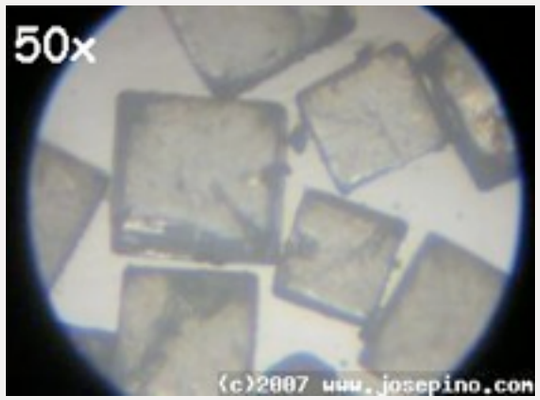
Science 8: Microscopes

Scale of the Universe
http://htwins.net/scale2/

Microscope Introduction

- Microscopes help us look at things more in depth
- Ex: Sugar

Naked Eye



Compound Microscope

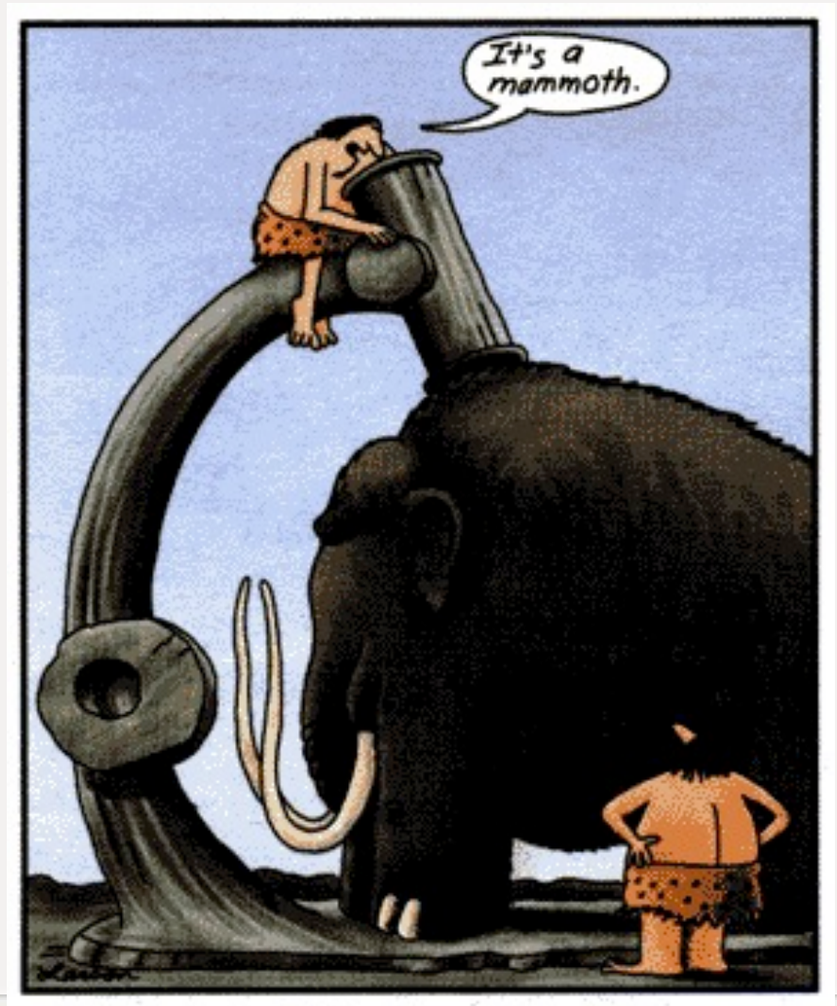
Electron Microscope

What is the difference?

