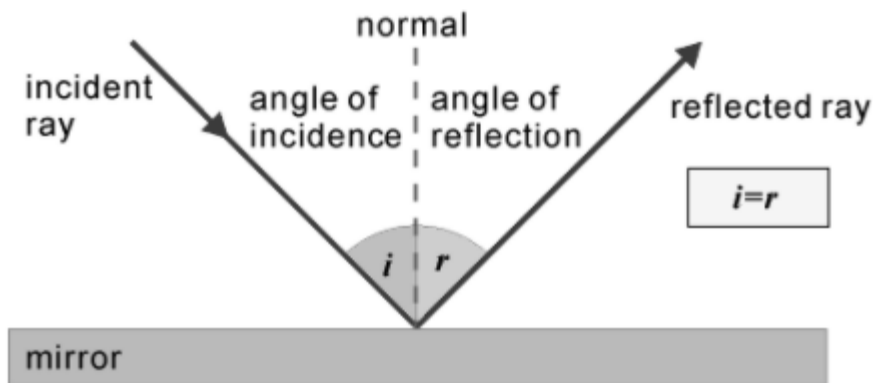


F. Answer the following Questions:

Q1. What are the laws of reflection of Light?

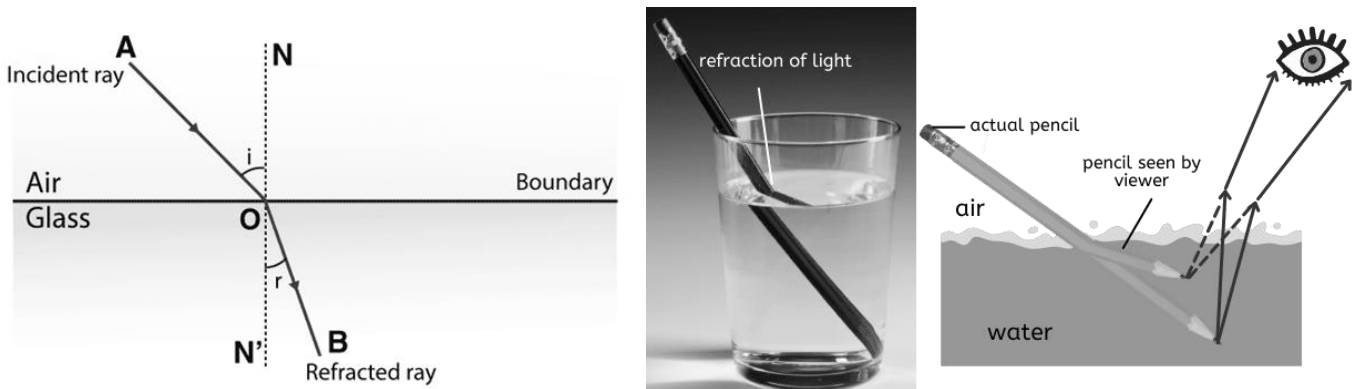
Answer: The two laws of reflection of light:

- The first law of reflection states that **the incident ray, the reflected ray, and the normal to the surface of the mirror, all lie in the same plane.**
- The second law of reflection states that the **angle of reflection is equal to the angle of incidence.** Both angles are measured with respect to the normal to the mirror.



Q2. What is refraction of light?

Answer: The refraction of light is the **bending of light rays** as they **pass from one medium to another**, thereby changing the path of the rays.

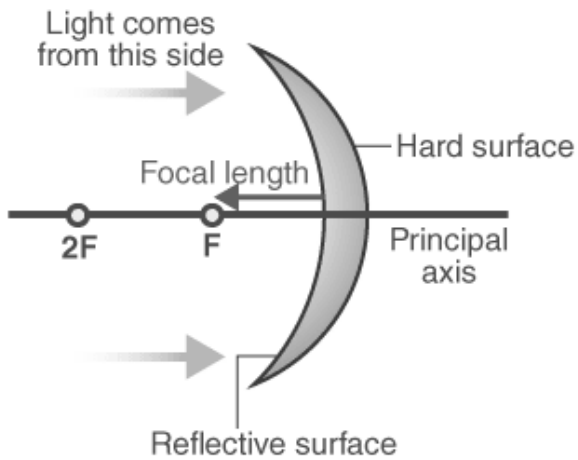


Q3. What are spherical mirrors? Which type of mirror can form a real image?

