

Perception: Vision & Brain

GL/Psyc/Nats 3690.E

Professor Josée Rivest

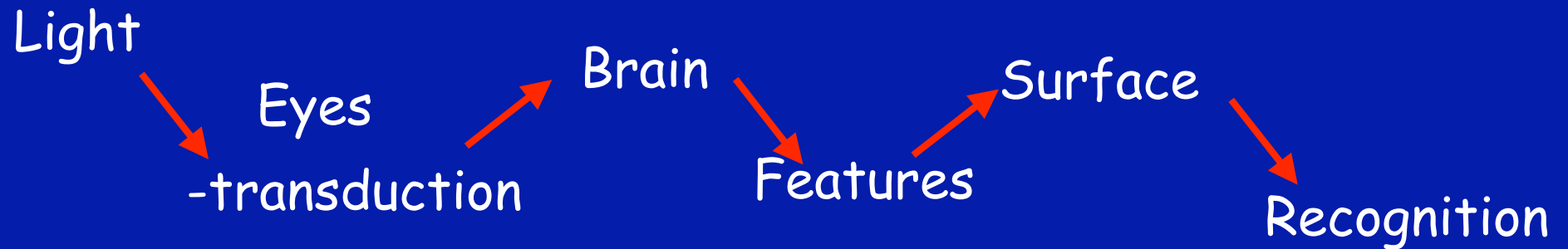
Course information

<http://www.yorku.ca/jrivest/>

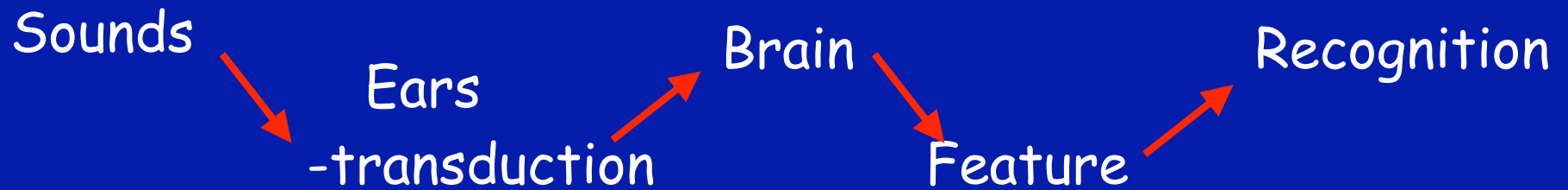
Perception

PERCEPTION

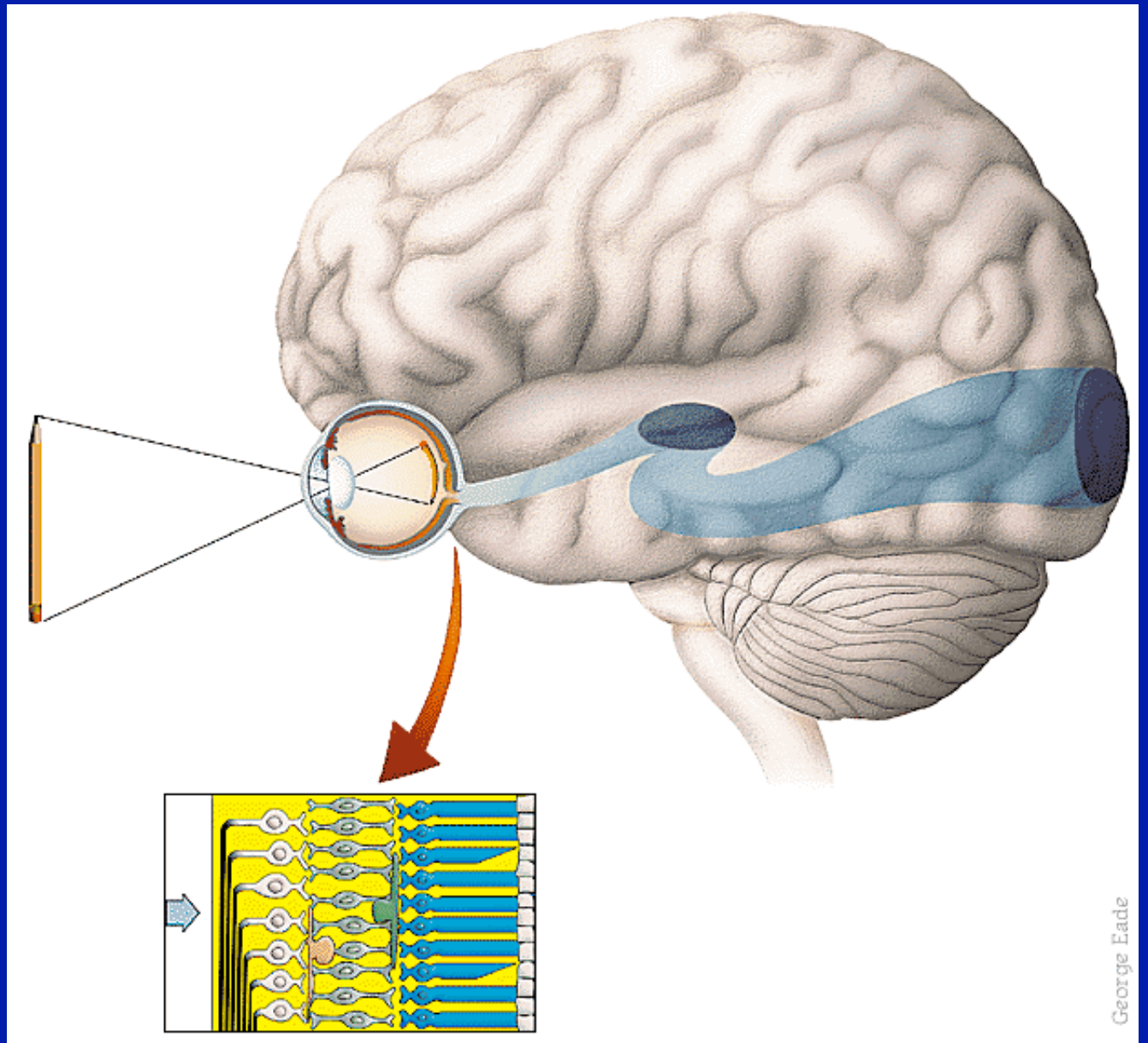
Vision



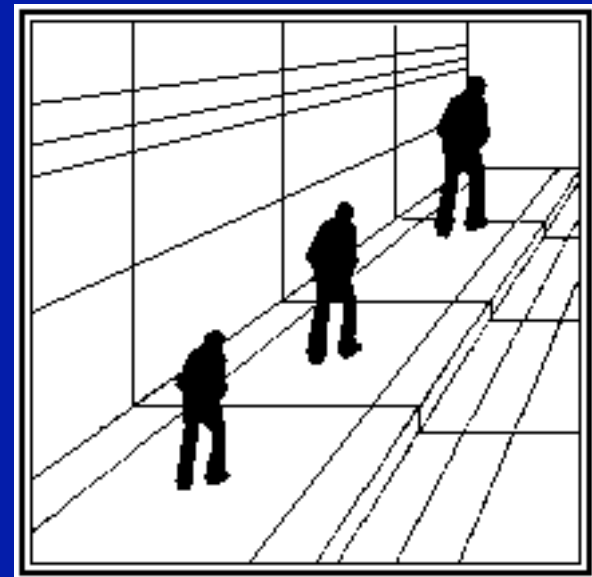
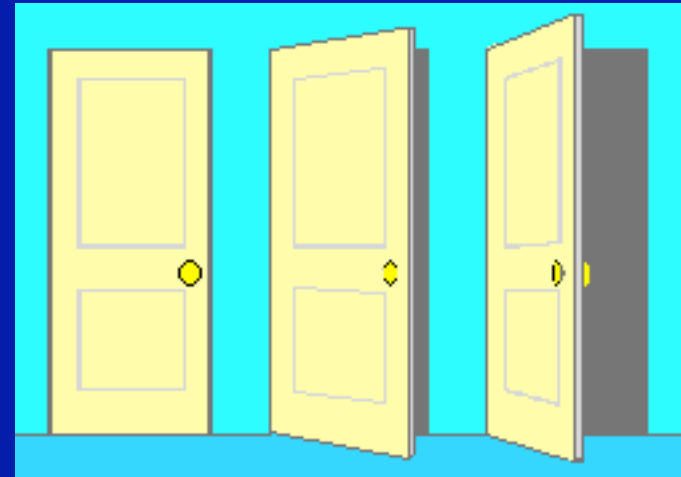
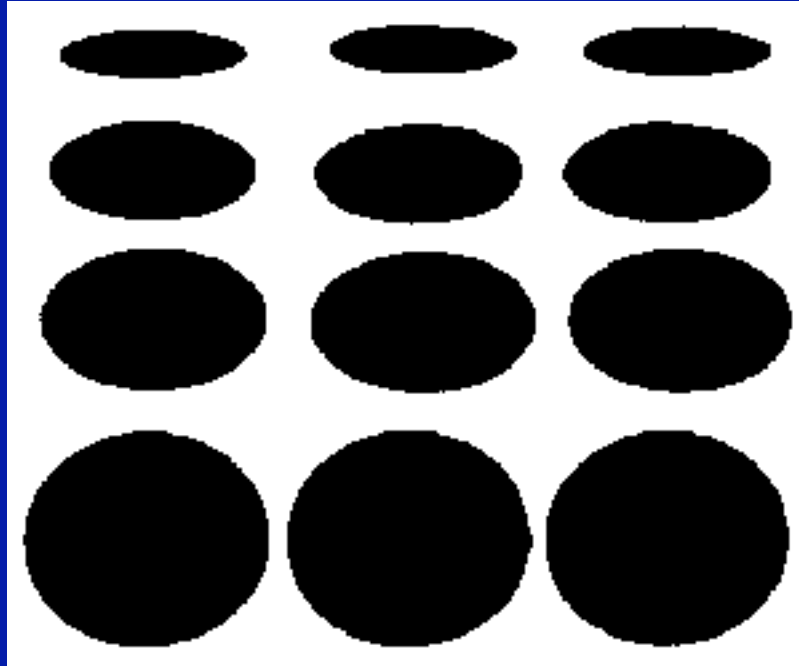
Audition



