Classroom Beekeeping

By Phil Kahler

Imagine a world without pollinators and it is not long before you realize a world without color, fragrance, or flavor. Honeybees and other pollinators are responsible for the continuation of most flowering plants. Clearly pollinators are key members of nearly all food webs, and it is becoming apparent that the earth's ecosystems are indeed fragile. It is this message I wish to share with my classes. Once my students realize the importance of honeybees in their own lives, it is my hope that they will begin to trade their fears of being stung for new understandings, that their fascination will turn to appreciation, and then to responsibility.

Making the commitment

I must confess that I did not become a beekeeper on purpose. As a boy I was fascinated by the observation beehive I saw at a nature center. So as an adult, when a parent volunteered to help me set up an observation hive in my classroom I took the opportunity. The observation hive was an instant hit with my students. Everyone enjoyed watching the workers, looking for the queen, drones, eggs, and waiting for the brood to hatch. But after the bees died out two winters in a row I decided to start a full-size hive at home. I reasoned that I could exchange frames of honey and brood to keep my observation hive thriving.

At the local bee supply I picked up my hive equipment, beekeeper's suit, and ordered a package of honeybees. Two weeks later with my hive assembled and ready, I got the call that my package of bees was ready for pick up. When I returned home with my three-pound package of bees, which is about 10,000 workers plus a queen, I began to feel a little uneasy at the prospect of having all those stingers buzzing around my head.

Pollen-covered worker foraging on a dandelion

My wife and son watched with excitement from a safe distance as I carefully followed the directions for getting the bees into their new hive. Everything I read said to stay calm and to work deliberately and smoothly. I am happy to report that I did not get stung even once that first season! More often than not, I have been stung when I was in a hurry and didn't wear all my protective clothing. These days I look forward to opening the hives. The sweet smell of fresh honey and the buzz of bees around my head are actually relaxing.

Establishing a living beehive in a classroom takes careful planning. The most obvious problem to overcome is the possibility of bees coming into physical contact with students. Only a small portion of my science classroom has access to an outside wall. This became a challenge because the location of the bee exit had to be right next to our frequently used outside door. I decided to drill the exit hole above the height of the door to ensure students would be below the bee's flight path.

To further direct the bees away from the door, I attached a small wooden box with its single opening pointing away from

Our new eight-frame observation hive now has clear entrance/exit tubes for better viewing. A mirror behind the hive lets us see the bees on the back. Several sugar syrup/honey feeder ports supply the bees with extra food during times of low nectar flow.

the classroom door. This ensures that bees leaving the hive are forced to make a sharp left away from the classroom door. Most of the bees continue up and over the roof. Only when the outside door is open do we have a lost bee or two enter the classroom.

Diligent supervision of the classroom and constant inspection of the observation hive are a regular part of my safety routine. Students with bee sting allergies are identified at the beginning of each school year in keeping with school policy, and our teachers have had epi-pen training. Alleviating student fears and teaching students appropriate behavior around bees is another important part of the safety equation. To this day I am the only one who has ever been stung by my classroom bees.

The response to the classroom hive from parents and staff has been quite supportive. Parents have donated time, money, and supplies toward the project. One parent used his woodworking skills to build a large, eight-frame hive to replace our small two-frame hive. Another parent found and purchased the clear plastic pipes for the bee exit. Parents have even donated replacement packages of bees and volunteered to pick them up for me from the bee supply company. Parents frequently drop by my classroom after school just to see how the bees are doing.

The number of visitors to my classroom and the length of their stay noticeably increases when we have the bees. Teachers from our younger classes often request time to bring their classes to the science room to see the beehive. Even the teacher in the room next to me, who carries an epi-pen for her allergy to bee stings, enjoys dropping by to see what is happening in the hive. When giving campus tours to prospective students and their parents, our principal is always sure to show them our beehive.

Hive care

The typical indoor observation hive is an artificial habitat that requires frequent maintenance if it is to be kept long-term.

A wild swarm captured for our hive in April 2008.

