# Create a UV Bracelet

## Make your own ultraviolet light detecting bracelet!

**Materials Needed:**

Ultraviolet (UV) beads*, pony beads, pipecleaner, scissors, sunlight.

**Note:* UV beads can be ordered on Amazon or at www.stevespanglerscience.com

**Instructions:**

**Step 1:** Thread your beads onto a pipecleaner. Mix the UV beads with the ordinary pony beads to make a design.

**Step 2:** Wrap the pipecleaner around your wrist and twist the ends together. Use scissors to trim the ends of the pipecleaner.

*Image: NISEnet.*

**Step 3:** Wear your bracelet outside on a sunny day and watch the UV beads change color! When you remove the beads from sunlight, the color will slowly fade back to white.

UV beads before (left) and after (right) exposure to UV light.
*Image: E. DeVore, SETI Institute.*

**What's Going On?** UV beads contain a special material called a *photochromic dye*. The molecules of this dye change color when exposed to ultraviolet light. The beads will change color when exposed to a UV light source, such as the Sun or a UV flashlight. The UV light causes a bond in the molecule of the dye to break, allowing the molecule to twist into a new shape. The newly-shaped molecule absorbs light differently, giving it a different color. This process is reversible: once the source of UV light is removed, the broken bond will reform and the bead will return to its original color. When you put the beads back in UV light, they will change color again!

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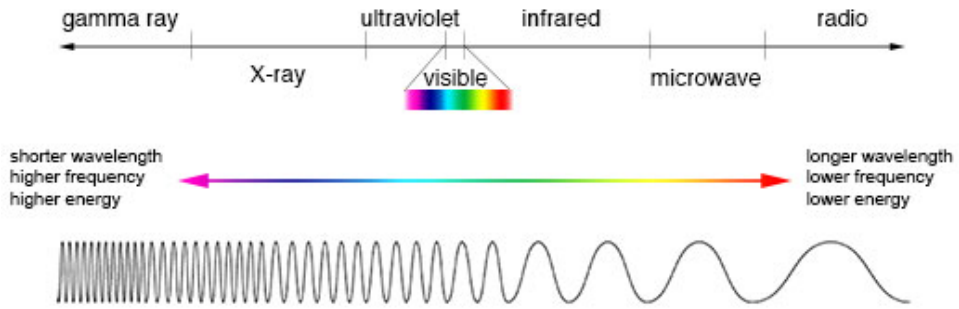
# What is Ultraviolet Light?

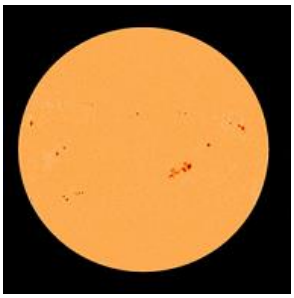
Our Sun shines brightly in the daytime, warms our planet, and helps plants grow. But the sunlight we see with our eyes is only a very small part of the light the Sun gives off.

Our eyes see only visible light, but the Sun gives off light across the *electromagnetic spectrum*. This spectrum consists of light energy travelling in waves, from very short waves like gamma rays to very long waves such as radio waves. Ultraviolet, or UV light, has shorter waves than visible light.



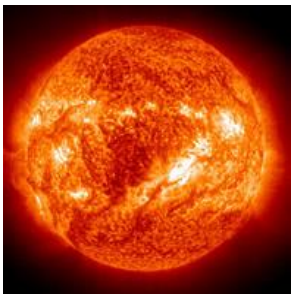

*Electromagnetic Spectrum.* *Image: NASA's Imagine the Universe.*

Ultraviolet light can be harmful to humans; it can give us sunburns and contribute to skin cancer, so we have to be careful to wear sunscreen when we are outside. But UV light can be helpful to other animals! Many animals, including some insects, birds, and fish, can see ultraviolet colors invisible to human eyes. This helps them find food, attract mates, and avoid predators.



The Sun photographed in visible light.
*Image: SOHO (ESA & NASA).*

Although some UV light passes through our atmosphere, most UV light from the Sun is filtered out by our atmosphere and never reaches the Earth's surface. To study UV light from the Sun and other stars, scientists use high altitude balloons, rockets, or spacecraft to get above the atmosphere. All stars emit UV light, some more than others.



The Sun photographed in ultraviolet light.
*Image: SOHO (ESA & NASA).*

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