Blocking UV Radiation

Overview

The rays of the sun are electromagnetic and different types of rays have different wavelengths. Some of the sun's rays are visible, what we would call sunlight, among the invisible ones are infrared rays that we feel as heat. There are some rays that we can't see or feel – such as ultraviolet or UV rays.
In this experiment we will measure different materials to see how effective they are in blocking UV radiation and discuss the effect of UV radiation on our biological systems

Equipment

- Einstein™ tablet, MiLAB
- Sunglasses
- White T-shirt
- Sunscreen
- Plastic bag

Experiment procedure

1. Launch the MiLAB program .
2. Make sure that only UV sensor is selected.
3. Set the sampling rate to 10 /sec.
4. Set the duration to 20 sec.
5. Point the UV sensor toward the UV lamp and click Run to measure how strong the UV rays are without any protection.
6. Keep the tablet the same distance from the UV lamp but this time place the sunglasses between the sensor and the lamp.
7. Select Run to begin recording data
8. Measure again from the same spot, this time placing the T-shirt between the sensor and the lamp.

9. Select Run to begin recording data
10. This time we'll test sunscreen. Since we can't put the sunscreen directly on the sensor, we'll use a plastic bag. Spread some sunscreen on the bag.
11. Measure again from the same spot, this time placing the bag with the sunscreen between the sensor and the lamp.
12. Select Run to begin recording data

The Science

There are three types of UV rays: UVA, UVB and UVC. **UVC** is dangerous. Luckily, it gets blocked by the ozone layer and doesn't reach us. **UVB** is partially blocked by the ozone layer, but a small portion is transmitted through the atmosphere. Limited exposure to UVB radiation produces vitamin D in our bodies, and that's good for us. But longer exposure to UVB can cause damage through sunburn, aging of the skin. **UVA** radiation isn't stopped in the atmosphere. It can hurt your eyes and even cause skin cancer. Sunscreen helps block these rays with chemicals like zinc oxide that deflects rays and organic chemicals that absorb harmful rays.