

Types of Rocks

How they're formed and how to tell them apart

Teach **THIS**

Types of Rocks

- Scientists who study rocks are known as Geologists
- Geologists sort all rocks into 3 categories based on how the rocks were formed
- Those three categories are:
 - Igneous Rocks
 - Sedimentary Rocks
 - Metamorphic Rocks

Igneous Rock

- Igneous rocks are formed when molten hot rock cools down and turns from a fluid into a solid.
- This can happen either at the earth's surface (volcanic) or under the surface (plutonic).



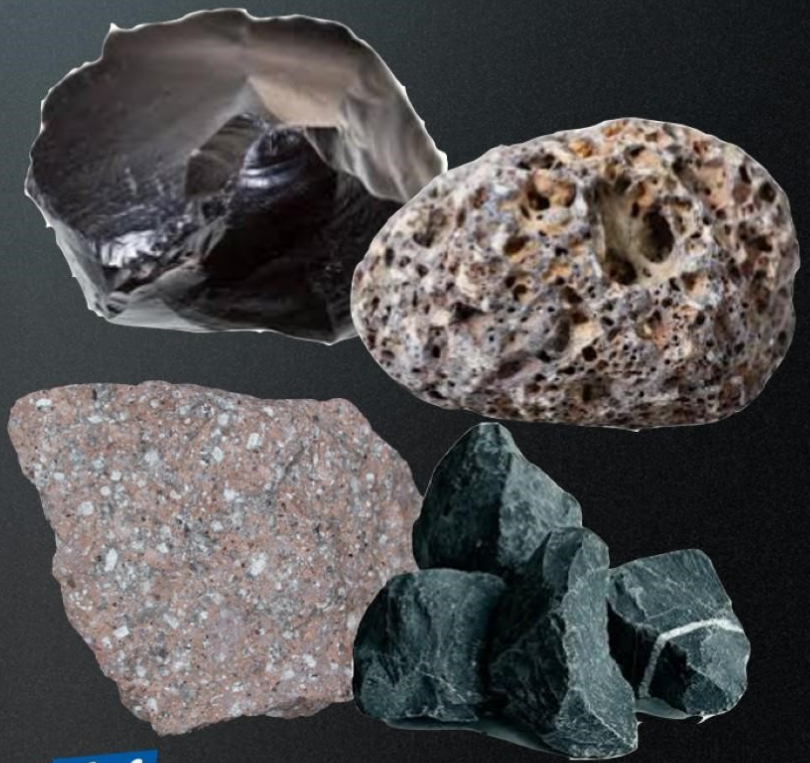
Volcanic Igneous Rock

- Also known as extrusive, this rock is formed when molten rock (magma) comes through the earth's surface.
- When magma comes to the surface we call it lava which cools fairly rapidly.
- This rock usually has small crystals.



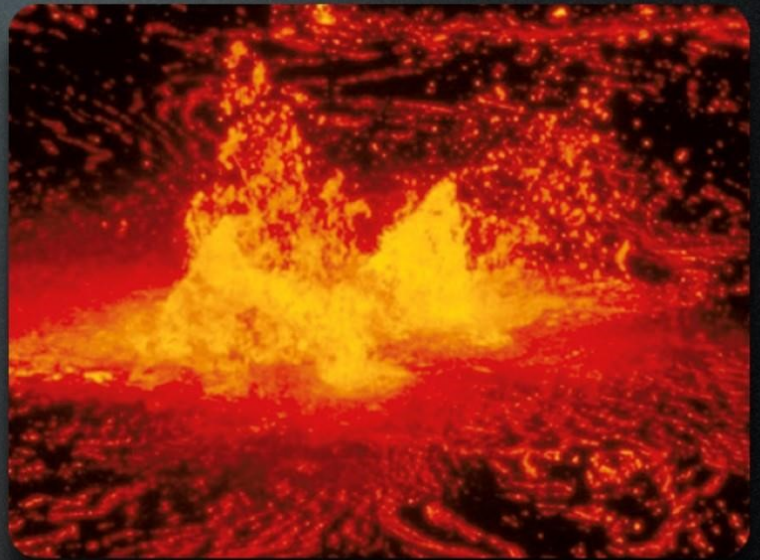
Volcanic Igneous Rock

- Examples of this rock include Basalt, Obsidian, Rhyolite and Pumice.



Plutonic Igneous Rock

- Also known as intrusive, this rock is formed when magma cools and solidifies below the earth's surface.
- This rock cools slowly, which means it has more time to develop larger crystals.