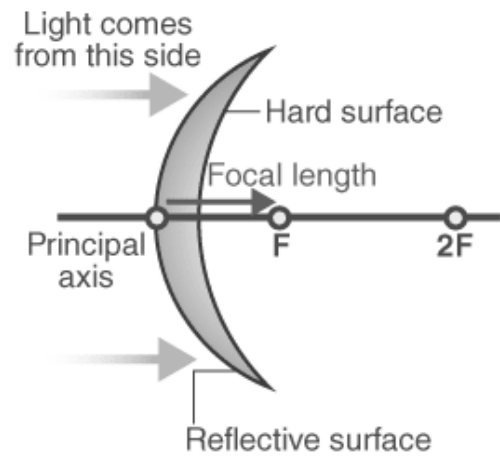
Answer: A spherical mirror is **a mirror that has the shape of a piece cut out of a spherical surface**. There are two types of spherical mirrors: **concave mirror and convex mirror**.

A convex and a plane mirror always form virtual images. Only a concave mirror can form a real image.

TYPES OF SPHERICAL MIRRORS



Concave mirror

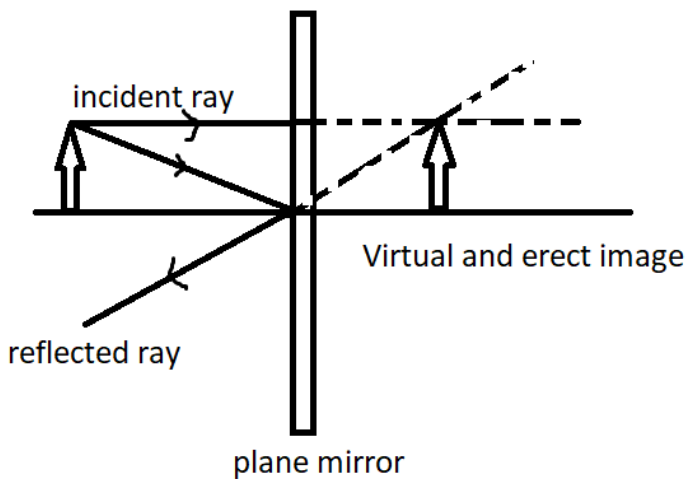


Convex mirror

© Byjus.com

Q4. What are characteristics of image formed by a plane mirror?

Answer: From the above diagram, the following characteristics of the image can be observed.

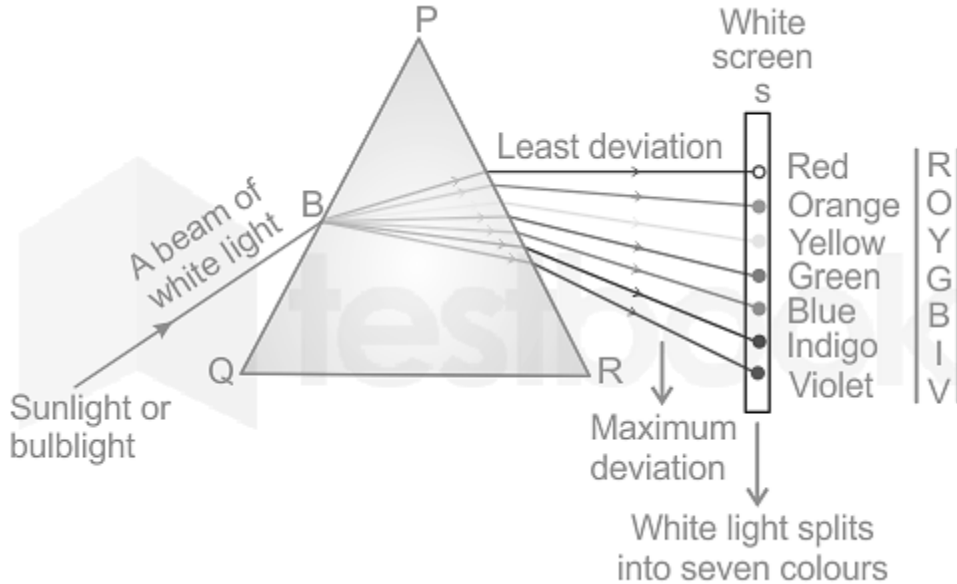


- It is **virtual**
- It is **erect and of the same size as the object**
- The **distance of the object** from **the plane mirror** is the **same as the distance of the image** from the **plane mirror**.
- It is **laterally inverted**.

