

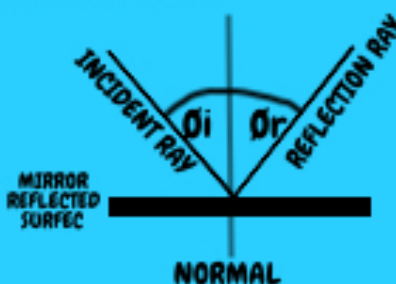
# PHYSICS: THE SCIENCE BEHIND MIRRORS

## PLANE MIRRORS AND REFLECTION

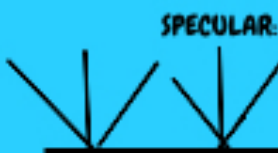
FIRST LAW OF REFLECTION:  
THE ANGLE OF INCIDENCE  
WILL BE EQUAL TO THE ANGLE  
OF REFLECTION

$$i_i = r_r$$

SECOND LAW OF REFLECTION:  
THE INCIDENT RAY, REFLECTED  
RAY AND THE NORMAL ARE ALL  
ON THE SAME PLANE



DIFFUSE REFLECTION:  
REFLECTION OFF OF AN IRREGULAR OR  
DULL SURFACE  
\*\*IT'S NOT PARALLEL AND THE IMAGE  
IS FUZZY



SPECULAR:

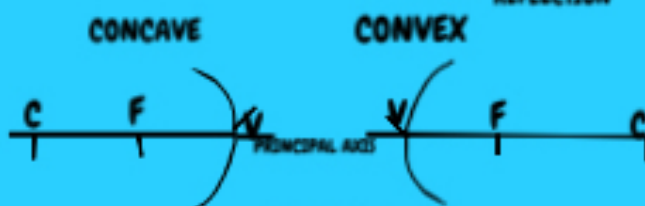


DIFFUSE:

## CURVED MIRRORS AND REFLECTION



- (1) ANY INCIDENT RAY TRAVELLING TO THE PRINCIPAL AXIS ON THE WAY TO THE MIRROR WILL PASS THROUGH THE FOCAL POINT UPON REFLECTION
- (2) ANY INCIDENT RAY PASSING THROUGH THE FOCAL POINT ON THE WAY TO THE MIRROR WILL TRAVEL PARALLEL TO THE PRINCIPAL AXIS UPON REFLECTION



TERMINOLOGY:  
C - CENTER OF CURVATURE  
F - FOCUS / FOCAL POINT  
V - VERTEX

PRINCIPAL AXIS - THE LINE IN WHICH EVERYTHING IS SET

## MIRROR IMAGES

CHARACTERISTICS OF AN IMAGE:  
THERE ARE FOUR MAIN CHARACTERISTICS OF AN IMAGE.  
SIZE - THE IMAGE MAY BE SMALLER THAN THE OBJECT VIEWED, LARGER OR THE SAME SIZE  
ATTITUDE (ORIENTATION) - UPRIGHT (RIGHT SIDE UP) OR INVERTED (UPSIDE DOWN)  
LOCATION - OBJECT CAN BE BEHIND THE MIRROR, CLOSER TO THE MIRROR, ETC.  
TYPE - REAL OR VIRTUAL

\*\*REMEMBER, A PLANE MIRROR IS ALWAYS...

- S - SAME SIZE
- A - UPRIGHT BUT BACKWARDS
- L - BEHIND THE MIRROR (SAME DISTANCE AS OBJECT IN FRONT)
- T - VIRTUAL IMAGE

VIRTUAL IMAGES:

WHEN LIGHT IS REFLECTED FROM A PLANE MIRROR, THE LIGHT RAYS ARE REFLECTED EVENLY; A PLANE MIRROR ONLY PRODUCES VIRTUAL IMAGES.



FUN FACT:  
THE EYE IS UNABLE TO SEE A REFLECTED RAY, SO IT ASSUMES THE LIGHT COMING TO IT IS IN A STRAIGHT LINE FROM THE OBJECT. THIS EXPLAINS WHY THE OBJECT APPEARS TO BE BEHIND THE MIRROR.