Plutonic Igneous Rock

- Examples of this rock include Diorite, Gabbro, Granite, Peridotite and Kimberlite (which contains diamonds).



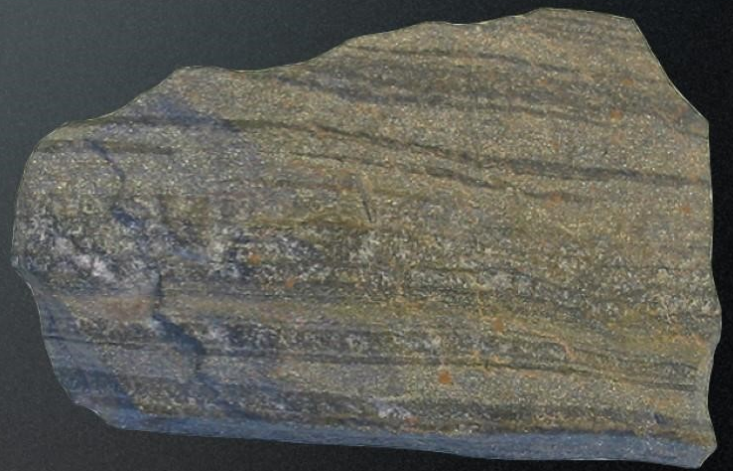
Sedimentary Rock

- Sedimentary rocks are formed when the forces of wind, rain, snow, and ice break down rocks on the surface and carry them away as sediment.
- Eventually this sediment gets stuck or comes to rest, usually at the bottom of a lake or river, and solidifies into a new rock (Lithification).



Sedimentary Rocks

- After one layer solidifies, a new layer will begin to develop on top, over time stacking many layers on top of each other
- Often the layers of sediment are still visible in Sedimentary rocks



Sedimentary Rocks

- Fossils are almost exclusively found in sedimentary rock
- They are created when an object or impression is left in one layer that is later covered up by a new one



Sedimentary Rocks

- Fossils help scientists figure out how old the rocks from a certain area are
- Because each new layer goes over the top of older ones, the older something is, the further down you'll find it
- So if scientists know a creature went extinct 10 million years ago, they know the layer with it's fossil must be at least 10 million years old



Sedimentary Rocks

- Example of sedimentary rock are Sandstone, Limestone, Mudstone, Claystone, which tell you what sediment they're made from
- Chalk, Coal, and Flint are other examples of Sedimentary rocks



Metamorphic Rock

- Just like an insect or an amphibian, when a rock goes through a metamorphosis, it changes forms.
- Metamorphic rock always starts as a different kind of rock, (usually sedimentary).



Metamorphic Rock

- When rocks get put under intense pressure or heat they begin to harden and develop bigger crystals.
- This heat and pressure usually happens near tectonic plate boundaries where the plates rub together or get forced under another plate.



Metamorphic Rock

- The final type of metamorphic rock depends on what it started as, the amount of pressure that was placed on it, the amount of heat, and the amount of time it was under pressure and heat.