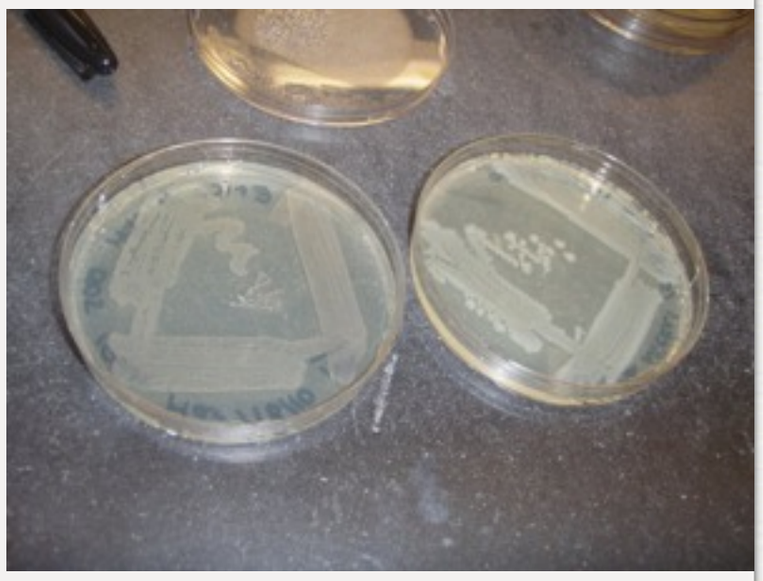
Early Microscopists

** Notes Package **

- Throughout history, people have always been interested in their surroundings

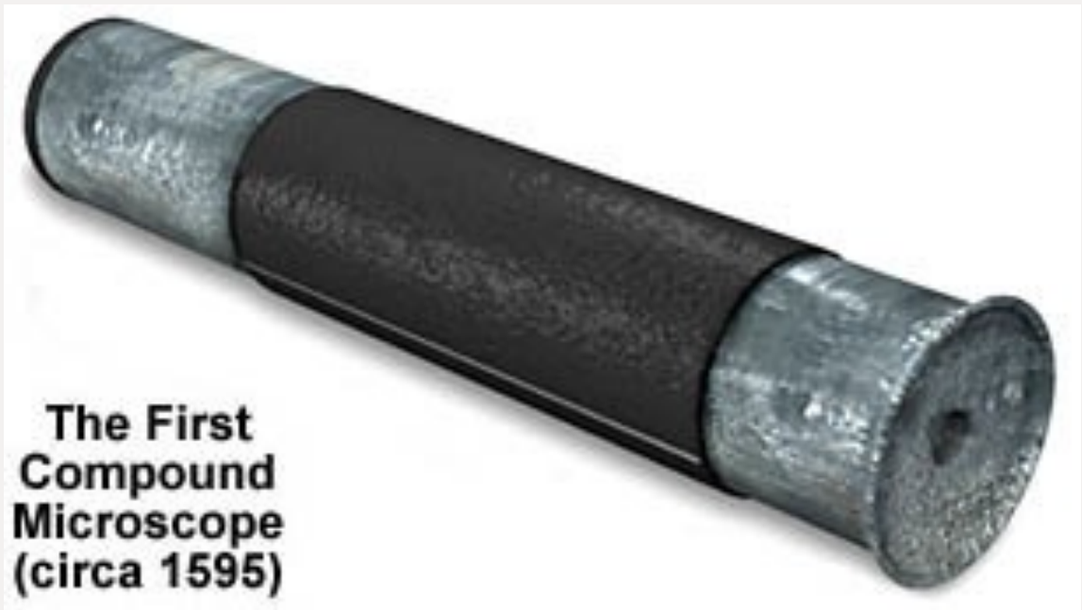


Early microscopes



H. and Z. Janssen CA. 1595

- Dutch lens makers: invented the compound microscope

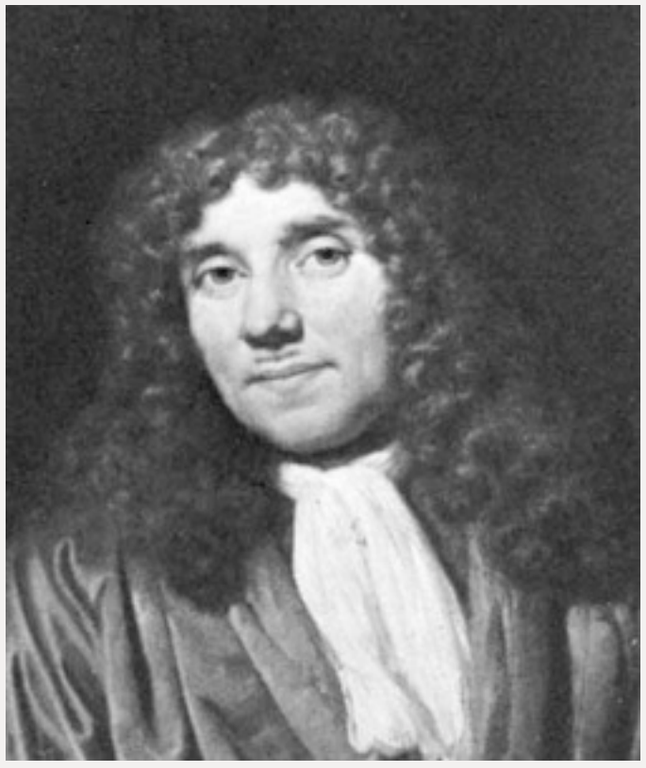


Robert Hooke Ca. 1665

- Handmade microscope: 3 lens system
- Examined a cork; saw that there were compartments which he called “cells”

