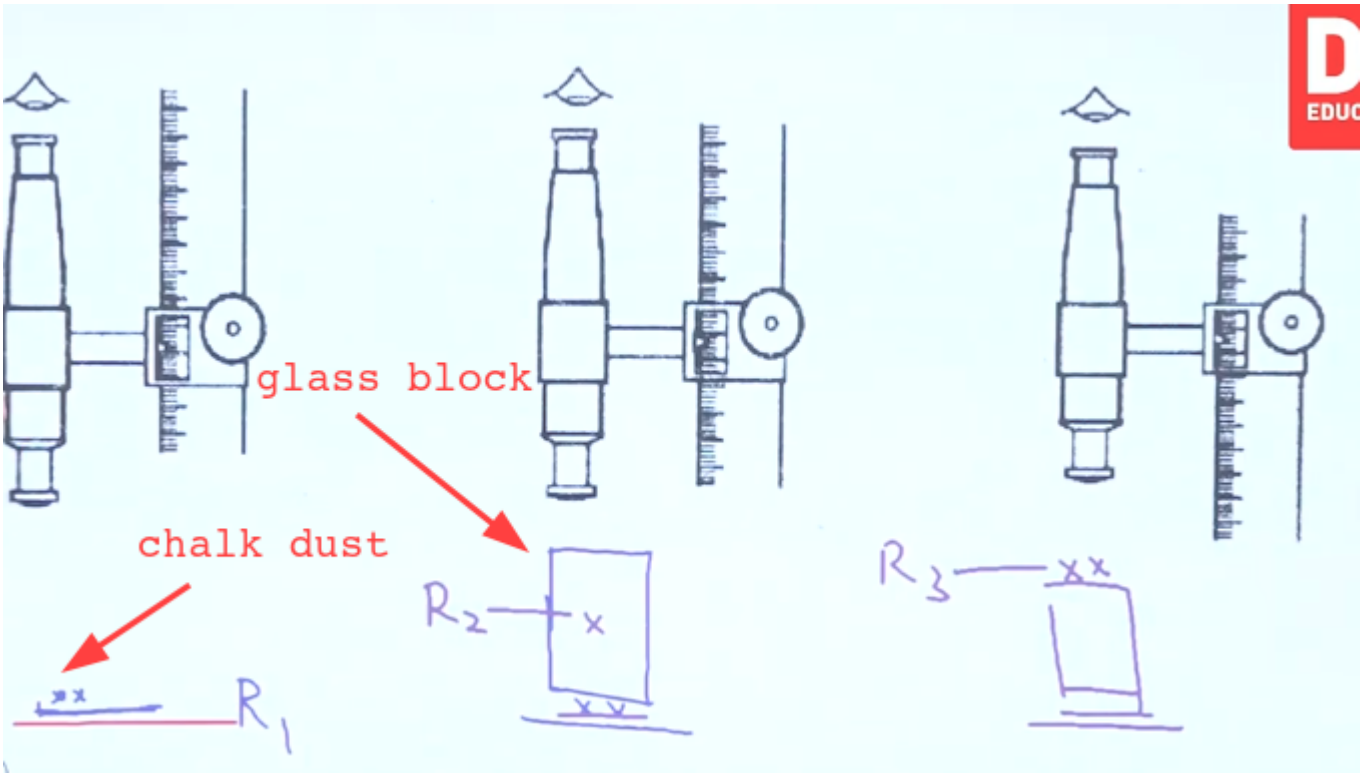
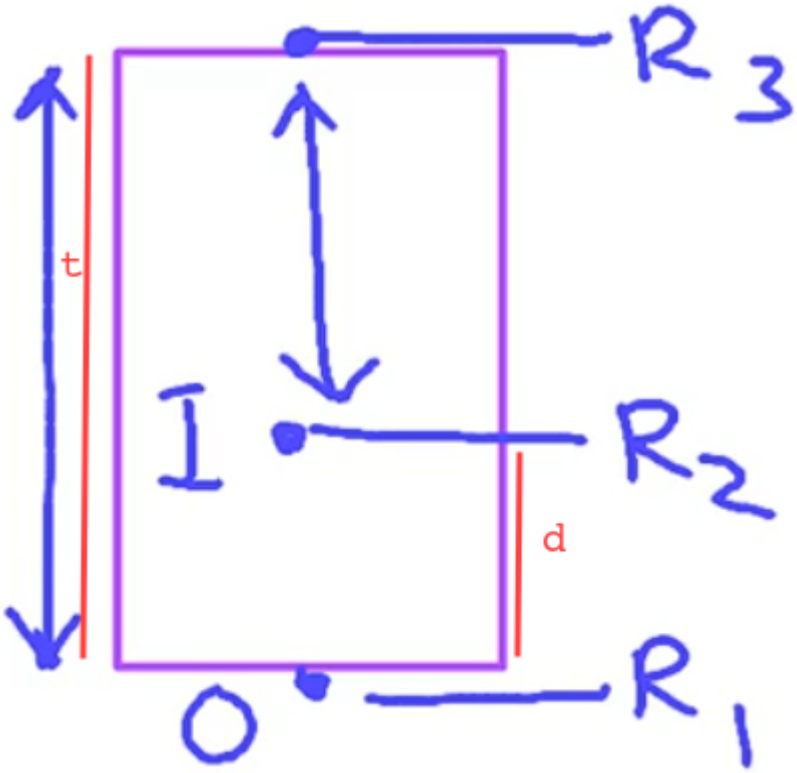
- Initial setup



Here the readings are relevant to `t` and `d` as follows.

