

**You will need:**

- Piece of white paper
- Clear glass full of water
- Peanut butter jar (or something about the same size)
- Duct tape



**Directions:**

1. Use your duct tape to create a slit over the lens of the flashlight (see photo for example).



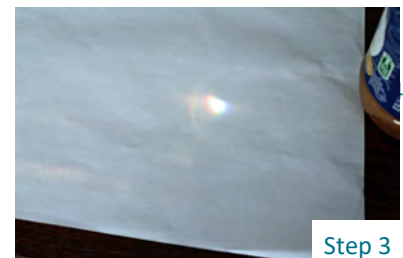
Step 1

2. Place your clear glass full of water on top of the peanut butter (or similar sized) jar. Set up the jar and glass beside your white piece of paper.



Step 2

3. Turn on the flashlight and shine the light through the clear glass full of water onto the white piece of paper. This is the tricky part. This part of the experiment is called trial and error. You will need to adjust the angle of the flashlight and how close the flashlight is to the glass until you see a little rainbow.



Step 3

4. As you can see from our example, we got a faint thin rainbow and a more vivid but shorter rainbow underneath.

Now that you made a rainbow, think about what you did to make it. We used the flashlight as our light source much like the sun that lights up our days (most of the time). Then we directed the light through a clear glass and water. Have you ever noticed that when you put a straw in a glass of water, the straw looks bent? The water slows down and bends the white light. All of the colors of the rainbow make up our white light. We only see them when something (like rain or water in a glass) slows down the rays of light and bends them which acts to separate them.

For birds, blue does not come from pigments like many other colors. Bluebirds (and blue jays) appear blue to us because of the structure of their feathers! Their feathers contain very small air pockets and melanin pigment crystals that scatter the blue light and absorb the other colors. Tiny structures in their feathers assemble the blue wavelengths and bounce them back out so that we see blue. Try looking at a bluebird or blue jay on a cloudy day. Do they look as blue? Even on sunny days, bluebirds appear gray at a distance.

## Eastern bluebird



Photo: Hazel Erikson/Audubon Photography Awards

## Blue jay



Photo: Rosemary Gillan/Audubon Photography Awards

Do you want to help bluebirds? Here's a link with some ideas: <https://www.ncbluebird.org/bluebird-care/>