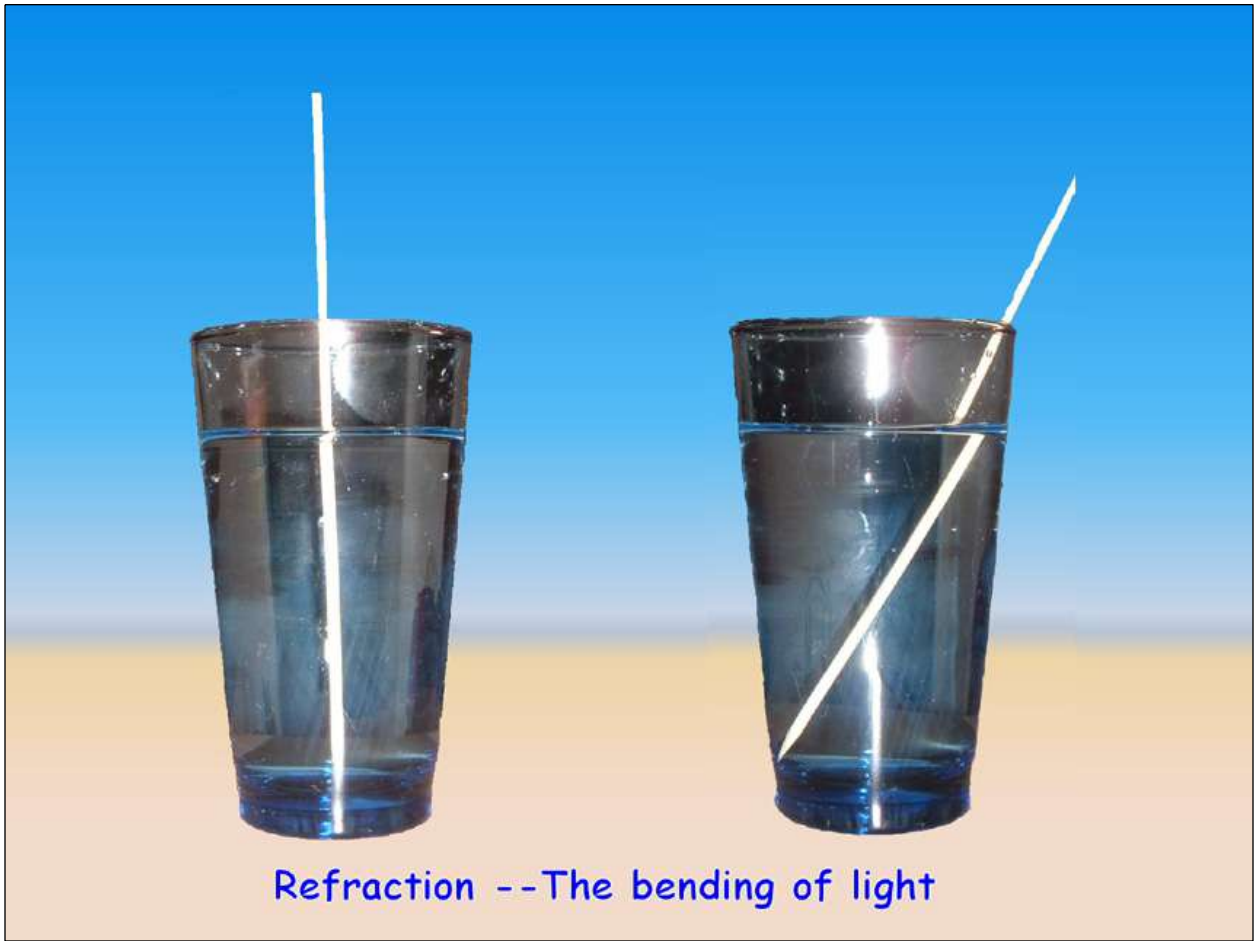
Chapter 14.1 Notes

Refraction

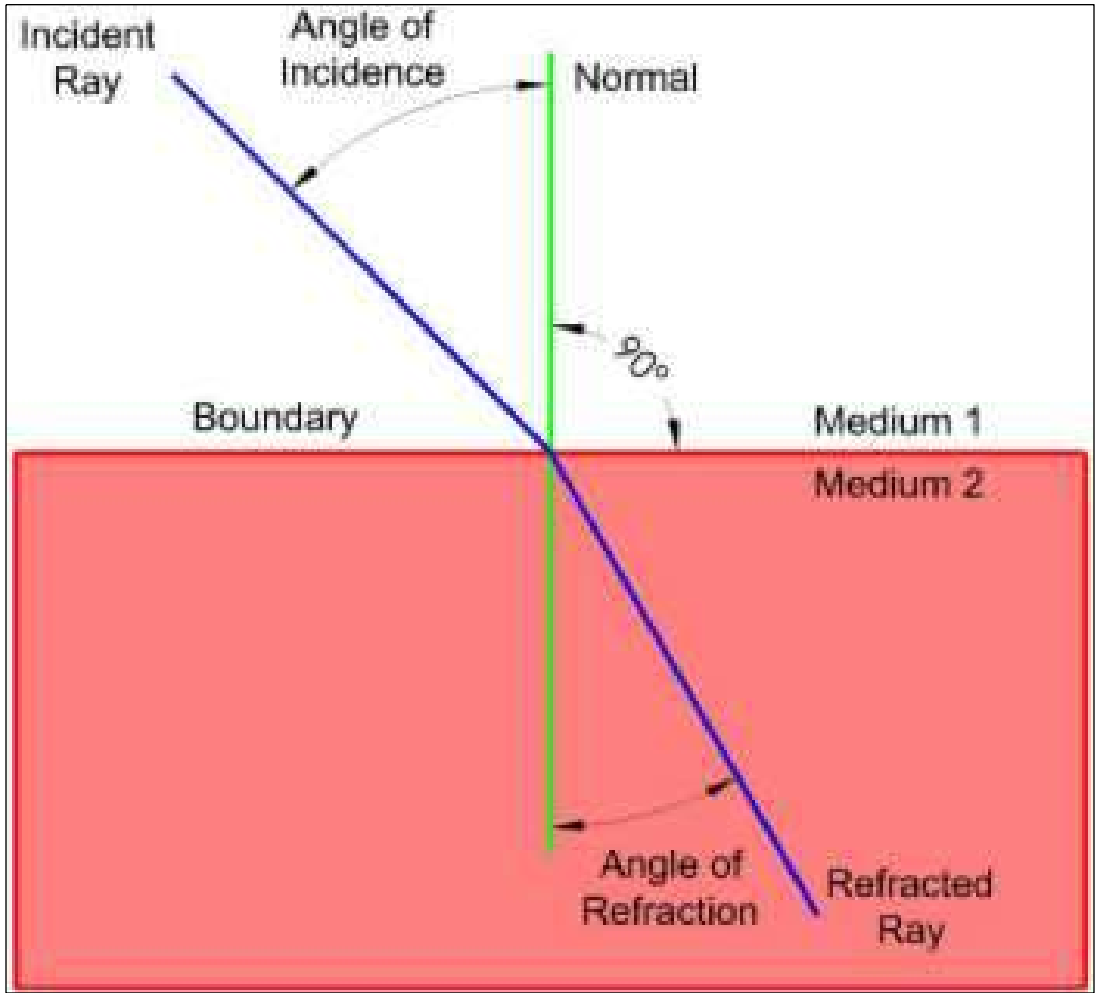
Refraction

- The bending of light as it travels from one medium to another is called refraction.

