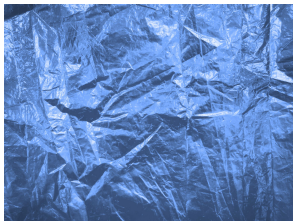
Light Exploration: Rainbows, Visible Spectrum, & Filters

Filter Day

Filter Activity:

Each group (3-5 students per group) should have the following materials:

- Colored cellophane filters (red, blue, green)
- 1 flashlight
- 1 white piece of paper (optional) if white surface is not available
- Colorful testing materials (e.g. colored construction paper, markers, or even the M&M's from the previous activity)
- Science notebooks

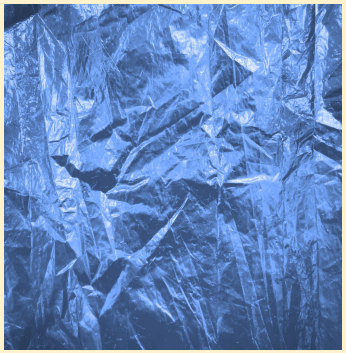






Part 1: White Light Through Filters

Steps:

1. Shine the flashlight through one of the colored filters onto a white surface. Observe how the light changes color.
2. Repeat with remaining filters.


Part 2: Colored Objects Through Filters



Steps:

1. With a filter attached to the flashlight, view different colored objects through different filters, noting how the object's apparent colors change.
2. Record your observations in your science notebook. Include the color of the filter, the color of the object being tested, and how the color changed using a filter.

Object Color	Through Red Filter	Through Blue Filter	Through Green Filter

Lab Questions



- Answer the questions on your lab sheet <u>with your group</u> - *focus on Part 3, Part 4, and the Discussion Notes*

- Be ready to share your ideas with the class when the timer ends.

Part 1

White Light Through Filters

1. What color do you see when you shine the flashlight through the **red** filter onto the white surface?
2. What color do you see when you shine the flashlight through the **blue** filter onto the white surface?
3. What color do you see when you shine the flashlight through the **green** filter onto the white surface?

Part 2: Colored Objects Through Filters

Object Color	Through Red Filter	Through Blue Filter	Through Green Filter

Part 3

Thinking About What You Saw

1. What happens to the colors when you look at the objects through different filters?

2. Why do you think the colors change when viewed through the filters?

Part 4 & Discussion

New Vocabulary

Visible Spectrum: The part of light that we can see with our eyes. It is made up of many colors. Draw or list some colors you think are part of the visible spectrum.

Discussion Notes:

Write one thing you learned from your group discussion about light and filters:

White light is made of colors.

Filters absorb and transmit specific colors.

A "visible spectrum" is the portion of the electromagnetic spectrum that is visible to the human eye, the rainbow of colors we can see.

- **Absorb:** To take in light.
- **Transmit:** To let light pass through.
- **Visible Spectrum:** The rainbow of colors we can see.



Apparent Brightness

Flashlight Investigation

Flashlight Activity:

*Teachers should prepare 1, 5, 10, 15, 20 meter markings ahead of time

Students should be split into groups (3-4 students per group). Each group should have two identical flashlights and copies of the simple data table.

What precautions can be taken to ensure this is a fair test?

Point out to students where the markings on the floor are located.

Partner 1 stands at the "starting line" with one flashlight (representing a light source, like the sun).

Partner 2 stands at the first designated distance (starting at 1 meter mark) with the second flashlight (representing a celestial object at varying distances).

The rest of the group records observations in their data tables, describing the apparent brightness (e.g., "Very bright, almost same," "Noticeably dimmer," "Much dimmer, tiny point of light").

When groups are ready, Partner 2 should move to the next meter marking, and the group observes and records. Continue until all distances have been observed and recorded.

