

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 all silicates 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	
	Glassy	Obsidian	Obsidian	Obsidian	n/a	
	Vesicular	Pumice	Pumice	Scoria	n/a	
	Pyroclastic	Volcanic tuff and breccia	Volcanic tuff and breccia	n/a	n/a	

- Put the rock number and rock name of the rock that probably cooled off and crystallized the slowest.
- Put the rock number and rock name of the rock that probably cooled off and crystallized the quickest.
- List all the rock numbers of rocks that are considered to be intrusive igneous rocks.
- List all the rock numbers of rocks that are considered to be extrusive rocks.

Teacher Notes, Reflection and Instructions

- This lab can take just over a 50 minute period. I have had a tough time finishing it in one class period.
- The 100% correct identification isn't the most important thing that I am looking at on this assignment. If a student can justify their answer to me, I give them the points. I think the procedure and process are the most important aspect of this assignment.
- Their rock kit contains 10 rocks. I try to have a variety of all rocks represented but don't yet. I am missing peridotite in all kits, and not all igneous rocks are represented in all kits. I have plenty of granite, obsidian, scoria, pumice so sometimes they get the same answer for multiple rocks. As my collection grows this will change. I also don't have any pegmatic or porphyritic samples yet.
 - If you don't have enough specimens just require less than the 6. I have done as little as three when I first started. Again the process is the most important part.
- I let my students work and ask questions from their table group. If I am lucky this promotes pretty good collaboration and some of the students get to do some teaching.
- After they have identified their rocks, I have 4 questions that they need to answer. I have a representative of each table group come up with one sample of each of the questions and we can verify whether they are correct or not. I have the representative justify his her choice to the class. Sometimes this sparks a little debate which I find healthy.
- I have magnifying glasses at each table as well, just in case they are looking for minerals such as quartz and the feldspars.
- Have your students use a piece of blank paper underneath their rocks as they identify them. This will limit the scratching of the desks.
- You can have your students read the text and see samples at my EarthScience.xyz website.