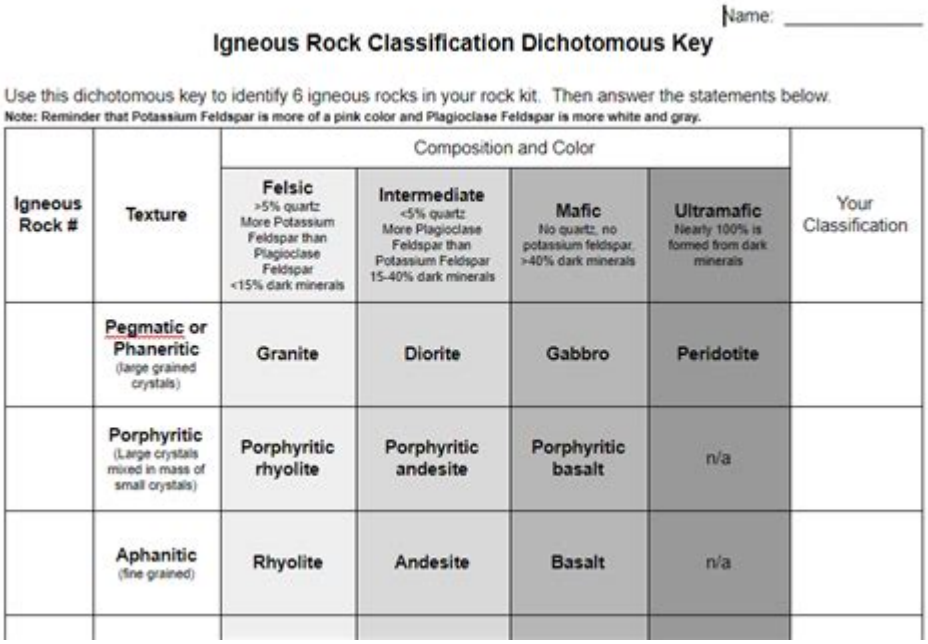
Igneous Rock Identification Lab Answer Key



Name: _____

Igneous Rock Classification Dichotomous Key

Use this dichotomous key to identify 6 igneous rocks in your rock kit. Then answer the statements below.

Note: Reminder that Potassium Feldspar is more of a pink color and Plagioclase Feldspar is more white and gray.

Igneous Rock #	Texture	Composition and Color				Your Classification
		Felsic >5% quartz More Potassium Feldspar than Plagioclase Feldspar <15% dark minerals	**Intermediate** <5% quartz More Plagioclase Feldspar than Potassium Feldspar 15-40% dark minerals	**Mafic** No quartz, no potassium feldspar. >40% dark minerals	**Ultramafic** Nearly 100% is formed from dark minerals	
	Pegmatic or Phaneritic (large grained crystals)	**Granite**	**Diorite**	**Gabbro**	**Peridotite**	
	Porphyritic (Large crystals mixed in mass of small crystals)	**Porphyritic rhyolite**	**Porphyritic andesite**	**Porphyritic basalt**	n/a	
	Aphanitic (fine grained)	**Rhyolite**	**Andesite**	**Basalt**	n/a	

Igneous rock identification lab answer key is an essential resource for geology students and enthusiasts looking to deepen their understanding of igneous rocks. In the study of geology, identifying different rock types is crucial for understanding Earth's processes and the formation of various geological features. This article will provide a comprehensive guide to igneous rock identification, including characteristics, classification, and an answer key for a typical lab exercise.

Understanding Igneous Rocks

Igneous rocks are one of the three main types of rocks, alongside sedimentary and metamorphic rocks. They are formed from the cooling and solidification of magma or lava. Depending on where the cooling occurs, igneous rocks can be classified into two main categories:

- **Intrusive (Plutonic) Igneous Rocks:** Formed from magma that cools slowly beneath the Earth's surface.
- **Extrusive (Volcanic) Igneous Rocks:** Formed from lava that cools quickly on the Earth's surface.

Key Characteristics of Igneous Rocks

To effectively identify igneous rocks, it is essential to understand their key characteristics. Here are

the primary features you should consider:

1. Texture

The texture of an igneous rock can provide valuable information about its cooling history. Common textures include:

- **Phaneritic:** Coarse-grained texture due to slow cooling, allowing large crystals to form. Example: Granite.
- **Aphanitic:** Fine-grained texture due to rapid cooling, resulting in small crystals. Example: Basalt.
- **Porphyritic:** Contains both large and small crystals, indicating a complex cooling history. Example: Andesite.
- **Glass:** No crystal structure due to extremely rapid cooling. Example: Obsidian.

