

## **612-0015 (05-045) Solar Heater Demo**

**Introduction:** Hot water has many uses. It is used in swimming pools, for cleaning, and for bathing. All of these activities are much more comfortable if water can be heated to a certain level.

Unfortunately, water is a difficult substance to heat. It takes an enormous amount of energy to raise the temperature, due to the high specific heat of water. This means that to raise the temperature of a shower to a comfortable level, a large amount of electricity or gas must be consumed. As the costs of energy rise, this is a problem.

Fortunately, there is a solution. The sun radiates an unimaginable amount of heat. If even a tiny fraction of this heat can be harnessed, it can be used to meet hot water demands.

**Operation:** The sun radiates heat, and black objects soak up heat. The solution, therefore, is simple: use a black panel to absorb heat from the sun, and transfer it to water. To that end, we have developed this clever kit. A precise groove is cut into a black plastic panel, doubling back on itself several times to maximize surface area. A length of tubing is run through this groove. As the panel heats up, the water inside the tubing will be warmed.

Make sure the valve on the bottom of the panel is fully closed. Then, use the included syringe to fill the tubing with water. Place the panel on its kickstand, and position the whole assembly in bright sunlight. Soon, the panel will have absorbed enough heat to significantly warm the water.

Since you know the precise amount of water in the tubing, and can measure the final temperature and the time, you can calculate the efficiency of the panel. Measure the temperature of the water and the time, and compute how many watts were required to effect this change. Each square meter of the earth receives approximately 1286 watts of sunlight. By knowing the volume of the water, the time, the final temperature, and the area of the panel, you can compute the efficiency of the entire system.

### **Warranty and Parts:**

We replace all defective or missing parts free of charge. Additional replacement parts may be ordered toll-free. We accept MasterCard, Visa, checks and School P.O.s. All products warranted to be free from defect for 90 days. Does not apply to accident, misuse or normal wear and tear. Intended for children 13 years of age and up. This item is not a toy. It may contain small parts that can be choking hazards. Adult supervision is required.

