

UV DEFENDERS



STUDENT WORKBOOK



COMING INTO COLOR

You can see light, but not all light can be seen. Both types of light are important, but the light you cannot see can make a big impact. In this activity, explore light outside the visible spectrum.

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WARNING: CHOKING HAZARD - Small parts.
Not for children under 3 years.



WHAT YOU NEED:

FROM THE KIT:

- 60 beads
- Bead color spectrum sheet

OTHER ITEMS:

- Scissors

WHAT TO DO:

1. Put the beads in a dark location for 30 minutes. Make sure they start clear for this experiment.
2. Review the following locations the beads will be placed in. Then, decide on two other locations and add them to the observations table.

Locations:



Outside in direct sunlight



Outside in a location where a table, shelter, or tree obstructs the sunlight



Inside on a counter or table away from windows, but where there is a lamp or other light source on above it



In a dark closet

Two other locations of your choosing (write them in the spaces in the chart)

3. Place 10 beads in each of the 6 locations for one minute.
4. Record your observations of each set of beads. Include intensity information from the bead color spectrum sheet in your observations.

Another factor to look into on your sunscreen bottle is the SPF. It is common to say that the SPF number is the amount of time that can pass before you need to reapply. Is this true? SPF stands for **Sun Protection Factor**, which is a number that indicates how well a sunscreen protects against sunburn, essentially how well it protects against UVB rays.

More accurately, the SPF number will tell you how long it will take UVB radiation to redden your skin, or give you a sunburn. Therefore, SPF 30 sunscreen, like the one you used from this kit, will protect you 30 times longer than if you had on no sunscreen at all. However, it is typically best to find a broad-spectrum sunscreen with the highest SPF possible to provide your skin the most sun protection.



THINK ABOUT IT!

? 1. Which sunscreen works better – a UVB only sunscreen with SPF 50 or a broad-spectrum sunscreen with SPF 30? Explain.

? 2. Describe the relationship between energy and sunburns.

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DON'T LOOK AT THE SUN!

You've probably heard it many times: "Don't look at the sun!" We know it's bright, but why not take a little look? Because if you expose your eye (the cornea) to sunlight, you could become completely blind because of damage caused by UV light. Explore how sunglasses work to understand how visible and UV light differ and cause eye damage.

WHAT YOU NEED:

FROM THE KIT:

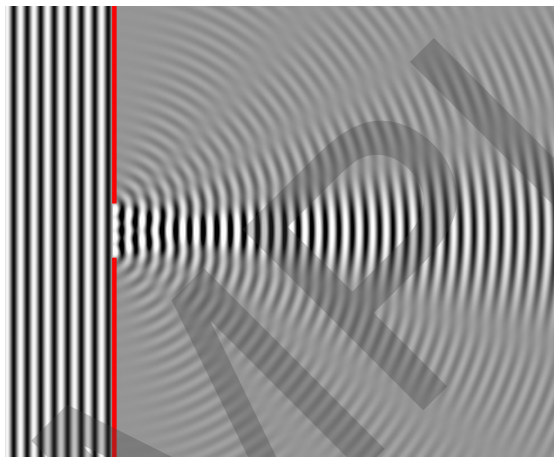
- 9 beads
- Bead color spectrum sheet
- Black construction paper
- Solar eclipse viewing glasses

OTHER ITEMS:

- Scissors
- Sunglasses
- Tape

Well, scientists tested it for themselves to see what would happen if you only shot a single photon through the double-slit device at a time. What they found was that the pattern on the other side was more similar to that of the interference pattern of a wave than the expectation of two spots with lots of photons clumped together. Therefore, while photons are particles, they act like waves. Ultimately, this demonstrates that light is made of both particles and waves.

Now, our discussion of light being both a wave isn't fully complete, however, because we haven't yet discussed diffraction. **Diffraction** is when a wave, like a beam of light, spreads out after passing through a small hole or moving around an object. This aspect of waves was why interference occurred, allowing the light to be brighter or duller.



THINK ABOUT IT!

? Describe a situation (not already provided) where diffraction and interference take place. Make sure to include whether it's constructive or destructive interference.



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Kit	SU-UVDEFS
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