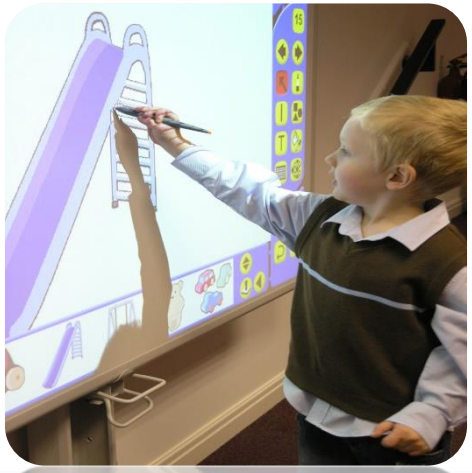
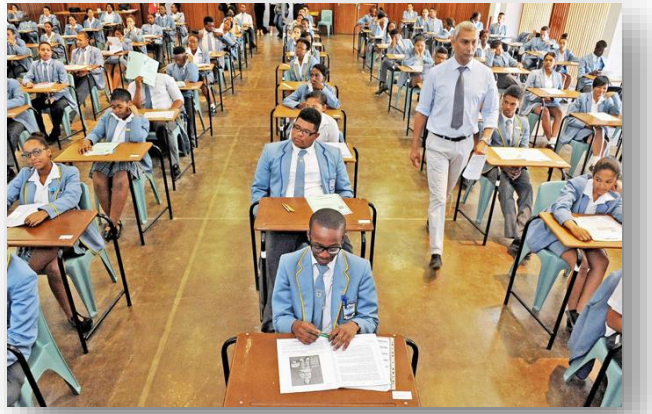
Class-8 Academic Lessons

Subject: Science(Light, 11th Chapter)

The Way we'd be learning…

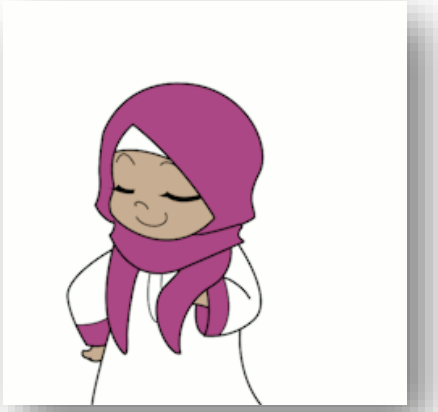


Clearing The Basic



Questions Appearing in Exams

Experiments



LIGHT

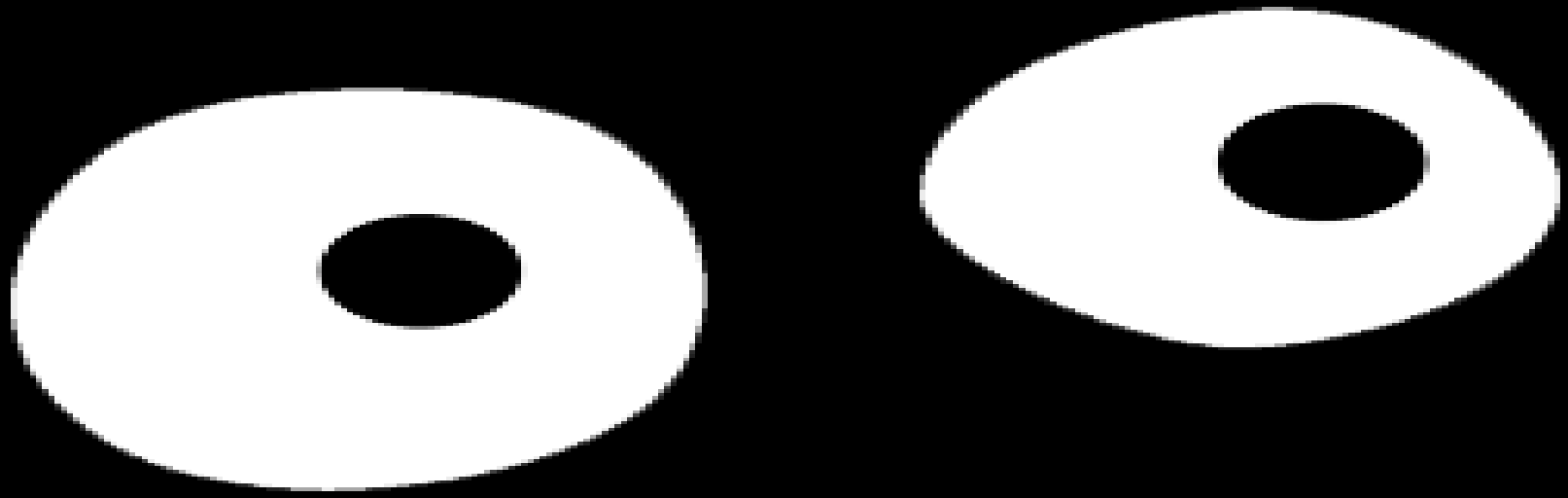
#What is Light?

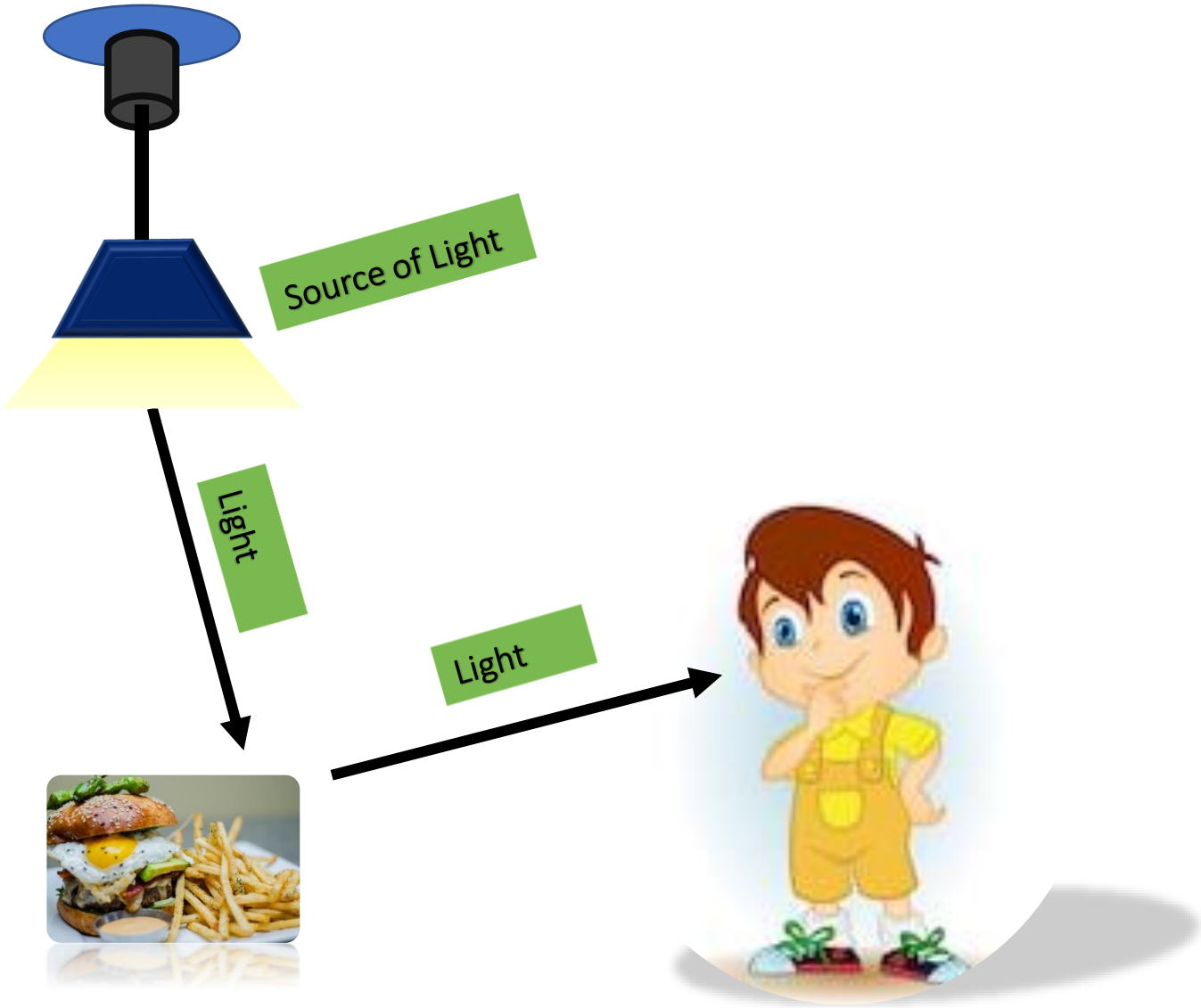
 # Light is an energy or object that comes out of our eyes, gets stuck in the object And helps us to see the object.

Light

If this issue is correct
Why can't I see at night?

So did Mr. Ptolemy had said wrong ??



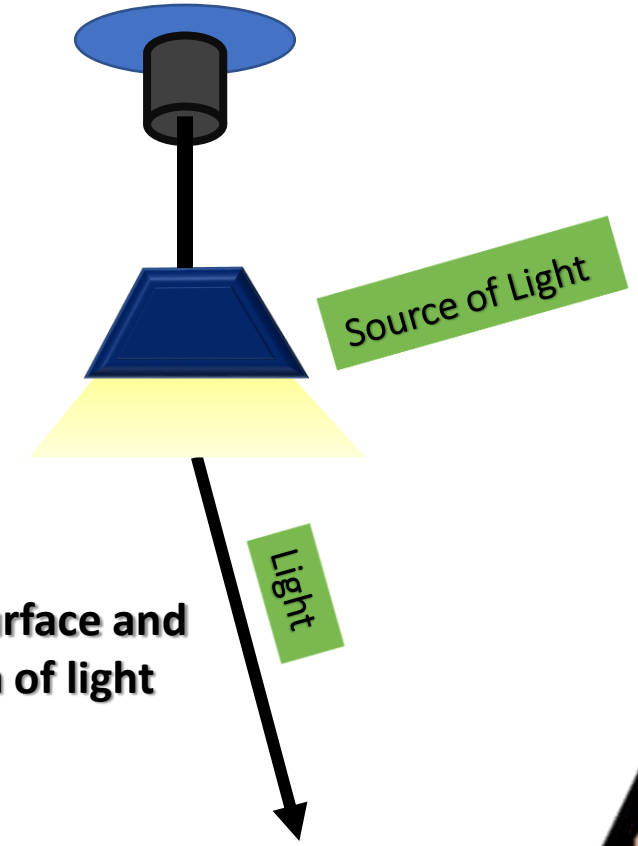


#Source of Light – Object – Eyes – Retina - Brain

(১) (Absorption)

(২) (Reflection)

(৩) (Refraction)



But why does lights bends in it's way??

(Reflection):

When a ray of light approaches a smooth polished surface and the lightray bounces back, it is called the reflection of light

(৩) (Refraction):

In Physics, refraction is the change in direction of a wave passing from one mediumto another or from a gradual change in the medium.[1] Refraction of light is the most commonly observed phenomenon, but other waves such as sound waves and water waves also experience refraction.

