

## Solar water heater contest

At the end of the quarter, there will be a contest to heat water using only the sun. The date and time of the contest are on the calendar. The contest will take place in front of Broida Hall. You will work on a team with your lab partner(s).

We will determine by lottery the order in which you position your solar water heaters. You will each be given a beaker with 200 ml of water. At the appointed time, you will pour the beaker into your apparatus. After 15 minutes, you will pour the water from your apparatus back into the beaker. You must recover at least 150 ml. You will insert a thermometer. We will measure the temperature. Hottest water wins.

Here are the rules and rewards:

1. The fully deployed solar water heater must fit inside a cube with a side length of 1 foot.
2. You may not use materials worth more than \$20. You must bring a list of materials, and receipts showing where you got your materials and how much you spent. If you acquire material from someone for free, one of us will estimate how much it would cost to purchase it, and count that towards your \$20.
3. Everyone who participates gets 7 points for the solar water heater construction, and 3 points for a mechanical drawing of it.
4. The only allowable source of energy is the sun. You may not, for example, use the sun's light to close an electrical switch that turns on an electric kettle. You may not use the sun to ignite a match which then ignites a fire to heat the water.
5. The hottest water wins. An additional 10 points go to each member of the winning team.

We will discuss mechanical drawing in class. To learn more about mechanical drawing, I suggest reading the section on Mechanical Drawing in "Building Scientific Apparatus" by Moore, Davis and Coplan (pp. 28-37).