

# Extension Increases Educational Attainment

COOPERATIVE EXTENSION

 University of  
**Kentucky**  
College of Agriculture,  
Food and Environment

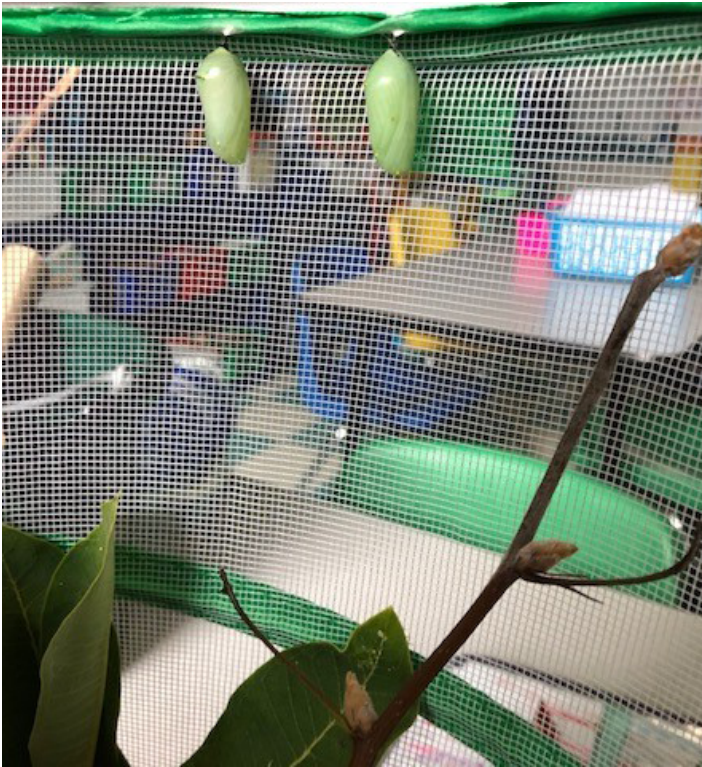


## 4-H Enriches Science Education by Challenging Critical Thinking Skills Related to Lifecycles

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*It starts with us*



*Monarch butterflies will soon emerge from the two green pupae in this classroom observation habitat.*

Extension Agents work closely with local school teachers to identify needs for experiential learning in science that fulfills state academic standards. In **Kenton County**, 4-H Youth Development and Horticulture agents collaborated with 10 teachers from 4 school districts in the county. Over 950 students in kindergarten through 6th grade participated in guided hands-on science investigations using Project Butterfly Winning Investigation Network for Great Science (WINGS) curriculum. Students identified needs for living things, recorded the lifecycle stages of butterflies, and discovered the responsibility of caring for living things.

The 4-H Youth Development Agent conducted orientation sessions providing teachers with information on habitats, caterpillars, milkweed sources, and caterpillar care instructions. The agent communicated regularly and made multiple site visits for insect care. Students observed the life cycle

of the monarch butterfly (egg, caterpillar, pupa, and butterfly) and related their observations to other species (i.e. birds, fish, or amphibians). Students identified parts of the butterfly and described the process of metamorphosis.

Students cleaned the habitats, cared for the caterpillars, and learned that butterflies could suffer from a virus like humans. Several habitats suffered the loss of pupae due to the infestation of a parasite fly. Youth and adults learned to identify the “frass” (caterpillar excrement) and the excrement of the parasite. Learning to examine the excrement in the habitat helped determine which pupae should remain in the habitat and which pupae needed to be removed. Teachers reported that students expanded their vocabulary, distinguished moths from butterflies and the pupae of different butterflies, and differentiated between male and female monarch butterflies. Students could identify and understand other caterpillars that emerged in their habitat came from eggs that were on the milkweed when it was placed in the habitat.

Project Butterfly WINGS involved many 4-H volunteers who located, cut and delivered milkweed to the classroom habitats. One family who helped collect milkweed for an observation station reported that their great uncle stopped mowing the milkweed in a field to ensure adequate milkweed was available to feed the caterpillars at a local school. In addition, speakers addressed monarch tagging and constructed low cost butterfly habitats for the butterflies. In the spring of 2019, 80% of the participating teachers plan to plant food sources for the caterpillars and butterflies in their school gardens. Teachers and Extension professionals are seeking grant funds to acquire and build higher quality observation stations and habitats for the caterpillars and butterflies.