

Name _____

HR _____

Minerals, Rocks and Resources Outline

Minerals

- _____ substances that are _____
 - The substance was not _____ by or from _____ things such as _____ or _____
- Chemical _____ or _____
- Minerals can be identified by their _____ and chemical _____
 - _____, Luster, _____, Hardness, Breakage, Specific Gravity (Density), _____, and Cleavage

Luster

- The way _____ is reflected from a _____ surface of a mineral
 - _____ Luster
 - hard, shiny
 - _____ Luster
 - shiny, _____, waxy, _____, earthy (dull)

Streak

- _____ a fresh corner of the _____ across a _____, unglazed streak

- The streak is the _____ form of the _____
- Some _____ minerals leave behind a _____ that is not the same _____ as the _____

Crystal Structure

- A regularly shaped _____ formed by an ordered pattern of _____



—Examples include: Six sided, _____, rectangular, sheets, fibers

Hardness

•Minerals can be tested by _____ the unknown mineral with the _____ or _____ of other minerals of known _____

Mohs Scale of Hardness

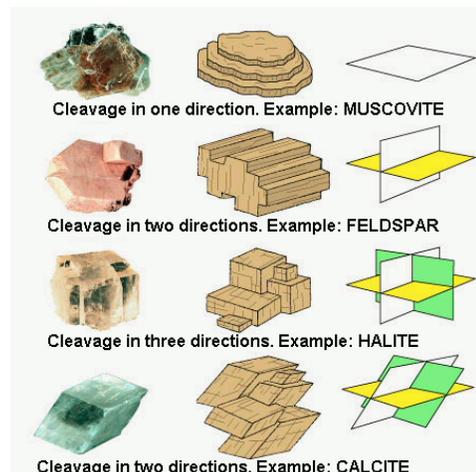
Mineral	Hardness	Common Household Substance
talc	1	plastic (1)
gypsum	2	salt (2.3)
calcite	3	fingernail (2.5)
fluorite	4	GOLD 2.5-3
apatite	5	copper coin (5)
orthoclase	6	window glass (5.5)
quartz	7	pen knife (6.5)
topaz	8	
corundum (sapphire)	9	
diamond	10	

Cleavage

•If a mineral _____ along a _____ surface, it shows _____ (to _____, or _____)

•Many minerals _____ along _____ planes, sometimes _____ to the sides of _____

•Those that _____ along even _____ that do not follow the _____ arrangement are said to _____



Density

- Can be found by either _____ the _____ of a sample by its _____ or flotation
 - _____ density is _____ g/cm³
- A substance will _____ in water if it is _____ dense and _____ if it is _____ dense
- _____ is a ratio of the _____ of a substance to the _____ of _____

$\text{Density} = \frac{\text{mass (g)}}{\text{volume (cm}^3\text{)}}$ <p>Volume of a cube is $(l)(w)(h)$.</p> <p>Volume of a sphere is $(4/3)\pi r^3$</p> <p>Volume of a rod is $(\pi r^2)(l)$.</p>

Rocks

- Nearly all _____ are composed of _____ or more _____
- _____ classify rocks according to how they were _____
 - _____ rocks form from _____ when it reaches the surface, _____ and solidifies
 - _____ rocks result from the _____ and _____ of _____ of _____
 - _____ rocks form when other types of _____ are _____ by _____ and/or _____

