



# UV Bracelets

What's special about UV beads?

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Try this!



Thread two UV beads onto a pipe cleaner. Add some ordinary beads.



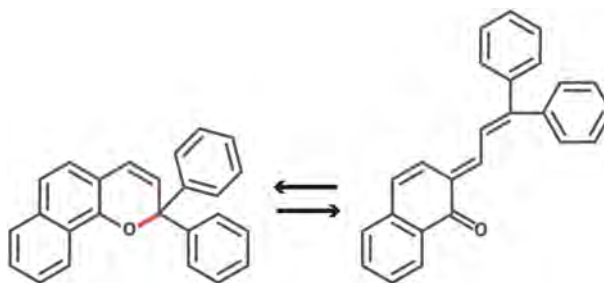
Wrap the pipe cleaner around your wrist and twist the ends to tie it. Now, step into sunlight or shine the UV flashlight on the beads. What happens?

Tiny dye molecules in the UV beads change shape in response to UV light (or sunlight), which changes their color. So even though we can't see the molecules, we can tell when they change shape!

## What's going on?

The ultraviolet (UV) beads change color, but the regular beads stay the same. The UV beads contain a special material called a *photochromic dye*. The molecules of this special dye change color when exposed to UV light.

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.



UV light causes a molecule to change shape

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. So when you turn off the special UV flashlight (or come out of the sun), the UV beads turn white again.

## How is this nano?

The UV beads in this activity change color as a result of nanoscale shifts in the shape of the dye molecules. The molecules are too small to see, but we can see the resulting change in color.



Some eyeglass lenses darken in sunlight

Nanotechnology takes advantage of special properties at the nanoscale to create new materials and devices. Some people have glasses that are clear indoors but darken into sunglasses when exposed to UV light outdoors. There are also new windows that use a similar technology to keep buildings cool and save energy.