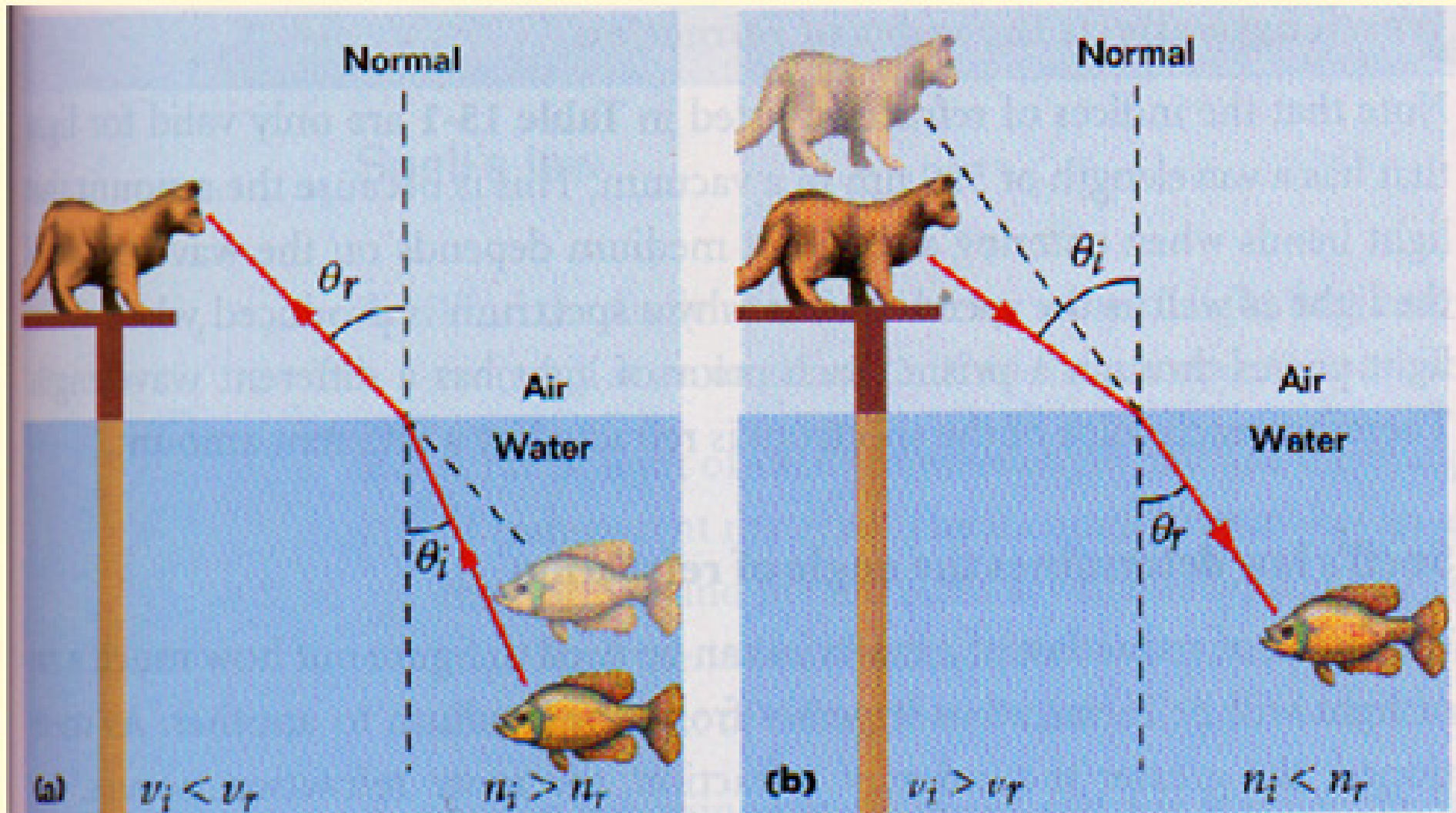