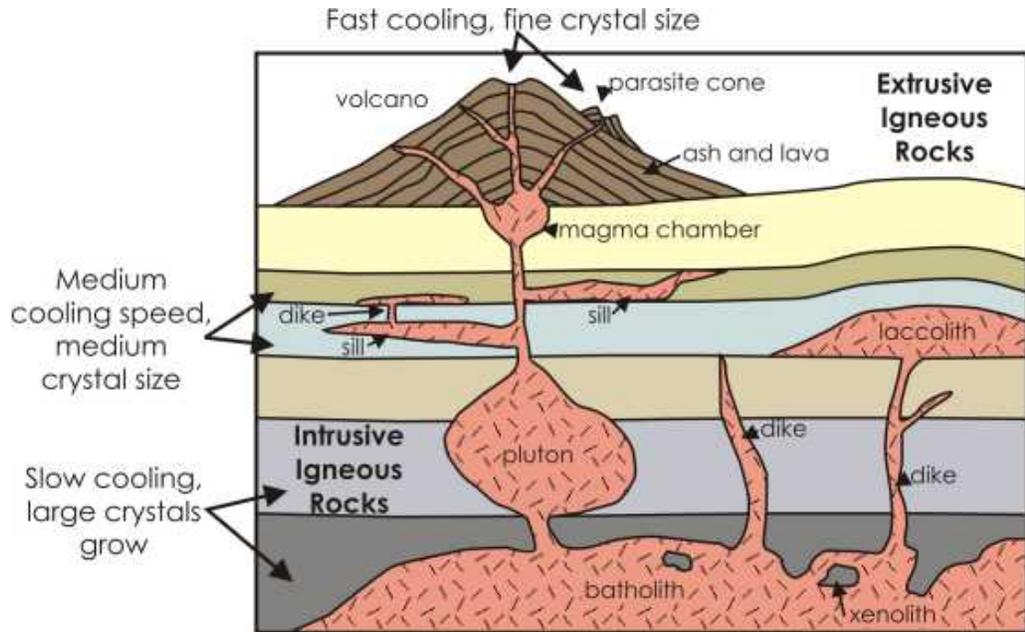
Igneous Rocks

- The result of the _____ of _____ or _____
- Most lack _____, however successive _____ flows can form a _____ rock structure
- Those that cool _____, deep within _____, are composed of _____ crystals

•Those that cool _____, at or near the Earth's _____, have _____ or no visible _____

Igneous Rock Formation

Igneous Rock Classification

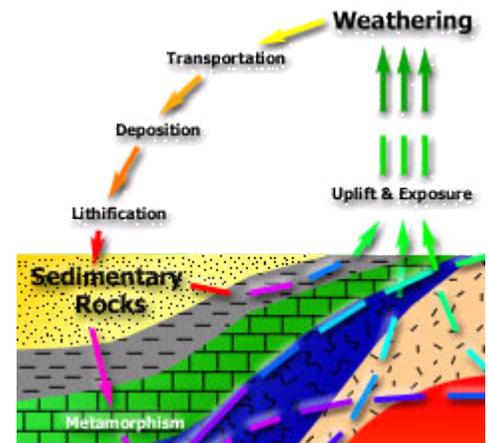


Texture	Composition				Interpretations		
	Felsic > 5% quartz <i>K-feldspar > Na-feldspar</i> <15% dark minerals	Intermediate < 5% quartz <i>Na-feldspar > K-feldspar</i> 15-40% dark minerals	Mafic no quartz <i>no K-feldspar</i> >40% dark minerals	Ultramafic nearly 100% dark minerals	cooling rate	depth of crystallization	other
coarse-grained	granite	diorite	gabbro	peridotite	slow	plutonic	-
porphyritic	porphyritic rhyolite	porphyritic andesite	porphyritic basalt	n/a	slow/fast	plutonic/volcanic	-
fine-grained	rhyolite	andesite	basalt	n/a	fast	volcanic	-
glassy	obsidian	obsidian	obsidian	n/a	very fast	volcanic	-
vesicular	pumice	pumice	scoria	n/a	fast	volcanic	gas-rich lava
pyroclastic	volcanic tuff & breccia	volcanic tuff & breccia	volcanic tuff & breccia	n/a	n/a	volcanic	explosive eruption