The elaborate maze of clear plastic tubing directing the bees in and out of the hive is a significant obstacle for them to overcome. At times the tubing becomes a bottleneck when bees trying to enter the hive are met with an equal number of bees trying to leave. Bees trying to clean the hive of debris have significantly more work to carry their load up the tubing to the exit.

This makes it imperative for the classroom beekeeper to clean out the dead bees and debris. Supplemental feedings of sugar syrup or honey are needed when the bees are not able to store enough honey due to limited space or when there are not many flowers blooming. I also feel the small exit hole does not always provide adequate ventilation. Because of these problems I have found that it is better to move the colony outdoors to a full-sized hive box in the fall after the first frost. Outdoor bees have an easier time cleaning the hive, have more storage space for honey, pollen, and brood, and have better ventilation. With a minimum amount of maintenance they can survive throughout the winter months.

My son and I search for the queen. We make sure she is laying eggs and that the brood is doing well.

A lucky find

One spring afternoon I saw a swarm of wild bees. They were on a low branch where I could easily reach them, so I hurried home to retrieve my bee suit, an ice chest, and a small jar of honey. By the time I made it back to the swarm, they had moved to a tall snag, just out of reach. What would have been an easy job of just clipping off the branch and lowering it into the ice chest had become a bit more challenging.

I found a long stick that would just reach the swarm, covered one end with copious amounts of honey, and used it to carefully knock the swarm down into my ice chest. Surprisingly, it all worked out as planned. The queen was somewhere in the middle of the swarm, and the disturbed workers that were buzzing around eventually calmed down and landed in the ice chest to be with their queen and the free honey I supplied.

Swarming bees are usually quite docile, because they have gorged themselves

Emptying a package of bees into the observation hive boxes turns out to be a bit trickier than emptying bees into a conventional hive.

Queen bee surrounded by some of her workers. If you look carefully, you can see newly laid eggs in some of the cells. One per cell, the egg is small, white, and about the shape of a rice kernel.

on honey before leaving the parent hive and do not feel protective of any young or honey stores. With a little care it was easy to scoop the swarm out of the ice chest and into the observation hive boxes.

Coaxing a package of bees into the observation hive is another story altogether. The observation hive boxes are narrow, making it difficult to shake the bees out of the package into the hive. A conventional hive box is much larger, making it easier to empty the bees into the hive where they belong. The best and easiest way to put new bees into an observation hive is to remove two full frames containing an assortment of eggs, larva, honey, pollen, and workers from a healthy, conventional hive and place them directly into the observation hive. You can order a new queen to put in the observation hive, or watch the workers raise a new queen on their own.

A hive inside

Our observation hive provides a wealth of material for students to observe under the microscope. I plan several labs which teach my students to prepare microscope slides of bee wings, legs, and Varroa mites. They enjoy this close observation of the bees and are able to make accurate drawings. During these lab activities my students learn that bees are hairy creatures and that Varroa mites are persistent parasites!

My students learn many aspects of bee behavior through their own observation. When my classroom hive is in operation it is not unusual to find a group of students clustered at the back of the classroom. "Hey, we found the queen!" "Look! Another one just hatched!" exclaims one student as a young bee is observed emerging from its once-sealed cell. "Why is that bee dancing and buzzing around all funny?" "Look! I just saw a bee carry in orange pollen! There is one with green pollen! How many colors of pollen are there?" The excitement they generate tells me that valuable connections are being made.

Teachers who want an observation hive in their classroom should start by contacting a local beekeeper for help. The Cooperative Extension Office at a college or university near you can help you find a beekeeper association in your area. Some beekeepers may even be able to loan a small observation hive to your classroom for two or three weeks.

Visit my Web page at www.tvja.org/science/bees.htm to see more photos, information, and links. If you would like to network with fellow educators who teach with insects in the classroom, please join the new Teacher's Group on insectgeeks.com.

Phil Kahler teaches seventh- to tenth-grade science and biology at Tualatin Valley Academy in Hillsboro, Oregon. Together with his wife, Toni, and son, Lucas, Phil enjoys gardening, beekeeping, camping, and fishing. He's an avid bird-watcher and photographer who enjoys sharing his passion for birds, the outdoors, and authentic science with his students.

Resources

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