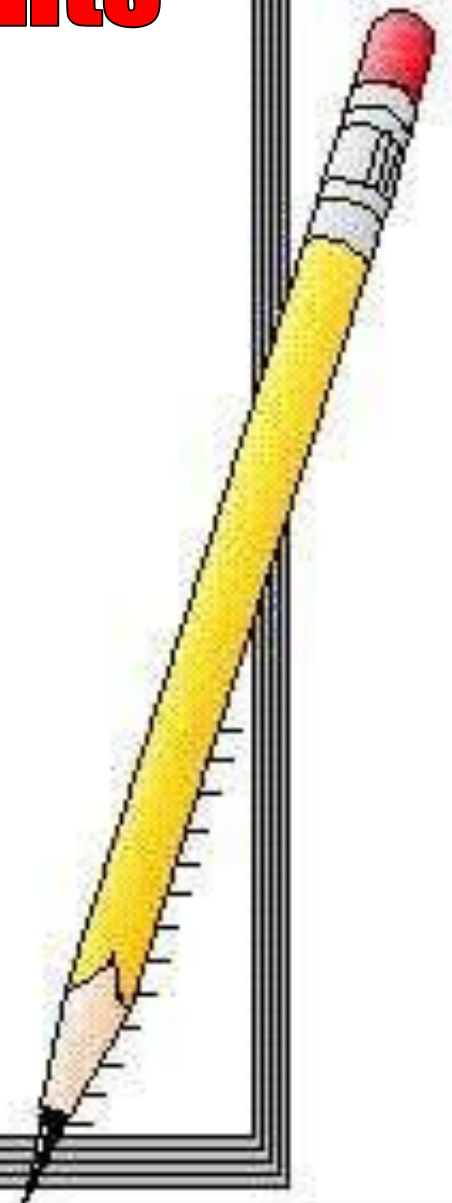


# Take exact measurements of the drosophila fly

254 Bot



LAB 2

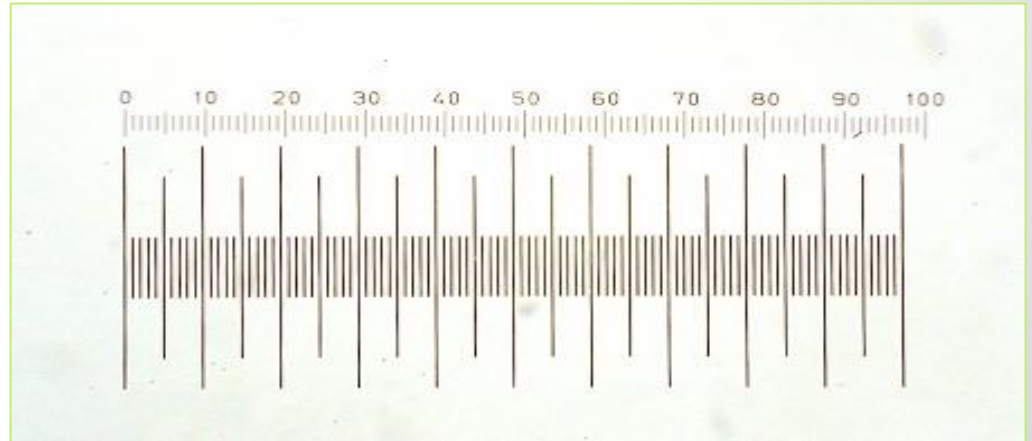
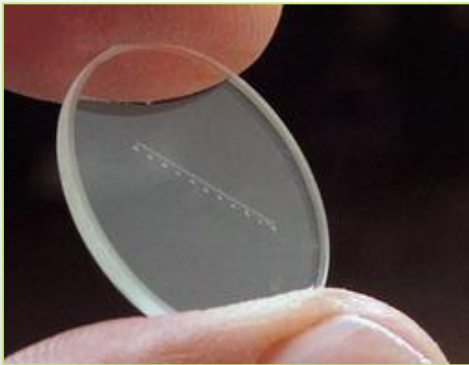




# Can we take measurements of this insect??



**Yes, by stage micrometer and eyepiece micrometer**



A microscope can be used not only to see very small things but also to measure them. Things seen in microscopes are so small that centimeters or even millimeters are too big. As a result, micrometers (or microns) are used. A micrometer, also written  $\mu\text{m}$ , is one thousandth of a millimeter - it's  $10^{-6}\text{m}$ .

