

How to use a Microscope



By Linda Dunkley

What you need to know about this presentation



- Clicking the a mouse will move you the next slide so you control the speed that you view the information. Take your time to learn everything on each slide.
- You can listen to the slides instead of reading the text by pushing the speaker icon. 

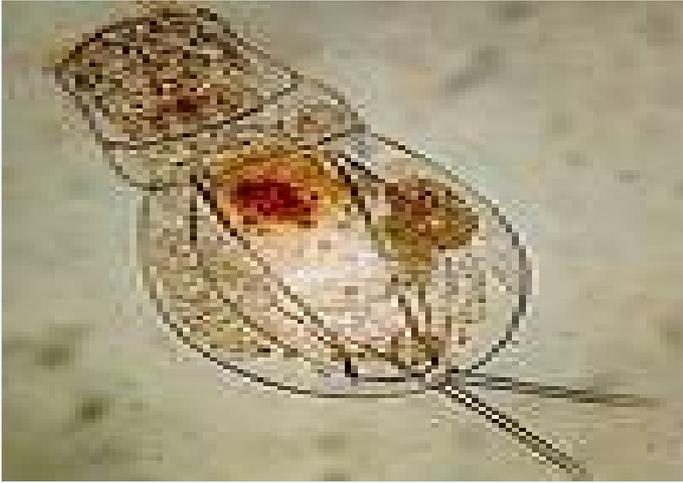
Welcome to Brightwater



This is what you will be doing at Brightwater. Your job is to know how to use a microscope before you come to Brightwater so that you can enjoy looking at microorganisms during your visit.



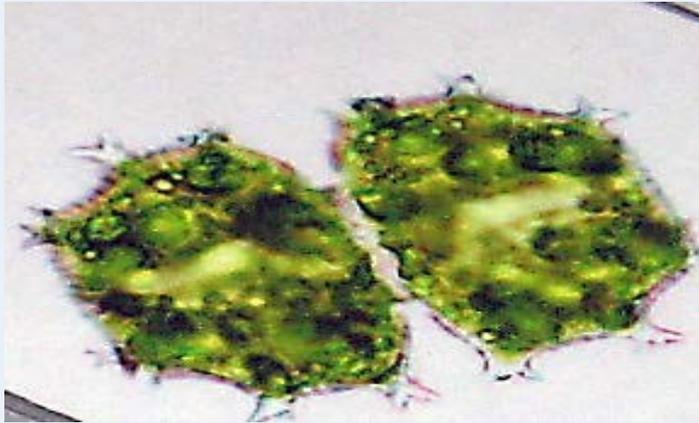
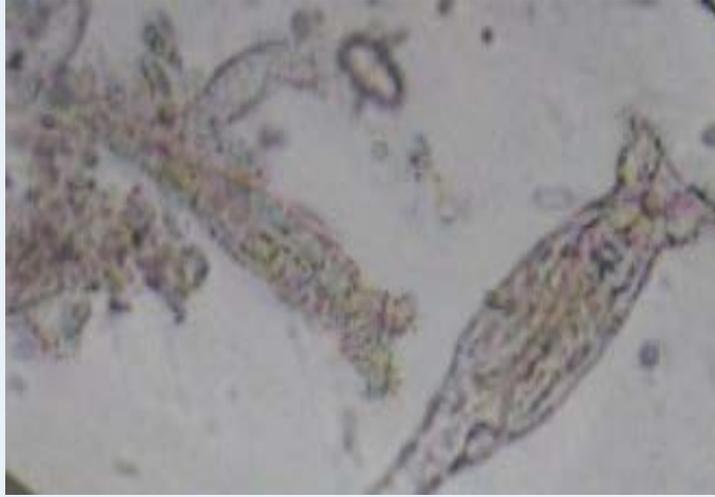
What will you see at Brightwater?



At Brightwater many of these microorganisms are living in the water, in the bottom of the creek bed and among the plants found in the creek.