1. Real depth = `t` = `R3 - R1`
2. Apparent displacement = `d` = `R2 - R1`
3. Apparent depth = `R3 - R2`



Therefore, using the following equation, we can find the refractive index of the glass block using these readings.

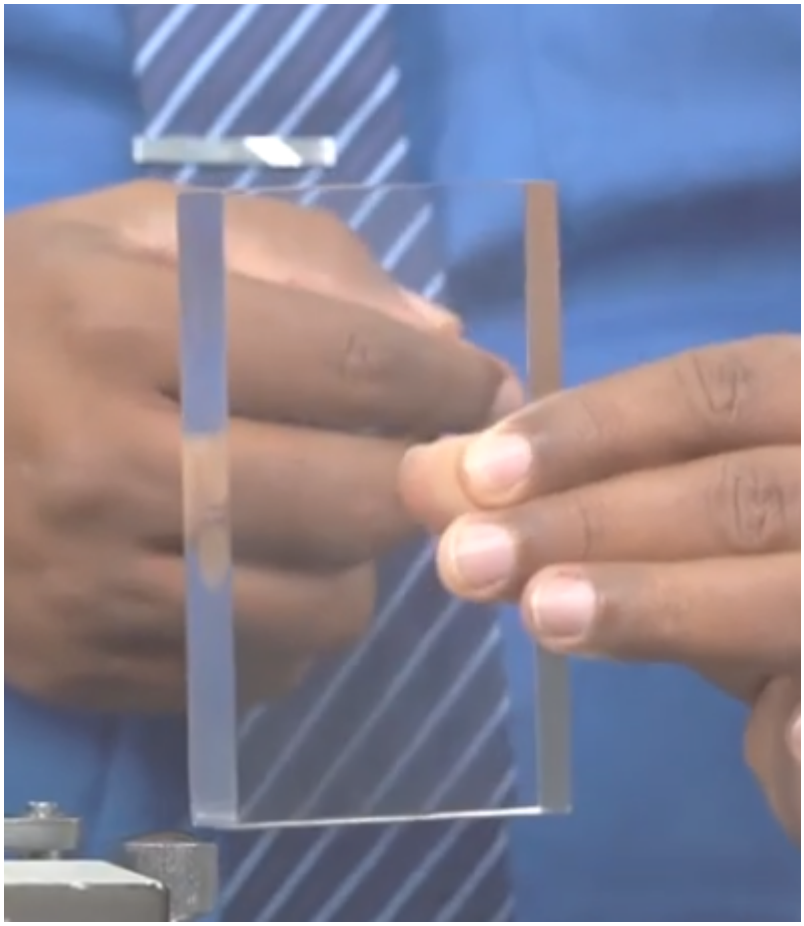
$$
\begin{aligned}
n &= \frac{t}{t-d} \\
t &= R_3 - R_1 \\
d &= R_2 - R_1 \\
n &= \frac{(R_3 - R_1)}{(R_3 - R_1) - (R_2 - R_1)} \\
\therefore n &= \frac{(R_3 - R_1)}{(R_3 - R_2)}
\end{aligned}
$$

