

SCIENCE WORKSHEET

CHAPTER 8 : Light and optics

8.4 -8.7

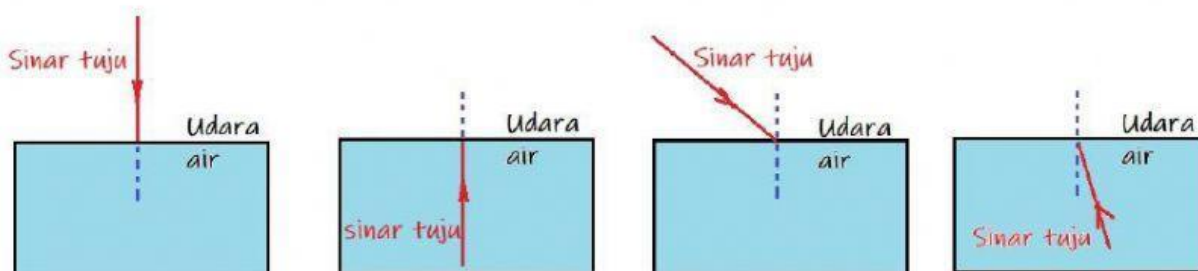
A. LIGHT REFRACTION

1. Based on your understanding, complete the ray of light as it passes through medium of different density and label the angle of refraction

Sinar tuju= incident ray

Udara = air

Air= water



1. Fill in the blanks.

towards	away,	Not refracted
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- a) when light hits the surface at 90° , it is _____ because the incident rays are parallel to the normal
- b) Light bends _____ from normal line when it travels from water to air (more dense medium to less dense)
- c) Light bends _____ normal line when it travels from air to water (less dense medium to more dense)

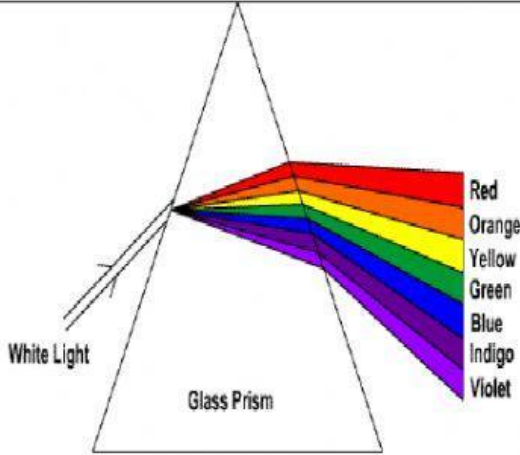

B. DISPERSION OF LIGHT

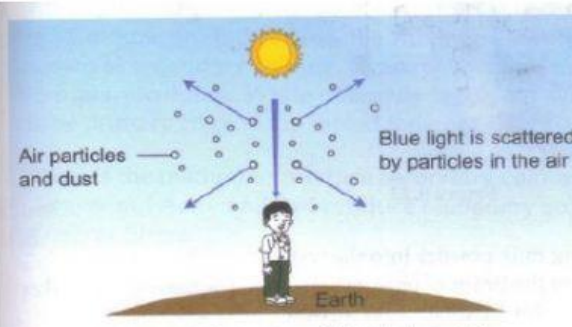
1. Light scattering occurs because each of these constituents of _____ will move at different _____ in a medium.
2. Dispersion is defined as the separation of _____ into different colours when the light is passed through the _____.
3. The scattering of light depends on the _____ of the light. Therefore, it can be said that the degrees of deviation is dependent on the wavelengths.

