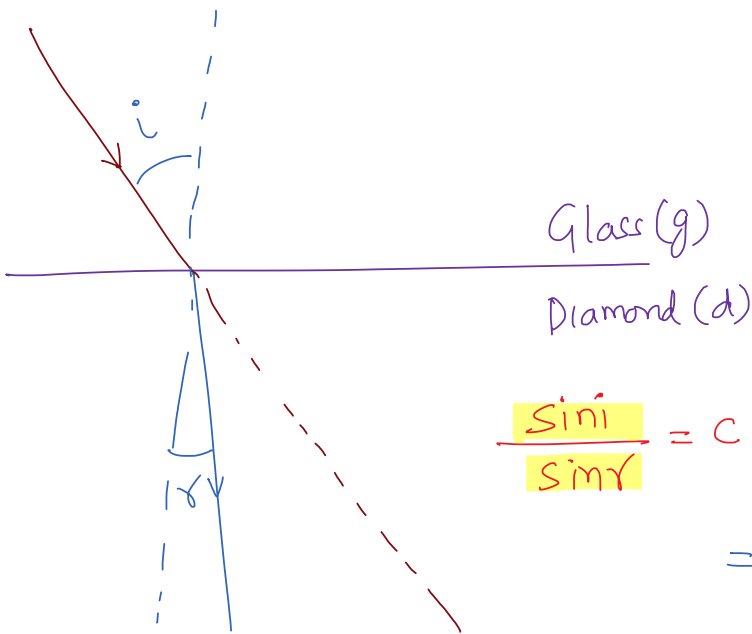


$$\frac{\sin i}{\sin r} = c = \text{Refractive index of the second medium (where light bends) wrt the first medium.}$$

$$= \mu_{21} = \frac{\text{Velocity of light in medium 1}}{\text{Velocity of light in medium 2}} = \frac{v_1}{v_2}$$

$$\mu_{21} = \frac{v_1}{v_2}$$

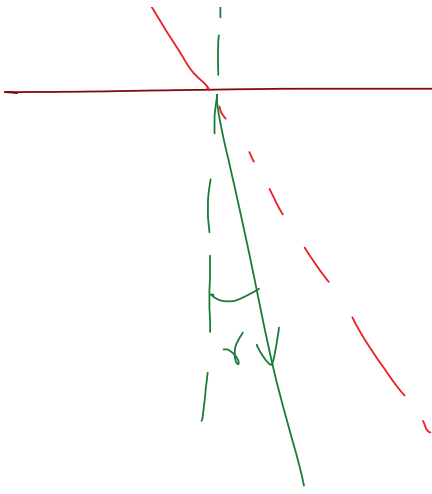


$$\frac{\sin i}{\sin r} = c = \mu_{dg} = \frac{v_g}{v_d}$$

= Refractive index of the second medium (Diamond) wrt the first medium (Glass)

