



*Winter 2008 Newsletter, Volume 5, Issue 1*

### ***EDUCATOR SURVEY REVEALS INTEREST IN TEACHING ENTOMOLOGY***

#### ***In This Issue***

##### ***Page 1***

- *Educator Survey*

##### ***Page 2***

- *Interactive Web Based Learning*
- *Recipient Highlights*

##### ***Page 3***

- *Insect Teaching Unit*

##### ***Page 4***

- *Insect Teaching Unit continued*

As part of the Entomological Foundation's Insect Science Education Program, the Foundation is investigating the need among educators for an Insect Science Education Teaching Kit (INSEKT), which would contain curriculum guides and materials for teaching about insects or using insects to teach or illustrate concepts. The Foundation implemented a survey in 2007 of K-12 educators who teach science to identify their needs and wants in teaching about science through insects. The survey was designed to determine if educators want and would use such a kit, as well as what the kit should contain to best meet the educators' teaching needs.

With 100% of the 2,134 respondents reporting an interest in receiving INSEKT to teach entomology, it is apparent that educators are excited about teaching children about science through insects. The majority of respondents to the survey teach grades K-5 in a formal educational setting. These educators want educational materials which teach about life cycles and interrelationships among living things and between living things and the environment.

The survey also exposed educators to the Foundation and its programs. As a result of the survey, more than 900 educators requested educational materials between September and November 2007. This clearly illustrates that there is a strong interest in teaching science through insects. The survey responses also point to the lack of resources as a limiting factor for educators. Approximately 76% of the respondents indicated that limited resources, including funding, could prevent them from teaching children about insect science.

Based on the results of the survey, the Foundation will launch a fundraising campaign to support the development of INSEKT. Our goal is to provide a kit that not only meets the needs and wants of educators, but is available at a low cost.

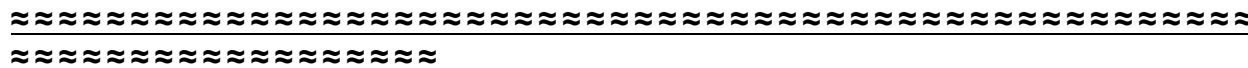
INSEKT is part of a new program to educate young people about science through insects. The program also includes an Educational Youth Interactive Web Site to educate young people through grade appropriate interactive games, exercises, and quizzes. The first phase of the interactive youth site, which is targeted to grades 3 and 4, is due to be released this summer. The interactive youth web site and the survey is funded by BASF, Dow Chemical Company Foundation, DuPont Crop Protection, and Monsanto.

By expanding the types of educational materials that we offer and by making them more available and easier to use, our educational outreach program can become a primary vehicle for promoting insect science literacy and preparing the next generation of leaders in the entomological sciences.



***DUE SUMMER 2008***  
***ENTOMOLOGICAL FOUNDATION YOUTH INTERACTIVE WEB SITE***

Intended as a self-guided educational site for children, the site will contain learning activities that help users understand primary areas of entomology related to the characteristics of organisms, life cycles, and organisms and the environment. The site will consist of three main sections, corresponding to the knowledge level of the user. Each section will contain a set of activities and objectives with an assessment (in game format) of what the user learned from the activities. The site will also contain a section for educators, which will list the names of the activities, their objectives, and the national science standard addressed by that activity. Currently, the site is being developed for grades 3 and 4. Future funding will be sought to include activities for all elementary grades. Many thanks to our funding partners BASF, Dow Chemical Company Foundation, DuPont Crop Protection, and Monsanto for their support of this program.



**RECIPIENT HIGHLIGHTS**

The Entomological Foundation supports science education by providing a program of free educational materials (i.e. books, posters, bookmarks) to educators for use in educating children about science through insects. As of January 2008:

- Requests for materials to teach children about science through insects increased 600% since the program began in 2004.
- Number of children reached by the Foundation through its outreach activities increased 2800% since 2004.
- 89% of the requests are from elementary school educators, 5% from junior high educators, and 6% from high school educators. Below are excerpts from two letters received from educators:

*I am done teaching my Insect Week to my first graders and it was awesome! I have to send a huge thank-you for the great lesson book and all of the other items that you sent. It made the week of teaching science a huge and smashing success!... First Grade Teacher, AK*

*Thank you so much for the wonderful book, The Insect Appreciation Digest. It is so clever and interesting. Also, thank you for the great bookmarks.... As a teacher, I appreciate everything that can help my students. The fact that it doesn't have to come out of my pocket is so nice! Thanks again.... Elementary School Teacher, TX*

Many thanks to Bayer USA Foundation for their support of our outreach program to educate young people about science through insects.



## EXPERIENCES FROM THE FIELD OF TEACHING

### **“Insect Unit”**

By Kathleen Weidenbach

#### **2007 President’s Prize winner for Outstanding Achievement in Primary Education**

##### **Introduction to Taxonomy - Science Class (Designed for fifth grade students)**

This lesson familiarizes the students with the scientific organization of the animal and plant world. Students begin by ordering the known world from universe to their street address, with more and more detailed information. Next, they are introduced to the way it is done in science, and we take examples of familiar organisms to practice classifying each animal until we are able to identify genus and species for each. Students spend part of these lessons becoming familiar with scientific names and then we focus specifically on insects. We also look at eight familiar orders, Lepidoptera, Odonata, Orthoptera, Hemiptera, Homoptera, Coleoptera, Diptera and Hymenoptera, learning about the derivation of the order name and representative insects from each.