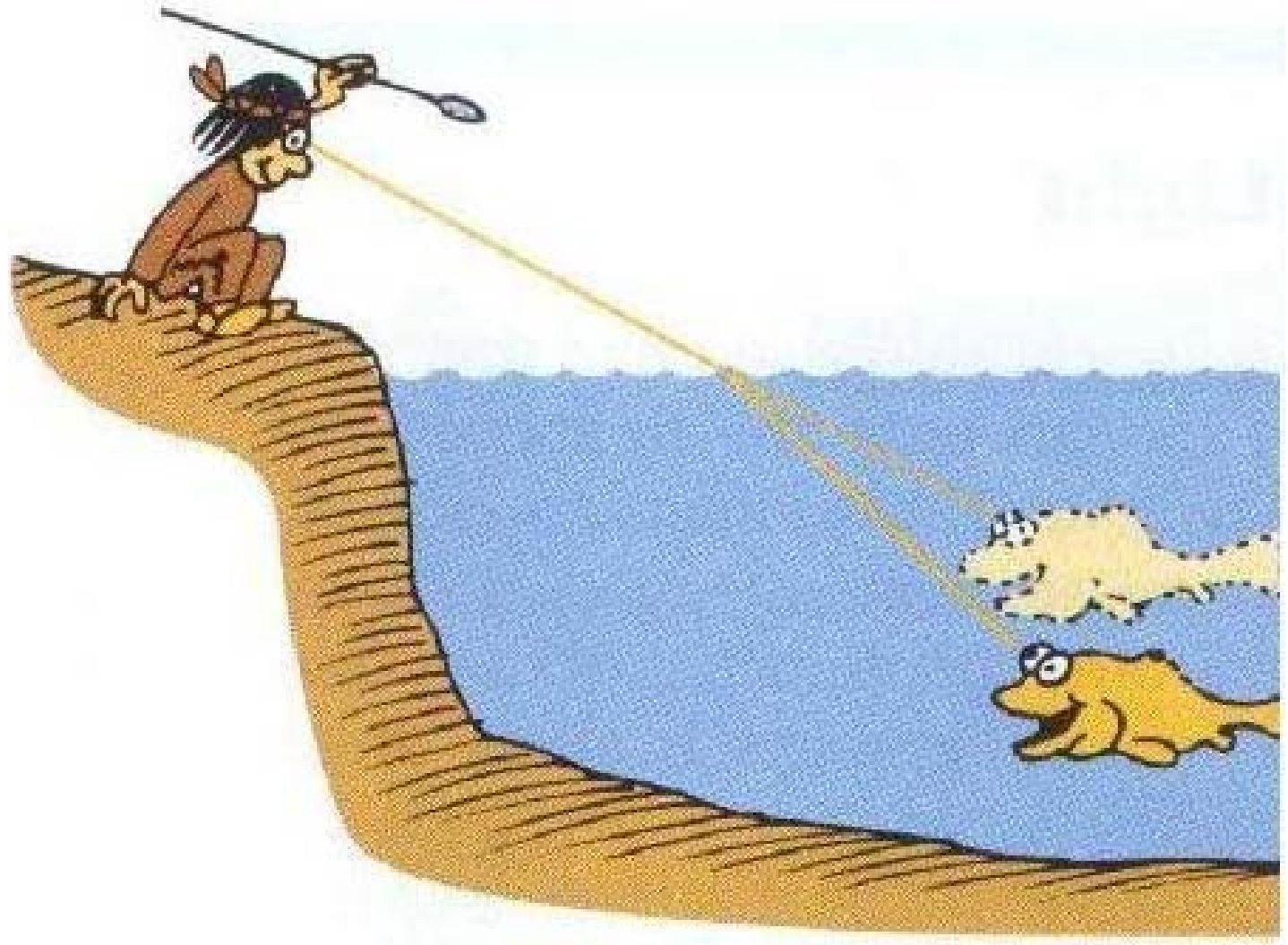


