

Lab Safety (pp7-9 of lab supplement)

- **Nothing goes in your mouth in the lab!**
 - **No food or drink on lab benches**
- **Do not wear contact lenses if possible,**
 - **If you must, make sure you know the risks and have signed a “Contact lens safety contract”**
- **We will provide goggles, gloves, lab aprons when needed**
- **If you break or spill something, let the instructor know**
- **Follow instructions for correct disposal of chemicals**
- **Know where the safety features of the lab are**
 - **Fire extinguishers, eye wash station, emergency shower**
 - **Help yourself and/or your neighbor immediately if you know how-don't wait if you don't have to!**

Emergency procedures

- **Where is our nearest exit?**
- **Where do we go if we have to evacuate?**



Workplace Hazardous Materials Information System

3 parts to the system...

1. Education
2. Labels
3. SDS sheets

WHMIS 2015 Labels

- 1 Product Identifier**
The product name exactly as it appears on the container and on the Safety Data Sheet (SDS).
- 2 Hazard Pictograms**
Hazard pictograms, determined by the hazard classification of the product. In some cases, no pictogram is required.
- 3 Signal Words**
"Danger" or "Warning" are used to emphasize hazards and indicate the severity of the hazard.
- 4 Hazard Statements**
Brief standardized statements of all hazards based on the hazard classification of the product.
- 5 Precautionary Statements**
These statements describe recommended measures to minimize or prevent adverse effects from exposure to the product, including protective equipment and emergency measures.
- 6 Supplier Identifier**
The company which made, packaged, sold or imported the product, and is responsible for the label and SDS.
- 7 Safe Handling Precautions**
May include pictograms or other supplier label information.
- 8 Reference to SDS**
If available.

Supplier Label

1 Product K1 / Produit K1

2

!

3 Danger	Danger
4 Fatal if swallowed. Causes skin irritation.	Mortel en cas d'ingestion. Provoque une irritation cutanée.
5 Precautions: Wear protective gloves. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. See label on container for more information. If on skin: Wash with plenty of water. If into inhalation system: Get medical advice or attention. Take off contaminated clothing and wash it before reuse. If discharged: Immediately call a poison centre or doctor. See label.	Conseils : Porter des gants de protection. Se laver les mains soigneusement après manipulation. Ne pas manger, boire ou fumer au moment de l'emploi. Voir l'étiquette. Éliminer le contenu/le produit conformément aux règlements locaux en vigueur. En cas de contact avec la peau : Laver abondamment à l'eau. En cas d'inhalation : Retirer un air frais/abandonner le produit. Éviter les vêtements contaminés et les laver avant utilisation. En cas d'écoulement : Appeler immédiatement un centre antipoison ou un médecin. Voir l'étiquette.
6 ABC Chemical Co., 123 rue Anselme St., Montreal, QC H0N 0M0 (1-800-456-7890)	

Workplace Label*

1 Product K1

7

Danger

Fatal if swallowed. Causes skin irritation.
Wear protective gloves (neoprene). Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product.

8 See SDS for more information.

- **Be familiar with the WHMIS brochure in your Lab Supplement:**

- **Labels: Workplace vs Supplier Label**
- **Symbols for safety equipment**
- **Hazard symbols (pictograms)**
- **SDS (Safety Data Sheet)**

- **In regular lab activities, students are responsible for:**
 - **Reading labels in the lab**
 - **Identifying the hazards associated with the labels**
 - **Handling chemicals according to the warnings on the label**
 - **Following instructions given in the lab regarding disposal and clean-up.**

Workplace label = much simpler; most often what you will see in the lab











- **Name of the product**
- **Safe handling, may include pictograms**
- **Reference to SDS**

ACETONE
No smoking, sparks, or flames
Wear eye, face, and hand protection
Use in well-ventilated area, or wear NIOSH-approved respirator with organic vapour cartridges

Safety data sheet available

The diagram shows a rectangular box representing a workplace label. Inside the box, the word 'ACETONE' is at the top. Below it are three lines of safety instructions: 'No smoking, sparks, or flames', 'Wear eye, face, and hand protection', and 'Use in well-ventilated area, or wear NIOSH-approved respirator with organic vapour cartridges'. At the bottom of the box is the text 'Safety data sheet available'. Three blue arrows originate from the left side of the box: one points to 'ACETONE', one points to the safety instructions, and one points to 'Safety data sheet available'. These arrows point towards a list of features on the left side of the slide.