For this, a micrometer eyepiece is used in place of the standard eyepiece of the microscope. This has a series of numbered lines inside of it which make it look like a ruler

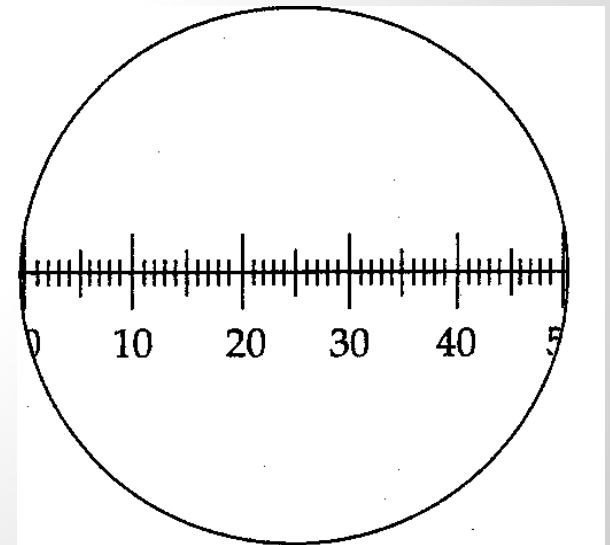
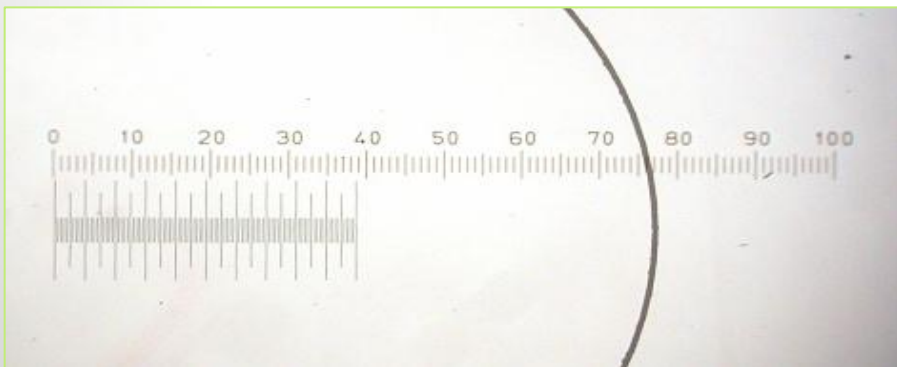
## **Micrometry**

It is a technique used to measure the size of microscopic objects.