What do microorganisms look like?



- They are so tiny you cannot see them without magnifying them.
- This is why it is important that you learn how to use a microscope properly before you come to Brightwater. 📢

Your microscope



It is very easy to break a microscope and they are expensive.

Therefore....

Please follow the instructions in this presentation and use the microscope for practicing the skills you have learned from this presentation.



What do you know about microscopes?

Think of all those TV shows about murder investigations?

Microscopes are used in many different areas such as science and police work.

When you come to Brightwater you won't be solving any murder investigations but you will be looking for microorganisms.



What do you know about microscopes?



- Have you ever used a magnifying glass to look at something small?
- Microscopes magnify things also. At Brightwater you will be looking at a droplet of water. Animals in this droplet are so tiny that you need a microscope to enlarge them so you can see them.



Your microscope



A compound microscope will be set up beside the computer. **Please wait** until you are following these instructions before you turn any knobs on the microscope.



What you will learn today

This presentation will start with a review of the parts of the microscope so you know what everything is.

Then you will learn how to put a slide onto the microscope and how to focus it so you can see microorganisms.



What you need to know when you come to Brightwater.



Remember:

Your job is to come to Brightwater knowing how to use the microscope.

This will make your visit to Brightwater enjoyable and it will be easy for you to see as many microorganisms as you can find in the creek water.



Compound Microscope



When you want to look at something that is too small to see without magnification you use a compound microscope like this one.



What is a compound microscope?



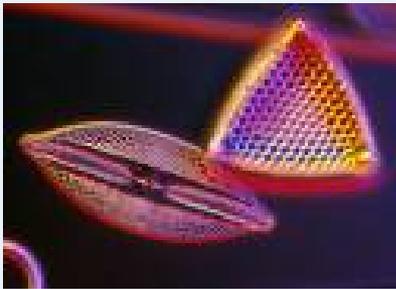
A Compound Microscope has three different lenses that can magnify microorganisms so you can see them in more detail.



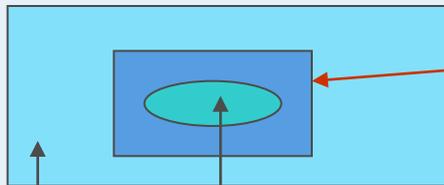
Words you need to know



- Slide – a piece of glass that you put your specimen on.



- Specimen – microorganisms found in a water droplet on the slide.



Slide
Water

- Slip cover - is a thin piece of glass that covers the water droplet.



Parts of the Compound Microscope

Eye Piece

Compound
Microscopes
have three
objective lenses

Objective Lenses

Arm

Stage

Stage Clip

Coarse Focus Knob

Fine Focus Knob

Base



Eye Piece



- This is the eye piece



Objective Lenses



A Close up of the Objective Lenses



The numbers on the objective lenses tell you how much they magnify the object. Notice the 10 and the 40 printed on the lenses.



Different magnification powers of the lenses.

Shortest lens Low power

Medium Power

Largest lens High power



The low power is 10 and the medium power is 40. Turn the lenses so you can feel them click into place.