The Cat and the Fish



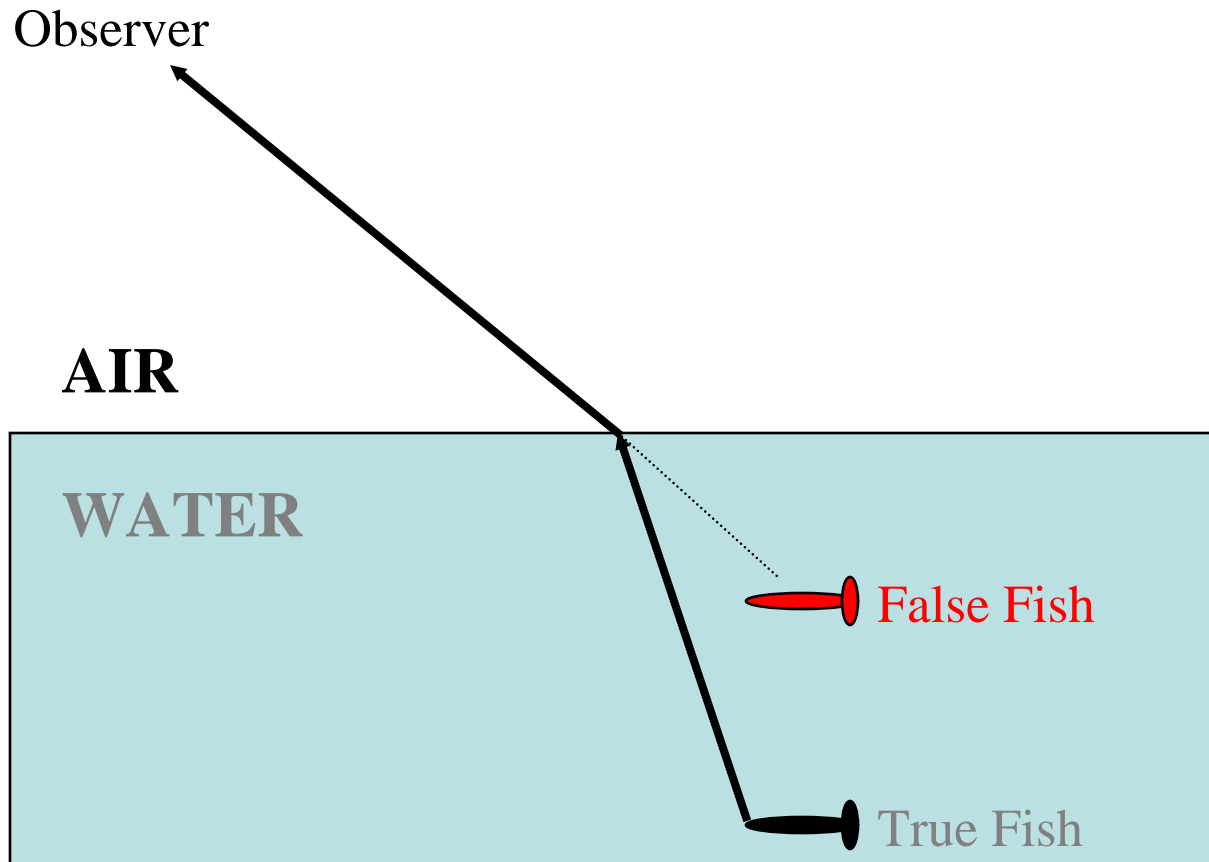
The light is refracted toward the normal when it passes into a denser medium.