# Eyepiece Micrometer

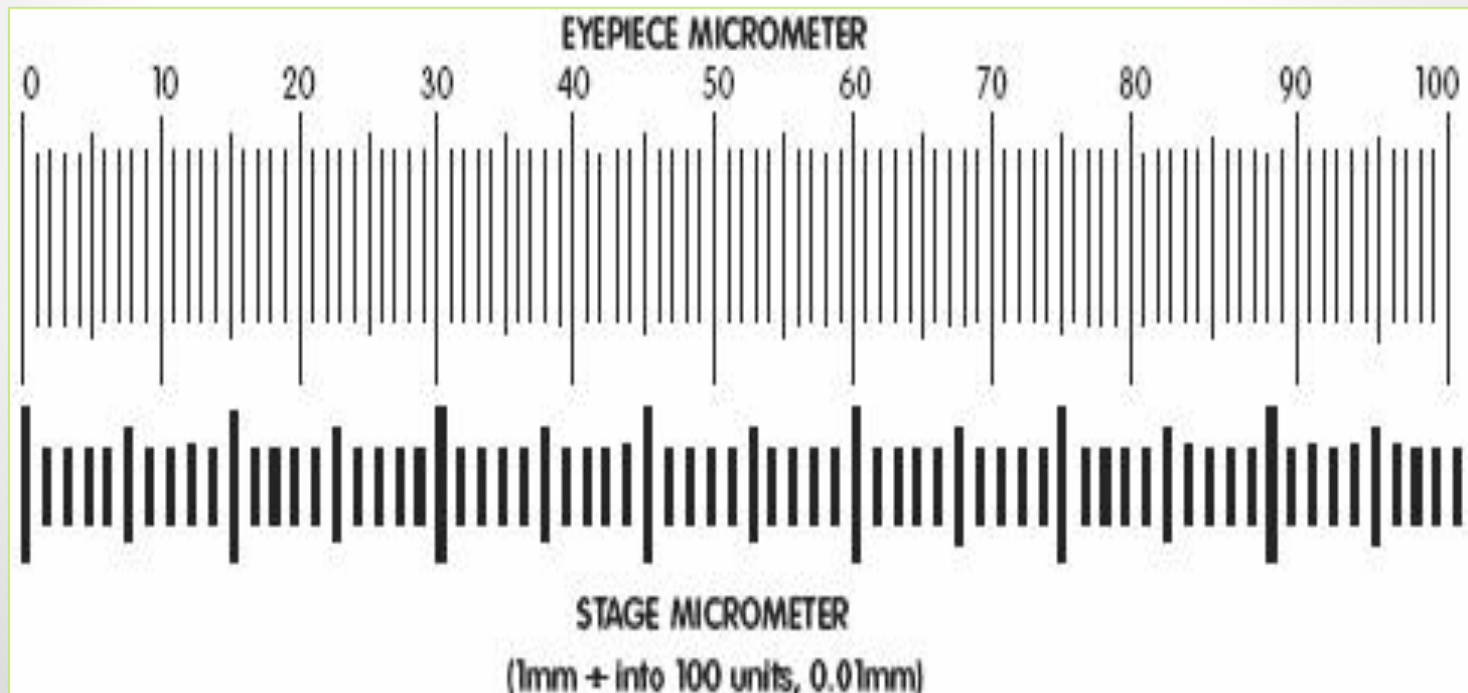


The eyepiece micrometer is a glass disc with **100 equal divisions** or lines on it but with no absolute value and it is placed in the eyepiece of the microscope. So we have to calibrate the eyepiece micrometer **but how??**