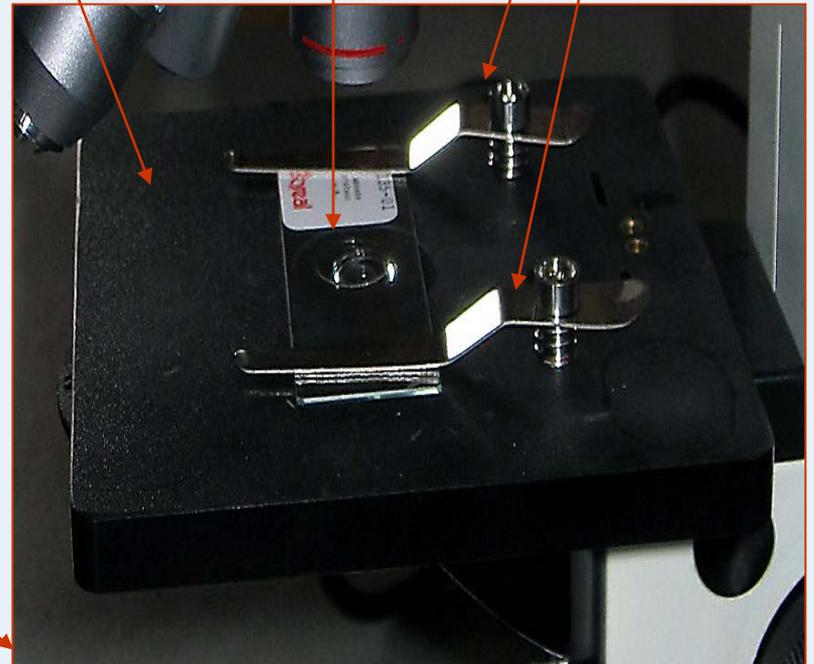
Stage and Stage Clips



Stage

Slide

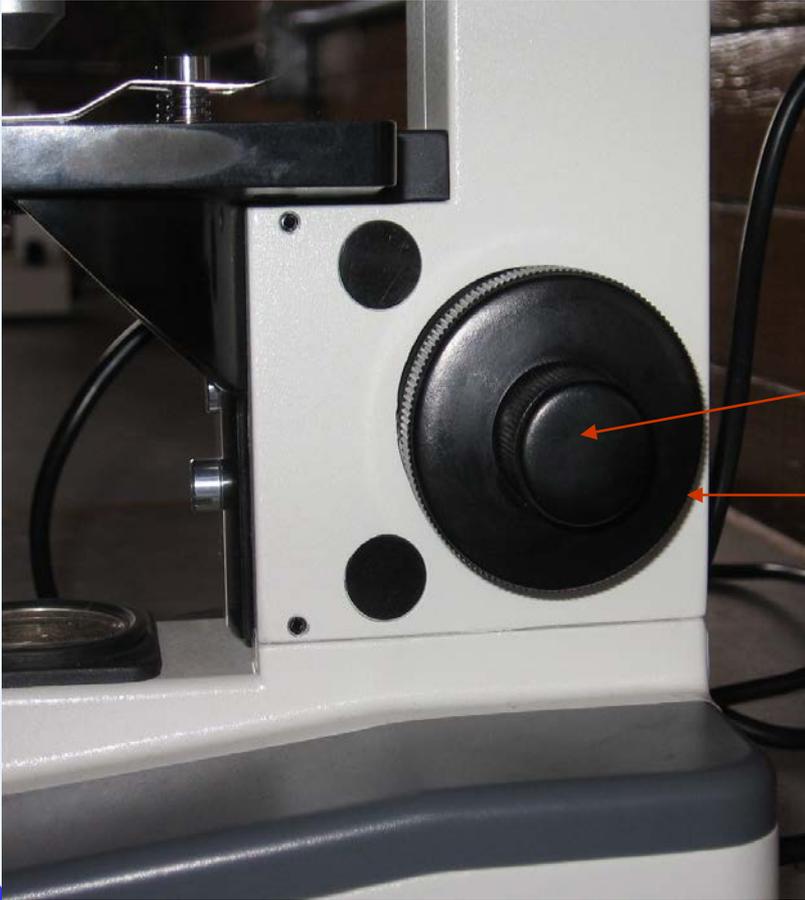
Stage Clips



Coarse and Fine Focus Knobs



Close up of the Coarse and Fine Focus Knobs



The Coarse Focus Knob is larger than the Fine Focus Knob.

Fine Focus Knob

Coarse Focus Knob

The Fine Focus Knob moves the stage up and down a little amount.



Close up of the Coarse and Fine Focus Knobs



The Coarse Focus Knob moves the stage further in a turn than the Fine Focus Knob does.