To eat tonight, the fisherman must aim LOW



Refraction

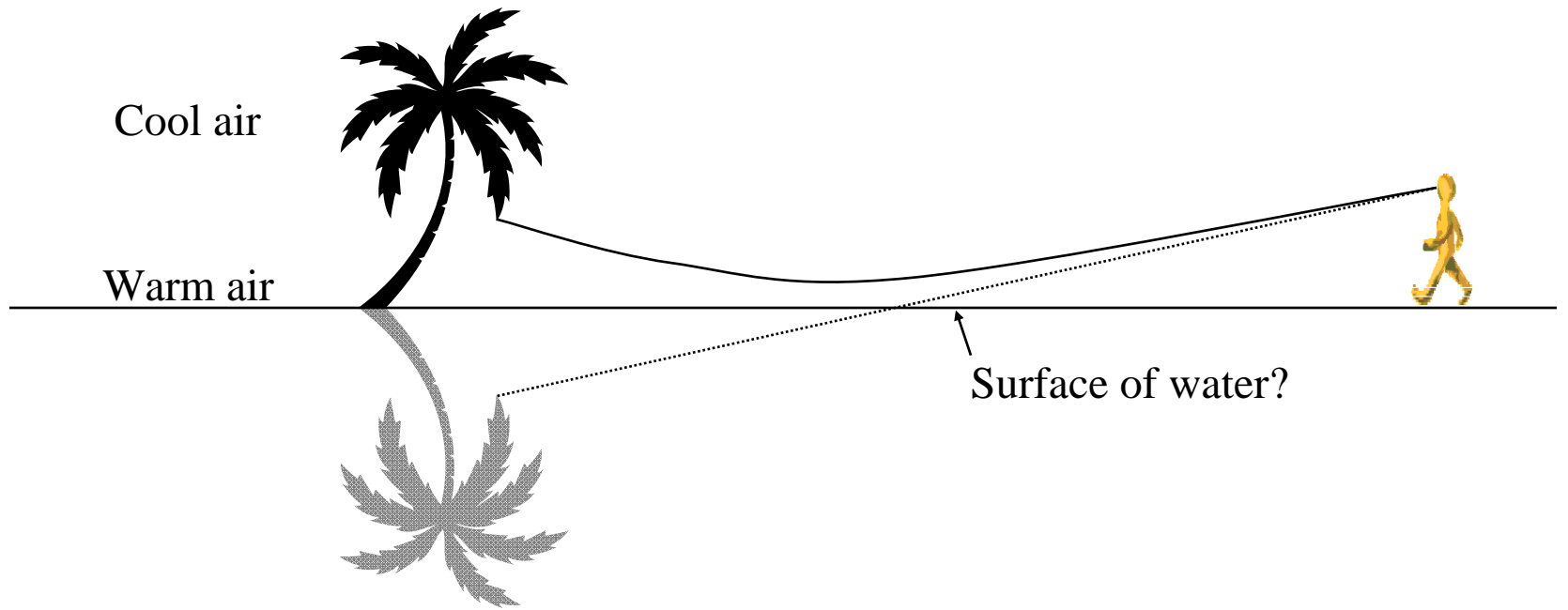
Makes things appear closer
in water



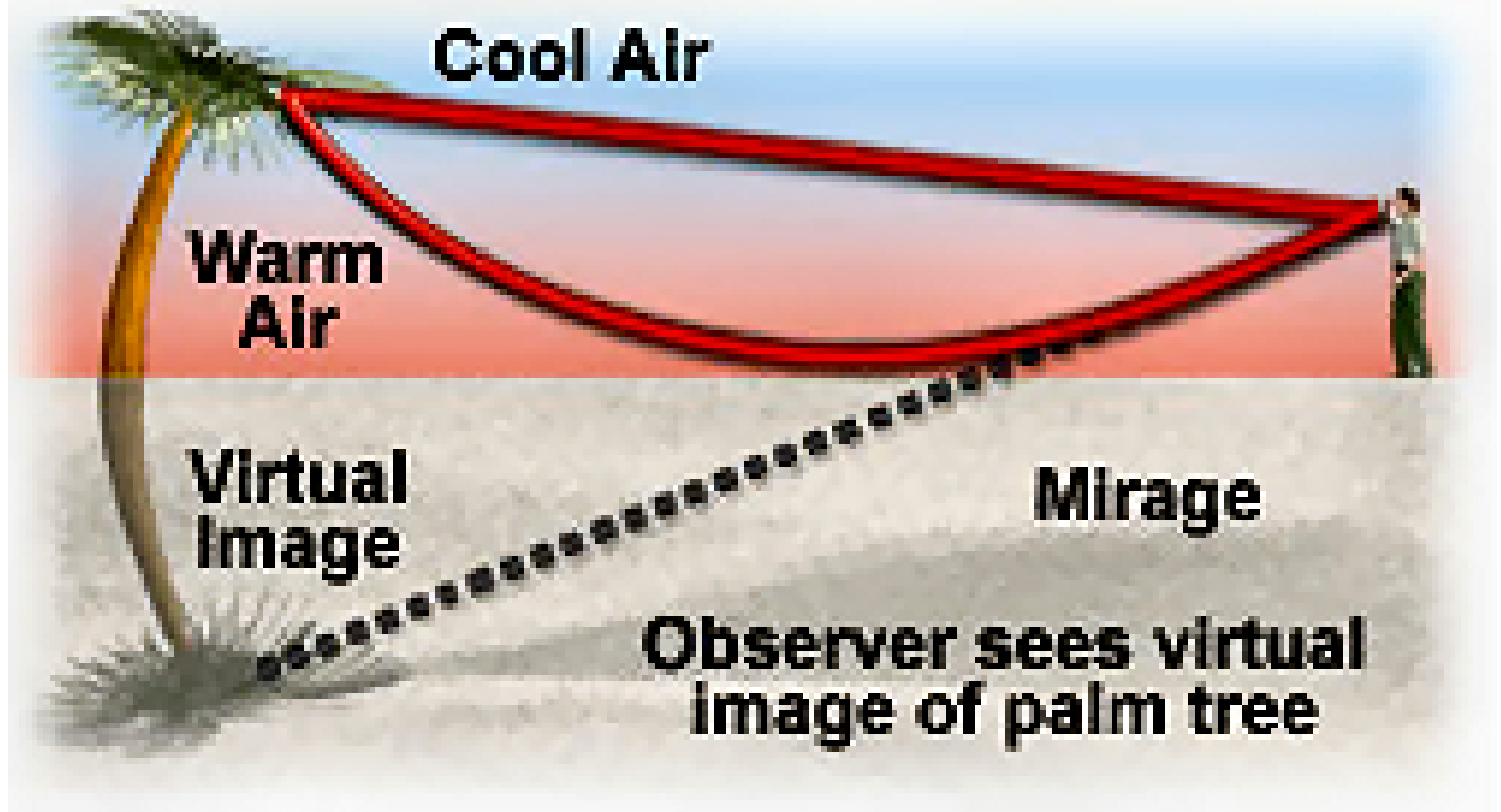
HOT AIR BALLOON



Mirage

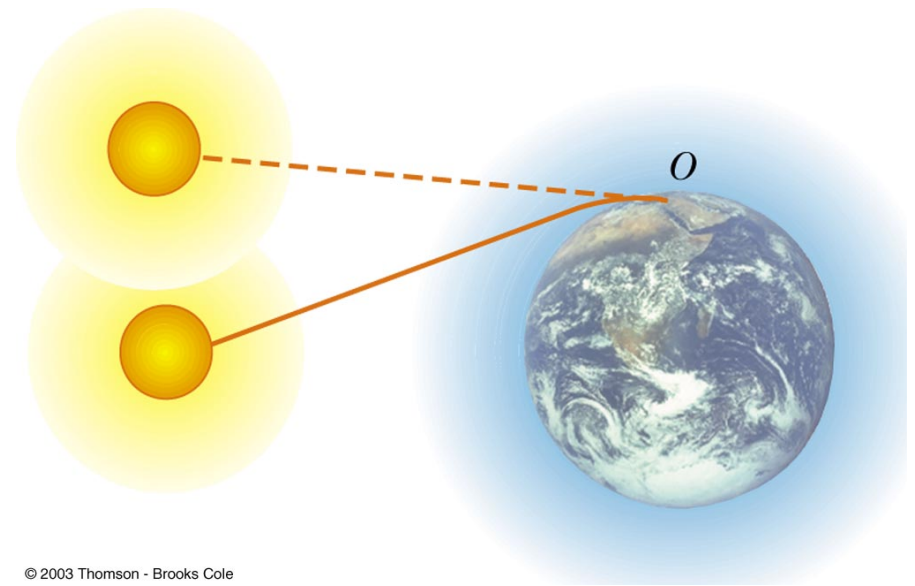


Mirage and Looming Artifacts

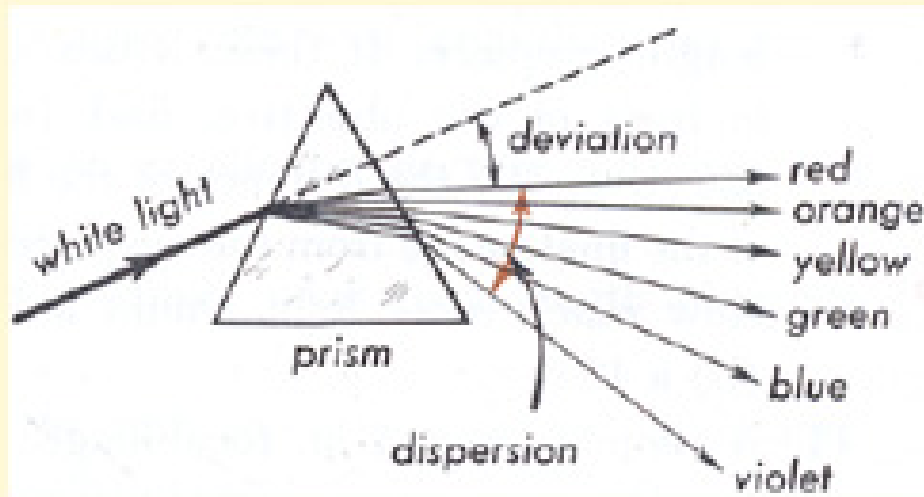


Atmospheric Refraction and Sunsets

