UV Man!
(or girl or dog or…)

Humans need UV radiation because our skin uses it to manufacture vitamin D – vital for maintaining healthy bones. About 10 minutes of Sun each day allows our skin to make the recommended amount. However, too much UV exposure causes the skin to burn and leads to wrinkled and patchy skin, skin cancer, and cataracts.

On Earth, we are protected by our atmosphere from most UV radiation coming from the Sun. The Ozone layer absorbs much of the UV, but some still gets through. We can protect ourselves by covering with clothing and using sun block.

In space there is no atmosphere to protect astronauts from ultraviolet radiation. Astronauts have to provide their own protection in the form of space suits, helmets with protective visors, and space stations. While these measures work very well for protecting against UV radiation, the higher energy radiation is not completely blocked. Even with protective shielding, astronauts aboard the International Space Station receive a daily dosage of radiation about equal to 8 chest X-rays! Astronauts wear special radiation detectors – dosimeters – that help determine how much exposure they have to radiation.

The UV-sensitive beads used in this activity serve as UV radiation detectors. They change color when exposed to ultraviolet radiation from the Sun or from UV lights. The brightness of the color corresponds to the intensity of the UV radiation. When shielded from UV sources, or when exposed to light that does not contain UV radiation - such as indoor light bulbs - the beads remain white.

You and your child will construct UV Man! (or woman!) and equip him with special radiation detectors to investigate the source of ultraviolet radiation – our Sun. Your child will explore how he/she can protect UV Man! – and themselves – from being exposed to too much UV radiation.

What You Need:

- 3 UV beads
- 2 *non*-UV beads
- 2 pipe cleaners
- Scissors
- Various materials that will "protect" UV Man from ultraviolet radiation, for example: construction paper of different colors, foil, plastic wrap (of various colors), sunscreen, masking tape, paper, cloth, etc.

What to Do:

Ask your child what happens if they stay outside in the Sun too long. Do they get a sunburn? The Sun's rays are good for us in small amounts, but can be dangerous if we get too much.

Invite them to explore how the Sun's ultraviolet radiation affects them by creating UV Man – or any figure they wish - and equipping him with radiation detectors (UV beads) that are made from a special pigment that is very sensitive and turns colors when exposed to the ultraviolet rays.

- Cut both pipe cleaners in half. Wrap one of the pipe cleaner pieces around the middle of another one of the pieces to form UN Man's legs and body.
- Thread the pipe cleaner that makes UV Man's torso through the UV beads alternating UV with non-UV beads. Slide all the beads towards UV Man's legs. What color are the beads? (White; there is no UV radiation coming from the inside lights.)

- Use another piece of pipe cleaner to form UV Man's arms, and the last piece to form his head.
- Cover UV Man and take him outside to a shady spot. Ask your child to predict whether UV Man is protected from UV rays in the shade.
- Uncover UV Man – Was his/her prediction correct? (Typically a little ultraviolet radiation reaches our skin even in the shade.)
- Put UV Man in the sun – What happens? Are there any changes? (The beads will darken; they are detecting ultraviolet radiation, the radiation that causes sun burn.)
- Take UV Man inside and invite your child to think about how he/she might protect UV Man from ultraviolet radiation. Have them choose some materials to cover UV Man (make a shirt, cover with tissue paper, use sunscreen, etc.)
- Cover UV Man with the materials you selected
- Take UV Man into the sun and observe how well his protective gear worked

Parent Prompts:

Were your child's predictions correct?

Do the Sun's rays ever turn you colors?
How are the astronauts protected from UV radiation?

What can you do to protect yourself from too much UV radiation?