

## **Rock-it Science Observations For Winter Lessons 2010**

### **Transformers (Older Groups)**

Students were given PVC pipe with about 800 turns of transformer wire wrapped on it. They attached light emitting diodes to the ends of the transformer wire and tested the coils near a strong source of oscillating magnetic fields (an old cassette tape eraser).

They may have noticed:

- The LED did not light up at all no matter how the tape eraser was placed.
- The LED did light up when an iron rod was placed inside the PVC pipe
- The LED would blink on for a fraction of a second when the end of the iron core was placed near the center of an electric drill or leaf blower just as it was turned on.
- The LED would blink on better with the soldering guns.
- Shaking magnets back and forth inside the tube produced no noticeable light.

Our tubes were exposed to changing magnetic fields, but Nicola Tesla decided to put a similar tube wound with wire in an oscillating electromagnetic field. He thought the addition of electric energy to the magnetic energy would make it so that the iron core would not be needed. We demonstrated this by firing up the Tesla coil!