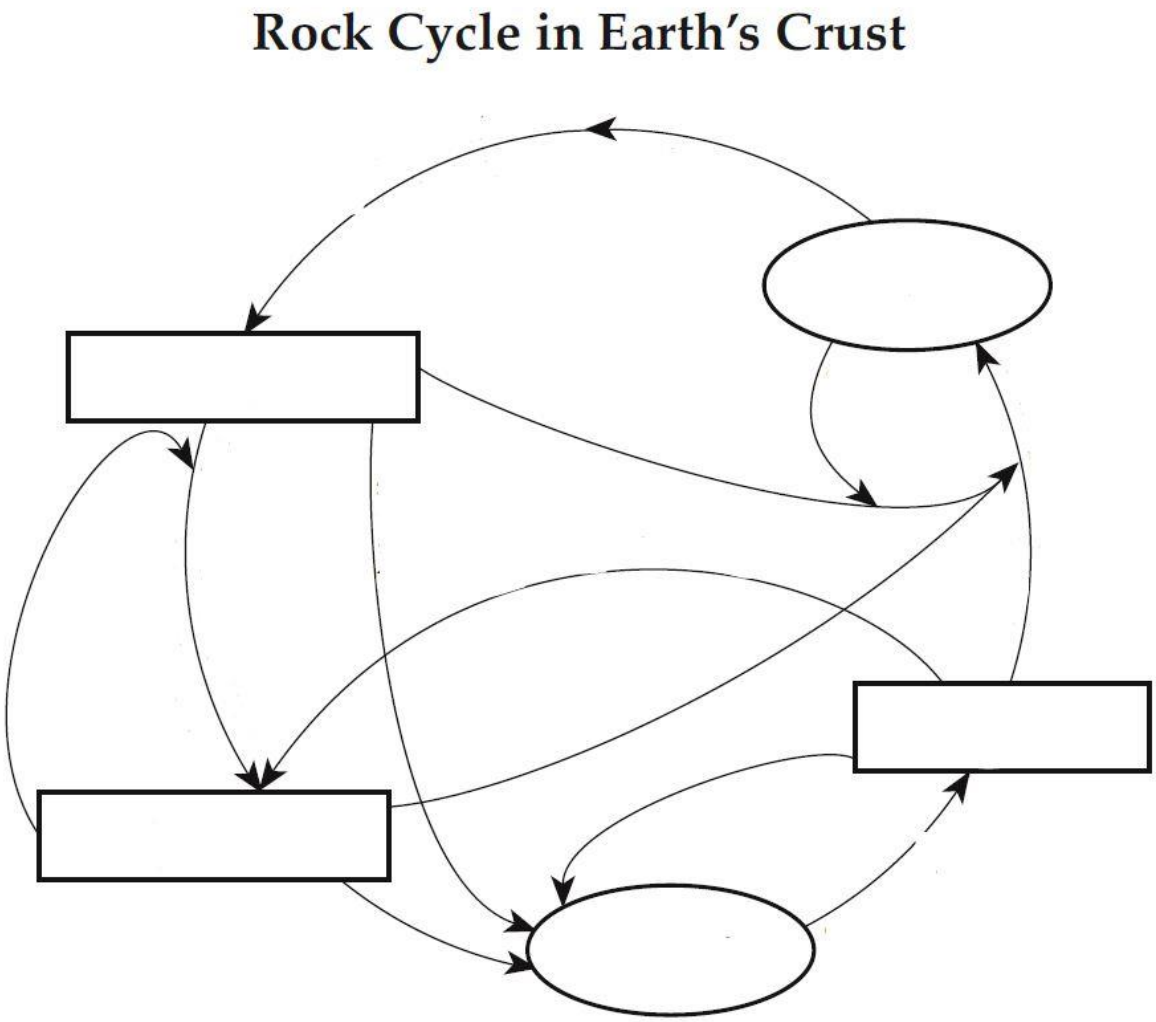
Section 2: Igneous Rocks

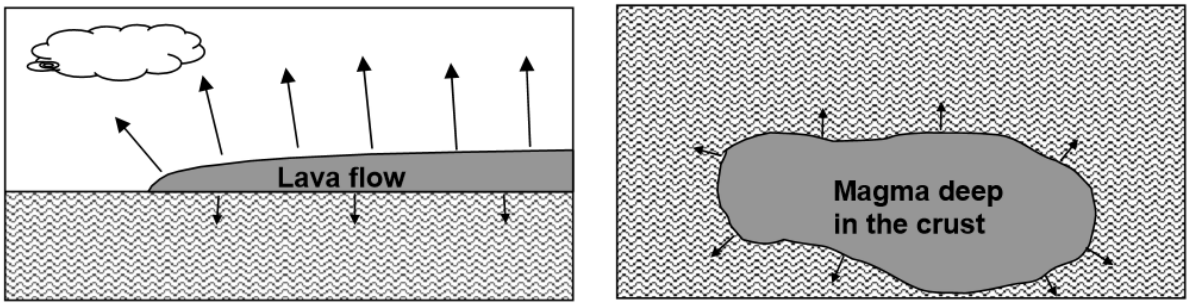


Section 2 Question: How do igneous rocks form and what characteristics are used to identify them?

What Do You See?

What Do You Think?

Two bodies of magma are shown in cross section below. One is above ground and the other is deep within the crust. The arrows represent heat escaping from the molten rock as it cools.



Which will cool faster? Lava erupted onto the surface Magma deep underground

