**Activity Worksheet 1**

**See like a bee**

**Materials**
- Ultraviolet/black light
- Flowers
- Miscellaneous objects

**Background Information**
Perceiving the world around us begins with vision, and vision would not be possible without light. This is because our eyes, with all their biological complexity and beauty, are really just sophisticated photon detectors. Photons are very small particles that are emitted by light sources such as the Sun or a light bulb. Photons travel away from their source at the speed of light (3.0 x 10^8 m/sec). Now, at different wavelengths, depending on the amount of energy they contain. Certain wavelengths activate the receptors in our eyes. Only a small range of the entire spectrum, or range of wavelengths, is visible to humans. We perceive the shorter wavelengths in the visible spectrum as red and the shorter wavelengths in the visible spectrum as violet. Some animals, such as bees, can see farther into the ultraviolet range than humans. What would the world look like if we could see like a bee?

**Safety Note**
UVA light sources are safest (do not use UVB or UVC), but even UVA black lights should be used judiciously. Never stare into the light or expose skin to the light. UV-protective eyewear should be worn during prolonged or repeated exposure. Follow all usual precautions with electrical devices.

**Procedures**
1. Examine the objects at the table under normal light and then under ultraviolet light.
2. Describe how their appearances change under the ultraviolet light.

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**Activity Worksheet 2**

**Disappearing dot**

**Materials**
- Copies of Figures 1 and 2

**Background Information**
Can you name all the parts of your eye? The white part is called the sclera. The colored part is called the iris. The iris constricts and dilates to control the amount of light (number of photons) entering the eye through the pupil. The cornea and lens focus this light onto the retina, which is located on the back wall of the eye. The retina is composed of two different kinds of light-sensitive receptor cells: rods and cones. Their concentration is highest in an area of the retina called the fovea. In contrast, there is another location, called the blind spot, or optic disk, where there are not any receptors. This is to make room for nerve fibers and blood vessels to exit the eye via the optic nerve, sending signals onward to the brain (see Figure 1). How is visual acuity influenced by this arrangement?

**Procedures**
1. While holding Figure 2 at arm’s length, close your right eye while focusing your left eye on the +. Slowly move the paper toward you while keeping your eye focused on the +.
2. At a certain distance—specifically, when the light from the image falls onto the portion of the retina without receptors—the dot will "disappear." Keep moving the paper toward you until the dot reappears.
3. Repeat this exercise with the opposite eye.

**Figure 2**

In your blind spot