

## WOWBugs: Newest Insect in the Curriculum

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With 17-day life cycles, fascinating, and often bizarre behaviors, user-friendly handling and no-hassle care, WOWBugs are unusual organisms sure to engage student interest. A National Science Foundation-supported curriculum development project has used WOWBugs to introduce fundamental ideas of contemporary life science study. This project focuses on both the “big concepts” that stretch beyond the boundaries of a single organism or a single discipline, and the current thinking about the pedagogy by which such concepts should be delivered.

WOWBugs (*Melittobia digitata*) are parasitic (or parasitoid) wasps about the size of the fruit fly, *Drosophila*. They are harmless and cannot sting humans. They pose no environmental risks, should a few escape.

Around the world, *Melittobia* lay their eggs on the outside of the larvae or pupae of other insects, where they undergo complete metamorphosis. Each stage, including the egg, is readily observable. The males and females are very different in that the amber-colored males lack eyes, have short stubby wings, and enlarged antennae. Females vastly outnumber males (about 25:1) in the population. Males are extremely aggressive toward other males, often killing one another after ferocious fights. This is all the more remarkable since males are totally blind. Matthews et al. (1996) and Matthews (1997) provide overviews of the biology and habits of the WOWBug. Additional information can be found on the World Wide Web at <http://entomology.ent.uga.edu/wowbugs/index.html-ssi>.

WOWBugs are very easy to care for in the classroom. Although their natural preferred hosts are the young of mud dauber wasps, in captivity they readily accept substitutes such as blow fly pupae (*Sarcophaga bullata*). A single culture in a container the size of a matchbox provides 300 or more adult WOWBugs, enough to supply several classes. Adult WOWBugs require no feeding beyond (if desired) offering females a new host so they can develop their eggs to maintain an ongoing culture.

WOWBugs can be introduced to students as a single stand-alone laboratory exercise or as a series of integrated activities that emphasize major life science concepts. A comprehensive 320-page manual (Matthews et al., 1996) includes 20 teacher-developed investigations that use the WOWBug. (The manual is available from Riverview Press, P.O. Box 5955, Athens, Georgia 30604.) Each activity is keyed to relevant science process skills and the new National Science Education Standards (National Research Council, 1995). The manual also includes detailed information on WOWBug biology, management, culture and rearing tips, transparency masters, and reproducible student pages. Additionally, the volume offers practical suggestions for concept elaboration and ideas for extended independent investigations.

All materials needed for successfully using WOWBugs, including cultures, hosts, culture containers, plus supporting videotapes and slides, are available from Carolina Biological Supply Company. However, many activities can be undertaken without specialized materials, and WOWBugs can easily be obtained from nature by following published instructions (Matthews et al., 1996).

A simple, entertaining, and instructional introductory activity is “The Great WOWBug Roundup”, which helps students appreciate that a major part of every animal’s behavior involves turning towards or away from factors like food, mates, predators, etc. Students discover basic concepts about animal orientation as they attempt to solve a simple but important task --the job of trying to recapture WOWBugs. An added element of surprise is provided as students are confronted with insects that -- despite functional wings -- crawl and hop rather than fly, and play possum when disturbed.

Minimal materials needed include a culture of living adult WOWBugs, a sheet of white paper, and a box or bag of “capture tools” such as pipe cleaners, cotton swabs, small watercolor brushes, plastic vials, and clear soda straws. After the instructor dispenses three to eight WOWBugs onto each team’s sheet of paper on their desktop, students must figure out a way to get all the WOWBugs back into captivity without death or injury, using any of the “tools” provided.

After about 10 minutes, class members share methods and techniques tried, and discuss the advantages, disadvantages, and relative efficiency of each. Like the other activities in the manual, this one focuses on concepts developed by students through a simple inquiry-centered investigation. Formal terminology such as taxis (oriented movement in response to stimuli) can be inserted as appropriate. Encouraging students to explore reasons why certain oriented responses might occur can lead to formulation of various hypotheses, and these in turn can stimulate further experimentation.

### References

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