Know the symbols and what they mean! Which ones do you see in the lab today?

	Exploding bomb (for explosion or reactivity hazards)		Flame (for fire hazards)		Flame over circle (for oxidizing hazards)
	Gas cylinder (for gases under pressure)		Corrosion (for corrosive damage to metals, as well as skin, eyes)		Skull and Crossbones (can cause death or toxicity with short exposure to small amounts)
	Health hazard (may cause or suspected of causing serious health effects)		Exclamation mark (may cause less serious health effects or damage the ozone layer*)		Environment* (may cause damage to the aquatic environment)
	Biohazardous Infectious Materials (for organisms or toxins that can cause diseases in people or animals)				

* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs). Including information about environmental hazards is allowed by WHMIS 2015.

Introduction to Microscopes

BIOL 104: Lab 1

Goals for today:

- **Compare longitudinal and cross sections**
- **Compare four types of microscopes**
- **Demonstrate correct use of stereomicroscope and compound microscope**
- **Be able to estimate size of objects with microscope**
- **Practice making wet mount slides and viewing life specimens**
- **Answer all questions in lab manual**

Function of Microscopes

Create a magnified image of a specimen while maintaining resolution

Magnification: create an image that appears larger

Resolution: ability to distinguish two objects/points from one another

**Increased
magnification
with increase
resolution**

**Increased
magnification with
no change in
resolution**

Electron Microscopes

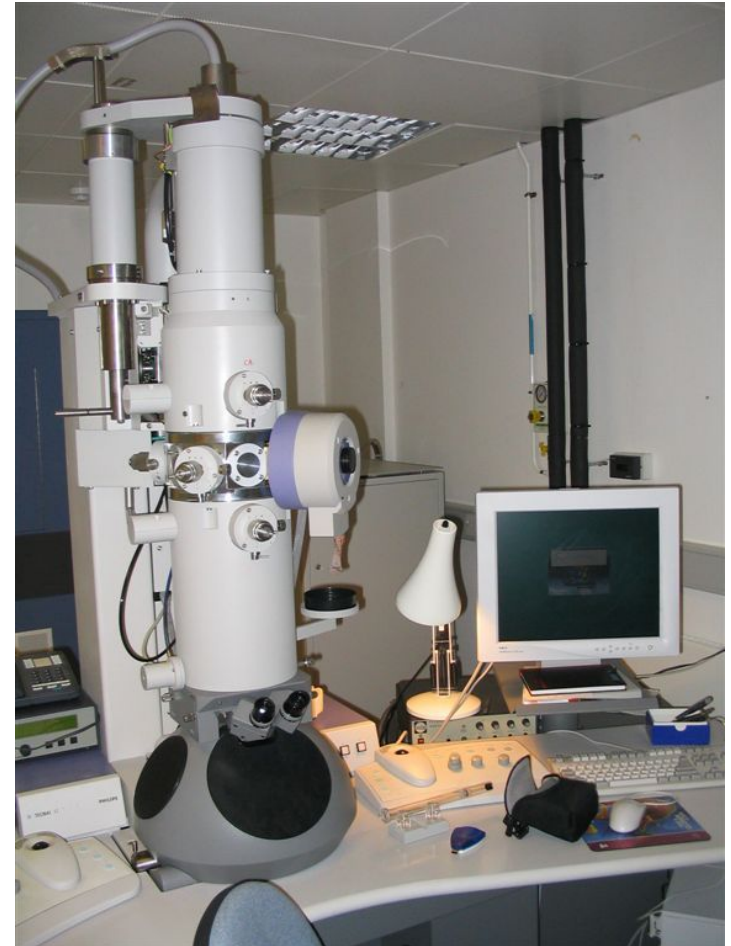
- Use electron beam to create image

Advantages

- High magnification
- High resolution

Drawbacks

- Expensive
- Require extensive and specialized prep of specimens



Scanning EM

Can view whole specimens

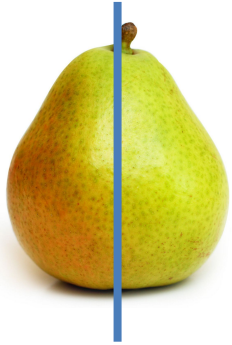
3D image (surface of specimen)