Sedimentary Rocks

•Most are composed of the _____ remains of other _____

•Usually are formed by the _____ and _____ of particles of _____

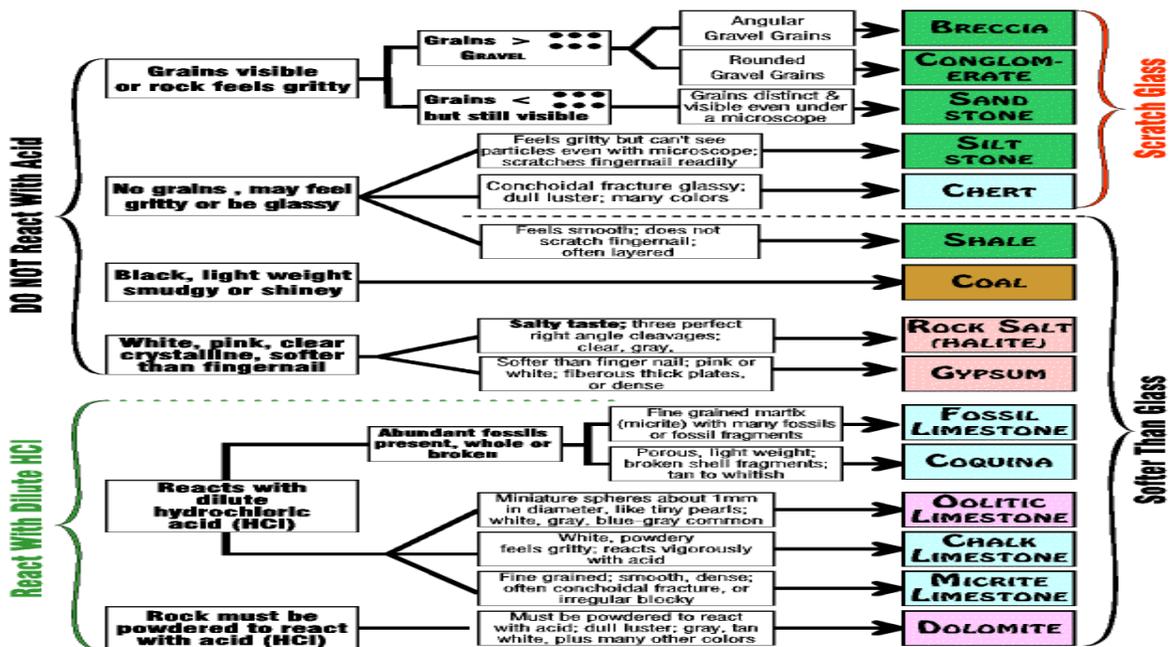


• Generally exist as a _____ layer over _____ and _____ rocks

Sedimentary Rock Characteristics

- _____ rocks are made up of different sized _____ such as _____, sandstone and conglomerate (composed of _____ or larger _____ held together by natural _____)
- _____ sedimentary rock contain the accumulation of _____ and _____ remains
 - _____ are commonly found
- _____ sedimentary rocks are _____ by the settling of _____ from solution in _____
 - This occurs during the _____ of _____ and when chemical reactions in the _____ form compounds that _____
 - _____ is an example

Sedimentary Rock Classification



Metamorphic Rocks

- Form when _____ and _____ rocks are changed by _____ and/or _____
- The only kind of _____ that _____ directly from another _____
- _____ may cause structures, such as _____, to become _____ or to disappear
- It also may cause new _____ to form, and/or _____ to grow
- Most are formed _____ within the _____ and _____ to the surface when _____ are formed

Metamorphic Rock Classification

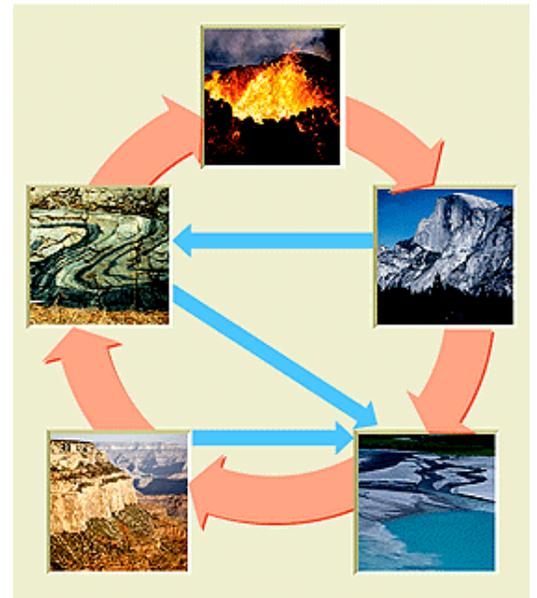
- _____
— _____ and _____ of the rock _____
- _____ Size
- _____
- Type of _____

