

Vancouver Community College  
Biology 1120  
Instructor Maria Morlin

January 2021 – hybrid course

Lab: Microscopy

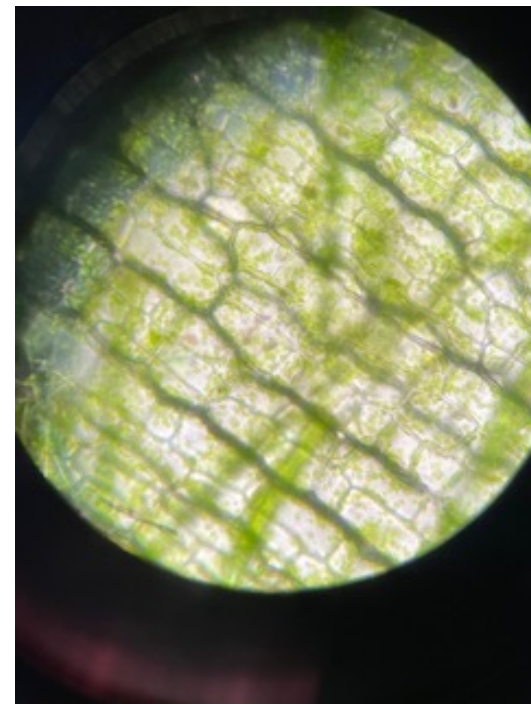
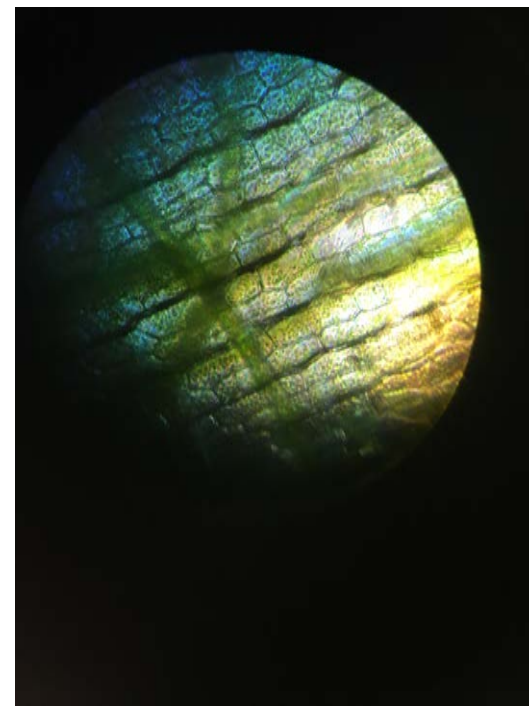
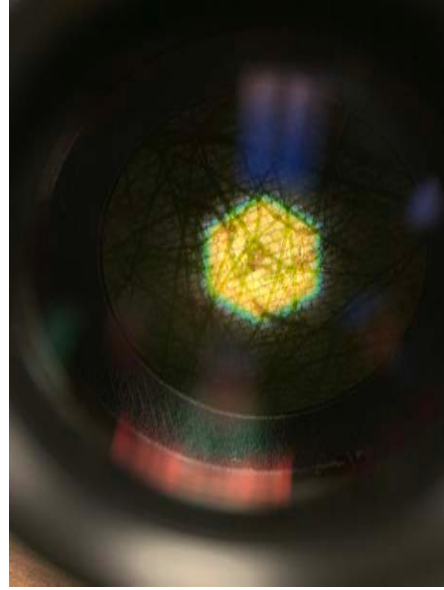
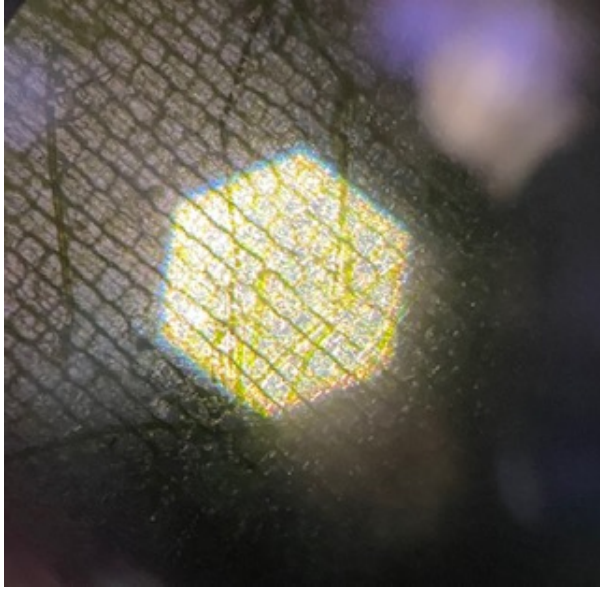
# Outline

