

**Read Chapter 16 on the Sun.****Web Warmup 8 is due before class on Monday April 25th.**

1. [4] *Hydrogen and helium are the two most abundant elements in the Sun. What percentage of the Sun is hydrogen and helium (by number of atoms)?*

91.2% Hydrogen and 8.7% Helium

2. [4] *How do observations of the Sun's surface (helioseismology) tell us about conditions in the solar interior?*

By observing the pressure waves in the solar surface, we can learn about the interior of the sun similar to the way we use seismic waves (earthquakes) to learn about the interior of the earth.

3. [4] *Describe how the energy generated from fusion in the Sun's core eventually reaches the Earth. In other words how is the energy transported through the different regions of the sun?*

The energy generated in the core from fusion starts in the form of gamma ray photons. Because of the high temperatures in radiation zone, the photons are not likely to be absorbed before reaching the bottom of the convection zone. There they are absorbed. This heats the bottom of the convection zone, causing the hotter gas to rise towards the surface thru convection. Eventually the energy in the form of heat reaches the photosphere. There the gas is thin enough that thermal radiation, light, can escape into space. That light travels through space and some of it intercepts the Earth.

4. [4] *How are neutrino's useful as a "window" into the core of the Sun?*

Because the neutrinos interact very weakly with matter they immediately pass from the core out of the sun. So they tell us about current conditions in the core.