**ES 11 Text Questions – Rocks**

**Oct 4/5 p68: 3,4,5,6,8**,

3. a) difference between magma and Lava: magma is molten rock under Earth’s surface, lava has erupted to surface

b) Plutonic rocks form below the surface

c) Volcanic rocks (Extrusive) form ABOVE surface

4. a) Felsic magma contain higher concentrations silicon and feldspar are LIGHT in colour and more viscous (slower moving), forms granite. Mafic is hotter, darker, contains more magnesium and iron, less viscous (flows faster), makes volcanic rocks.

B) Plutonic rock more likely to form from felsic magma.

C) Mafic more likely to form volcanic rock

5. a) Texture depends on crystal size, shape and arrangement

b) Plutonic rocks tend to have larger crystals because they have more time to form due to slower cooling times underground. Volcanic rocks have smaller crystals because they have less time to form due to quicker cooling temperatures.

c) glassy texture caused by very quick cooling times, almost no time for crystals to form.

6. a) Porphyry – different textures within one rock – large crystals surrounded by fine –grained rock.

B) due to different cooling times. 1st stage magma deep below surface cools slowly forming large crystals while rest remains hot. Slowly magma forced up to surface, rest cools faster forming small grains.

7. a) Granite family – from felsic magma, made of quartz, orthoclase feldspar, and other (such as mica and hornblende). Light coloured. Quartz grains look like little chips of cloudy or grayish glass. Coarse grained. Granite most common continental igneous rock. Plutonic. Obsidian

b) Gabbro family –from Mafic magma, dark plagioclase feldspar and augite. Denser than granite family. Can be coarse grained (Gabbro), fine-grained (basalt), glassy (basalt glass)

c) Diorite family – composition and colour in between granite and Gabbro families

**Oct 17/18 HW: p74   9b, 10-15**

9b. Name and describe three groups of sedimentary rocks:

Clastic – fragments of other rocks that are cemented together. Eg sandstone

Chemical – from dissolved minerals that have precipitated out of solution eg. Rock salt, gypsum

Organic – came from once living material, eg. Coal, limestone from crustaceans

10. a) What collects and moves the greatest amount of sediment is running water ( wind, ice and gravity play smaller role)

b. Cement can be: silica, calcite and iron oxide.

c. fine particles can form into rock without cement by pressure.

11. a. Sediments are sorted by water: when running water slows down and can no longer carry the particles, the largest, heaviest particles settle out first, then smaller and smaller up to fine sand and silt.

c. Rock from each kind of sediment: Clastic – shale from silt, sandstone from sand, conglomerate from gravel

Chemical – limestone, halite

Organic – Coal, limestone from shell

12. a. Conglomerate – rounded pebbles held together by cement.

b. sandstone is permeable because not all the cement fills the spaces in between fragments, making it porous.

c. shale is impermeable because the spaces between the particles are too small.

13. a. chemical sediments are formed when dissolved minerals fall (precipitate) out of solution.

b. Three examples of chemical sediments: limestone, gypsum, rock salt

14. Origin of organic limestone: shells of dead sea creatures (are made of calcite) settle to ocean floor, get broken up and in time get cemented together into limestones.

15. Stratification is the arrangement of visible layers in the rock

b. Stratification develops in sedimentary rocks when a change in sediment is being deposited. Can be due to rivers shifting coarse and distributing different sediment, landslide, precipitation washing other sediment to/from....

16. Fossils – remains , impressions of long dead plants and animals embedded in rock.

**Oct 24/25 P79 #19-23**

19. Metamorphic Rock: new rocks formed from existing rocks by extreme heat, pressure , chemical action.

4 Examples: schist, gneiss, marble, slate

20. A. Explain Regional Metamorphism: when large areas of rock are under intense heat and pressure. Pressure from weight of overlying rocks and squeezing of moving rock masses. Heat from friction.

b. what general changes does metamorphism cause? Pressure squeezes their grian closer together. Squeezing makes them more dense, less porous.

c. In what ways does metamorphism change sandstone? Makes it Quartzite, less porous, more dense.

Limestone? Creates marble

22. A. what causes contact metamorphism? Hot magma forces its way into overlaying rock.

b. how do the effects of contact metamorphism compare to regional? Regional affects larger area.

23. A. list general steps of the rock cycle. Fragments of existing rock, often igneous, is weathered away (by wind, water) forming sediment. Sediments are compacted, cemented forming sedimentary rock. These rocks can be heated or squeezed, creating metamorphic rocks. If these rocks are forced below surface and melt, they become igneous again.

b. 2 shortcuts in rock cycle: igneous may be metamorphosed directly. Sedimentary rocks may be weathered without being metamorphoses. Metamorphic rocks may be metamorphosed ow weathered a second time.