

Vancouver Community College
Biology 1120
Instructor Maria Morlin

September 2020 – hybrid course

Lab: Microscopy

Outline

- Microscope summary of demonstrations
- Objectives
- Student submission of cellfies
- VCC biology images
- Notes on microscopes and observations
- Notes on Köhler illumination
- Notes on measurements
- Vancouver Community College lab video resources

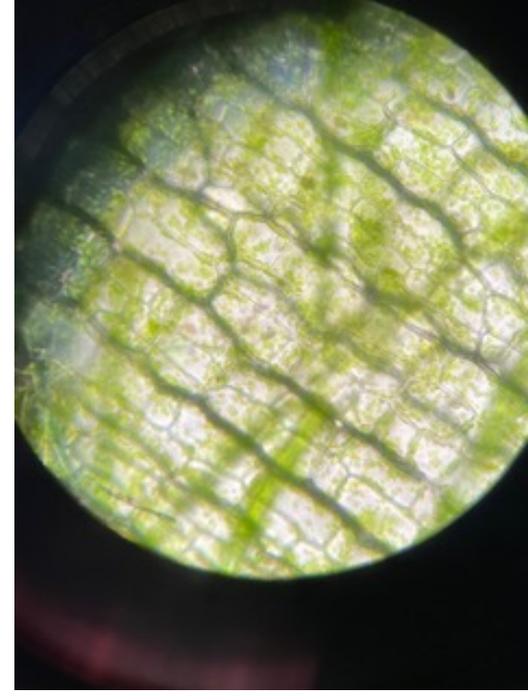
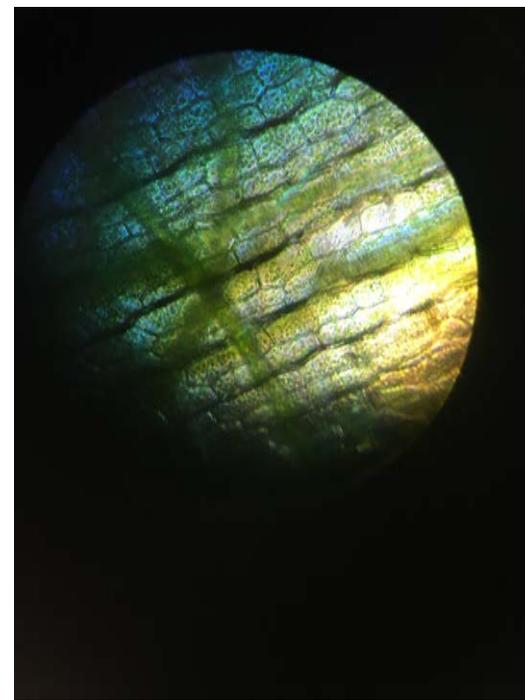
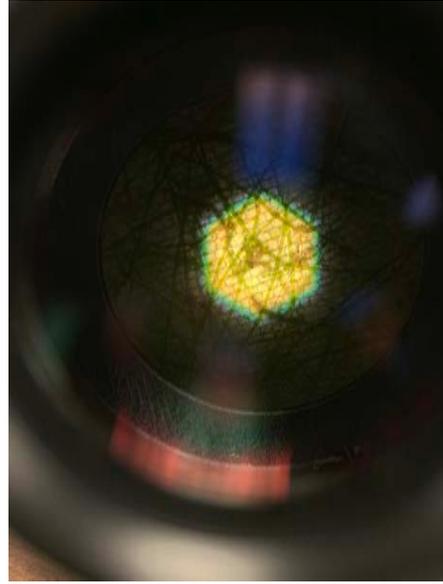
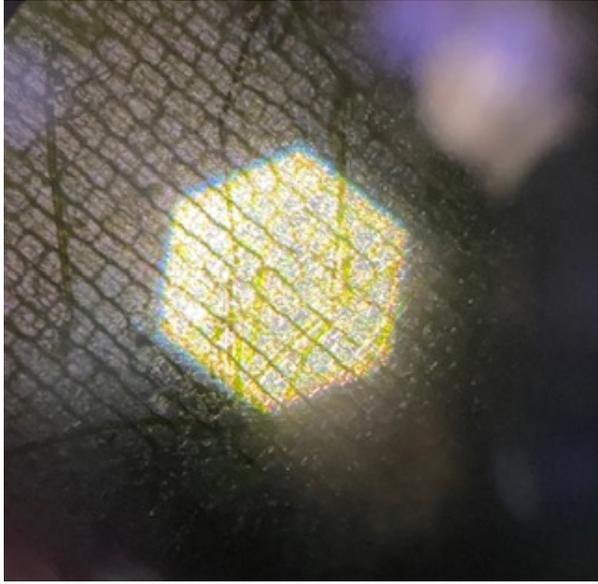
Summary of microscope demonstrations

- Robyn demonstrated:
 - Parts of the microscope and safe care
 - Preparing a wet mount slide (we used elodea)
 - Making a slide of cheek cells
 - Köhler illumination – how to get a clear image through the microscope
 - Drawing
 - Measuring the size of specimens

