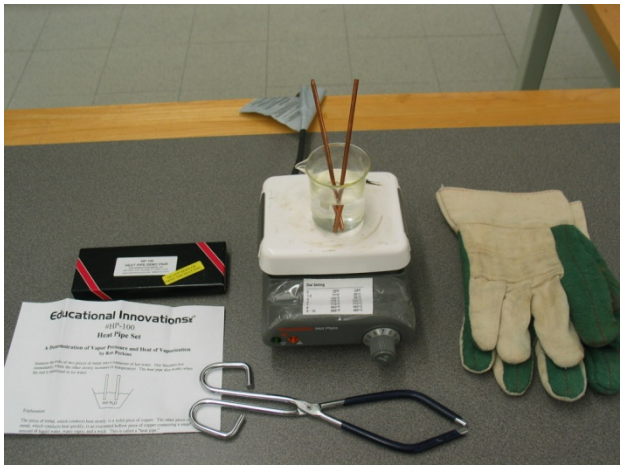
Heat Pipe



Purpose: To demonstrate the use of vapor pressure and heat of vaporization to rapidly transfer thermal energy.

Location: room 136, shelf P3; (beaker tongs, I4; hot plate, I5)

Fill the 100 cc beaker halfway with water, set hot plate to 7 and heat for about 5 minutes. Have a student come up and hold the ends of both of the copper rods in the hot water until the student can announce with certainly which rod feels hottest (see photo). There should be time for several other students to come up and confirm for themselves that one rod is much hotter than the other. Seek explanations from the class.

The rod which conducts heat more slowly is solid copper. The other “rod”, which conducts heat quickly, is an evacuated copper tube containing a small amount of water, water vapor, and a wick. This is called a “heat pipe”, which is a principle component of heat pumps which are used in refrigerators, air conditioners and home heating and cooling systems. (See enclosed sheet for more explanation.)