Metamorphic Rock



Limestone

+

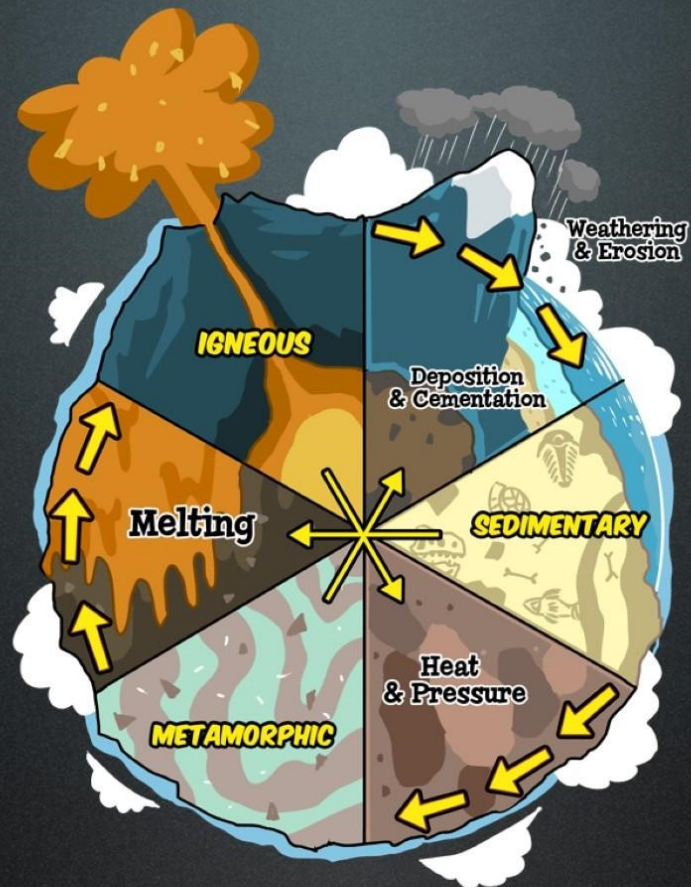


Heat &
Pressure

=



Marble

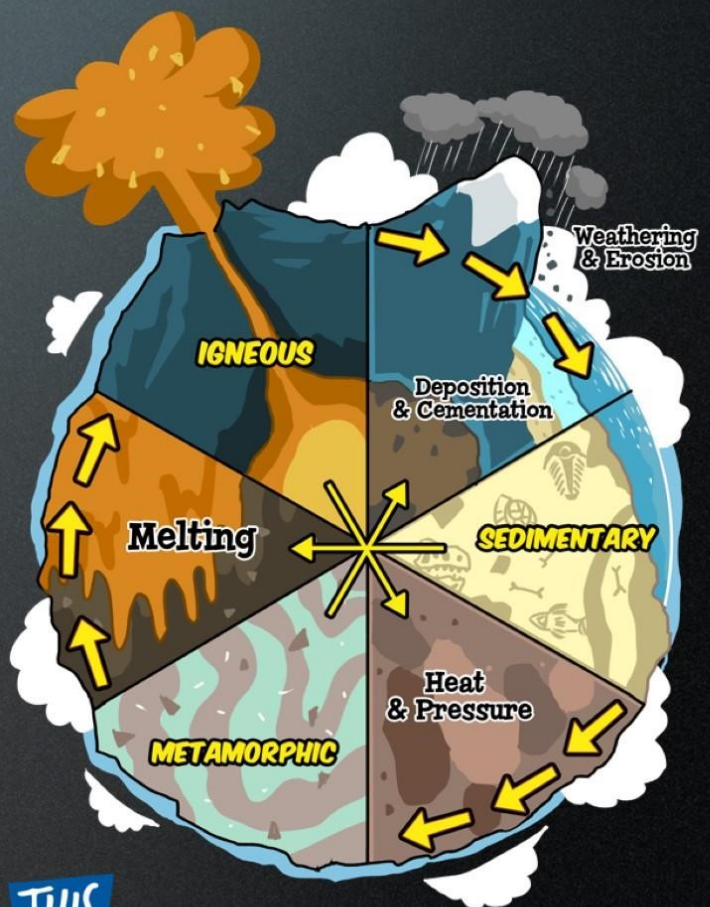


Rock Cycle

Teach **THIS**

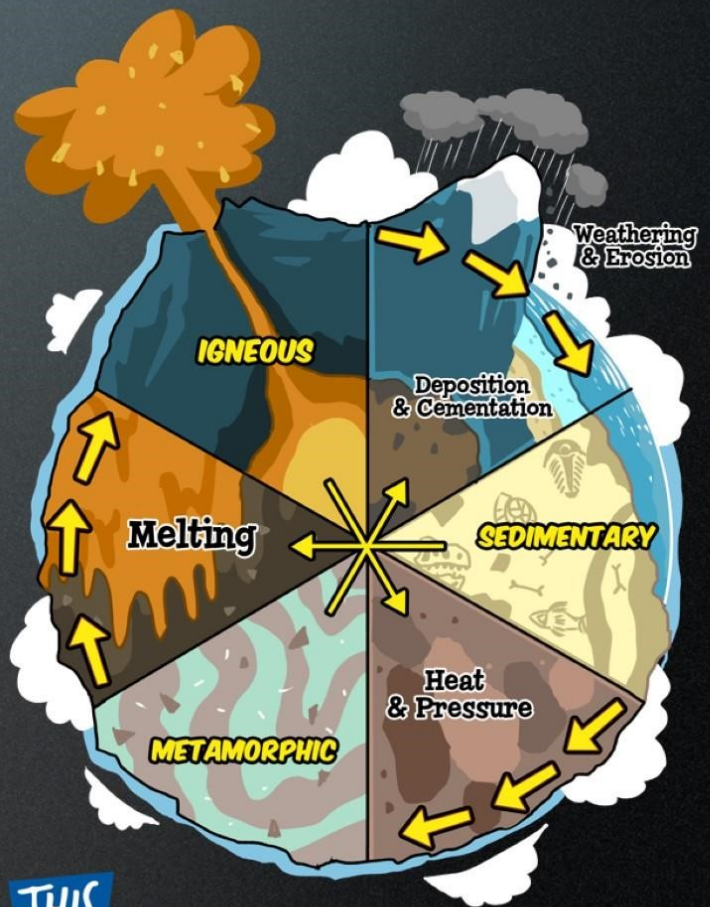
Rock Cycle

- All three types of rocks are constantly changing, sometimes from one type to the other.



