

GEO101 review for MidTerm #1

Investigating Geologic Questions

determining the sequence of events -

- observation separate from interpretation

- superposition

- cross-cutting relationships

- inclusions

- baked contacts

continental drift - early evidence

- shape of continents, common fossils, glacial striations

depicting geologic features -

- block diagrams, cross sections, stratigraphic columns

elevation, depth, relief and slope gradient

mass, weight and density

geologic time and the age of the earth (4.5 billion years)

Plate Tectonics

global distribution of

- mountains, continental plains,

- continental shelves, ocean trenches, abyssal plains, mid-ocean ridges

- volcanoes and earthquakes

what are lithospheric plates

- convergence, divergence, transform boundaries

- mantle and crust processes associated with each type of plate boundary

what drives plate motion - ridge push versus slab pull

speed of plate motion

oceanic hotspots as tracers of plate motion

Earth Materials

what is a mineral - solid, naturally occurring, inorganic, ordered internal

structure and defined chemical composition

rocks contain minerals - clastic rocks versus crystalline rocks

- size and organization of minerals within rocks

- the physical meaning of mineral cleavage - planes of weakness

major classes of rock forming minerals -

- carbonates, oxides, halides, sulfates, sulfides, native minerals

- silicates - the most important and most abundant

- linkages among silica tetrahedral - framework, chains, sheets, isolated

distribution of minerals within the earth - continental and oceanic crust

- upper and lower mantle, inner and outer core

Igneous Rocks and Magma

magma forms by melting rocks -

decrease pressure, introduce volatiles, transfer heat

phase diagram of pressure (or depth) and temperature

silicic melts - composition and melting point

mafic melts - composition and melting point

changing the composition of melts -

partial melting, contamination, fractional crystallization

movement of magma - viscosity, density

extrusive versus intrusive rocks

composition and grain sizes

features of intrusive igneous rocks - dikes, sills, batholiths and plutons

rate of cooling from magma to rock

geologic context of igneous rocks -

subduction zones, continental rifts, mid-ocean ridges

Volcanism

lava flow controlled by composition, viscosity, density, amount of volatiles

explosive versus effusive eruptions

pyroclastic debris, volcanic gases

where are potentially active volcanoes in the USA?

what are the main hazards presented by volcanoes?

volcano architecture - circular vents versus fissures

collapsed craters - calderas

size of volcanoes -

large shields, medium stratovolcanoes, small cinder cones

hotspot volcanism - in oceans and on continents