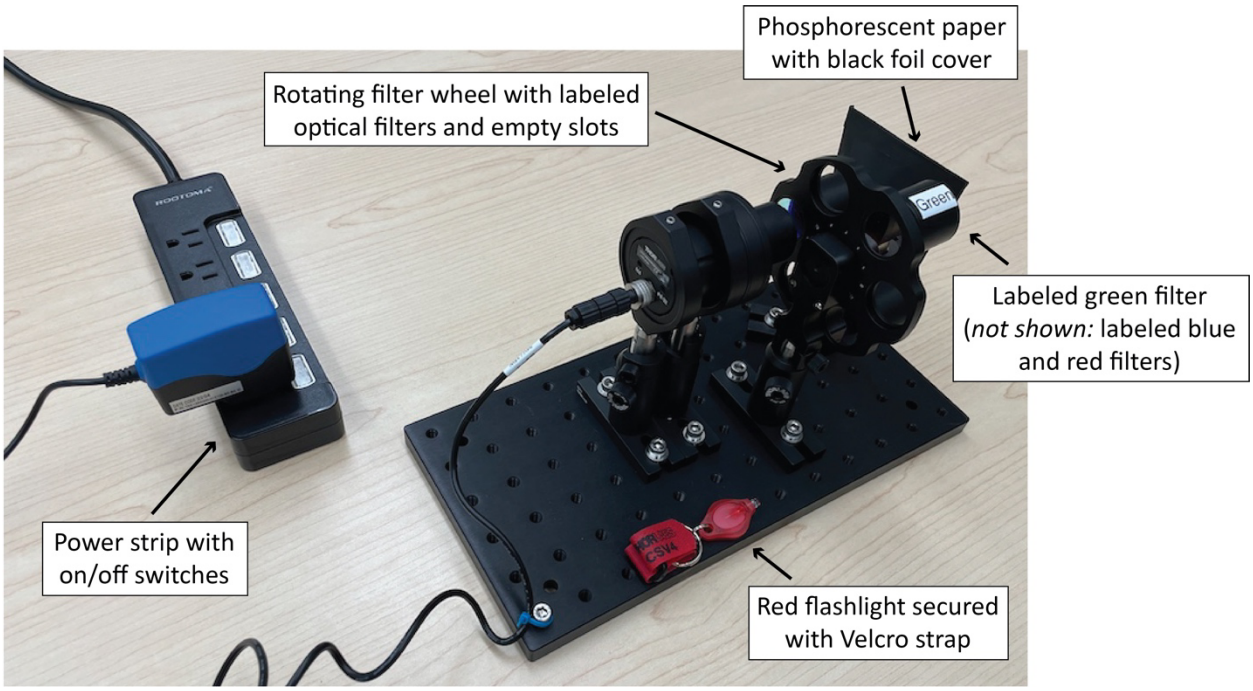
Phosphorescence (“Glow in the Dark”) Kits

Overview of your Phosphorescence ("Glow in the Dark") Kit:

- *Phosphorescent* materials are also known as "glow in the dark" materials. You might have seen them before: for example, you can buy "glow in the dark" stickers or decals that you might use to decorate your room. Phosphorescence can also be found in nature! Some animals, like certain species of jellyfish, are also phosphorescent.

- Today, you will learn about phosphorescent, or "glow in the dark," materials using a special kit. Your kit consists of the following components, which are also labeled in the picture below:

    - Phosphorescent ("glow in the dark") paper with a removable black foil cover
    - White LED light
    - A rotating filter wheel with labeled optical filters (red/green/blue) as well as some empty slots
    - A power strip with on/off switches (used to turn the white LED light on and off)
    - A red flashlight, which can be removed from a Velcro strap



Learning Goal #1: Optical Filters Only Let Certain Colors of Light Pass Through

- Undo the Velcro strap to remove the red flashlight. Then, shine the red flashlight through one of the empty slots in the rotating filter wheel. You might find it helpful to put a piece of white paper or your hand behind the filter wheel so you can see the color of the light clearly. When you shine the red flashlight through an empty slot, you should see *red light.*

- Next, try shining the red flashlight through the ***red filter.*** What color light do you see?

- Finally, try shining the red flashlight through the ***green filter*** and through the ***blue filter.*** What do you see when you shine the red flashlight through these filters?

Learning Goal #2: White Light is Made Up of Many Colors

- Now turn on the white light using the switch on your power strip. First, rotate the filter wheel so that the white light is going through an empty slot in the filter wheel. You should see *white light* on the black foil cover.

- Next, rotate the filter wheel so that the white light goes through the ***red filter.*** What color light do you see on the black foil cover? Try rotating the filter wheel so that the white light goes through the ***blue filter*** and then the ***green filter*.** What color light do you see on the black foil cover in these cases?

Learning Goal #3: Phosphorescent ("Glow in the Dark") Materials Have to be Exposed to Light Before They Can Glow
and
Learning Goal #4: Some Colors of Light Have More Energy Than Others

- Rotate your filter wheel so that the white light goes through the ***red filter***. Make sure that all the lights in the room are off and that the room is as dark as possible. Once the lights in the room are off, ***remove the black foil cover*** and expose the phosphorescent ("glow in the dark") paper to the red light for about 30 seconds. Then turn the white light off and look at the phosphorescent paper. What happens?

- Next, repeat the same steps with the ***green filter*** in front of the white light. What happens to the phosphorescent paper after you turn off the white light in this case?

- Finally, repeat the same steps with the ***blue filter*** in front of the white light. What happens to the phosphorescent paper after you turn off the white light in this case?