One of the important characteristics of the image is that it is laterally inverted. It means if you raise your left hand it would appear in the plane mirror that you have raised your right hand.

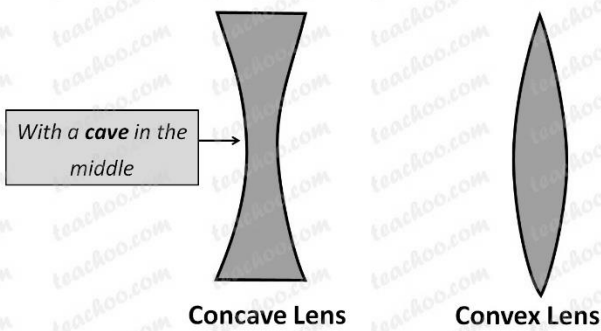
Q5. What will happen if beam of light passes through glass prism?

Answer: The light is divided into its component colours - **red, orange, yellow, green, blue, and violet** - as it passes through the prism. Dispersion is the division of visible light into its various colours. So we can conclude that when light goes through a prism, dispersion occurs.



Q6. What is lens? What kind of lens is used as magnifying glass?

Types of Spherical Lenses

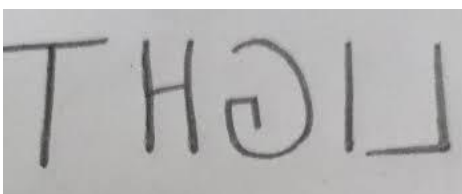


Answer: A lens can be defined as **a transparent medium having one flat and one curved surface or both curved surfaces**. Since they are transparent, light can easily pass through them.

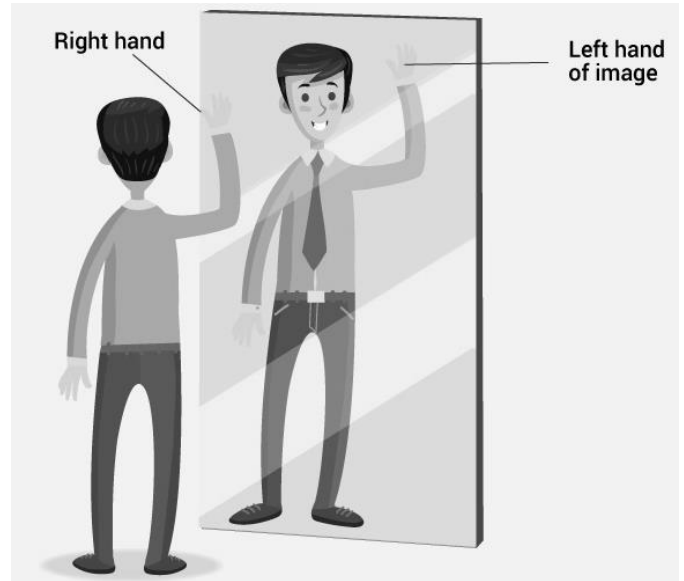
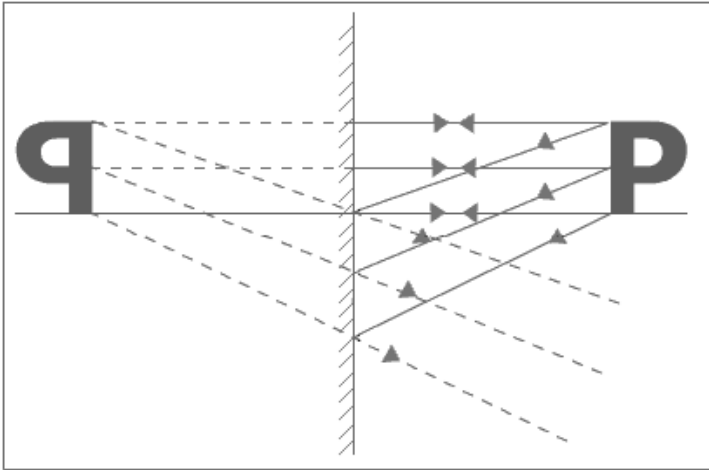
A convex lens has the **capacity to make an object appear much larger than it actually is**, hence is used in the **making of a magnifying glass**.

