HANDOUT

Parts of the Earth - based on chemical properties

1) **Crust-** a thin outer layer on average < 20km thick -
   a) Continental Crust - ~35km thick (may exceed 60km); P waves travel at 6 kps; p = 2.67-2.8 g/cm^3; granitic rocks (sometimes use <u>sial</u> for rocks high in Si &A1)
   b) Oceanic Crust - between 5-8 km thick; P waves travel at 7 kps; p = —2.9 g/cm^3; basaltic rocks (sometimes use sima for rocks high in Si & Mg)

Mohorovicic Discontinuity (Moho) - in 1909 Andrija Mohorovicic presented the first convincing evidence for layering within the Earth (seismographic stations > 200km from an earthquake obtained faster average travel velocities for P waves); the boundary separates the crust from the mantle. ••

2) **Mantle** - contains 80% of the Earth's volume; 2885km thick; appears to be solid; P waves travel at 8 kps in the upper mantle; p = 3.3 g/cm^3 in the upper mantle & —5.5 g/cm^3 at the base of the mantle; ultramafic rock - dense igneous rock of mainly ferromagnesium minerals (ex: olivine & pyroxene); 4800°C at mantle-core boundary
   a) Low-velocity Zone - between 100-250km; P & S waves decrease in velocity; possibly due to molten rock; a.k.a. asthenosphere (weak ball), above it is the lithosphere (crust & upper mantle) & below is the mesosphere (rest of mantle)

3) **Core** - 1/6 Earth's volume & 1/3 mass; radius = 3486km (larger than Mars); consists of
   a) Outer Core - liquid; ~2270km thick; Fe, S & O with minor amounts of Si & C; p = 10 g/cm^3 at the core-mantle boundary
   b) Inner Core - solid; radius of 1216km; Fe & Ni; p = 13.5 g/cm^3 at the center; 6600°C at inner core-outer core boundary & 6900°C at center of the Earth

<u>Parts of the Earth</u> - based on physical properties

1) Lithosphere
2) Asthenosphere
3) Mesosphere
4) Outer Core
5) Inner Core