

CHECK YOUR LEARNING

Suggested Answers

1. Conduction and convection transfer energy through a medium, whereas radiation transfers energy through empty space.
2. Maxwell predicted that electromagnetic waves should be able to travel through empty space and would move at the speed of light.
3. Hertz discovered radio waves in 1887 and Roentgen discovered X-rays in 1895.
4. microwaves, infrared light, red light, X-rays, gamma rays
5. Sunscreen protects the skin from ultraviolet light.
6. red, orange, yellow, green, blue, indigo, and violet
7. Objects in the universe emit many forms of electromagnetic radiation besides visible light. When we detect these other forms of radiation we can view celestial objects and events in greater detail.
8. Sample answers: radio, television, microwave oven, cellular telephone, DVD remote control.
9. **(a)** X-rays, baggage screening; **(b)** ultraviolet light, vitamin D; **(c)** radio waves, radar; **(d)** infrared light, DVD remote control; **(e)** microwaves, telecommunications; **(f)** gamma rays, cancer treatment; **(g)** visible light, theatre/concert effects
10. Students' mind maps should list the following typical physical properties of light: transfers energy; can travel through empty space; travels extremely fast; travels in straight lines, causing objects to cast sharp shadows; shows wave-like properties; occurs in visible and invisible forms.
11. You could shine white light through a prism to produce a rainbow of colours and then shine the colours through a second prism to re-form white light.