

## ***Properties of Matter***

### **How to Get Maximum Heat from Alcohol Burners**

Bunsen burners, which use natural or propane gas for fuel, produce a hotter flame than alcohol burners, which use ethanol for fuel. In the Carolina laboratory, this meant that a beaker of ice water, heated over a Bunsen burner, took about 8 min. to boil. Using an alcohol burner, the beaker of ice water took about 20 min. to boil. So performing the *Properties of Matter* investigations with alcohol burners will take about twice as long as using Bunsen burners.

To maximize the heat produced by alcohol burners, follow these suggestions:

1. Follow the set-up directions included in each burner box. Make sure you use only the alcohol provided with the burner (95% denatured ethanol).
2. Fill the burner reservoir 2/3 full of denatured ethanol.
3. Make sure the black cork has been removed from the copper loop.
4. If the burner has been used before, check for black carbon deposits in the tiny burner hole on each loop. Use a straight pin to clean out any carbon build-up.
5. Before lighting the burner:



**An alcohol burner**

- Tilt the burner upside down to allow the alcohol to wick down the tubes. If some alcohol drips out, wipe it up with a dry paper towel.
- Place the metal shield around the copper loop. This prevents drafts from blowing out the flame and directs the heat upward to the burner stand and beaker. This may be the best solution for getting maximum heating from the burner (see photo).

You can also place the burner on a little pad or something similar (for example, a ceramic drink coaster), to lift the burner flame closer to the wire gauze of the stand. **However, this may create a safety issue** if the pad is unstable and makes it easier for the burner to tip over. Student and teacher safety is of paramount importance, so use extreme caution if you try this option.