The ring and plug experiment
You need a large wood screw and a screw eye; the head of the screw must just go through the screw eye. Screw each one into the end of a stick, letting at least 2.5 cm of metal protrude. Heat the head of the screw in a flame for a while and then try to put it through the screw eye. Keep the screw hot and heat the screw eye in the flame at the same time. Now try to put the screw head through the screw eye. Keep the screw head in the flame. Cool the screw eye in cold water. Again try to put them together. Next cool the screw head and try again.