

## Physical Science Review

### Unit 4 (Chapters 26-34)



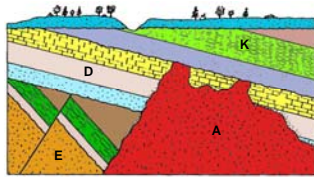
## Chapter 26 – Geologic Time

### Review

- Principles of Relative Dating
  - Original Horizontality
  - Superposition
  - Cross-cutting Relationships
  - Inclusions
  - Faunal Succession
- Unconformities
  - Breaks in the rock record
- Absolute Time
  - Half-life
  - What is it that we are dating?
    - Thermal events, not the elements

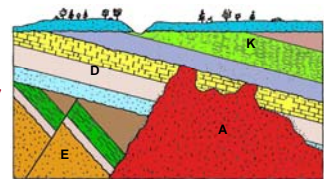
Which of the following is the oldest rock unit shown?

- A. A
- B. E
- C. D
- D. K



What principle of relative dating do you use to determine that A is younger than D?

- A. Superposition
- B. Faunal Succession
- C. Original Horizontality
- D. Cross-cutting Relationships



## Chapter 27 – Planet Earth

### Review

- Basic Rock Types
  - Igneous
  - Sedimentary
  - Metamorphic
  - Common rocks of each type
- Continents
  - Age & Composition
  - Subdivisions
- Ocean Basins
  - Age & Composition
  - Subdivisions

Layers of limestone containing fossil clams and sea snails are found at the top of Mount Timpanogos. What is the best explanation for how they got there?

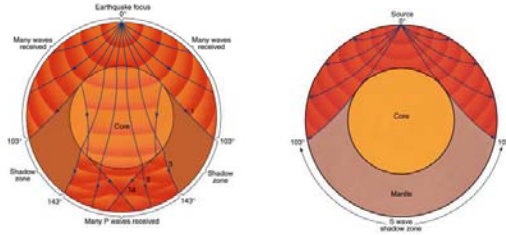
- A. They were deposited in an ocean and have since been uplifted by tectonic processes
- B. The fossils were formed during metamorphism of the mountain
- C. The mountain has always been there and the fossils are left over from the time of creation
- D. The limestones formed when lava flowed out of a volcano and trapped the fossils

Chapter 28 – Earth's Interior

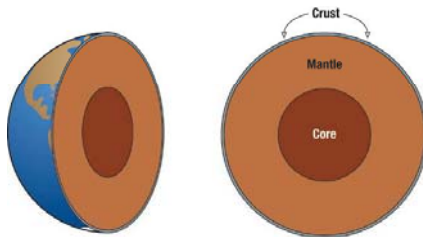
Review

- Evidences
  - Direct Observations (Drilling, Mantle Inclusions)
  - Meteorites
  - Gravity & Density
  - Seismic Waves (Shadow Zones)
  - Magnetic Field
- Compositional Model of Earth Structure
- Mechanical Model of Earth Structure

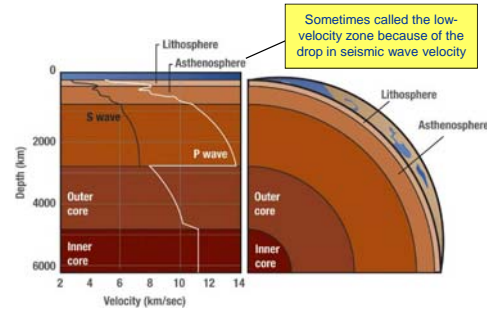
Why are there shadow zones for P and S waves?  
Why are these zones different for P and S waves?



Compositional Model of Interior



Mechanical Model of Interior



Chapter 29 – Evidence for Plate Tectonics

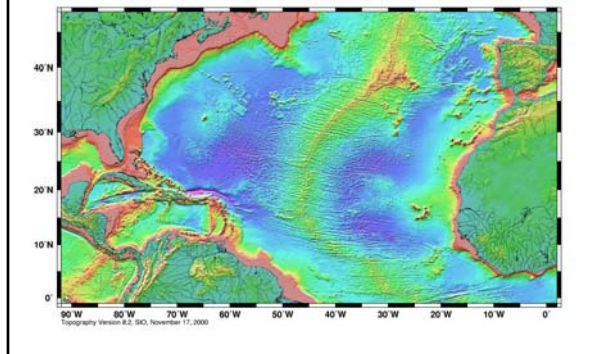
Review

- Continental Drift
  - Alfred Wegener's evidences
    - Jigsaw fit of continents
    - Structural fit of continents
    - Fossils
    - Paleoclimatic evidence
    - Paleomagnetic evidence
  - Why was theory not accepted?
- Additional Evidences leading to acceptance of theory
  - Seafloor topography
  - Guyots
  - Magnetic stripes on seafloor
  - Locations of earthquakes, volcanoes
  - Thickness & age of sediment on seafloor

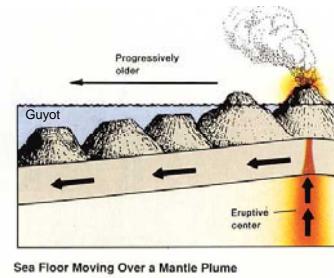
Which are not correctly matched

- a) Oceanic crust—basalt
- b) Continental crust—granite
- c) Oceanic crust—relatively young
- d) Continental crust—relatively old
- e) Oceanic crust—much metamorphic rock

### Seafloor Topography



### Guyot Formation



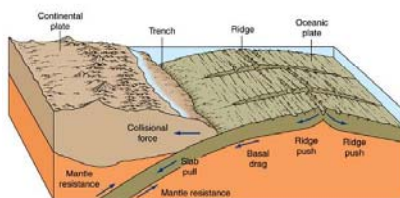
Which of the following is not an evidence for the theory of plate tectonics?

