SNC2D PHYSICS

LIGHT & GEOMETRIC OPTICS

- Curved Mirrors (P.420)

Curved Mirrors

The strange image you see in a funhouse mirror is produced by a mirror that has flat, outward-curved, and inward-curved sections in it. While they may be fun to look at, mirrors with multiple curves have no real practical uses. However, mirrors with a single curvature find many uses in our homes and optical devices. There are two types of curved mirrors: converging (concave) and diverging (convex).

Curved Mirrors

Figure 1 Makeup mirrors are often converging (concave).

Figure 2 Diverging (convex) mirrors show a wide area.

Curved Mirrors

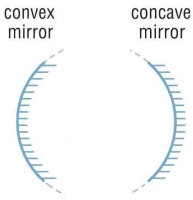
Curved mirrors are created when you make part of the surface of a sphere reflective. (Hint: to help visualize these surfaces, consider a large spoon.)

Curved Mirrors

If the reflection is from the outer surface of the sphere (i.e. the bottom of the spoon), the mirror is called a ***convex*** *or* ***diverging mirror****. The centre of a convex mirror bulges toward you.*

Curved Mirrors

If the reflection is from the inner surface of the sphere (i.e. the top of the spoon), the mirror is called a ***concave*** *or* ***converging mirror****. The centre of a concave mirror bulges away from you.*



Curved Mirror Terminology

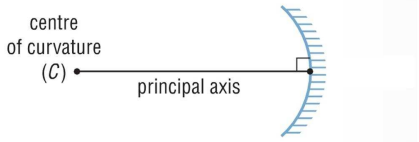
Converging and diverging mirrors are described using similar terms.

- *The **centre of curvature (C)** of a mirror is the centre of the sphere, part of whose surface forms the curved mirror.*

Curved Mirror Terminology

Converging and diverging mirrors are described using similar terms.

- *The **principal axis (PA)** of the mirror is the line going through the centre of curvature and the centre of the mirror. Because of this the principal axis intersects the mirror at 90° and is normal to the surface.*



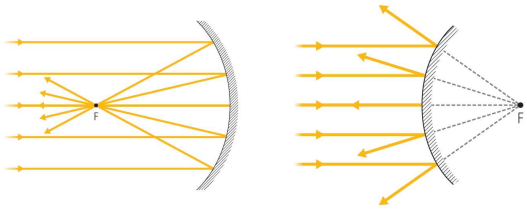
Curved Mirror Terminology

Converging and diverging mirrors are described using similar terms.

- *The **vertex (V)** is the point where the principal axis intersects the mirror.*

Curved Mirror Terminology

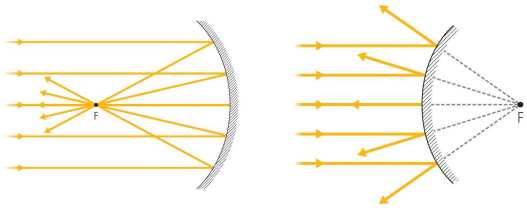
Like plane mirrors, curved mirrors obey the law of reflection. However, when parallel light rays strike a curved surface, each ray of light will reflect at a slightly different position.



Curved Mirror Terminology

NOTE!

All of these rays eventually meet at – or seem to spread out from – a common point. The point where the light rays meet – or appear to spread out from – is called the ***focus (F)****. The focus (F) is a point halfway between the vertex and the centre of curvature.*



Activity: Converging Mirror Terminology

ISSUE

Not all mirrors are plane mirrors – many are curved. But like plane mirrors, curved mirrors obey the law of reflection. As such, it is important to first understand the terminology used when working with curved mirrors.

INSTRUCTIONS (2DPHYS - WS3)

A. Complete Part 1 (Converging Mirror Terminology).

✔ Check Your Learning

1. How are converging mirrors and diverging mirrors different? How are they the same?

   difference – shape of the mirror and the image created
   similarity – reflect light rays to produce an image