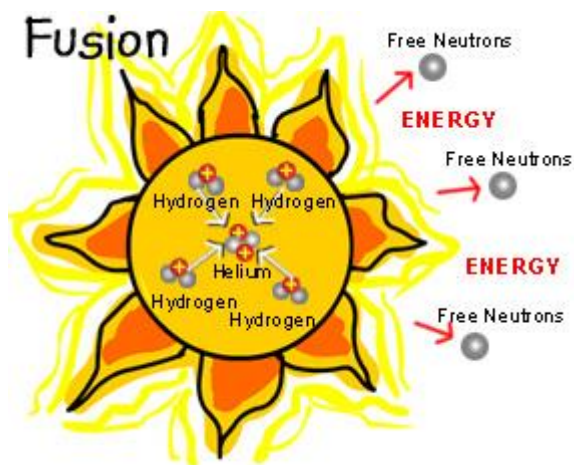


Introduction to Solar Energy

Engineering Connection: Chemical/Mechanical engineering. Students will be introduced to the concept of solar energy through the study of solar panels. Students will learn other engineering concepts such as heat, power, and heat capacity.

Reinforces Lessons: [Connection Fractions and Rational Expressions](#)

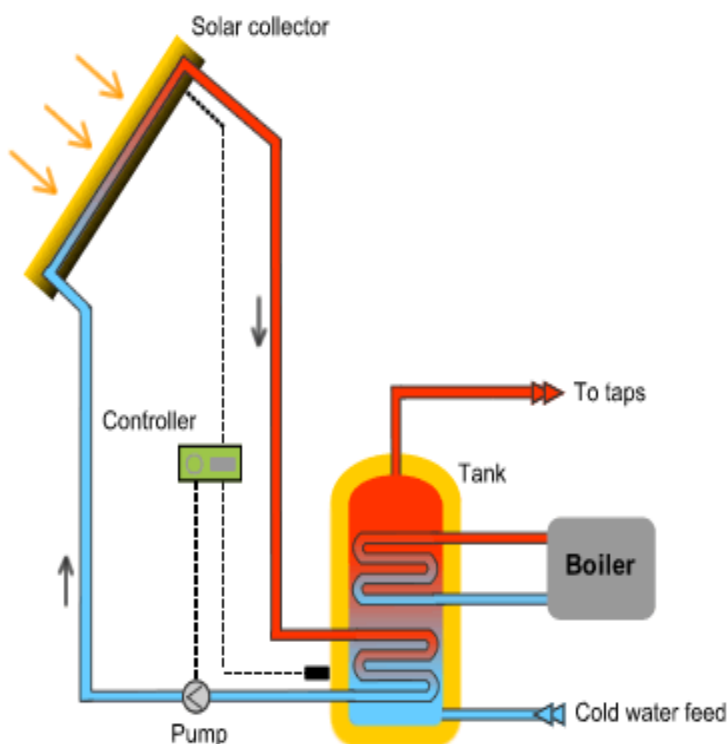
Here is a riddle for you to solve: what is bright, hot, and free? Yes, the sunlight is correct. The sun not only lights up the Earth, it also gives us the heat that we can use for energy (solar energy). Solar energy is the energy produced when the sun converts tons of hydrogen molecules into helium molecules. This process creates heat and electromagnetic radiation (this



is why you feel the sun's warmth and see its light. The sun shines in all directions into space, the Earth surface receives only a small portion of the sun's energy. Engineers and scientists can capture the solar energy with solar panels and put that energy to use. A solar panel is made out of two components: a *collector* and a *storage unit*. The collector collects the radiation that falls on it and the storage unit holds the excess energy produced during peak times (day time) and releases it when the productivity drops (nighttime).

One of the easiest ways to use solar energy is to produce heat. The heat produced can be stored in a liquid such as water. Many resourceful people buy solar panels to put on their homes roofs and use the energy to heat water. The collector in this case is the solar panel and the storage unit is the hot water tank. You can also heat up a swimming pool using solar panels. In this case, the pool itself is the storage unit.

Do you think a heated pool can stay warm forever? No, heat likes to be transferred to cooler places, so pools are usually covered to prevent the heat from escaping. The sun's



heat can also be used to heat a house and the water used in the home.

Activity 1

This activity will examine why our parents tell us to wear white or bright colors on hot days vs. black/dark colors.

You will need:

- 2 Glass Jars
- Water
- Thermometer
- White paper
- Black paper



Wrap one jar with the white paper and the other jar with the black paper. Fill both jars with room temperature water and leave the jars in the sun for a couple of hours. Measure the temperature of the water in each jar and discuss the results.

* The jar that is wrapped with black paper absorbs more heat from the sun because it does not reflect the sunrays like the jar that is wrapped with white paper. This is why you should wear white or bright clothing during the summer, so you don't absorb much heat from the sun.