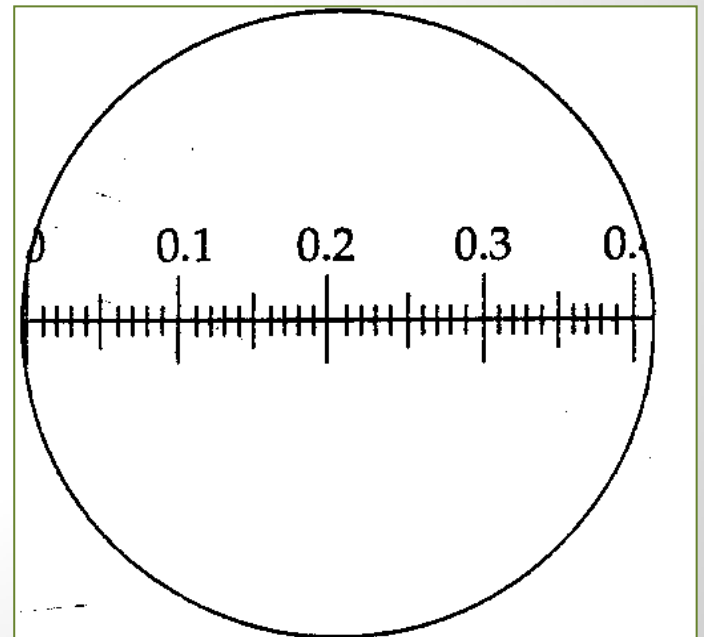
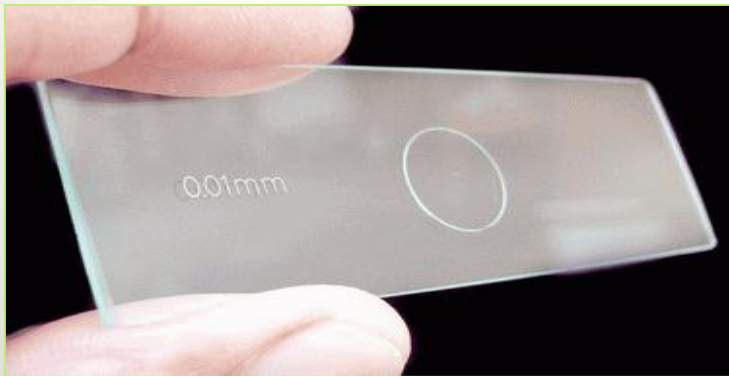
## \* Principle:

Calibration of the eyepiece micrometer using the Stage micrometer



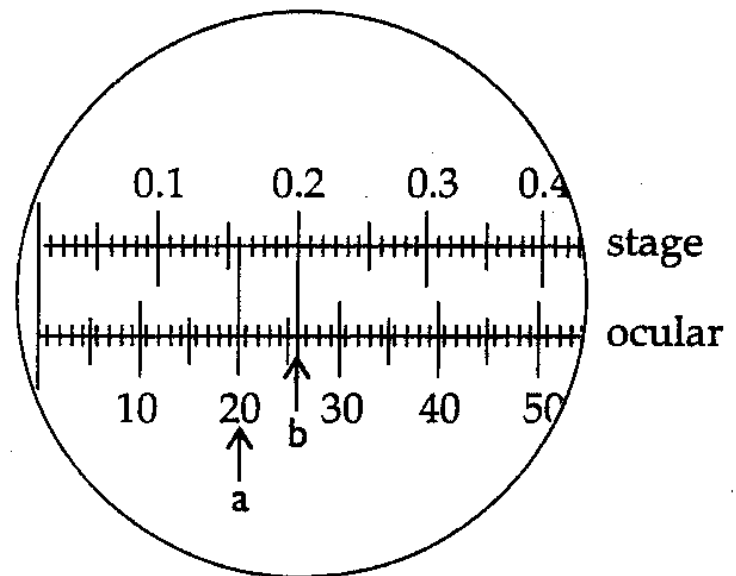
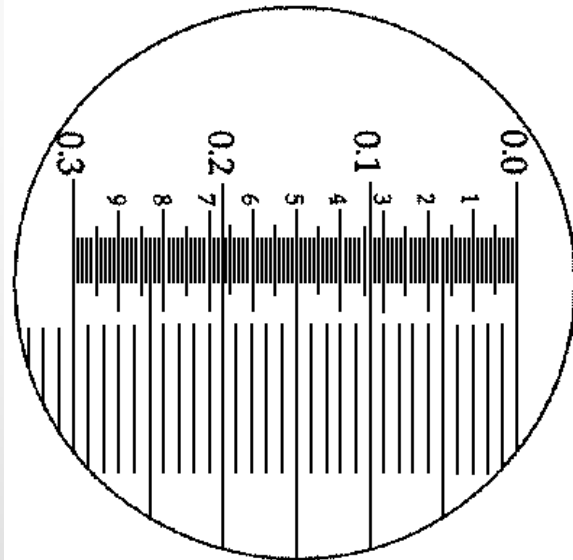
## Stage micrometer

