

## Lecture 5

Volcanoes located at mid-ocean ridges and subduction zones

Earthquakes associated with subduction zones, getting deeper as subducting slab sinks

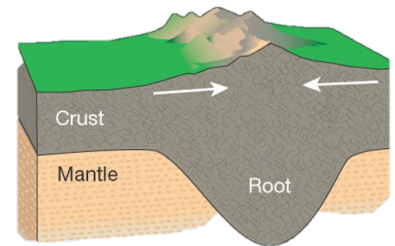
Solid rock flows with high temperature and pressure, over millions of years

### Continental Crust

- 20-70km thick
- Al, Ca, K rich silicates – originally from mantle
- Mostly Granite
- $2.7g/cm^3$  – buoyant which produces topography and sits above the lithospheric mantle, less dense and weaker than oceanic crust
- Base of crust called 'moho'
- Oldest continental crust is 4 billion years old

### Continents

- 25% of the Earth's surface
- Continental crust comprises 35% of the Earth's surface
- Diverse composition
- Wider mountain belts than in oceans



Lower density of continental crust means mountains have a smaller gravitational pull than expected (isostasy)

∴ Each 1km of mountain = 6km of continental crust 'root'

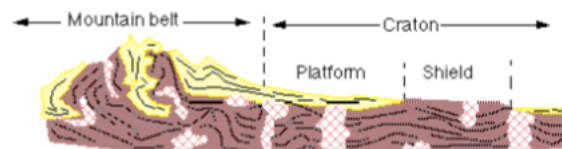
Root = symmetrical displacement of mantle below mountain

Craton = most flat land

Shields = continental crust exposed at surface

Platforms = continental crust buried by sediment

Mountain belts = elevated, pointy land



### Surface Geology

- Continental crust is granitic/felsic, rich in silicon (Si), potassium (K) and sodium (Na)
- Common minerals: Quartz, Orthoclase feldspar (K) (pink), Plagioclase feldspar (Na/Ca) (goes green)
- Continental crust is "**felsic**" (has more silicates) than oceanic crust ("**mafic**").

Speed of P waves is different though continental and oceanic crust ∴ you can map crust type by measuring speed of p waves (slower=continental [less dense], faster=oceanic [denser])

### Plate Boundaries

#### Convergent

- Oceanic-oceanic subduction → produces new continental crust
  1. Oldest (densest and coldest) oceanic crust subducts
  2. Subducting plate will heat up
    - Releases water and minerals break down
      - Water + basaltic oceanic crust = granitic continental crust
    - Water melts mantle into magma which rises as granitic magma
  3. ∴ new continental crust as volcanic island arc