Carefully try to turn each knob and remember what they do.



Tips for Remembering the Parts of the Microscope

- You put your eye to the eye piece of the microscope.
- The slide containing the specimen are on the stage the same way actors are watched on the stage. And you are watching microorganisms.



Tips for Remembering the Parts of the Microscope

- If you want to see the specimen big choose the 40X power lens. If you want to see it smaller choose the 10X power lens.

- Look at your microscope and try to find the parts you just learned about.



Take the time to practice



- Look at the microscope and review the parts.

- Look at each objective lens and see that they are different lengths and remember that each one magnifies the specimen a different amount.



Take the time to practice



- Turn the focusing knobs and learn which direction to turn it to make the stage go up or down.
- Remember to stop before the lens touches the stage 

How to Carry a Microscope.



- When you carry the microscope you must use two hands, one hand holding the arm of the microscope and the other hand supporting the base.



How to Turn the Microscope on



- There is a switch on the base of the microscope that you push to turn it on. The button is on the back of the microscope.
- Try to turn your microscope on now.



Putting the Slide on the Stage



- Place the prepared slide on the stage and move the clips onto the top of the slide. The clips will prevent the slide from moving while you focus on your specimen.



Focusing. Step One



- Turn the lowest power objective lens (10X) into place.
- You will feel a click when it is in place. You won't see anything if it is not in the right place.
- You will be using the shortest lens right now. 💡

Step 2



- Using the **Coarse Focus Knob** move the stage and lens close to each other, but **don't let them touch**.



Step 3



- Observe which direction you need to turn the knob in order to move the stage away from the objective lens.



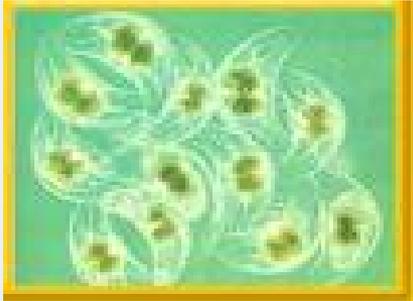
Step 4



- While you are looking through the lens, slowly turn the coarse focus knob in the direction that separates the stage and lens.



Step 5: Find a microorganism

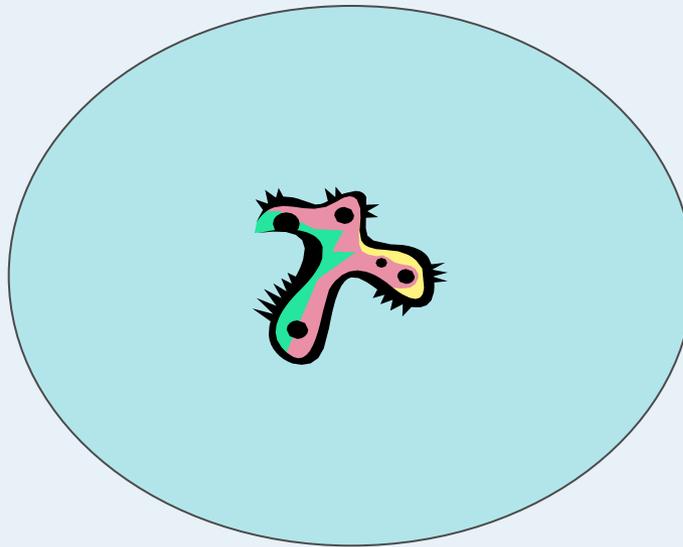


- While looking through the eye piece find one microorganism that you want to look at in more detail.
- Slowly move the slide with your hands in the **opposite direction** to what you want it to go.
- Place this microorganism in the center of what you see through the eye piece.



Step 5: Find a microorganism

- When you are looking in the eye piece you will see a circle of light. Put the microorganism in the middle of this circle.



Step 6:

Move the objective lens to 40X

- You will feel a click when the 40X objective lens is in place.
- Now you will be able to see more detail in your microorganism.