- Objectives
- VCC biology images
- Notes on microscopes and observations
- Notes on Köhler illumination
- Notes on measurements
- Vancouver Community College lab video resources

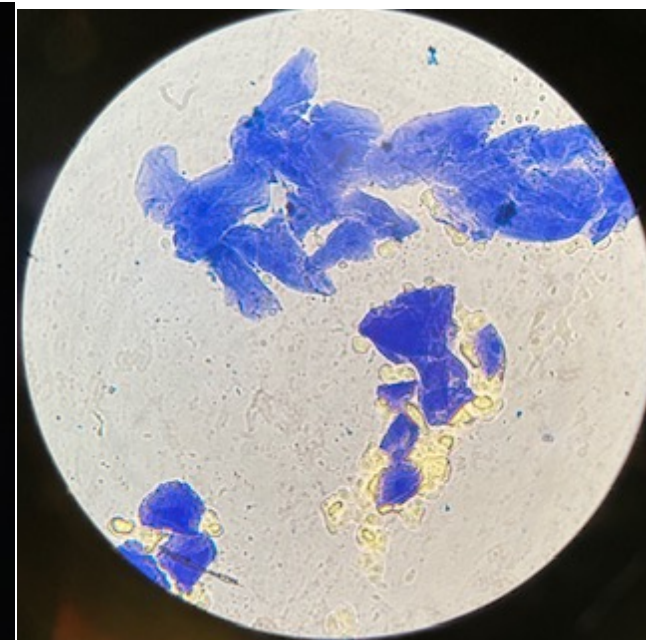
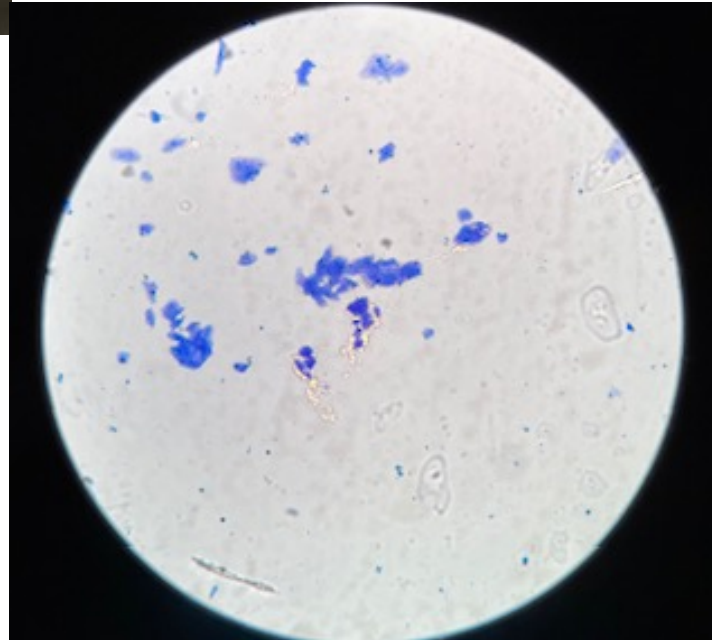
# Objectives

1. Learn parts and use of the Zeiss compound light microscope:
  - Oculars, nosepiece, objective lenses, stage, focus knobs, on/off switch, light intensity switch, condenser & condenser knob, phase contrast turret, diaphragm.
2. Identify a slide of an elodea (plant) sample.
3. Identify a buccal epithelial cell, draw and label.
4. Explain Köhler illumination
5. Measure specimen diameter.
6. Measure the size of a drawing.

