

Discovery Lab Pre-Visit Activities Super Size Me Grades 9-12

Thank you for booking your field trip to the Orlando Science Center! As a means of preparing your students for their Discovery Lab and enhancing their experience, we are providing you with these pre-visit materials to share with your class.

Discovery Lab Objective:

Examine a world unseen by the naked eye. Learn how to use a multi-lens microscope and discover the micro-life living in Florida's ponds. Look inside to observe the cells in your own body. What goes on when we are not looking? Find out in this microscopic exploration. Includes a demonstration of our Scanning Electron Microscope. Class size is limited to 28 students per session.

Next Generation Sunshine State Standards:

SC.912.N.1.1, SC.912.N.2.4, SC.912.L.14.2, SC.912.L.14.3, SC.912.L.14.4

Key Vocabulary:

- Microscopy: the use of microscopes to view things unable to be seen with the human eye.
- **SEM:** Scanning Electron Microscope is a microscope that uses a high-energy beam of electrons to display the image
- Symbiosis: close interactions between species
- Bacteria: a single-celled microorganism whose cells have neither membrane=bounded nucleus nor organelles.
- **Membrane:** a thin layer of tissue that surrounds or lines a cell, a group of cells, or a cavity; any barrier separating two fluids.

Key Concepts:

- Optical microscopes use visible light and a system of lenses to magnify images of small samples. This experiment will introduce students to how a microscope works, by observing the way the letter "e" appears when viewed through the lenses of a compound microscope.
- All living organisms on Earth are divided into pieces called cells. In this experiment, students will examine the chloroplasts inside a plant cell and observe the effects of salt water on the cell.
- Freshwater ponds provide a home for a wide variety of aquatic and semi-aquatic plants, insects, and animals. The vast majority of pond inhabitants, however, are invisible until viewed under the microscope. In this experiment, students will identify and classify several common aquatic microorganisms.
- In ecology, the close and often long-term interactions between different biological species are termed symbiotic relationships. In this experiment, you will collect cheek cells from inside your mouth, study their structure, and search for any commensal organisms that might be present.

Discussion Topics:

- Microscopes are used in many different scientific fields. They are used to study living and nonliving things alike. What types of scientific fields would need to be magnification to be studied?
- Inside microscopes, there are various lenses. Lenses come in various shapes such as convex or concave and have different thicknesses. Which type of lens do you think is inside a microscope?
- There are many things that humans cannot see with the naked eye. Telescopes help us see things that are far away. What types of small things do you think we can see with microscopes?

In Class Activities:

- In the late 1600s, a scientist named Robert Hooke looked through his microscope at a thin slice of cork. He noticed that the dead wood was made up of many tiny compartments, and upon further observation Hooke named these empty compartments cells. You can take a closer look at the cells, also called lenticels, of a piece of cork by following these instructions. You will need: compound light microscopes, microscope slides and cover slips, small cork water, and a sharp knife or razor blade. Prior to class, carefully cut a few very thin slices of cork using a razor blade or sharp knife. Have students prepare a wet mount slide of the sliced cork. Begin viewing the slide with the scanning objective. Then switch to a higher power objective to see more detail.
- Many times fishermen think that their fish is larger than it actually is. Part of this is pride, but part of it is that images sometimes seem larger in water. You can create a magnifying lens using this concept. You will need a note card, a single-hole puncher, clear tape, and a pipette. In a note card, use a single-hole puncher to punch out a triangle of holes right next to each other. Take 2 pieces of clear plastic tape and put on each side of the card, covering the hole. Carefully take a dropper and drip ONE drop of water onto the tape, over the hole. Carefully slide the card over an image or text and see how it changes!

Additional Resources:

http://www.az-microscope.on.ca/history.htm

http://www.udel.edu/biology/ketcham/microscope/scope.html

http://www.exploratorium.edu/imaging_station/