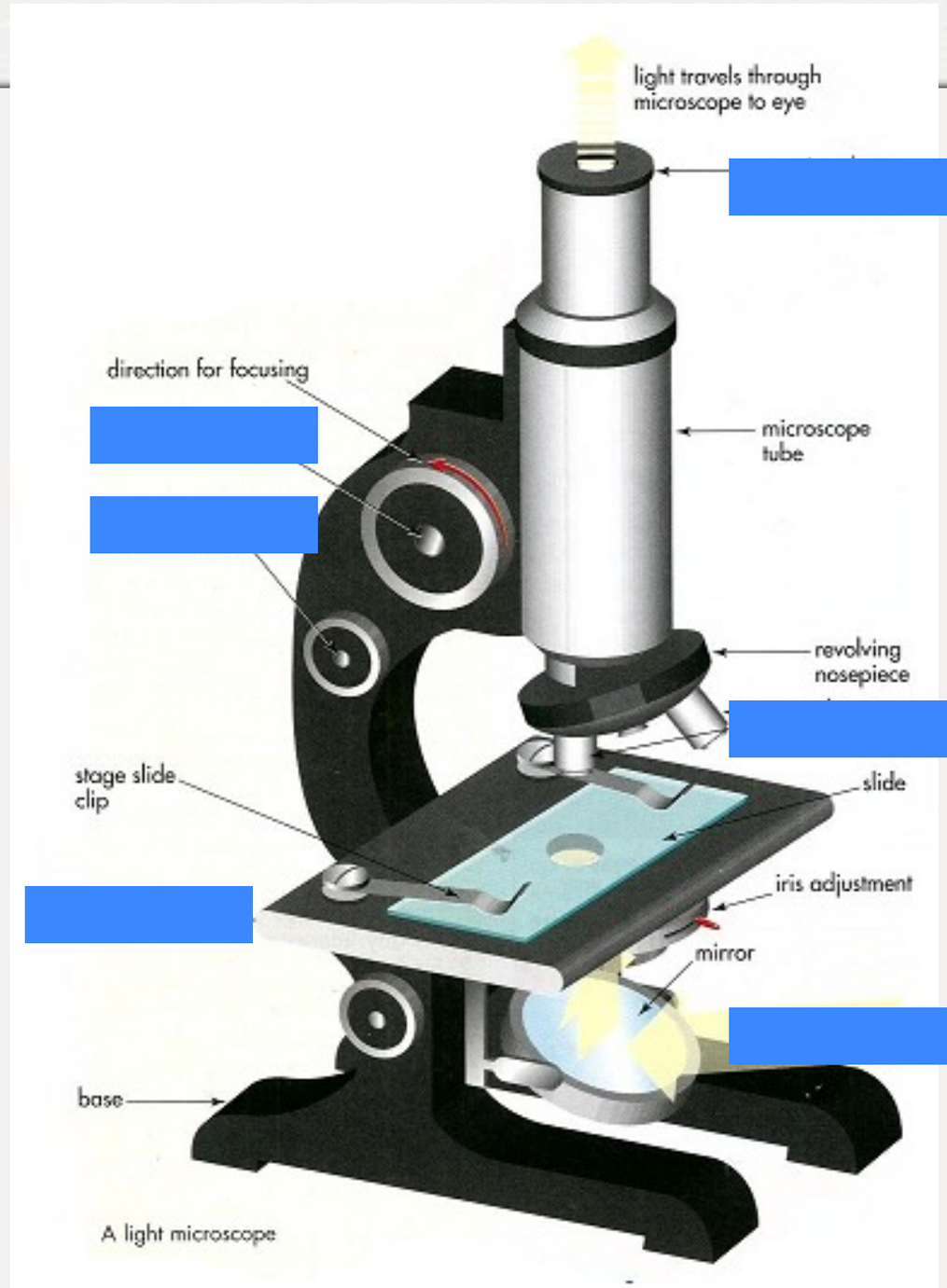
Leeuwenhoek Ca. 1665

- Used a simple single-lens microscope (250X)
- Observed free living single cells; Named them "animalcules"