Transmission EM

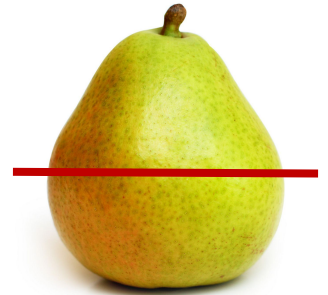
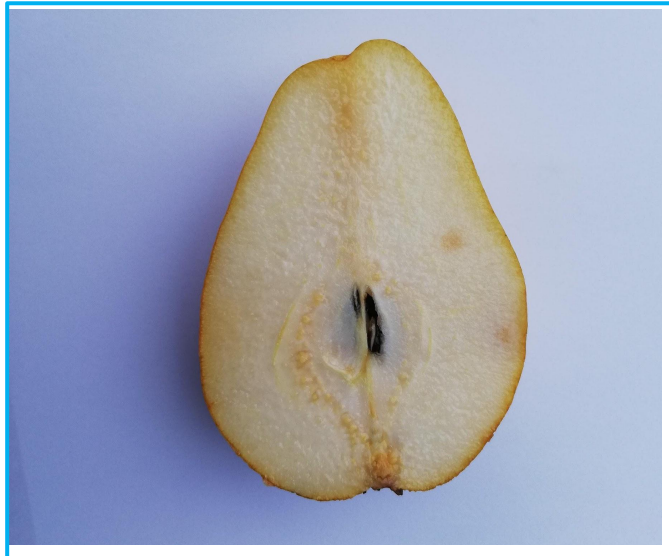
2D image

