What are rocks?

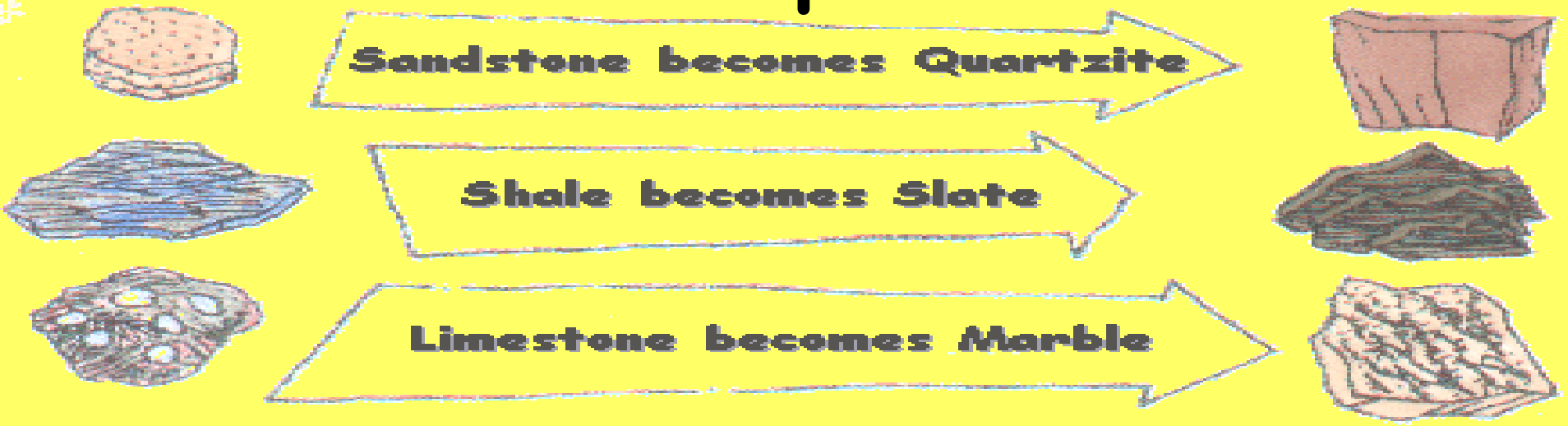
Earth's crust is made up of many different kinds of rocks. **Rocks** are a mixture of minerals usually cemented together.

Scientists group, or **classify**, rocks by the way they form. Some rocks form from melted minerals that cool and harden. These are classified as **igneous rocks**.

Rocks that form when small pieces of minerals, or the remains of living things, become cemented or compacted together are classified as **sedimentary rocks**.

Metamorphic rocks

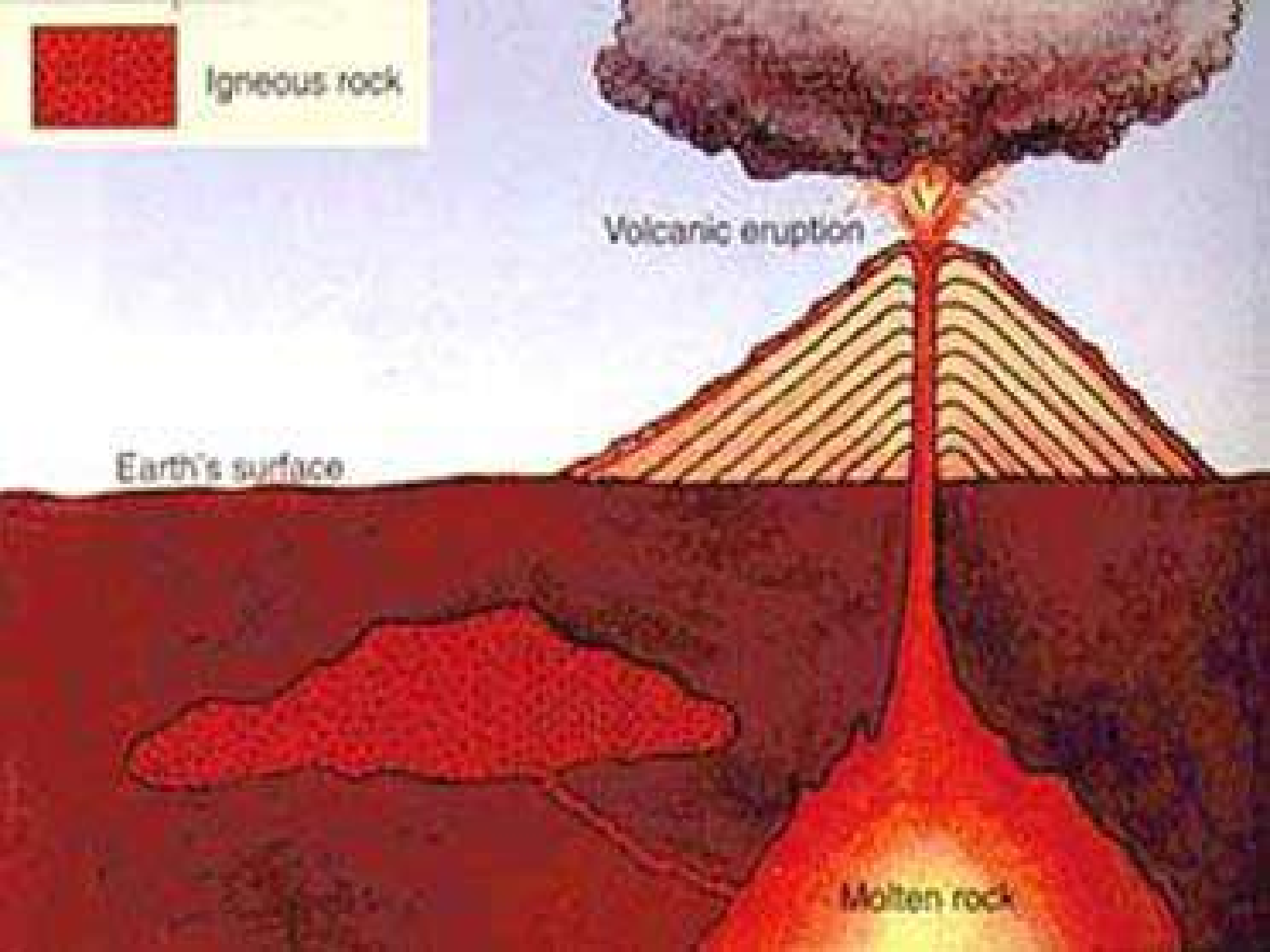
form from existing rocks which are slowly changed by heat and pressure.



