

PhysicsScientific Notation

- Easy way to express really big/small numbers
- Involves moving the decimal place (L or R)

Speed of Light: 3.0×10^8 m/s
 $\underbrace{300000000}_{\text{m/s}}$

Ex. A.) $3 \rightarrow 3.0 \rightarrow 3.0 \times 10^0$

B.) $\underbrace{1000}_{\text{m/s}} \rightarrow 1.0 \times 10^3$

C.) $\underbrace{357691}_{\text{m/s}} \rightarrow 3.57691 \times 10^5$

Ex. A.) $0.03 \rightarrow 3.0 \times 10^{-2}$
 3.6×10^5
 3.58×10^5

B.) $\underbrace{0.00000000063}_{\text{m/s}} \rightarrow 6.3 \times 10^{-9}$

Ex. for calculators:

Ex) 2.56×10^{12}

2.56 EXP 12

EE

$\times 10^x$

Significant Figures

Calculations: round to correct significant figure at LAST STEP of a problem.

Rule: For multiplication/division
 Answer should be in the lowest sig fig possible (depending on problem)

Ex. $3.5 \times 2.673 = 9.355 \rightarrow 9.4$

Physics

- The science that examines general properties of matter, and establishes laws that express & explain natural phenomena.

Many fields

- Optics

- Forces

- Kinematics

- Energy

- Electricity

- Astrophysics

- Engineering

- Quantum Physics

- Technology

Optics

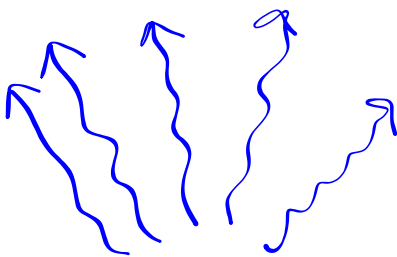
Propagation of Light

- Light - Movement
- Sources
- Reflection
- Refraction
- Mirrors
- Lenses
- The Eye

Light Sources

Incandescent

- light & heat



Luminescent

i) Fluorescent

- no heat

ii) Phosphorescent

- no power
- no heat

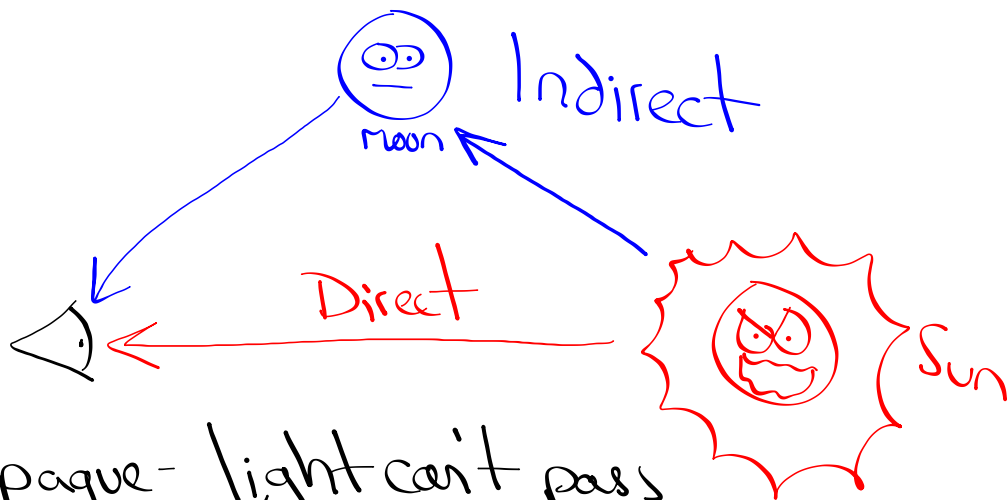
Laser

- Monochromatic
- one direction
- In Sync



How We See Objects

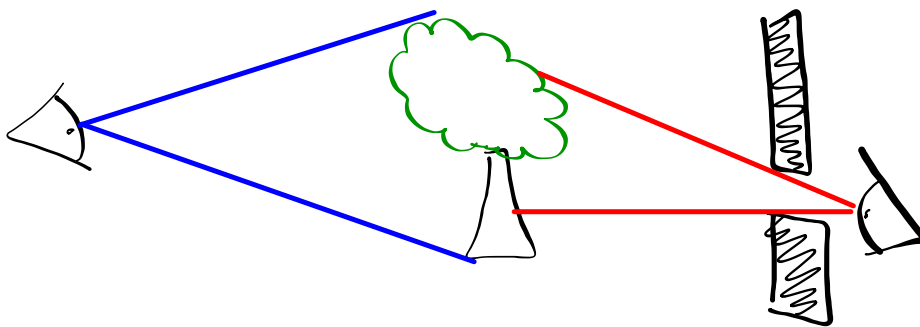
Vision - Light rays coming from an object strikes our eyes.