# Student submission of cellfies 2020

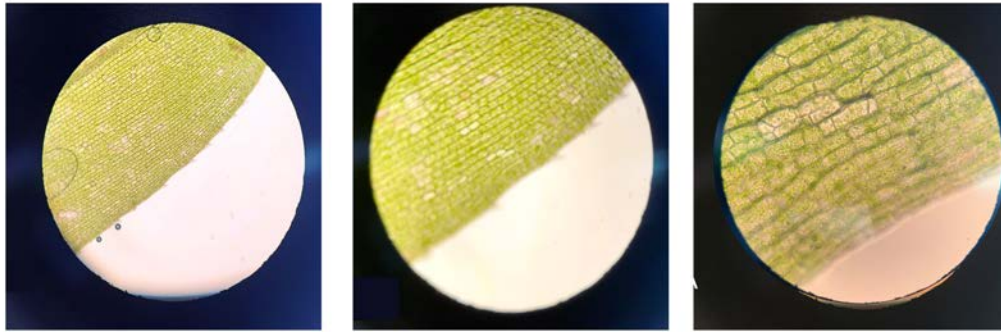


These were taken through the ocular lenses. The green structures are plant cells. The blue-stained structures are cheek epithelial cells. The hexagons show a closed diaphragm, placing the hexagon in the middle of the field of view (FOV) with a blue light around sharp edges. Well done.



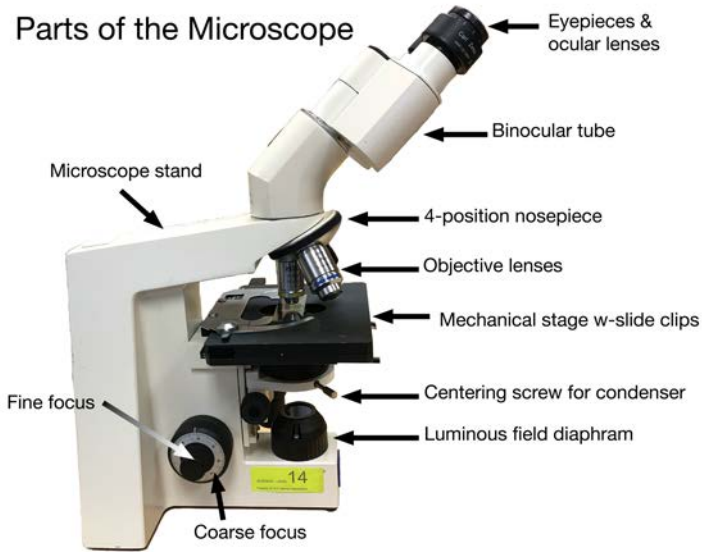
# VCC biology lab slide images

Elodea under the microscope at increasing magnifications

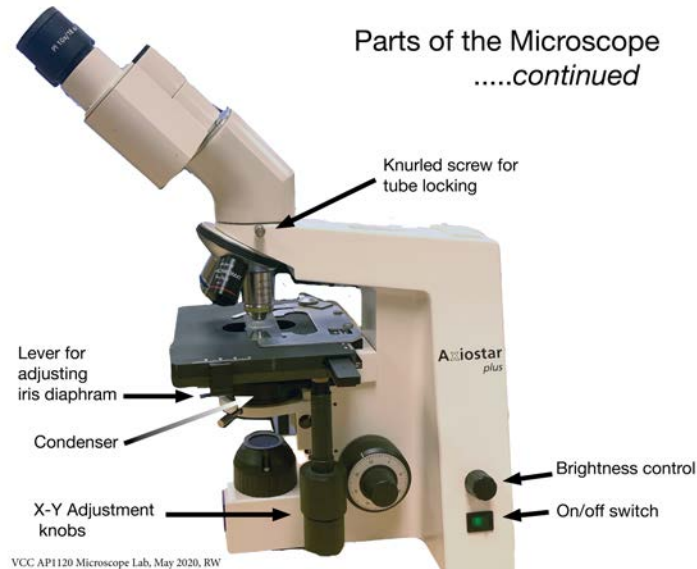


50X → 100X → 400X

Parts of the Microscope



Parts of the Microscope  
.....continued



Field of View Measurements  
Zeiss Axiostar Plus

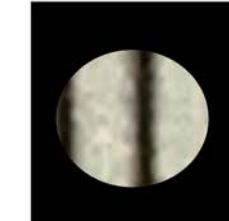
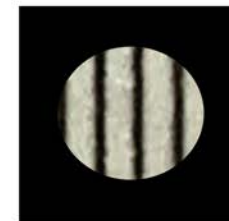
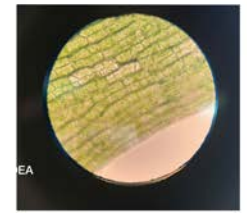
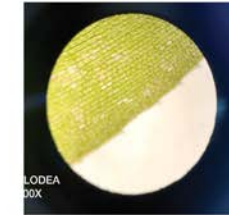
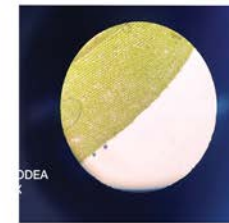
50X



