*Harmonious Electrons, Symmetry, and The Existence of God*

**Flame Test Lab**

**Student Page**

Objective: students will observe the unique colors that result when a metal ion is exposed to a flame and explain the origin of the colored light.

Safety: flame hazard: avoid contact with flammable substances.

Safety goggles and aprons required.

Procedure:

1. Prepare a data table to record the color produced by each metal chloride tested.
2. Light a Bunsen burner and adjust the air so a hot flame is present.
3. Dip a clean wet splint into the first salt so that a few grains of the salt stick to the splint.
4. Stick the salt coated tip of the splint into the flame; observe and record the color of the flame with your naked eye, and then look at the flame with the spectrometer. Record the wavelength where you see a band of color and sketch the spectrum. If colors are similar, it is important to characterize them specifically. For example, sky blue is different from baby blue.
5. Dispose of the splint in the waste water beaker.
6. Repeat steps 3-5 for each of the metal chlorides provided.

Questions to think about

1. Why is it necessary to characterize the colors specifically?
2. How much of each salt is needed for a successful test? Explain.
3. What is happening when the metal is exposed to the flame, and when the colored light is visible?
4. Why is the color of each metal ion unique?
5. What design flaws could lead to incorrect results in this lab?

Prepare a lab report as directed by your teacher.