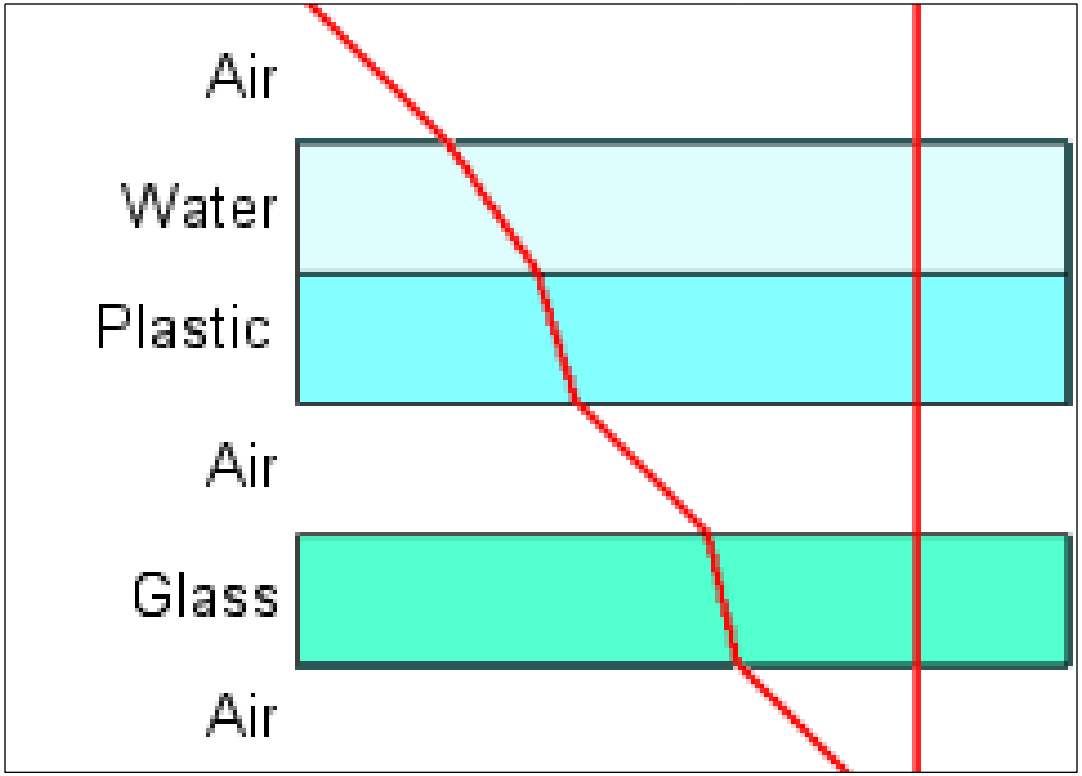


Refraction Demo

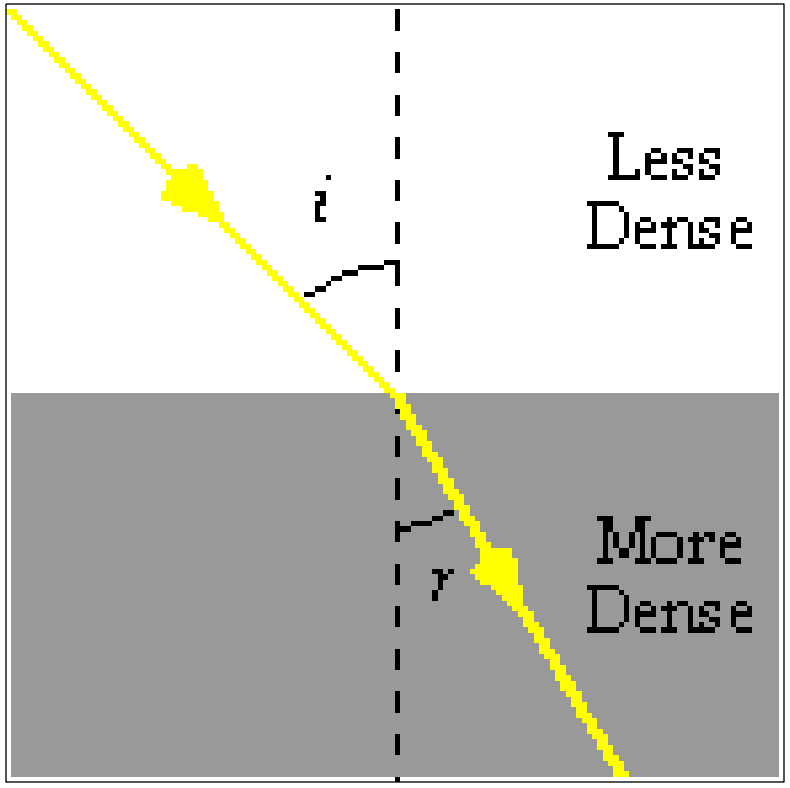
- The angle between the refracted ray and the normal is called the angle of refraction. The angle between the incidence ray and normal is called the angle of incidence.