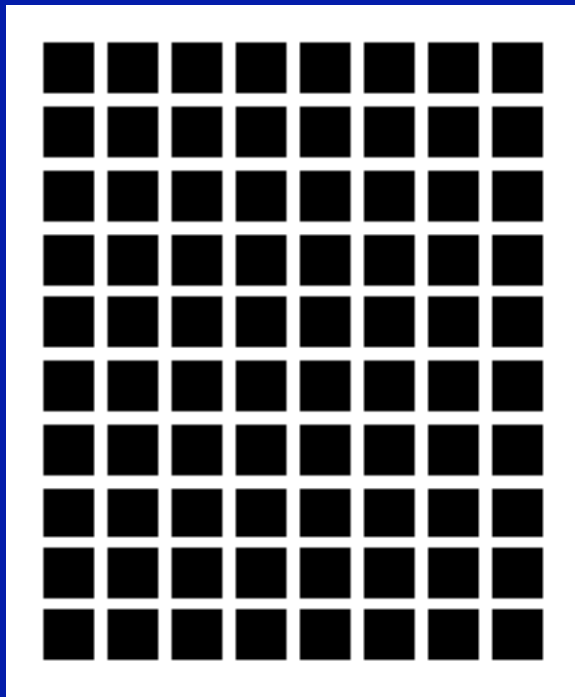
The anatomy and physiology of the visual system



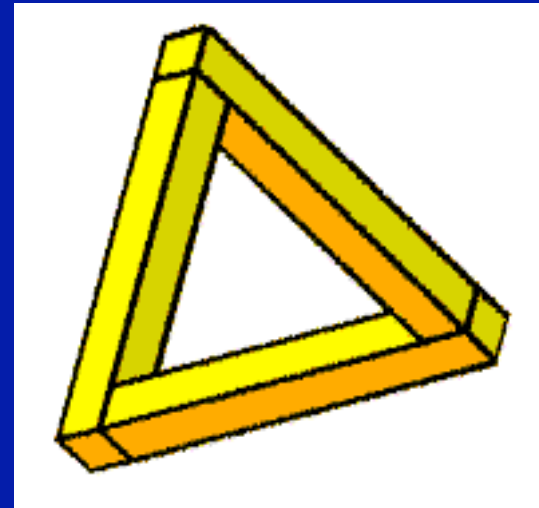
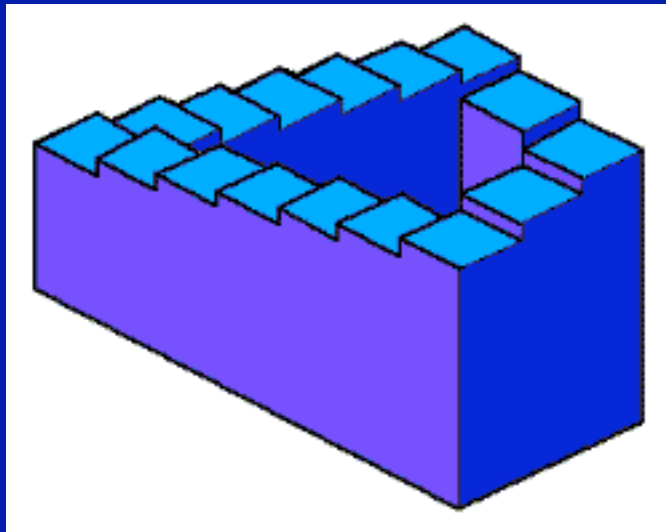
How do we see depth?



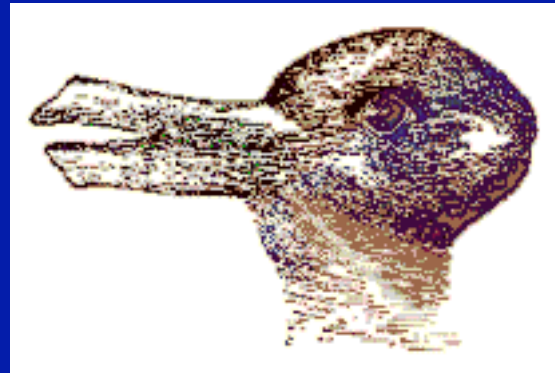
What do illusions tell us about the functioning of the brain?



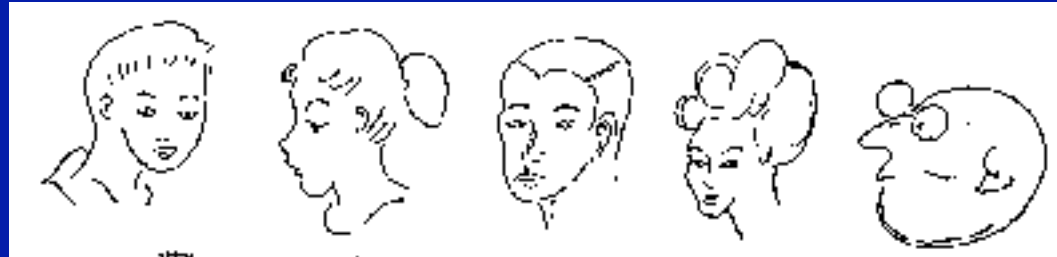
Why are these images impossible?



Does attention help vision?