Microscope Parts

** Notes Package **



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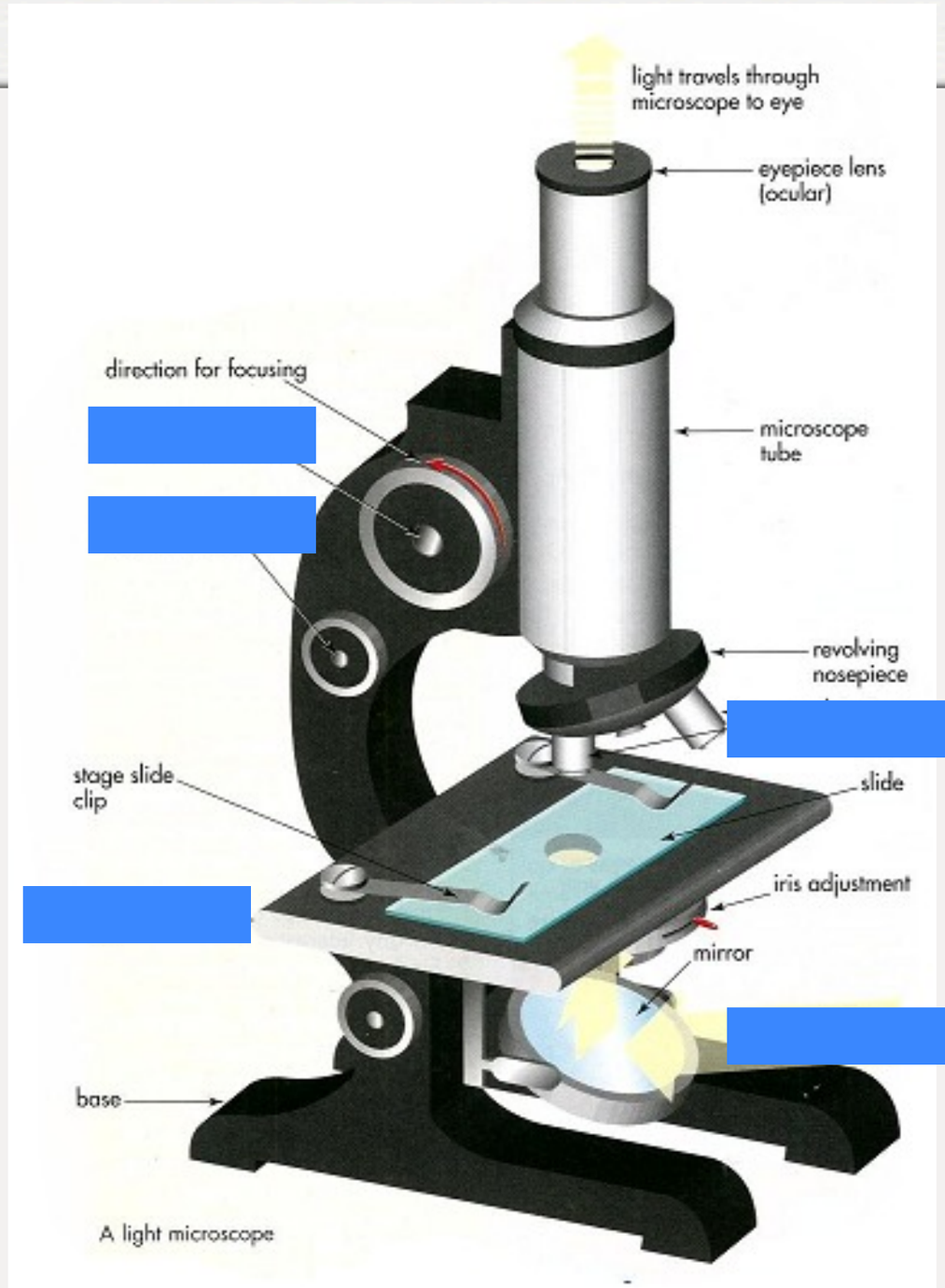