Some Important Definitions

(১)(Incident Ray)

(২)(Point of incidence)

(৩)(Normal)

(৪)(Reflected Ray)

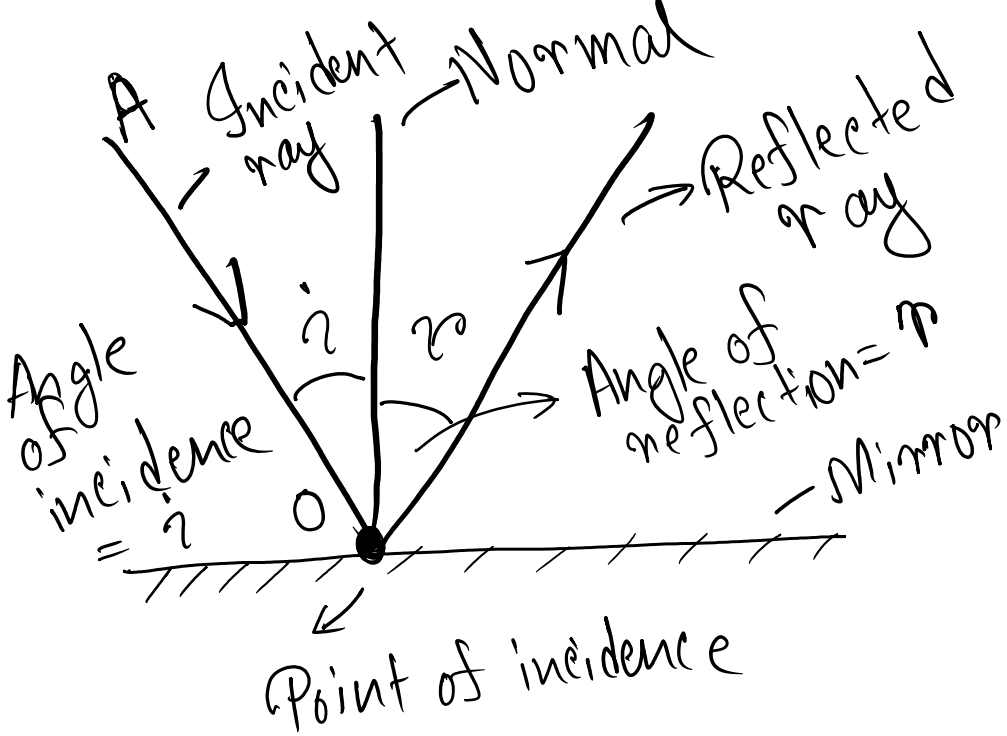
(৫)(Angle of Incidence)

(৬)(Angle of Reflection)

(৭)(Refracted Ray)

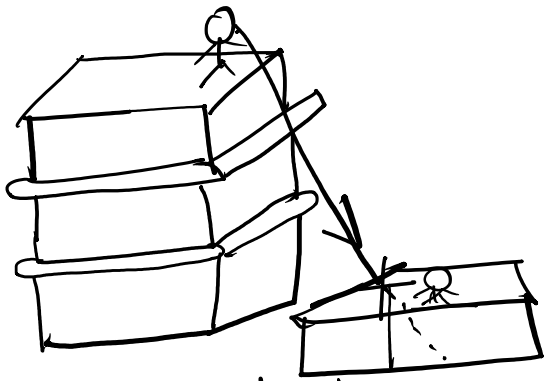
(৮)(Angle of Refraction)

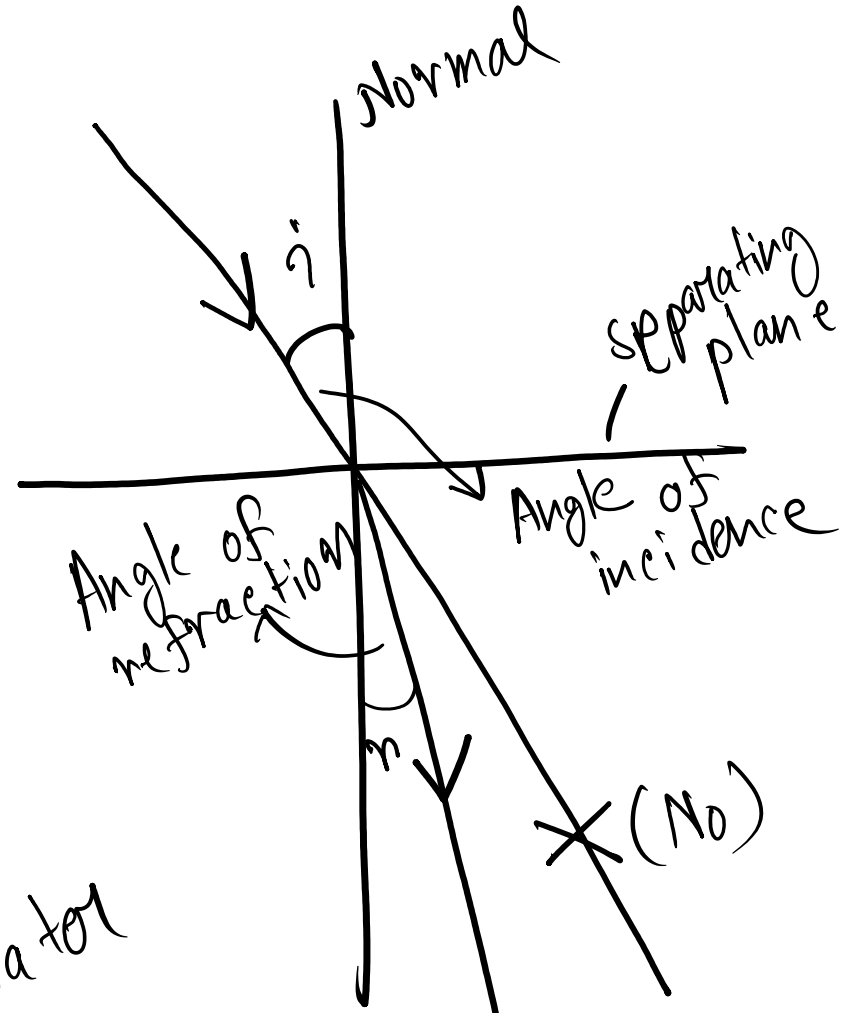
Let's do it!!!

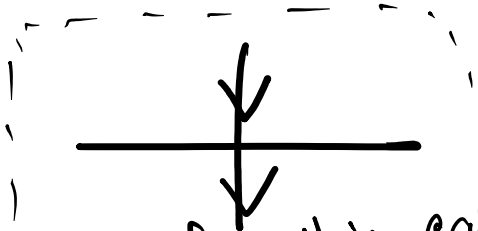


Reflection

$i = r$ → 2nd Law of reflection



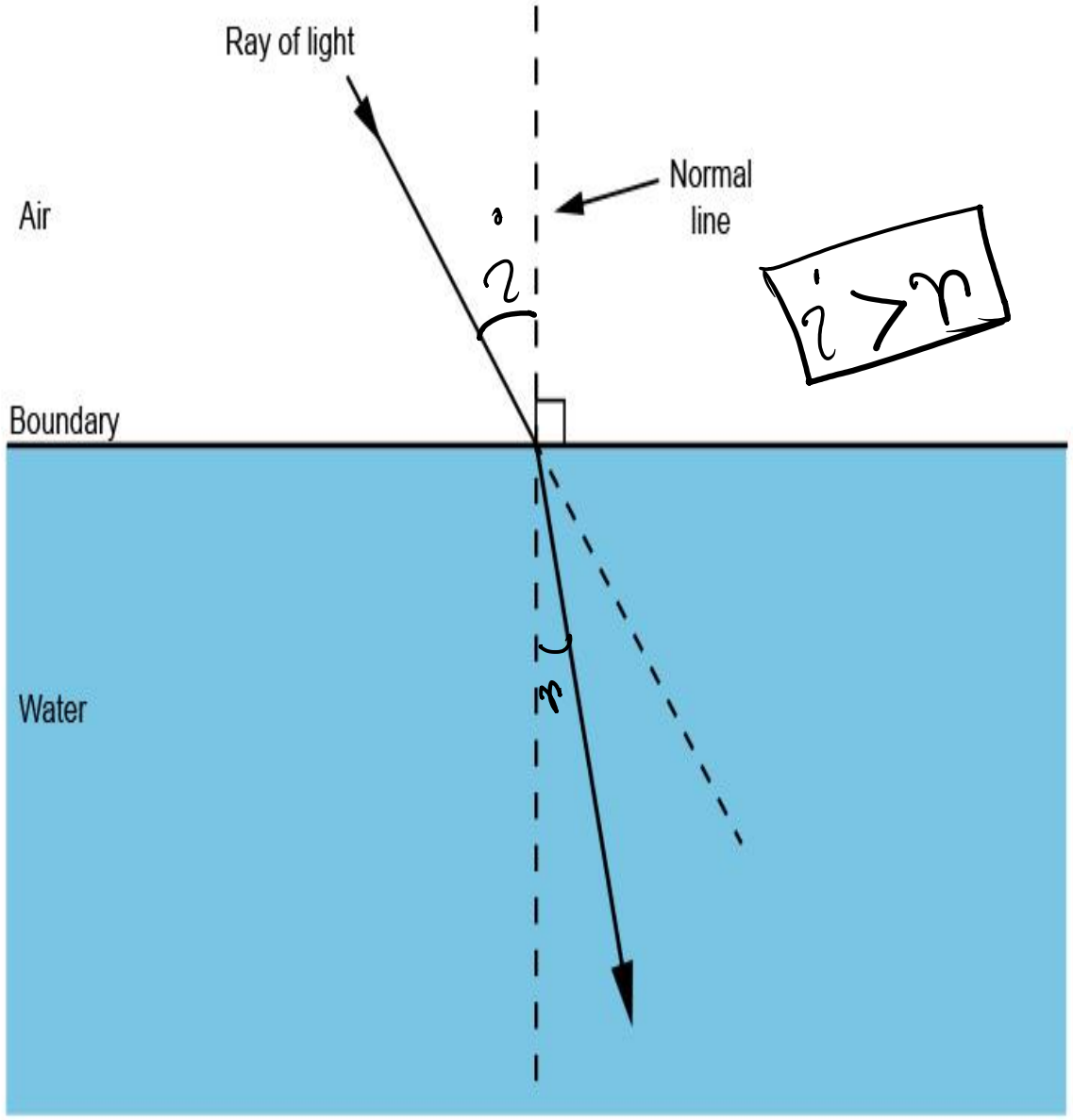




only for this case of refraction

Refraction

$i = r$!