Step 7: Use the fine focus knob

- From this point on you will not touch the coarse focus knob. It is very important to remember not to use the coarse focus knob.
- From this point on you will only use the fine focus knob.
- If you use the coarse focus knob with the medium and higher power lenses you could break the lens.



Step 7 Continued



- While looking into the eye piece turn the **fine focus** knob until you see your microorganism clearly.
- You should be able to see some internal structures.



Daphnia



This is an example of a Daphnia. You can see it's internal structures.



Troubleshooting

- Help! I can't see anything except my eye lashes.

- Solution: Maybe your eye is too close or far away from the eye piece.
Remember to keep both eyes open when looking into the eye piece.



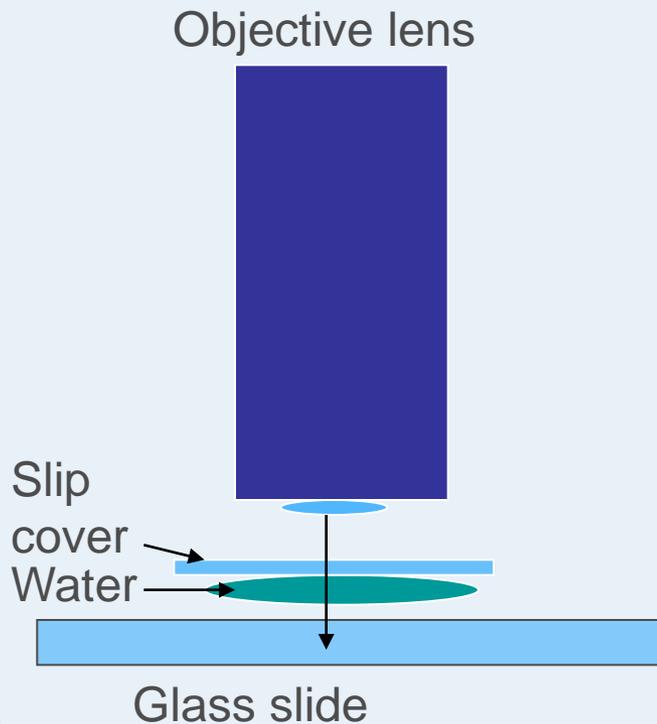
Troubleshooting

- I can see something but it does not move when I move the slide.
- Solution: Your lens is probably dirty so ask the facilitator or your teacher to clean the lens with lens paper and see if that fixes it.

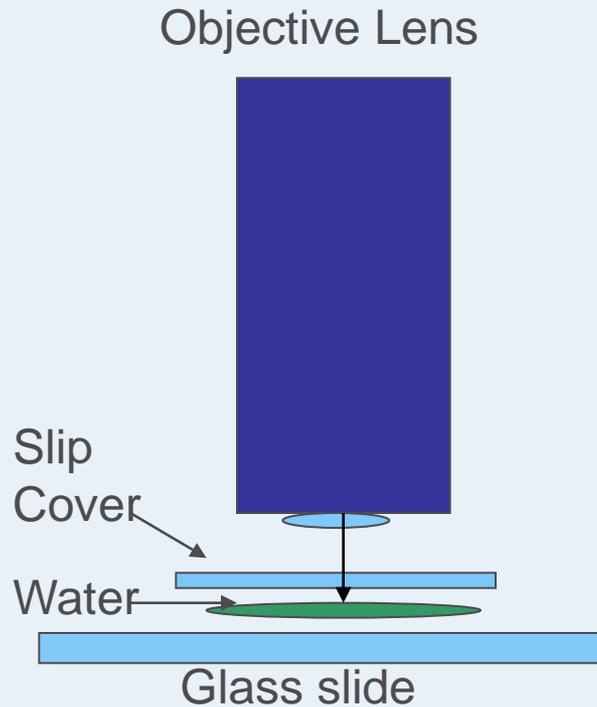


Troubleshooting

- I can see things that look like scratches.
- Solution: You have focused on the slide not the water droplet. Adjust your focus until microorganisms come into view.



