

## Notes on Earth Structure

### I. Earth Structure Itself

#### A. Made of several layers

1. Inner Core
  - a. about 1200km at the center of the Ea.
  - b. very hot, under a lot of pressure
  - c. mostly Fe, Ni metals, very dense, 12.7-13.0 g/cm<sup>3</sup>
  - d. solid in nature
2. Outer Core
  - a. about 2250km thick
  - b. liquid in nature
  - c. made from Fe, Ni
3. Stiffer Mantle
  - a. assumed to be solid
    - 1) more likely to be a stiff gel like substance
    - 2) half liquid / half solid
  - b. density 3.3-5.5 g/cm<sup>3</sup>
  - c. tectonic plates subduct into this area
4. Asthenosphere
  - a. other name = plastic mantle
    - 1) very much a semi-solid at melting point
    - 2) think of warm candle wax, moldable, pliable when warm
    - 3) convection currents occur here
      - (a) warm rises, cool sinks
      - (b) causes tectonic plates to move over Earth's surface
5. Crust
  - a. Very thin compared to other layers
  - b. ranges from 10-65km thick
    - 1) 10km below oceans
    - 2) 65 under inner continents
  - c. part of the lithosphere
6. Lithosphere
  - a. the crust and upper section of the asthenosphere
  - b. solid, rock like, stiff
  - c. litho – means stone
    - 1) interest idea: lithography (art) ( advertising)
7. Temperature
  - a. decrease until 20m mark
  - b. below 20m, temps raise 1 degree/40m
  - c. heat comes from radioactive materials (U,Th,K)

***See ESRT pg 10, Inferred Properties of Earth's Interior. know how to read and identify information.***

8. Earth's overall shape
  - a. *slightly* bigger at the equator than at the poles
    - 1) circumference @ equator 40,074 km
    - 2) circumference @ poles 40,007 km
    - 3) this size difference is only a hair when considering the relative size
  - b. the Earth still looks like a perfect circle from space
  - c. **note diameter of Earth on ESRT on the Astronomy Table**

## II. Latitude and Longitude

- A. Grid like system with coordinates to locate places on Earth accurately

## III. Topography and Topographic Maps

- A. Land can be shown a 2 dimensional map by using lines and symbols
- B. Topography Maps
  1. show relief, ups and downs of the land
  2. quadrangles- maps of an area broken down into sections
    - a. Adirondack quadrangles
  3. Symbols and items of a map
    - a. map scale: shows relative distances to scale
      - (1) measures distance in ratio 1:24 000 means 1" = 24,000'
      - (2) watch measurement lines – be careful
    - b. contour lines
      - (1) interval is identified
      - (2) usually brown
      - (3) close together means steep slope
      - (4) far apart means gradual slope
    - c. depression contours
      - (1) contour line with hatch marks on it
      - (2) shows a dip in land
    - d. bench mark
      - (1) measured elevation at a particular time
      - (2) land does continue to rise and fall after measurement
    - e. magnetic declination
      - (1) show direction of true north in relation to magnetic compass
      - (2) very precise travel (airplanes, satellite pictures etc) would need to take this into account in calculations
  4. Gradient
    - a. also known as slope

$$\text{gradient} = \frac{\text{change in elevation between 2 points (field value) (ft)}}{\text{distance between 2 points (mi)}}$$

- b. identifies how steep a relief is
- note equation on front page of ESRT!!**

5. profile

- a. a sideways picture of an area
- b. draw using contour lines and map scale