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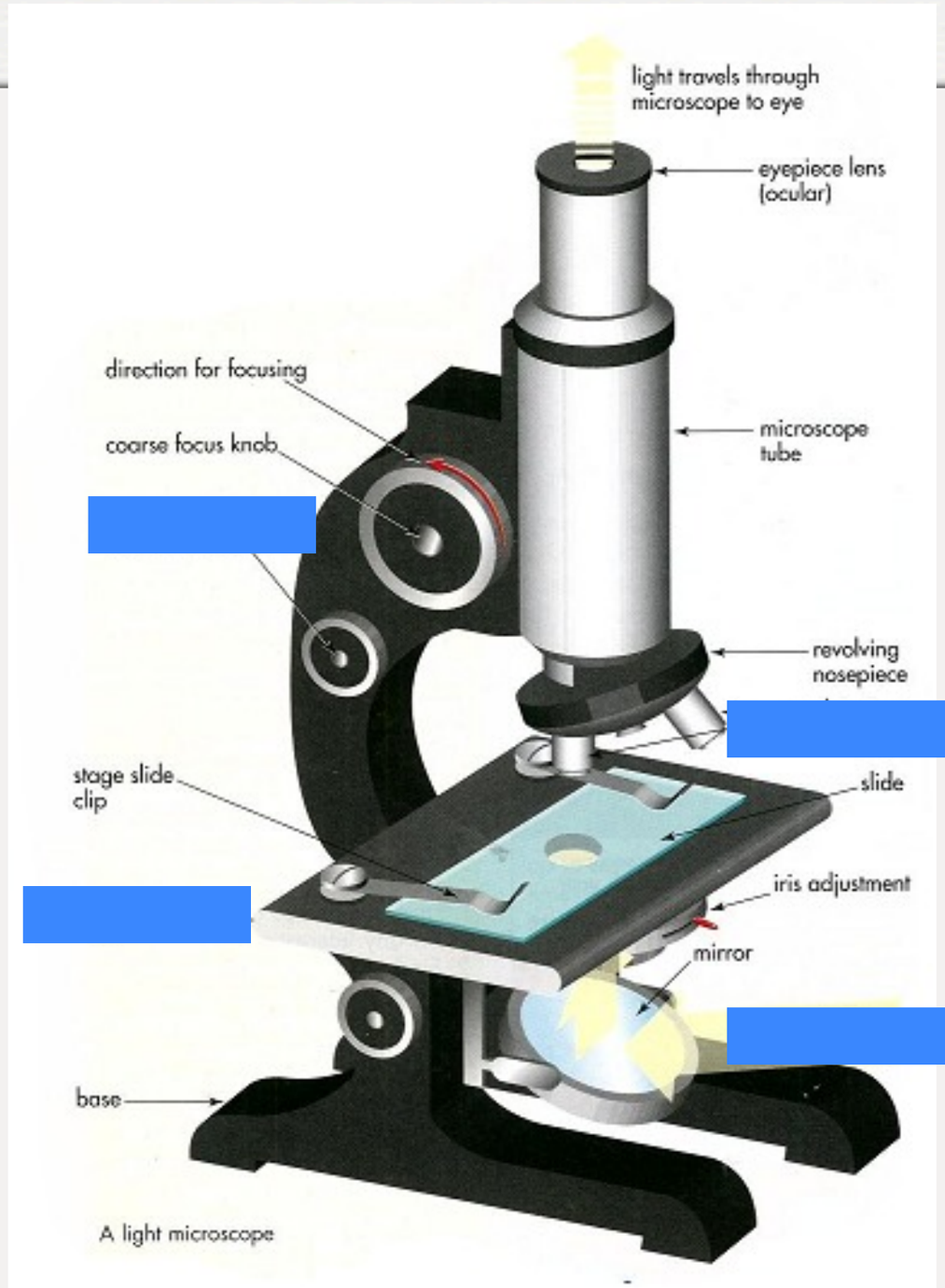