Troubleshooting



- Remember that the lens focuses on different things as it moves away from the slide.
- Notice the arrow from the objective lens points to the water. Compare the same picture on the previous slide



Step 8

- When you are finished looking at your microorganism move the stage down.
- Put the 10X power objective lens into place.
- Turn off the microscope.



Step 9:



- Remove the slide from the slide clips and put it in the proper box.



Summary

- Turn on the microscope
- Put the slide into the stage clips
- Put your 10 power lens in place
- Move the stage up towards the lens



Summary Continued

- Focus using the coarse focus knob
- Find a microorganism and move it to the center of the field of view
- Change to the 40 power lens



Summary Continued

- Using only the fine focus, focus until you see the details of the microorganism.
- When you are finished move the stage down
- Turn to the 10 power lens
- Turn off the microscope



Test your knowledge

What is this?



Look at the photo. Try to identify the name of the part that has an arrow pointing to it. Click the mouse to find the correct answer.



Test your knowledge

It is the eye piece.

What is this part called?



Move to the next slide to find the answer.



Test your knowledge

These are the objective lenses. There are three of them, lower, medium and high power.



What are these?



Test your knowledge



The large one is the Coarse Focus Knob and the middle smaller one is the Fine Focus Knob.



Practice

- Now take the time to practice putting a slide on the microscope and focusing.

- When you feel confident, ask your teacher to test you.
- Go to the next slide.

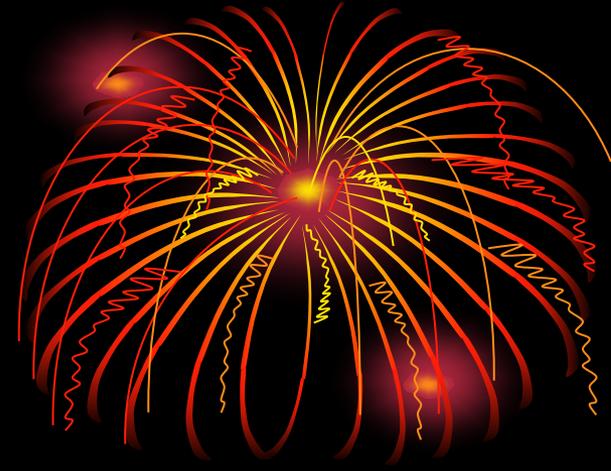


Test your knowledge



- Demonstrate for your teacher how to focus and let your teacher look into the eye piece at the microorganism.





Congratulations
you now know
how to work a
microscope!



The End

Enjoy your visit to Brightwater.

(Need a photo)