Metamorphic Rock Classification

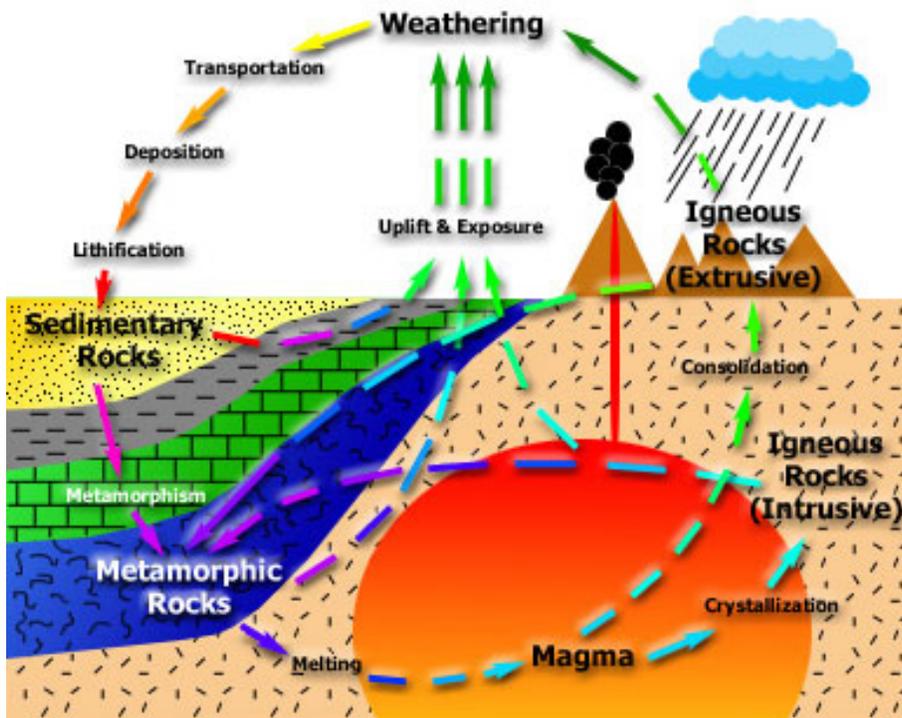
Original Rock	Texture	Rock Name	Metamorphic Process	Metamorphic Grade	Comments
mudstone	Foliated	slate	regional	lower	breaks into plates (slaty cleavage)
mudstone	Foliated	phyllite	regional	moderate	more shiny and crenulated than slate
mudstone	Foliated	schist	regional	mod-high	different schists recognized on the basis of mineral content
mudstone granite	Foliated	gneiss	regional	high	well-developed light and dark banding
quartz sandstone	Non-foliated	quartzite	contact	low-high	sugary texture composed of interlocking quartz grains; relatively hard; won't fizz with acid
limestone	Non-foliated	marble	contact	low-high	sugary texture composed of interlocking calcite grains; relatively soft; may fizz with acid
basalt	Non-foliated	metabasalt	contact	low	greenish color due to chlorite

The Rock Cycle

- _____ changes in _____ and rock _____ that takes place at the Earth's _____ and _____ Earth
- Nearly all _____ are made from the _____ of other _____
- Rocks are _____ based of their _____
- Rocks can _____ in response to changing _____ at the _____ or _____ Earth



The Rock Cycle



Natural Resources

- _____ from the _____
 — _____ resources can be _____ after they have been used

- _____, fresh _____, _____
- _____ resources can _____ be _____ after they are used for _____ of years, if at all
- _____ - gold, copper, iron, _____ – coal, oil and natural gas

Alternative Energy Sources

- _____ energy can be used to provide _____, hot water and generate _____
- However, the amount of _____ energy that reaches Earth _____ with the _____ of _____ and the _____
- _____ energy, _____ from _____ Earth, can be used but is _____ only in certain areas around the world.
- _____ generators are used in many areas to provide _____ where there are _____, _____, _____
- _____ energy can generate electricity without _____
- However, there is a danger of a _____ accident and long-term storage of _____ wastes