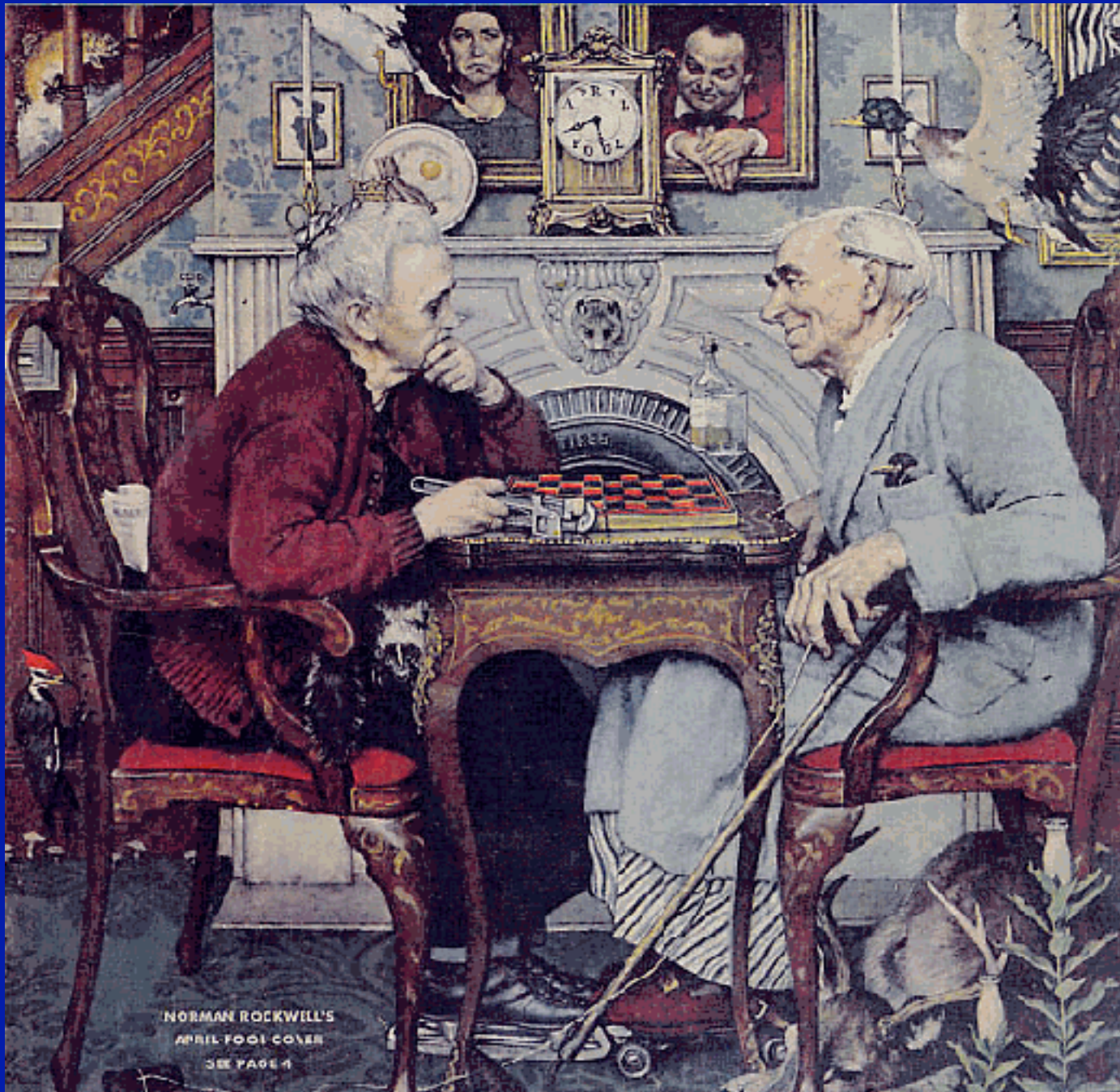


Does our knowledge influence
what we see?



Does our knowledge influence
what we see?