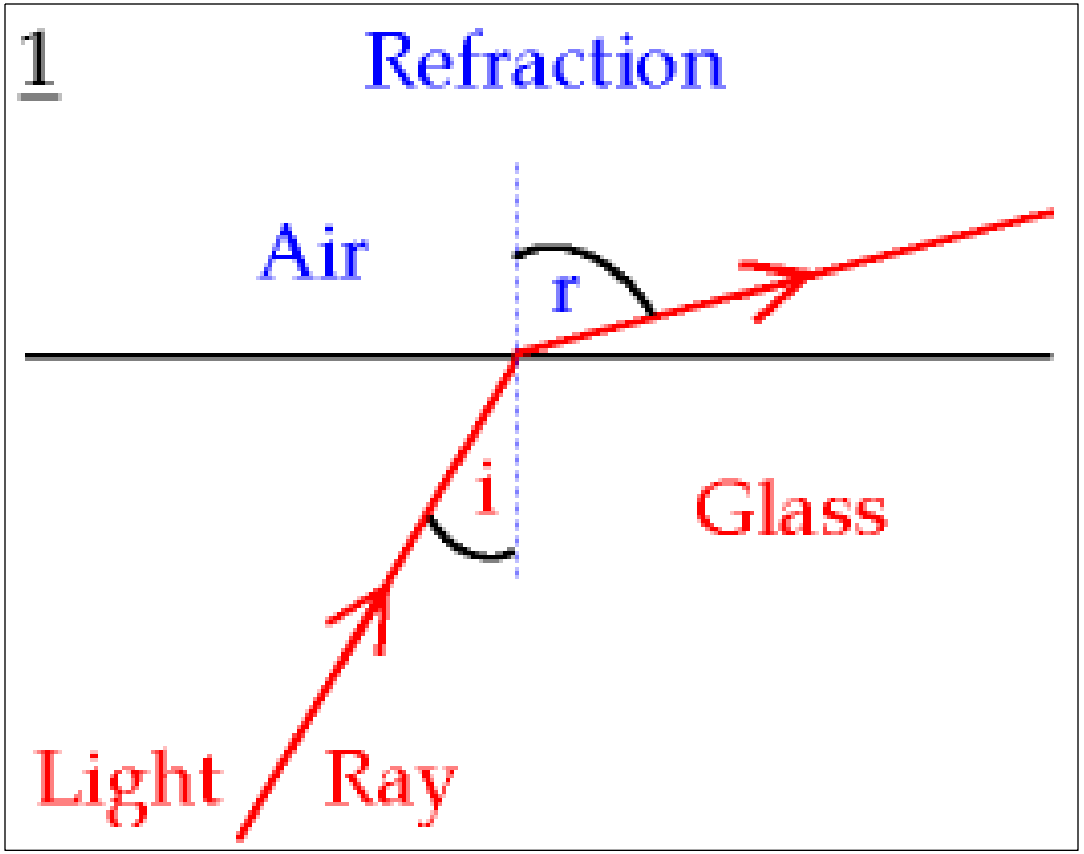
- Glass, water, ice, diamonds, and quartz are all examples of transparent media through which light can pass. The speed of light in each of these materials is different.



- When light moves from a material in which its speed is higher to a material in which its speed is lower, such as from air to glass, the ray is bent toward the normal.



- If the ray moves from a material in which its speed is lower to one in which its speed is higher, the ray is bent away from the normal.

