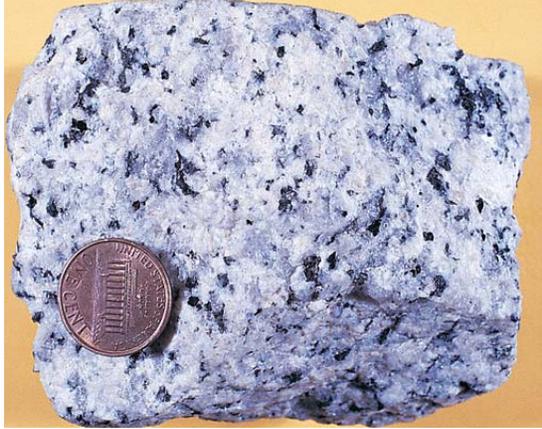


# Igneous Rock Classification

texture √	color >	light colored pink, white, gray green, lavender	medium to dark colored purple, greenish	dark gray to black	dark green to black
	minerals>	10 - 30% orthoclase (potassium-feldspar) 10 - 40% quartz 0-33% Na plagioclase 8-15% amphibole and biotite	55-70% plagioclase feldspar 15-40% biotite & amphibole	25-70% Ca plagioclase 25-75% dark mafic minerals (pyroxene, amphibole, olivine)	0-5% Ca plagioclase 65-100% olivine 0-25% pyroxene 0-10% ore minerals (magnetite, ilmenite, chromite)
composition		Felsic (sialic)	intermediate	Mafic	ultramafic
<b>fine = aphanitic</b>	extrusive volcanic	<b>Rhyolite</b>	<b>Andesite</b>	<b>Basalt</b>	<b>Komatiite</b>
<b>coarse = phaneritic</b>	intrusive plutonic	<b>Granite</b>	<b>Diorite</b>	<b>Gabbro</b>	<b>Peridotite</b>
environ- ment		subduction zones	subduction zones	mid-ocean ridges, hot spots	mid-ocean ridges, mantle