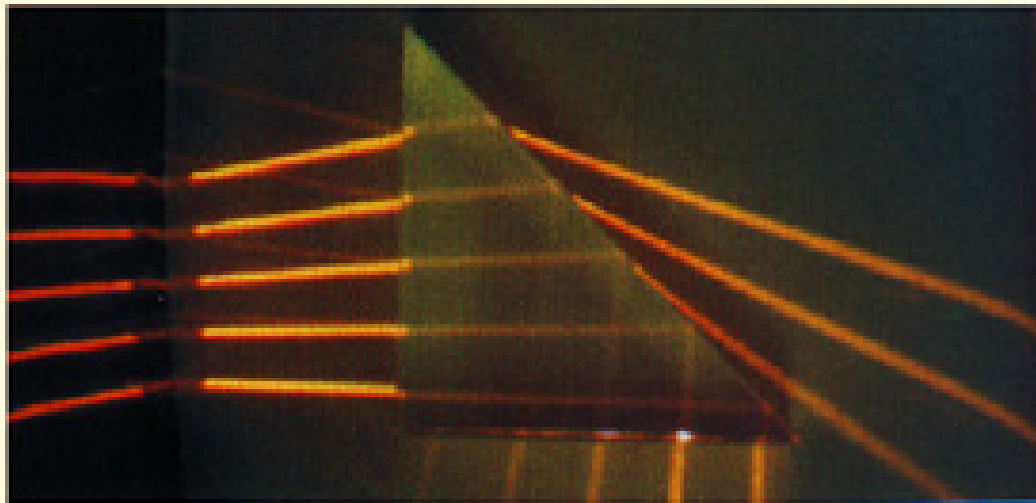
- Light rays from the sun are bent as they pass into the atmosphere
- It is a gradual bend because the light passes through layers of the atmosphere
 - Each layer has a slightly different index of refraction
- The Sun is seen to be above the horizon even after it has fallen below it



