

## CHECK YOUR LEARNING

1. Refraction is the change in direction of a light beam that occurs when the light enters a new medium.
2. (a) When light enters a new medium, its speed changes causing the light to travel in a new direction. Light bends toward the normal if its speed is slower in the new medium and away from the normal if its speed is greater in the new medium.  
(b) In order for light to be refracted, it must travel from one transparent medium into another, and light must have a different speed in each medium.  
(c) Light must have a slower speed in water than in air because light bends toward the normal when it enters water from air.
3. (a) Medium A is air and medium B is ice. When light passes from one medium into another, its path will be closer to the normal in the medium where light's speed is slower, so medium B must be ice.  
(b) The diagram does not show the direction in which the light is travelling, but this does not matter because the light would follow the same path going either way.
4. (a) away from the normal  
(b) toward the normal
5. Partial reflection and refraction are illustrated in Figure 11.
6. Sample answers: mirrored sunglasses, energy-saving window coatings, domes around ceiling-mounted security cameras, security windows in store offices
7. Sample answer: One application of partial reflection and refraction is in the use of two-way mirrors that are used in places where people on one side need to be able to see through the mirror but do not want people on the other side to be able to see through. This is the case for situations such as police lineups, focus groups or other observations of behaviour in which those being observed might behave differently if they could see the people who are observing them.