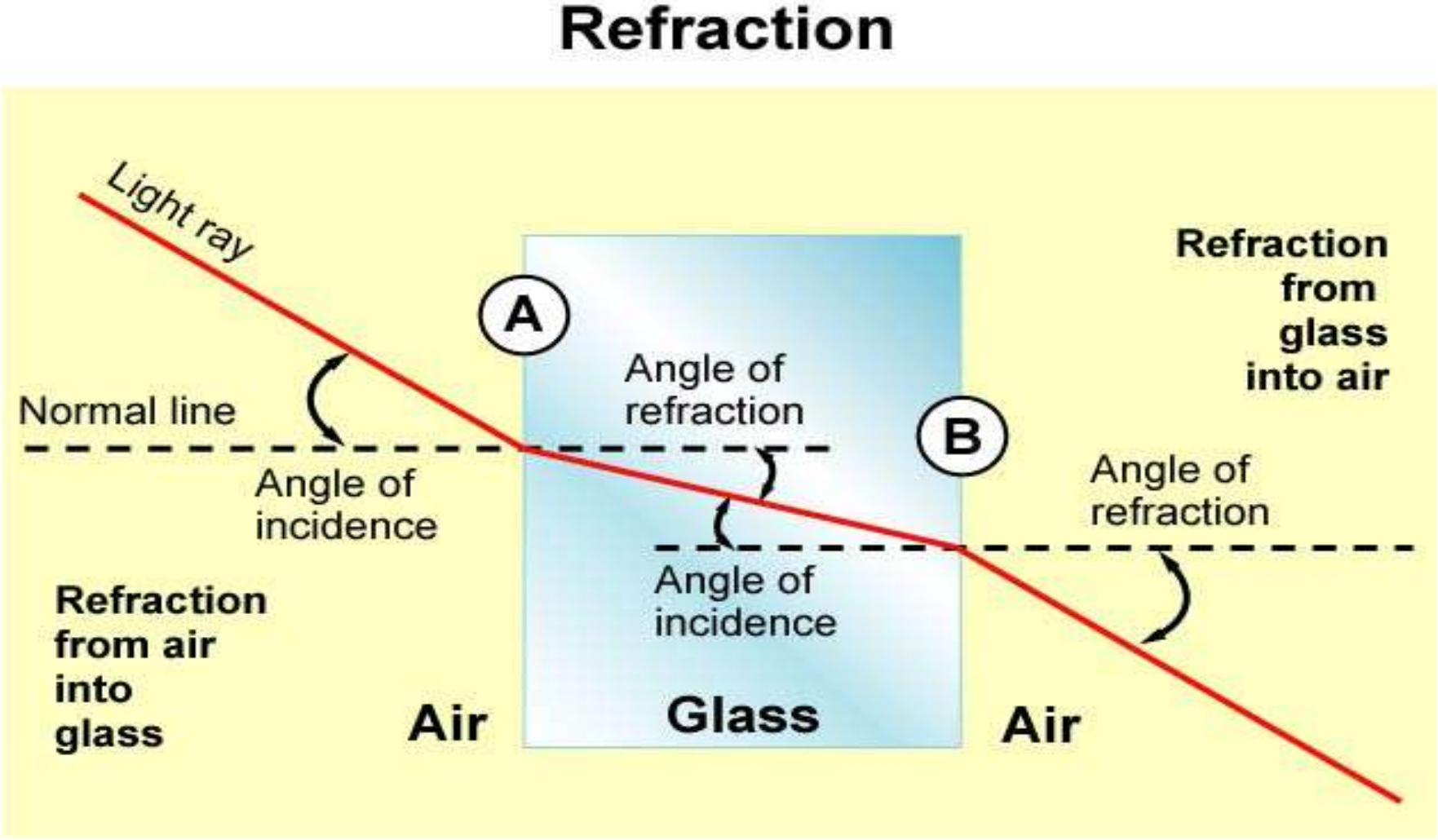


- The index of refraction for a substance is the ratio of the speed of light in a vacuum to the speed of light in that substance.
- Index of Refraction = Speed of light / Speed of light in medium
- Speed of light = 3×10^8 m/s
- Index of Refraction for air = 1

If the speed of light in a diamond is 1.42×10^8, what is the index of refraction?

Snell's Law

- Index of refraction$_I$ ($\sin\theta_I$) = Index of refraction$_R$ ($\sin\theta_R$)



If a light ray leaves the air (that has an index of refraction of 1) enters glass at an angle of 30 degrees and exits at an angle of 26 degrees, what is the index of refraction of the glass?