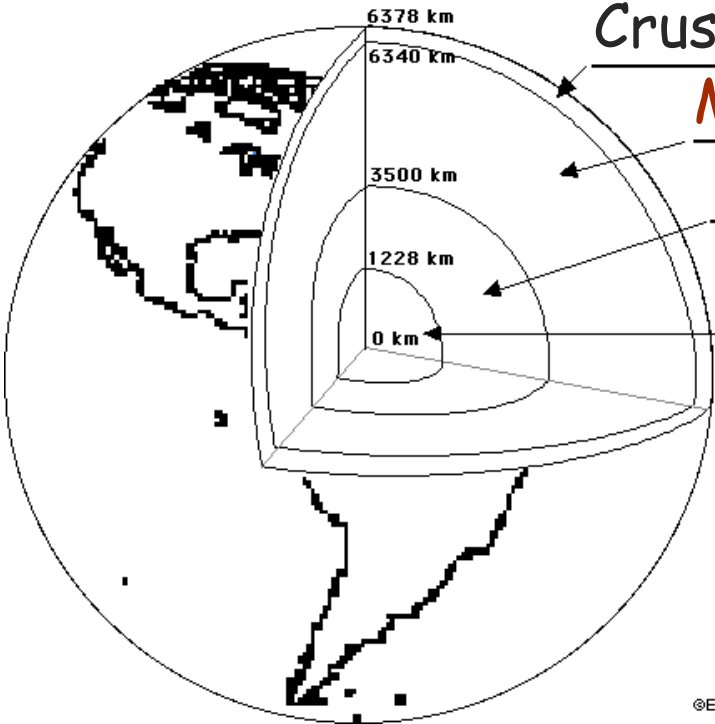


Structure of the Earth





Crust

Mantle

Outer Core

Inner Core

Structure of the Earth

Crust

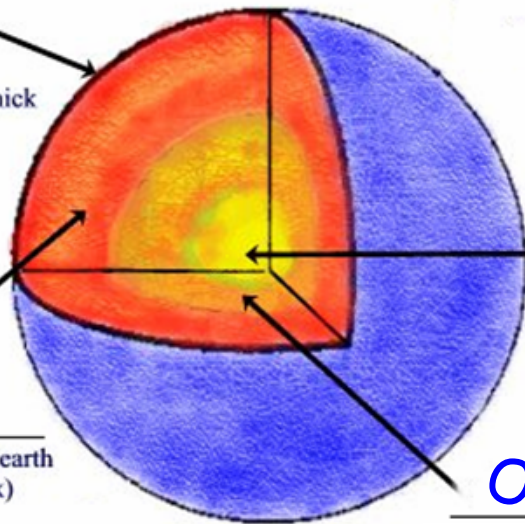
Outer Layer
Up to 75km thick

Mantle

Middle layer of the earth
(up to 2800km thick)

The upper part forms part of
the Lithosphere
and is rigid.

The lower semi-molten part forms
the Asthenosphere



INNER Core

Central part of the earth
Inner most part of the Earth
Composed of Iron and Nickel
The inner part has solid
properties (5000 °C)

OUTER Core

Inner most part of the Earth
Composed of Iron and Nickel
The outer part has liquid
properties (3000 °C)

Crust: Stiff, outer surface of the earth. Where we live and under the ocean. Also called the LITHOSPHERE

There are two types of crust:

Continental crust: thicker but less dense. (land).

Oceanic crust: thinner and more dense. Under most of the oceans in the world.

Mantle: Thickest layer of the earth. Is composed of "plastic" molten rock (melted, or liquid)

There are two zones of the mantle:

Asthenosphere: Overlaps with crust. "plastic" -- a little bendy and can flow, but technically a solid.

"The Rest of It" -- just called the mantle

Outer Core:

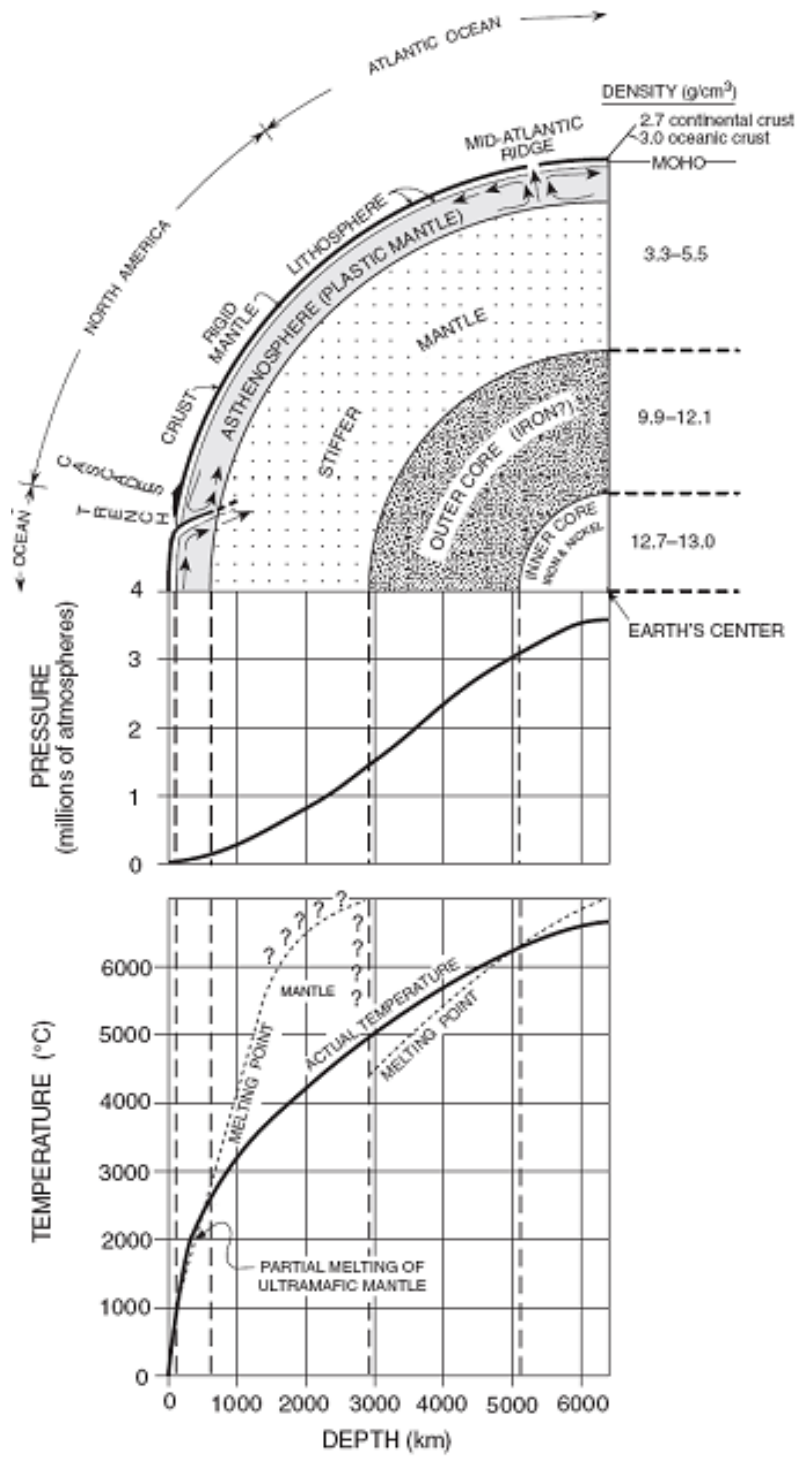
liquid and composed of iron and nickel

Inner Core:

solid and composed of iron and nickel is solid because of the intense pressure

Reference Table Diagram

Inferred Properties of Earth's Interior



Reference Table Diagram

**Average Chemical Composition
of Earth's Crust, Hydrosphere, and Troposphere**

ELEMENT (symbol)	CRUST		HYDROSPHERE	TROPOSPHERE
	Percent by Mass	Percent by Volume	Percent by Volume	Percent by Volume
Oxygen (O)	46.40	94.04	33.0	21.0
Silicon (Si)	28.15	0.88		
Aluminum (Al)	8.23	0.48		
Iron (Fe)	5.63	0.49		
Calcium (Ca)	4.15	1.18		
Sodium (Na)	2.36	1.11		
Magnesium (Mg)	2.33	0.33		
Potassium (K)	2.09	1.42		
Nitrogen (N)				78.0
Hydrogen (H)			66.0	
Other	0.66	0.07	1.0	1.0

What makes up the Earth, Hydrosphere & Atmosphere

The most common elements on Earth are _____ and _____ .