- It is used to calibrate the eyepiece micrometer.
- Stage micrometer looks like a microscope slide but has a standard scale etched into it . The smallest divisions are 0.01 mm in length. It is just like a tiny ruler.
- **0.01 mm = 10 micrometer**



# Procedure

- 1-we place the eyepiece micrometer in the right eyepiece lens of the LM.
- 2-we place the stage micrometer on the stage of the LM.
- 3- we look into the eyepiece and focus on the stage micrometer at low power. We move the stage micrometer so that both the eyepiece and stage micrometer parallel to each other.

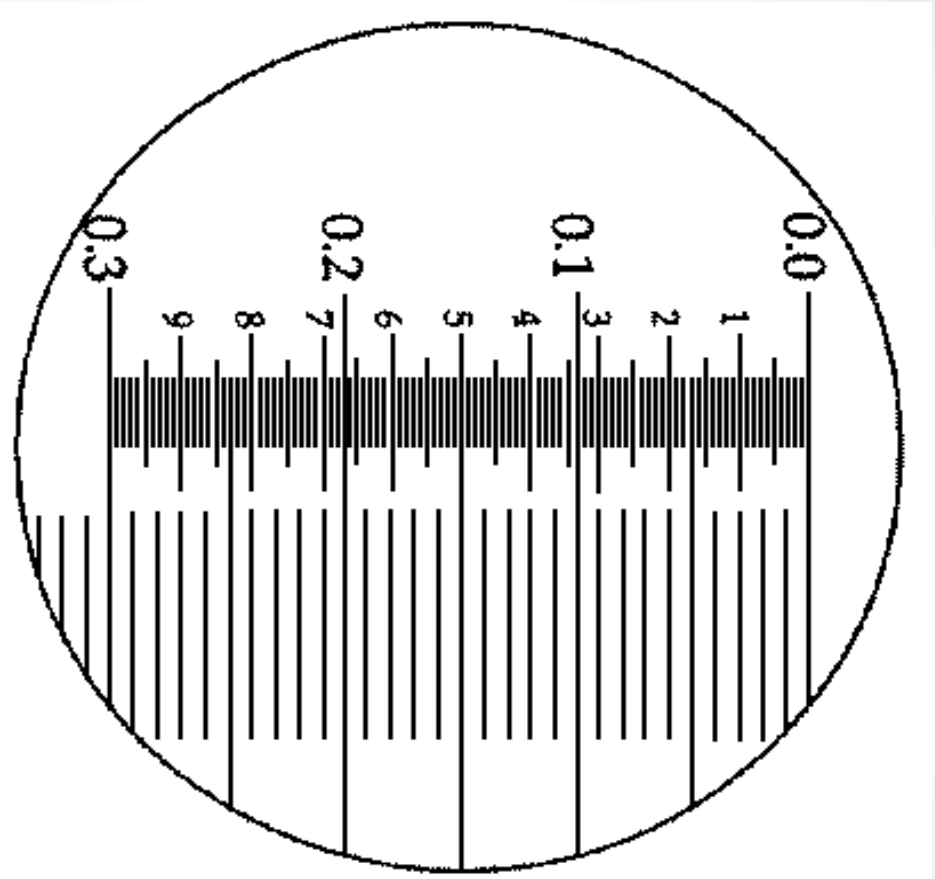


# Procedure

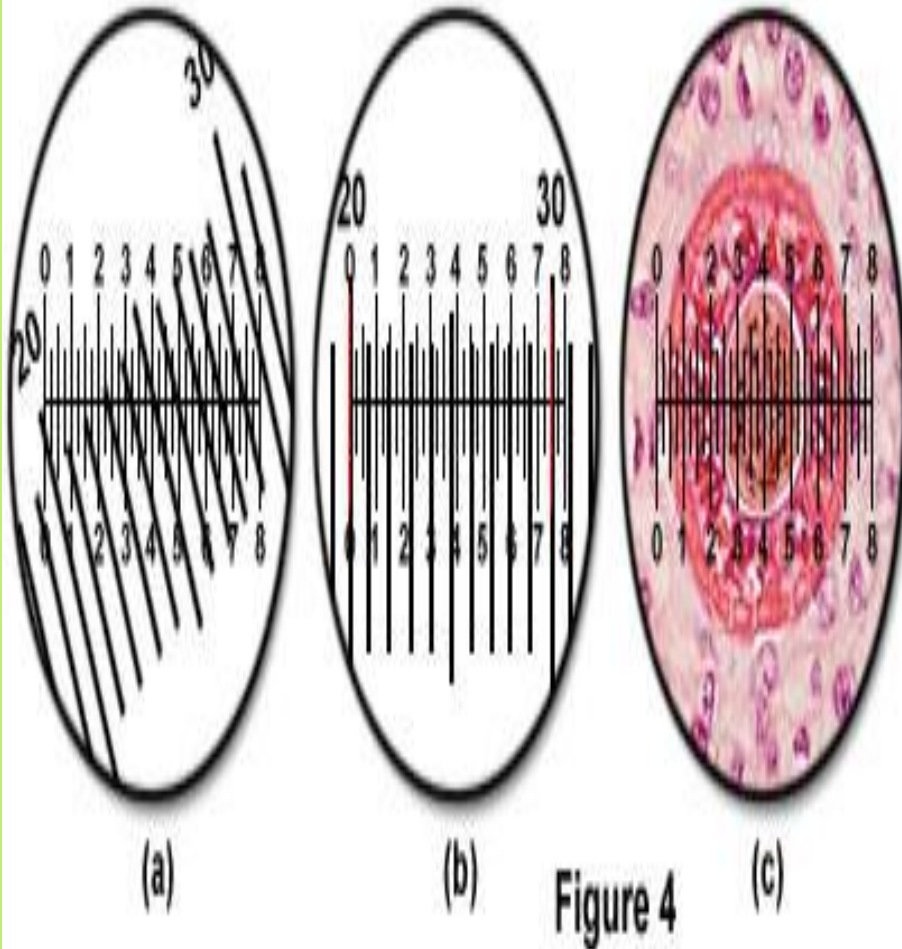




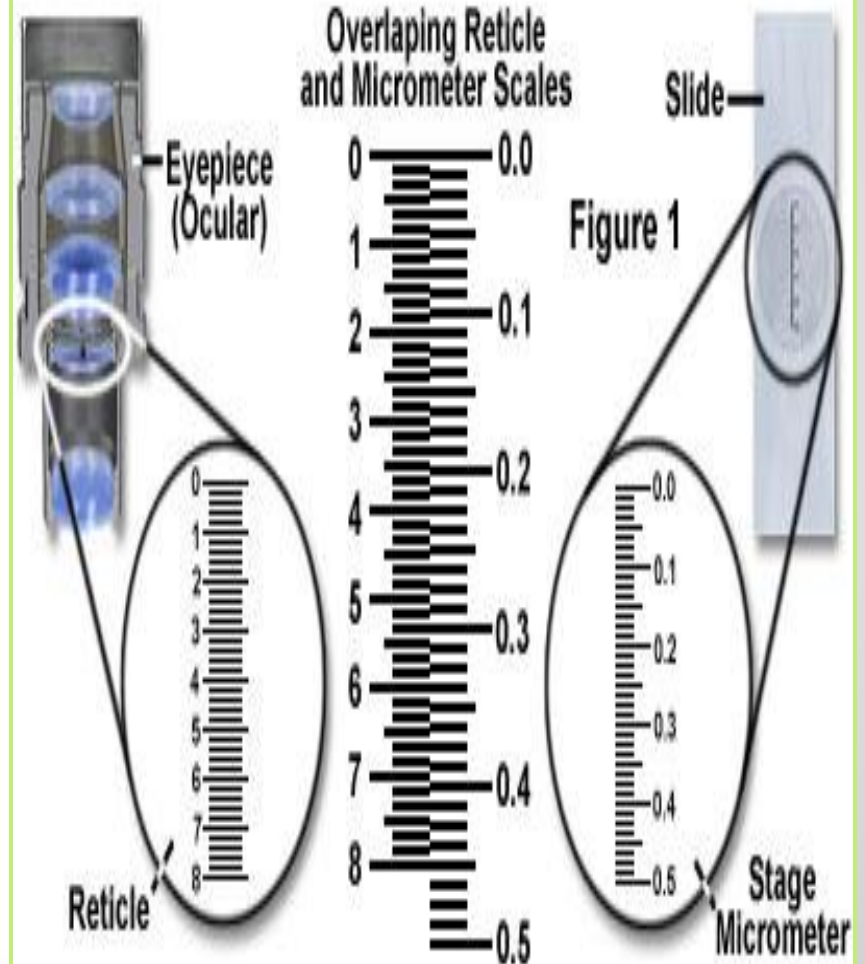
