Intermediate Science 8

Unit 2 Optics

Unit 3: The Many Properties of Light

Know the following terms:

Visible Light	Rectilinear propagation	Reflection
Specular Reflection	Diffuse Reflection	Refraction
Dispersion	Crest	Trough
Amplitude	Wavelength	Frequency
Equilibrium position	Spectrum	Electromagnetic Radiation
Light Year		

Important concepts to know:

1. The ideas and theories of light from the past
   - Pythagoras
   - Galileo
   - Michelson
2. The six properties of visible light.
3. Distinguish between specular and diffuse reflection.
4. Understand and identify refraction.
5. Identify the speed of light as 3×10^8 m/s.
6. Compare the speed of light to the speed of sound using thunder and lightning as an example.
7. Provide examples of technologies that were develop using the properties of light (microscope, telescope)
8. Understand the wave model of light.
9. Know the three ways to measure wavelength
10. Be able to calculate frequency in hertz (Hz).
11. Know the relationship between wavelength and frequency for a wave.
12. Understand how a prism can be used to observe the dispersion of light.
13. Know the visible light spectrum (ROY G BIV)
14. Know the relationship between each colour and its wavelength (Longest ->Shortest)
15. Understand why we see certain colours. (reflection and absorption of certain wavelength)
16. Understand that light is a form of energy that can be detected by the human eye.

17. Describe the electromagnetic spectrum in terms of wavelength, frequency, and energy. Include, in order of decreasing wavelength (increasing frequency):

(i) radio waves
(ii) microwaves
(iii) infrared
(iv) visible light
(v) ultraviolet
(vi) x-rays

higher the frequency indicates higher energy

18. Provide examples of the use of each type of electromagnetic radiation. Include:
(See notes)

(i) infrared: motion sensors
(ii) radio waves: telecommunications
(iii) microwaves: cooking food
(iv) ultraviolet: sun tanning
(v) x-rays: medical detection

19. Describe possible negative and positive effects of technologies associated with electromagnetic radiation

20. Indicate that generally higher energy electromagnetic radiation is more harmful to humans.

21. Recognize that there are positive and negative effects of exposure to electromagnetic radiation. Include:
(See chart in notes)

(i) x-rays: positive-medical detection, negative-over exposure can lead to cancer
(ii) ultraviolet: positive-used to treat jaundice in babies, negative-skin cancer
(iii) radio waves: positive-improved telecommunications, negative-uncertain of long term exposure effects

22. Know the following textbook questions:

Textbook Page #	Question
Page 134	**1, 2,3,4,5**
Page 136	**1, 2,3,4**
Page 137	**1, 2, 3 ,4, 5, 6, 7, 8**
Page 142	**1, 2,3,4**
Page 147	**1,2**
Page 161	**1, 2,3,4,5**
Page 155	**2, 3,4,5,7**
164	**1, 2,3,4,5**
167	**1 to 12**