Name: _____ Period: _____ Date: _____

# Life Science
# Microscope Lab

Students are to go to each of the described stations. A maximum of three groups (six students) may be at any one station at a time. **Follow the directions** for each station, make the microscopic observations as required and complete the necessary color drawings. All drawings must be labeled w/ proper information. All Drawings need to be completed on the specimen diagram sheets and in color using your colored pencils.

Remember: **Low power is 40x magnification -** (objective 4 power x ocular 10 power)
**Medium Power 100x magnification** - (objective 10 power x ocular 10 power)
**High Power is 400x magnification** – (objective 40 power x ocular 10 power)
**Oil Immersion Lens** – requires the use of oil… we will not be using this lens at this time.

Follow proper Microscope protocol at all times:

1. Always begin observations under low power with the stage up near the objective lens.
2. Turn on the microscope light.
3. Place the specimen slide onto the stage placing directly against the slide holder. Never place a wet/damp slide onto the stage.
4. Always make sure there is no moisture on top of the coverslip. Wetness/moisture will damage the objective lens.
5. Maneuver the slide to center the specimen directly under the light
6. Using the Coarse Adjustment, move the stage until the sample comes into focus use the fine adjustment to focus the sample to your sight.
    a. If you are having difficulty finding the sample, move the slide back and forth while looking into the microscope – moving samples are easier to see when unfocused in the scope.
7. Change objective lens and refocus using ONLY the fine adjustment.
8. Clean up the station and return the microscope to low power with the stage at the top of the adjustment.

**Station #1: Wet Mount type set "e"**

What to do:

1. Materials required: Water dropper, glass slide, cover slip, sample letter "e" .
2. Cut out the letter "e" into a 1cm square.
3. Place the sample "right side up" onto the middle of the slide as though you were "reading" the letter "e"
4. Place two or three drops of water on top of the sample.
5. Place the edge of a cover slip on the edge of your sample at a 45$^{o}$ angle.
6. Allow the edge of the coverslip to touch the sample AND the water.
7. Gently drop the cover slip onto the sample, trying to avoid trapping air bubbles.
8. Place the edge of a strip of paper towel at the edge of the cover slip to absorb excess water.
9. Start by observing your sample under **low power** (using the dissecting scope provided). View the sample.
    a Is the sample "right side up" or "upside down"? _____
    b Use the slide mechanism on the stage to move the slide **to the right**. Which direction does it move while observing it under the microscope? _____
    c Use the slide mechanism on the stage to move the slide **up**. Which direction does it move while observing it under the microscope? _____
10. Under low power - DRAW AND LABEL what you see. This is ***drawing #1***.
11. Under high power - DRAW AND LABEL what you see. This is ***drawing #2***.

**Station #2: Cheek cell wet mount and stain**

What to do:

1. Materials required – Microscope slide, coverslip, toothpick, methylene blue stain and water.
2. Place a drop of stain onto the center of the slide.
3. Use the rounded end (not pointed end!) of a new clean wooden tooth pick to gently scrape the inside of both cheeks.
4. Smear the rounded tip of the toothpick onto the stain on the slide. Allow it to "stain" for 30 seconds to one minute.
5. **DO NOT PUT THE TOOTH PICK BACK INTO YOUR MOUTH**. Throw it away.
6. Place the edge of a cover slip on the edge of your sample.
7. Gently drop the cover slip onto the sample, trying to avoid trapping air bubbles.
8. Place the edge of a strip of paper towel at the edge of the cover slip to absorb excess stain.

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9. Add a drop or two of clean water to the edge of the slide and use a dry paper towel to draw the clean water across the stain to the paper towel to dilute the darkness of the sample.
10. Start by observing your sample under low power.
11. Under low power - DRAW AND LABEL what you see. This is ***drawing #3***.
12. Under high power - DRAW AND LABEL what you see. This is ***drawing #4***.

**Station #3: Onion Epidermal Cells wet mount and stain**

What to do:

1. Materials required – Fresh Onion slice (single layer), Microscope slide, coverslip, toothpick, scalpel, forceps (tweezers), needle probe, methylene blue stain, paper towel and water.
2. Take a small piece of a single layer of onion (about 1cm x 1cm). Snap the onion slice, remove the thin skin layer from the inner, concave, side of the onion.
3. Place a drop or two of clean water onto the slide. Place the onion skin onto the center of the slide. Try not to allow the sample to fold over itself Add a drop of stain to the middle of the sample. Place a cover slip onto the sample.
4. Use a paper towel to draw the stain across the sample and dilute the stain.
5. Start by observing your sample under low power.
6. Under low power - DRAW AND LABEL what you see. This is ***drawing #5***.
7. Under high power - DRAW AND LABEL what you see. This is ***drawing #6***.
8. Label the cell wall, cytoplasm, nucleus on both drawings.

**Station #4: Elodea Leaf – a living wet mount**

What to do:

1. Materials required – Fresh Elodea plant, Microscope slide, coverslip, toothpick, scalpel, forceps (tweezers), needle probe, paper towel and water. Use scissors to cut a single leaf from the Elodea plant supplied.
2. Place a drop of clean water onto the slide
3. Use the tweezers to remove a small leaf from the upper end of the Elodea plant provided.
4. Place the entire leaf onto the water drop.
5. Place a cover slip over the sample and GENTLY flatten the leaf under the cover slip.
6. Under low power - DRAW AND LABEL what you see. This is ***drawing #7***.
7. Under high power - DRAW AND LABEL what you see. This is ***drawing #8.***
8. You should be able to see individual cells and even a few individual chloroplasts inside these cells! You may even be able to see the chloroplasts moving as the cellular cytoplasm is streaming inside the cell.
9. Label the cell wall, chloroplast, cytoplasm, vacuole.

**Station #5 - Macro Organisms – Fruit Flies and Hissing Cockroach**

What to do:

1. Materials required – Covered Petrie dish with fruit fly and cockroach samples, dissecting microscope.
2. Place a COVERED Petrie dish with a sample of living Fruit Flies under the dissecting microscope.
3. Bring the sample into focus. Try to identify different parts of the Fruit Fly.
4. DRAW AND LABEL what you see. This is ***drawing #9.***
5. Place a COVERED Petrie dish with a sample of living Cockroach under the dissecting microscope.
6. Bring the sample into focus. Try to identify different parts of the Hissing Cockroach.
7. DRAW AND LABEL what you see. This is ***drawing #10.***

**Station #6 - Comparing Protists using living project specimen**

What to do:

1. Living specimen will be displayed on the TV screen at the front of the room. A short amount of time will be spent looking at samples of Paramecium, Amoeba, Euglena, Stentor and Water Bears (Tardigrade).
2. Make a quick sketch of each of these samples and finalize them as color drawings after the demonstration. Label the following structures on your drawings
    a. **Paramecium** label: pellicle, cilia, nucleus, cytoplasm ***drawing #11.***
    b. **Ameba** label: pseudopods, cell membrane, cytoplasm and nucleus ***drawing #12.***
    c. **Euglena** label: nucleus, chloroplast, pellicle, cytoplasm ***drawing #13.***
    d. No drawings of **Stentor** or **Water Bear** are required… just enjoy God's creation!