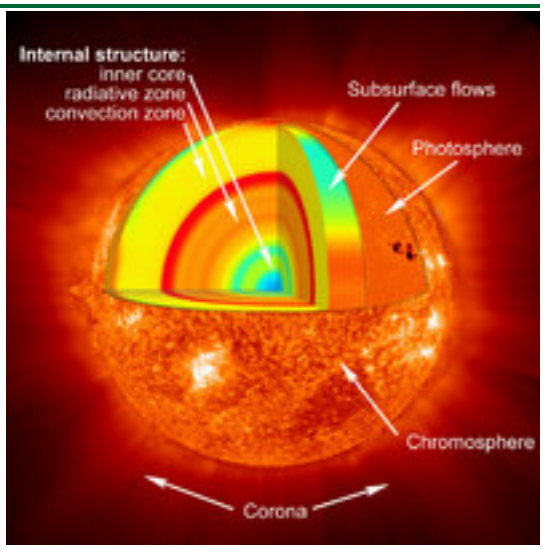
The Science of the Sun

By Cindy Grigg

[1] *Photo credit: NASA*



[2] Our sun is a star. Like all stars, it is a mass of very hot gases. On Earth, burning fossil fuels like gasoline or coal gives us energy for our cars and heating our homes. But the sun's energy doesn't come from burning fuels. The sun's energy comes from nuclear fusion. The nuclei (plural form of nucleus) of different atoms of gases in the sun fuse or join together. Most of the sun's fusion happens when atoms of hydrogen smash into each other. Under high pressure and at high temperatures, the atoms join or fuse together. This creates helium atoms. Every atom releases heat and light when it fuses with another atom.

[3] How big is the sun? Its diameter, the distance across its center, is about 870,000 miles. That's more than one hundred times the diameter of Earth. The sun's volume is more than a million times the volume of Earth. Another way to say this is that the sun could hold one million Earths inside it.

[4] The sun has different layers of gases. Each layer blends into the next, like the layers of Earth's atmosphere. The **core** is the center of the sun. Most of the sun's mass is in its core. The core is extremely dense. It is also very hot. Almost all fusion takes place in the core.

[5] Energy created in the core moves outward. It passes next into the **radiative or radiation zone.** The energy from the core heats this zone just as a radiator heats the air in a room. This zone is less dense than the core.

[6] The next layer is the **convective or convection zone.** The heat from the radiative zone spreads and heats the atomic particles in the convection layer. This heat makes the particles move in a circular motion, much like boiling water in a pan on the stove. Individual particles rise, "boiling" to the surface. Near the top of the radiative zone, density is near zero. This layer is called the last of the interior layers of the sun.

[7] The next layer is called the **photosphere.** The word means "sphere of light." This is the part of the sun that we can see. Some people call it the first layer of the sun's atmosphere. Another layer is the **chromosphere.**

[8] Above the chromosphere is the **corona.** The corona reaches far into space, more than half a million miles from the photosphere. The corona is the outer part of the sun's atmosphere. The word "corona" comes from the Latin word for crown. It is seen as a glow around the sun during an eclipse. Particles stream outward into space from the sun's corona. This stream of particles is called the solar wind.

[9] The sun creates energy in the form of heat and light when atoms of gases fuse together. Even though the sun is a ball of gases, it is made up of several layers. The main layers are the core, the radiative zone, the convection zone, the photosphere, the chromosphere, and the corona. The sun produces gigantic amounts of energy. Its energy comes from the fusion of atoms. The sun is the source of most of the energy on Earth.

Name _____ Science Pd _____

The Science of the Sun

1. *The energy from the core heats this zone just as a radiator heats the air in a room*. This sentence from the story is an example of _____.
   - (A) A metaphor
   - (B) Symbolism
   - (C) Alliteration
   - (D) A simile

2. The sun is a mass of _____ gases.
   - (A) Burning
   - (B) Very hot
   - (C) Exploding
   - (D) All of the above

3. The layer of the sun that we see is the _____.
   - (A) Core
   - (B) Photosphere
   - (C) Convection zone
   - (D) Radiation zone

4. The sun's energy comes from _____.
   - (A) Nuclear fusion
   - (B) Magnetic energy
   - (C) X rays
   - (D) Burning natural gas

5. Word meaning: Fusion is nuclear energy. In this sentence, what does "nuclear" mean?
   - (A) Relating to the nucleus of an atom
   - (B) The "control center" of a cell
   - (C) A type of fuel used in cars
   - (D) All of the above

6. Almost all fusion takes place in which part of the sun?

   _____

   _____

7. A stream of particles moving from the sun's corona outward into space is called _____.
   - (A) Sunspots
   - (B) Coronas
   - (C) Solar jets
   - (D) Solar wind

8. The last paragraph is an example of _____.
   - (A) Cause and effect
   - (B) A summary
   - (C) Supporting details
   - (D) Figurative language