

BIOLOGY 1200

VANCOUVER COMMUNITY COLLEGE

Instructor: Maria Morlin

January 2022– hybrid course

Lab #1: Microscopes and Cells

Outline

- Microscopes and cell lab summary of demonstrations
- Objectives
- Lab setting pictures
- Student submissions of cellfies
- VCC biology lab slide images and objective lens/field of view
- Notes on cells and observations
- Some terms to review in the manual
- Measuring specimens
- Vancouver Community College microscope lab video resources

Microscopes and cell lab demonstrations

1. Klaudia demonstrated the use of the compound microscope – parts, how to set up and focus, and the dissecting microscope.
2. Klaudia demonstrated how to make slides of live organisms and cheek cells.
3. Each student had a separate station including:
 - a) Prepared slides
 - b) Live samples
 - c) Both microscopes
 - d) Slides and cover slips
 - e) Pipettes

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. Learn parts and use of the dissecting microscope.
3. Prepare slides of cells in the lab manual handout, draw and label.
4. Prepare slide of a buccal sample, identify epithelial cell, draw and label.
5. Distinguish between unicellular, aggregate, colonial and multicellular organisms

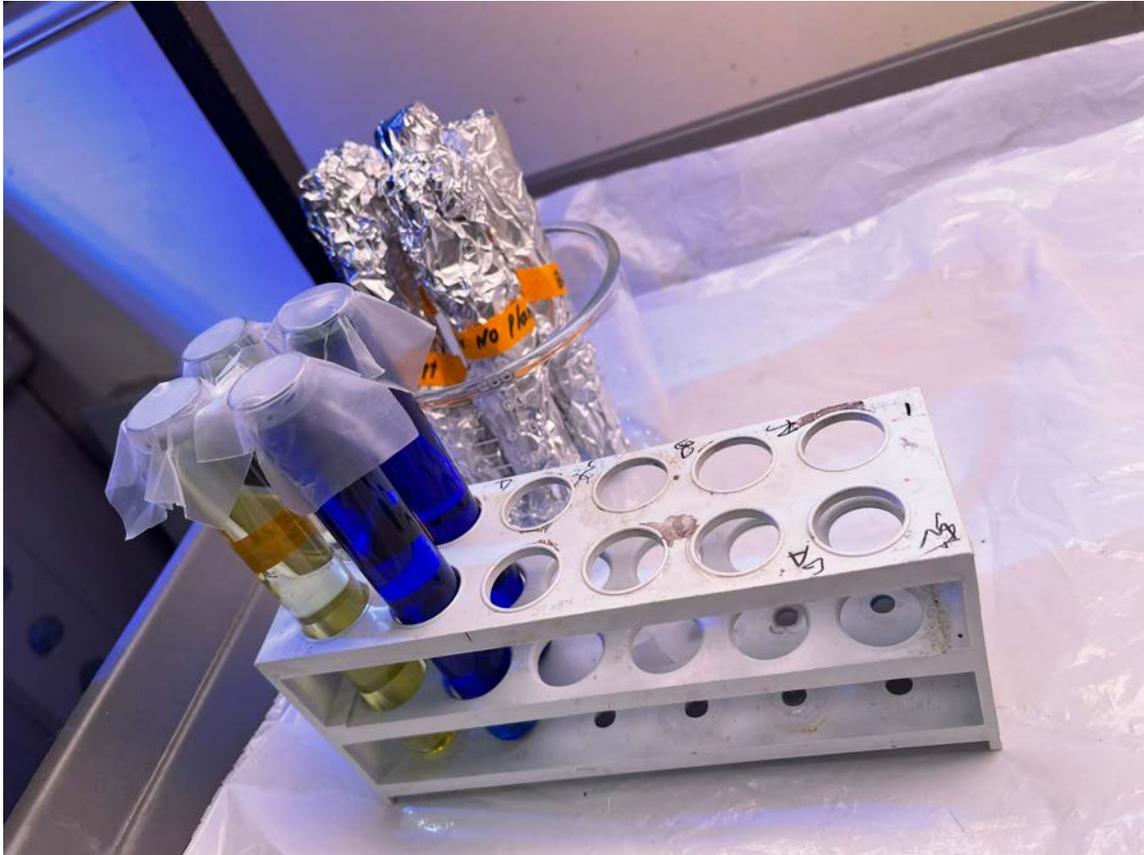


Goldfish tank at the back of the classroom

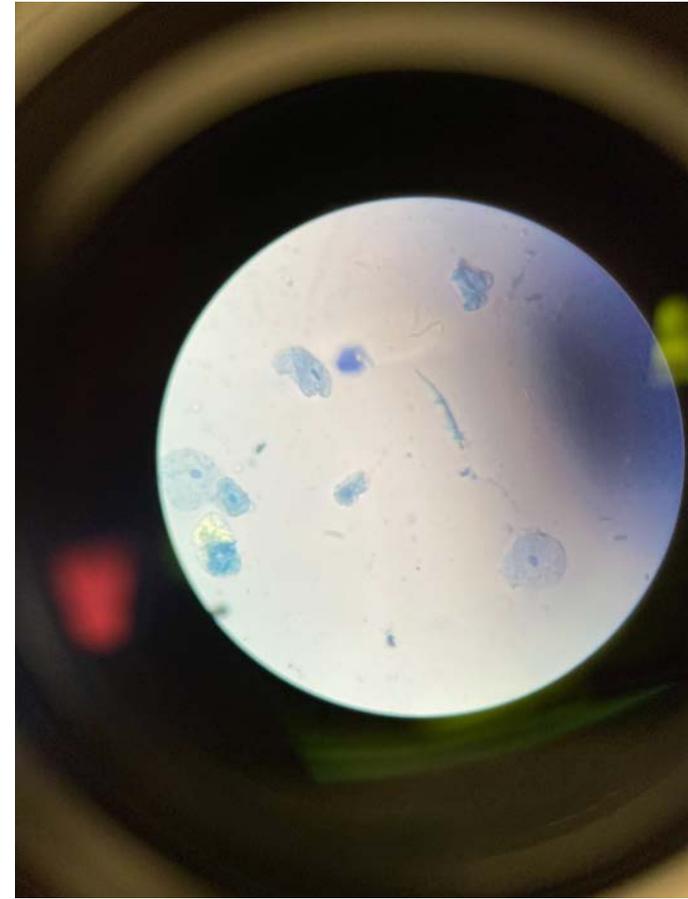
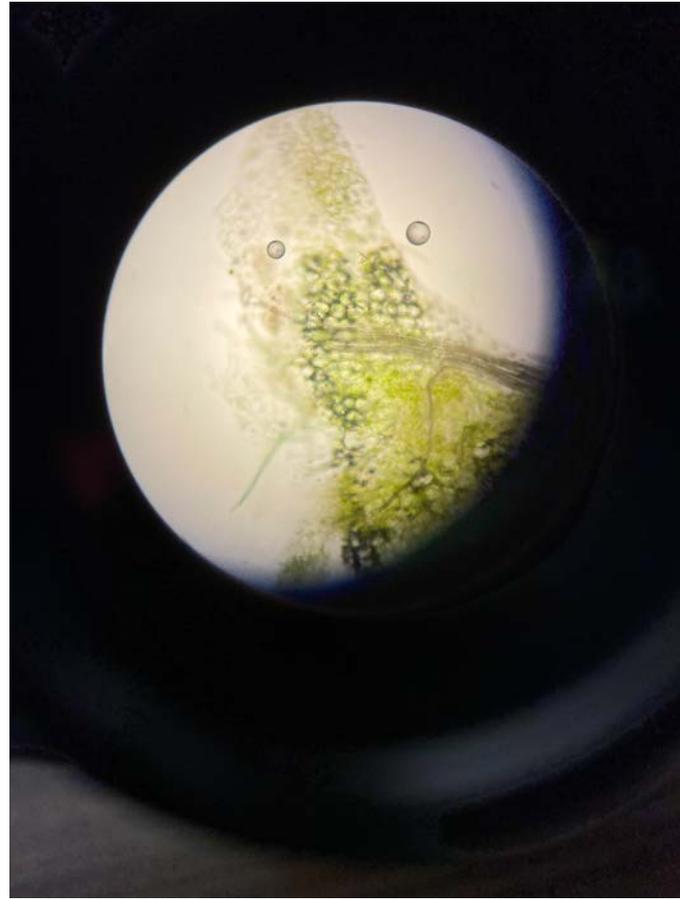


Leaf insect

Elodea lab. Students did an experiment on whether the elodea plant would perform photosynthesis in the light and/or cellular respiration in the dark.