How are **igneous rocks** formed?

Large pools of molten rock inside Earth called **magma** sometimes rises through cracks in rocks into the upper part of Earth's crust.

Igneous Rocks


Igneous rock
Volcanic eruption
Earth's surface
Molten rock

In the upper part of Earth's **crust**, the temperature is cooler than the temperature inside the **mantle**.

As magma rises through cracks in the Earth's crust, it cools and crystallizes. As it hardens, **igneous rock** is formed.

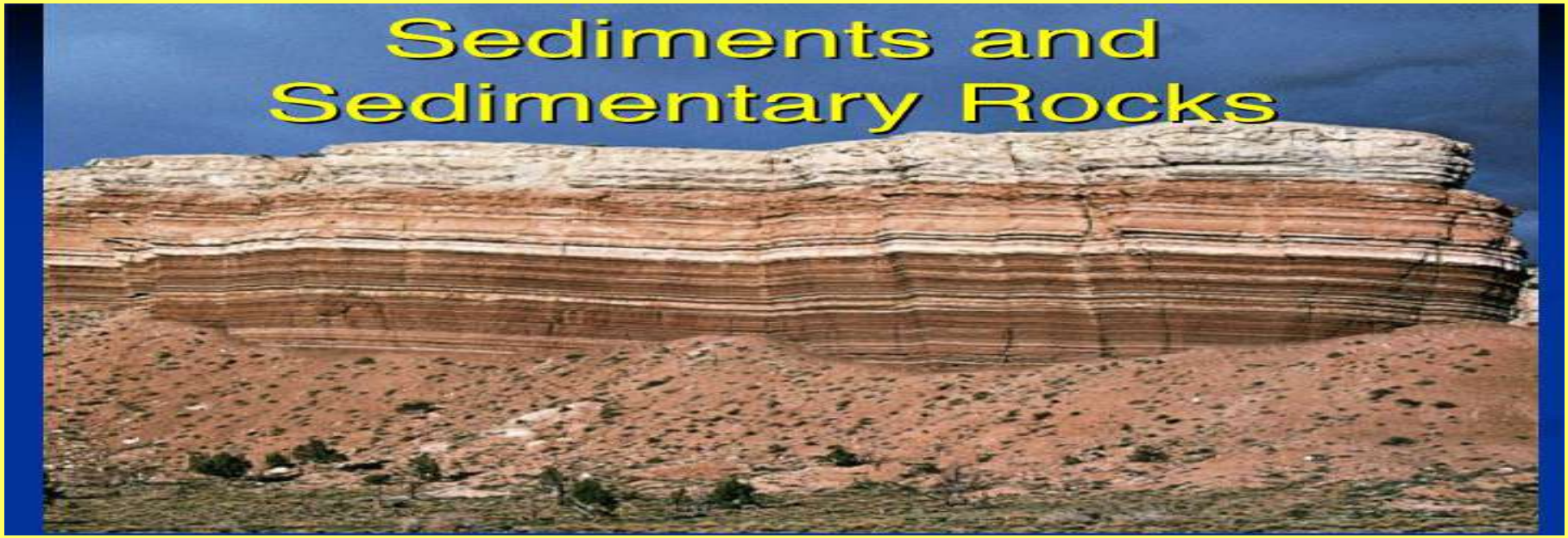
Igneous rock can take thousands of years to form from magma.

Depending on where they form, igneous rocks are classifies as **intrusive** or **extrusive**.

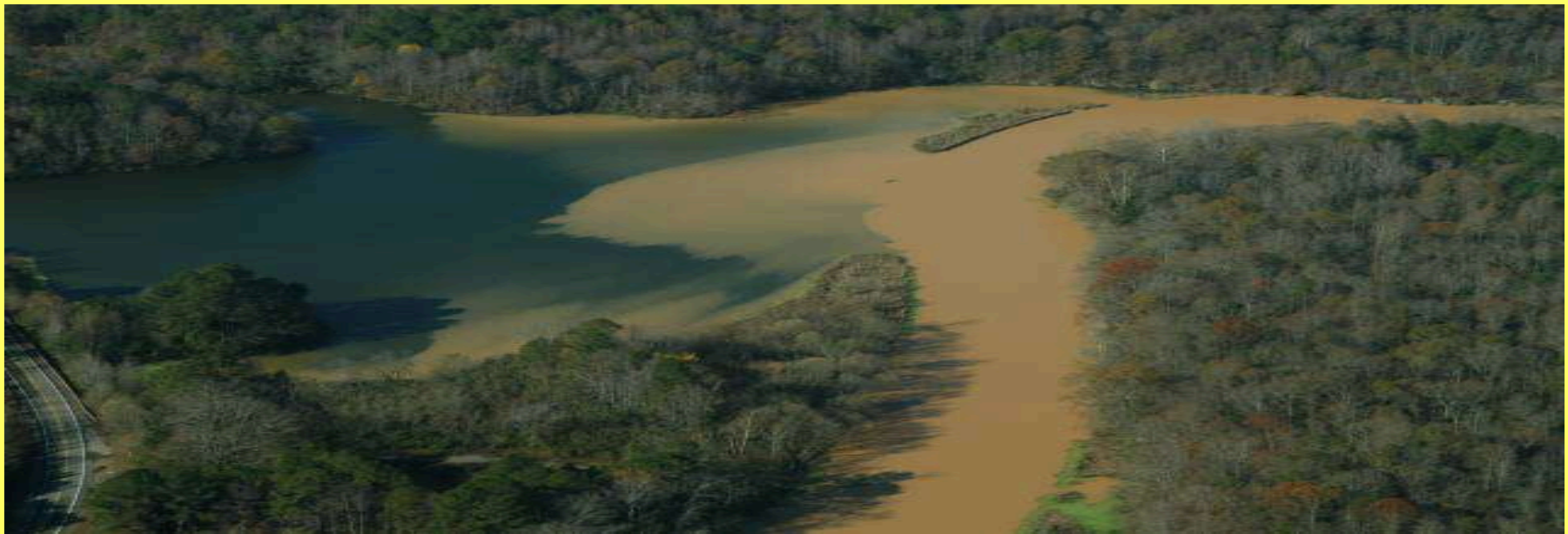
One type of igneous rock is **intrusive.** This is rock that cools from magma inside Earth. Granite is a common intrusive rock.