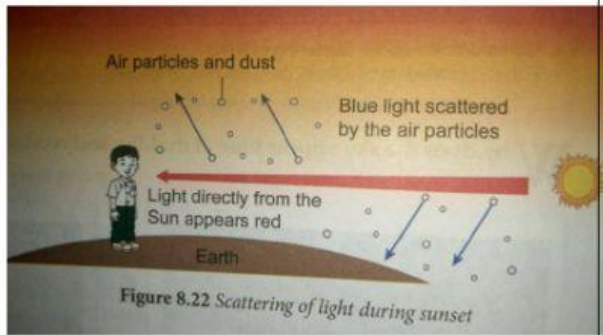
A. LIGHT SCATTERING

The two natural phenomena are caused by the scattering of light. Scattering of light occurs when light is reflected in all directions by clouds or particles in the air.

Q: Light scattering occurs when light rays are _____ and _____ in all directions by clouds or particles in the air.

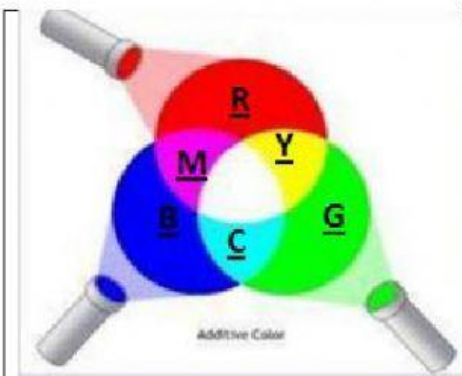
 <p>The diagram shows a triangular glass prism with a white light ray entering from the left. The ray is labeled 'White Light'. As it passes through the prism, it is dispersed into a spectrum of colors. The colors are listed on the right: Red, Orange, Yellow, Green, Blue, Indigo, and Violet. The prism is labeled 'Glass Prism'.</p>	 <p>When a white light ray is directed to a prism, the white light will be separated into its (7) components of colour. This is because the different colours in the white light bend towards the normal at different angles when entering the prism.</p> <p>This is also known as the _____</p>
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 <p>The diagram shows a sun at the top, with light rays traveling downwards towards a person on the Earth's surface. The light rays are labeled 'Blue light is scattered by particles in the air'. The person is labeled 'Earth'. The diagram also shows 'Air particles and dust' in the atmosphere.</p> <p>Figure 8.21 Scattering of light during midday</p>	<p>During midday, the _____ light is scattered most in all directions by the fine air molecules in the atmosphere.</p> <p>Therefore, the sky looks _____ during midday</p>
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- During sunset, the sun is at the horizon .
- _____ and _____ light are less scattered and will go through the atmosphere to reach your eyes.
- Other colored lights such as blue light are scattered away.
- Therefore, the sky looks _____ during sunset.

B. ADDITION OF LIGHT



- **RED + GREEN = YELLOW**
- **RED + BLUE = MAGENTA**
- **BLUE + GREEN = CYAN**

Tips:

**ROBERT YELL GOT
CYANIDE BY ME**



PRIMARY COLOURS

- _____ colour
- Cannot produced by colour mixing







SECONDARY COLOURS

produced from _____ of 2 colours



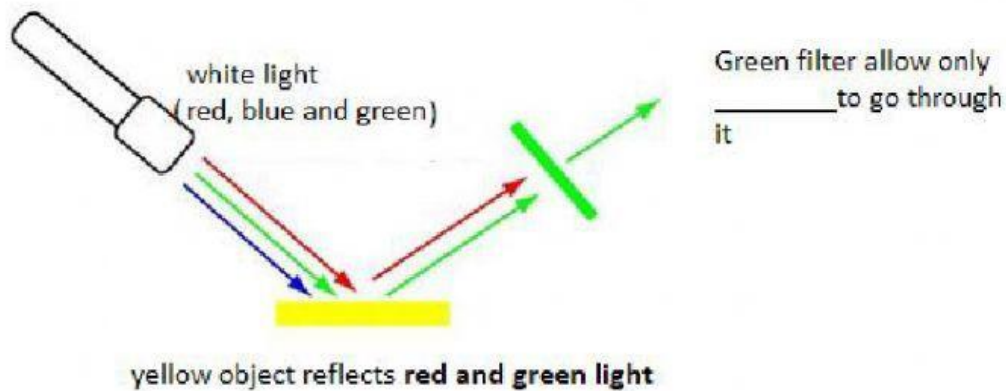
C. SUBTRACTION OF LIGHT

The same color of light as opaque objects will be **reflected** to our eyes, while other colors will be **absorbed**.