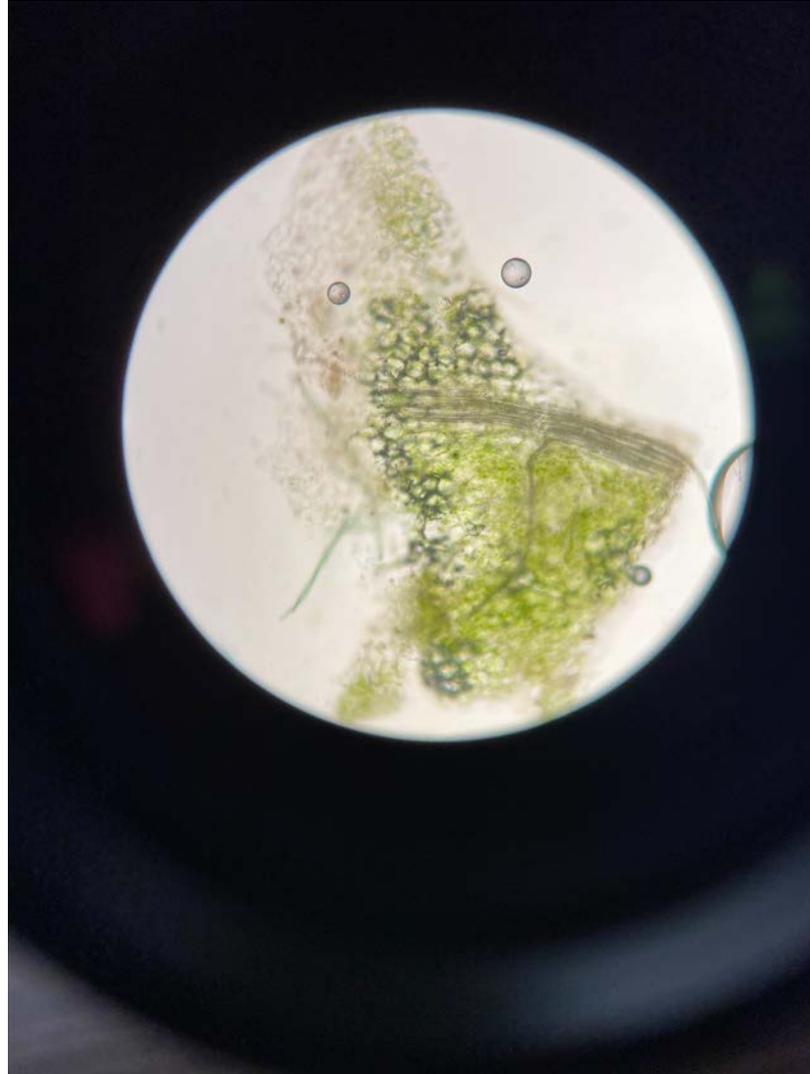


Student submissions of cellfies



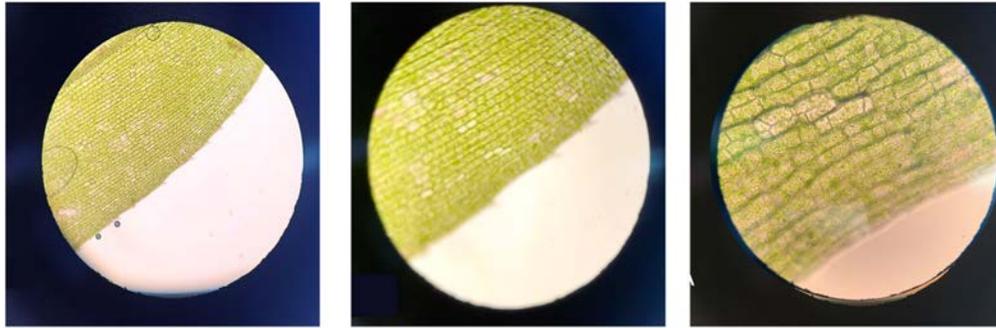
These were taken through the ocular lenses. See if you can identify various cells and structures.

