

## Unit 2 - Optics

### Key Words

wave	electromagnetic radiation	spectrum
reflection	refraction	transparent
translucent	opaque	iris
lens	pupil	sclera
cornea	retina	optic nerve
blindspot	rod cells	cone cells
near-sighted	far-sighted	astigmatism
blindness	snow blindness	colour blindness

### Questions:

1. Compare the speed of light with the speed of sound.
2. Describe three technologies that utilize light
3. Describe the following properties of light:
  - a. Rectilinear propagation
  - b. Reflection
  - c. Refraction
  - d. Dispersion
  - e. Light travels through a vacuum
4. Describe the following types of electromagnetic radiation (know where they fall on the electromagnetic spectrum, how are they dangerous, how do we use them or encounter them in everyday life):
  - a. Radio waves
  - b. Microwaves
  - c. Infrared light
  - d. Visible light
  - e. Ultraviolet light
  - f. X-rays
  - g. Gamma rays

5. What is the difference between specular and diffuse reflection?
6. Draw a ray diagram for a reflection. Include :
  - a. Incident ray
  - b. Reflected ray
  - c. Normal
  - d. Angle of incidence (i)
  - e. Angle of reflection (r)
7. Draw a ray diagram for a refraction. Include :
  - a. Incident ray
  - b. Refracted ray
  - c. Normal
  - d. Angle of incidence (i)
  - e. Angle of refraction (R)
8. What is the relationship between the angle of incidence and the angle of reflection?
9. How is an image made by a plane mirror different than the object that's creating it? How is it the same?
10. What happens when light travels from one medium into another medium with a higher density?
11. Label the basic parts of an eye (pupil, iris, sclera, cornea, lens, retina, muscles, optic nerve)
12. Describe how the eye focuses light to form an image
13. For each vision problem, provide a definition, what causes it, and how it is corrected:
  - a. Myopia (near-sighted)
  - b. Hyperopia (far-sighted)
  - c. Astigmatism
14. Describe the different types of blindness we discussed (legally blind, snowblind, colour blind)
15. Describe two uses for fibre optics.