



Children's Museum of Houston

Black Light Up My Life

Background: Is there anything cooler than things that glow in the dark? It's great fun experimenting with things that glow in the dark and black lights are the perfect tool to do so. These are the lights that you find in use in quite a few places: haunted houses, rock and mineral displays, some parties, some art displays, at crime scenes, and in banks. But why are they in so many places and how do they work?

Materials:

- A Black Light (These can often be found in party stores.)
- Items to Explore (for example: markers, highlighter pens, money, rocks, clothing or different kinds of paper, some kinds of liquids such as mineral oil or club soda etc.)

Procedure:

1. Watch the Mr. O video on Black Lights at: <http://www.cmhoustonblog.org/2010/11/04/black-light-up-my-life/>
2. Mount the black light to a wall or have a friend help you. It can be hard to explore if one hand is constantly holding onto the black light.
3. Lay out the materials you want to explore
4. Turn on the black light. **WARNING:** While it doesn't look like it, black lights produce quite a bit of light, so don't stare at them any more than you would stare at any bright light source, as both can damage your eyes.
5. Turn off the overhead lights
6. Try holding out different materials and see what happens to them under normal and black light. Try coloring with highlighters and markers. There are even some special paints specific for use under a black light. What do you discover?

Why? Black lights are special light bulbs that filter out most light except for ultraviolet (UV) rays. The electromagnetic spectrum (see the chart below) is divided into many different types of radiation, a segment of which is white light, the light we can see, which is divided into Red, Orange, Yellow, Green, Blue, Indigo, and Violet (ROY G BIV). On the higher-energy range of light, just above the color violet is ultraviolet rays which we are most familiar with in our use of sunscreen to prevent skin damage.

So why do black lights make things glow? Specifically, they make substances called **phosphors** glow. Phosphors absorb the UV light, and then release the energy immediately as visible light. They should not be confused with materials like **phosphorescent paint** that absorb white light energy then slowly release the energy as a green glow. Phosphors, which do have phosphorus as a part of their chemical make-up, are present in several dyes, which make them great to create glow-in-the-dark paints, markers, artwork, etc. Highlighter pens use phosphors to appear brighter under normal light, so they often glow quite interestingly under black lights. Many countries also use phosphors on their money to prevent counterfeiting and some places use phosphor inks on their hand stamps to ensure they know you already paid admissions.

Many laundry detergents use phosphors and other substances as color brighteners, which is why white and other light clothes glow under the light. Also, our bodies use phosphorus to create many

body parts, which is why our nails and teeth glow under the black light. It is also why forensic scientists use black lights when searching for evidence at crime scenes.

Questions to Ask:

- Will glow sticks, necklaces or bracelets glow under a black light?
- Why do certain parts of your body glow under a black light?
- Would plants grow under a black light? Why or why not?