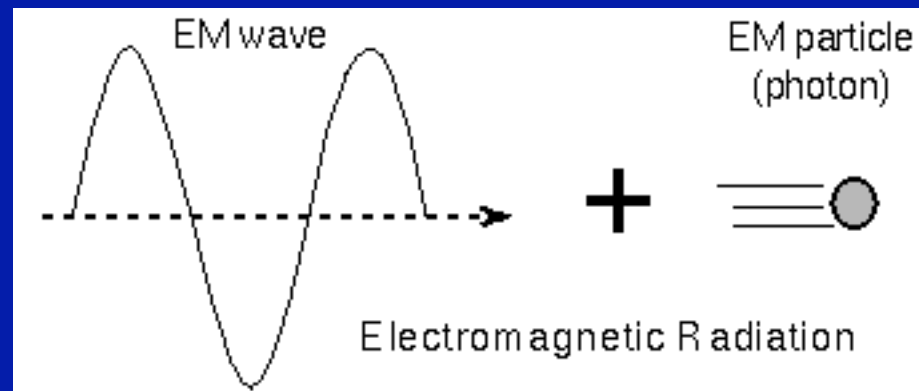




NORMAN ROCKWELL'S
APRIL FOOL COVER
SEE PAGE 4

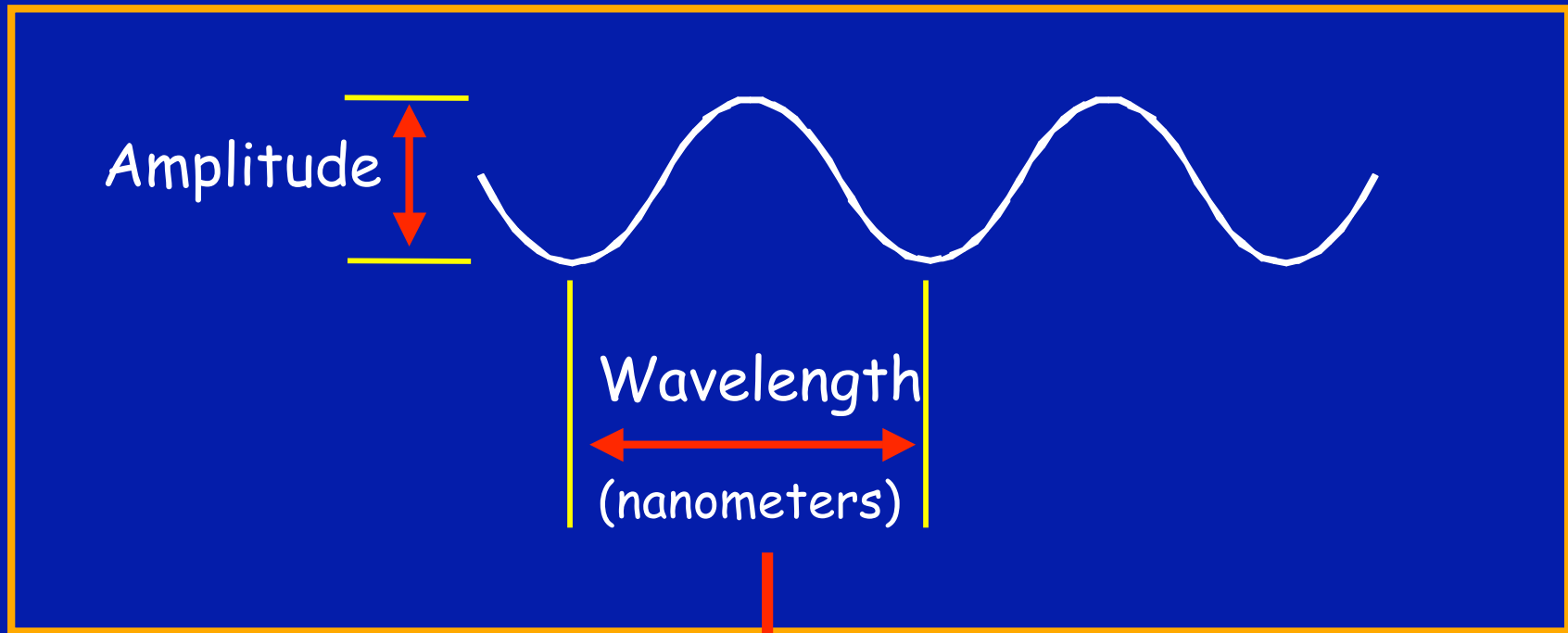
Light

- electromagnetic radiation
- photons



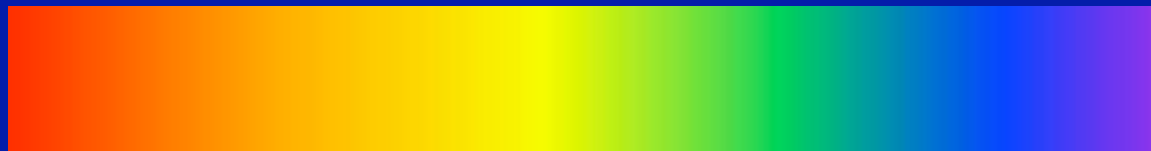
- amplitude, wavelength & complexity

Light: an electromagnetic wave

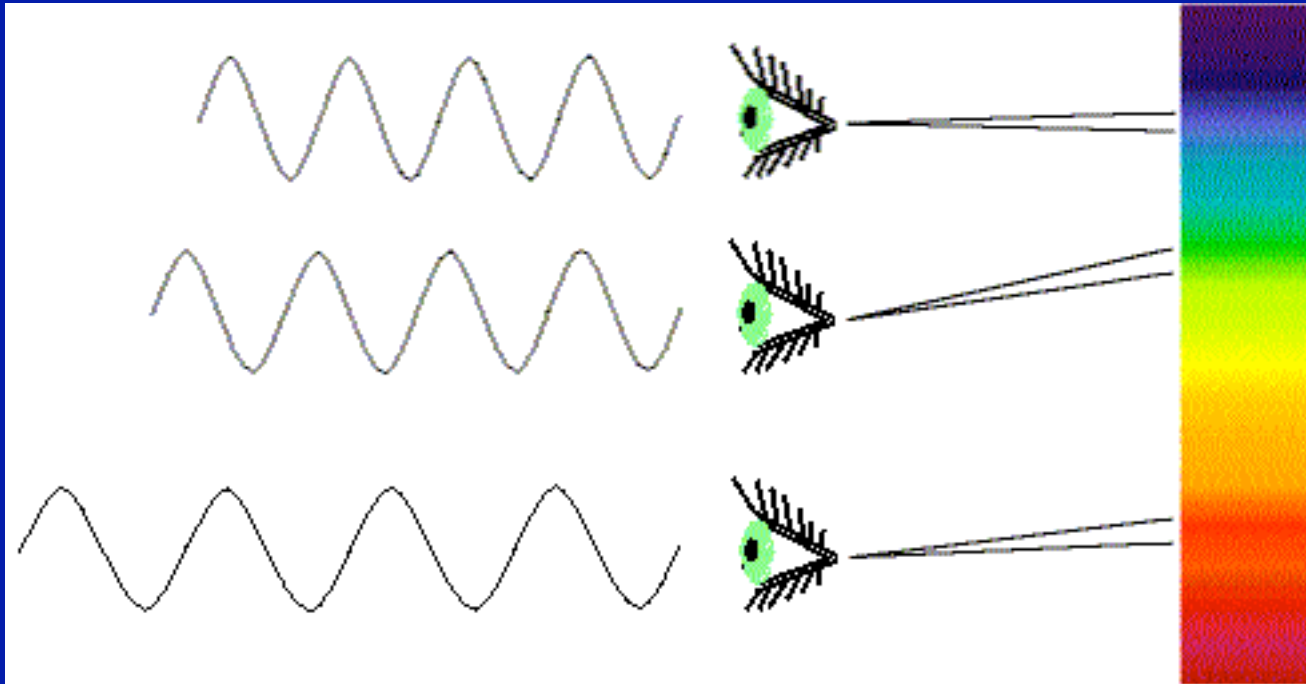


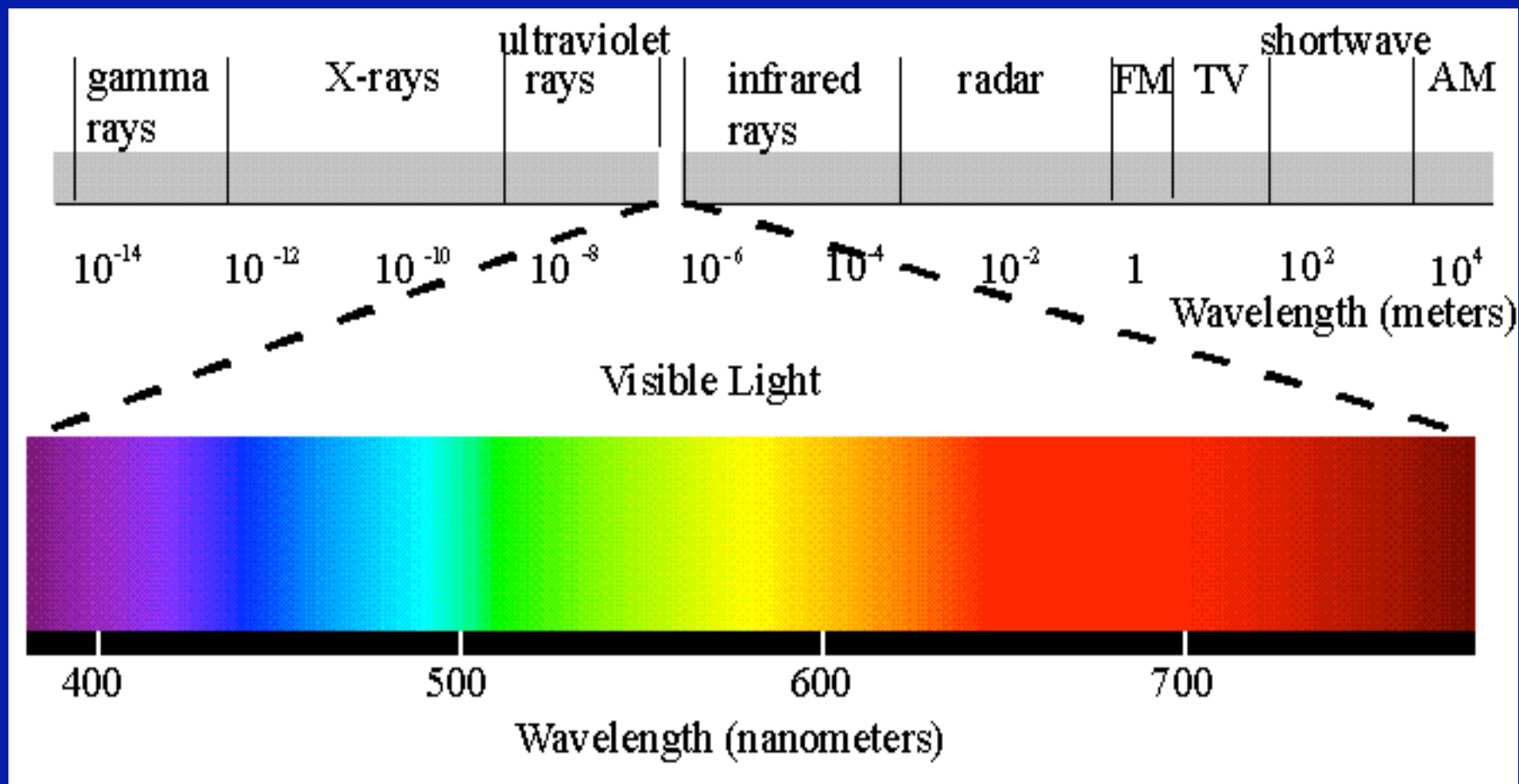
Visible:

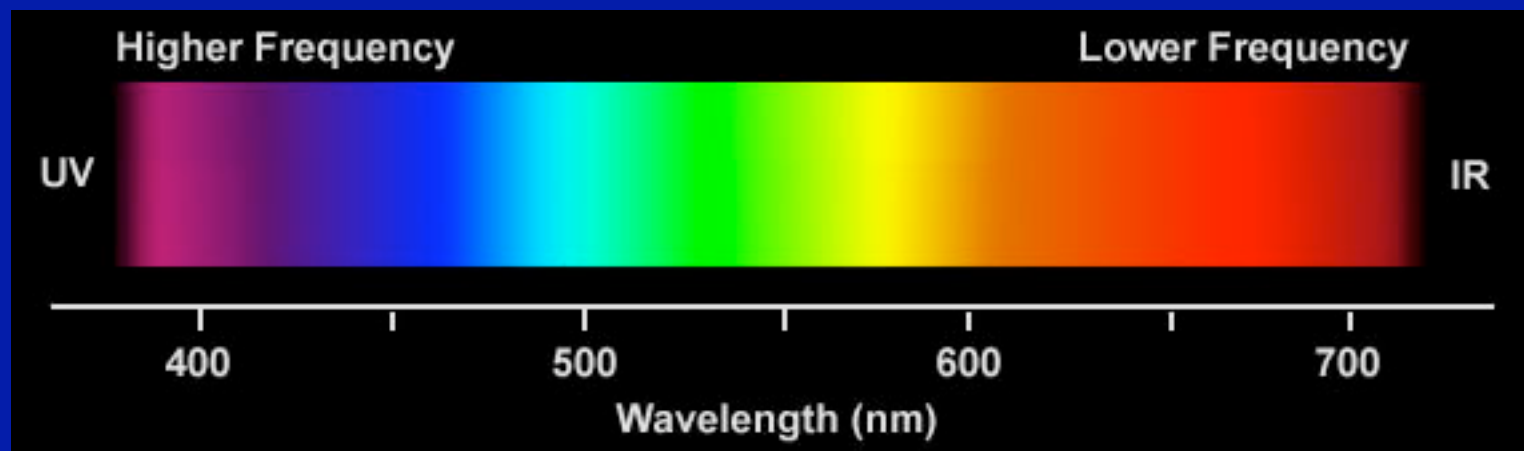
700 to 400 nm



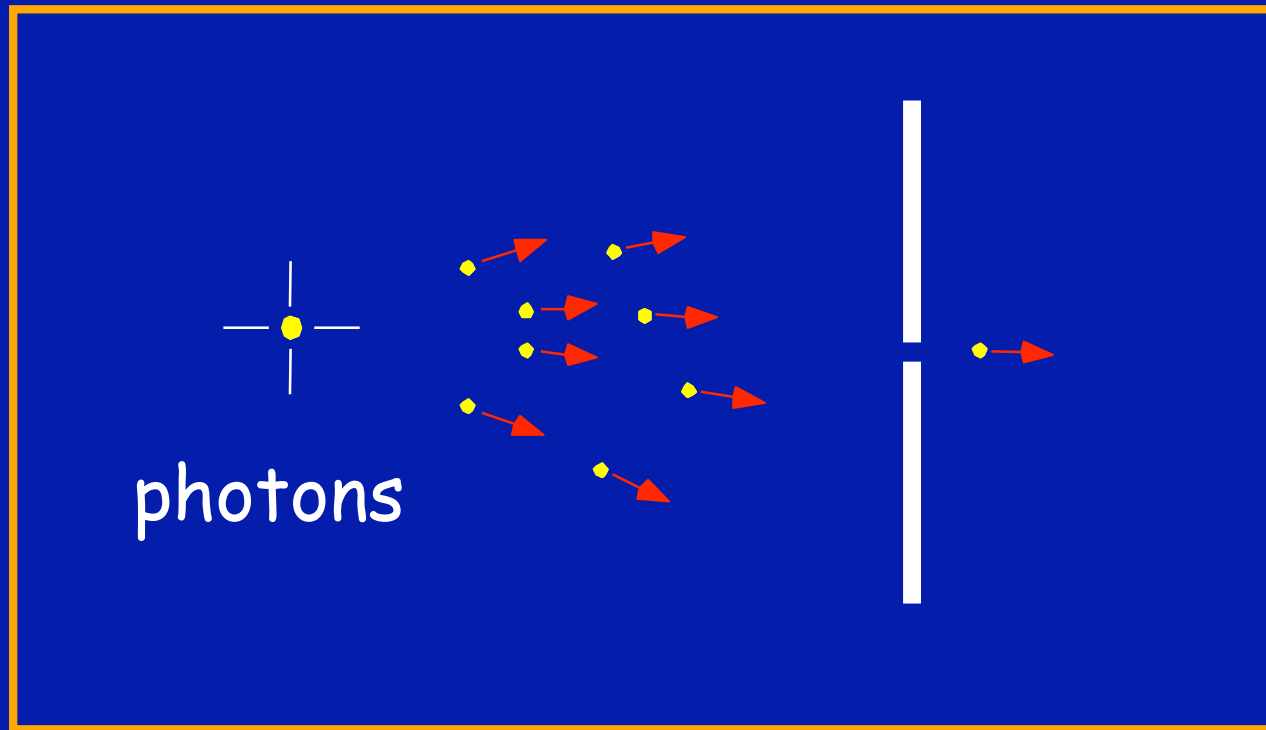
Different wavelengths =
different colours



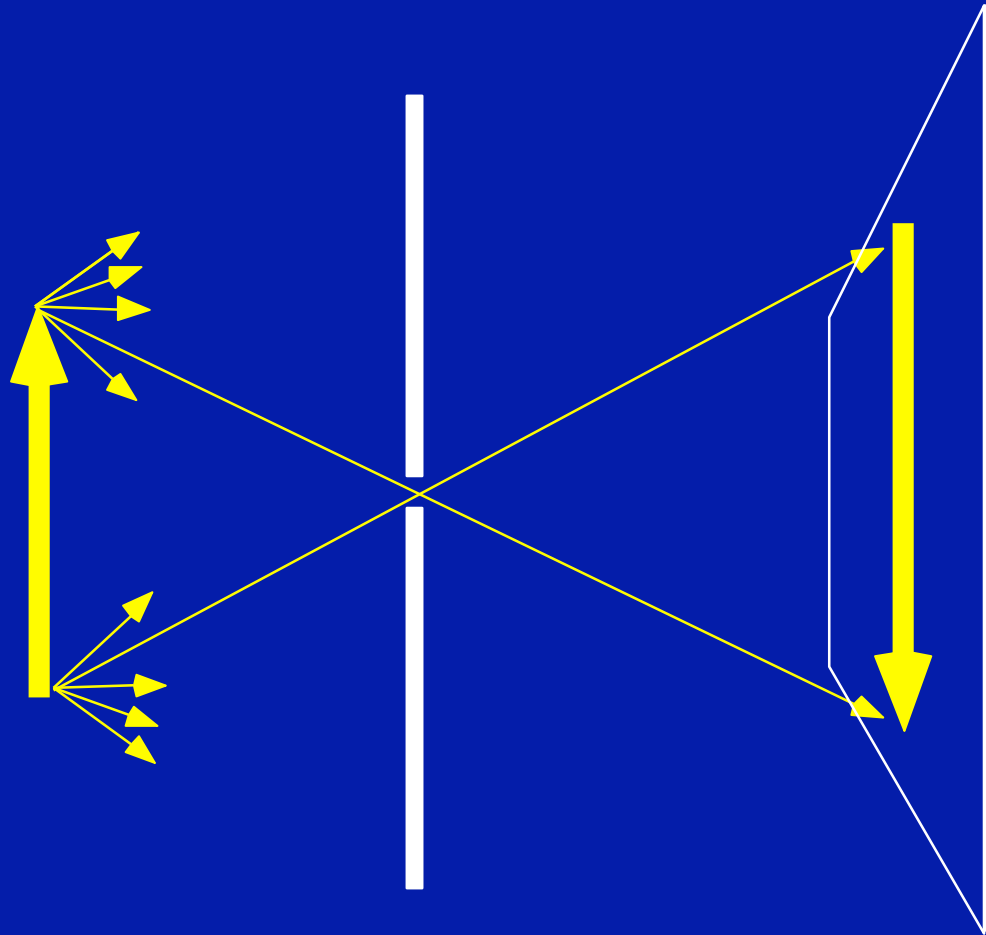




Light travels in a straight line



Pinhole Optics



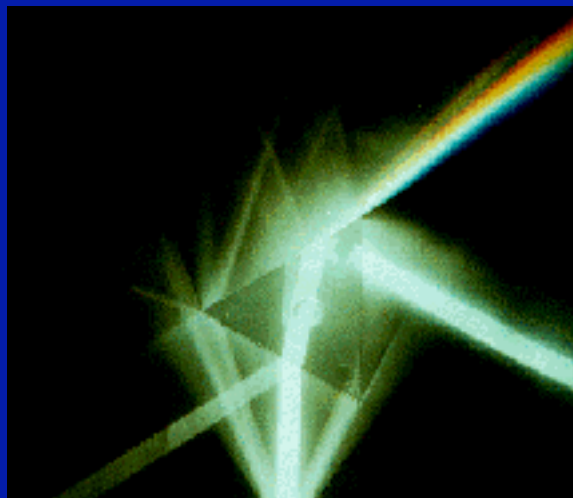
Properties of Light

- Transparent & translucent media
 - absorption *...more for longer wavelength*
 - diffraction *...more for shorter wavelength*
 - refraction *...less for shorter wavelength*
- Opaque media
 - absorption & reflection