Another type of igneous rock is **extrusive**. That is rock that cools quickly from lava at Earth's surface. Obsidian is an example of extrusive rock.

How are **sedimentary rocks** formed?



Most **sedimentary rocks** are formed in water. These rocks form **sediments** which are rock particles carried and deposited water, wind, or ice



The layers of sediment may be hundreds of meters thick. As more sediment is added, the lower layers become tightly packed under the pressure and weight of the new layers.

The older sediments become solid rock when water and air are squeezed out from between the sediment layers.

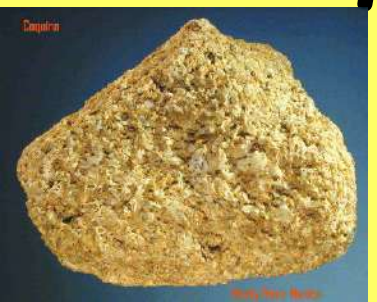
The sediments may also become solid rock when dissolved minerals in the water cement the sediments together.

Some types of **sedimentary rocks** form from the remains of living organisms.

The shells or skeletons of sea animals contain **calcium carbonate**. When these organisms die, their remains are left on the bottom of the ocean.

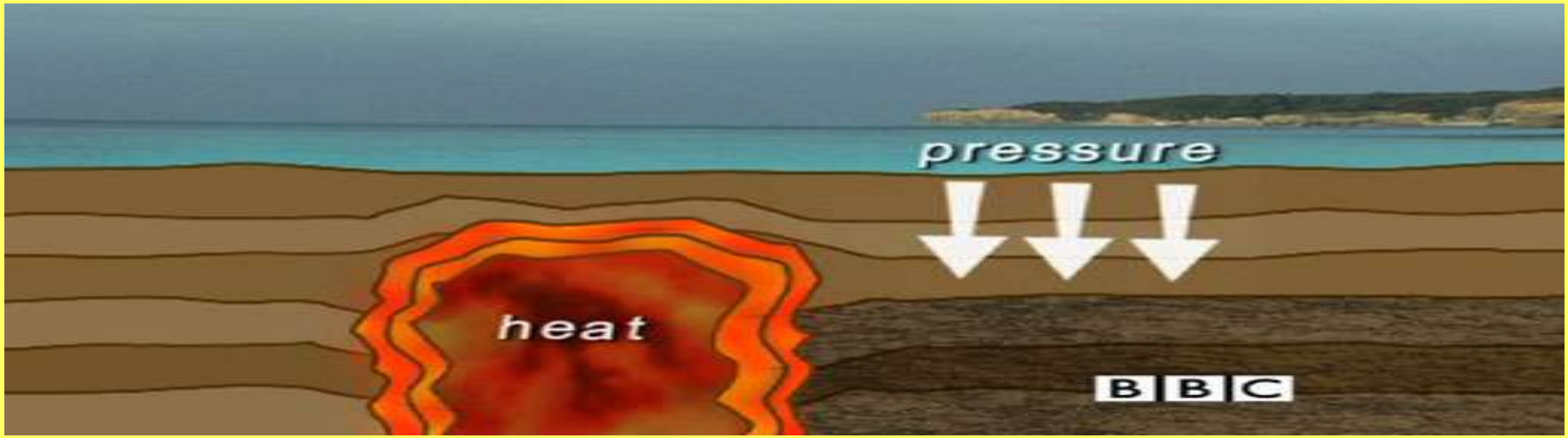
Over millions of years, the shells and skeletons build up on the ocean floor.

Some of the calcium carbonate dissolves and comes out of the solution to cement the minerals together. This forms solid rock.