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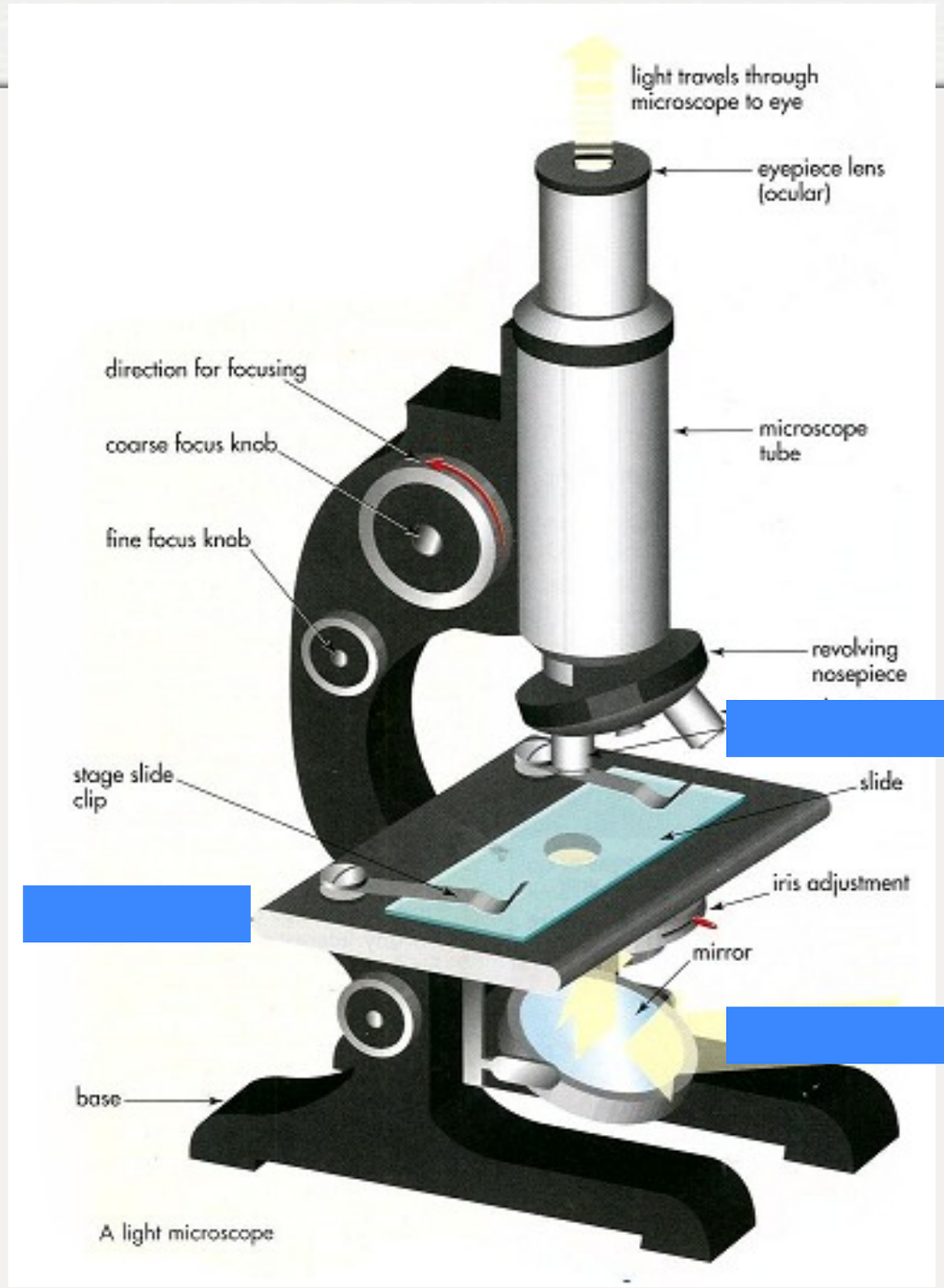

Microscope Parts

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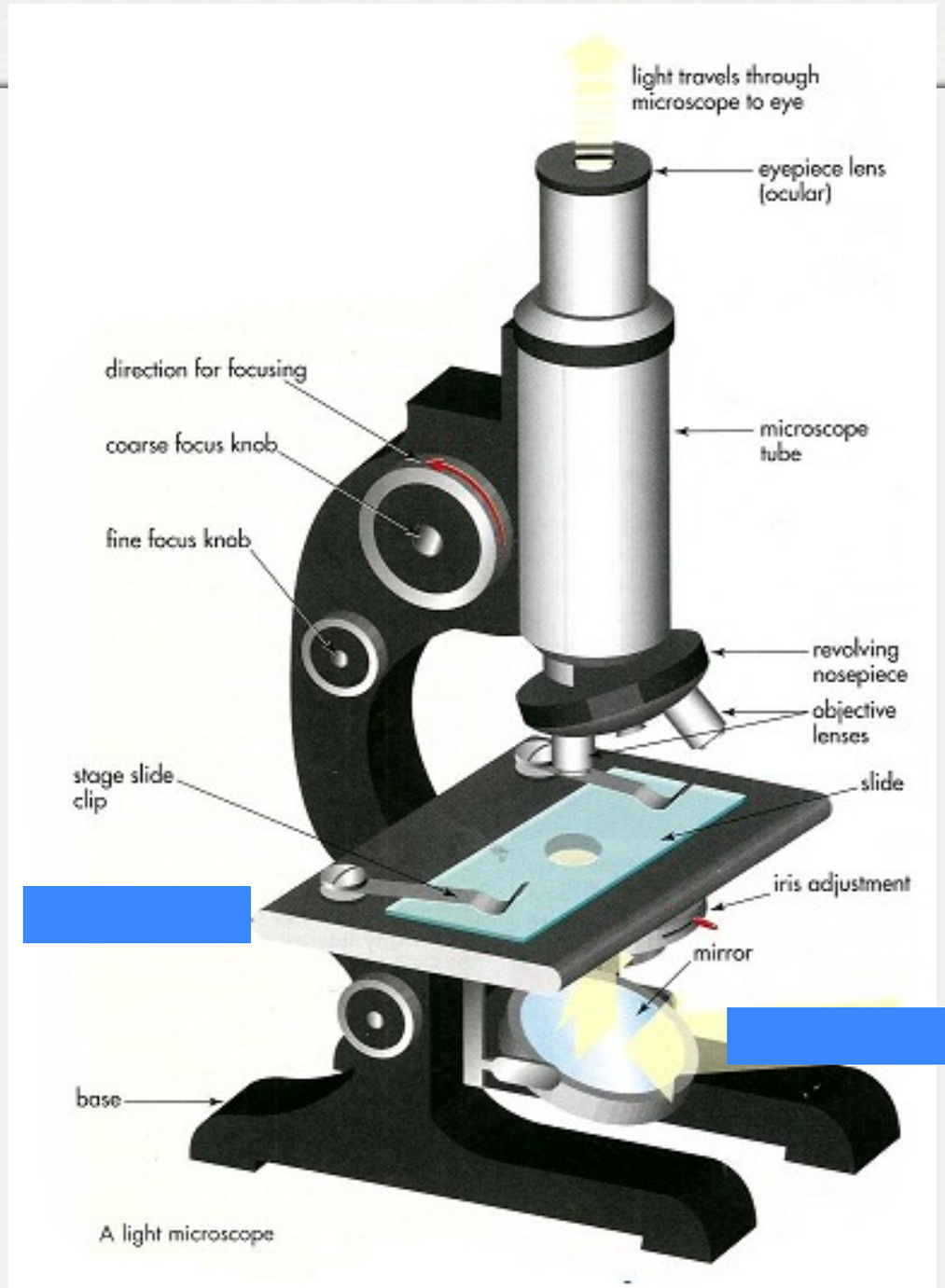