Refraction:

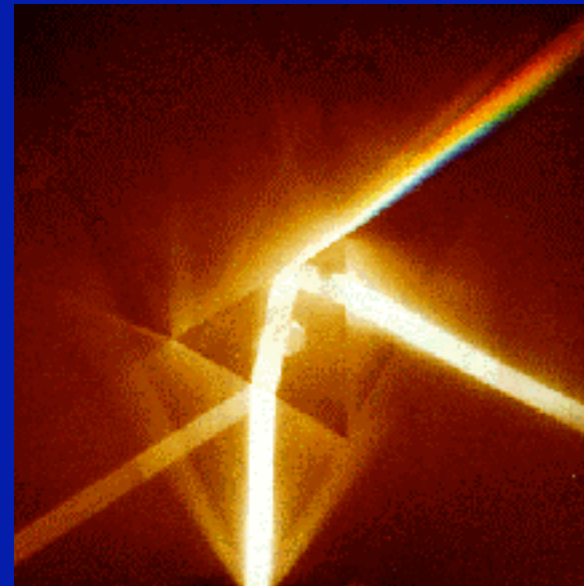
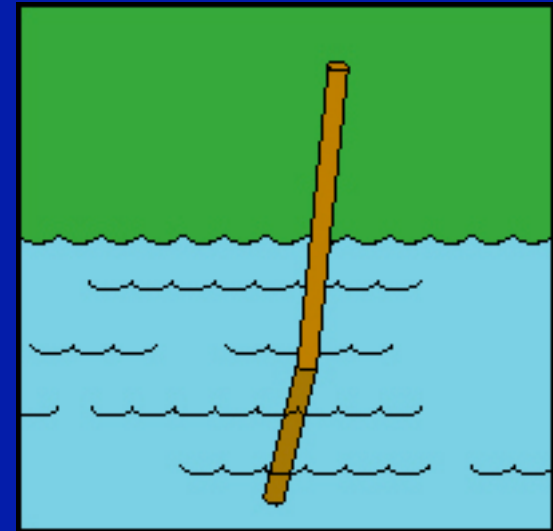
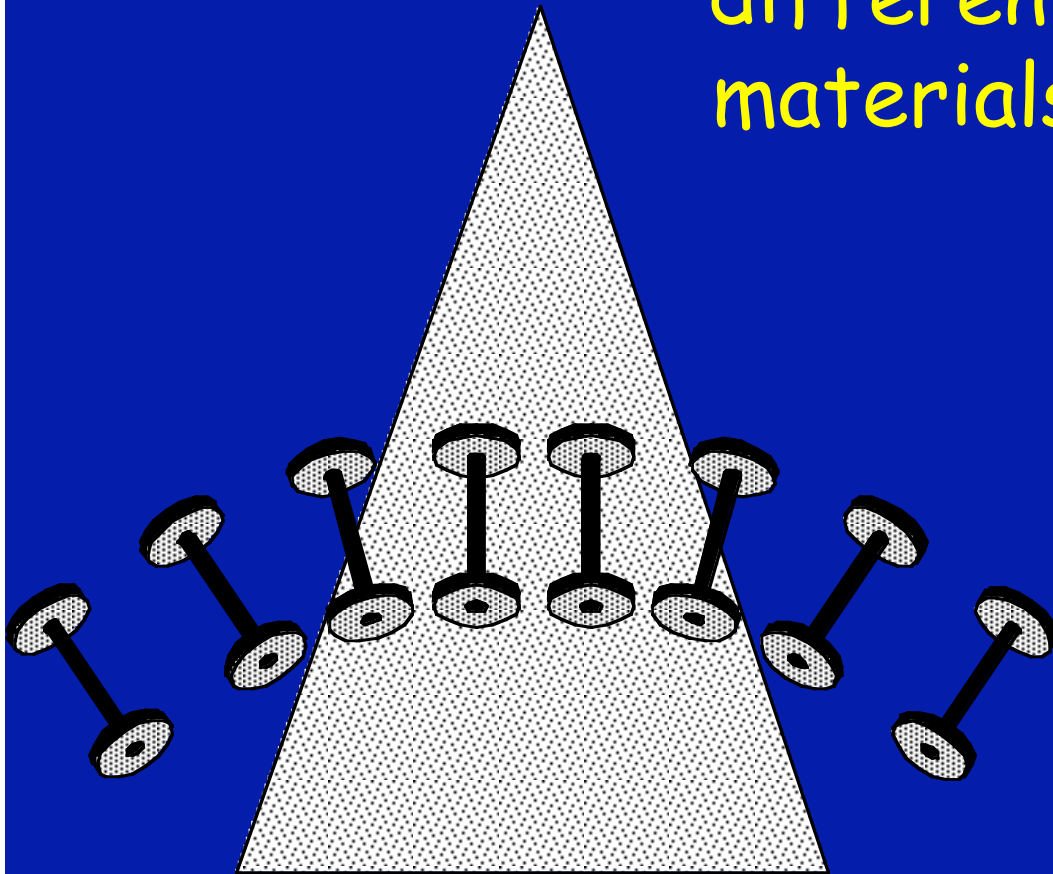
Speed of light
is different in different materials

$$\text{Refractive Index} = \frac{\text{speed of light in material 1}}{\text{speed of light in material 2}}$$