Q7. What is meant by lateral inversion? Write laterally inverted image of the word 'LIGHT'.

Answer: The phenomenon due to **which left-hand side of an object appears as the right-hand side of the image and vice versa in a plane mirror** is called **lateral inversion**.

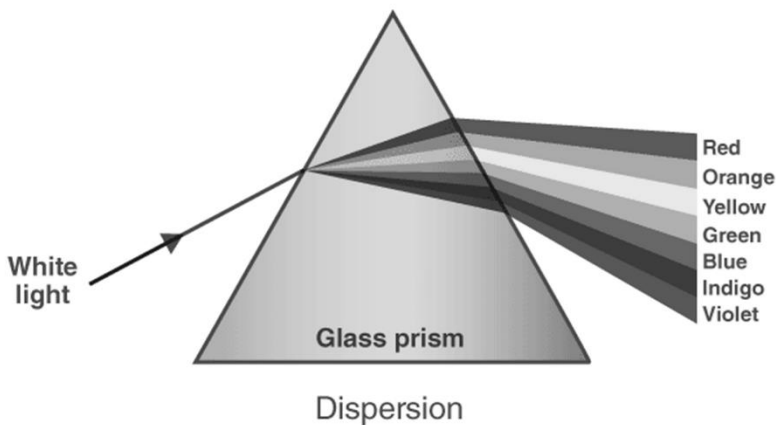


Other examples:



Q8. Define dispersion of light. What did Newton demonstrate by his experiment with the prism?

Answer: When white light is passed through a glass prism it splits into its spectrum of colours (in order violet, indigo, blue, green, yellow, orange and red) and **this process of white light splitting into its constituent colours** is termed as **dispersion**.



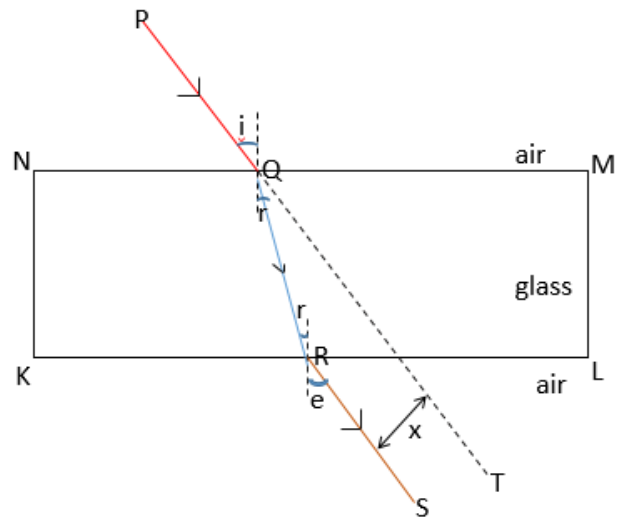
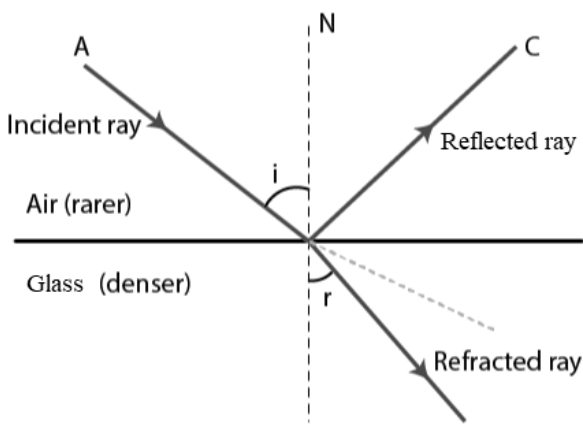
Newton demonstrated by his experiments with the prisms that white light consists of a mixture of seven colours.