Microscope Parts

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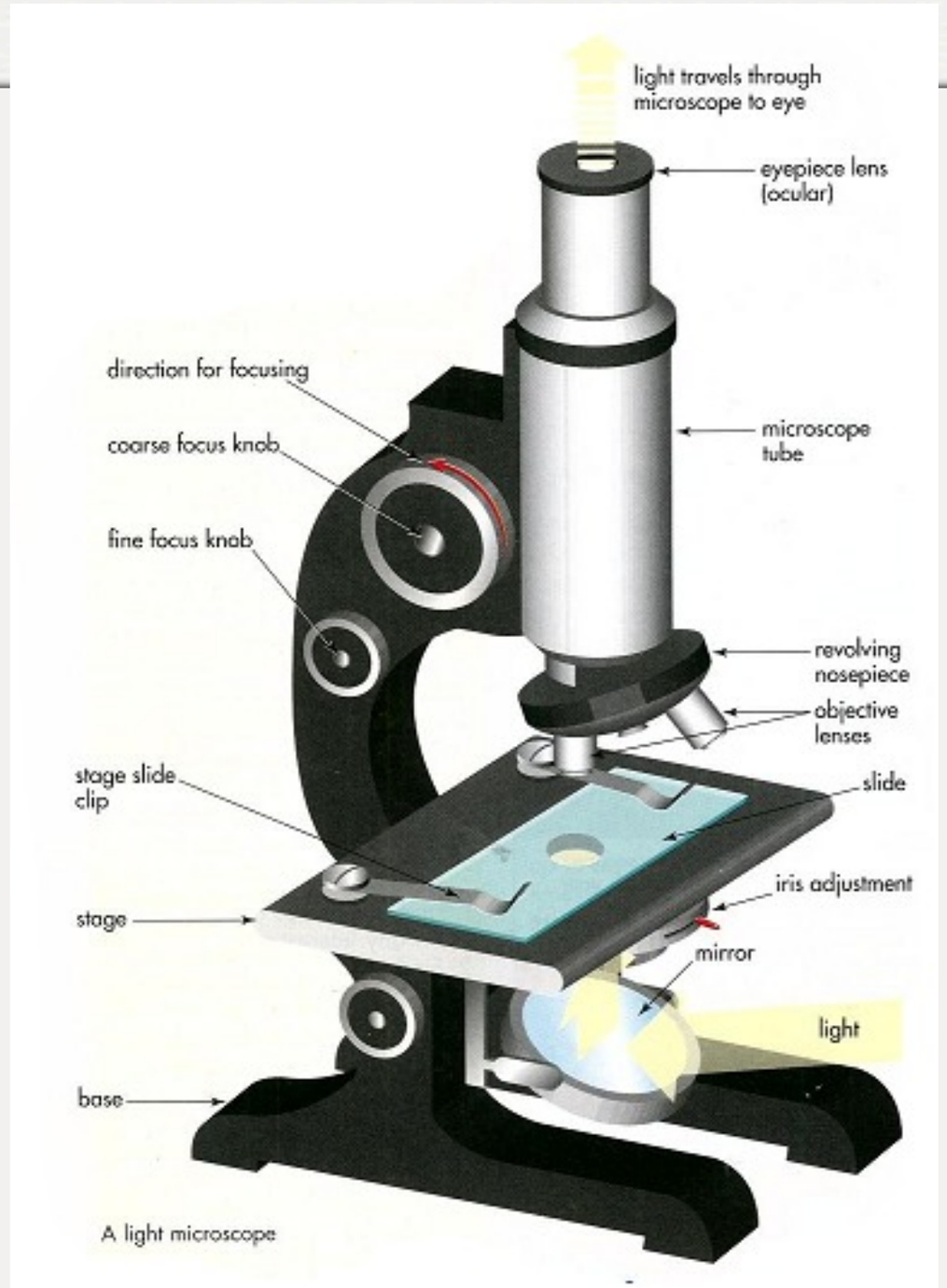


