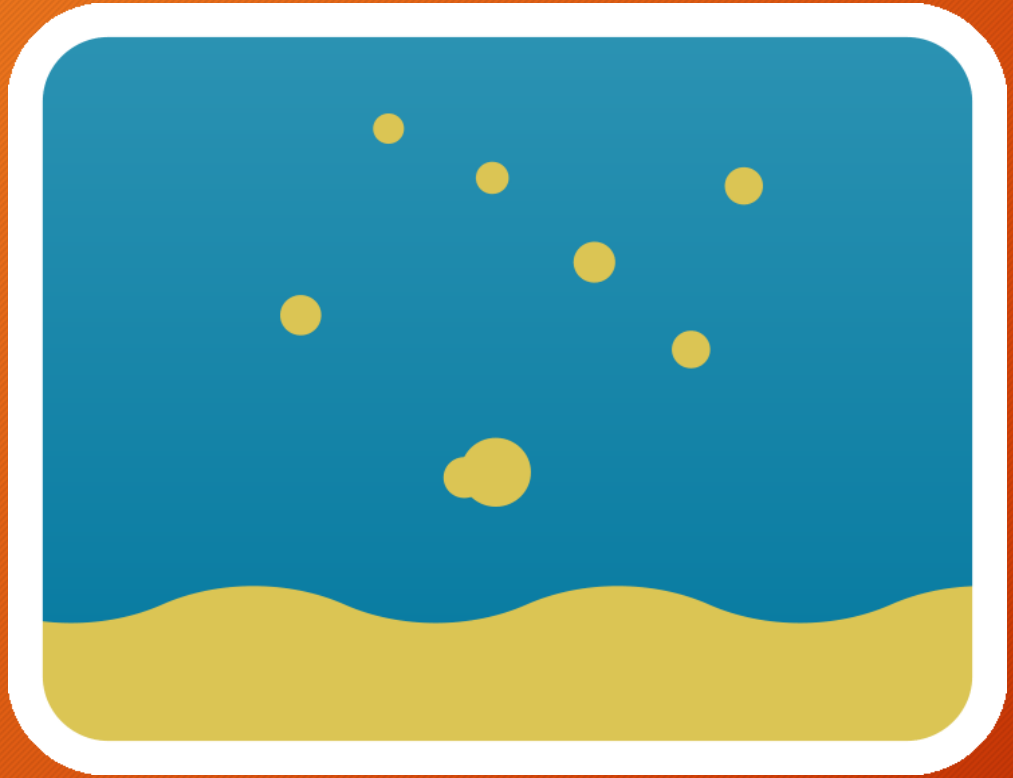


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Sedimentary rock

- Created by pressure **compacting sediment** (small particles being carried away from **erosion**)
 - Create **layers** ex: limestone
- They may preserve signs of life and surface activity:
 - Like **fossils**, tracks, ripple marks, etc.

Sedimentary rock



Metamorphic rock

- Rock that has been trapped under the Earth's crust for a **LONG time**
 - The **heat** and **pressure** causes the rock to transform
 - Ex: slate, marble, schist
- Come in a lot of different colours
- Often see signs of **stretching or squeezing** (ex: wavy stripes)

Metamorphic rock



Rock Cycle

- Each of the three categories of rock **can be turned into the other!** As such, rock formation is not a straight line but rather a cycle...

