

The Way I See It!



Lesson Plans

1. "What's in the Bag?" -
<http://chroma.mbt.Washington.edu/outreach/BAG.html>
2. History of Microscopy!
3. Let's Compare the Compound Light Microscope and the Electron Microscope!
4. Fun With Optical Illusions!
5. "Making 3-D glasses" -see lesson plan resources
6. Anaglyphic Creations!
7. Anamorphic Explorations!

History of Microscopy



Objectives:

- To understand the progression of microscopy from the late 1700's up to the present time.
- To compare and contrast the simple microscope that was first developed with the simple compound light microscopes used today.

Materials:

Class set of Usborne Science & Experiments' "The World of the Microscope"

"Microanalysis" PowerPoint presentation (slides 1-4)

overhead projector

screen

index cards or cardstock

metric rulers

hole punch

clear plastic

tape

newspaper

dropper

compound light microscope set up with the letter "e" magnified (for evaluation section)

Procedure:

1. Briefly discuss the history of the microscope (have students read pg. 4 in "The World of the Microscope" (Use slides 1 & 2)
2. In their particular groups have the students brainstorm and write about what life would have been like prior to the invention of the microscope.

3. Call on groups to share their ideas and show slide 3 of the PowerPoint presentation and discuss.
4. Explain to the class that they will simulate the very first microscope that was made by using common materials.
5. Pass out the lab sheet to each student and have them record the pre-lab for this activity (title, purpose, materials, procedure)
6. Have a member of each group come up and gather all of the needed materials for each group member.
7. Discuss the procedure with the class and demonstrate using the overhead projector.
8. Allow each student to create the simple microscope using the lab sheet (see attached)
9. Have the students record their observations and complete the analysis questions.

Evaluation:

Using various resources, have students create a time-line of the events that led to the discovery of the microscopes that we use today.

Have students compare the images produced by their simple microscope with the images produced by the compound light microscope and discuss the similarities and differences.

Let's Compare the Compound Light Microscope and the Electron Microscope!



Objectives:

- To compare and contrast the compound light microscope and the electron microscope
- To be able to distinguish between the TEM and the SEM
- To understand practical applications of the electron microscope

Materials:

Class set of Usborne Science & Experiments' "The World of the Microscope"

"Microanalysis" PowerPoint presentation (slides 4-12)

overhead projector

screen

compound light microscopes

prepared slides

electron microscope images (donated by Bob Goddard-NHMFL, Tallahassee, FL)

Procedure:

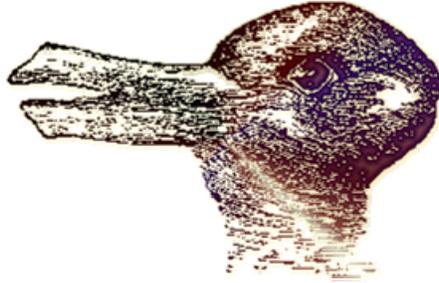
1. Review the information from the previous lesson using slides 1-3 of the PowerPoint presentation.

2. Briefly discuss the progression of the microscope from the late 1700's up to the present technological advances, along with the types of microscopes that are used today and the practical applications. (Use slides 4-15)
3. Explain to the students that they will get a chance to view images using the compound light microscope and will compare them with images taken from an electron microscope.
4. Have students set up their assigned microscope for use.
5. Pass out the prepared slides to each group for viewing.
6. Have students draw their observations in their journal.
7. When all groups have completed this task, show several images from an electron microscope on the screen using the overhead projector.
8. Students will need to draw three of those images in their journal.
9. Discuss the similarities and differences in the images produced by both types of microscopes using Slide 16 of the PowerPoint presentation. Students should record these findings in their journal.

Evaluation:

Using various resources, students will create a Venn diagram comparing the Compound Light Microscope and the Electron Microscope. (Slide 17)

Fun With Optical Illusions!



Is it a rabbit or a duck?

Objectives:

- To understand that an optical illusion is an object that deceives you into thinking it is something else.
- To use common materials in order to create their own optical illusion.

Materials:

Colored pencils
White cardboard
Pencils
Scissors
Tape
Rubber bands
String
"101 Optical Illusions" by Terry Jennings

Procedure:

1. Briefly discuss optical illusions.
2. Demonstrate how to make optical illusions using several examples from "101 Optical Illusions."

3. Tell students that they will be given an opportunity to create an illusion of their choice.
4. Allow students to come up to collect their materials by groups.
5. Give students time to create their optical illusion.
6. Allow students to play with and share their optical illusions.

Evaluation:

Students will use the information learned in this lesson to create their own optical illusion for homework.

Anaglyphic Creations!

Objectives:

- To understand how our eyes see anaglyphic images
- To discover how 3-D anaglyphic images are created
- To create their own anaglyph

Materials:

Adobe PhotoShop loaded on student computers

Use of the computer lab

Several examples of 3-D images created by teacher

3-D glasses

Procedure:

1. Briefly go over the information from the previous lesson regarding anaglyphs.
2. Explain to students that they will be allowed to create their own anaglyph today.
3. Students must first search the internet for a picture that they would like to make an anaglyph out of.
4. Students must seek teacher's approval before receiving the instruction sheet for creating anaglyphs.
5. Once approval has been granted, students will then proceed to make their anaglyph being sure to follow the directions carefully.
6. Students will need to test the accuracy of their anaglyph by using their 3-D glasses (created in the previous lesson) to view the anaglyph.
7. If the anaglyph has been made correctly, then the student will need to see the teacher for approval and instructions to print.

Evaluation:

The finished product!

Anamorphic Explorations

Objectives:

- To investigate the origin of anamorphs
- To gain an understanding of how anamorphs are created
- To explore several anamorphs created by teacher

Materials:

Examples of anamorphs

Chrome tail pipes (about 10" in height and 1 ½" in diameter)

Overhead projector

Screen

Use of computer lab

Other resources

Adobe Photoshop

Procedure:

1. Briefly define and show an example of an anamorph using the overhead projector.
2. Have students research the origin of anamorph and how they are created.
3. Discuss their findings as a class.
4. Demonstrate to the students how to make an anamorph using Adobe photoshop.
5. Share several anamorphs with the class using the chrome tail pipes to view them.

Evaluation:

From their research, students should have found that some artists have been able to draw anamorphs. For homework, have students attempt to create their own drawing of an anamorph to be tested in class on the next day!



The Way I See It!

Simple Microscope Lab Sheet

Title: Making A Simple Microscope

Purpose: To create a simple microscope using common materials and simulate the first microscope ever created.

Materials:

- Index card
- Hole punch
- Metric ruler
- Clear plastic
- Tape
- Newspaper
- Dropper

Procedure:

1. Cut a piece of index card (10 cm by 3 cm) and make a hole at one end with a hole punch. (The hole should be 5 mm wide)
2. Put a small piece of clear plastic over the hole and tape it down.
3. Take a dropper of water and hold it above the plastic over the hole. Drop the water over the hole. (You only need one drop)
4. Hold your microscope very close to your eye and move close to a piece of newspaper in order to magnify the letters.
5. Find other objects to look at using your simple microscope. Record your observations on your lab sheet. Use drawings and very detailed descriptions.

Analysis/Conclusion:

How difficult was it for you to see the image? Did you have any control over how the specimen was viewed? Briefly describe what it would have been like as a scientist in the late 1700's.