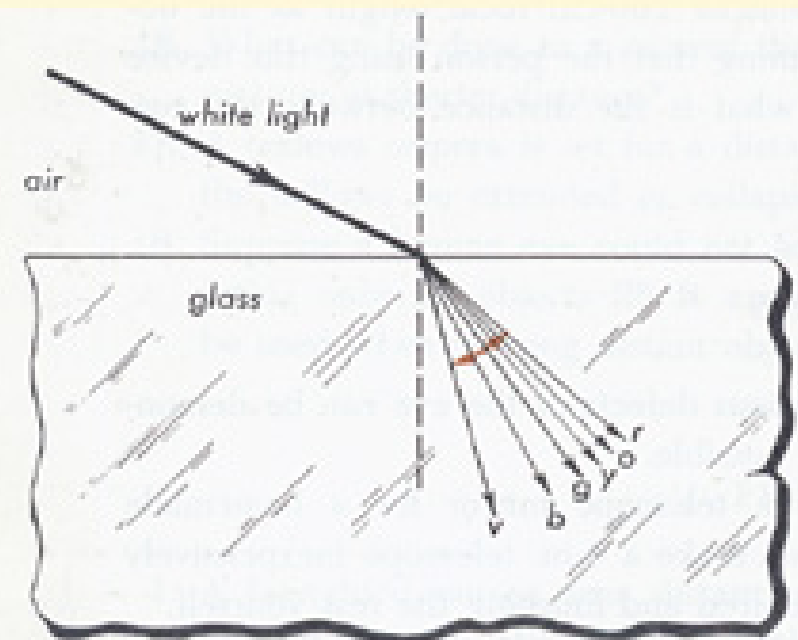
Dispersion & Prism



Longer wavelength red light is refracted less than the shorter wave length violet light.



Refractions & Total Reflections in a prism..

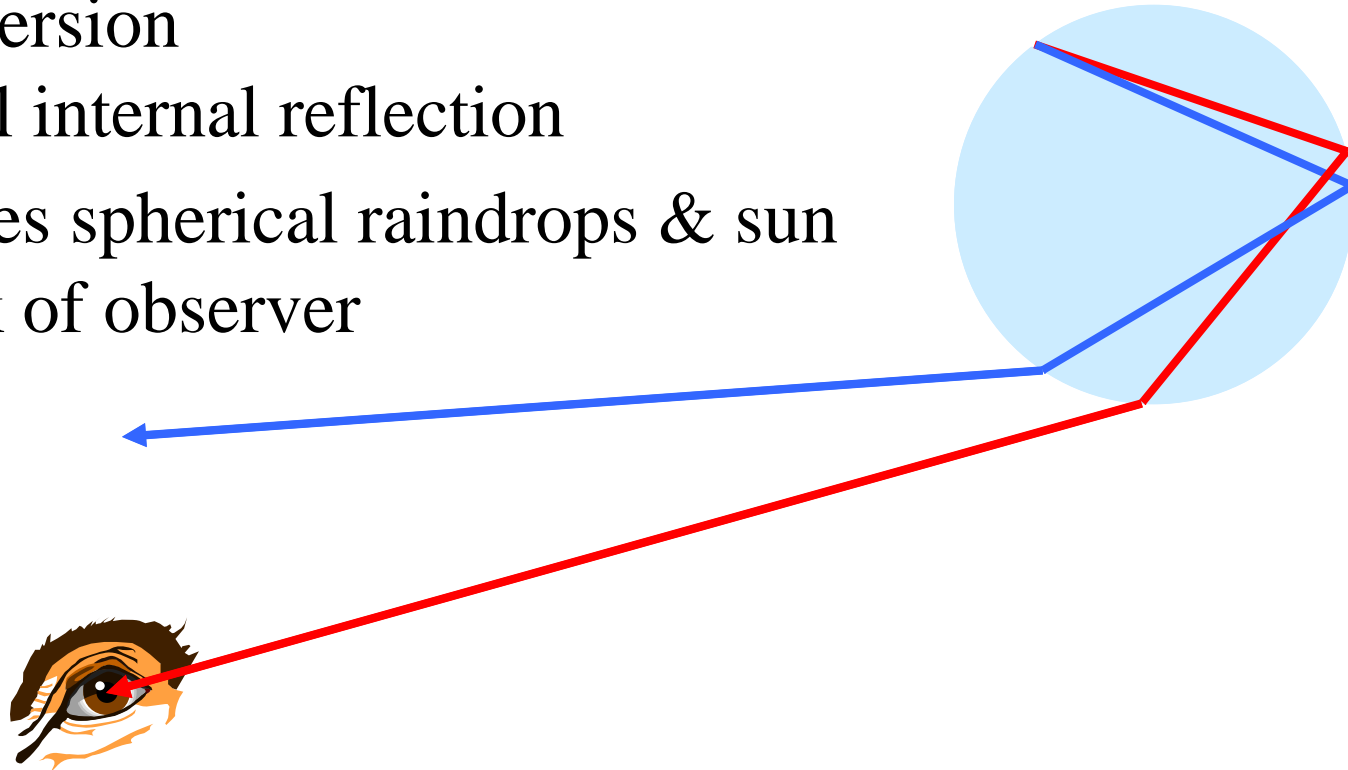


Rainbow

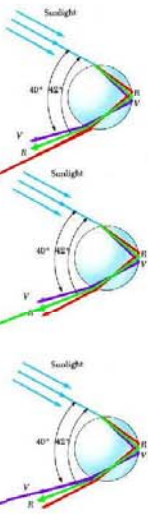
Rainbow explained by:

- 1) Dispersion
- 2) Total internal reflection

Requires spherical raindrops & sun
in back of observer



How a red devil sees a rainbow



Consistently reflects off a water droplet sphere at a 42° angle.