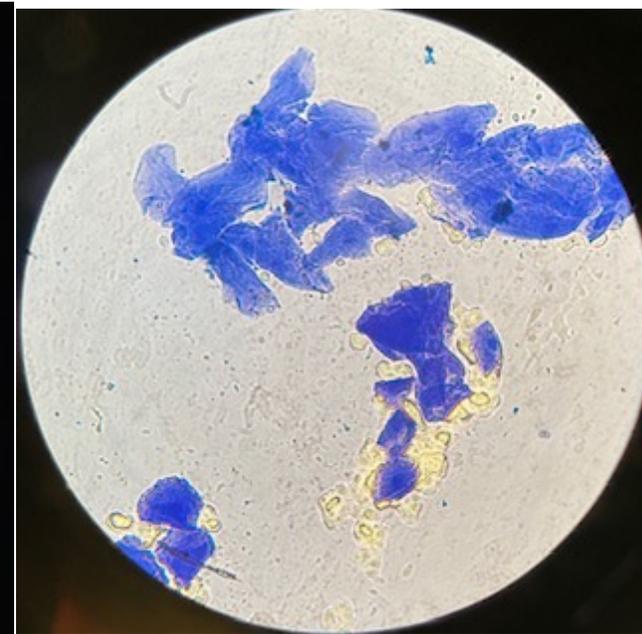
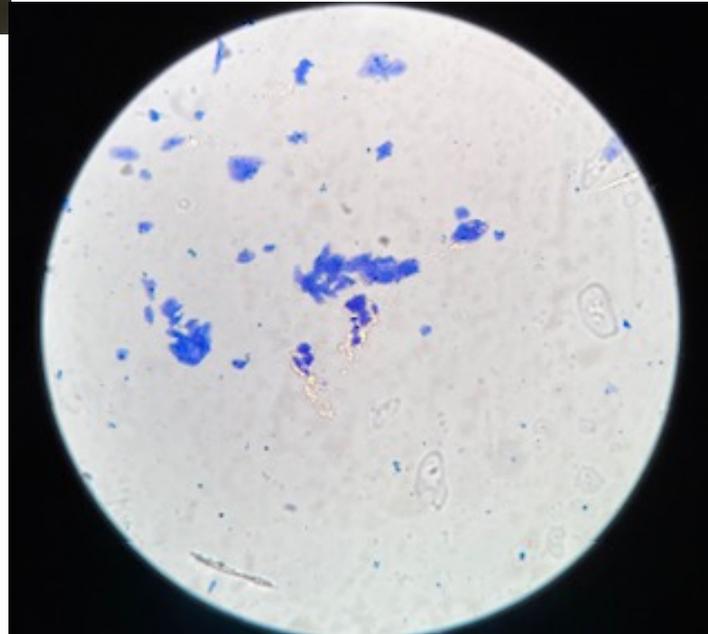
Objectives

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. Prepare slide of an elodea sample, draw and label.
3. Prepare slide of a buccal sample, identify epithelial cell, draw and label.
4. Adjust the microscope with Köhler illumination
5. Measure specimen diameter.
6. Measure the size of a drawing.

Student submission of cellfies

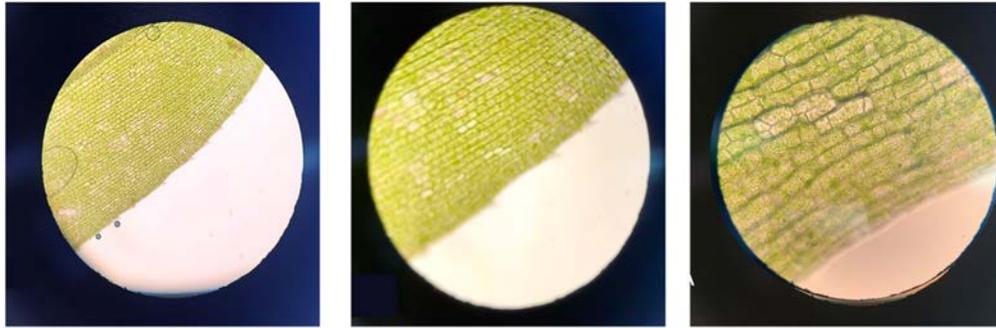


These were taken through the ocular lenses. See if you can identify plant cells, cheek cells and structures. The hexagon shows the diaphragm closed, placing the hexagon in the middle of the field of view (FOV) with a blue light around sharp edges. Well done. Excellent specimens of the elodea cells and cheek cells.