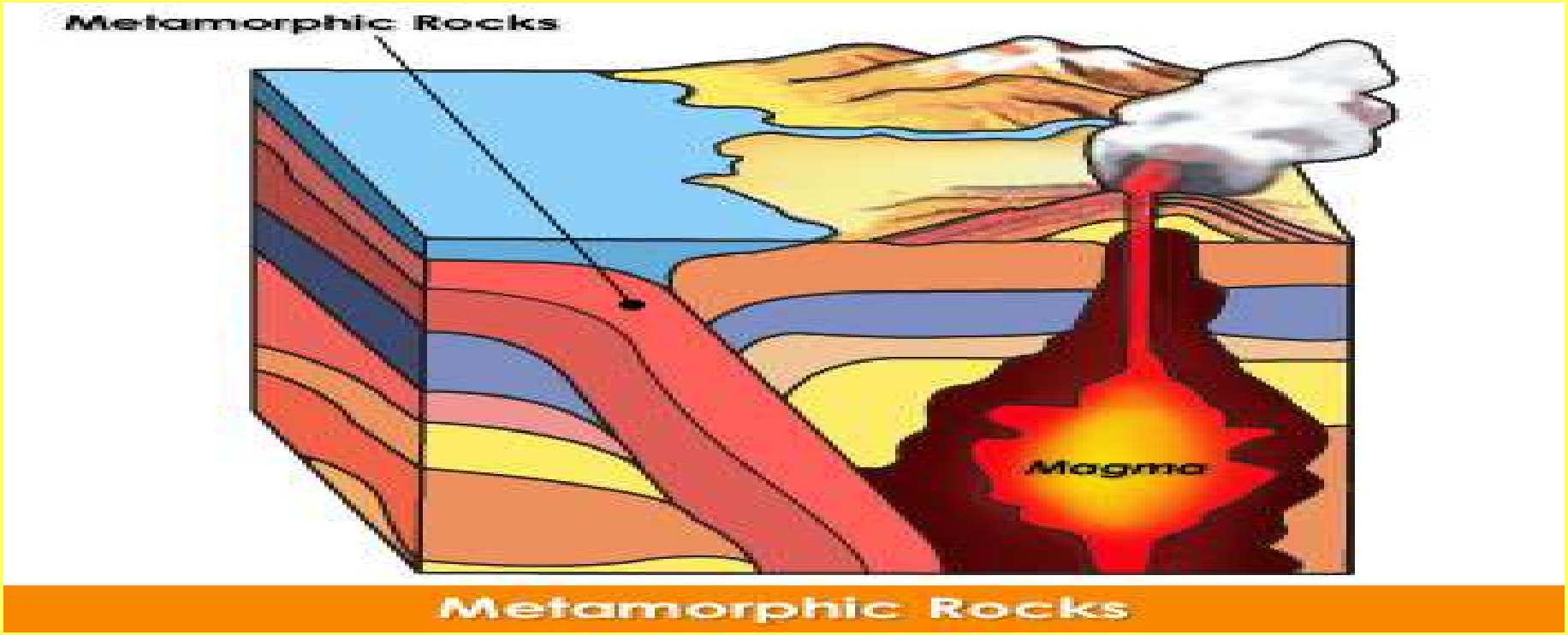


How are **metamorphic** **rocks** formed?

The inside of Earth is like an oven. Heat and pressure inside Earth "bakes" rocks and changes the minerals in them.

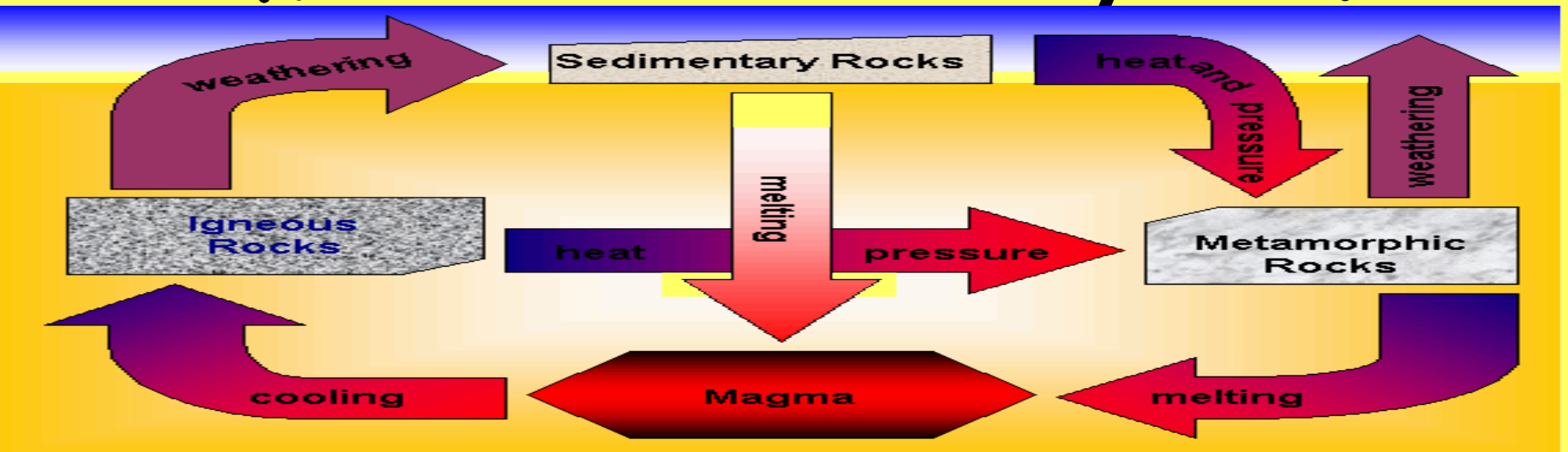


These chemically changed rocks are called **metamorphic rocks**.

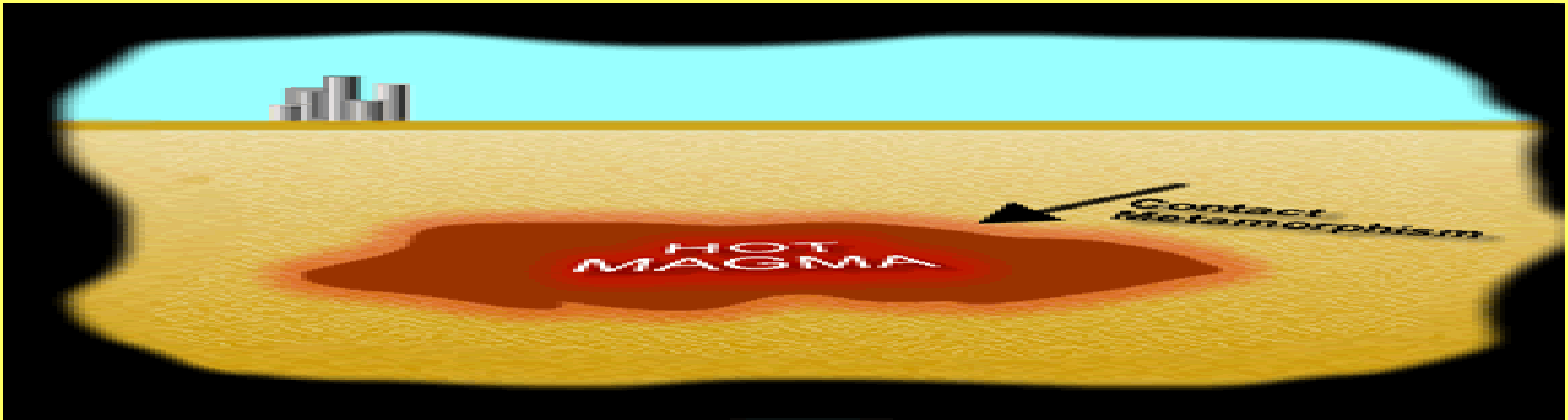


Existing rocks can be subjected to chemical changes like extreme heat above 800° C and the minerals melt into **magma** or molten rock.