The igneous rocks granite and gabbro have large minerals. In which location would they have formed?

on the surface deep in the crust

What Do You Think Now?

Focus Question: How do you classify an igneous rock?

Examine rock samples
List ways that you can divide them in groups:

Separate samples into categories you decided to use
List the rocks by their sample number that you placed in each category:

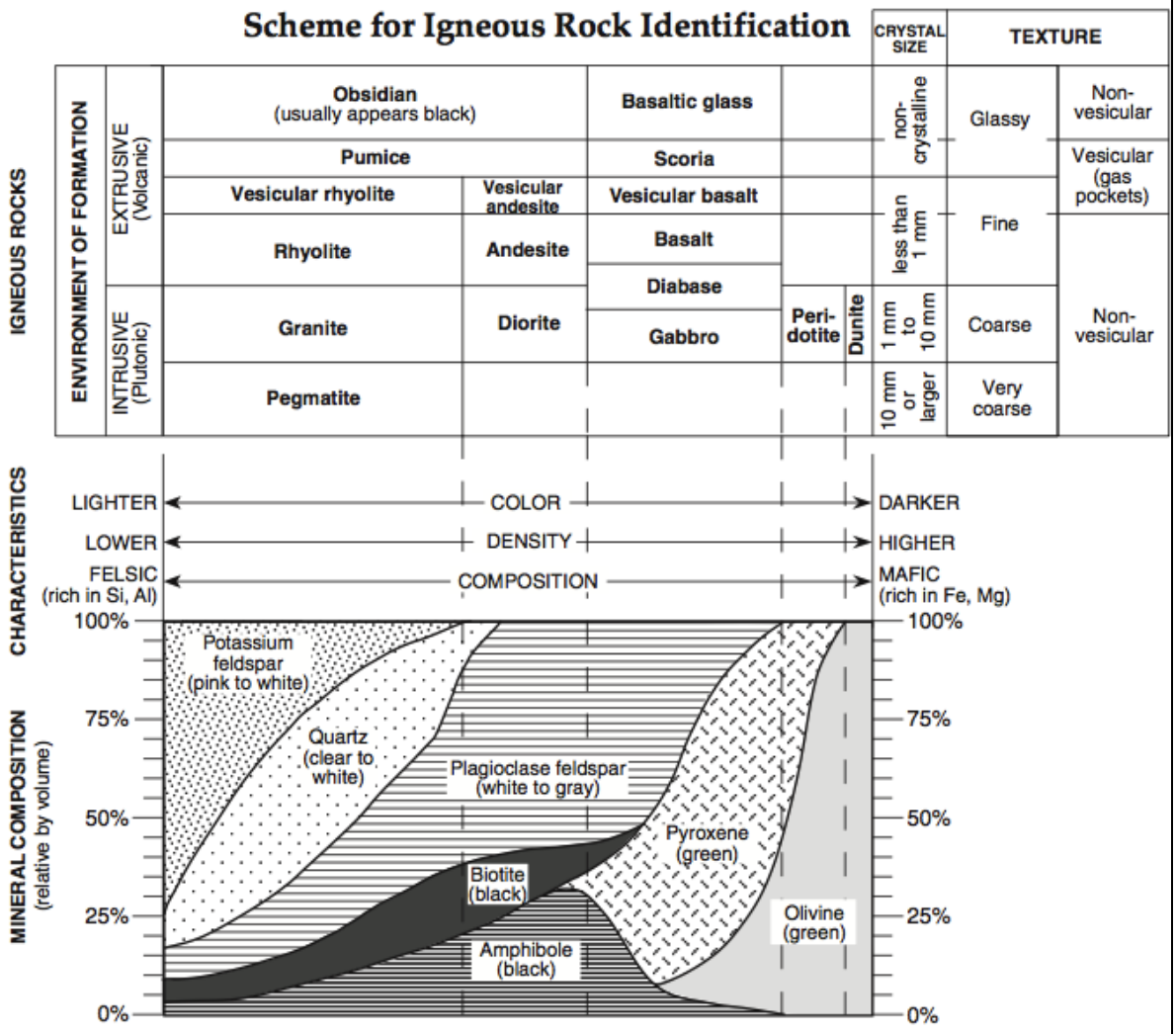
Describe difficulties you experienced:

