



HOW TO: Plasma Lamp Fluorescence

Supplies needed:

- 1 Fluorescent Light ~\$2
- 1 Plasma Lamp ~\$20

Safety:

Do not place metal close to plasma lamp. Burns can occur if touched for too long of a time. Both of these items are fragile, and breaking either can result in the release of hazardous materials. Take appropriate care.



This activity is an impressive demonstration of **Corona Discharge, Luminescence** and **Fluorescence**. The Plasma lamp operates on the ideas designed originally by Nikola Tesla. Electricity is transmitted through a capacitor in a high voltage alternating current to the Neon gas in the chamber. This creates a series of particle-level interactions which results in the glowing light that you see in the globe. Many ionized particles interact to create the light which 'glows' from the lamp. The charged particles are attracted to low-resistance conductors, which is why it is attracted to a human finger on the outside of the globe.

Ionized particles extend beyond the globe, and can be observed when using a standard Compact Fluorescent Lightbulb. The ionized particles are attracted to this bulb, and some of the ionized particles excited in the lamp extend out past the globe of the lamp. These charged particles will begin to interact with the mercury vapor inside the CFL. This interaction excites the electrons in the mercury, which causes the electrons to rotate in a higher shell. The particles will relax and in doing this, emit a photon in the UltraViolet. This particle is invisible to the human eye, until it is absorbed and re-emitted in the visible light spectrum by the phosphorous coating on the CFL.

