

Strand 3: Force and energy

3.1: Curved mirrors

Section A

1. B
2. C
3. C
4. C
5. B
6. B
7. B
8. C
9. C
10. B
11. C

Section B

1.
 - (a) Convex mirror
 - (b) It is suitable for use in supermarkets because it provides a wide field of view, allowing security staff to observe a large area of the shop.
 - (c) Vehicle side mirrors, under-vehicle search mirrors
 - (d) The image formed is upright and diminished.
2.
 - (a) Concave mirror
 - (b) It converges parallel rays of sunlight to a small area, producing intense heat for heating the water.
 - (c) Salon mirrors, dentist mirror
3.
 - (a) X- Convex mirror; Y – Concave mirror
 - (b) Convex mirror – Vehicle side mirror; Concave mirror – Dentist's mirror
- 4.

Description	Type of curved mirror
A reflecting surface that curves inward, resembling the inside of a spoon.	Concave mirror
A mirror shaped like a parabola that brings parallel rays to a single focus.	Parabolic mirror
A reflecting surface that bulges outwards, like the back of a spoon.	Convex mirror

- 5.

- (a) S- Focal point, Q- Pole
- (b) It helps to determine the direction of reflected rays.
- 6.
 - (a) A- The image formed is real, inverted, magnified (enlarged). Practical application: Projectors, such as a cinema projector, where a magnified image is required.
 - (b) B – The image formed is virtual, upright (erect), diminished (smaller than the object). Practical application: Vehicle side mirrors, because they provide a wide field of view.
- 7.
 - (a) Reflective surfaces that are used to redirect and focus sunlight to a specific point.
 - (b) Concave mirror
 - (c) Concave mirror

3.2: Waves

Section A

- 1. B
- 2. C
- 3. B
- 4. C
- 5. B
- 6. C
- 7. D
- 8. C
- 9. C
- 10. C
- 11. B

Section B

- 1.
 - (a) The stone disturbs the water particles, causing them to vibrate. This disturbance is transfers energy outwards, producing circular ripples.
 - (b) Floating objects on the water move up and down as the ripples pass. The ripples can move or displace floating objects away from the point where the stone was dropped.
- 2.
 - (a) Group A – Transverse wave; Group B – Longitudinal wave
 - (b) In transverse waves, the particles vibrate perpendicular to the direction in which the wave is travelling. In longitudinal waves, the particles vibrate parallel to the direction in which the wave is travelling.
 - (c) Transverse: water ripples, waves made from moving a rope, light, X-rays and radio waves. Longitudinal: sound waves, ultrasound waves.
- 3.
 - (a) A- crest/highest distance moved; B- amplitude
 - (b) Traveling in a straight line, reflection, bending and movement around objects
 - (c) Amplitude is the maximum displacement of a particle from its rest position.
 - (d) Greater amplitude produces a louder sound.

4.
 - (a) The collection and interpretation of information about an object without being in physical contact with it.
 - (b) Waves such as electromagnetic waves travel between the Earth's surface and sensors on satellites. The sensors detect radiation reflected or emitted by objects on the Earth's surface. The information is then processed to produce images or other data about the area.
 - (c) Communication; Medical diagnosis and treatment; cooking and heating.
5.
 - (a) Transverse wave.
 - (b) The particles of the rope vibrate perpendicular to the direction in which the wave travels.
 - (c) Water ripples, waves made from moving a rope, light, X-rays and radio waves.
6.
 - (a) Remote sensing.
 - (b) Satellites use electromagnetic waves to collect information from the Earth's surface. Sensors detect radiation reflected or emitted by the land and vegetation. The information is processed into images that can be used to identify areas affected by drought.
 - (c) It covers large and remote areas quickly. It allows information to be collected without physically visiting the area.
7.
 - (a) Ultrasound waves (high-frequency sound waves).
 - (b) The ultrasound waves enter the body and are reflected by different tissues and structures of the foetus. The returning echoes are detected by the scanner and converted into an image, allowing medical personnel to observe the unborn baby.
 - (c) X-ray imaging; Ultrasound imaging of internal organs