Consistently reflects off a water droplet sphere at a 41° angle.

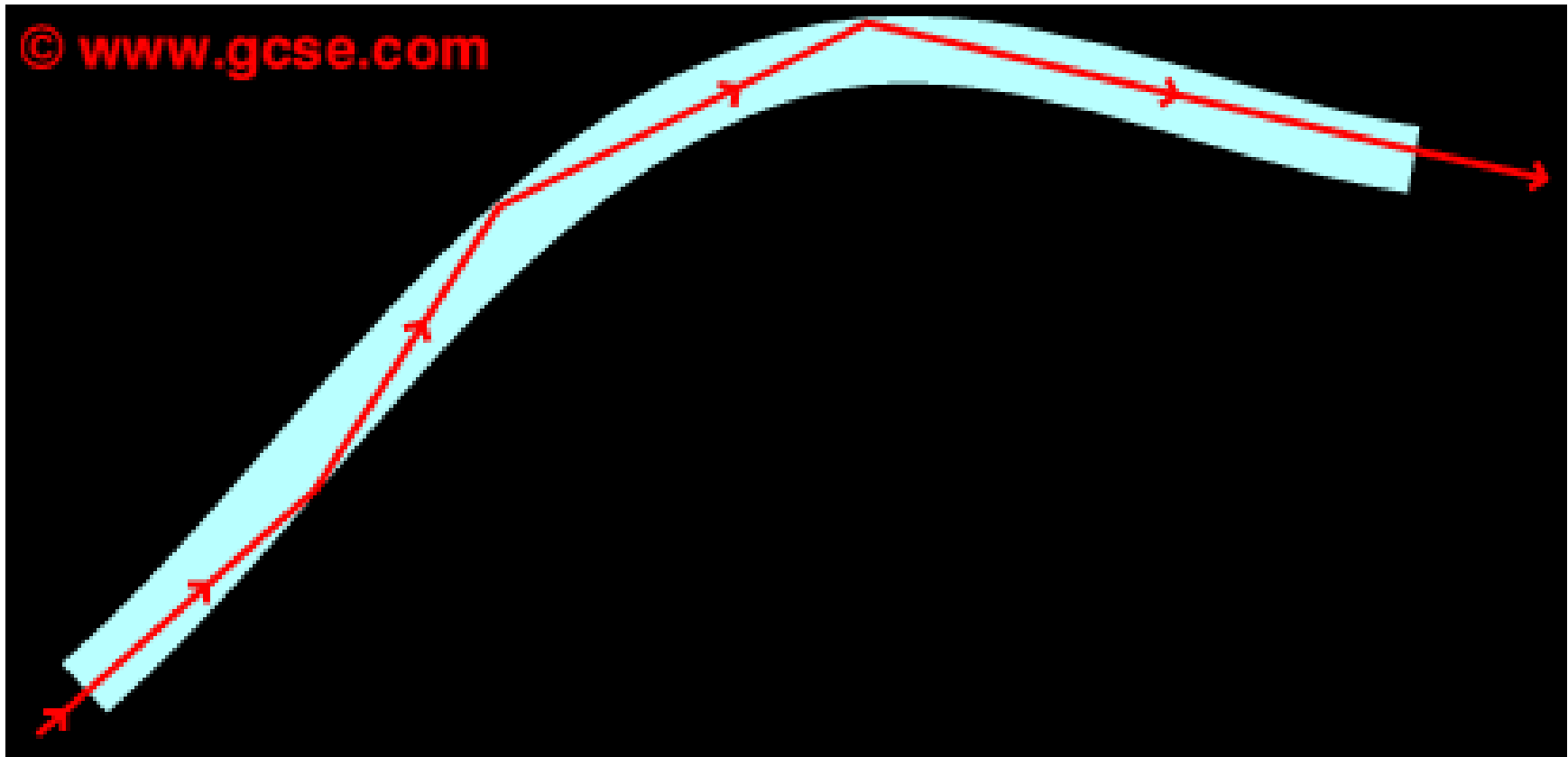
Consistently reflects off a water droplet sphere at a 40° angle.

Oh my! The red light reaches my eye from up there. The green light reaches my from a little bit lower and the violet light reaches my eye from lower still. I love physics!