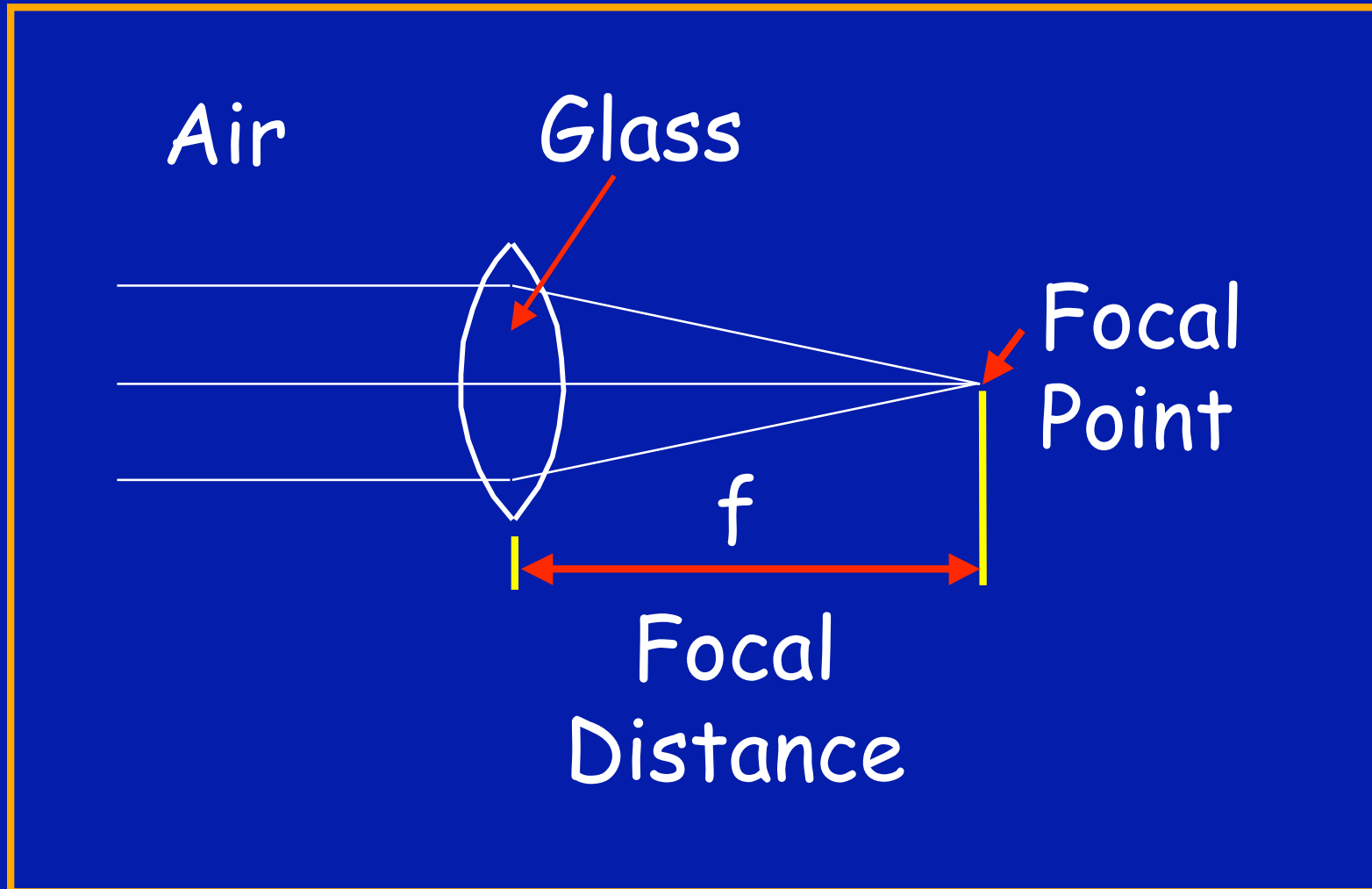


Refraction:

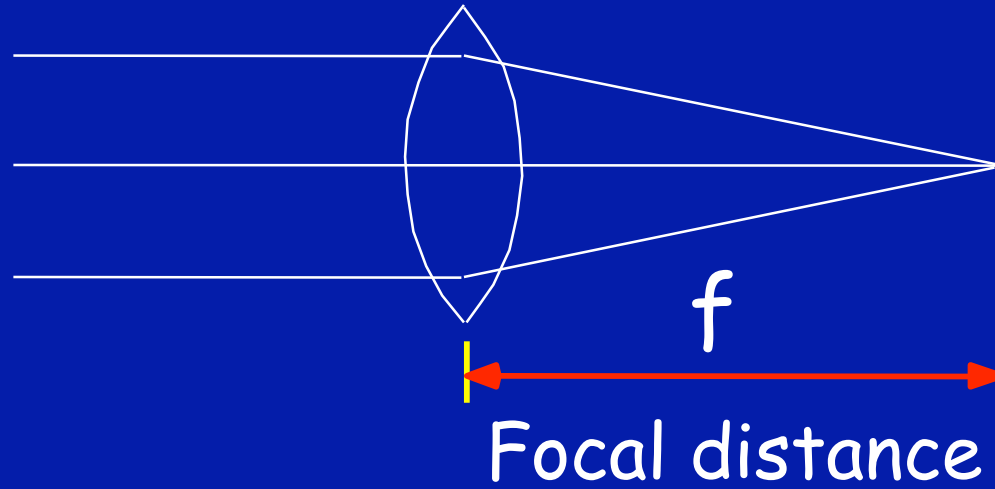
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Refractive index