<p>1. Primary coloured objects</p> 	<p>a) The green leaves only reflect _____ light . Light of other colours are absorbed, therefore the leaves appear _____.</p> <p>b) The red flowers only reflect _____ light. Light of other colours are absorbed, therefore the flower appear _____</p> <p>c) The blue butterfly only reflects _____ light. Light of other colours are absorbed, therefore the butterfly appears _____.</p>
<p>2. SECONDARY COLOURED OBJECTS</p>  <p>(yellow object)</p>	<p>d) A yellow object reflects yellow, red and green colors. The overlap of red and green lights causes the object to appear _____</p>
 <p>(white object)</p>	<p>e) White objects reflect all colors in _____ light</p>
 <p>(Black object)</p>	<ul style="list-style-type: none"> • Black objects absorb all colours in _____ light. • No coloured lights are _____ • Therefore, the objects appear _____

D. (COLOUR FILTER)Penapis warna

1.Fill in the blanks.


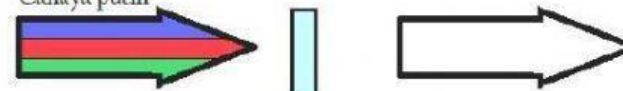
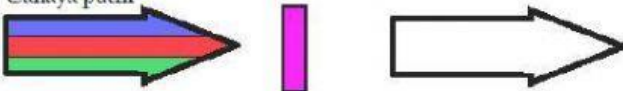


2. Write the color of the light that passes through the **primary color filter**.

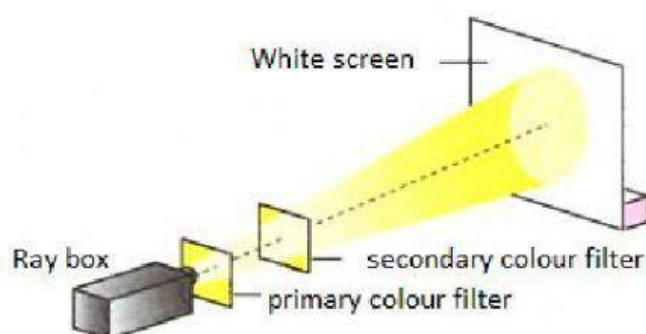
<p>Cahaya putih →  →</p> <p>Penapis merah</p> <p>Cahaya putih =white light Penapis merah = red filter</p>	
<p>Cahaya putih →  →</p> <p>Penapis hijau</p> <p>Cahaya putih =white light Penapis hijau = green filter</p>	
<p>Cahaya putih →  →</p> <p>Penapis biru</p> <p>Cahaya putih =white light Penapis biru = blue filter</p>	

3.2. Write the color of the light that passes through the **secondary color filter**.

Tips : Secondary colour filter : Allow only the light of the same colour and the light of primary colours which form the secondary colour to pass through. Light of other colours are absorbed

<p>Cahaya putih</p>  <p>White light Yellow filter</p>	
<p>Cahaya putih</p>  <p>White light Cyan filter</p>	
<p>Cahaya putih</p>  <p>White light Magenta filter</p>	

E. Effects of primary color filters and secondary color filters on white light and colored light



Primary colour filter	Secondary Colour filter	Colour that appears on screen
Merah / Red ●	Blue ●	<i>No light/ tiada cahaya</i>
	Yellow ● ●	
	Magenta ● ●	
Biru / Blue ●	Cyan ● ●	
	Magenta ● ●	
Hijau / Green ●	Yellow ● ●	
	Cyan ● ●	
	Magenta ● ●	