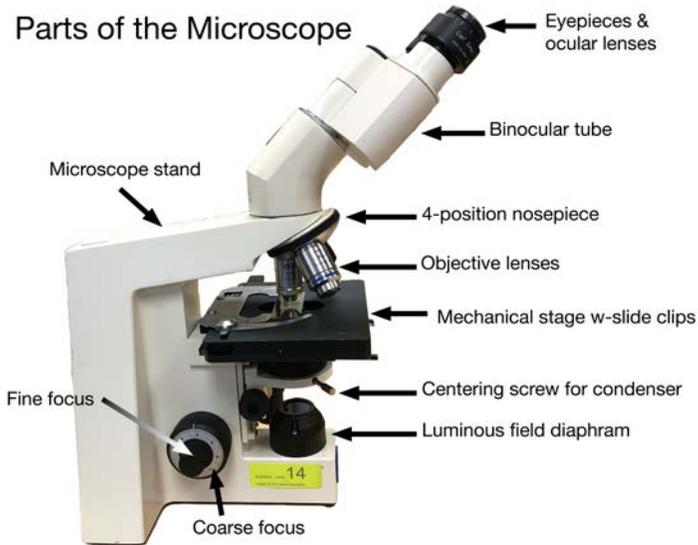
VCC biology lab slide images

Elodea under the microscope at increasing magnifications

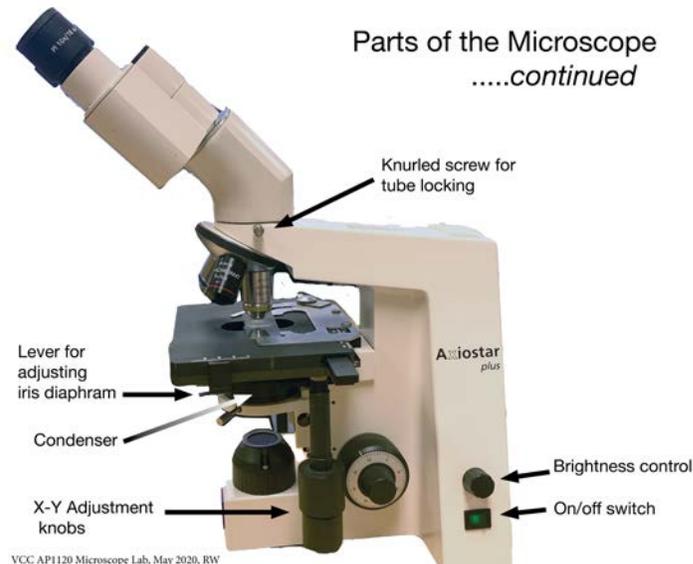


50X → 100X → 400X

Parts of the Microscope



Parts of the Microscope
.....continued



Field of View Measurements
Zeiss Axiostar Plus

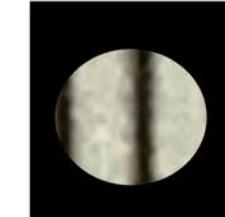
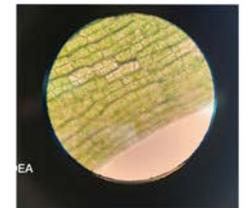
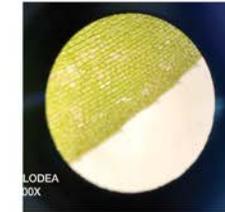
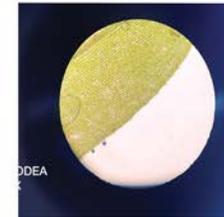
50X



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

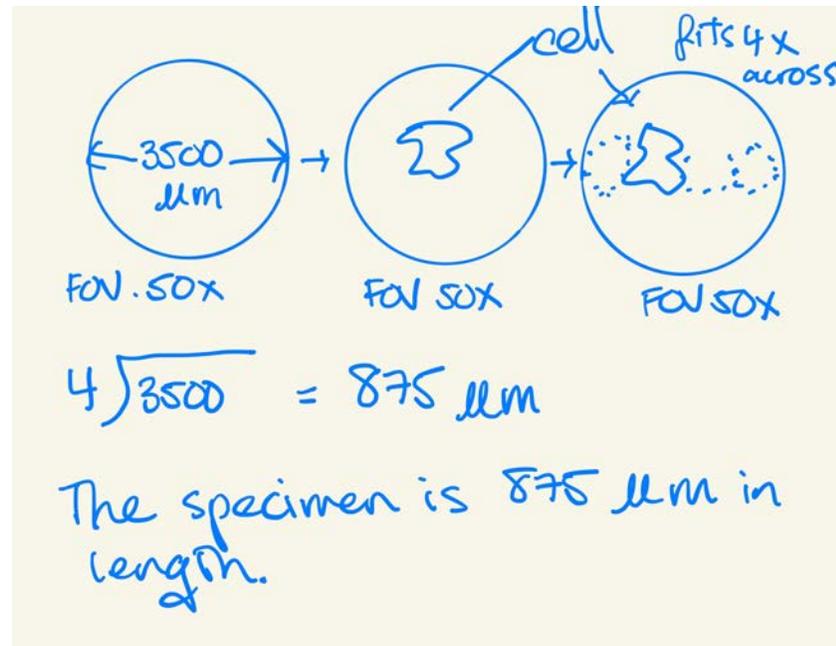
Field of View (microns): 440

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 slides from the lab, and compare the 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.
- If you have a less-than-optimal view through the microscope, you may need to use Köhler illumination again, particularly if the condenser has accidentally been lowered. Check it. You may also have to clean the objective and ocular lenses.

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 (μm). 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
- 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>