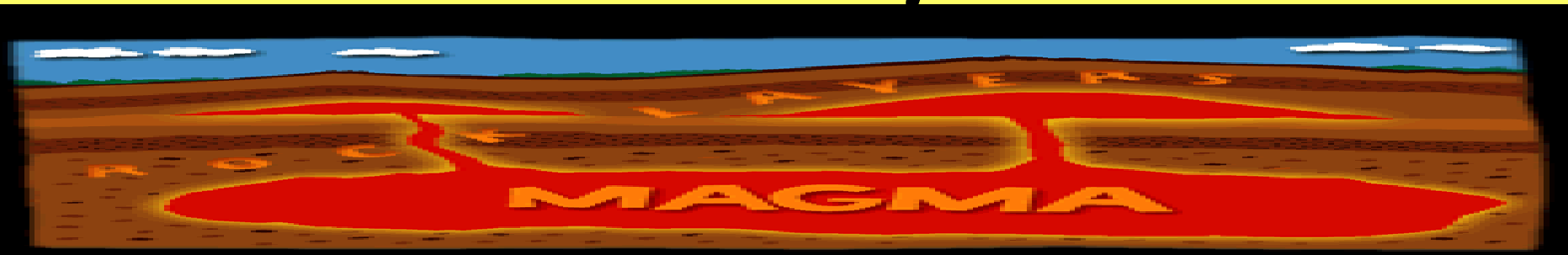
Rocks are also affected by forces within Earth that cause pressure. Extreme pressure can flatten minerals into layers.



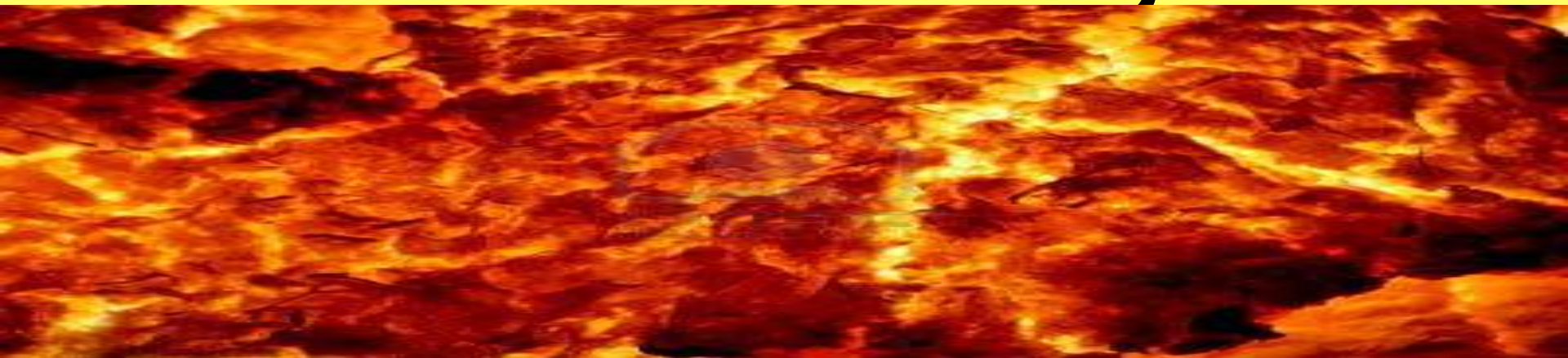
Metamorphic rocks are sometimes formed when existing rocks come into contact with or mix with **magma**.



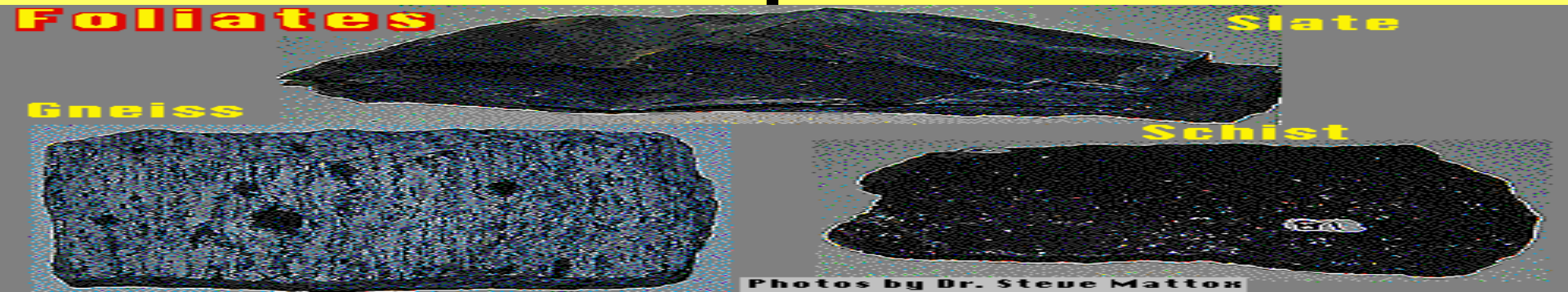
Magma can move into cracks in deeply buried sedimentary rocks. It may also flow between layers of sedimentary rocks.