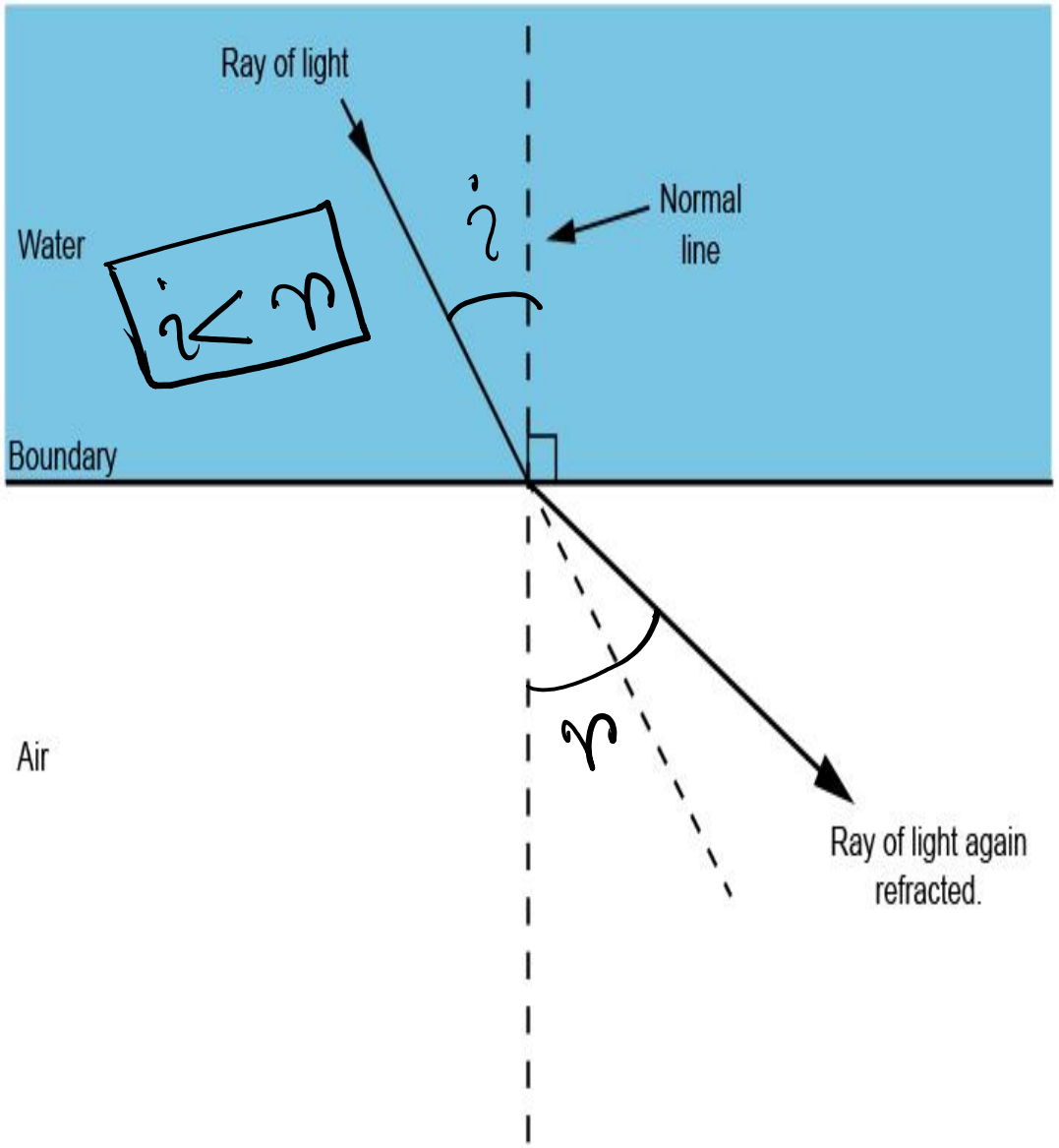


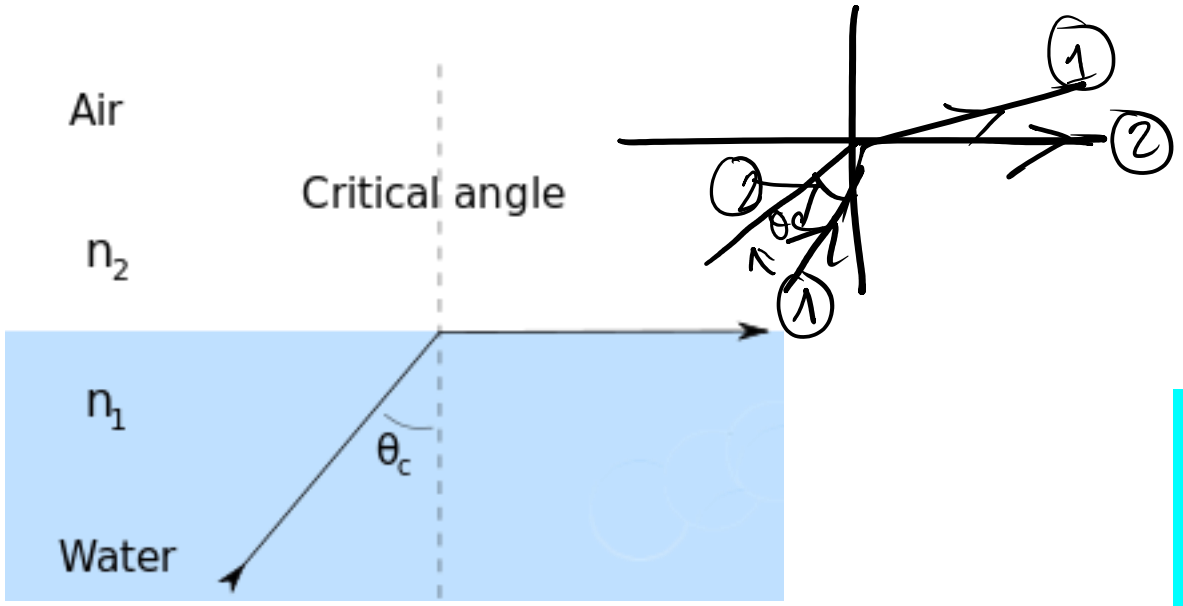
Figure: Light bending while going through different mediums

#Critical angle:

Zawad → Human
Syed → family Name

The angle of incidence beyond which rays of light passing through a denser medium to the surface of a less dense medium are no longer refracted but totally reflected.For this,reflected angle is 90^0.
Critical Angle is indicated by θ_C .

θ_C → Angle
θ_C → Critical Angle

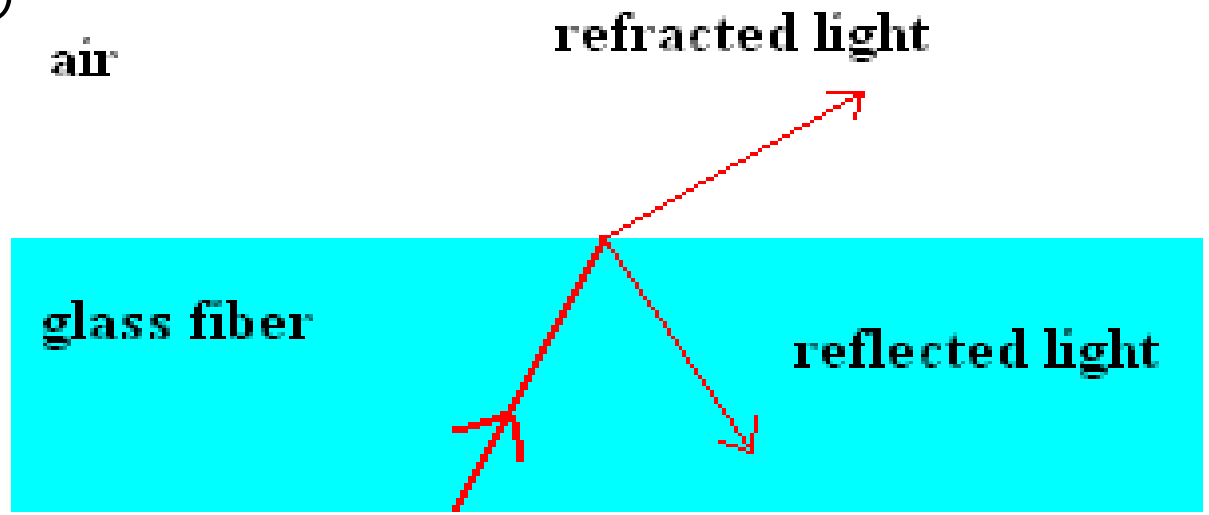


#পূর্ণ অভ্যন্তরীণ প্রতিফলন:

Total internal reflection, in physics, complete reflection of a ray of light within a medium such as water or glass from the surrounding surfaces back into the medium. The phenomenon occurs if the angle of incidence is greater than a certain limiting angle, called **the critical angle.**

Conditions:

(1)The light must be travelling from a more dense medium into a less dense medium (i.e. glass to air)
(2)The angle of incidence must be greater than the critical angle.

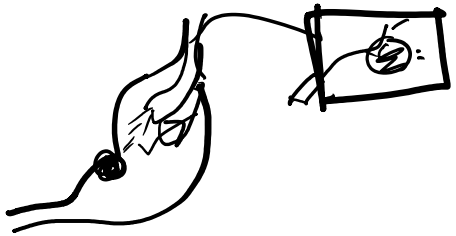


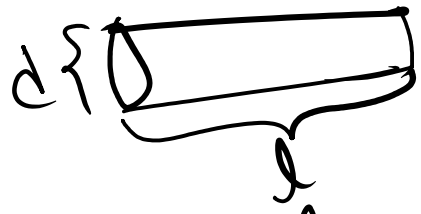
#Optical Fiber:

(1) Very thin glass fiber, which works by utilizing total internal reflection.