= Refractive index of Diamond wrt Glass

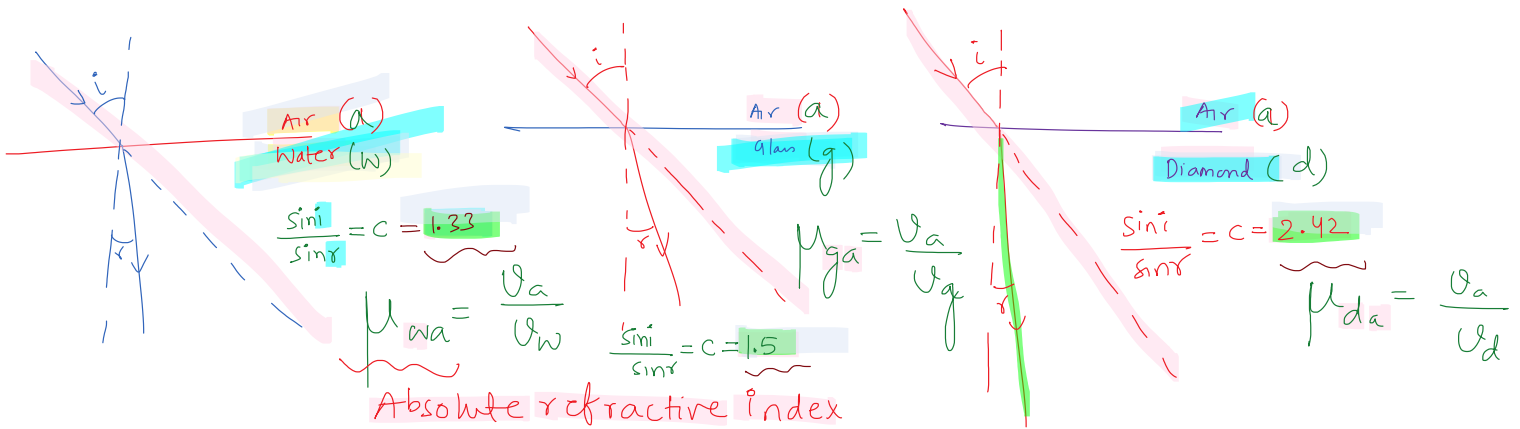




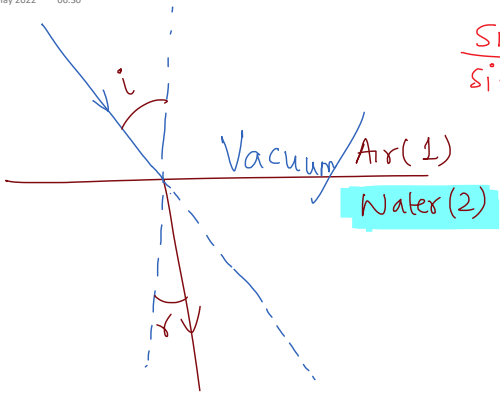
Water (4)

Ruby (5)

$$\frac{\sin i}{\sin r} = c = \mu_{54} = \frac{v_4}{v_5}$$



Higher the refractive index, the light will bend more towards the normal.
 Higher the refractive index, more will be the bending of light rays.



$$\frac{\sin i}{\sin r} = c = \mu_{21} = \frac{v_1}{v_2}$$

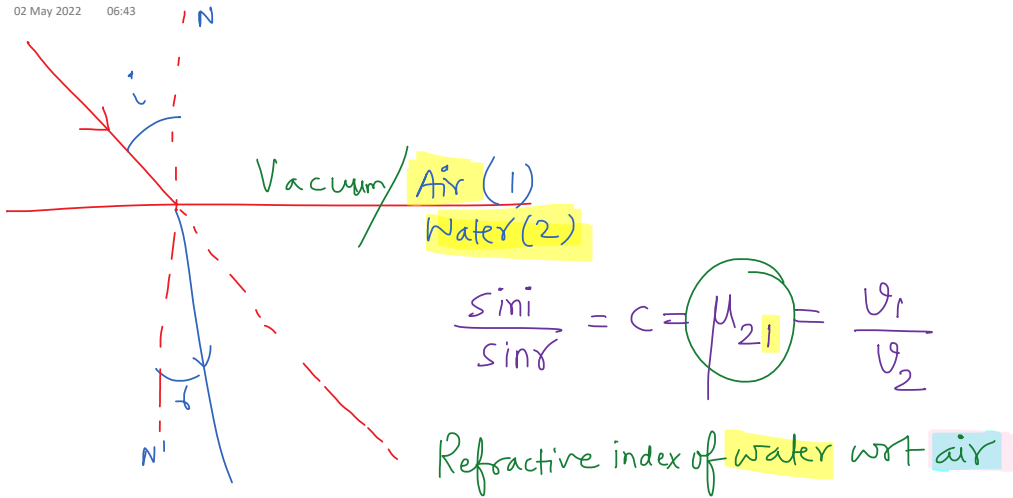
$$\mu_{21} = \frac{v_1}{v_2}$$

$$\mu_{21} = \frac{v_1/v_1}{v_2/v_1} = \frac{1}{\left(\frac{v_2}{v_1}\right)} = \frac{1}{\mu_{12}}$$