Microscope Handling

- <u>Handling Procedures:</u>
- Carrying: Hold the microscope by the arm and the base!
- Focusing a slide:

- Place the slide on the stage; Make sure you clip it in properly

- Turn the revolving nose piece to the lowest objective lens (10x)

- While watching from the side, use the coarse adjustment to lower the lens until it is right above the stage

- Look through the eye piece and turn the coarse adjustment until the specimen is in focus

- Adjust the light that is reaching the slide if it is to bright or to dull to see

- Use the fine adjustment to get a clear image of the specimen

Microscope Handling

- Focusing a slide (higher objective lens):

- When moving to a higher powered lens DO NOT use the coarse adjustment

- Turn the lens until it “clicks into place” and only use the fine adjustment to focus the specimen

- If you use the coarse adjustment you run the risk of breaking the slide

Microscope Calculations

** Notes Package **

- Magnification

Microscopes have <u>two</u> lenses; When you look through a microscope the image is inverted AND reversed

Eye Piece Lens

Objective Lens

Total Magnification:
Calculated by multiplying the eye piece magnification by the objective lens magnification

Magnification

- Examples:

Eye piece lens: 10X (Which is normally always 10X)

Objective lens: 10X, 4X, 40X

Magnification:

Magnification

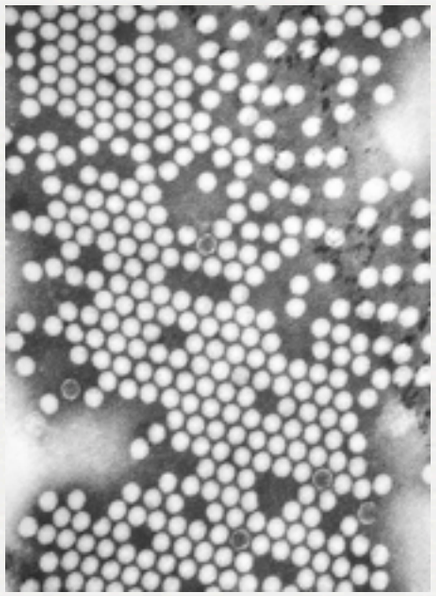
- Examples:

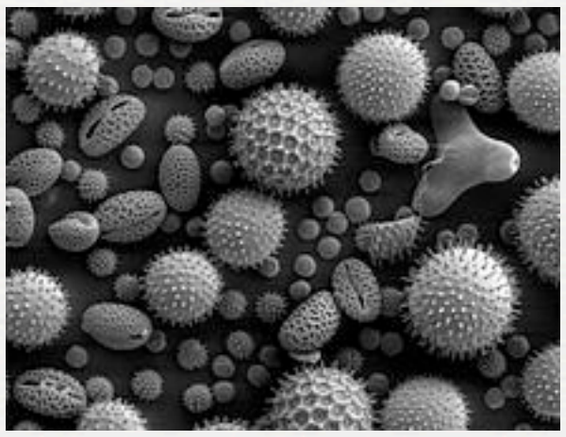
Eye piece lens: 10X (Which is normally always 10X)

Objective lens: 10X, 4X, 40X

Magnification: 100X, 40X, 400X

Other Kinds of Microscopes





- Transmission Electron Microscope: Shoots the specimen with electrons
- Scanning Electron Microscope: Scans the specimen with electrons; Produces a 3D image