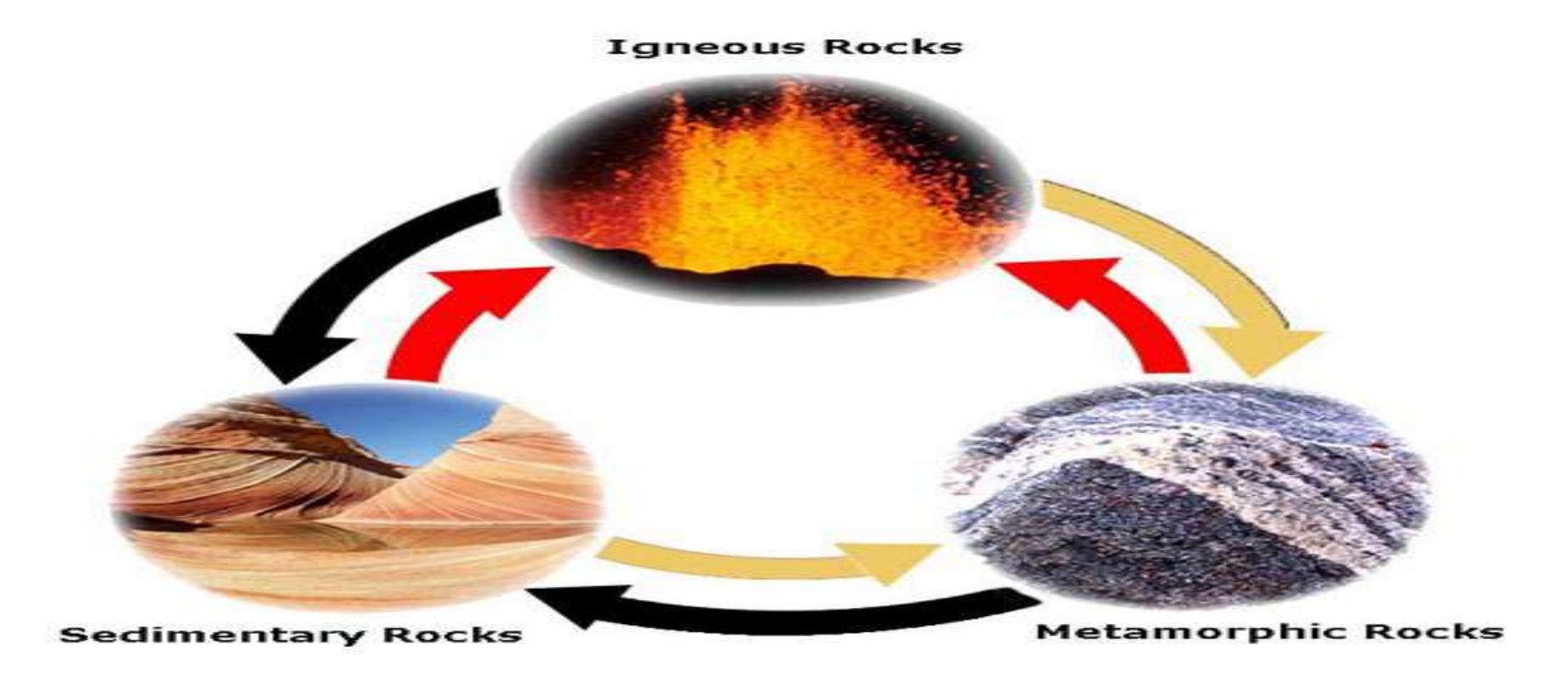
The heat and chemical solutions in the magma cause the minerals inside the sedimentary rock to change.



The heat from magma can also change minerals in igneous rocks and turn one kind of metamorphic rock into a different kind of metamorphic rock.

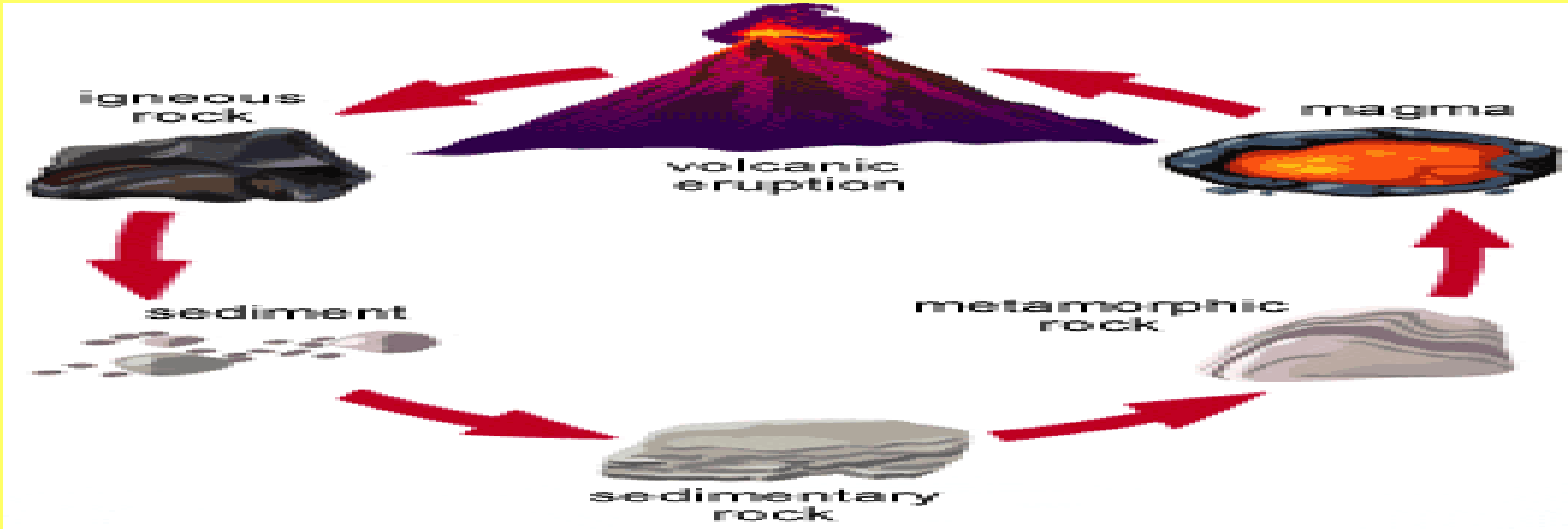


What is the rock cycle?

