

3.1+3.2 Notes

The Rock Cycle and Igneous Rocks



What is the difference between a rock and a mineral?



Define: Rock



- A **rock** is a solid mass of different minerals or mineral like matter that occurs naturally on our planet.



- Think of it like a solid mixture



quartz



feldspar



Biotite



Granite



Olivine



Pyroxene



Plagioclase

Gabbro

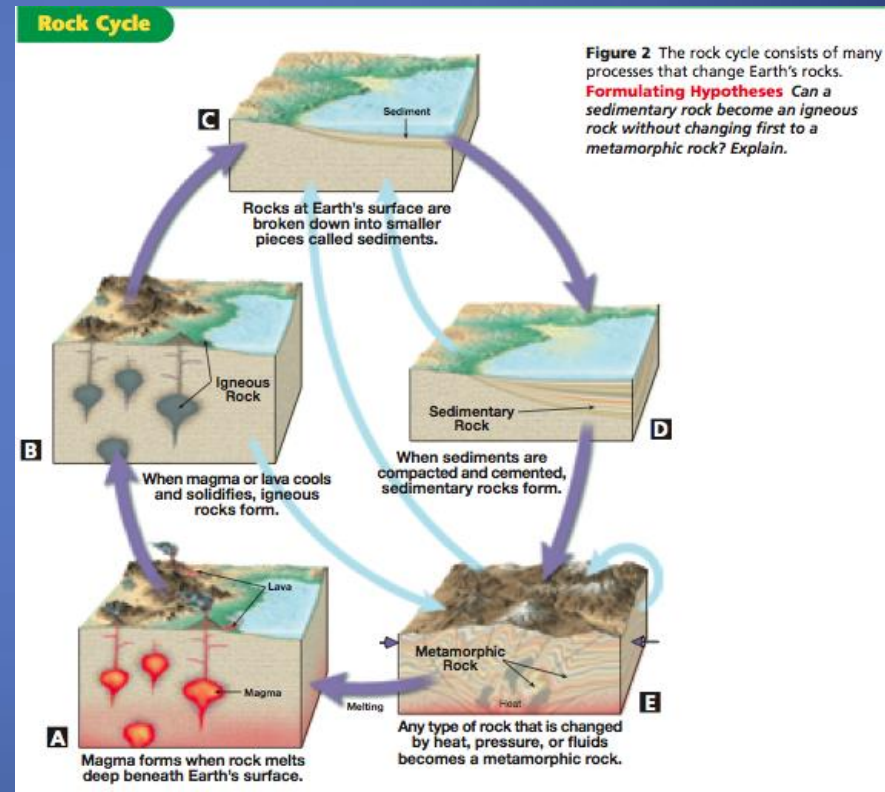


The Rock Cycle

3 Rock Types

- Sedimentary
- Metamorphic
- Igneous

Interactions among earth's air, water, and land can cause rocks to change from one type to another