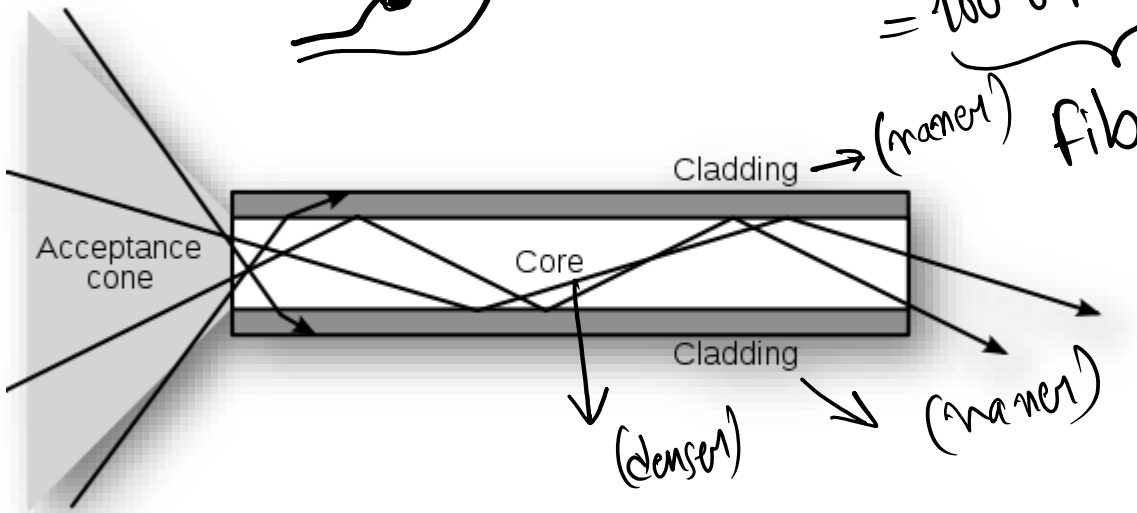
(2) Used in medical science

(3) Used in telecommunications

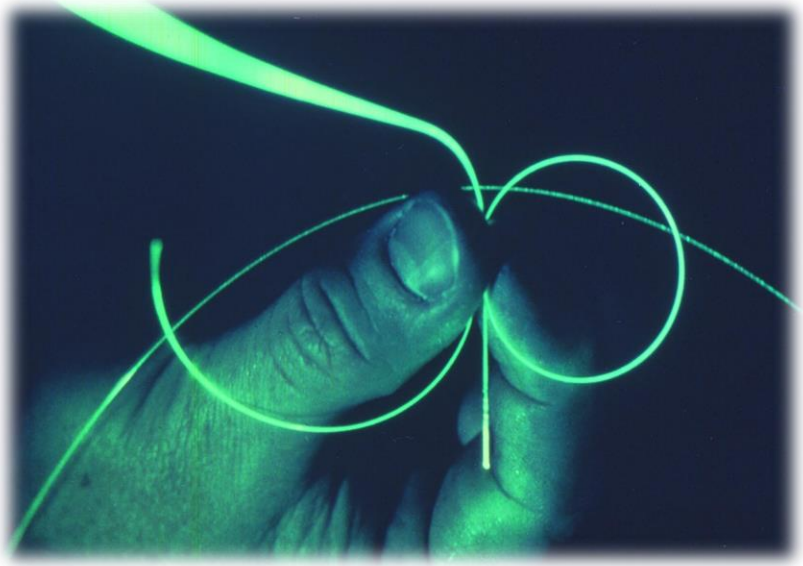


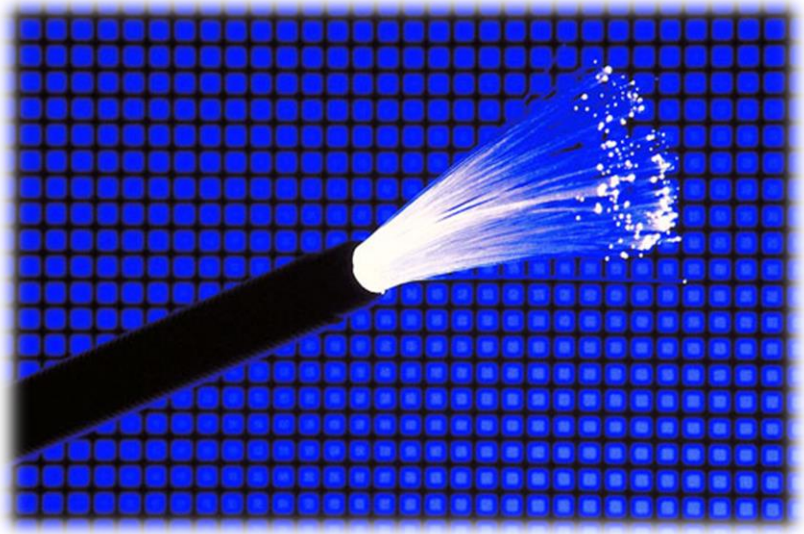


ratio = $\frac{l}{d}$ = 100 or more



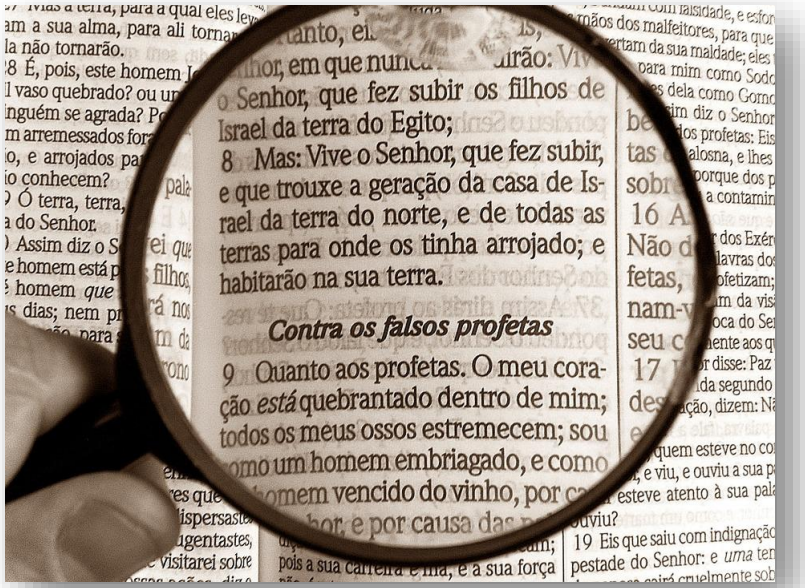
fiber

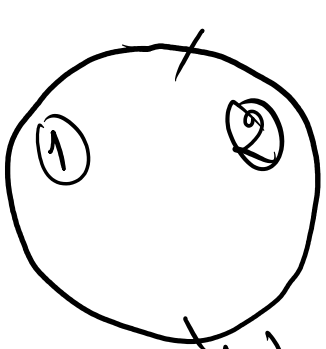




Magnifying glass

(1) Helps to enlarge the object,
(2) Capable of creating straight, magnified and unrealistic reflections of objects within focal lengths.





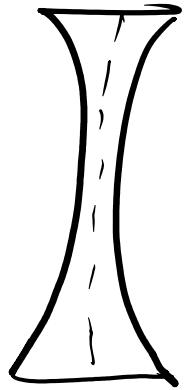
Sphere(i)

Sphere(ii)

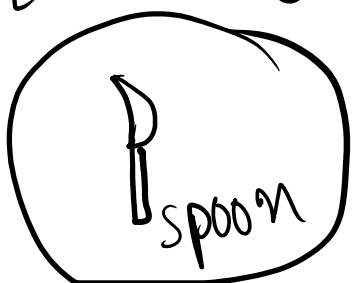
(1) & (4) ⇒

Convex Lens

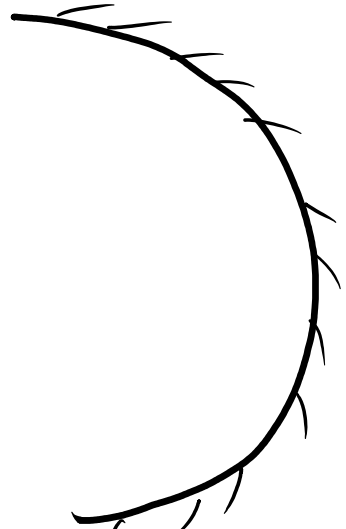
(2) & (3) ⇒



Concave Lens



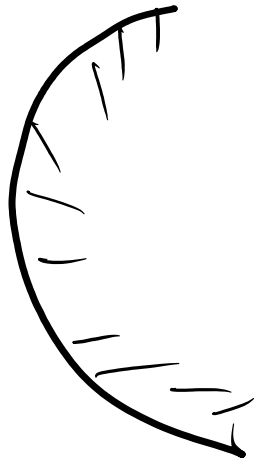
(2) ⇒



Silvering

Concave Mirror

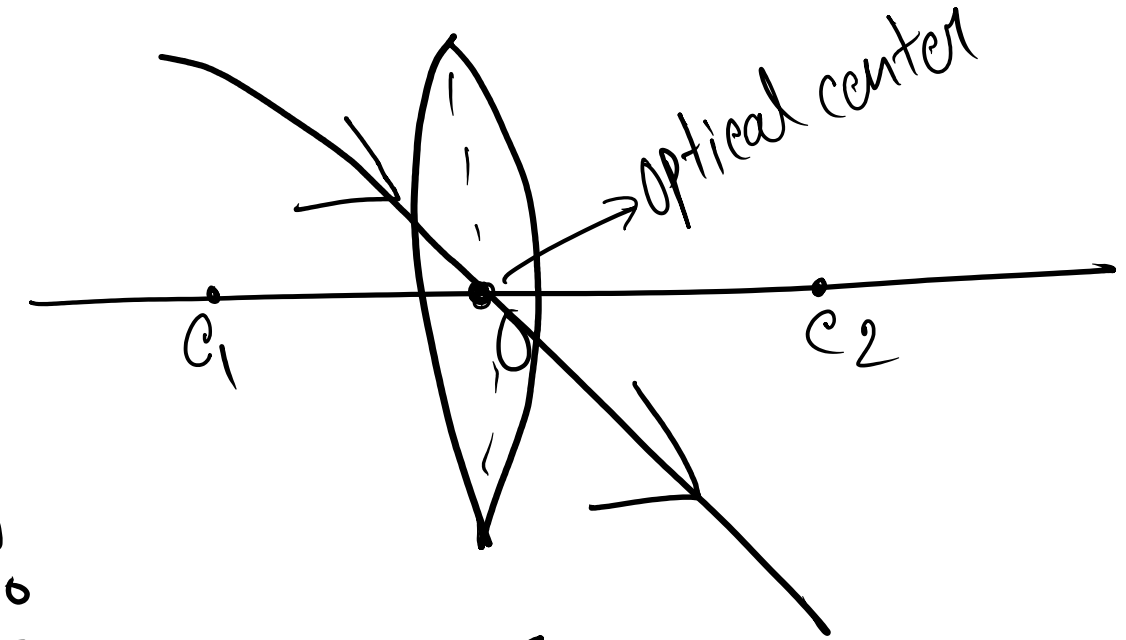
(1) ⇒



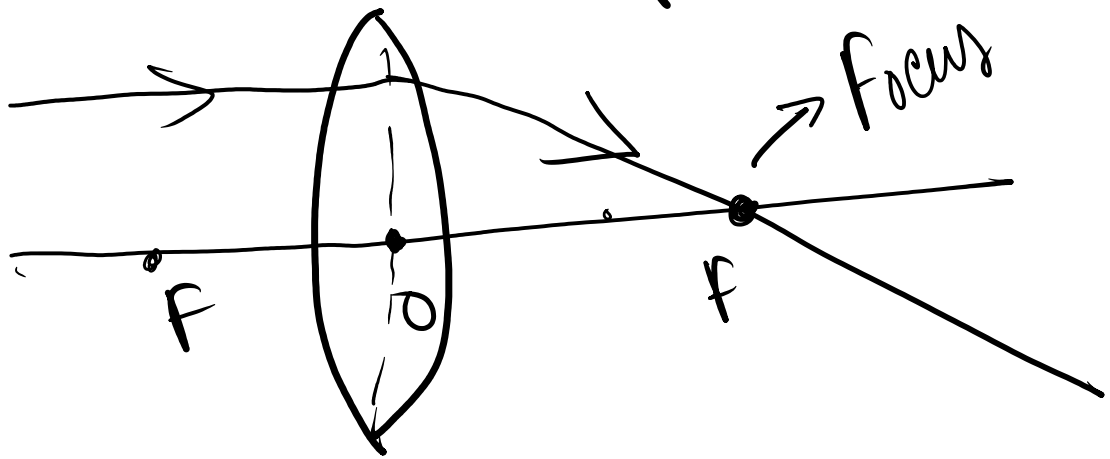
Convex Mirror

3 Rules to draw a ray diagram

1 First Rule:

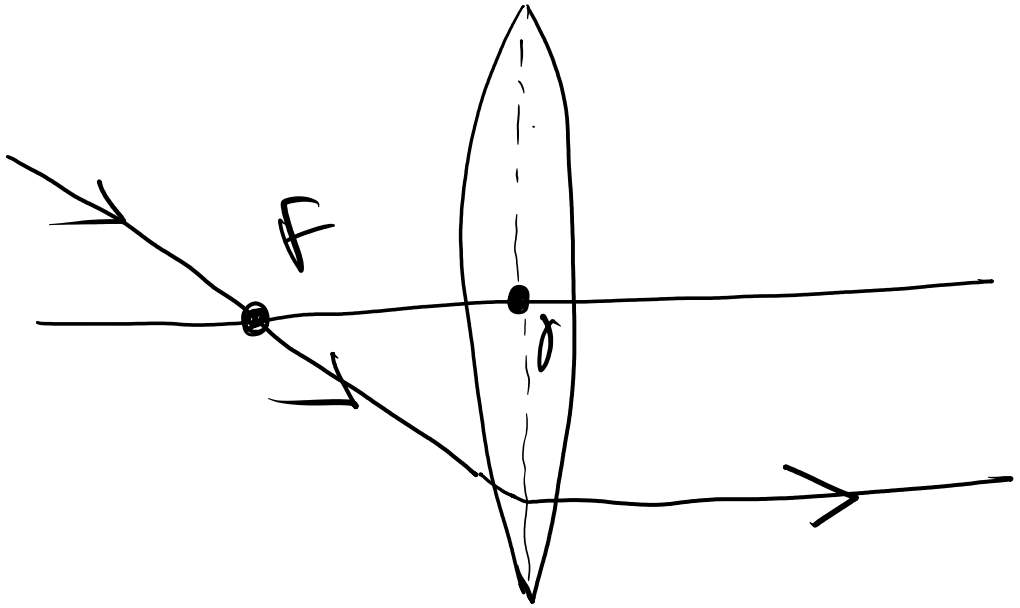


2 2nd Rule:



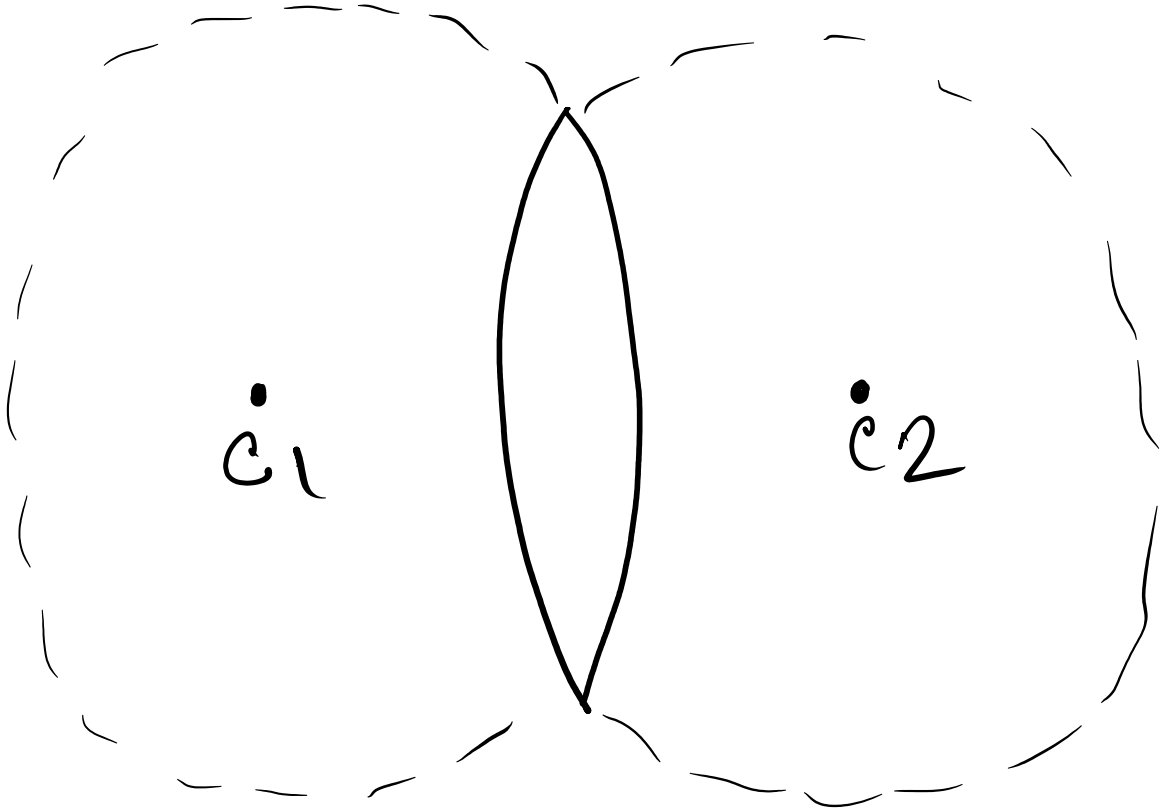
3 Rules to draw a ray diagram

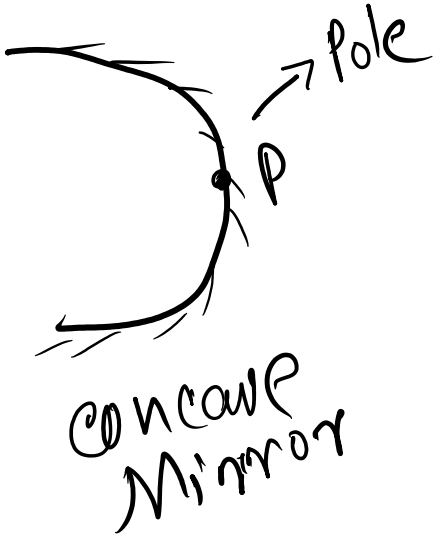
(3) 3rd Rule



Some important definitions…

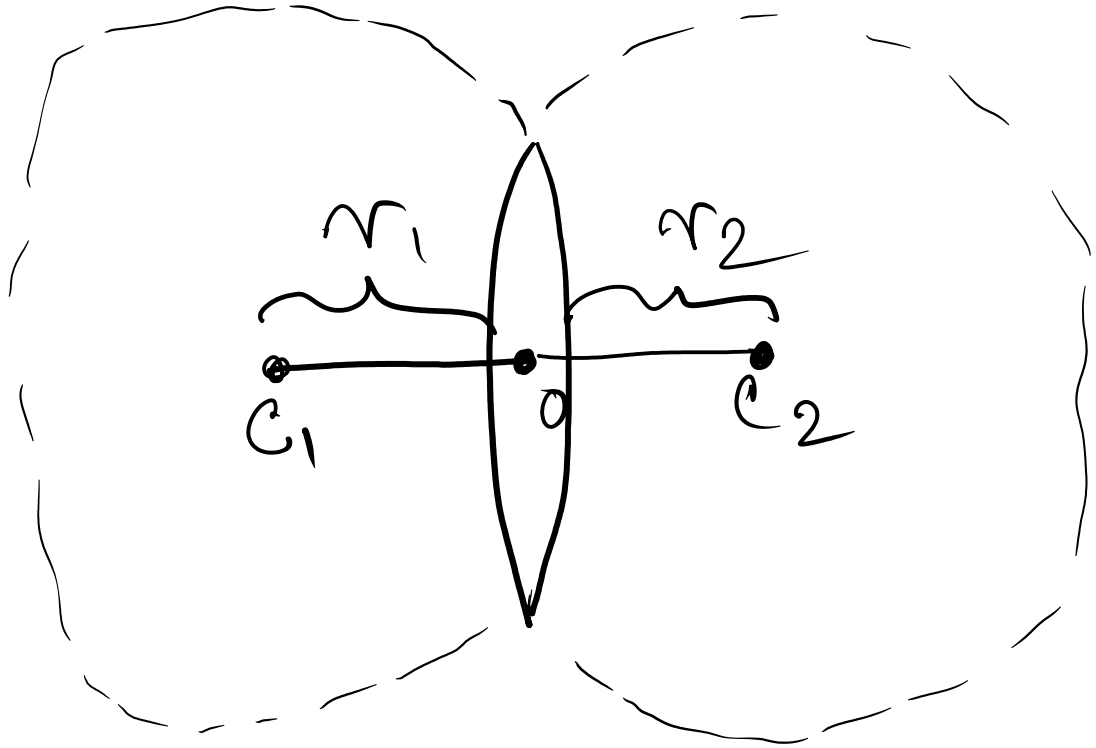
(2) (Centre of Curvature): The center of the sphere that the spherical mirror is part of is called the center of curvature of the mirror.





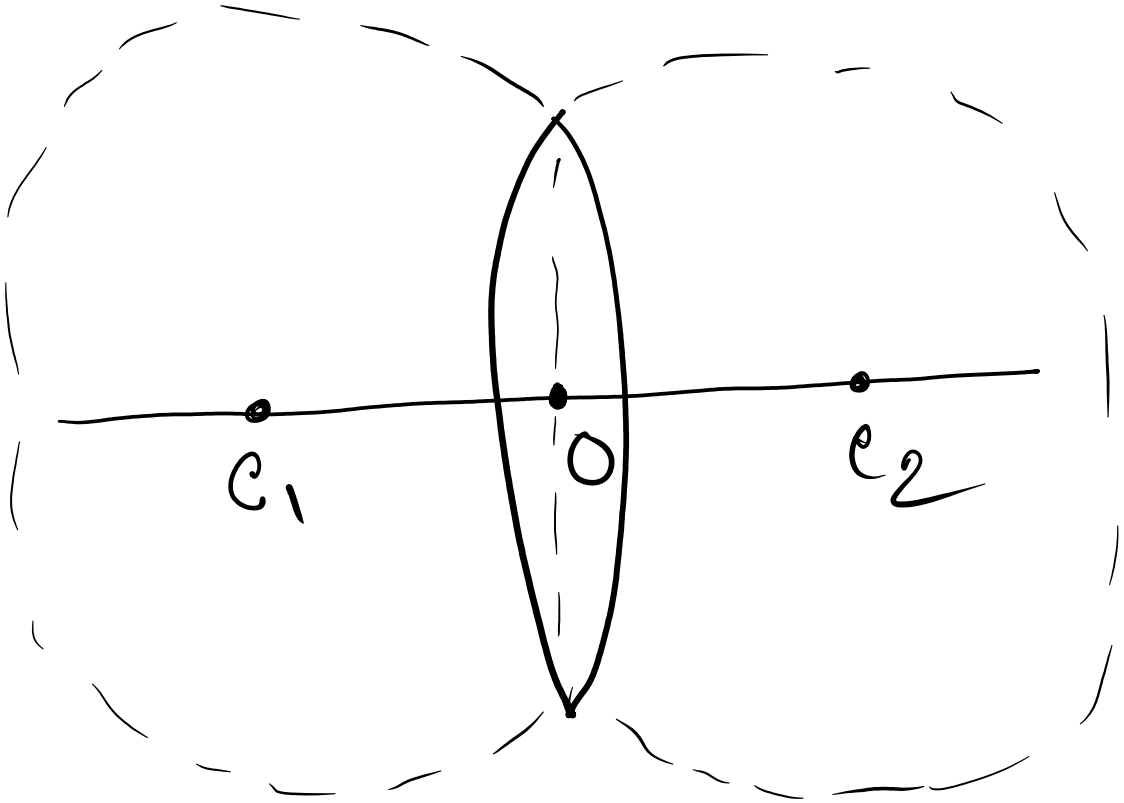
Some important definitions …

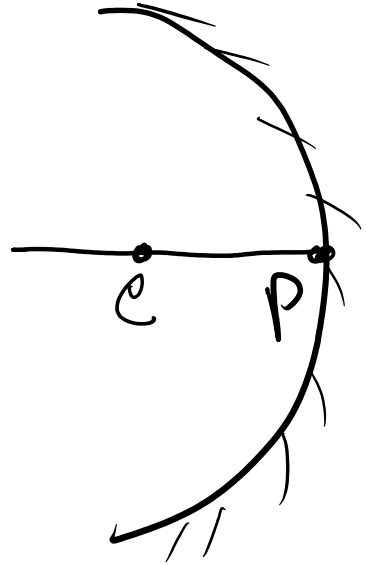
(3) (Radius of Curvature): The radius of the sphere that the spherical mirror is part of is called the radius of curvature of the mirror.



Some important definitions …

(5) (Principal Axis): The straight line passing the pole and the center of curvature of a spherical mirror is called the main axis of the mirror.