$$\mu_{21} = \frac{1}{\mu_{12}}$$

$$\mu_{gd} = \frac{1}{\mu_{dg}}$$

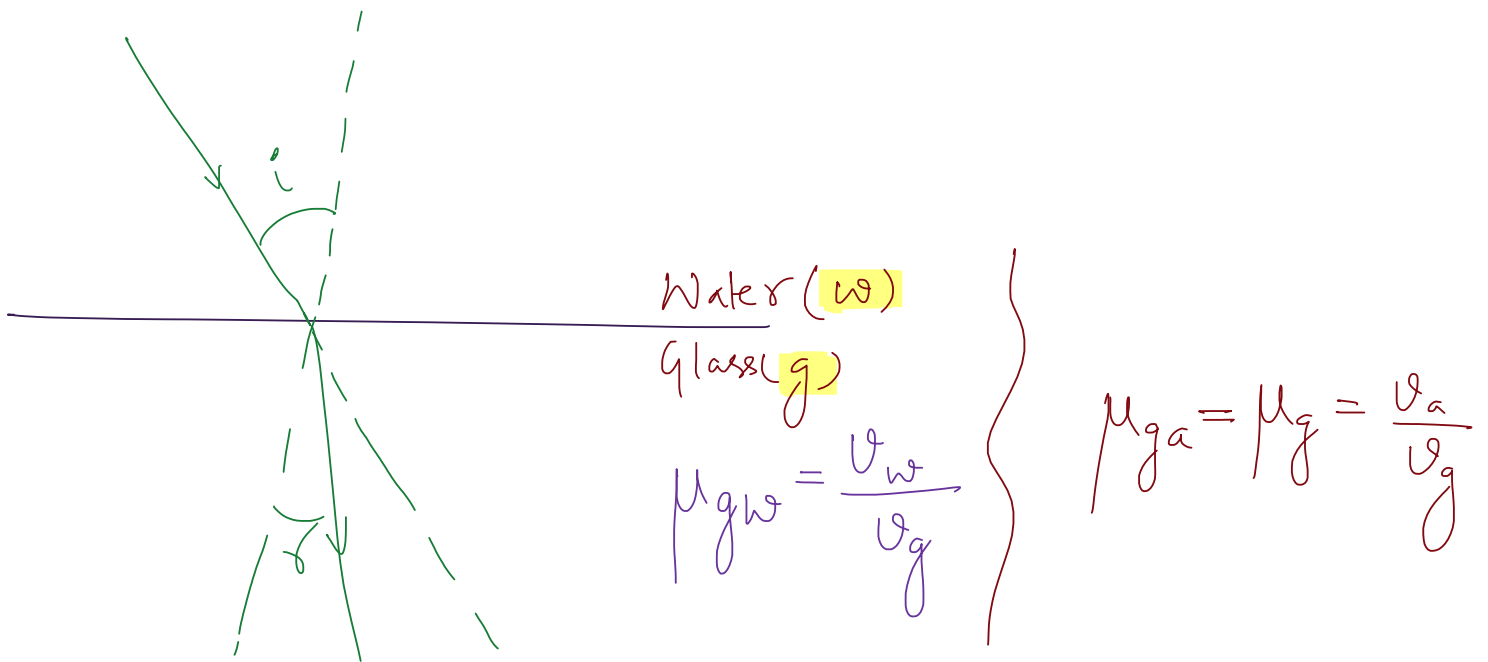
$$\mu_{67} = \frac{v_7}{v_6}$$



Absolute refractive index means refractive index of a medium when the first medium from where light is coming is air/vacuum.

$$\mu_{21} = \mu_2$$

Refractive index of glass is 1.5 means Refractive index of glass wrt air is 1.5 that means Absolute Refractive index is 1.5



1. Calculate the refractive index of the material of a glass slab. Given that the speed of light through the glass slab is 2×10^8 m/s and in air is 3×10^8 m/s.

$$\mu_{ga} = \frac{v_a}{v_g} = \frac{3 \times 10^8}{2 \times 10^8} = 1.5$$

$$v_g = 2 \times 10^8 \text{ m/s}$$

$$v_a = 3 \times 10^8 \text{ m/s}$$

2. Calculate the speed of light in water of refractive index $4/3$. Given the speed of light in air is 3×10^8 m/s.

$$\mu_{wa} = \frac{4}{3}$$

$$\frac{v_a}{v_w} = \frac{4}{3}$$

$$\frac{3 \times 10^8}{v_w} = \frac{4}{3}$$

$$\Rightarrow 3 \times 3 \times 10^8 = 4 \times v_w$$

$$\frac{9 \times 10^8}{4} = v_w$$

$$2.25 \times 10^8 \text{ m/s} = v_w$$

3. The refractive index of glass is 1.6 and that of diamond is 2.4. Calculate the refractive index of diamond with respect to glass.

$$\mu_{ga} = 1.6$$

$$\mu_{da} = 2.4$$