- A. The locations where most earthquakes & volcanoes occur
- B. The age of rocks on the ocean floor
- C. The shadow zone for S-waves passing through the Earth
- D. The similarities in the fossils found on many of the continents

### Chapter 30 – Plate Tectonic Model

- Review
  - Forces that drive plates
  - Basic types of plate interactions and examples of each type
    - Divergent (Spreading)
      - Oceanic
      - Continental
    - Convergent (Collision)
      - Ocean/Ocean
      - Ocean/Continent
      - Continent/Continent
    - Shear (Transform)
  - How continents evolve
  - Hot Spots

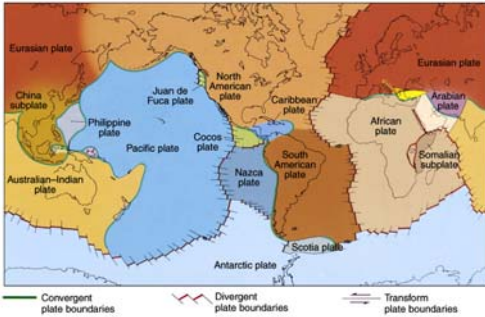
### Forces affecting plate motion



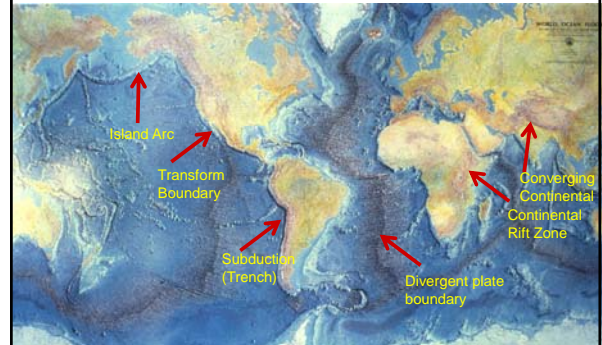
Which is not associated with a plate boundary

- a) East African rift valley
- b) Grand canyon
- c) Icelandic volcanism
- d) San Francisco earthquakes
- e) Aleutian trench

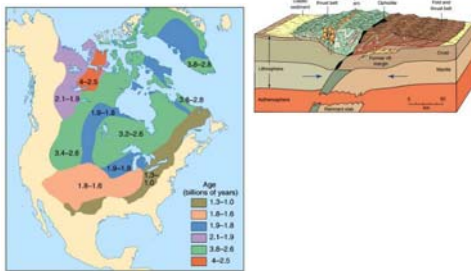
Current plate boundaries



Name that boundary



Continental Growth

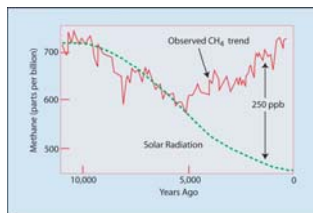


Chapter 31 – The Changing Earth

- Review
  - Hydrologic System
    - Rivers
    - Glaciers
    - Groundwater
    - Shorelines
    - Deserts
  - Climate Change
    - Evidences
      - Solar Radiation Cycles
      - Temperature Change
      - CO<sub>2</sub> and Methane
    - Forecasts for the future

The graph below shows atmospheric methane concentrations for the last 10,000 years. Why has the methane concentration continued to increase even with a drop in solar radiation during the last 5,000 years?

- A. A change in the ellipticity of Earth's orbit
- B. An increase in the tilt of Earth's rotation axis
- C. Human activities that have released extra methane



Chapter 32 – Beyond the Earth

- Review
  - Structure of Solar System
    - Terrestrial Planets
    - Jovian Planets
    - How are they different?
  - Features of Planets
    - What is unique to Earth?
    - How do the Earth and the Moon compare?
  - How do we determine distances?
    - Radar Ranging
    - Triangulation

Which of the following planets would likely have the highest density?

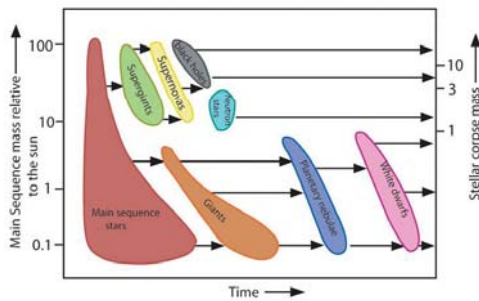
- A. Jupiter
- B. Saturn
- C. Neptune
- D. Uranus
- E. Mercury



### Chapter 33 – History of a Star

- Review
  - Life History of Typical Star
    - Nebula
    - Protostar (~10 million yrs)
    - Main Fusion Stage (~10 billion yrs)
    - Red Giant
    - White Dwarf
  - How does the history of smaller and bigger stars differ from typical stars?
  - How can we use the HR diagram to determine distance?

### Stellar Evolution



For a typical star, like our Sun, the hydrogen/proton fusion stage is...

- A. The shortest life stage
- B. The earliest life stage
- C. The longest life stage
- D. None of the above, a star like our Sun doesn't ever reach the hydrogen fusion stage.



Two **main sequence** stars have different colors, but the same brightness. Which one is **closest** to the Earth?

- A. The bluest one
- B. The reddest one
- C. The yellowest one
- D. Impossible to tell from color



### Chapter 34 – Cosmology

- Review
  - Structure of Milky Way
  - Types of galaxies
    - Elliptical, Spiral, Barred, Irregular
    - How can we determine the age of a galaxy?
  - Determining Distance
    - Cepheid Variables
    - Red Shift
  - Big Bang Model
    - Evidence
      - Expansion of Universe (Red Shift)
      - Microwave background radiation
      - Composition of Universe (H, He)
      - Dark Night Sky (Olber's Paradox)