Q9. What are the rules that are followed by light during refraction?

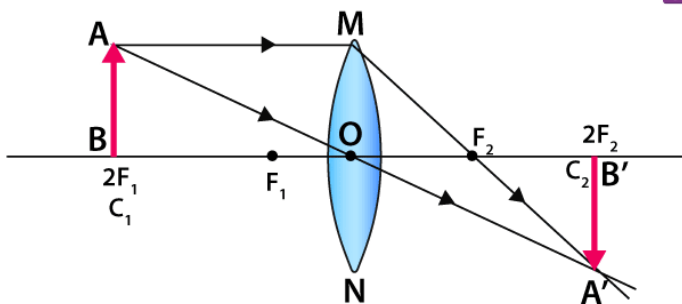
Answer: Laws of refraction are the rules which light rays follow when they enter from one medium to another medium.

There are certain rules that are followed by light during refraction.

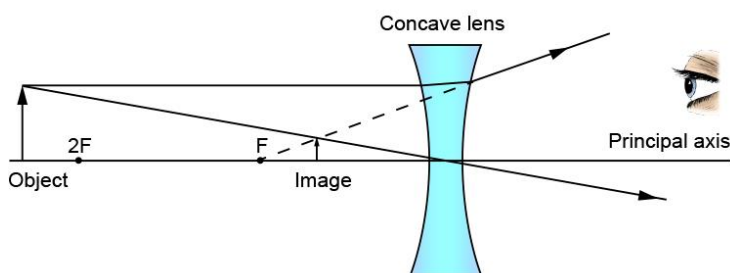
- When **light travels** from a **rarer to a denser** medium, it **bends towards the normal**.
- When the light travels from a **denser to a rarer medium**, it **bends away from the normal**.
- **When light travels along the normal**, there **is no deviation** that is the ray suffers no refraction.



Q10. What type of image can a convex and concave lens make?



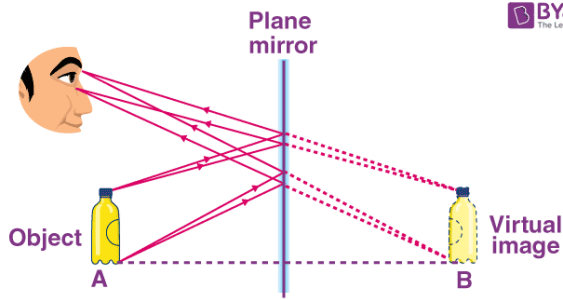
— **Answer:** A **convex lens** can form **real and inverted image**. When the **object is placed very close to the lens**, the **image formed is virtual, erect and magnified**. When used to see objects magnified, the **convex lens is called a magnifying glass**.



A **concave lens** always forms **erect, virtual and smaller image than the object**.

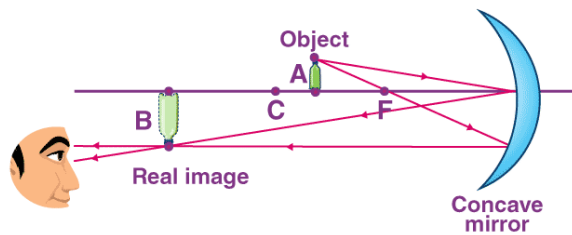
Q11. What are real and virtual images? Explain with help examples?

Answer:



BYJU'S The Learning App

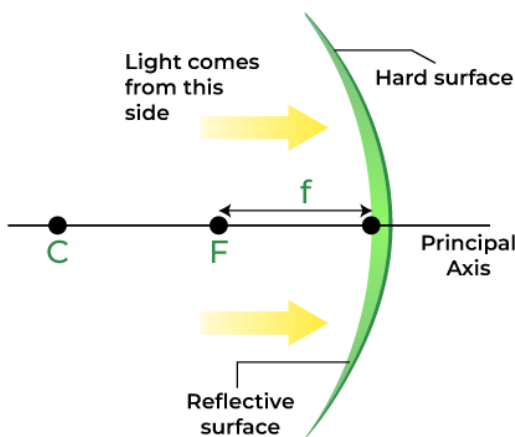
- A **virtual image** is an **upright image** that is achieved where the **rays seem to diverge**.
- A virtual image is **produced** with **the help of a diverging lens or a convex mirror**.