3



## Reticle Calibration and Specimen Linear Measurement



## Eye-piece Reticles and Stage Micrometers



# How to Calibrate??

## At x 10 objective Calculation:

**Stage micrometer Division    eyepiece micrometer Division**

20

20

40

40

60

60

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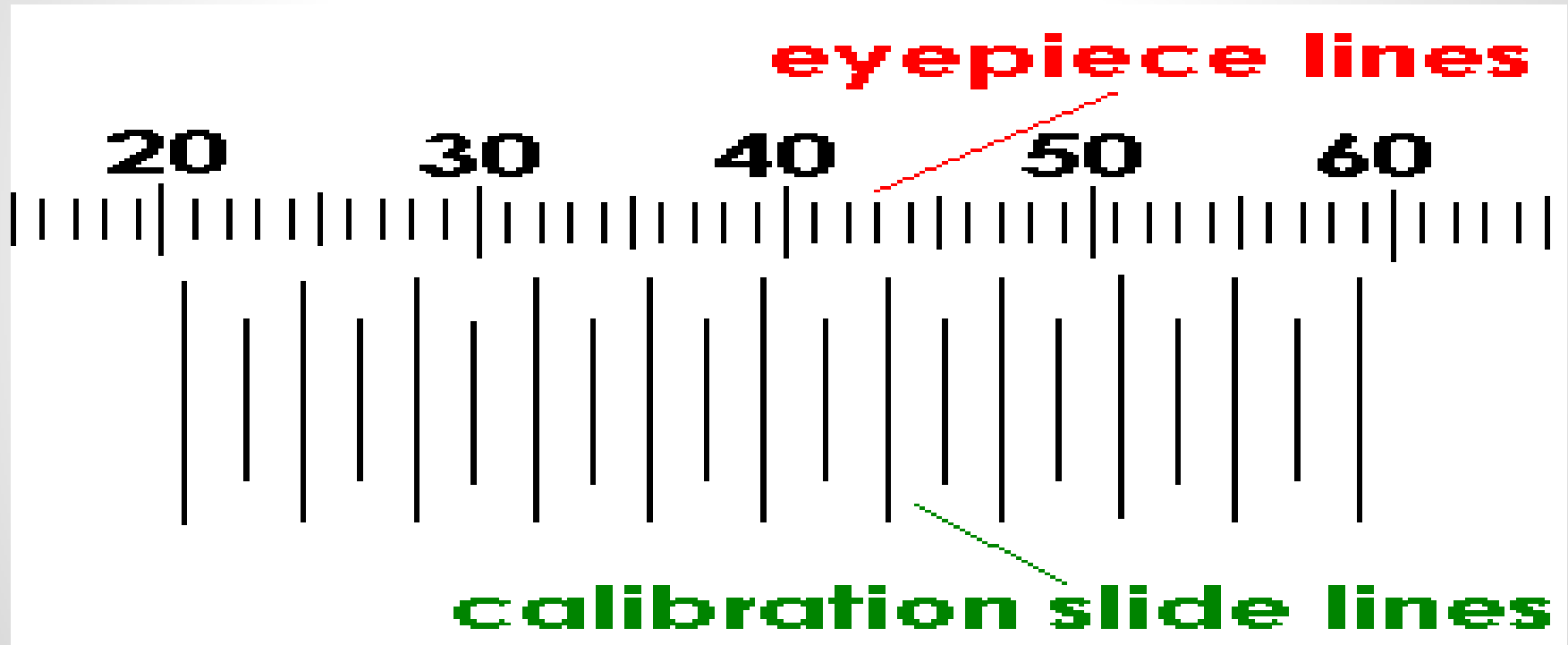
120