More student cellfies: from left to right,
paramecium, plant cells, amoeba



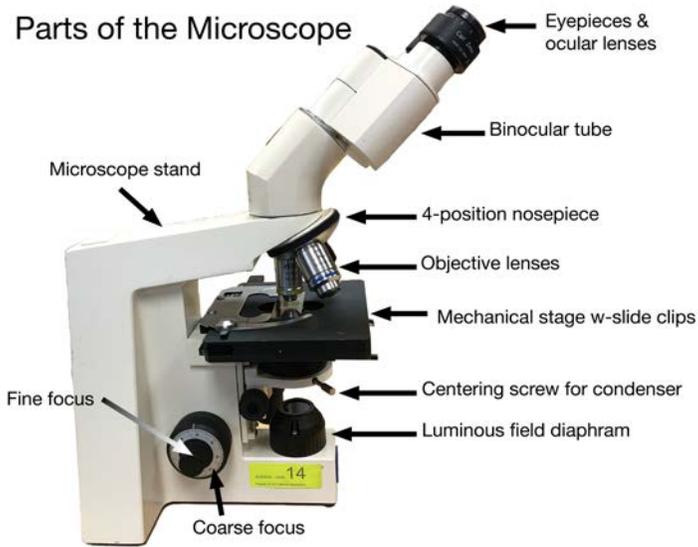
VCC biology lab slide images

Elodea under the microscope at increasing magnifications

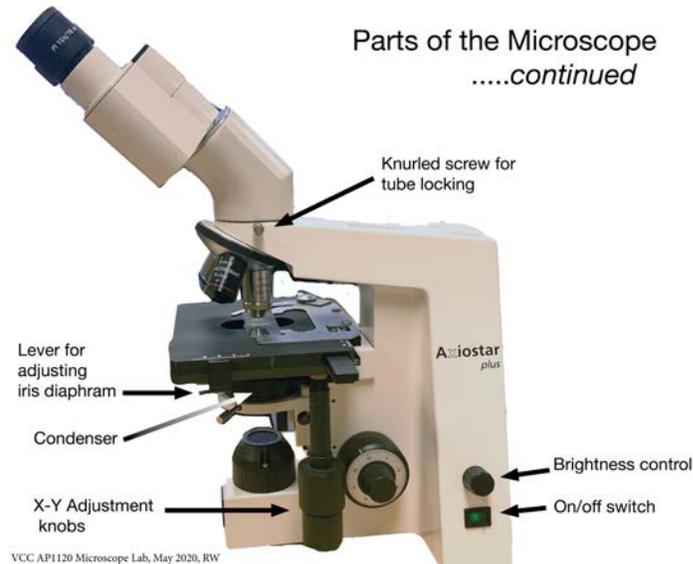


50X → 100X → 400X

Parts of the Microscope



Parts of the Microscope
.....continued



Field of View Measurements
Zeiss Axiostar Plus

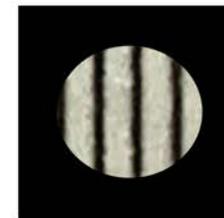
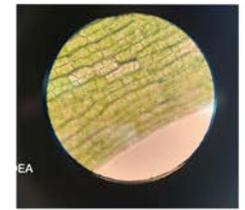
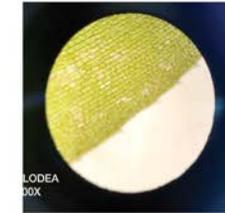
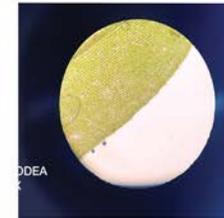
50X



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 different cells & observations

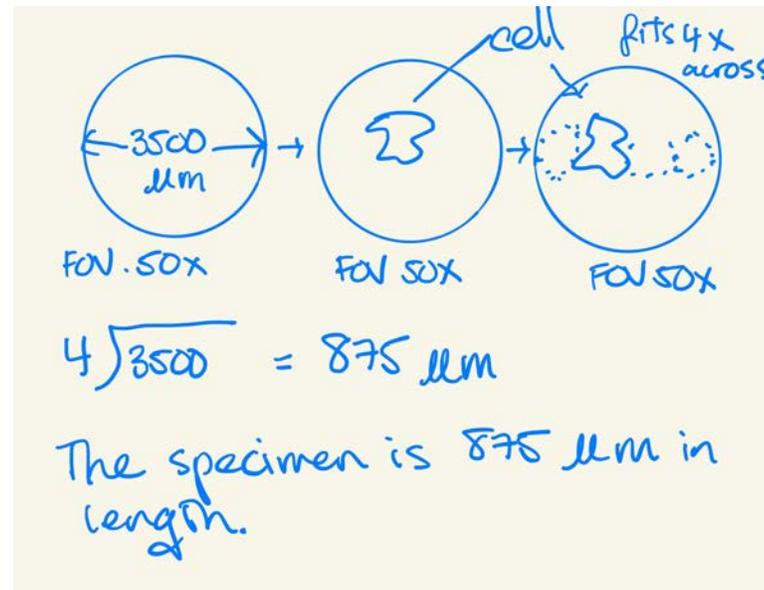
- Make sure to read the introductions in the manual handout about the organization of cells. Some are unicellular, like the amoeba, some are loose aggregates so they can live on their own if necessary, some are colonial and some multicellular. It's usually agreed that if cells must live in a group with other cells, and are more or less organized into tissues, they are multicellular. But there is a gray area between colonies and multicellularity.
- Review parts and use of the microscope, and the 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 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.

Some terms to review in the manual

- Autotrophic
- Heterotrophic
- Cell membrane
- Ectoplasm
- Endoplasm
- Contractile vacuoles
- Food vacuoles
- Pseudopodia
- phagocytosis
- Unicellular
- Aggregate
- Colonial
- Multicellular
- Flagella
- Cell wall
- Central vacuole
- Chloroplasts
- Nucleus

Measuring specimens (we did not do in this lab, but useful to know)

- 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>