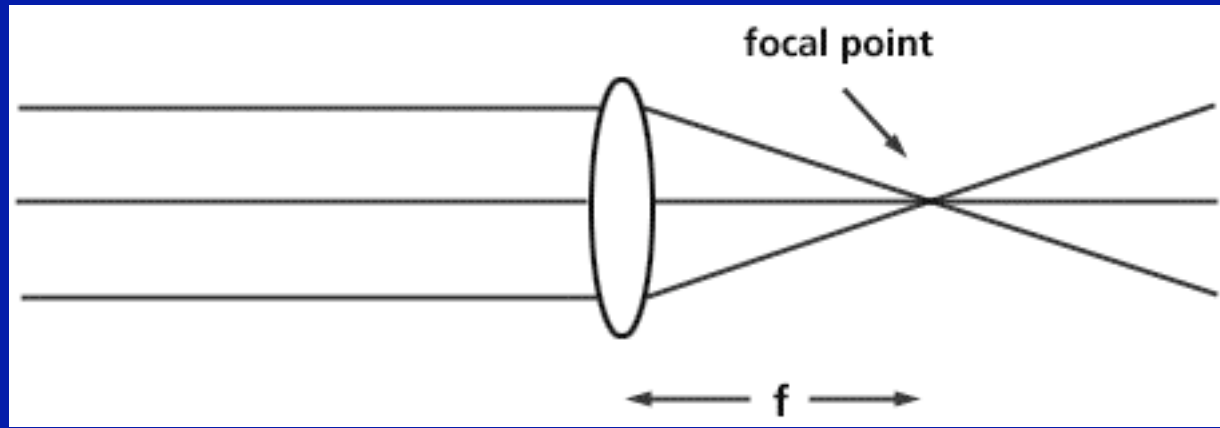


Lenses

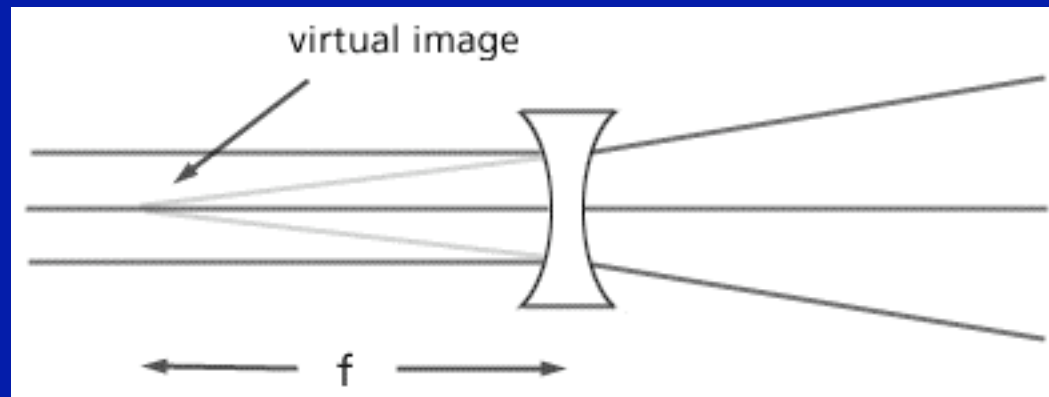


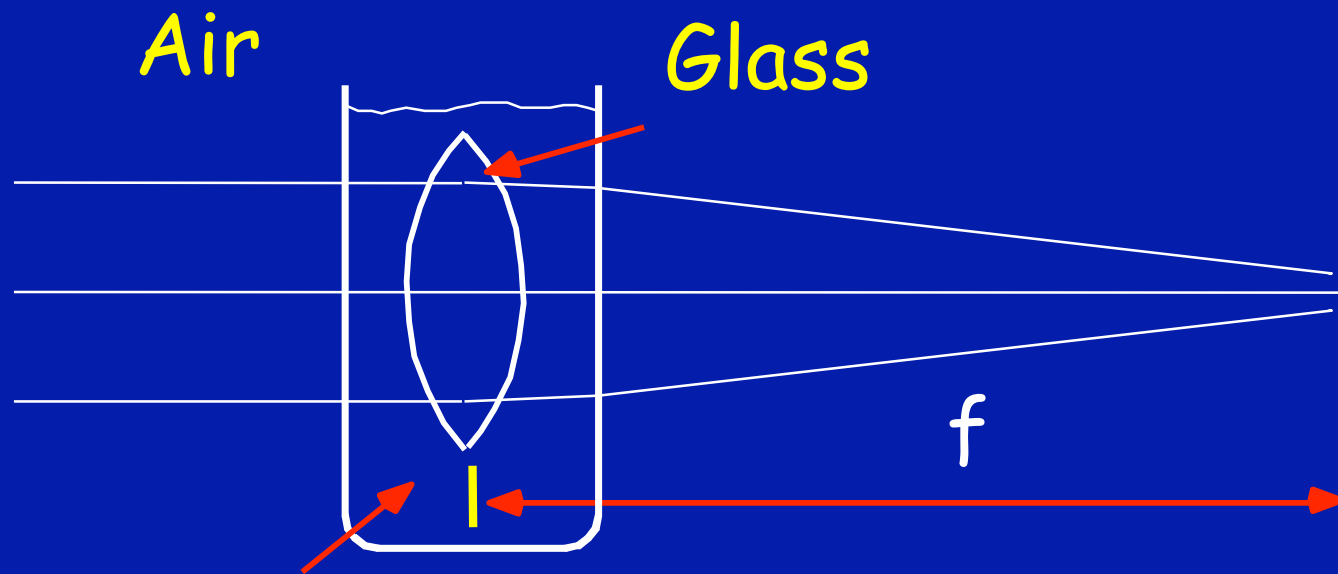
$$\text{Diopters} = \frac{1}{f(\text{meters})}$$

Convex lens: converging

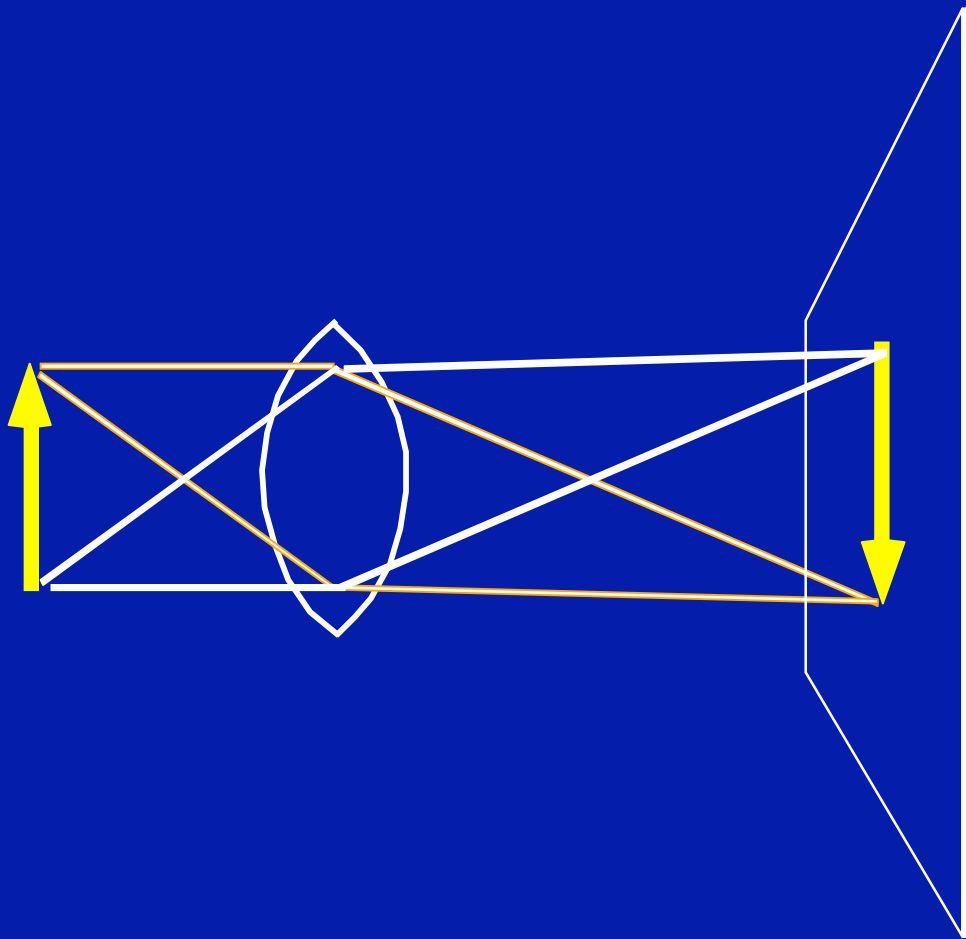


Concave lens: diverging





Water: *less refraction*



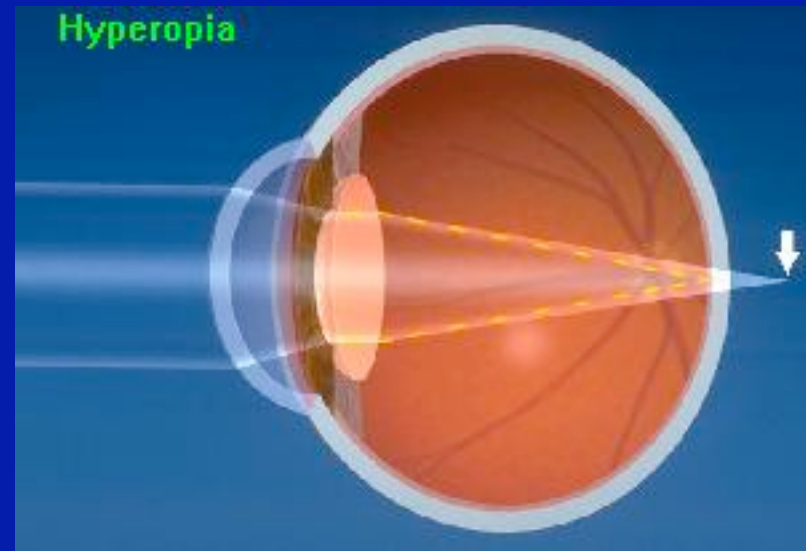
Problems of Accommodation

- Hypermetropia (hyperopia)
 - farsightedness
 - > 45 years old: presbyopia
- Myopia
 - nearsightedness

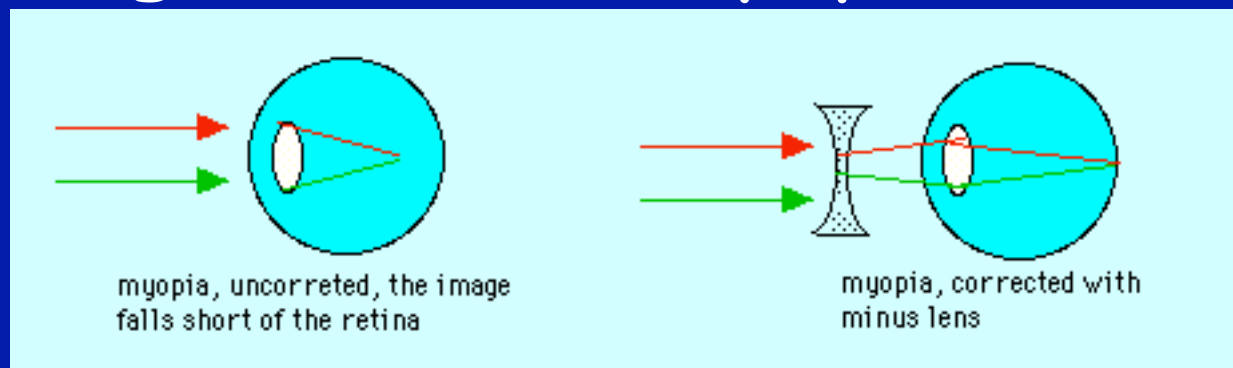


Problems of accommodation

Farsightedness:
Hypermetropia



Nearsightedness: Myopia



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