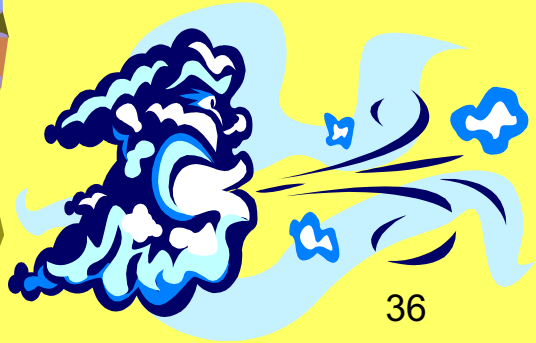


Rocks on Earth change over time. Some of these changes take place inside Earth.

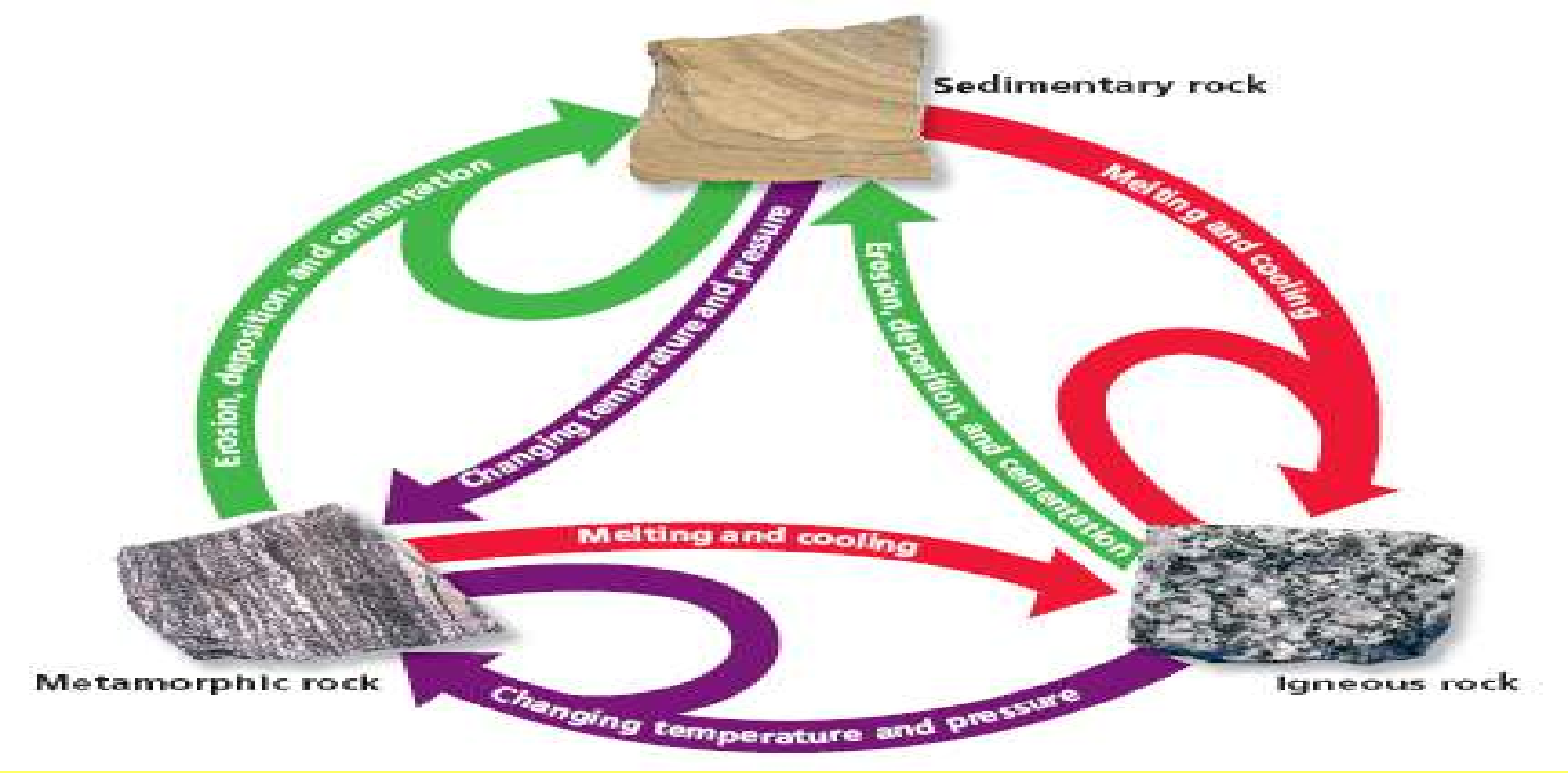
Inside Earth, tremendous heat and pressure can slowly change rocks from one kind to another.



Other changes in rocks like rain, ice, wind or chemicals in the air or water take place at the surface.