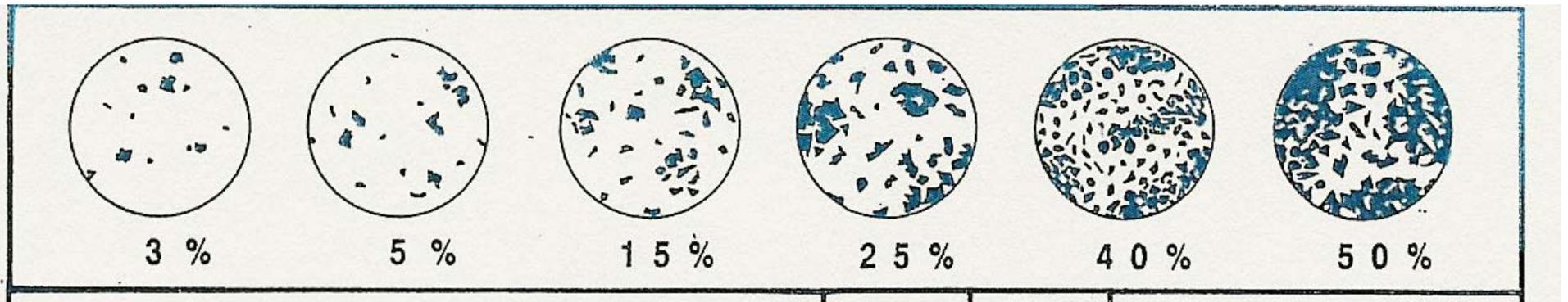
Phaneritic = coarse grained



Aphanitic = fine grained ground mass

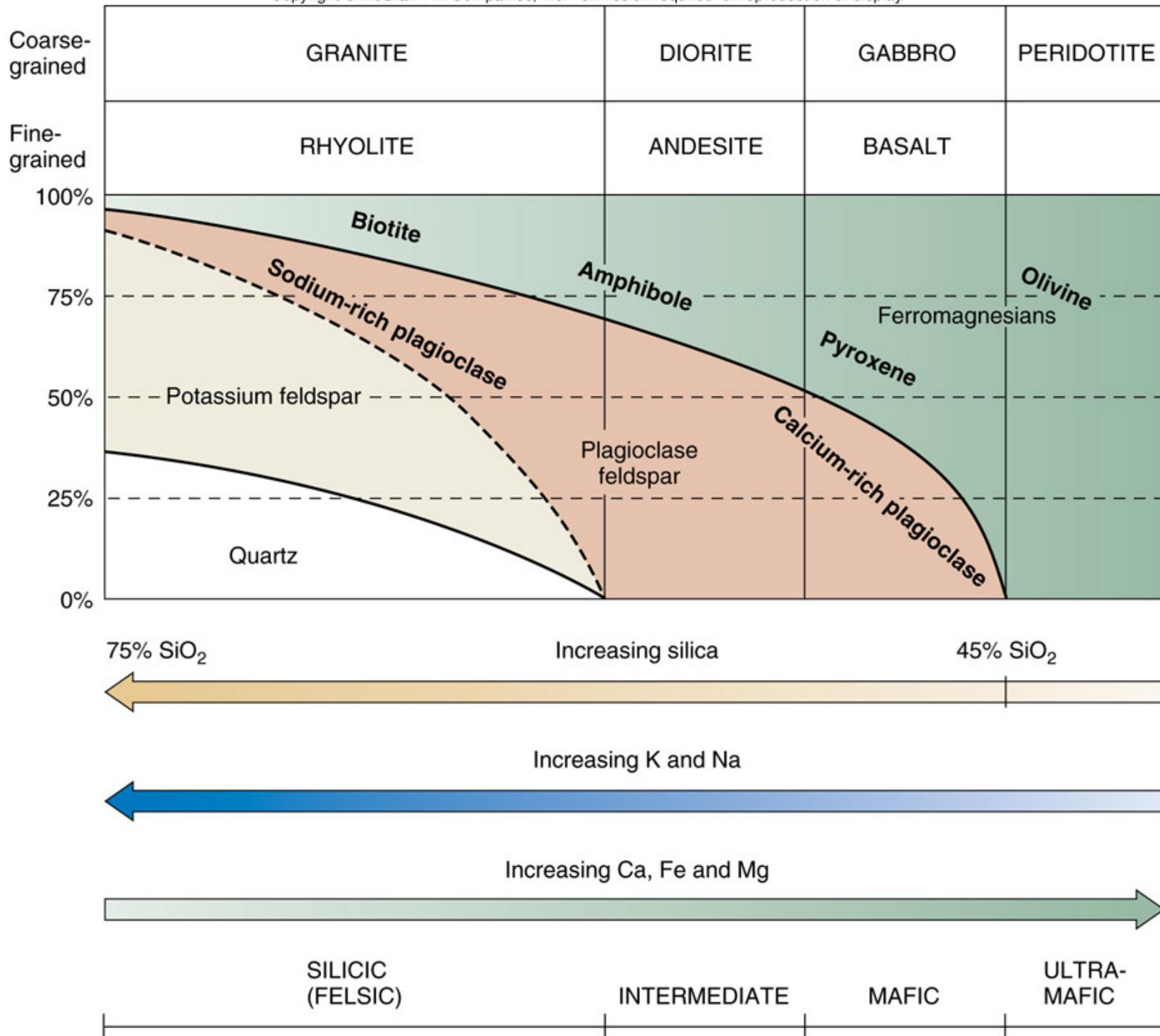


# Estimating percentages



granite





granite



# Granite (pegmatite)



# Granite (pegmatite)



granite



granite



granite



# Graphic granite



# Granite (pegmatite)



granite



granite



# granite



granodiorite



diorite



diorite



gabbro



**gabbro**



gabbro



# Gabbro - anorthosite



peridotite



rhyolite



rhyolite



# Porphyritic andesite



# Porphyritic andesite



# Porphyritic basalt



basalt



# Vesicular basalt



# Scoria (highly vesicular basalt)



# Glassy igneous rocks

texture	composition	characteristics	name
glassy	? not applicable	massive, black glass	<b>Obsidian</b>
glassy	? not applicable	frothy, grey glass of subparallel glass fibers with many squashed air bubbles - may float	<b>Pumice</b>
glassy	? not applicable	grey glass, rounded spherical structures	<b>Perlite</b>

# Snowflake obsidian



obsidian



# Mahogany obsidian



pumice



# Weathered pumice



perlite



# Pyroclastic igneous rocks

texture	composition	characteristics	name
pyroclastic	volcanic ash, pumice fragments, some rock fragments or glass	light colored volcanic ash, sometimes with glass and pumice fragments	<b>tuff</b>
pyroclastic	volcanic ash, pumice fragments, some rock fragments or glass	fine grained or gritty, light in weight if not compacted; light color	<b>ash fall tuff</b>
pyroclastic	volcanic ash, pumice fragments, some rock fragments or glass	particles or grains are fused or welded, with flow lines	<b>ash flow tuff</b>
pyroclastic	round pebbles and bombs that were blown out of a volcanic vent, with ash	volcanic fragments larger than 2 millimeters (about size of pencil point)	<b>agglomerate</b>
pyroclastic	volcanic bombs, pebbles, ash, pumice fragments, some rock fragments, or glass	sharp, angular volcanic fragments larger than 2 centimeters (1 inch diameter) mixed with others	<b>volcanic breccia</b>

tuff



tuff



tuff



tuff

Pyroclastic (particles)

ash size (<2mm) felsic



agglomerate

