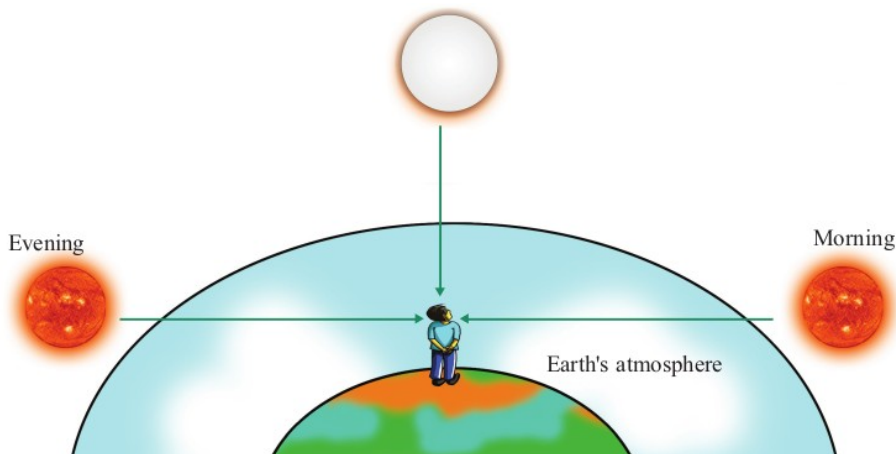


PHYSICS - X-PART-6 CLASS 53



Colours of the rising and the setting sun

1. Which are the occasions when sunlight has to travel greater distance through the atmosphere before reaching the eyes of an observer on the earth?
 - * Morning and evening
2. As sunlight passes through the atmosphere, which colour in it undergoes maximum scattering? Which colour undergoes minimum scattering?
 - * Colour in it undergoes maximum scattering – Violet
 - * Colour in it undergoes minimum scattering – Red
3. When light reaches the observer after travelling long distances through the atmosphere, which colour reaches the eye? What is the reason?
 - * Red, it has highest wavelength and least scattering.
4. The western horizon remains reddish for some more time even after sunset. Why?
 - * During sunrise and sunset, light reaching us from the horizon has to travel long distances through the atmosphere. During this long journey, colours of shorter wavelength would be almost fully lost due to scattering. Then, the red light which undergoes only less amount of scattering decides the colour of the horizon. That is why the sun appears red during sunset and sunrise.
5. Can you now guess why red colour has been given to the tail lamps of vehicles and signal lights?
 - * Red light has highest wavelength and least scattering. So red light is able to travel the longest distance through the atmosphere.



Tyndal Effect

* When rays of light pass through a colloidal fluid or suspension, the tiny particles get illuminated due to scattering. Because of this, the path of light is made visible. This phenomenon is Tyndal Effect.

* The intensity of scattering depends on the size of particles in the colloid. As the size increases, the intensity of scattering increases.



Light Pollution (Photo Pollution)

1. What will be the consequences of light pollution?

- * The life cycle of living beings will be affected adversely.
- * Sky watching becomes impossible due to diminished sky vision.
- * The light from tall flats misleads the migrating birds. It affects the accuracy of their judgement of direction.
- * The excess light from the high beam of headlight in vehicles causes a hindrance to the vision of others and can cause accidents.

2. Write down what else can be done to minimize the light pollution.

- * Place motion sensors on essential outdoor lamps.
- * Reduce the use decorative lighting.
- * The use of automatic systems to turn off street light at certain times.
- * Reduce extravagancy of light.
- * Consider replacing outdoor light with intelligently designed, low glare fixtures.

Worksheet

1. Write down a practical definition for scattering of light.
2. Why does the setting and rising sun appear red?