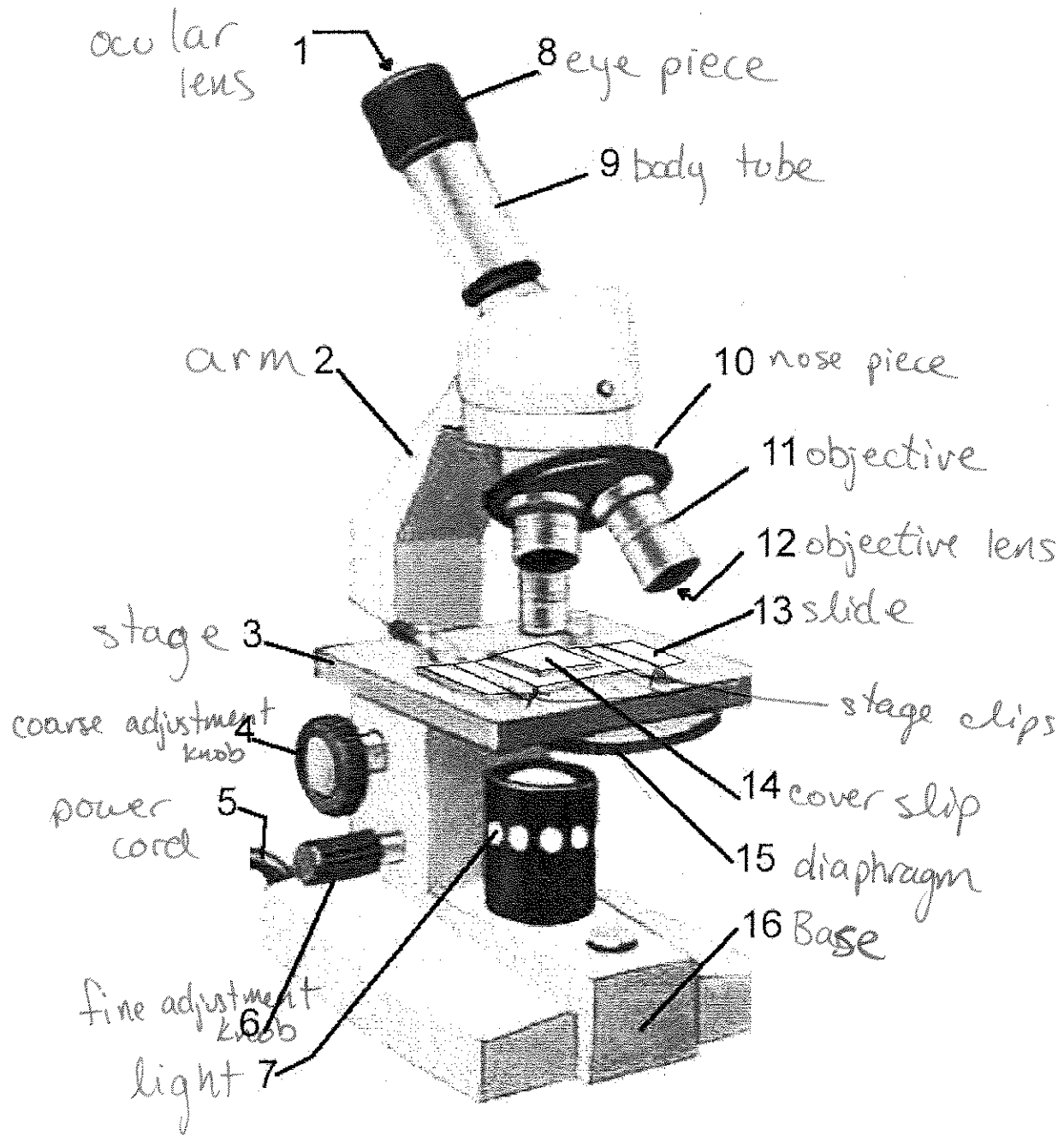


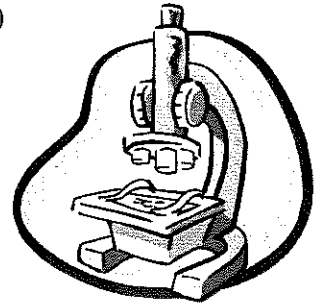
# The MICROSCOPE

The type of microscope we use in our classroom is a compound light microscope. Why is it called this? it uses light, and 2 lenses are used to magnify.