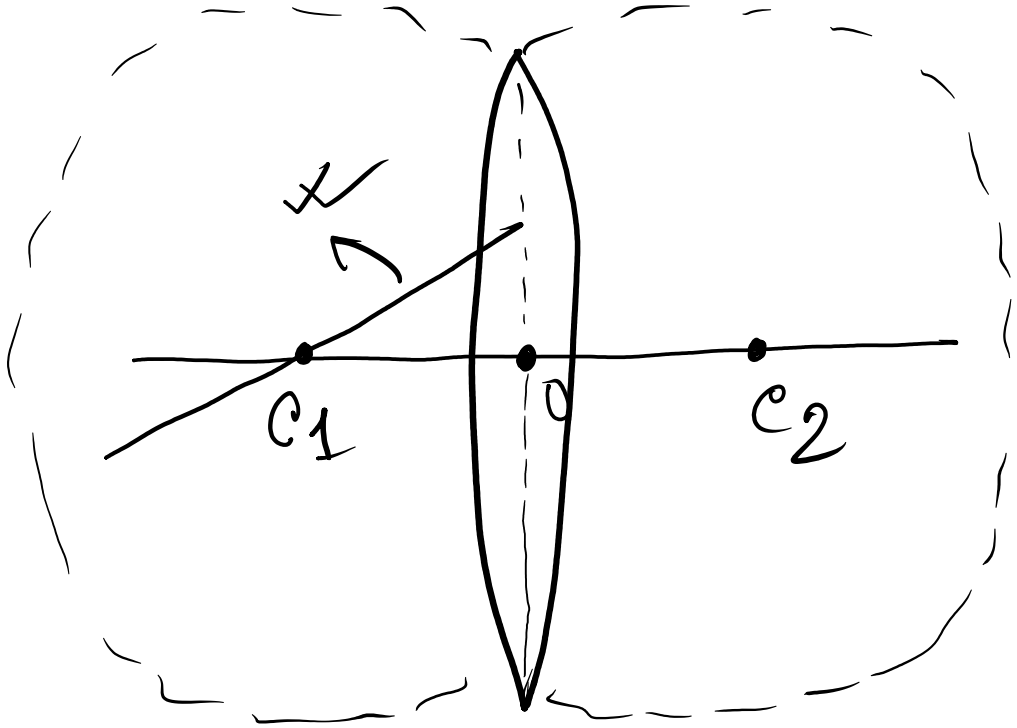


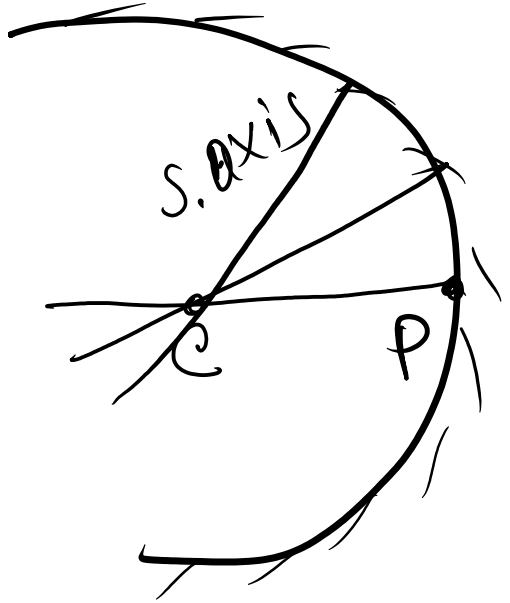


concave mirror

Some important definitions …

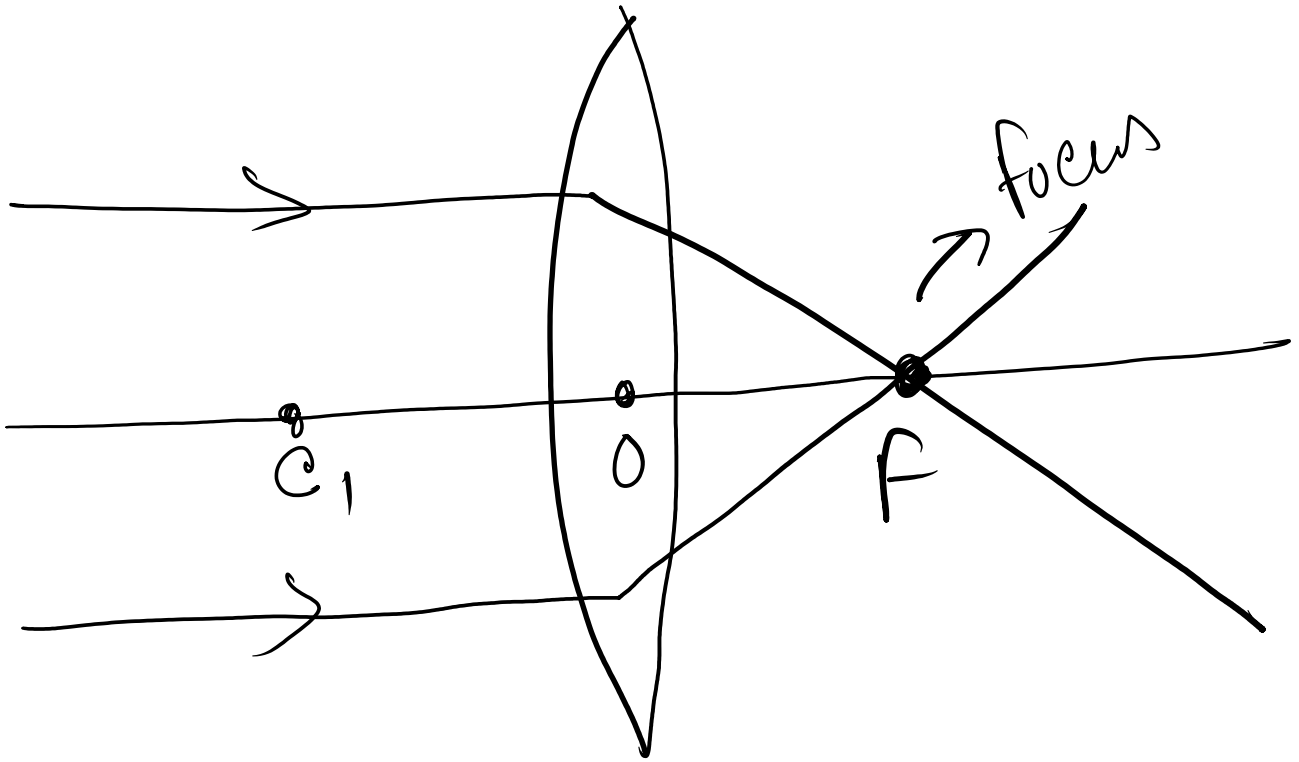
(6) (Secondary Axis): The secondary axis of a mirror is a straight line passing through a point on the surface of the reflecting surface and the center of curvature, except for the pole point of the spherical mirror.





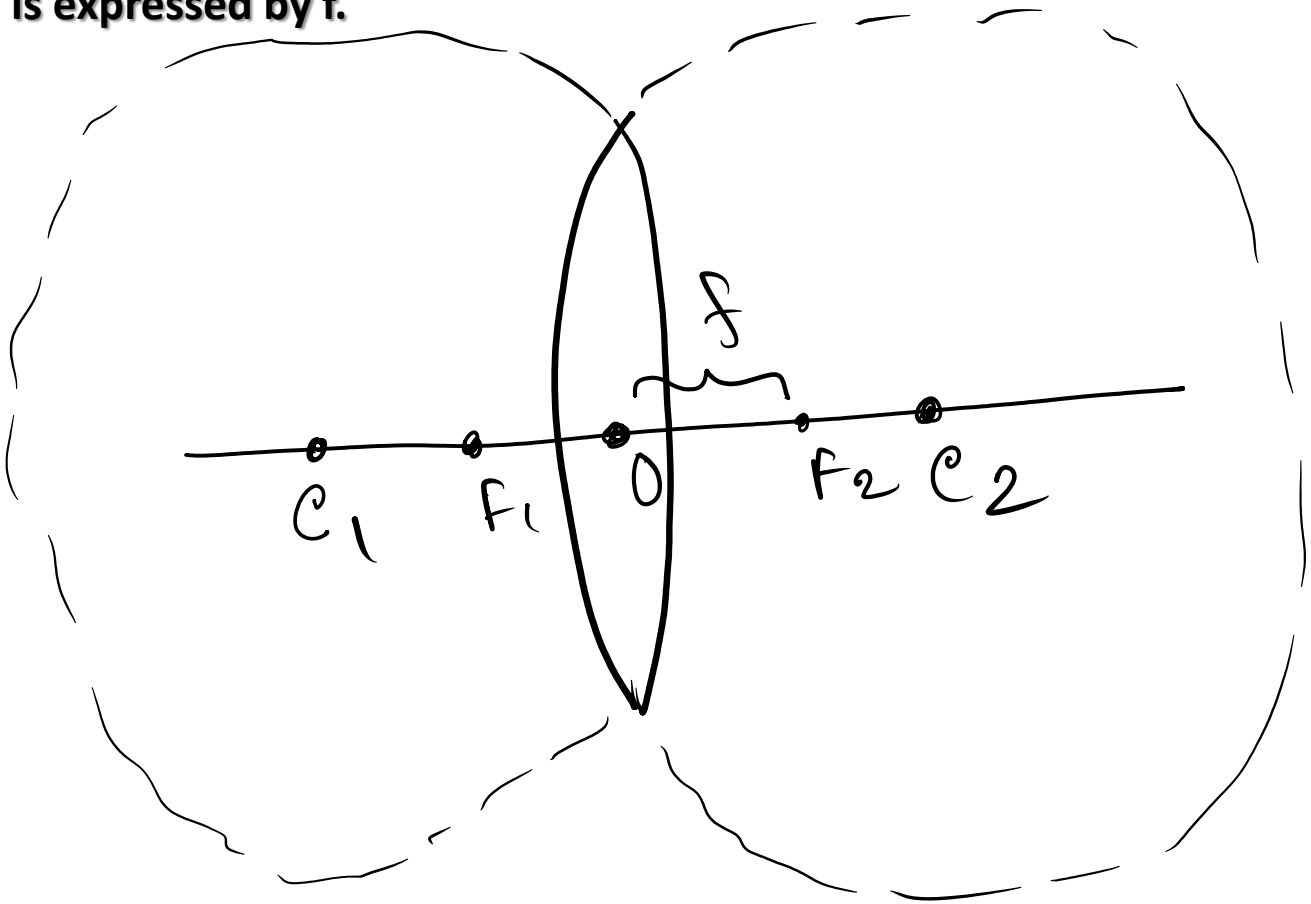
Some important definitions …

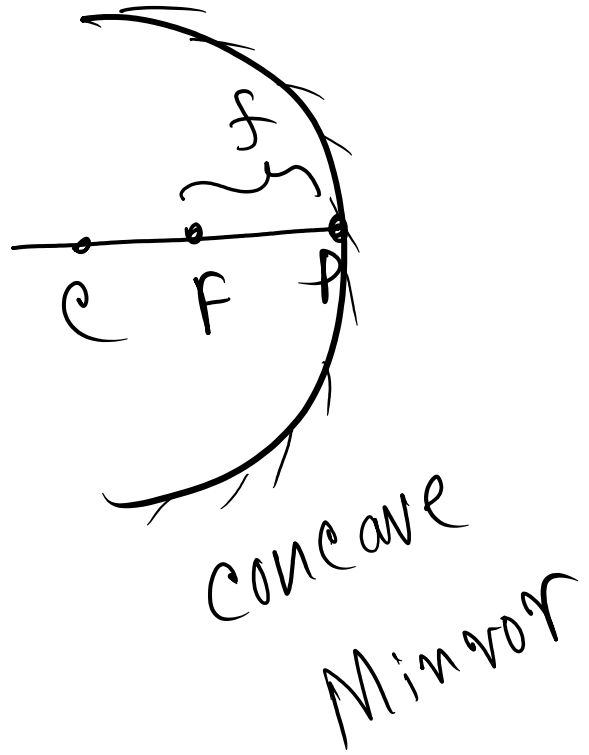
(7) (Principal Focus):



