

Answers from the UV Beads and Sunscreen activity

- The baggie without sunscreen will be the brightest.
- *(Correct answers are determined by what sunscreens you use)*
- The sunscreen with the highest SPF will block out the most UV rays; however, the age of the sunscreen also affects its ability to block UV. Sunscreens lose effectiveness over time--all sunscreens should be replaced each year to guarantee their effectiveness.

Vocabulary for young students

- ultraviolet radiation (UV) - a part of the spectrum of sunlight that is located outside the visible light spectrum at its violet end

Background information about ultraviolet radiation and UV beads

Sunburn is a condition resulting from an overexposure of the skin to the ultraviolet rays found in sunlight. Everyone, even dark skinned persons, are at risk for sunburn. Fair skinned, blue-eyed blonds and redheads are especially susceptible to being sunburned.

We all need exposure to the sun, as it is our primary source of vitamin D. But it does not take much time in the sun for most people to get the needed amount of vitamin D. When we stay in the sun for periods of time without skin protection, the sun's ultraviolet rays can cause minor to major damage. Damages from the sun can be skin damage, sun poisoning, eye damage, immune systems suppression, and in some cases even cancer. The sun weakens the skin's elasticity leading to premature aging, such as early wrinkles and a tough leathery look. Over exposure also leads to the development of flat, scaly, reddish patches called Solar Keratoses, which sometimes are precancerous. The most serious consequence of over exposure to the sun is skin cancer. It is not uncommon for people under 30, living in Florida, to have developed skin cancer. Over 700,000 new cases of this most common form of cancer occur each year. No tan is a safe tan.

Not all sunlight is "equal" in UV concentration. The intensity of the sun's rays depends upon the time of year, as well as the altitude and latitude of your location. UV rays are strongest during summer. Extra protection is also required near the equator, where the sun is strongest, and at high altitudes, where the air and cloud cover are thinner, allowing more damaging UV rays to get through the atmosphere. Even during the winter months, if your family goes skiing in the mountains, be sure to apply plenty of sunscreen; UV rays reflect off both snow and water, increasing the probability of sunburn. Even on cloudy, cool or overcast days, UV rays travel through the clouds and reflect off sand, water, and even concrete. Clouds and pollution don't filter out UV rays, and they can give a false sense of protection. This "invisible sun" can cause unexpected sunburn and skin damage. Often people are unaware that they are developing sunburn on cooler or windy days because the temperature or breeze keeps skin feeling cool on the surface.

UV Beads - The UV sensitive beads contain a pigment that changes color when exposed to ultra-violet light from the sun or certain other UV sources. The pony beads are not, however, affected by visible light so they will remain white indoors or when shielded from UV light. The electromagnetic radiation needed to affect change is between 360 and 300 nm in wavelength. This includes the high-energy part of UV Type A (400 - 320 nm) and the low energy part of UV Type B (320-280 nm). Long fluorescent type black lights will work well with these beads. Incandescent black lights (the type used to make fluorescent paints glow), will not change the

color of the beads nor will UV Type C (280-1 nm). The beads will however, respond to differing amounts of UV light, becoming a brighter color when more UV light is present. Students should also be able to see changes in the intensity of color when there is cloud cover versus a clear day, or in the morning versus noontime.

Related books for young students

- *Sammy Learns About Sunscreen* by Manisha Shelley Kaura (Bookstand Publishing, 2015)