100X



400X



50 X Magnification

Field of View (mm): 3.5

Field of View (microns): 3500

100 X Magnification

Field of View (mm): 1.75

Field of View (microns): 1800

400 X Magnification

Field of View (mm): 0.44

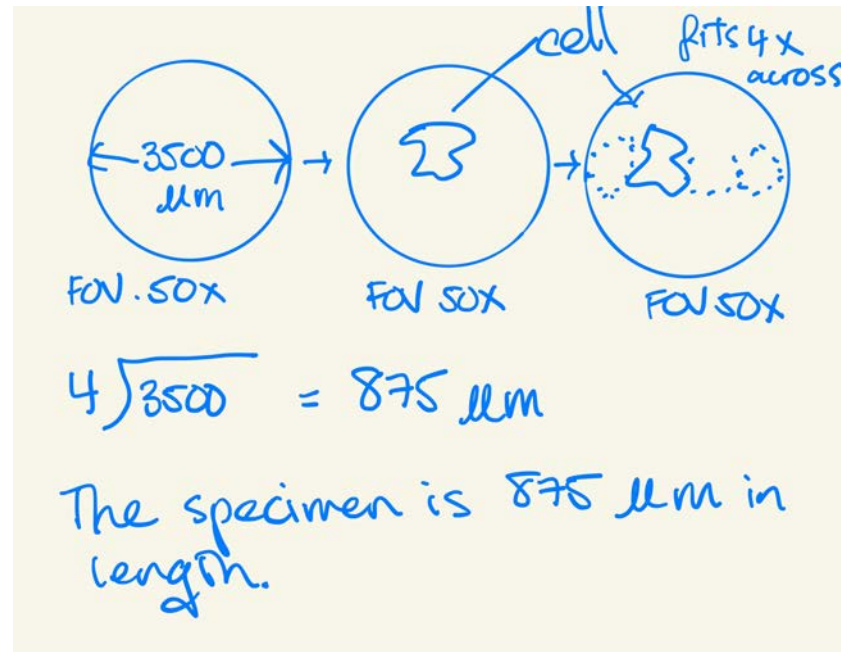
Field of View (microns): 440

# Notes on microscopes and observations, Köhler illumination

- Make sure to read the lab handout and answer the questions. Review parts and use of the microscope, relation between magnification and size of field of view (FOV) (at a higher magnification, the area viewed is smaller)
- Review specimens from the lab (previous slides) and compare animal cells (epithelial cheek cells) to those of the plant cells. These are both eukaryotes, but have some differences, such as a plant cell wall not present in an animal cell.

# Notes on measurements

- If you know the diameter of your field of view, you can measure the length of a specimen such as a cell.
- For example, at the Zeiss microscope's low power (50x), the FOV diameter is 3.5 mm, or 3500 micrometers ( $\mu\text{m}$ ). If you are measuring a cell, estimate how many cells could fit across the FOV diameter. Then divide that number into the diameter to get the length of one cell.



Vancouver Community College microscope lab videos  
- produced by Robyn Wood, Hilary Brown and Klaudia Jurkemik

- Part 1. Introduction to the use of the Zeiss compound microscope:
  - <https://www.youtube.com/watch?v=cDVJIHpiGNo>
- Part 2. Overview of microscope and preparation of a specimen.
  - [https://www.youtube.com/watch?v=s\\_FU-CMi-EU](https://www.youtube.com/watch?v=s_FU-CMi-EU)
- Part 3. Kohler illumination.
  - <https://www.youtube.com/watch?v=i2TEYyF4duA>
- Part 4. Drawing specimens at different magnifications.
  - <https://www.youtube.com/watch?v=UZ38GzzIVSs>
- Part 5. Measuring specimens.
  - <https://www.youtube.com/watch?v=WTkR7J3Vwts>