---

120

To calculate the relationship between the two points that have aligned, the following formula is used:

**\*\* Number of units** = number of divisions on stage micrometer divided by the number of divisions on the eyepiece.



$$\frac{Y}{X} \times 10 \mu\text{m} = \text{measurement between 2 lines on the eyepiece}$$

120 eyepiece divisions = 120 stage division  
(1 stage division = 10 micrometer)

Therefore 120 stage divisions = 1200 um

- 120 eyepiece divisions = 1200 um

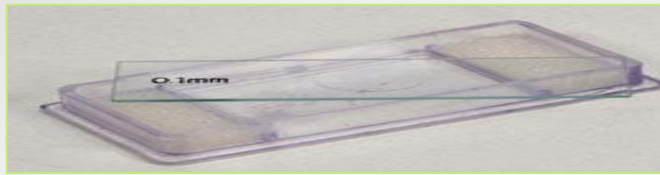
- 1 eyepiece division (at x 10) =  $1200 / 120$   
= 10 um

**Similar calibration can be performed  
with the x 40 and x 100**

**Result should be as follows :**

1 eyepiece division at x 40 = 2.5 um

1 eyepiece division at x 100 = 1 um

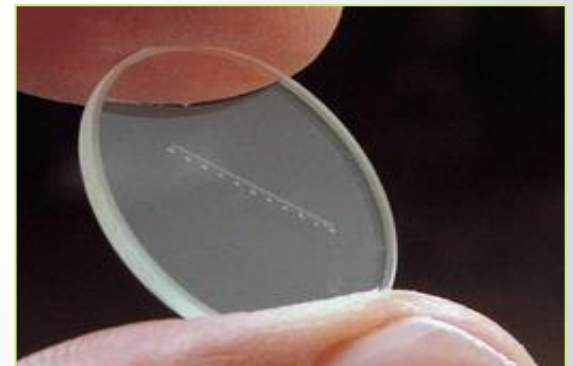
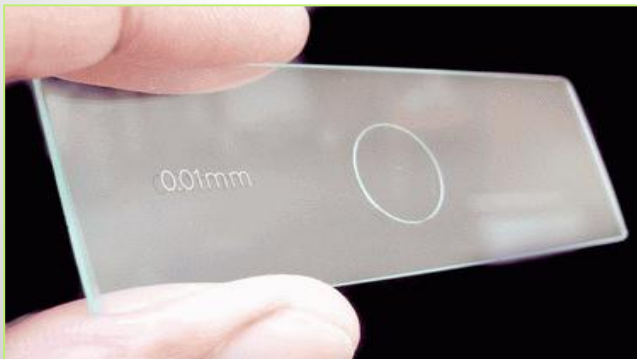


## Note:

- If you change microscopes, the calibration process must be done again for each of the objective lenses that you are using.

- **Why?**

- Because the magnification is different on different microscopes.



منيرة الدوسري

Thank You  
So Much