Compare your classification with categories used by other groups and add categories to your list that you had not thought about.

Extend:

Refer to page 6 of ESRT *Scheme for Igneous Rock Identification*

Use the table to identify your samples by name



Texture	Composition	Rock Name	Minerals Present

Claim:

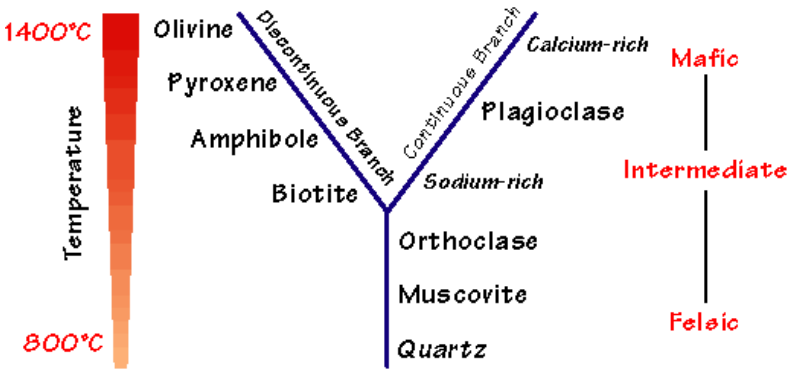
Evidence:

RETURN TO WDYTN

DIGGING DEEPER

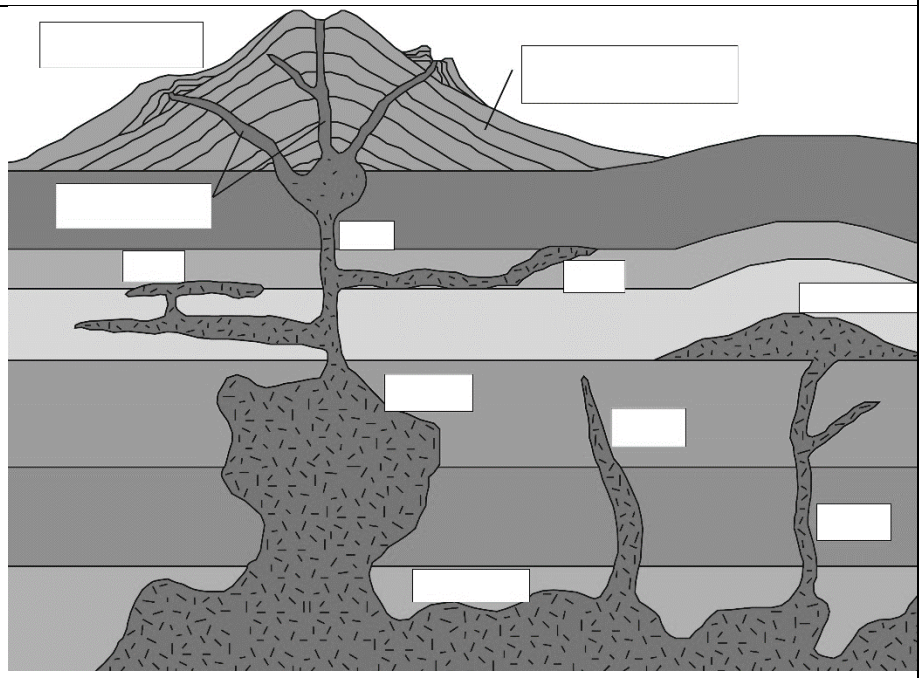
The Nature of Igneous Rocks

- Igneous rocks are composed of six common minerals;
  - Quartz
  - Feldspars
  - Micas
  - Pyroxenes
  - Amphiboles
  - Olivines
- These silicate minerals are resistant to physical weathering but susceptible to chemical weathering