**Specimen has to be sectioned
(=sliced very thin)**

Preparing specimens may involve sectioning



Longitudinal section

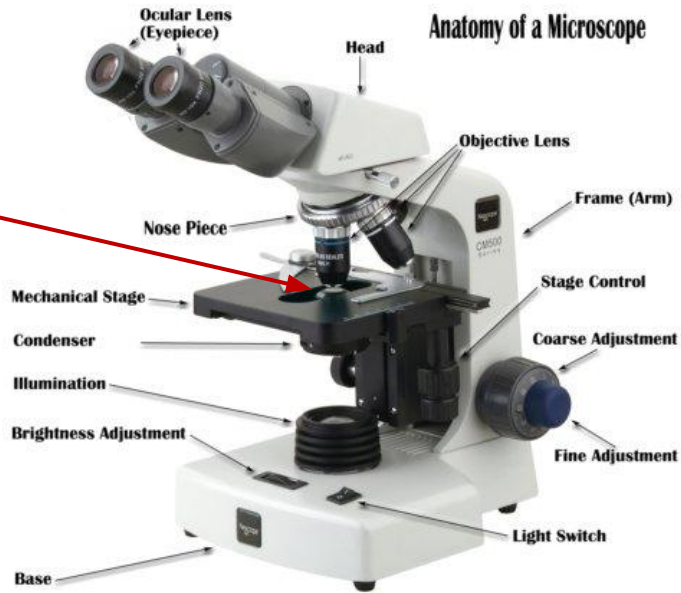


Cross section



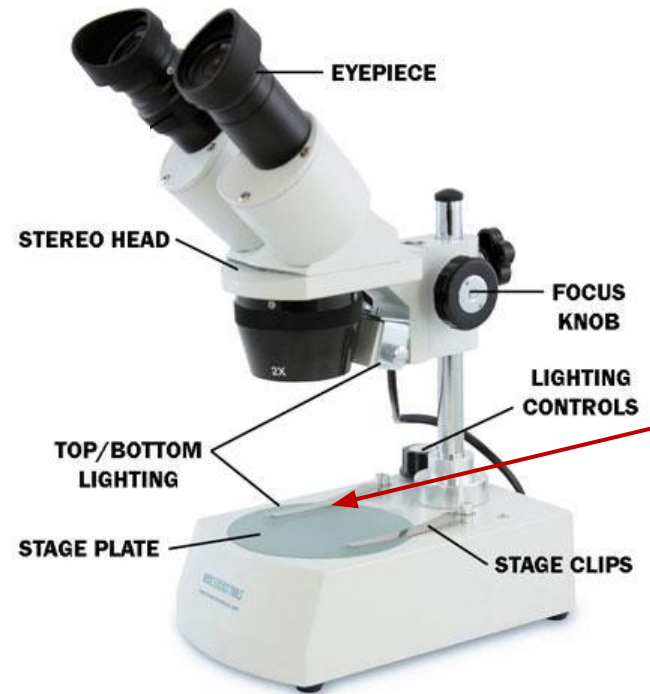
Light microscopes

Compound Microscope



© OnFocus Laboratories

Stereo Microscope



Compare types of light microscope:

Compound	Stereo/Dissecting Microscope
Thin, transparent specimens	Whole, small organisms or objects
Higher magnification (max approx. 400-1000)	Lower magnification
?	
?	

Other comparisons to consider:

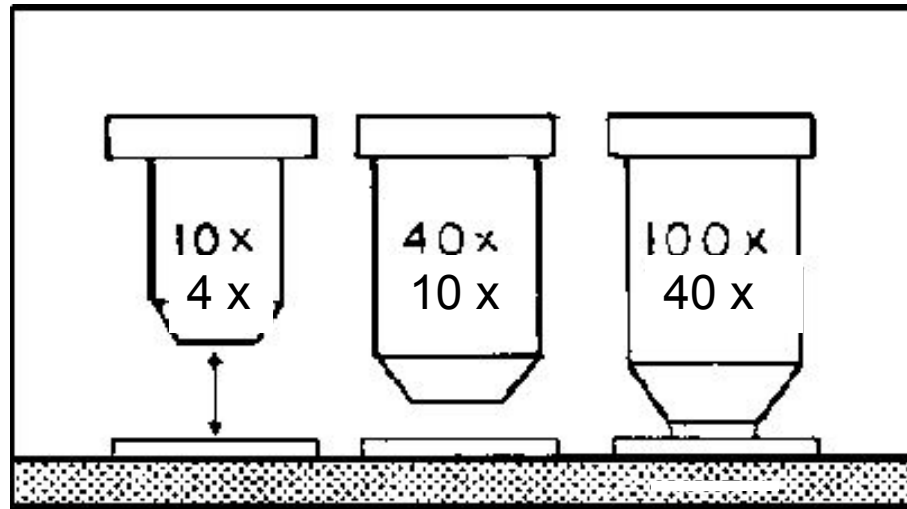
Is the image 3D or 2D? Is it inverted or same as naked eye?
Surface of specimen or internal feature visible...

COMPOUND MICROSCOPES

Magnification

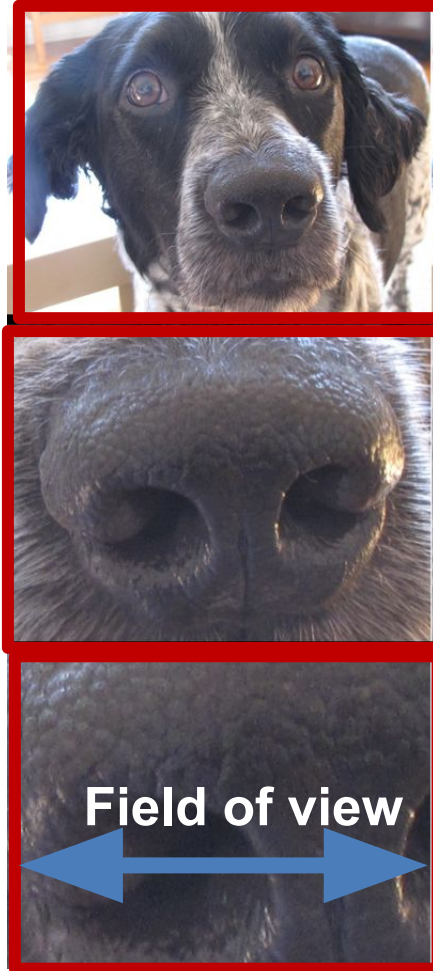
	Objective	Ocular Eyepiece	Total Magnification
Low Power		10 x	
Medium Power		10 x	
High Power		10 x	

Working Distance: Space between specimen and magnifying lens



- ALWAYS START AT LOWEST MAGNIFICATION
- As you increase magnification, working distance decreases
- Important to **“Focus First”**: be in focus **before** you change magnification!

