

# **The Microscope**

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**History, Development, Care, Use, Parts, &  
Function**

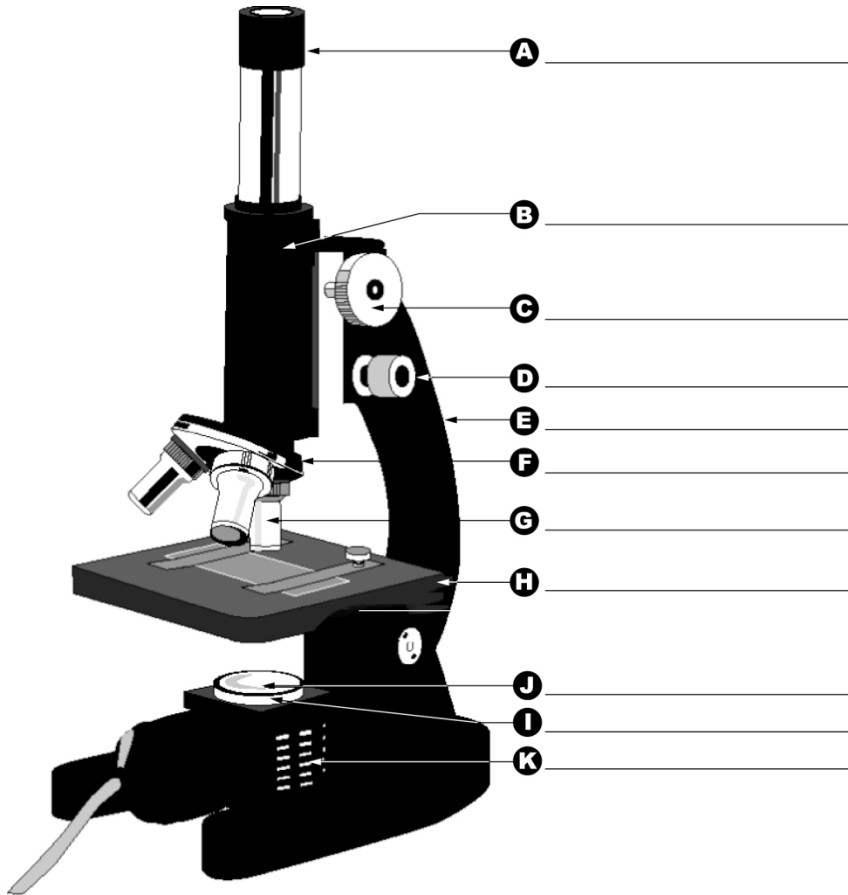
# Why Do We Use a Microscope?

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- The microscope is an instrument that magnifies extremely small objects so they can be seen easily.
- It produces an image much larger than the original object.
- Scientists use the term *specimen* for any object studied with a microscope.

