

THE GREAT OUTDOORS



Seeing lichen when magnified in jeweler's loupe can offer new perspectives. Photo: David Lowenstern.

Through a New Lens

Introducing young people to magnification can be rewarding for teacher and student alike.

By J. Morton Galetto

Maybe you can remember your first experience looking through a hand lens or a microscope – that moment when a miniature world was opened up to you for the first time. You began to see details that, prior to the aid of a lens, you didn't know even existed. In that moment your world became larger by examining the smaller details.

Magnified views of the natural world are generally available to children on worksheets, in photos or diagrams, but for young children that is often too abstract. However, when presented with a magnifying glass everything becomes more accessible. Most introductions to a hand lens involve passing out a group of these visual aids to children. Teachers' lesson plans suggest having students hold the lens close to one of their eyes with one hand and instructing them to look at the fingerprints of the opposite hand. Instructions are to "move your hand in and out until your finger print becomes clear. That's the "sweet spot."

Young people are asked to articulate what they see. A chorus of young voices may announce that they have found the "sweet spot." Hopefully some "Whoa, look at that!" may be elicited from that moment of clarity.

Many people think engaging with nature must occur through quiet introspection. Sometimes viewing wildlife does involve being still and quiet. But to look at a stick or a bug, quiet isn't entirely necessary – and by describing their experience, children may encourage the enthusiasm of their peers. Lesson plans often suggest that students be descriptive of what they see, and to make comparisons. This is a vital observational skill. You can coach youngsters by leading with words yourself like, "I notice..." Young people want to experience what their peers are seeing, so encouraging interchange is important.

Observational skills and comparative analysis are necessary in all areas of science. Geologists must tell rocks apart, botanists need to examine plants to distinguish species, chemists have to study reactions, and even in the social sciences inspection is key. If you reflect on this for a moment you will realize that we must make comparisons throughout our lives. The ability to be descriptive and relay one's observations is not innate; it is learned, and articulation to others is a proficiency that must be honed. Suggesting that young people are detectives looking for clues often inspires more enthusiasm for sharing.



Interacting with youngsters when they observe nature up-close can add value to their experience. Asking questions about their observations helps them hone their observation and communication skills. Photo: Julia Wiberg, CU File.

Asking youngsters to describe what they see also adds to the learning experience. It makes for an active involvement in learning versus a passive, less beneficial approach.

That is not to say an introspective experience has no value, but by modeling with our words we encourage children to do the same.

In the out-of-doors there are lots of objects to examine. This activity isn't limited to formal teaching situations. Parents, grandparents, family acquaintances, and young friends can create an enhanced outdoor experience with this activity. Having a hand lens on an outdoor walk can open up new worlds to inspection.

Glass magnifiers are preferred because they have greater clarity than plastic and scratch less easily. Thick cords or lanyards are also helpful to avoid misplacing or damaging the lenses in sandy pockets or dropping them on the ground.

The *Beetles Project* devotes time to using hand lenses in the field. After all, bugs are fascinating under magnification. One nifty idea involves placing a bug on a mirror, allowing some of the undersides to be observed as well as the more commonly seen upper side. The project recommends some sources for purchase including Science Lab Supplies, noting that there are many options, with their favorite being a 5x/8x Double Lens that sells for \$1.45.



Youngsters make use of hand lens at a CU Maurice River Nature Journaling activity. Photo: Julia Wiberg, CU File.

JP Manufacturing also has many choices for buying lens including factory seconds. If you are a teacher you may also wish to shop Foldscope.com, offering bulk options. A jeweler's loupe is good for adults but more difficult for children; I experience eye strain rather easily with a loupe so a lesser

magnification may ease this, even though the results may not be as dramatic.

As a child I found that not all items are equally interesting when magnified. Personally I think having a group of cool things on hand, or knowing some great candidates, can make the experience more enjoyable. One very clever outdoor idea is to study everything in a square foot area.

You can set up a learning station that is replete with neat things to magnify. If the weather is inclement having some objects already available can make for a fun rainy-day indoor experience.

After enjoying the great outdoors with hand lenses, a microscope could be a logical next step. Beginning with a hand lens makes the leap to a microscope much easier, especially for younger children. Also, a microscope can be frustrating or too difficult to work as a first stepping-off point to a magnified world. Using a lower-power uncomplicated microscope is a good place to start. Youngsters will find it easier to work, possibly even without adult assistance.

Making incremental steps from lesser to greater magnification is an interesting exercise. Use whatever the magnification helps to make visualization clearer. There

are some favorite oft-mentioned contenders for close inspection. For naturalists, bugs seem to top many lists. Windowsills often offer a sampling of dead candidates. Body parts of insects under magnification offer lots of surprises, while lichen and mosses are surprisingly interesting up close. Flower parts offer the opportunity to discuss pollination and a host of other things. Bark and its difference depending on the type of tree is also of interest.



People of all ages can enjoy seeing nature magnified. Photo: Julia Wiberg, CU File.

Other items often mentioned are grains of sand, sugar, salt, human hair, fur, fingernail cuttings, dryer lint, coffee grounds, melting snow, spider webs, fish tank water, mushroom gills, and ear wax. Clearly the resulting experiences, depending on the extent of magnification, will have very different end results as well.

I'm hoping this might inspire some adults to introduce their child, a grandchild, or favorite youngster to look at the outdoors in a different light, and to help them to develop a vocabulary of descriptive words. And who knows, if you're open to the experience it may just be you who says, "Whoa, look at this!" ■

Important safety warning: Lenses can be focused to make a spot hot and even to ignite a fire. In a group, some children are sure to know this and rules need to be established. With an individual child judgment should be exercised. My father taught me to start a fire as a survival tool, but this may or may not be wise. I would say individual discretion is in order!

Sources

Hand Lens Introduction, The BeetlesProject.org

5 Ways to Use your Magnifying Lens,
<https://naturestudyhomeschool.com/?s=magnifying+lens>

There are many lesson plans and ideas on the internet to inspire those who want to share a closer look at the world around us and beneath our feet.