



APRIL 20-24, 2020

TOPIC: DISPERSION OF LIGHT

SUB-TOPIC: WHAT CAUSES A RAINBOW

OVERVIEW:

The Dispersion of Light is the phenomenon of splitting of a beam of white light into its seven constituent colors when passed through a transparent medium. Dispersion of light can be defined as the splitting of white light when it passes through a glass prism into constituent spectrum of colors (ROYGBIV). As we all know, white light contains millions of colors. Dispersion figuratively means “distribution” or splits into its constituent colors at various frequencies and various angles.

Now, **what causes a rainbow?**

A rainbow is caused by sunlight and atmospheric conditions. Light enters a water droplet, slowing down and bending as it goes from air to denser water. The light reflects off the inside of the droplet, separating into its component wavelengths or colors. When light exits the droplet, it makes a rainbow.



When can we see a rainbow?

A rainbow requires water droplets to be floating in the air. That’s why we see them right after it rains. The Sun must be behind you and the clouds cleared away from the Sun for the rainbow to appear.

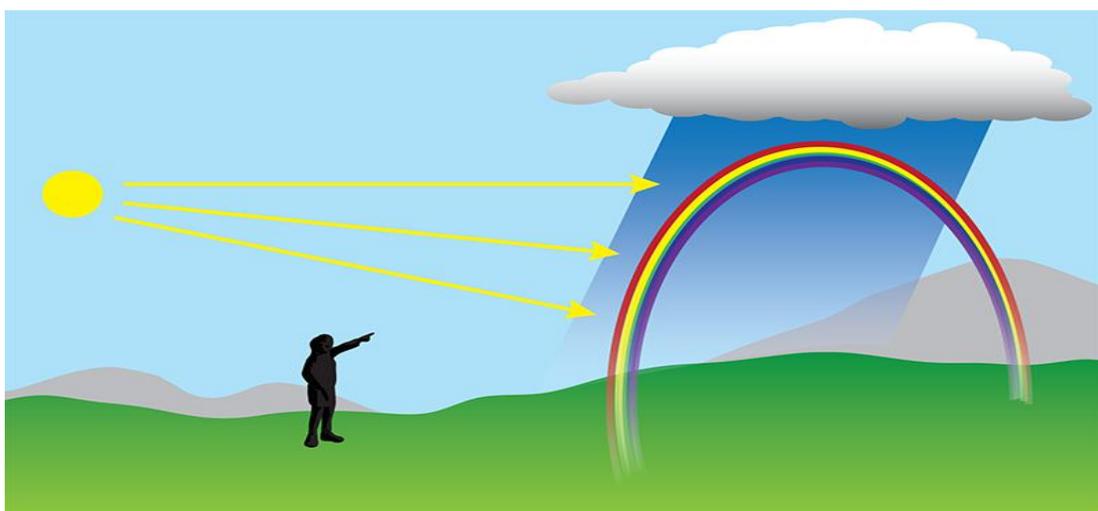


Photo from Scijinks.gov

Why is a rainbow a bow or arc?

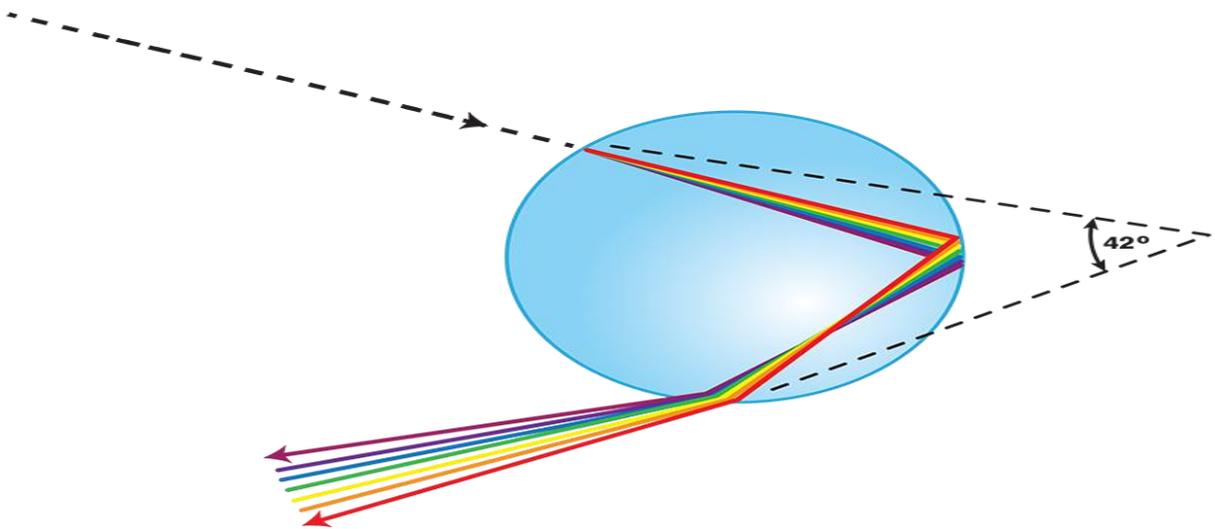
A full rainbow is actually a complete circle, but from the ground we see only part of it. From an airplane, in the right conditions, one can see an entire circular rainbow.



Aerial photographer Colin Leonhardt photographed a circular rainbow while flying around a rain shower above Cottesloe Beach in western Australia in 2013.

What happens in the water droplets?

The sunlight shines on a water droplet. As the light passes into the droplet, the light bends, or refracts, a little, because light travels slower in the water than in air. The light bounces off the back of the water droplet and goes back the way it came, bending again as it speeds up when it exits water droplet.



Why the colors?

Sunlight is made up of many wavelengths or colors of light. Some of those wavelengths get bent more than other when the light enters the water droplet. Violet (The shortest wavelength of visible light) bends the most, red (the longest wavelength of visible light) bends the least. So when the light exits the water droplet, it is separated into all its wavelengths. The light reflecting back to you, the observer with the Sunlight coming from behind you, from the water droplets will appear separated into all the colors of the rainbow. Violet will be on the bottom and red on the top.



LA IMMACULADA CONCEPCION SCHOOL
SENIOR HIGH SCHOOL
GRADE 12 – STEM: GENERAL PHYSICS 2

LESSON 6 TASK

Individual Task

Day Activity/Experiment

Direction: On a one whole sheet of yellow paper, give your observation, insight and conclusion on the said experiment.

Materials:

White light , Red light, Green light, and Blue light

Any color red, green, and blue material.

Procedure:

1. Try to turn off the light of the entire room.
2. Put each of the material over the table.
3. Open each colored-light, one at a time.
4. Observe and discuss the phenomena.