$$
\therefore n = \frac{Real\ Depth}{Apparent\ Depth}
$$

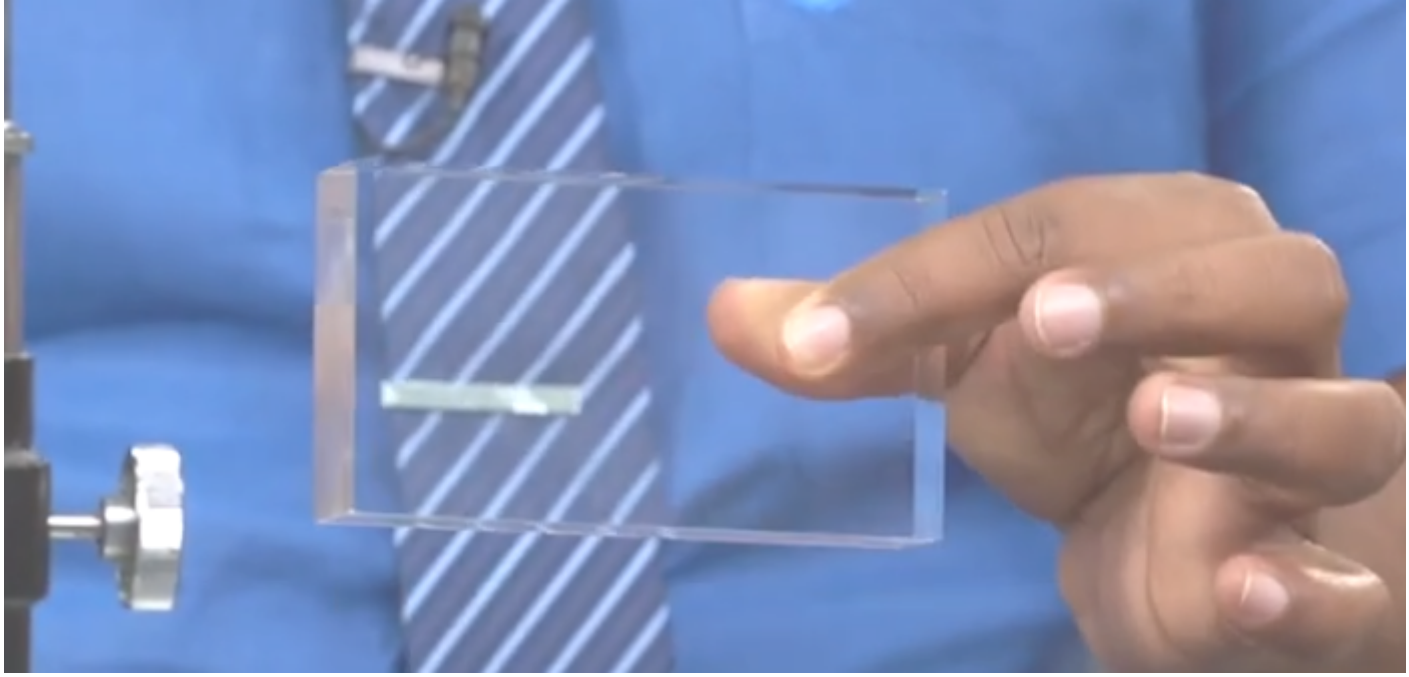
Important points

- Why should we keep the longest side of the glass block vertically (t).

> By keeping it like that we increase the thickness and therefore the value `t`, so we can reduce the percentage error when getting the readings `t` and `d`



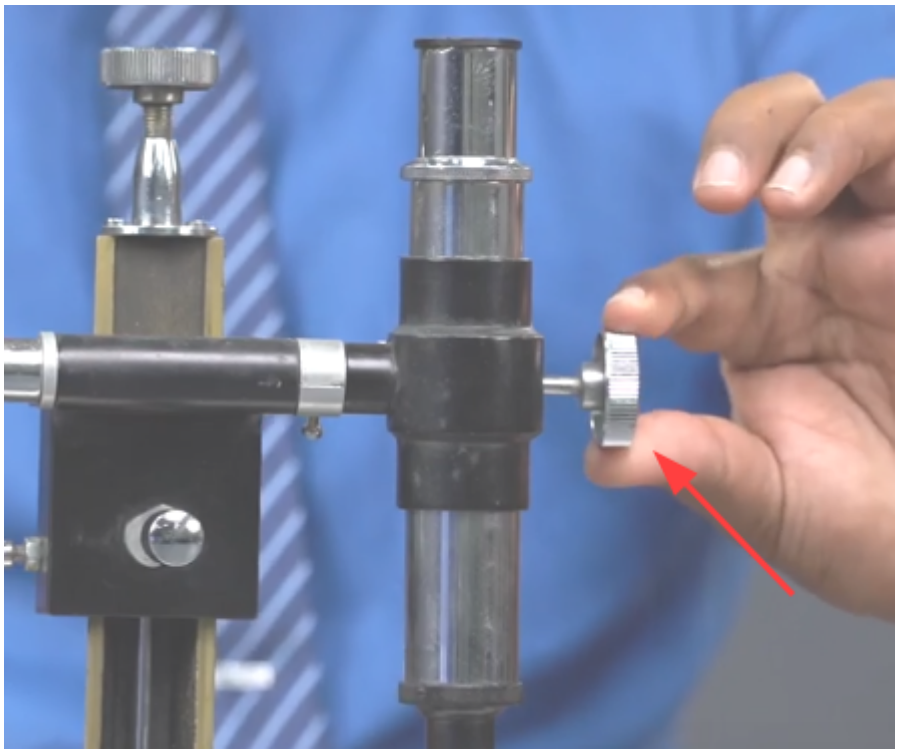
Not that the above figure shows the orientation that will give us the highest thickness, but its hard to keep the glass block like this in the microscope, therefore we keep it the next best way which is shown below



- When initially setting up the microscope, you can use the microscope adjustment screw to do the fine tunning, but after take the first reading, you can't take that to adjust the fine tunning, why?

Because when you adjust this screw the vernier scale doesn't change. Only the height changes, therefore this could affect to the next readings if we do so.

So we can only adjust this screw to get the first reading, after that we have to use the vertical fine/corse adjestment screw



- When you take the reading, the vernier side should be always kept at your side, why?

For convinience. So thats easy for us to take the reading.

- If you want to find the refractive index of a liquid, what can we do?

we can put a pin in a beacker, fill it with the liquid and get the readings and use the same method as above.