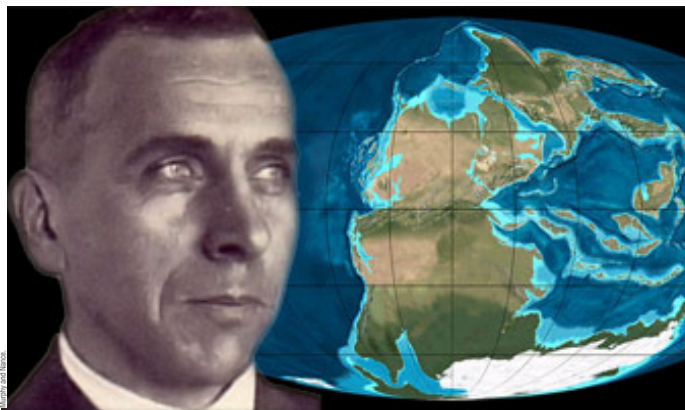
The hydrosphere is made up primarily of _____ and _____ .

The atmosphere is made up primarily of _____ and _____ .

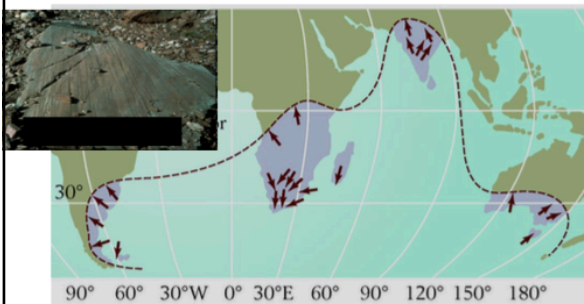
hydrogen nitrogen
oxygen oxygen oxygen silicon

Evidence of Continental Drift:

https://www.youtube.com/watch?v=MLTev3VK_oo



Wegener's observations:
glacial deposits



Contemporaneous glacial deposits on present day continents. The direction of glacial movement (interpreted from striations) is indicated by arrows.

650 million years in under 2 minutes:

<https://www.youtube.com/watch?v=NYbTNFN>



Wegener's observations: the paleoclimate

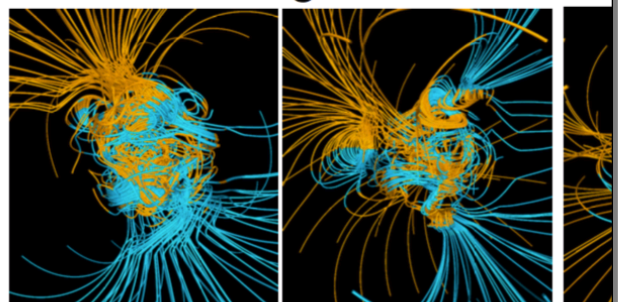
Paleo = ancient,
prehistoric

Paleoclimate zones
across Pangaea
inferred from geology.

Evidence for location
of the continents with
respect to the equator
and the poles.



Magnetic Reversals



500 years before the
middle of reversal

In the middle of reversal

<http://www.es.ucsc.edu/%7Eglatz/geodynamo.h>

On average, every 200,000 years, Earth's mag
reverses within 2000 years!

The sun reverses its polarity approximately eve
<http://www.youtube.com/watch?v=B4UfVo7->

Tricky Practice Questions

1. According to the *Earth Science Reference Tables*, which two elements make up the *greatest* volume of the Earth's crust?
 - a. Oxygen and potassium
 - b. Silicon and iron
 - c. Silicon and potassium
 - d. Iron and nickel

2. According to the *Earth Science Reference Tables*, the temperature of rock located 1,000 kilometers below the Earth's surface is about
 - a. 2,100 °C
 - b. 3,200 °C
 - c. 2,800 °C
 - d. 200 °C

3. According to the *Earth Science Reference Tables*, the rate of temperature increase below the Earth's surface is *greatest* between depths of
 - a. 1500 and 2500 km
 - b. 250 and 500 km
 - c. 3500 and 400 km
 - d. 2500 and 3500 km

4. According to the *Earth Science Reference Tables*, as the depth within the Earth's interior increases, the
 - a. Density, temperature, and pressure decrease
 - b. Density and temperature increase, but pressure decreases
 - c. Density, temperature, and pressure increase
 - d. Density increases, but temperature and pressure decrease.

5. According to the *Earth Science Reference Tables*, in which group are the zones of the Earth's interior correctly arranged in order of increasing average density?
 - a. Crust, mantle, inner core, outer core
 - b. Inner core, outer core, mantle, crust
 - c. Outer core, inner core, mantle, crust
 - d. Crust, mantle, outer core, inner core

6. According to the *Earth Science Reference Tables*, what is the relationship between density, temperature, and pressure inside the earth?
 - a. As depth increases, density, temperature and pressure decrease
 - b. As depth increases, density, temperature, and pressure increase.
 - c. As depth increases, density and temperature increase, but pressure decreases
 - d. As depth increases, density increases, but temperature and pressure decrease.