##### **Introduction to Research Reports on a Particular Insect - Language Arts**

Using field guides, students explore the variety of insect life and choose one insect from one of the eight orders we looked at in science on which to focus their research. They must write a detailed report, which includes common and scientific name, identification, range and habitat, life cycle information, relationship with humans, and any other interesting facts they find. The research report must be accompanied by a biologically correct portrait drawn on a 9 x 12 sheet of paper and colored accurately. Reports and portrait completion usually takes about a week or two. This work continues as we study insects in science class.

When all students have completed the research and portraits, we begin building giant sized papier-mache models of each insect. Models must be biologically accurate as well (body parts, legs, antennae, wings, etc). The models are painted, wings, legs, antennae are added and then they are hung in the hall with the research report and models. This part takes about three to four weeks and continues as we study insects in science.

##### **Insect Unit Lessons**

Following the introduction, we begin the unit by looking at characteristics of insects. Anatomy diagrams are labeled and insect collections are passed among students who identify the various parts on real insects using their diagrams. Students are also asked to identify the order of each insect as an introductory exercise (we repeat this at the end of the study and compare our results). Metamorphosis is introduced at this time and we talk about complete and incomplete metamorphosis.

The unit continues with a focus on each of the orders, beginning with Lepidoptera. Using larva from the University of Minnesota Monarch program, each student is given a caterpillar to rear and study. Observations, feeding, and cleaning of the container must be done every day. Journals are kept with detailed entries, which include measurements of the larva and how much it eats at various intervals. This continues for about a month, going from a tiny caterpillar to chrysalis to adult butterfly. Because this unit is taught in the fall, by the time the adults emerge it is usually late October. For that reason we do not release the butterflies but instead use them to teach the students how to pin insects for a collection. Each student creates a collection label and learns how to pin the butterfly. The insects are then mounted in clear plastic boxes and each student gets to keep his or her butterfly.

Concurrent with the butterfly development activities, we continue our general study of insects. One day is spent on each of these topics: getting food, reproduction and life cycle, habitats, locomotion, defenses and predation, and the relationship of humans and insects. We focus on each of the orders named above, studying in detail the characteristics of each order. We build paper models of grasshopper mouth parts and also a paper thorax with wings to demonstrate locomotion. Working in groups, the students make a poster of one of the orders, listing characteristics and illustrating insect from the order they have chosen. The posters are presented to the rest of the class and then hung in the hallway with our models and research report.

After all the orders have been studied, the students learn about insect keys. (Continued on next page)

**(Continued from page 3: “Insect Unit”)**

We spend one or two class session keying out insects using color photos. Students working in groups are given a selection of laminated insect photos and use keys to identify each one. Each student must also make an illustrated booklet of Lepidoptera development using the monarch as the example and another booklet showing life cycle for each of the eight orders we studied (whether complete or incomplete metamorphosis).

**Insect Trapping Experiment**

After the students have demonstrated proficiency at identifying insects in photos, we set insect traps around the school yard with detailed descriptions of each habitat. The students are instructed in the steps of the scientific method prior to setting the traps. Following placement of the traps, the students write a hypothesis stating which of the habitats will yield the greatest variety of insects. We usually set about seven traps with four students working together on a location. After a week, we collect the traps and each group must sort the insects in their traps, identifying them by order and counting how many are in each trap. Insect keys are used to sort them by order. We come together as a group to share our data and then look at it to make conclusions as a group.

Several days are also spent looking at the life cycle of honey bees. A local beekeeper brings an observation hive to class and the students learn about beekeeping, try out the equipment, and extract honey with the help of the beekeeper. Each student designs a label for their honey jar, prepares the jar ahead of time, and is able to take a small jar home to share with their family. I also try to schedule a visit from the Bell Museum of Natural History curator of education who brings in hissing cockroaches and other invertebrates.

In addition to the research paper and portrait, monarch journal, metamorphosis booklets, paper mouth parts and flight models, and the trapping data, the unit concludes with a unit test. Most of the students are pretty surprised at how much they have learned about insects and take pride in how much they know.

*Kathleen Weidenbach is a fifth grade teacher at Pratt Community School in Minneapolis, Minnesota. The President's Prize for Outstanding Achievement in Primary and Secondary Education, funded by the Entomological Society of America, recognizes educators who have gone beyond the traditional teaching methods by using insects as educational tools. One winner is chosen from primary teachers (grades K-6) and one from secondary teachers (grades 7-12). The Entomological Foundation wishes to thank the Entomological Society of America for their support of this award.*



(Vol. 5, Issue 1)

Entomological Foundation (EIN 52-1756169)  
9332 Annapolis Rd., Suite 210  
Lanham, MD 20706