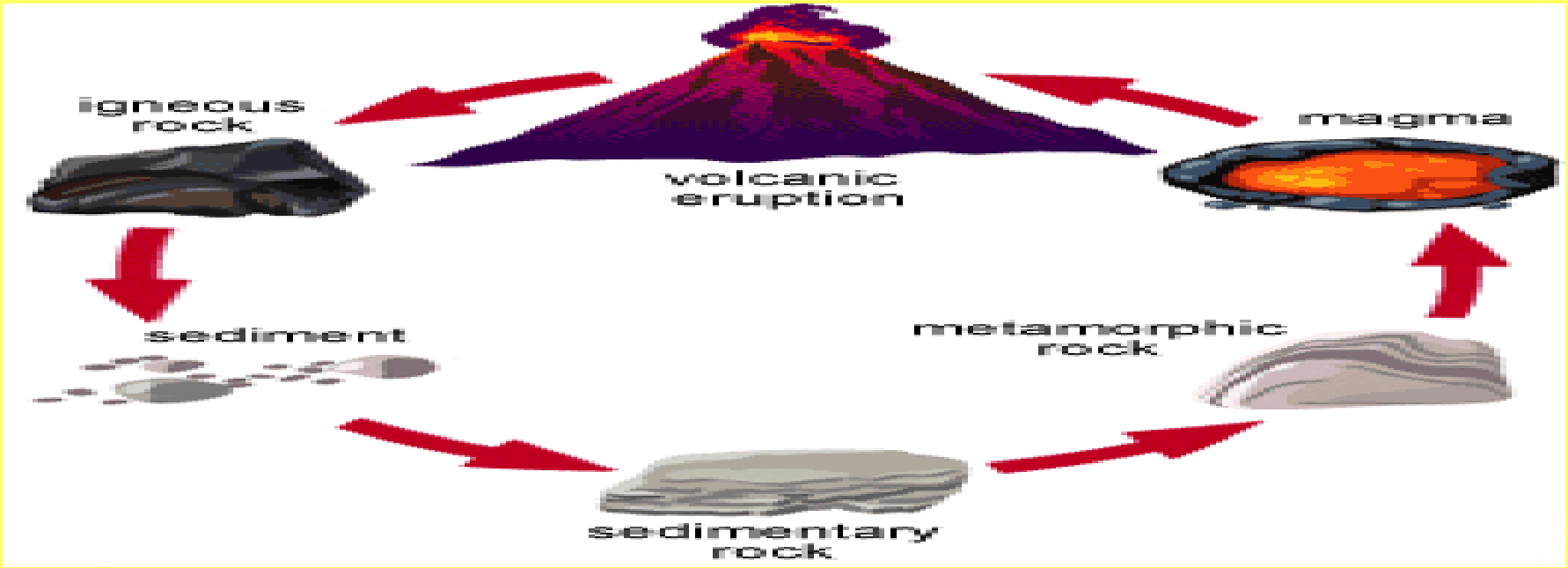


The series of natural processes by which rocks are slowly changed from one kind to another is called the **rock cycle**.

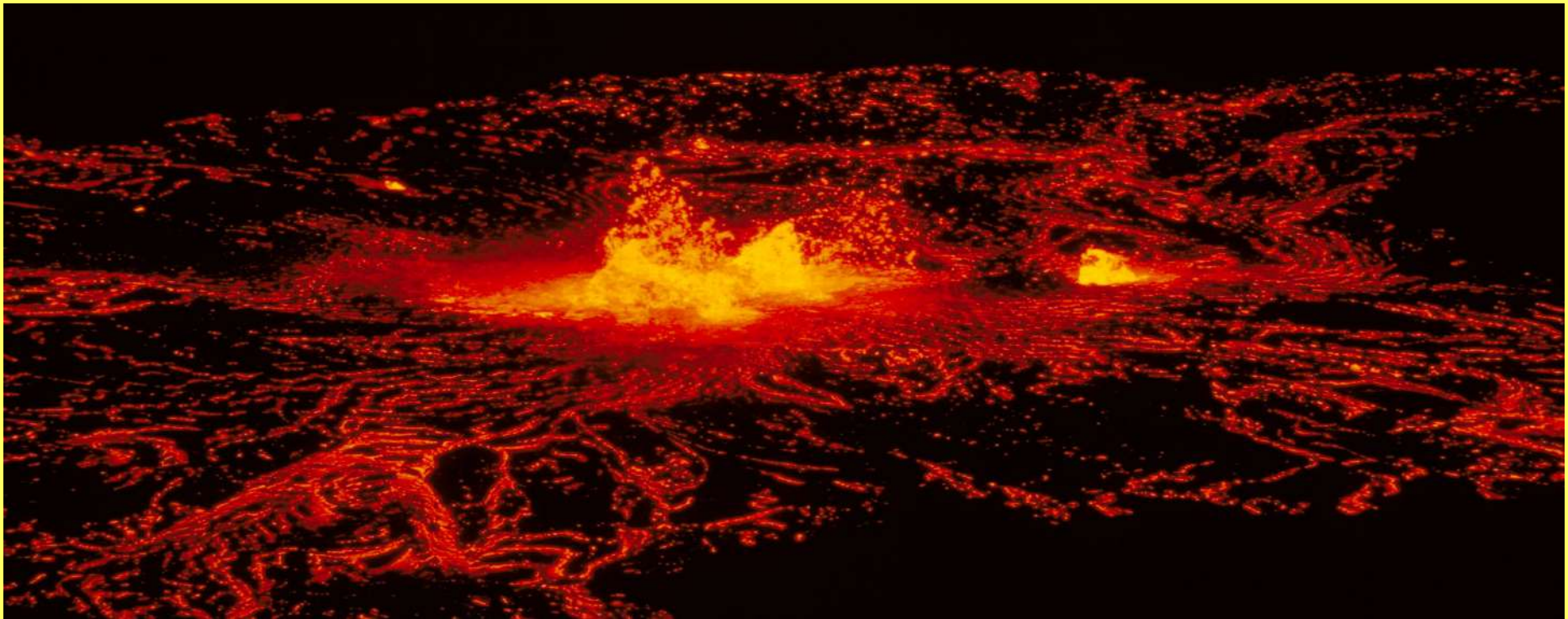


All three classes of rock eventually lead to **sedimentary rock**.

The three classes of rocks can also be changed into **metamorphic rock** or back into **magma**.



Only **igneous rocks**, however, come directly from **magma**.



High temperatures can change any rock back into **magma**.