NOTES ON MINERALS AND ROCKS Chap 3, 4 & 5

Atomic Structure: protons- positive particles in nucleus,
Electrons – negative moving particles outside of nucleus,
Neutrons – neutral particles in the nucleus
Atomic number (# of electrons = # of protons),
Atomic Mass (protons+ neutrons)
Memorize element symbols: H, He, C, N, O, F, Na, Mg, Al, Si, S, Cl, Ca, Fe, Ni, Zn, U
All minerals are different due to bonding patterns, strength. Provides unique characteristics for all (streak, luster, hardness, color)

Minerals

Properties:
Color most easily observed, least useful in identification
Luster: overall appearance *metallic vs nonmetallic* (required) can also be pearly, vitreous, translucent, waxy, transparent…)
Crystal Shape: seen only in unbroken crystal, ie halite – cubic, galena-cubic, quartz- columnar
Streak: use a ceramic plate – color of powder on rubbed finger
Cleavage: how crystal splits on a flat plane
Hardness: *Moh's Hardness Scale* memorize
Acid Tests – tests for minerals and rocks that contain *calcium carbonates*
Special Properties:
Double refraction – calcite – refracts light
Magnetic – magnetite – attracts magnet due to Fe content
Radioactive – uranium
Fluorescent – fluorite, calcite – glows under black light
Slippery – graphite – waxy feel, great lubricant
Flammable – sulfur
Edible/taste – halite

Notes from pgs 53-57 will be done in class as a group/class project.

Uniformitarianism – the concept of the ***present is the key to the past***

Rock is a group of minerals bound together

Igneous rocks all have magma/lava origins
Sedimentary rocks are formed from cementing layers and sediments
Metamorphic Rocks – existing rocks changed due to heat and pressure

Igneous Rocks

Plutonic / intrusive- found inside the Earth, usually large crystals, cooled slowly

Volcanic / extrusive- at or near the surface of the Earth, usually small or invisible crystals, cooled quickly

Magma

Felsic – light-colored, high in silica, thick and slow moving

Mafic – dark colored, contains Fe,Mg, low silica, thinner and more fluid

Texture - size, shape and arrangements of crystals

Coarse – large crystals, intergrown,

-cooled very slowly so minerals can align together in plastic /semi-molten state.

-Happens intrusively, plutonic

example, gabbro, granite

Fine – small or invisible crystals

Cooled quickly, minerals could not align

- happens at or near the surface, extrusive, volcanic

ex. Basalt, pumice, rhyolite

SEDIMENTARY ROCKS

Clastic – glued or cemented together shale, sandstone, conglomerate

Rocks weather into smaller pieces and get transported, pieces get rounded

Deposition occurs, and particles settle together

Cements flow in from rainwater, ocean water etc – binds the particles together

high in Silica (SiO_2)	whitish or clear in color, unreactive to acid
iron oxide (FeO)	reddish in color
calcite ($CaCO_3$)	whitish to clear, bubbles in acid

Deposition, cementation and pressure SEE THE ROCK CYCLE

Chemical – formed from material coming out of solution in the form of a precipitate ie rock salt, (halite), chemical limestone

Organic – formed from the remains of living creatures ie fossilized limestone, reactive to acid due to carbonates present from shells of creatures

Stratification – visible layers. Material falls through or out of the water layers on the bottom. As time passes more and more material is put down, which is very heavy over time.

Fossils

Mud cracks, ripple marks

METAMORPHIC ROCKS

2 kinds of metamorphism:

regional metamorphism – large chunks of land of put under heat and pressure due to the collision of tectonic plates (mountain building).

Heat from friction of rocks and pressure of great rock layers overlying and intense

Constant pressure of plate pushing in. The more pressure, rock grains are squeezed together – more dense, less porous

Heat and pressure allow the minerals to move somewhat and they move towards each other (like to like) creating or alignment of mineral – layers **foliation**

Shale → slate → phyllite→ schist

Granite, shale , conglomerate, → gneiss

Contact metamorphism – the outer boundary of a magma chamber

Heat is intense, pressure is intense as the pressure in the magma chamber grows

Rock Cycle

Shows the cycle all rocks can go through. Any rock can turn into another rock.

Pg 82 Review 1-22

I&A 1, 2, 3, 5 see also pg 61 I&A5

Either in Lab or Class do Studying Rocks in Thin Sections pg 80-81