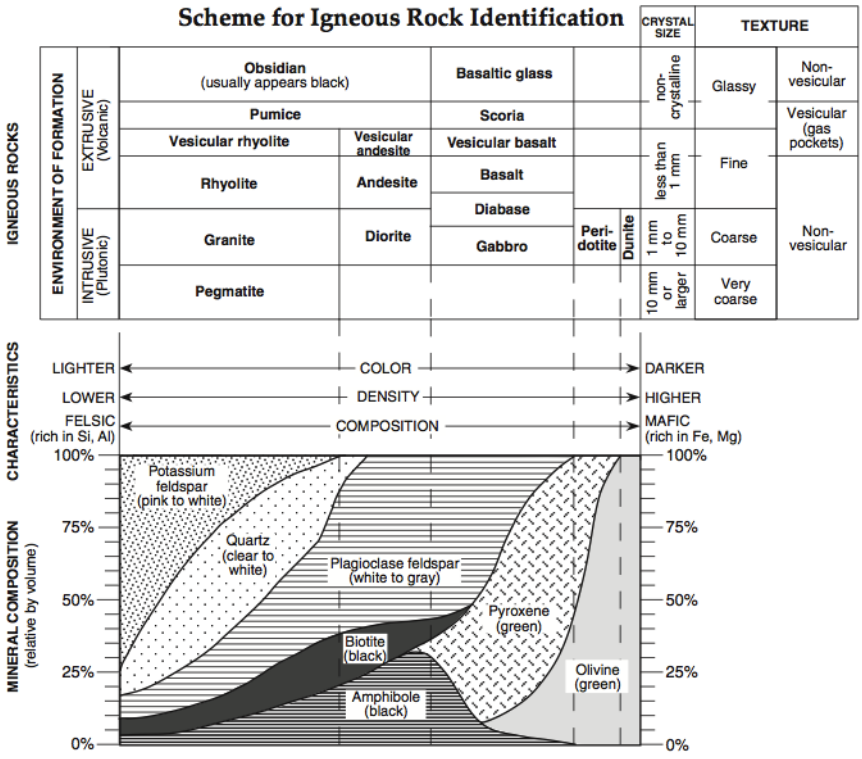
Magma, Lava, and Igneous Rock

- Earth's interior temperature increases with depth
- At depths of 100 to 350 km, rock can melt at certain times and places to produce magma
- Molten rock increases in volume by approximately 10% decreasing its density
- This allows the magma to rise towards the surface
- Some magmas cool and solidify before they reach the surface



Classifying Igneous Rocks

- Composition of an igneous rock is dependent on the source of the magma
- Crystals in an igneous rock are considered large when they are larger than 1mm in size
- Vesicular texture forms when dissolved gases in magma create bubbles and escape from the cooling rock
- Partial melting of mantle material produces basaltic mafic magmas at mid0ocan ridges and convergent boundaries with subduction
- Intermediate to felsic magmas are produced by assimilation, magma mixing, and fractional crystallization of mafic magmas at convergent boundaries with subduction



PAGE INTENTIONALLY LEFT BLANK

Chapter 3, Section 2 E.B.C.
Igneous Rocks

Name:_____
Period:_____

Question (2)		
Claim 1 (2)		
A. Supporting Evidence (3)	B. Supporting Evidence (3)	
Claim 2 (2)		
A. Supporting Evidence (3)	B. Supporting Evidence (3)	
Analysis (6)		

	Claim *A statement or conclusion that answers the original question/problem.*	**Evidence** *Scientific data that supports the claim. The data needs to be appropriate and sufficient to support the claim.*	**Analysis** *A justification that connects the evidence to the claims. It shows why the data counts as evidence by using appropriate and sufficient scientific principles and vocabulary*.
0	Does not make a claim, or makes an inaccurate claim.	Does not provide evidence, or only provides inaccurate or vague evidence.	Does not provide an analysis, or only provides an irrelevant analysis.
1	Makes an accurate but vague or incomplete claim.	Provides vague evidence and does not include specific data.	Repeats evidence and links it to claim, but does not include specific scientific principles.
2	Makes accurate and complete claim.	Provides correct evidence but does not include specific data.	Connects all evidence to the claims using scientific principles or vocabulary but not both.
3		Provides correct evidence and includes specific data.	Connects all evidence to both claims using scientific principles and vocabulary.

CHECKING UP: Page 292, 1 through 4 (2 points each)

____
13

1.

2.

3.

4.

Investigate the map on page 3 of the ESRT. (5 points)

- What igneous feature is listed in the table of contents?

- Describe its location in NYS.

- What is the age of the feature in years?