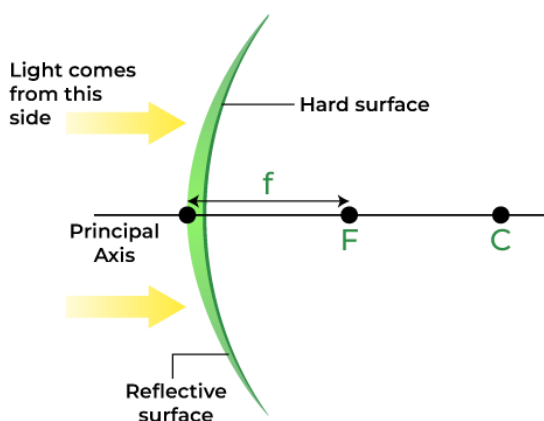
- **Real images** are **obtained** using a **converging lens or a concave mirror**.

- The **size of the real image** depends upon the **placement of the object**.

Q12. What is the difference between the shape of a convex and concave mirror. Explain with the help of diagrams. Answer:



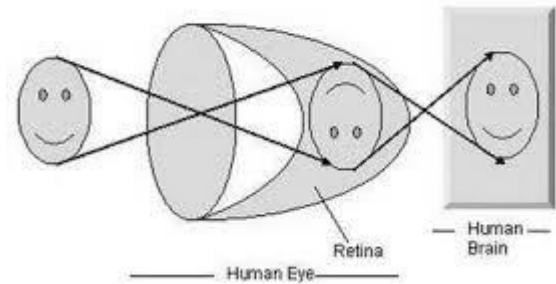
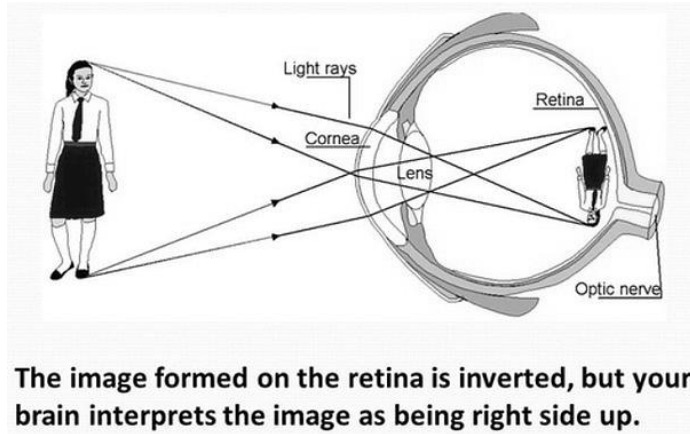
- ❖ A **concave mirror** is a **curved mirror** where the **reflecting surface is on the inner side** of the curved shape. It has a surface that **curves inward**,
- ❖ **Concave mirrors** are also **converging mirrors** because they cause **light rays to converge or come together after reflection**.
- ❖ Depending on **the position of the object** and the mirror, concave mirrors can **form both real and virtual images**.



- A **convex mirror** is a curved mirror with **the reflecting surface on the curved shape's outer side**. It has a **surface that curves outward**
- Convex mirrors are also known as **diverging mirrors** because they cause **light rays to diverge or spread out after reflection**.
- Convex mirrors always form **virtual, erect, and diminished images, regardless of the object's position**.

Q13. Explain how image is formed in a human eye?

Answer: The *crystalline eye lens* acts as a *light-sensitive screen* by forming an *inverted true image* of the item *on the retina*. The light that enters our eyes is converted by the *retina into electrical impulses* that our *optic nerve transmits to our brain*, which produces the images we see.

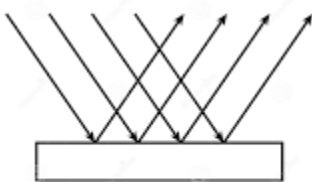


The image formed on the retina is inverted, but your brain interprets the image as being right side up.