## Functions of the Parts of the Microscope

- 1) arm : Supports the upper part of the microscope; is used to carry the scope.
- 2) base : Supports the bottom of the microscope; is used to carry the scope.
- 3) body tube : Keeps the eyepiece and the objective apart and in line (lines up lenses)
- 4) objective lens : Contained in the objective. Magnification varies.
- 5) nose piece : Turns to change to different objectives
- 6) fine adjustment : Turns to bring the specimen sharply into focus
- 7) objective : Contain lenses with different amounts of magnification (4x, 10x, 40x)
- 8) coarse adjustment : Moves the stage or body tube up and down to bring specimen into basic focus
- 9) stage & stage clips : Supports the slide being viewed
- 10) stage clips : Hold the slide in place on the stage
- 11) stage : Moves to bring the specimen into view
- 12) diaphragm : Located under the stage, it opens and closes to let in different amounts of light
- 13) light : Shines light onto the specimen (through the diaphragm)



## MICROSCOPE MATH

To find out the total magnification of a specimen, you must multiply the magnification of the ocular lens (usually 10 x) by the magnification of the objective lens (usually 4 x, 10 x, or 40x).

### For example:

Under low power 
$$\begin{aligned} \text{total} &= \text{ocular} \times \text{objective} \\ &= 10 \times 4 = \boxed{40x} \end{aligned}$$

Under medium power 
$$= 10 \times 10 = \boxed{100x}$$

Under high power 
$$10 \times 40 = \boxed{400x}$$

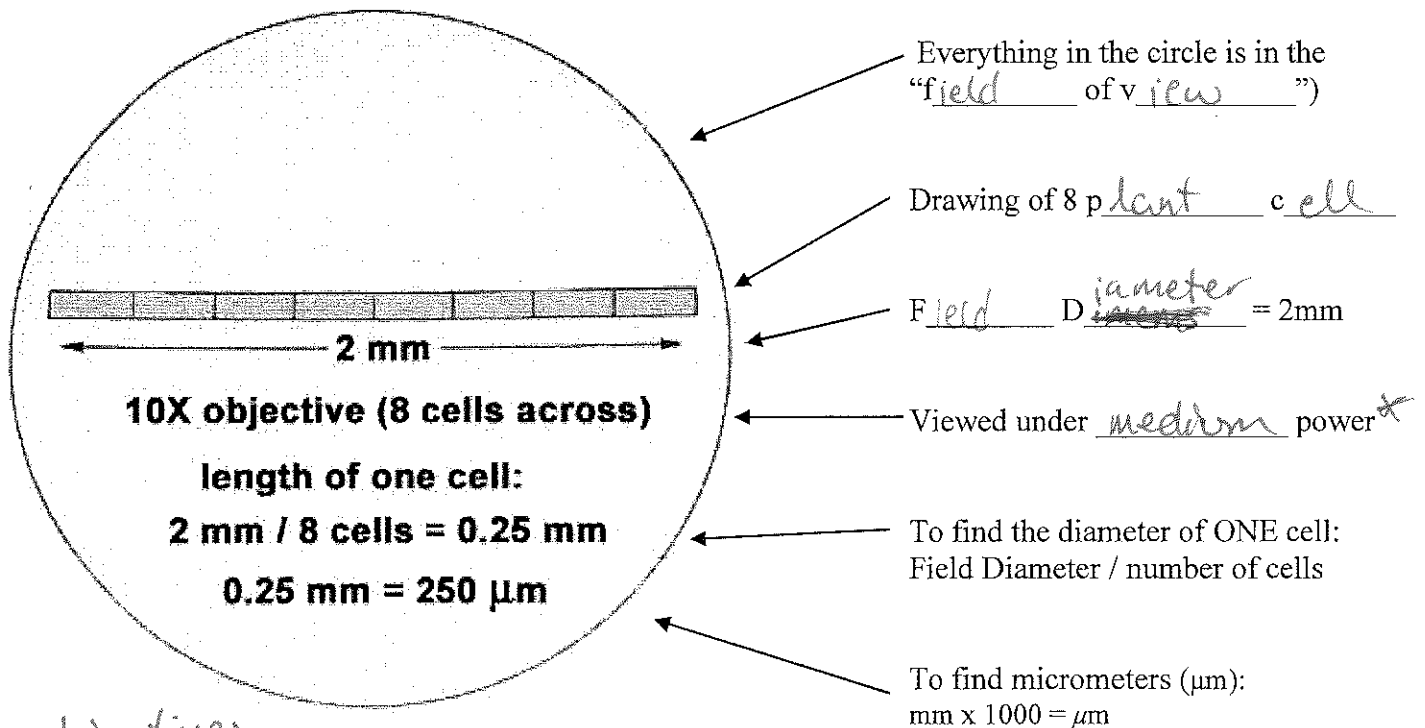
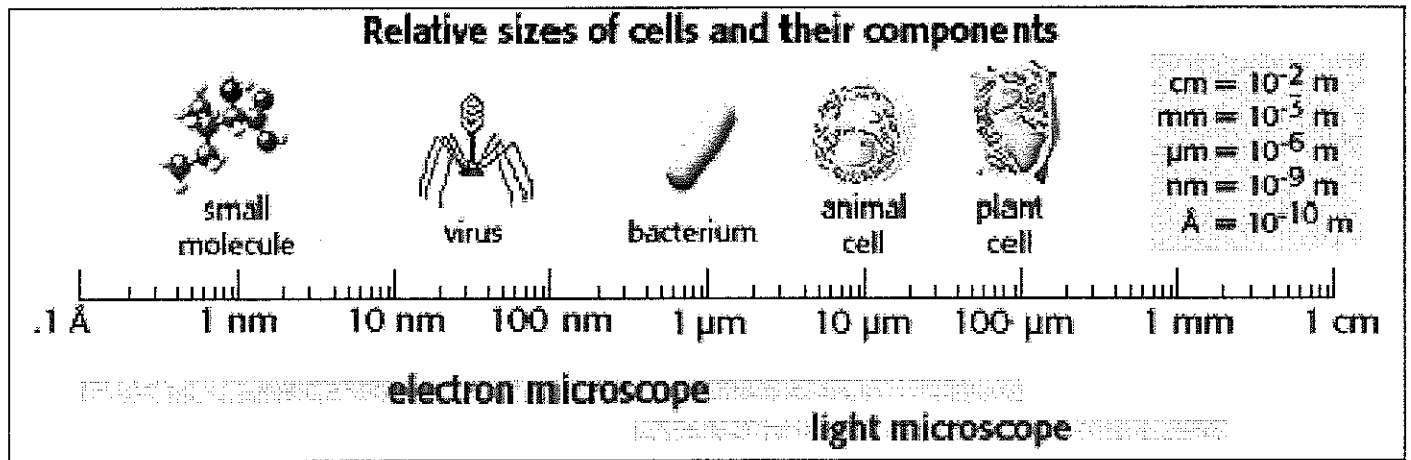
# IMPORTANT DEFINITIONS

