2 - Igneous Rocks

Definition

- Chunks of frozen magma or lava
- Crystalline

Lava

- Molten rock at Earth's surface
- Forms volcanic igneous rocks

Magma

- Molten rock at Earth's surface
- Forms plutonic igneous rocks

From a Liquid to a Solid

Through a process of freezing over a range of temperatures due to rocks being composed of multiple minerals of multiple freezing points

Types

- Aphanitic
  - Crystals too small to see,
  - Typical of volcanic rocks
  - Lava freezes quickly so crystals are smaller
- Phaneritic
  - Crystals visible to naked eye
  - Typical of plutonic rocks
  - Magma freezes slowly so crystals are bigger
- Porphyritic
  - Mixture of large and small crystals
  - Typical of both volcanic and plutonic rocks
- Vesicular
  - Foam, bubble-rich lava froze solid before bubbles could escape

    - Only volcanic rocks
- Pyroclastic
    - Composed of fragments of solid volcanic rock ejected from volcano, such as ash and rocks
    - Only volcanic rocks
- Glass
    - Forms when lava freezes too quickly for minerals to form
    - Only volcanic rock
    - Also known as obsidian

> **Color Index**
>
> The percentage of the rock made of dark colored minerals

Felsic Minerals

- Not as dense
- Light in color
- No Fe and Mg
- Low melting temperatures
- Low color index
- High silica 65
- Lavas around 700 C

Mafic Minerals

- Dense
- Dark in color
- Contains Fe and Mg (Ferromagnesian)
- High melting temperatures
- High color Index
- Low silica 52
- Lavas around 1200 C

Igneous Equivalents

- A mafic magma will be a mafic lava at the surface
- A felsic magma will be a felsic lava at the surface
- Gabbro = basalt (oceanic crust)
- Granite = Rhyolite (continental crust)

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