2. Color

The color of igneous rocks can be indicative of their mineral composition:

- **Light-colored (Felsic):** Rich in silica and aluminum, often containing quartz and feldspar. Example: Rhyolite.
- **Dark-colored (Mafic):** Rich in iron and magnesium, often containing olivine, pyroxene, and amphibole. Example: Basalt.
- **Intermediate:** Contains a mix of light and dark minerals. Example: Andesite.

3. Mineral Composition

Identifying the minerals present in an igneous rock can help in classification. Key minerals include:

- **Quartz:** A common component of felsic rocks.
- **Feldspar:** The most abundant mineral group in igneous rocks.
- **Biotite and Muscovite:** Mica minerals found in many igneous rocks.
- **Olivine:** Common in mafic rocks and indicative of high-temperature formation.

Igneous Rock Classification

Igneous rocks can be classified based on their texture and mineral composition. The following chart summarizes the primary types of igneous rocks:

Texture	Felsic	Intermediate	Mafic	Ultramafic
Phaneritic	Granite	Diorite	Gabbro	Peridotite
Aphanitic	Rhyolite	Andesite	Basalt	Komatiite
Glass	Pumice			

Igneous Rock Identification Lab Activity

In a typical igneous rock identification lab, students are provided with various rock samples to analyze. The following steps outline a general procedure for identifying igneous rocks:

1. **Collect Samples:** Gather a diverse set of igneous rock samples.
2. **Examine Texture:** Observe the rock under a hand lens or microscope to determine its texture.
3. **Identify Color:** Note the color of the rock and classify it as light, dark, or intermediate.
4. **Analyze Mineral Composition:** Use a streak plate and acid test to identify key minerals present in the rock.
5. **Record Observations:** Document all findings in a lab notebook for future reference.

Igneous Rock Identification Lab Answer Key

To assist students in their learning process, an answer key can be invaluable. Below is a sample answer key for a hypothetical igneous rock identification lab:

Sample Number	Rock Type	Texture	Color	Key Minerals
1	Granite	Phaneritic	Light	Quartz, Feldspar
2	Rhyolite	Aphanitic	Light	Quartz, Feldspar
3	Diorite	Phaneritic	Intermediate	Plagioclase, Hornblende
4	Basalt	Aphanitic	Dark	Olivine, Pyroxene
5	Pumice	Glass	Light	Vesicular texture
6	Gabbro	Phaneritic	Dark	Plagioclase, Pyroxene
7	Obsidian	Glass	Black	Silica

Conclusion

In conclusion, understanding igneous rock identification is a fundamental skill for geology students. By familiarizing themselves with the characteristics, classification methods, and practical lab procedures, students can enhance their geological knowledge and appreciation for Earth's natural processes. The **igneous rock identification lab answer key** serves as a practical tool for reinforcing learning outcomes and ensuring accurate identification of igneous rock samples. Through hands-on experience and careful observation, students can develop the skills necessary to become proficient in rock identification and analysis.

Frequently Asked Questions

What are the primary characteristics used to identify igneous rocks in a lab setting?

The primary characteristics include texture (grain size), mineral composition, color, and the presence of specific features like vesicles or glassy surfaces.

How can one differentiate between intrusive and extrusive igneous rocks?

Intrusive igneous rocks, like granite, have larger crystals due to slow cooling beneath the Earth's surface, while extrusive igneous rocks, like basalt, have smaller crystals due to rapid cooling at the surface.

What role does mineral composition play in identifying igneous rocks?

Mineral composition is crucial as it determines the rock's classification (e.g., basalt, rhyolite) and influences its color, density, and overall appearance, aiding in accurate identification.

What tools are commonly used in an igneous rock identification lab?

Common tools include hand lenses, rock hammers, streak plates, and microscopes for examining thin sections to assess mineral content and texture.

Why is it important to understand the cooling history of igneous rocks during identification?

Understanding the cooling history helps in determining the rock's formation environment and influences its texture, which is key for accurate classification and identification.

Igneous Rock Identification Lab Answer Key

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