Teacher Notes

Overview:
During this activity, students will visit 6 lab stations to learn more about microscopes. The stations should be completed after students have had a lesson about the basic parts of a microscope and an overview of the proper procedures for using them. Students will need at least 15-20 minutes per station. Other materials for this unit, such as station cards, student worksheets, and puzzles are available on the Biology page of the Science Classroom at http://sciencespot.net/Pages/classbio.html. Scroll down to the Microscope Mania section.

Objectives:
As a result of this activity students will be able to:

- Identify the basic parts of the microscope and describe the function of each.
- Demonstrate the proper procedure for viewing a prepared slide at different powers of magnification.
- Demonstrate the proper procedure for making a wet mount slide and viewing it at different powers of magnification.
- Describe the differences between low power and high power (i.e. higher power allows us to see more detail, but we see a smaller section of the specimen.)

Station Descriptions:

Station 1: Mystery Pictures
Students try to identify 24 mystery pictures. Mystery pictures may be found on the websites at http://sciencespot.net/Pages/kdzbio.html or printed from the Havana Junior High Mystery Pictures webpage at http://mason.k12.il.us/havanajh/mystery/. The page includes a link to an answer key at the bottom!

Materials Needed: Set of 24 mystery pictures and/or computers with Internet access

NOTE: A set of 24 cards with mystery pictures and clues for each is available in the Microscope Mania section of the Biology Classroom at http://sciencespot.net. I print my cards on photo paper and laminate them to keep them from smudging.

Extension Idea: I have a microscope camera connected to my computer. After students have completed the mystery picture activity, they are allowed to try to capture digital pictures of interesting objects. The best ones are featured on our Mystery Pictures website or printed for display in the hallway. Students might also try getting close up images of objects using a digital camera.

Station 2: Make It Simple
Students use glass slides and drops of water to create a simple lens to view the letter "e". The activity challenges students to compare how the size of the water drop affects the magnification. Students may also use hand lenses and compare the magnification to the water drop lens.

Materials Needed: Glass slides, eye droppers, small cups of water, ruler, and hand lenses.

Extension Idea - I found several different sizes of "bug jars" at the local school store and Toys R Us. The clear jars have a lid with a magnifying glass in the cover. Students have enjoyed using these "bug jars" to view pond water samples, preserved bug specimens, and anything else they think would be cool to see close up.

Station 3: Select-A-Slide
Students will learn how to view prepared slides under different powers of magnification. After this activity, students should be able to describe differences between low and high power, i.e. higher power allows us to see more detail, but we see a smaller section of the specimen.

Materials Needed: Prepared slides and microscopes

Station 4: Pond Water Critters
Students will learn how to make a wet mount slide and view it under different power of magnification. If ID guides are available, challenge students to identify the organisms they see and compare observations with other students.

Materials Needed: Slides, cover slips, eye droppers, and microscopes.

NOTE: You will also need pond water samples and/or other items that can be used to make wet mount slides (leaves, onions, etc.). You may also want to provide an identification guide (or provide access to online resources) to help students identify the organisms they see. Golden Guide offers a basic ID guide for pond life that is helpful for middle school students.

Station 5: Scope Basics
Students will use their time at this station to study the parts of the microscope as well as the functions of each. The Parts & Pieces game challenges students to label the diagram in the shortest amount of time possible. The Vocab Challenge activity provides students with a chance to review the basics of a microscope by matching all the cards correctly in the shortest amount of time possible.

Materials Needed: Sets of the microscope study diagram and labels*, sets of the vocab matching cards*, and timers (optional)
* These materials are provided with the station cards - I copy the study diagram, labels, and matching cards on cover stock and laminate them to help them last longer. I store the games in

ziploc bags and provide at least three sets of each game (Parts & Pieces and Vocab Challenge) at the station.

NOTE for the Vocab Cards: If you would like the cards to be "self checking", code the back of the cards by the writing the same letter or number on matching cards. Students can check the matches easily by comparing the backs of the cards. Be sure to inform the kids that "no peeking" is allowed and all cards must be face up at the start of a game.

Station 6: Microscopes Online

Students will visit three Internet sites during their time at this station – all the sites are listed on the Microscopes page of my Kid Zone at http://sciencespot.net/. If students have extra time, they are allowed to explore other sites listed on the Microscopes page.

Materials Needed: Computers with Internet access (1 -3 computers depending on the size of the groups).

Extension Ideas:

• Use Internet resources to explore different types of microscopes and the history of each if you have not already done so. Several of the scientists associated with the development of microscopes are included in the word search puzzle. Challenge your students to research the scientists (or other terms on the puzzle) to create trivia questions for their classmates. I have a list of kid-safe websites for microscopes available at http://sciencespot.net/Pages/kdzbio.html.

• I also have an Internet worksheet for microscopes that is available on the Biology page of the Science Classroom - http://sciencespot.net/Media/micromanianet2015.pdf.

• Use a digital camera or microscope camera to create your own mystery pictures. Allow students to use the equipment to create their own mystery pictures to challenge their classmates.