Ultraviolet (UV) Detecting Beads Lesson Plan

Ultraviolet (UV) light is one of the invisible rays of light that are given off by the sun. UV rays can damage two of the body's vital organs: skin & eyes. The most common evidence of too much sun is sunburn. Sunburns are ***not*** a normal part of childhood. Your skin remembers every sunburn you have ever gotten—the damage adds up. You can't change the damage that has already happened but you can learn more about UV rays and how to protect yourself with sun safe behaviours. These UV beads contain a pigment that changes colour once exposed to UV light. The beads will remain white when indoors or if shielded from UV light. Some bead colours change faster and more dramatically than others (purple).

Simple activities to do with the UV Beads:

Make a UV detecting bracelet. Thread 10 beads onto a length of the cord provided. Once the beads are exposed to some UV light, you may choose to trade some colours with a friend to get a better assortment. Try to arrange the colours so that 2 beads of the same colour are not next to each other. Tie a knot on either side of the beads so they will stay in place and not slide around.

Test the effectiveness of clothing. Cover different student's bracelets with different clothes—a thin cotton t-shirt, a jacket, some denim or jean material, man-made fabric (stretchy materials usually have some man-made fibres in them). Do the beads stay white?—indicating total UV protection. Are the beads pale in colour?—some UV protection. Are the beads brightly coloured?—little or no UV protection. Covering up with clothing is always the best way to protect your skin from UV rays.

Test the effectiveness of sunscreen. Teacher Activity: Coat several beads with different Sun Protection Factor (SPF) sunscreens—SPF 15, SPF 30, SPF 50+. Expose the beads to UV rays. Observe which set of beads changes most dramatically—the paler it becomes the more it has been protected. Which SPF protects best? Do different brands of the same SPF number protect differently?

Measure the sun's UV rays on different coloured beads & at different times of the day. You will find that the beads change colour much faster at noontime than in the late afternoon. To add another twist, take your beads outside at the same time of the day but under different weather conditions. Does cloud cover change the amount of UV light that reaches both the beads and your skin?

Investigate UV absorption. Place different transparent filters between UV light and the beads. Try regular eyeglasses, sunglasses, and UV absorbing window film (if you have any). You will find that the front windshield of most vehicles absorbs some UV light but that most side windows do not have this built-in protection.

Encourage students to wear their UV bracelet on a regular basis to remind them that when the beads are brightly coloured they need to cover up with clothes, a hat, and sunglasses, apply sunscreen SPF 30+ and seek shade.

adapted from Elgin St. Thomas Health Unit