Field of view

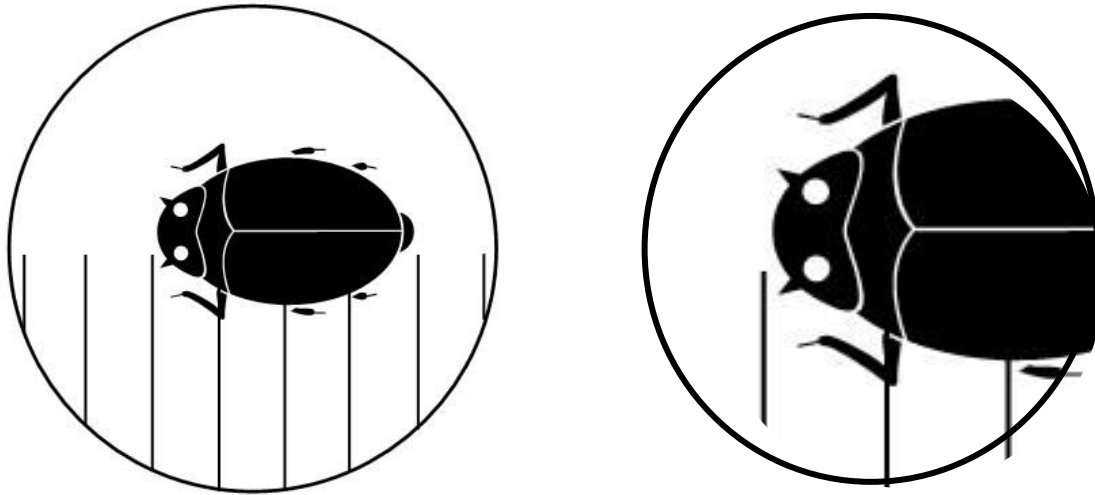


Increasing
magnification

Field of view

Field of View

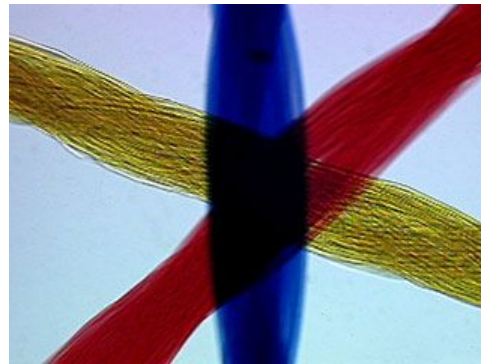
- How much of the specimen is visible = **field of view**
- Changes as you magnify



Page 9: Measure field of view with ruler (use the ruler like a slide!) and calculate field of view at other magnifications

Depth of field

- **Compound microscope gives 2D image**
- **Need to refocus to see top and bottom of an object**
 - **Use “crossed threads” prepared slide to see this**
 - **Are you moving the slide up or down?**
 - **Which will you see first, the top or the bottom?**





Today's to do list:

- **Complete all activities in the “Microscopy” lab in your lab manual**
- **You can do Stereomicroscope later if stations are busy-everyone must **use their own compound microscope****
- **Please ask for help** if you do not understand the instructions!
- **Answer questions on the last page**
- **After you are cleaned up, check in with Eunice to complete the post-lab quiz**

Before you leave today...

- Clean up slides, turn off microscopes
- Wipe down your microscope and workspace with alcohol wipe

If you leave a mess, this will impact your lab professionalism mark!

- Prepare your things to leave but keep a pencil or pen
- Check in with Eunice to do the post-lab quiz
- Find a quiet space to **complete the post-lab quiz**, hand it in before you go.

To prepare for Monday's lab:

- read assigned lab materials (look in the Lab Schedule or eLearn) for next week
- Complete the pre-lab assignment before Monday's lab