Some important definitions …

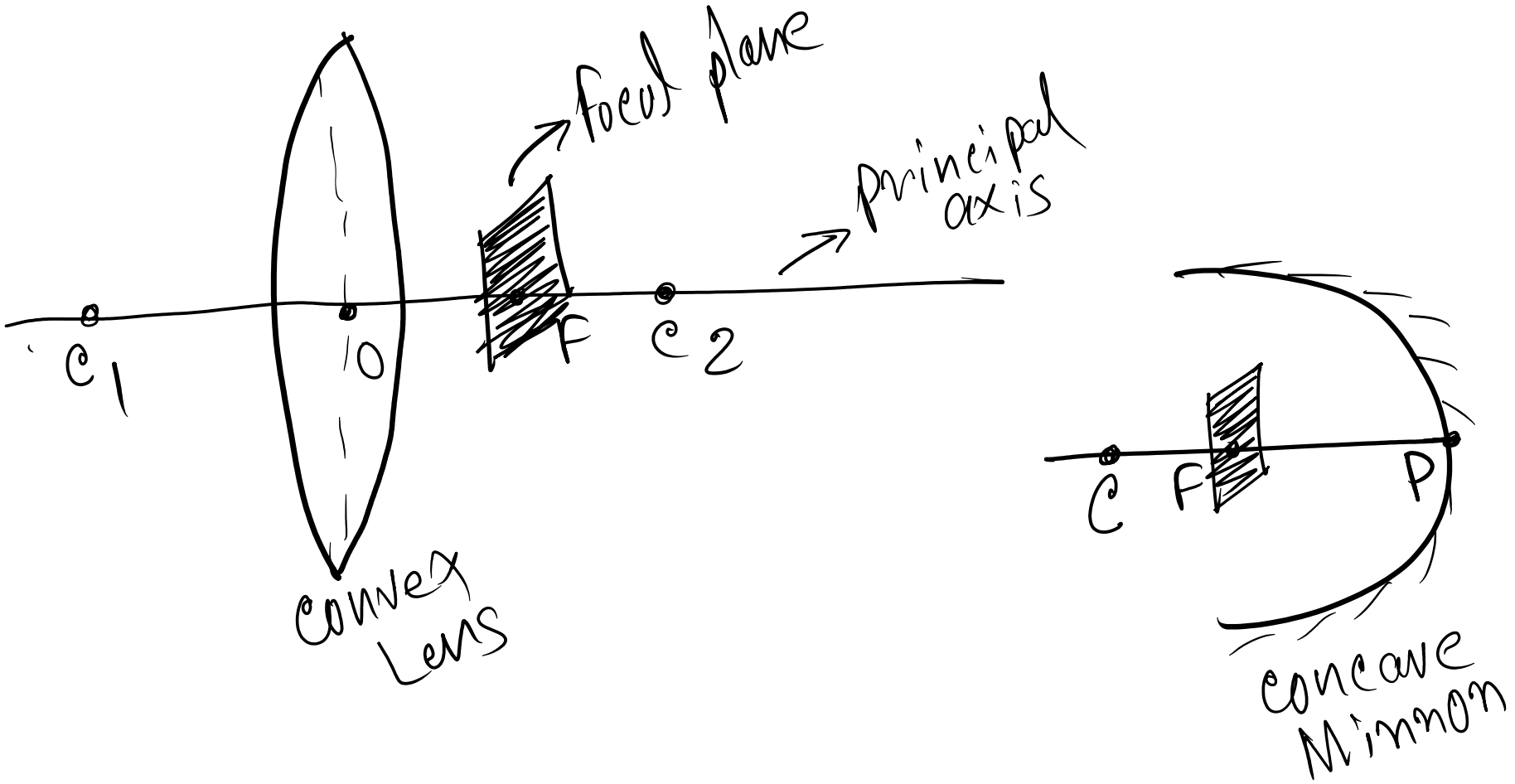
(8) (Focul length): The distance from the pole of the spherical mirror to the main focus is called the focal length which is expressed by f.



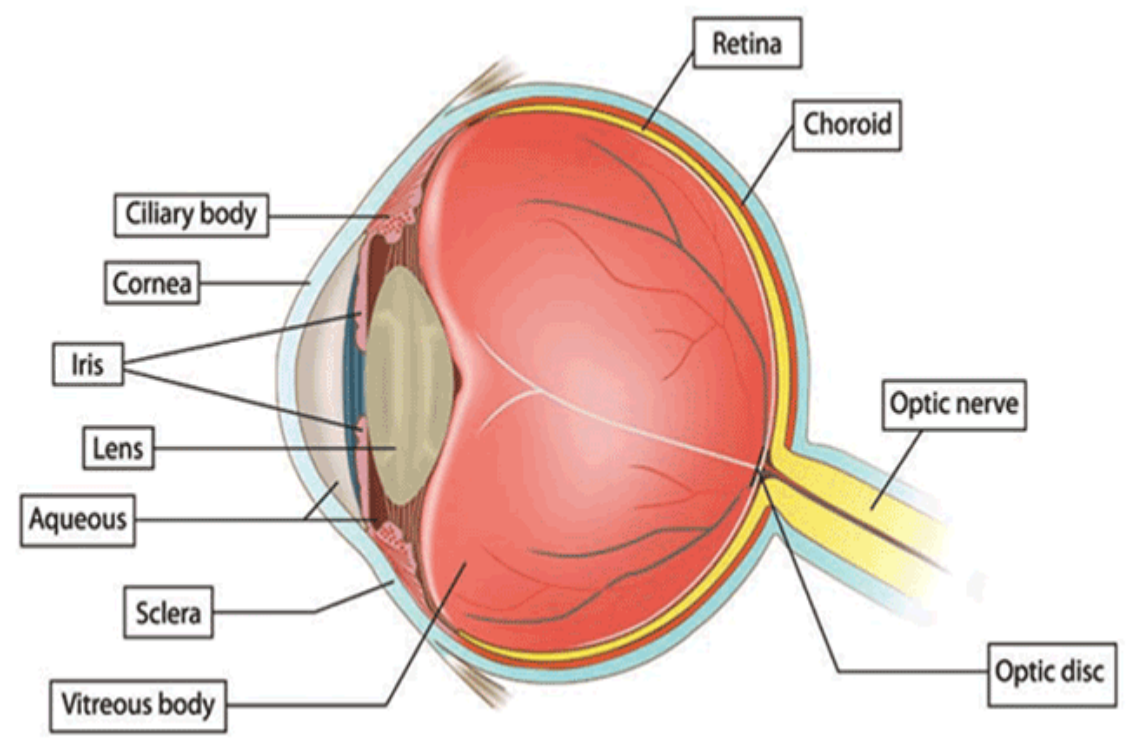


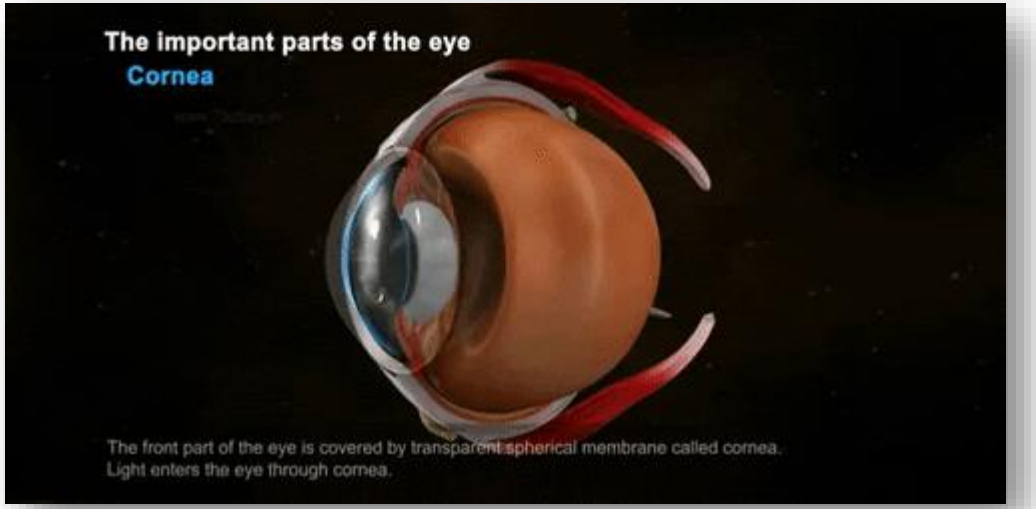
Some important definitions …

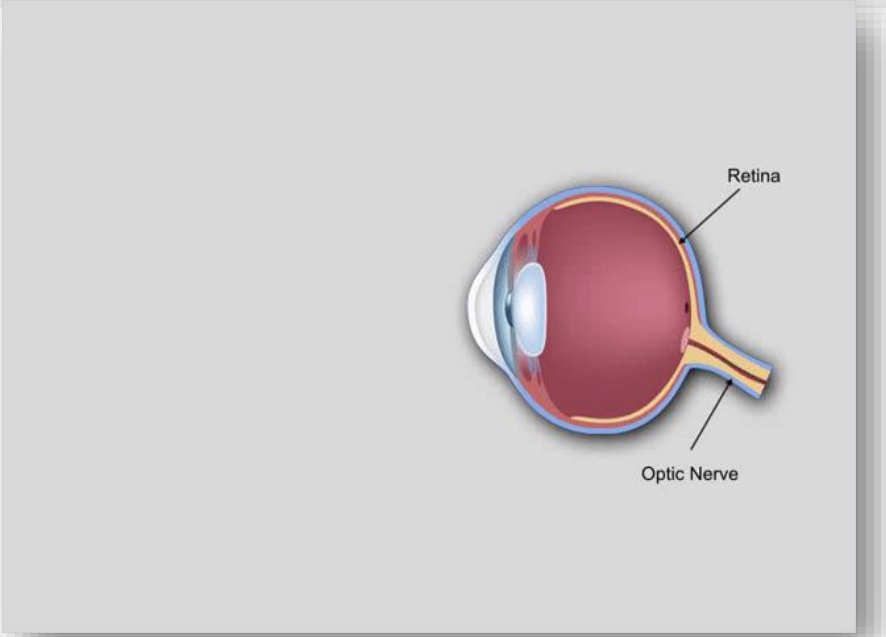
(9) (Focul plane): The plane of perception that is imagined perpendicular to the main axis through the main focus of the spherical mirror is called the focus plane.

