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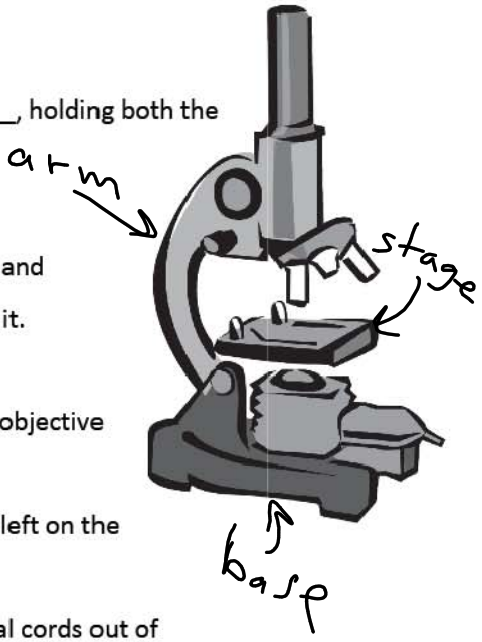
FOCUS: Introduction to the Microscope

ESSENTIAL QUESTIONS: Can you independently use a compound light microscope to find, focus on, and draw various protists?

Guidelines for Using a Compound Light Microscope



- Always carry the microscope with 2 hands, holding both the arm and base.
- Do not force any knobs.
- Take note of how the microscope is stored and put it away the same way you found it.
  - Always store a microscope with the scanning objective (or lowest objective lens) in place.
  - Never store a microscope with a slide left on the stage.
- Keep desks and aisles clear and keep electrical cords out of walkways.
- Read and review all instructions before beginning.
- Leave time to clean up at the end of class:
  - Throw cover slip away. They are not reusable. Always throw them away before washing the slide so they don't end up in the drain.
  - Wash slides in the sink, dry them, and return them to the slide box to be reused.

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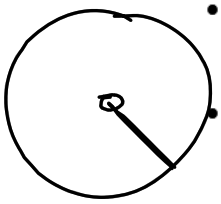
Magnification in the Compound Light Microscope

- Your microscope has 3 objective lenses: Scanning, low, and high.
- The eyepiece also has its own magnification.
- Total Magnification Power = objective x eyepiece

	Objective Lens	Eyepiece	Total Magnification
Scanning Power	4x	10x	40x
Low Power	10:1 or 10x	10x	100x
High Power	40:1	10x	400x

Focusing on a Specimen

1) Always start with the Scanning objective.
   - Use the course adjustment knob to focus.
   - The image will be too small to draw at this magnification, but it is much easier to scan the entire slide at this level.
   - You won't be able to find a single specimen at higher powers without this step.
   - Do not use the stage clips. Try shifting the slide around until you find something.



2) Once you've focused on Scanning, secure the slide with the stage clips, center the specimen (using the pointer for reference), and switch to low power.
   - Use the fine adjustment knob to re-focus.
   - If you are not centered and focused on low power, you will not be able to see anything in high power.

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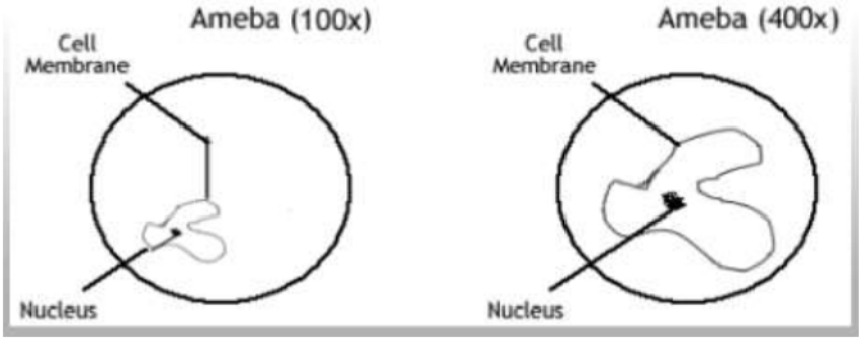
3) Finally, switch to high power.
   - At this point, use ***only*** the fine adjustment knob to focus.
   - Using the course adjustment knob at this level could crack the slide or lens, especially if you're inexperienced.

Drawing Specimens

- Always use pencil, so you can erase and shade.
- All drawings should be labeled with the specimen name and magnification (40x, 100x, or 400x).
- Any required organelle labels should be written outside the circle representing the viewing field.
- Specimens should always be drawn to scale. For example, if the specimen takes up the entire viewing field, your drawing should fill the entire drawing circle.



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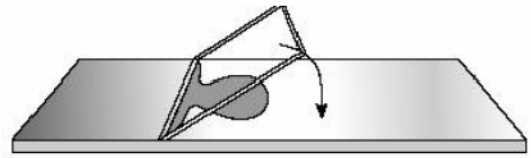
Making a Wet-Mount Slide



1) Place a specimen in the center of the slide.
2) Place one drop of water directly over the specimen. Too much water will actually make the specimen much more difficult to view.
3) Place the cover slip at a 45° angle (approximately) with one edge touching the water drop and then gently let go. Do not drop vertically to avoid air bubbles.

Troubleshooting

- "The image is too dark!"
  - Make sure the light is on.
  - Adjust the diaphragm under the stage.
- "There's a spot in my viewing field. Even when I move the slide, the spot stays the same!"
  - Your lens is dirty. Use lens paper to clean it.
- "I can't see anything under high power."
  - Remember the steps! View, center, and focus under scanning first and then low before switching to high.
  - When in doubt, go back one step and try again.
- "Only half my viewing field is lit. It looks like a half moon!"
  - Your objective lens or diaphragm is not fully clicked into place.

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Practice Labeling the Parts