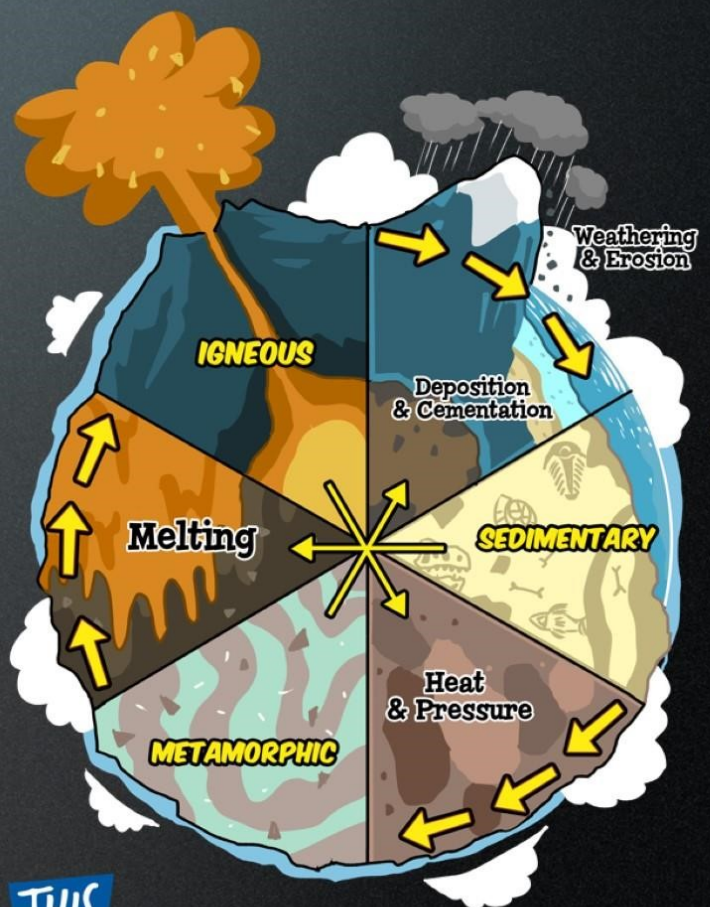
Rock Cycle

- Igneous, Sedimentary, and Metamorphic rocks are always being broken down by the wind, rain, ice and snow, which makes sediment.
- That sediment forms sedimentary rocks.



