**The Sun:**

**Unit 4: Astronomy**

**Mini-Unit:** Our Solar System

**Goal 3: The student will demonstrate the ability to explain the role and interaction of revolution, rotation, and gravity on the components of the Sun-Moon-Earth system.**

Objectives – The student will be able to:

* Describe the Sun-Moon-Earth system
* Describe the characteristics of our sun, including structure, thermonuclear reactions, coronal mass ejections, flares, sunspot cycles, solar wind, and auroras and their impact on Earth

**Textbook:** Unit 8, Chapter 29, pg. 754

Structure of the Sun:

Composition of the Sun:

1. 75% Hydrogen
2. 14% Helium
3. 1% Trace amounts of elements

Nuclear Fusion – the process by which nuclei of small atoms combine to form a new more massive nucleus; the process releases energy.

Fusion powers the sun by combining hydrogen atoms in order to form Helium, the remaining mass is converted to energy, E = mc2

The Sun’s Interior:

1. Three Layers: Core, Radiative Zone, Convective Zone
2. Fusion occurs in the core (15,000,000 degrees Celsius)
3. Core is ionized gas (plasma)

The Sun’s Atmosphere:

1. Three Layers: Photosphere, Chromosphere, and the Corona
2. Photosphere is called the Sun’s “surface” because it is what you see
3. Corona the outermost layer of the sun’s atmosphere

Solar Activity:

Sunspot: the dark area of the photosphere of the sun that is cooler than the surrounding areas and has a strong magnetic field

* Observing sunspots showed that the Sun rotates (about 27 days)
* The increase and decrease of sunspots follows an 11 year cycle

Solar Flare: An explosive release of energy (electrically charged particles such as protons and electrons) that comes from the sun, and that is associated with magnetic disturbances on the sun’s surface (sunspots)

Coronal Mass Ejections: A part of coronal gas that is thrown into space from the sun, can cause disturbances with Earth’s radio communications

Auroras: Colored light produced by charged particles from the solar wind and the Earth’s atmosphere that react and excite the oxygen and nitrogen in the Earth’s upper atmosphere