Space Science Researcher - Cadette

1. What more can you see?

Make a prism picture with a clear glass of water or a CD/DVD. Hold your prism-maker up to sunlight and have the reflecting light bounce onto a white piece of paper. What colors do you see? Copy the colors onto a piece of paper with markers or colored pencils. Why do you think there are so many more colors?

2. Explore “invisible” light

We can see only a limited spectrum of light – but we use the light we can’t see every day! Take a TV remote or any device that remotely turns on an electronic. These devices usually have a bulb in them, and when you hit various buttons on the remote, the light should faintly turn on. Look at the bulb while you press the remote’s buttons. What do you see? Then, use a video camera or phone to take a video of the bulb while pressing the buttons. On the video, you will notice a much more apparent light. That is because our video-recording devices are capable of seeing and capturing light that our human eyes cannot perceive. Try experimenting with various clear objects to see what blocks the light from the bulb, such as sunglasses or a clear glass.

3. See the stars in a new way

Using a digital camera or a phone camera, take photos of the sky on a clear night. If you have a telescope, try taking these photos through the viewing lens! Use the instructions below to see what light you can capture from different camera settings. Do your photos show more than your eyes could see?

Shot List

Some of these objects are more fun to capture through a telescope—but some are best captured without. Experiment with a few different approaches to find out which works best.

- Take a photo of sunrise or sunset.
- Take a ¼-second, ½-second and 1-second photo of the Moon. Which one is your favorite?
- Take a 10-second exposure of the stars. What can you see? Can you see colors?
- Take a 1-minute exposure of the same stars. What is different?
- Take a 15-minute exposure with the North Star, Polaris, in the center. Any surprises? Can you predict what will happen if you take a 60-minute exposure?
- Take a 10–15-minute exposure of the sky. Near the end of the exposure, briefly use a flashlight to illuminate things in the field of view. Try illuminating people, bushes, trees, etc.—see what happens.
- Take photographs of your favorite constellations.

4. Expand your vision

Take a minute to think about light and its brightness. When you wake up in the morning and turn on the lights, do your eyes take a second to adjust? When you step outside at night after being in a brightly lit room, is it hard to see the stars? Your eyes take time to adjust to different light levels. Go into a brightly lit room, then quickly step outside at night. How long does it take for the stars to appear in your vision? After stargazing and jotting down any constellations you see, step quickly back inside to a brightly-lit room. Are the lights uncomfortably bright? Do you feel the need to blink a lot? Why do you think this happens?

5. Conserve the night sky

One reason that the visibility of the stars might be limited is the amount of light pollution in your area. Bigger cities emit much more light than cities in rural areas. Those extra lights make our night sky appear lighter than it should, obscuring the light from the stars. Become a citizen scientist and sketch an idea for an invention to prevent or block light pollution. If you have materials at home, make a model of your invention and share it with a family member and explain how it works. Think about ways you can reduce light pollution at home, and share these ideas with the other people in your home, so you can work together to reduce light pollution.

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