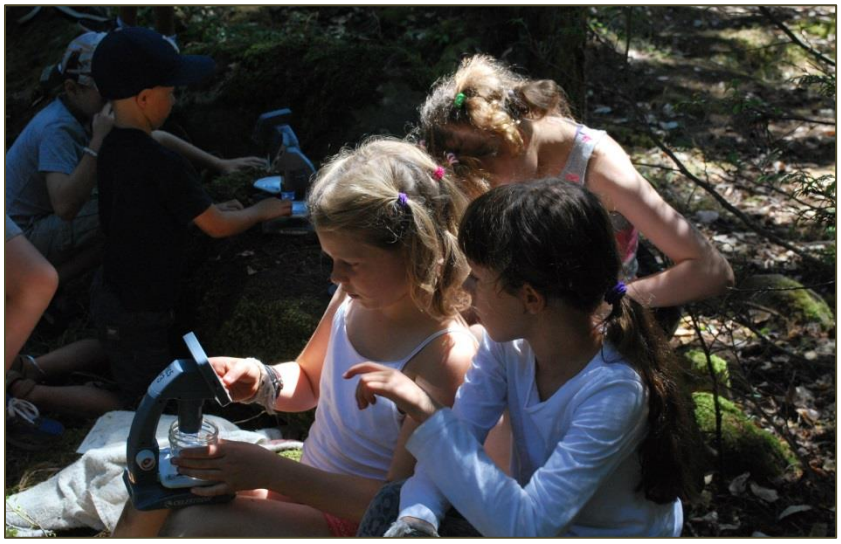
Introduction to Digital Microscopes



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Activity Name: Introduction to Digital Microscopes – Lesson One of the Nature in Miniature Series

Ages: 6-14

Activity Energy: Medium

Length of time: 30 minutes

Number of Participants: Limited by # of microscopes or hand lenses. Recommend one microscopes per student for best results, especially during the introductory lesson.

Indoor/Outdoor: Either, preferably outdoor

Concept: To introduce the use of digital microscopes and teach the students to use them effectively. To encourage students to see small details in their surroundings.

Materials Required: At least one digital microscope for every two students. Hand lenses can be used as a substitute.

Introduction: One of my favorite things to do as a child was to wander the back yard with a magnifying lens, finding cool things to look at; especially insects. Speaking to others, I realized this is a common experience among many people, and possibly an important experience for sparking a life-long interest in nature. Advances in technology are providing new opportunities for exploring, and advances in digital microscopes have made them affordable, user friendly, and most important for nature based education programs: portable. These easy to use digital microscopes are a great way to have students look at nature in more detail, and provide a tool for explaining biological processes and features not visible to the naked eye. The LCD viewing screens allow students to share their finds with other students in a way not possible with conventional microscopes. We have used these microscopes with grades kindergarten to eight with very good success.

Here are some recommended activities based on our experiences teaching students on Mayne Island, B.C. The goal of these lessons is to encourage students to become interested in exploring nature on their own, and to become excited about the discoveries they make while doing so. It is up to individual educators to determine how much lesson structure is needed to facilitate that sense of exploration and discovery. This is the first of a series of lessons using the digital microscopes.

The Mayne Island Conservancy Society has been using the Celestron Infiniview Microscopes. We have six microscopes, and we paid $200 each for them. These microscopes are available free for loan to any organization wishing to use them to deliver environmental education. We only ask the cost of transportation be covered by the borrowing organization and the units are replaced if they are damaged or broken.
The microscopes are equipped with an LCD display screen and are powered by a rechargeable lithium battery that lasts for about 1 hour of continuous use. The microscopes have the ability to take pictures and video that is stored on micro-SD memory cards, and can be used to create reports or presentations. If you are interested in borrowing the microscopes please contact the Mayne Island Conservancy at info@conservancyonmayne.com.

Methods:

1. Plan the lesson by finding an outside place where students have something dry to sit on. Some students were happy to hold the scopes in their lap while others preferred to place them on the ground in front of them. A shady location is strongly recommended because the LCD screens are not easy to see in the sun.
2. Begin by having the students turn on the microscopes (the orange button on the bottom right of the screen).
3. To get the students used to adjusting the microscopes we get them to start by focusing on their index finger. Make sure the students are using the platform adjustment knob and focus dial to focus rather than moving their finger up and down. The students will be amazed at how dirty their fingers look. Hold a 'dirty finger' contest to get them all involved (including the boys) and used to showing each other what they have in focus. One of the great benefits of the LCD screens is having multiple people able to view an image at the same time.
4. Once the students have all demonstrated the ability to focus on their index finger, encourage them to explore and find their own things to look at. Tell them they will have to share their favorite find with the group after a set period of time.
5. Optionally you can provide instruction on using the camera and video features. These can be useful for creating project reports and presentations. You will need a computer to retrieve the media.

Tips for Teachers:

- We strongly recommend using outside spaces as much as possible. Although the microscopes can be used inside or outside, outside is where the fun things to look at are.
- We have worked with students sharing a microscope in pairs or with small groups with a microscope each. In our experience it's much better to have one microscope per student for the introduction lesson. We found the students not holding the microscopes became bored and distracted, which in turn distracted the rest of the group. When we taught the introduction to a similar but smaller group with a scope for every student we had much better results.