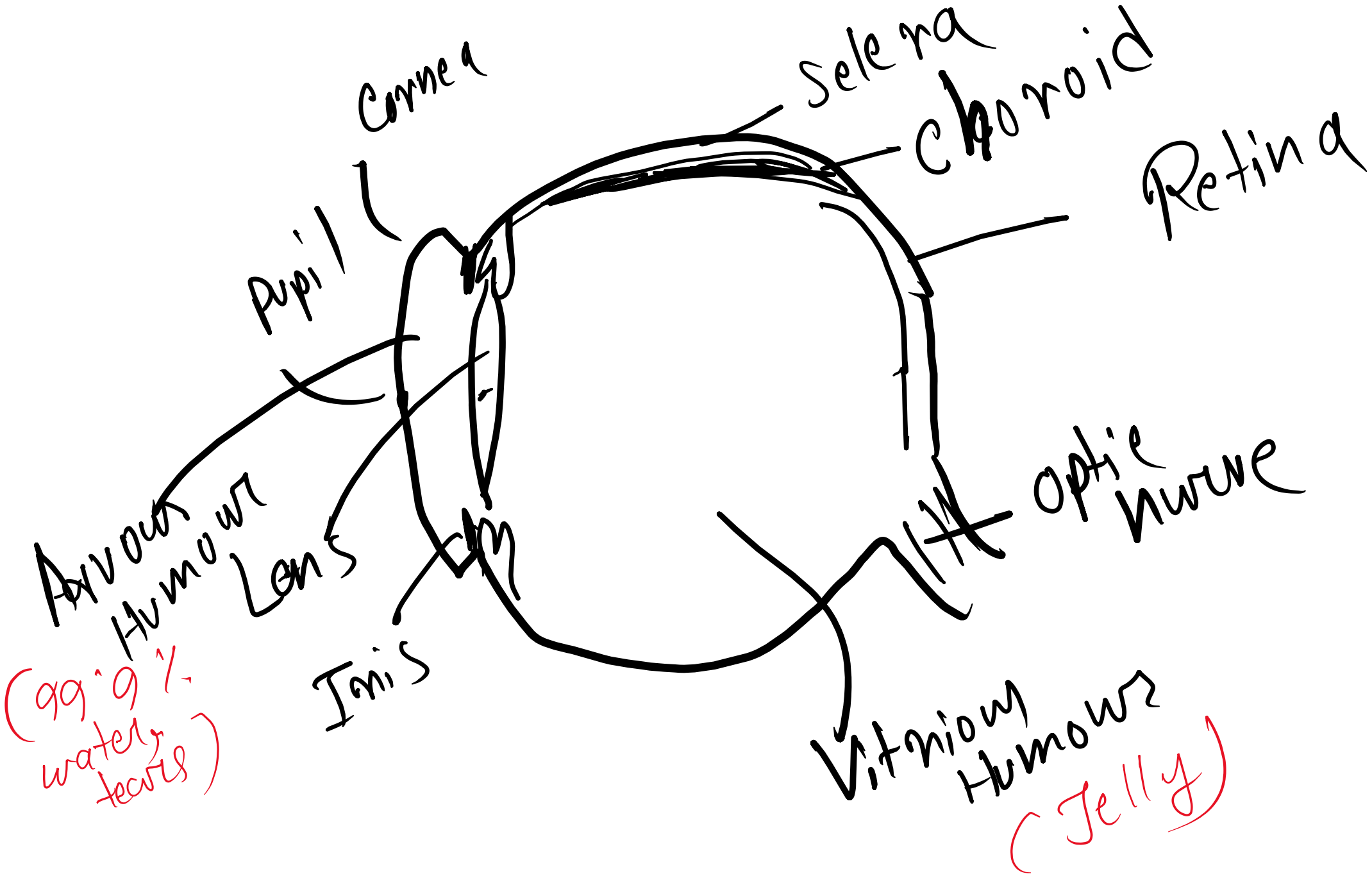


#Human Eye:


Retina
Choroid
Ciliary body
Cornea
Iris
Optic nerve
Lens
Aqueous
Sclera
Optic disc
Vitreous body

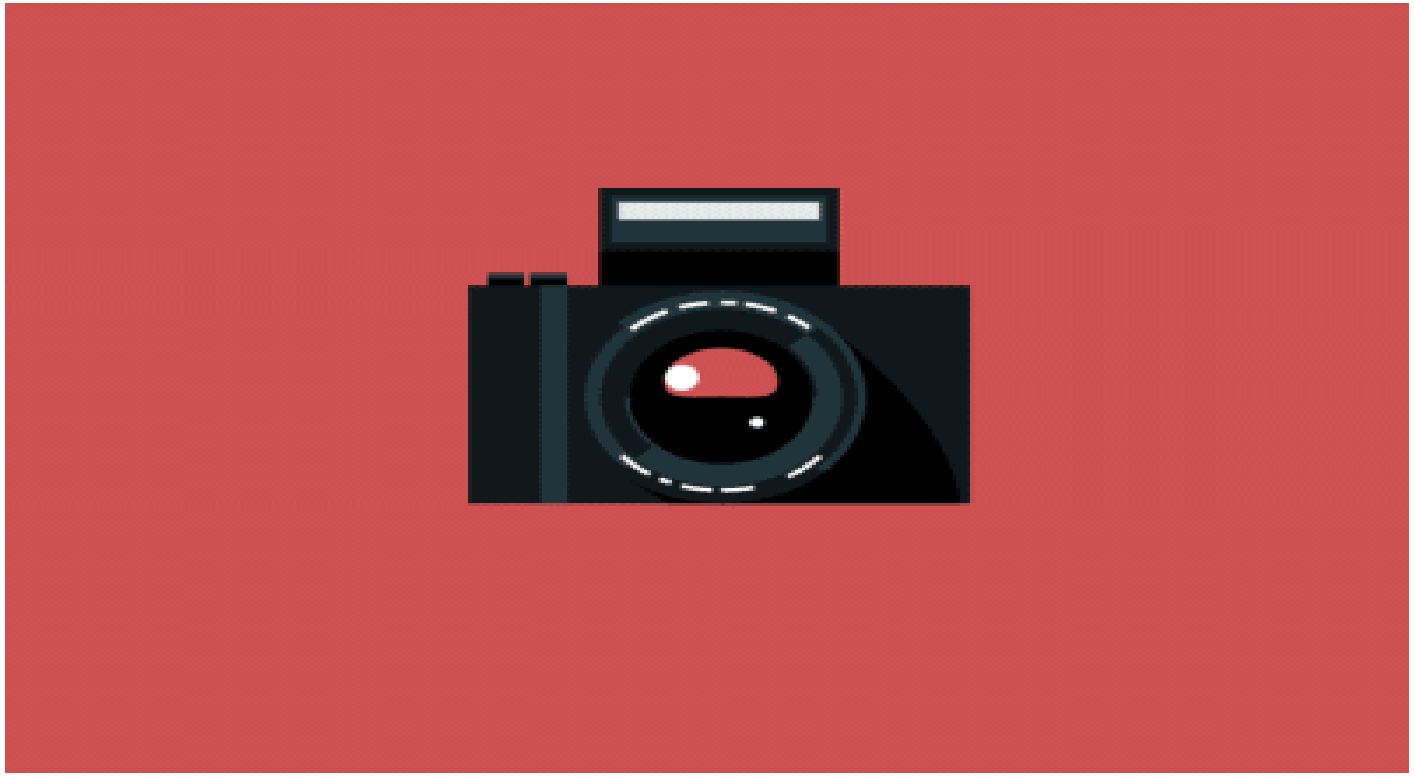

The important parts of the eye
Cornea
The front part of the eye is covered by transparent spherical membrane called cornea.
Light enters the eye through cornea.


Retina
Optic Nerve


Cornea
Sclera
Choroid
Retina
Pupil
Aqueous Humour
(99.9% water, tears)
Lens
Iris
optic nerve
Vitreous Humour
(Jelly)

Photographic camera

This device uses the image lens of illuminated objects
The light is taken on the photographic plate.
That is why it is so named.



#Parts of it:

(1) Camera box

(2) Camera lens

(3) Aperture

(4) Shutter

(5) Screen

(6) Photographic plate

(6) Slide

#The working principle Of Photographic Camera:

The Shutter is opened

Controlling the camera box according to necessity

Obtaining the proper brightness by adjusting aperture

Removing the ground-glass screen,photographic plate is settled

Exposure happening

$Ag^+ + e^- = Ag$

$AgCl \rightarrow Ag^+ + Cl^-$

Plate immersed in a chemical solution called Developer

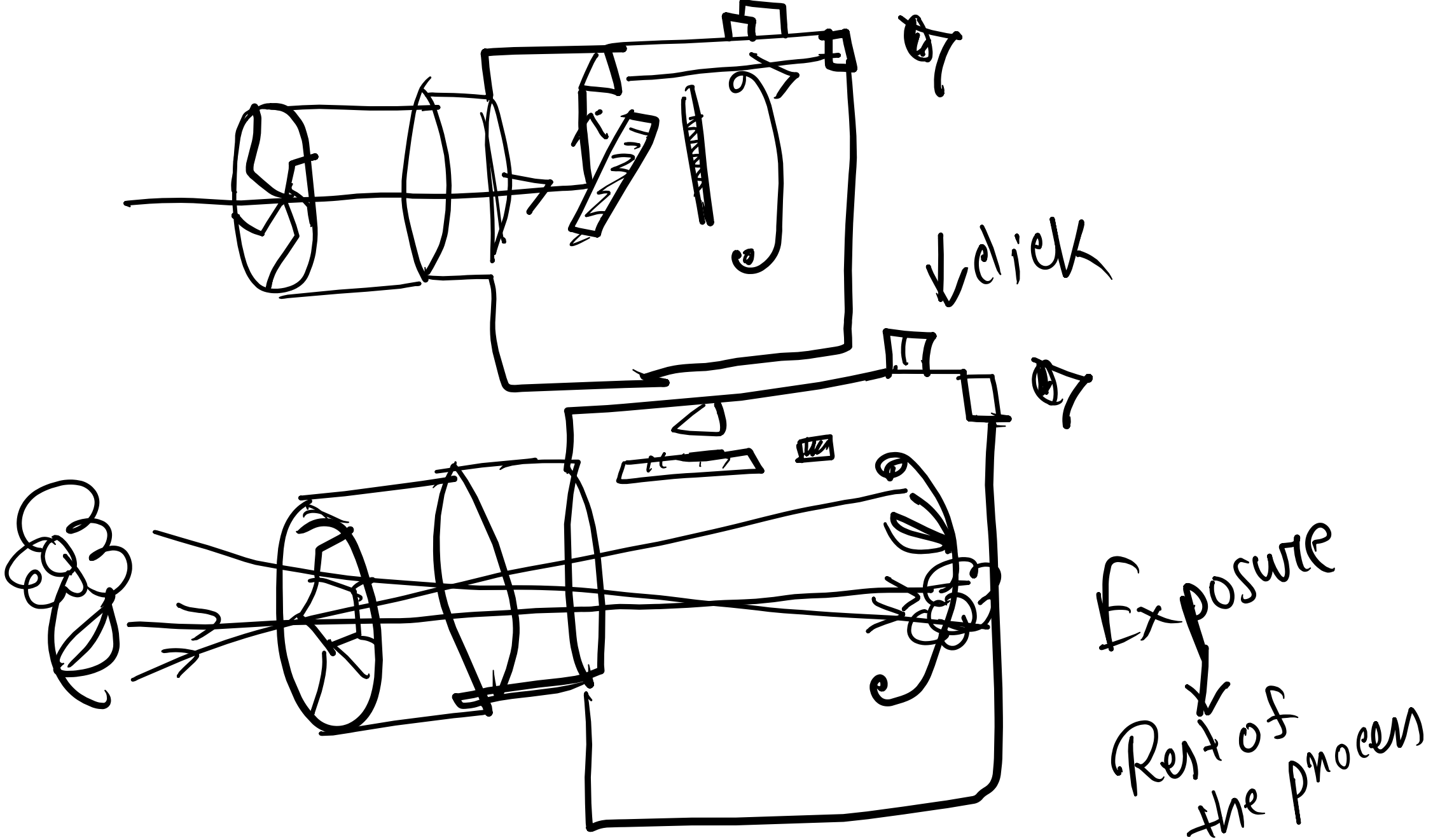
Reduction reaction takes place

Thickness of coation of silver

Cleaning the plate with water,immersed in hypo solution

$Na_2S_2O_3$

At last getting the NEGATIVE


click
Exposure
Rest of
the process

Questions that might appear….

1.What is light?
2.What is the refraction of light?
3.What is total internal reflection?
4.What is the critical angle?
5.What is optical fiber?
6.What is magnifying glass?
7.Located inside the focus
what'd be the nature of the reflection of an
object in a convex lens?
8. Every parts of the Human eye.
9. What is shutter / diaphragm / developer / hypo solution?
10. Write the conditions of total internal reflection.
11. Write how the camera works.
12. Write about the structure of the camera.
13. Write the differences between the human eye
and the camera.