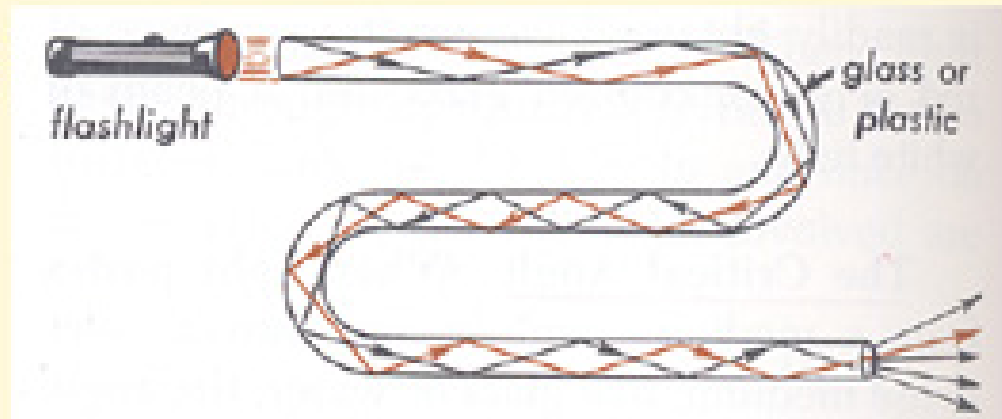
Typical Red Devil physics student

As long as bends are slight, total internal reflection means that light can pass along fiber optic cable without losing energy because of TIR

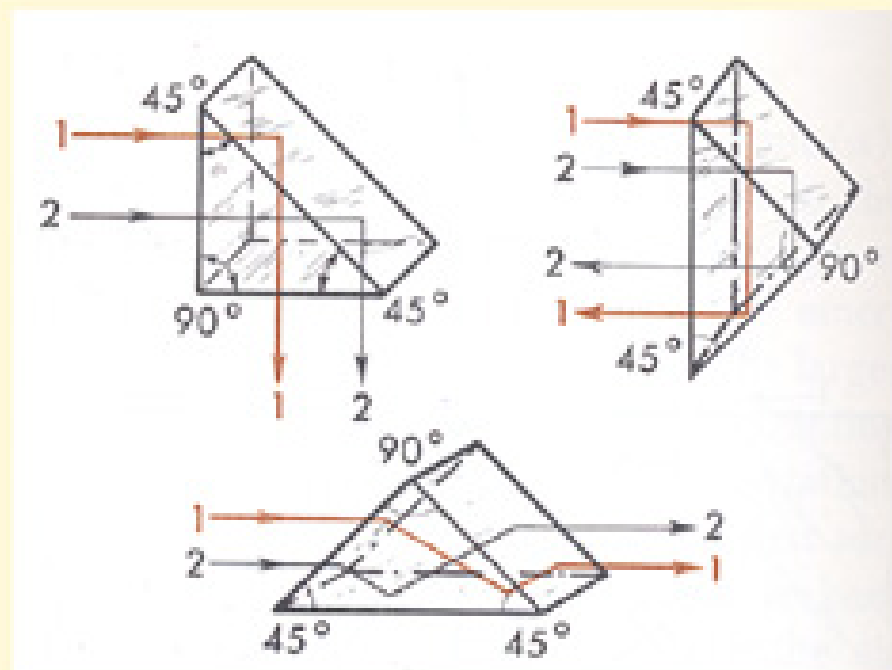


Total Reflection & Prisms

The rays are within the critical angle.

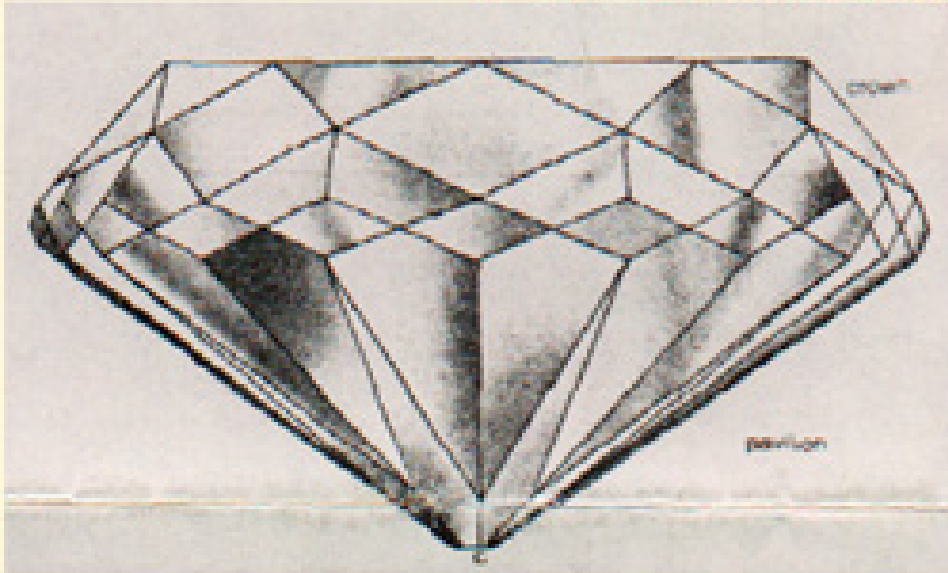


Hence: we have total reflection.



These prisms invert the image.

Diamond Action



Refractions & Total Reflections.

Diamonds have big index of refraction
Easy to get dispersion & TIR