Rock Cycle

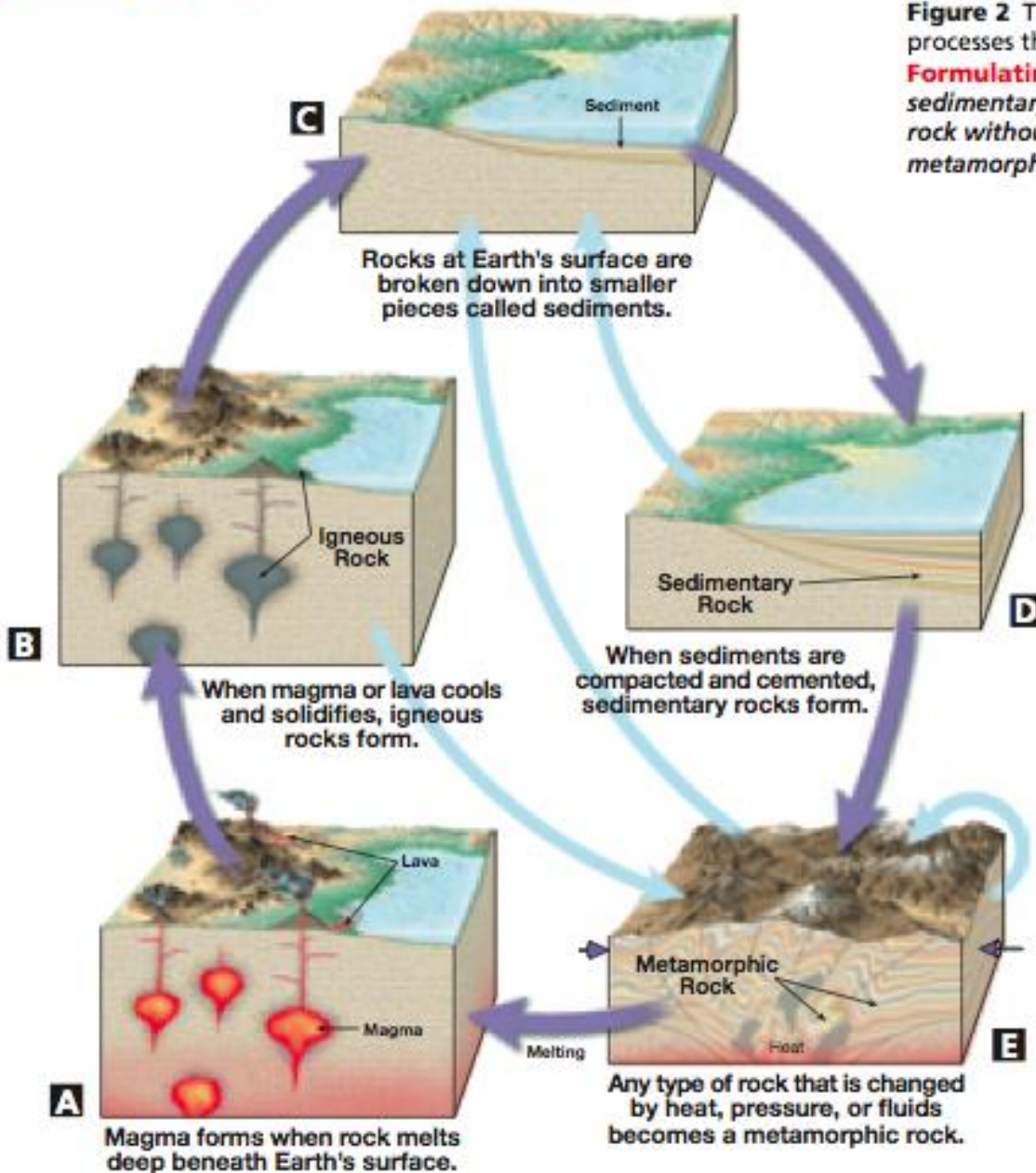


Figure 2 The rock cycle consists of many processes that change Earth's rocks.

Formulating Hypotheses Can a sedimentary rock become an igneous rock without changing first to a metamorphic rock? Explain.

Igneous Rocks

- **Igneous rocks** are rocks formed from magma or lava that cools and hardens.
- The word igneous comes from the Latin word “ignis” which means fire



2 types of igneous rocks



- Intrusive igneous
 - Magma that cools inside the earth's crust to form igneous rock



- Extrusive igneous
 - Magma that cools on the surface of earth to form igneous rock

Extrusive igneous

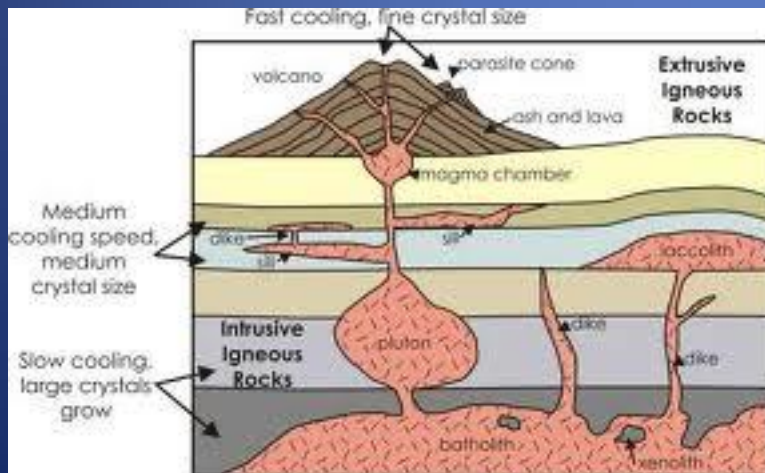
- Form on the surface
- Lava cooling into a solid
- Rocks have fine-grained and glassy textures



Intrusive Igneous



- Form in the earth's crust
- Magma chambers cooling to form rocks
- Rocks have a coarse grained texture



Texture

- Some magma cools at different rates than others
- The rate of magma cooling affects the mineral's crystal size in the rock
- Fast cooling= small crystals (fine-grained)
- Slow cooling= large crystals (coarse-grained)
- Crystal size affects the characteristic **texture**



Coarse Grained Texture

Slow magma cooling

- Large equal sized crystals
- Looks speckled
 - Each speckle is a mineral



Fine Grained Texture

Quick magma cooling

- small equal sized crystals
- Very hard to see crystals
 - Some times looks smooth



Glassy Texture

Instant magma cooling- no time for crystals to form

- Looks like glass
- Very shiny
- No visible crystals at all



Porphyritic Texture

- Slow magma cooling, but with different mineral content
- Some minerals solidify faster than others
- This causes one mineral to be small and others to be large
- Looks like big crystals mixed in with small crystals



Composition

- Different igneous rocks can have different mineral content
- Granitic (*Felsic*)
- Basaltic (*Mafic*)



Granitic (*Felsic*) Composition

- High silica content
- Light in color
- minerals like
 - Quartz
 - Feldspar
 - Plagioclase



Basaltic (*Mafic*) Composition

- low silica content, High Magnesium and iron
- dark in color
- minerals like
 - Olivine
 - Pyroxene
 - Plagioclase