**Specimen:** Anything viewed under the microscope

**Field of View:** The area of the specimen that you can see under the microscope

**Field Diameter:** The size of the field of view (usually measured in micrometers)

**Micrometer:** One millionth of a meter ( $\mu\text{m}$ ); used to measure very small distances

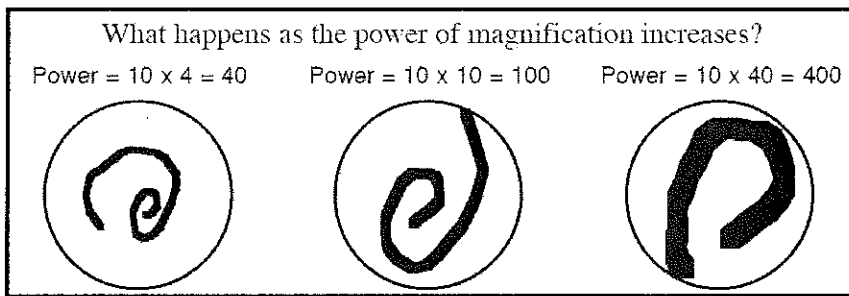


objectives

4x = low

10x = medium

40x = high



As the power of magnification increases,

- The specimen appears LARGER or SMALLER (circle one)
- The specimen appears CLOSER or FURTHER AWAY (circle one)
- You can see MORE OF or LESS OF the specimen (circle one)
- The “field of view” is LARGER or SMALLER (circle one)
- The lens is CLOSER TO or FURTHER FROM the slide/specimen (circle one)

Microscope Safety Rule	Reason why this rule should be followed
1. carry the microscope <u>by the arm and base</u>	...so you don't drop it
2. Don't touch <u>the lenses</u>	...you can scratch them
3. Replace <u>cover slips</u>	... to keep the slides
4. Wrap up <u>cord</u>	...so it doesn't cause hazards
5. Only use <u>Kimwipes</u> to clean lenses	...so they don't get scratched
6. Always use <u>coarse</u> adjustment FIRST	...to bring specimen into basic focus
7. Use <u>low</u> power first (and when putting away)	...so you don't hit the objective lens
8. When changing objectives, <u>rotate carefully</u> (from side)	...to make sure you don't hit your slide, or interfere

### TYPES OF MOUNTS (how a specimen is prepared on a slide)

A **wet mount** is a common preparation of microscope slides used for viewing liquid specimens, live specimens, or any type of specimen that needs to be kept moist.

Permanent microscope slides, unlike wet mount slides, may be prepared long before the slide is used and will include only dead specimens. A permanent slide locks a specimen in a resin seal created by the evaporation of a solvent.

There are several types of permanent microscope slides, noted by different abbreviations:

- “wm” stands for **whole mount**, or an entire specimen placed on the slide (*e.g. a whole insect*)
- “ls” stands for **longitudinal section**
- “cs” (or “xs”) is a **cross section**
- “sq” is a **squash** preparation of the specimen
- “sm” stands for **smear**
- “sec” or “section” means that a slice, piece, or section of the specimen has been placed on the slide.
- “st” is a **stained specimen**. (Stained organisms may be living or dead, are often easier to see, and are used in freshly made slides as well as permanent slides.)