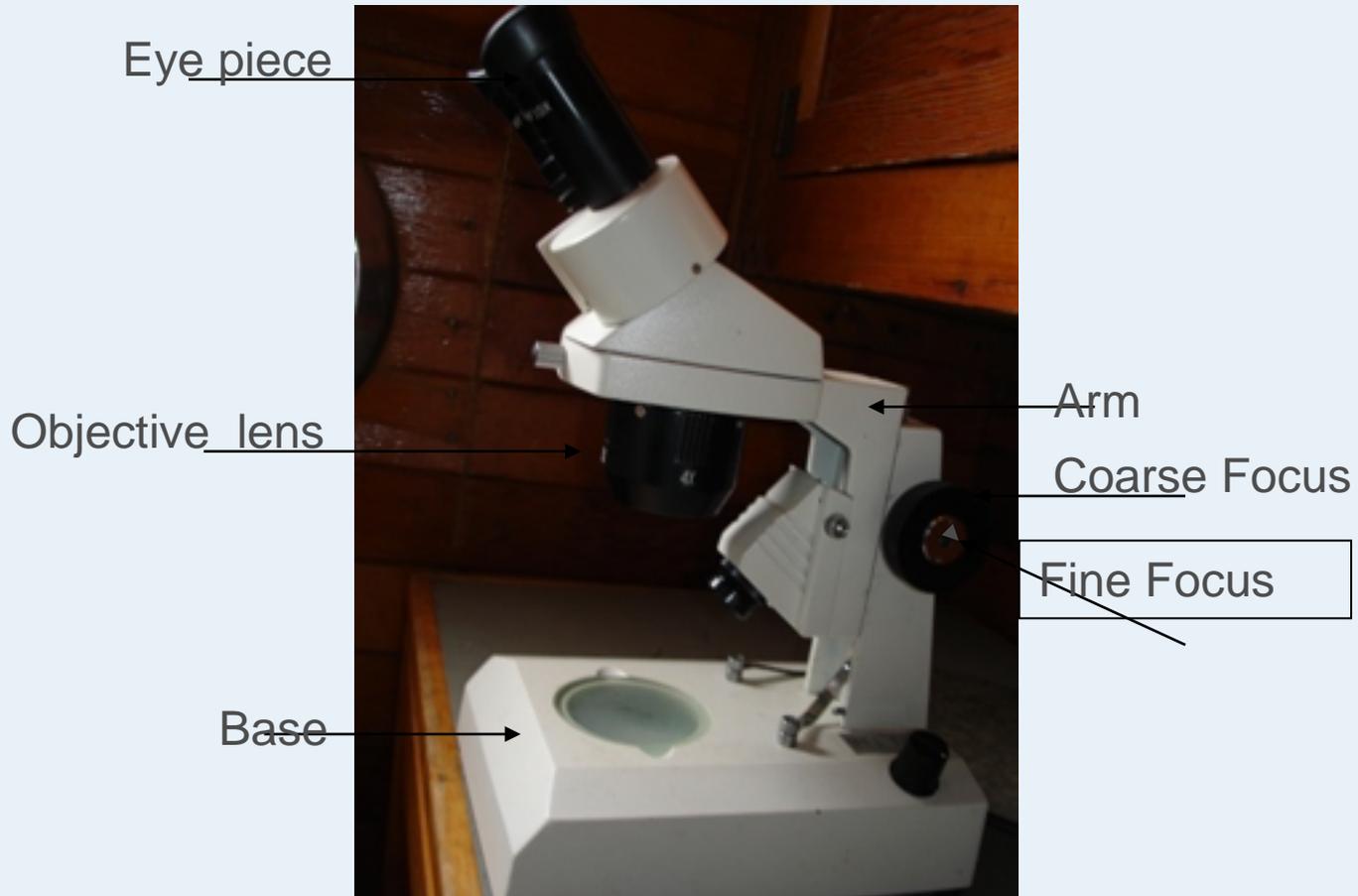
- Include audio in ppt
- Send microscopes to schools
- C:\Documents and Settings\Linda\My Documents\873\Google Image Result for [http--www_biologycorner_com-resources-MICRO-labeled_gif.htm](http://www.biologycorner.com/resources/MICRO-labeled_gif.htm) good information about quizing students

Types of Microscopes



- Dissecting Microscopes are used when you are trying to enlarge something that is large enough to see without any magnification. At Brightwater you will be looking at lichen under this microscope.

Parts of the Dissecting microscope



If you need to put the microscope away.

- Make sure that the stage is clean.
- Position the lowest objective lens in the position closest to the stage.
- Unplug the microscope and wrap the cord around the microscope.
- Cover the microscope and carefully carry it to where it is stored.

Take the time to practice

- Take a lens tissue from the box and practice cleaning the eye piece and the objective lenses.

Cleaning the lens

- To see the specimen you need clean lenses.
- Only use lens paper to clean the lenses.
- If you use other types of tissue to clean the lenses you could scratch the glass.

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- <http://images.google.ca/images?q=euglena&ndsp=20&svnum=10&hl=en&lr=&start=40&sa=N> euglena
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