The Rock Cycle and Igneous Rocks

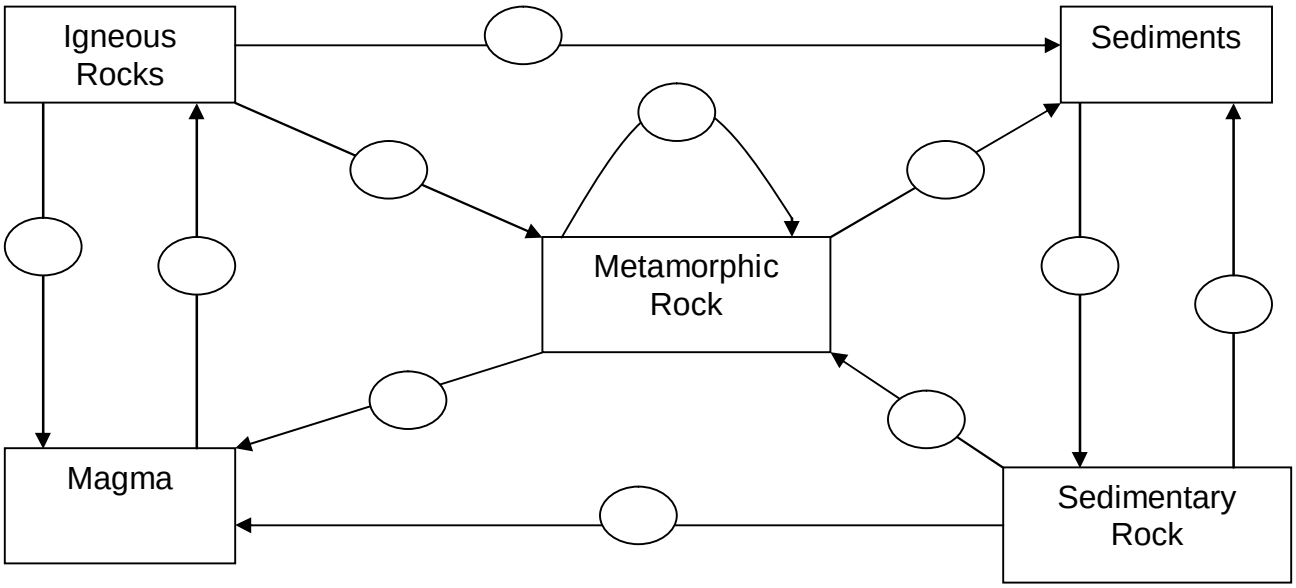
Earth Science Mr. Traeger

Name: _____ Period: _____ Date: _____

The Rock Cycle

- The rock cycle is directly related to the theory of _____, the idea that the Earth's tectonic plates are continuously moving.

Number	Process
1	Heating (melting)
2	Cooling and solidification (Crystallization)
3	Heat and Pressure
4	Weathering and Erosion
5	Cementation and Compaction (Lithification)



Igneous Rocks: Basics

- _____ rocks form when _____ or _____ cools, crystallizes, and solidifies.
- _____ is magma that reaches the surface of the Earth.
- Two basic types of igneous rocks are _____ and _____.
- _____ igneous rocks form deep within the Earth. These rocks are also referred to as _____.

- _____ igneous rocks form at the surface of the Earth. These rocks are also referred to as _____.
- The process where orderly patterns form when _____ cools is called _____.

Texture

- _____ cooling forms _____, coarse textured crystals.
- _____ cooling forms _____, fine textured crystals.
- Silicon, oxygen, aluminum, sodium, potassium, calcium, iron, and magnesium are the main _____ found in _____.
- Igneous rocks are usually classified by _____ and _____.
- _____ is the most important characteristic for determining where an igneous rock formed. The rate of cooling determines this.
- An igneous rock is _____ if it has a fine-grained texture.
- Gas bubbles trapped in solidifying lava are known as _____.
- An igneous rock is _____ if it has a coarse-grained texture.
- An igneous rock with very large crystals embedded within smaller crystals has a _____ texture.
- Very rapid cooling can form a _____ texture, as in obsidian.
- The _____ of an igneous rock will influence _____.

Composition

- Igneous rocks have varying _____ content.

- A scientist named _____ found that minerals with higher melting points _____ before minerals with lower melting points. This is the basis for _____ _____ _____.

- A _____ reaction series occurs when each mineral has a different crystal structure.

- A _____ reaction series is when calcium-rich crystals react with sodium ions to become more sodium rich.

- _____ _____ is the process of creating more than one rock type from the same magma. This proves that a single magma form many different types of igneous rocks.

Classification

- Light colored rocks such as granite are known as _____. These rocks are rich in the minerals quartz and orthoclase/plagioclase feldspar.

- Intermediate colored rocks such as diorite have moderate amounts of the minerals biotite, amphibole, and pyroxene.

- Dark colored rocks rich in iron and magnesium such as gabbro are known as _____. These rocks are rich in the minerals plagioclase, biotite, amphibole, pyroxene, and olivine.

- Extremely dark rocks such as peridotite/dunite with low contents of silica and high contents of iron and magnesium are known as _____.

- The following chart, reproduced from the course textbook on page 62, is how igneous rocks are classified.

	Granitic (Felsic)	Andesitic (Intermediate)	Basaltic (Mafic)	Ultramafic
Phaneritic (coarse-grained)				Peridotite
Aphanitic (fine-grained)				Komatite
Major Mineral Composition	Quartz K-Feldspar Na-Feldspar	Amphibole Intermediate plagioclase	Ca-Feldspar Pyroxene	Olivine Pyroxene
Minor Mineral Composition	Muscovite Biotite Amphibole	Pyroxene Amphibole Biotite	Olivine Amphibole	Ca-Feldspar
Rock Color Based on % dark minerals	Light-colored < 15% dark minerals	Medium-colored 15-40% dark minerals	Dark grey to black > 40% dark minerals	Dark-green to black ~ 100% dark minerals