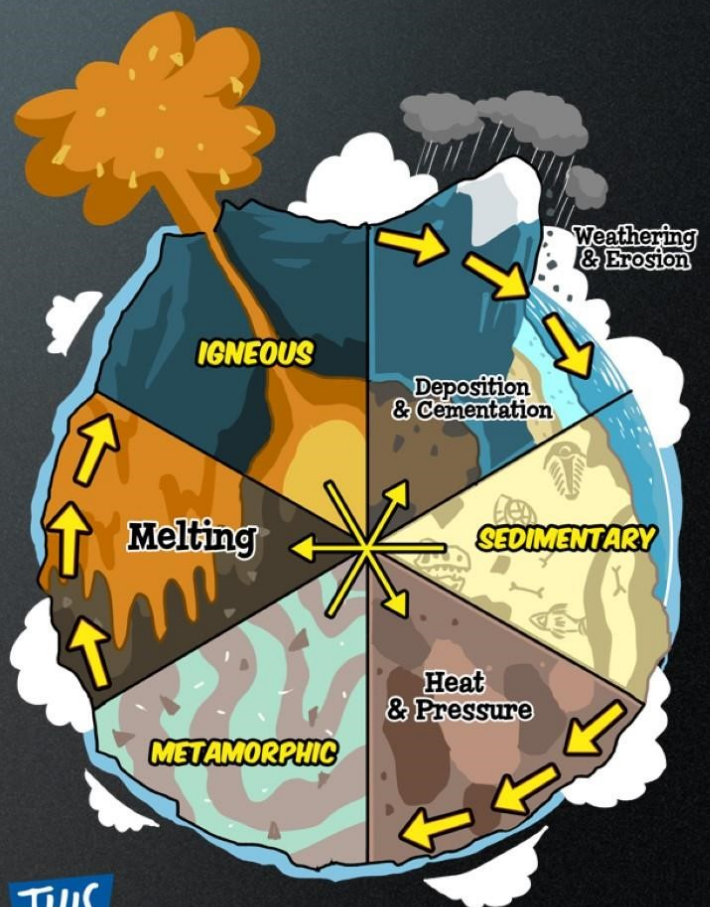
Rock Cycle

- Those sedimentary rocks, or sometimes igneous rocks, are buried or pulled underground where they get put under heat and pressure, and can change to metamorphic rocks.



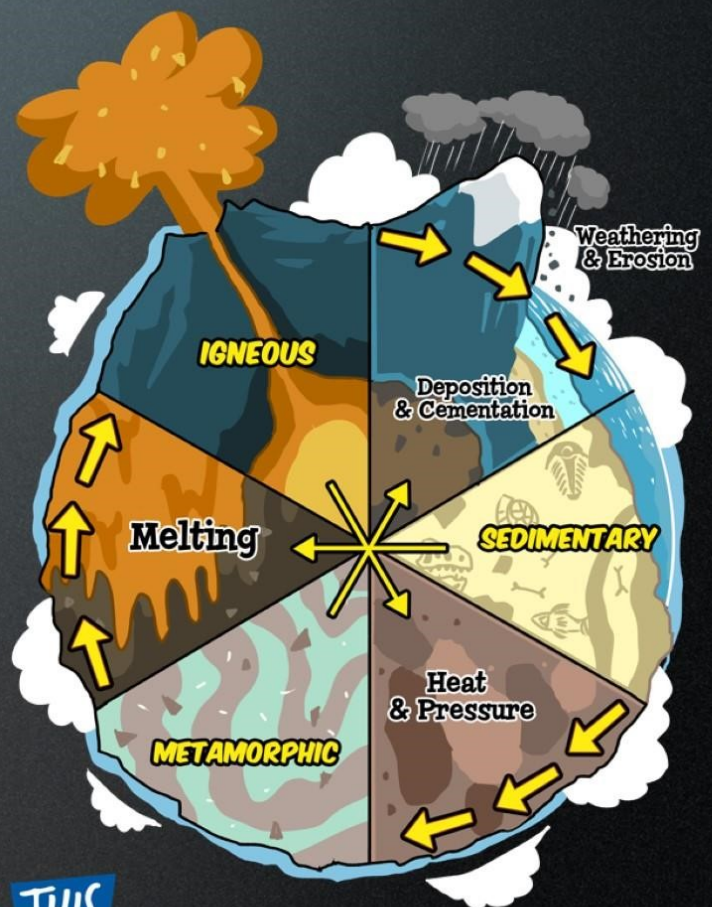
Rock Cycle

- Or those rocks under heat and pressure might just fully melt into Magma, which turns into Igneous rocks either below or above the surface of the earth.



Rock Cycle

- Under the right conditions every type of rock can become any of the others.



Telling Rocks Apart

- Telling rocks apart can be difficult, but there are a few tricks that can help.



Spot an Igneous Rock

- Deep in the earth's surface igneous rocks grow crystals as they cool.
- If all the crystals in the rock are fused together, like the granite on right, without any dull rock sticking it together, its an igneous rock.
- If there are air pockets in the rock (like with a pumice stone) it is also igneous, but is volcanic.



Spot a Sedimentary Rock

- Sedimentary rocks are made of sediment from other rocks, that is solidified together.
- They generally look layered because of how they're formed, and the particles align themselves horizontal because of the pressure.
- If the crystals or part of the rock look 'glued' together by surrounding cement, or if all the elements are different sizes or shapes it's sedimentary.
- Fossils are also a giveaway.



Spot a Metamorphic Rock

- Metamorphic rocks are other types of rocks that have been changed because of heat and pressure.
- It will often look twisted, swirled, or folded.
- The crystals are often lined up by the heating and pressure process, so you'll see lines of crystals instead of specks of crystals (like we saw in igneous rocks).



Telling Rocks Apart

- About 75% of the surface of the earth is covered by sedimentary rocks.
- Most of the rocky outcrops on the planet (mountains) are made up of igneous rocks.
- Metamorphic rocks are limited to areas where there are plate boundaries, usually with volcanoes and are much rarer.