# Parts of the Microscope

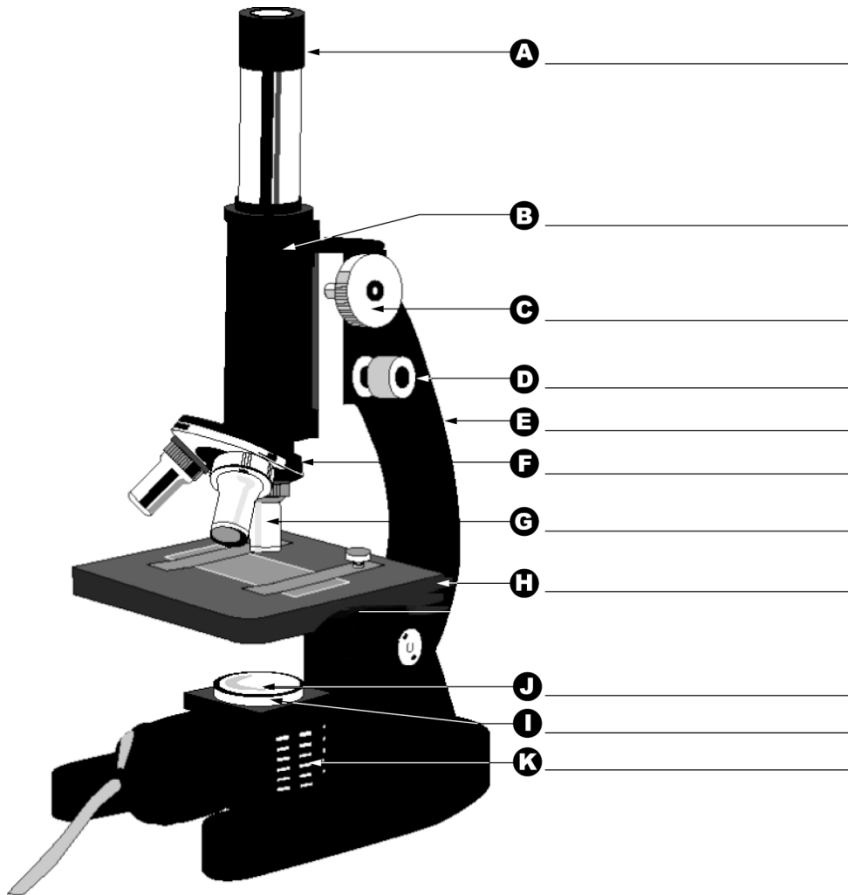
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- a) Eyepiece (ocular lens)
- b) Body Tube
- c) Coarse-adjustment Knob
- d) Fine-adjustment Knob
- e) Support Arm

# Parts of the Microscope

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f) Revolving  
nosepiece

g) Objective Lenses

h) Stage

i) Condenser Lens

j) Diaphragm

k) Light Source

# Parts of a Microscope

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- a) Eyepiece (ocular lens) - lens which we look into; at top of the body tube; usually 10X
- b) Body tube - tube that contains the eyepiece and supports the nosepiece
- c) Coarse-adjustment Knob - large knob for focusing with the low power objective lens
- d) Fine-adjustment Knob - small knob for focusing with the medium and high power lenses
- e) Support Arm - supports the body tube and lenses; used to carry microscope

# Parts of a Microscope

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- f) Revolving Nosepiece - rotates to select an objective lens
- g) Objective Lenses - (L, M, H) low, medium and high power lenses (usually 4X, 10X, and 40X)
- h) Stage - supports the stage clips and slide
- i) Condenser Lens - focuses the light from the light source on to the specimen
- j) Diaphragm - regulates the amount of light illuminating the specimen
- k) Light source - provides light to illuminate the specimen; usually electrical

# Magnification

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- The magnification of an object is the number of times bigger it appears in the microscope compared to seeing it with the naked eye.
- An object magnified 10 times ( $X$ ) will appear 10 times longer and wider in the microscope.

# Magnification for a Compound Microscope

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- For a compound light microscope, the TOTAL magnification is the product of the objective lens power and the ocular lens power.
- In a equation form :
  - TOTAL magnification = objective lens X ocular lens
- For example:
  - What is the total magnification of the specimen viewed if the objective lens power were 4X and the ocular lens power were 10X?
  - TOTAL magnification =  $4 \times 10 = 40X$ .



# Magnification Exercises

<b>Objective Lens Power</b>	<b>Ocular Lens Power</b>	<b>TOTAL Magnification (Objective X Ocular)</b>
4	10	40
10	10	
40	10	
100	20	
25		200
	10	500



# Care & Use of the Microscope

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- ❑ Be very careful using the compound light microscope – it is very fragile and very expensive.
- ❑ **Carrying the Microscope:**
  - Carry the microscope with two hands – one hand on the support arm and the other under the base of the microscope.
- ❑ **Cleaning the Microscope:**
  - Use **ONLY** lens paper to clean the lenses of the microscope.