Q14. What are regular and irregular reflections? Explain with the help of a diagram.

Answer: Regular Reflection:

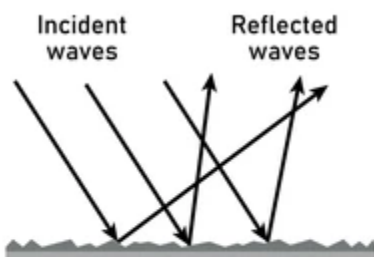
Regular Reflection



When a *beam of parallel light rays is incident on a smooth and plane surface*, the *reflected rays will also be parallel*. This type of reflection is called *Regular Reflection*.

Reflection from a polished surface is called regular reflection.

Irregular reflection:



Diffuse Reflection

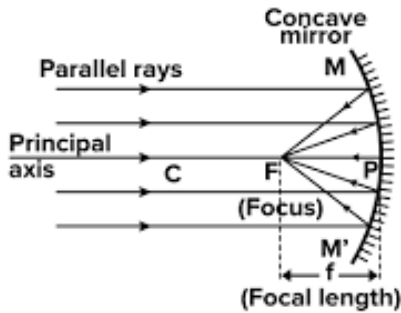
When a *beam of parallel light rays is incident on a rough surface*, the *reflected rays scatter in different directions*. This type of reflection is called *irregular or diffuse reflection*.

Reflection from a rough surface is called diffuse reflection.

Q15. Explain the principal focus of mirrors with help of suitable diagrams.

Answer:

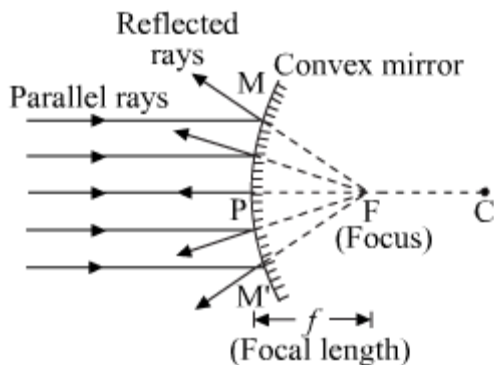
In concave mirrors:-



Principal focus of a concave mirror: *The principal focus of a concave mirror is a point on its principal axis to which all the light rays which are parallel and close to the axis, converge after reflection from the concave mirror.*

(ii) Focal length of a concave mirror: The focal length of a concave mirror is the distance between its pole and the principal focus.

In Convex mirror:



A convex mirror diverges (spreads out) a beam of parallel rays of light.

(i) Principal focus (F) of a convex mirror - Focus is the point at which the *incident rays, parallel to the principal axis*, appear to have come from, *after reflection*.

(ii) Focal length (f) - Focal length of a convex mirror may be defined as the distance between its pole and focus.

Q16. You know the lateral inversion of alphabets can be read in plane mirrors. Now write the following in laterally inverted alphabets, and read them using a mirror.

Answer:

a. I STUDY IN CLASS VII

I 7YDUƆ ƆI ƆƆAƆ ƆI ƆƆAƆ ƆI ƆƆAƆ

b. RECTILINEAR PROPOGATION OF LIGHT

ƆI ƆƆAƆ ƆI ƆƆAƆ ƆI ƆƆAƆ ƆI ƆƆAƆ ƆI ƆƆAƆ

c. SAVE LIGHT SAVE ENERGY

ƆI ƆƆAƆ ƆI ƆƆAƆ ƆI ƆƆAƆ ƆI ƆƆAƆ ƆI ƆƆAƆ

d. VIBGYOR

VIBGYOR

Q17. A person with weak eye sight uses spectacles. What type of lens is used in the spectacles if a person is not able to see the nearby objects (due to image formed behind the retina) and when the person is not able to see far-off objects (due to image formed ahead of retina)? (Hint – Use the property of lenses to converge or diverge the rays of the light.)

Answer:

Explanation: a person **who can't see nearby object** is suffering from long sightedness he or she **should use convex lens** and if he can't see the **far objects use concave lens**.