Opaque - light can't pass through opaque objects

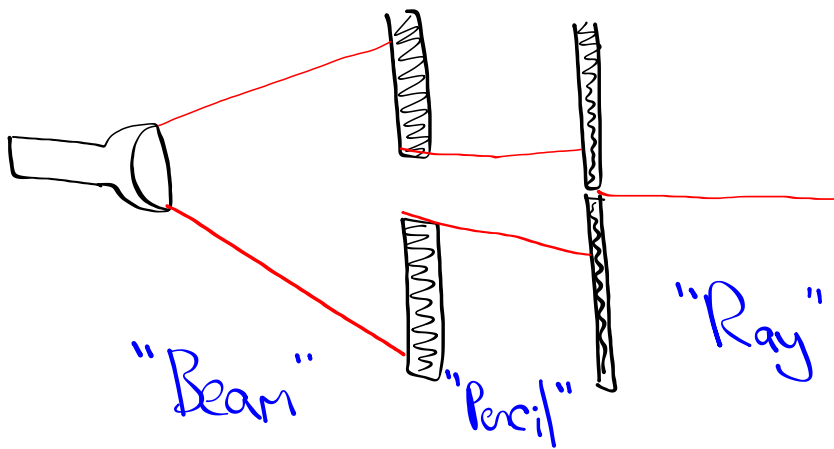
Field of Vision

The range of what we can see

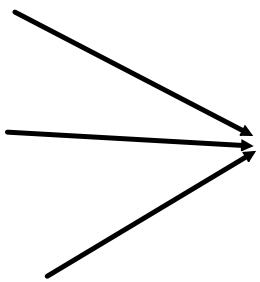


Rectilinear Propagation

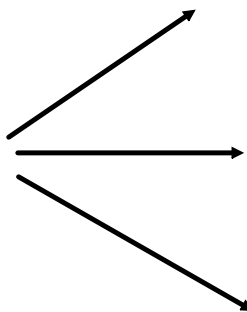
- light travelling in a single direction



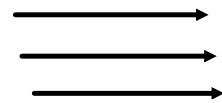
Converging



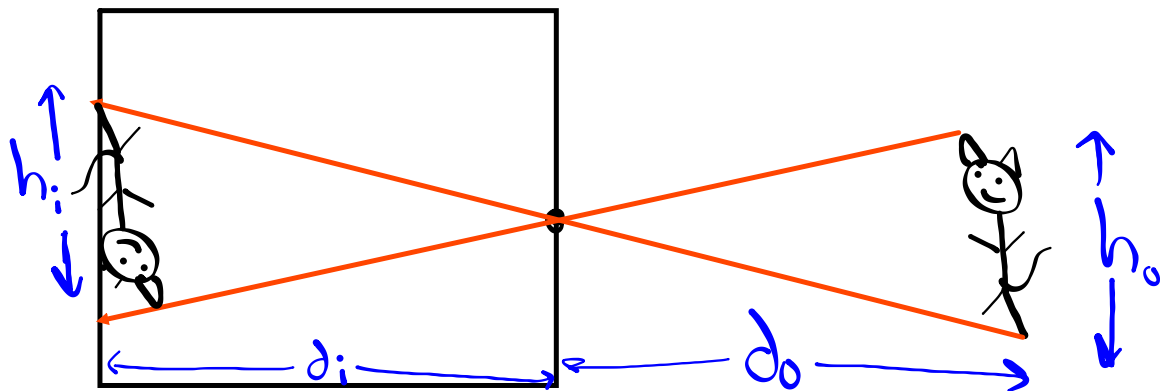
Diverging



Parallel



Pinhole Camera & Magnification



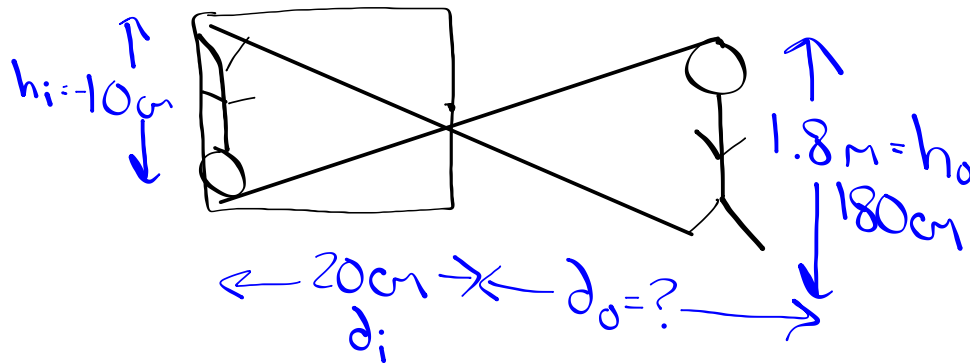
$$* \frac{h_i}{h_o} = -\frac{d_i}{d_o} = M$$

Magnification

Units: 2x the size
 $\frac{1}{2}$ the size

Ex. A pinhole camera 20cm deep is used to take a selfie of a student 1.8m tall. The image produced is 10cm in height. How far must the student be from the camera to be completely in the picture?

What is the magnification? $1m = 100cm$



$$\frac{h_i}{h_o} = -\frac{d_i}{d_o}$$

$$\frac{-10cm}{180cm} = \frac{-20cm}{d_o}$$

$$\boxed{d_o = 360cm}$$

$$M = \frac{-10}{180} = -\frac{1}{18} \text{ the size}$$

-0.056x the size