Distance Between Flashlight 1 and 2 (from initial flashlight observation point to flashlight 2)	**Apparent Brightness of Flashlight 2 (compared to Flashlight 1 at starting point)**
0 meters (or feet)	
1 meter (3 feet)	
2 meters (6 feet)	
3 meters (9 feet)	
4 meters (12 feet)	
5 meters (15 feet)	
10 meters (30 feet)	

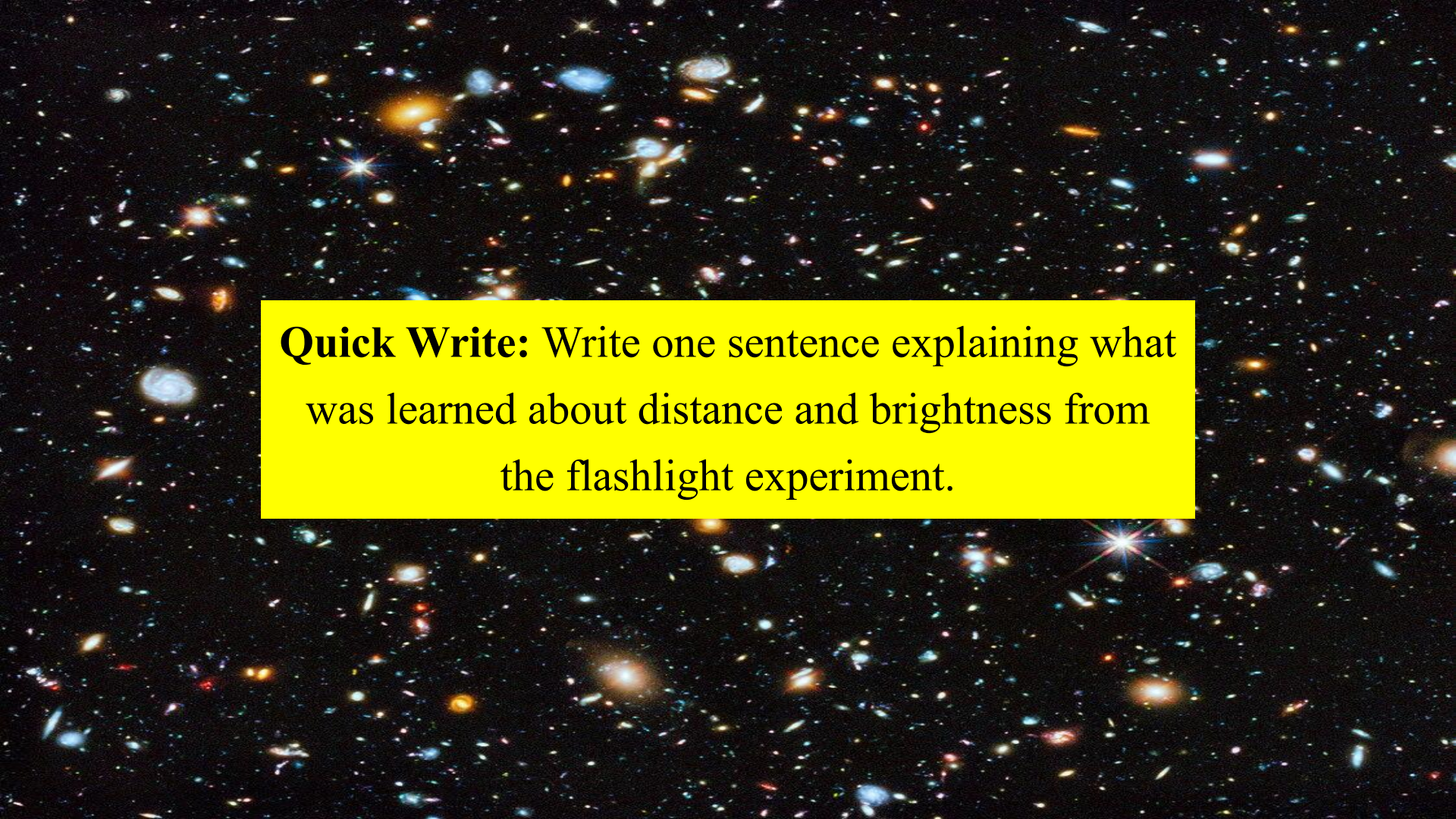
Lab Questions



- Answer the questions on your lab sheet with your group
- Be ready to share your ideas with the class when the timer ends.

1. Is the flashlight actually getting dimmer, or just *looking* dimmer?
2. What do you notice about the size of the light as it moves further away?

- Class discussion: Share your group's findings.
  - What is the connection between distance and brightness?
  - How would you apply your observations to our Sun and the stars in the sky?



Quick Write: Write one sentence explaining what was learned about distance and brightness from the flashlight experiment.