How Many Butterflies

Alabama Wildlife Federation Activity

Grade Levels
3-5

Overview
Students become "butterflies" as they look for one or more components of butterfly habitat during their physically-involved activity.

Subject Areas
Science, Language Arts, Physical Education

Duration
Preparation: 30 minutes
Activity: 60 minutes

Learning Objectives
Students will be able to 1) define a major component of habitat, and 2) identify a limiting factor.

Alabama Course of Study Objective Correlations for Science
Third Grade: 7 & 13
Fourth Grade: 5
Fifth Grade: 9

Materials
- Construction Paper
- One Black Felt Pen
- Envelopes
- Yarn or String
- Tape or Glue
- One Jump-rope or Hula-hoop
- Butterfly & Caterpillar Field Guides (*see p2 for suggestions*)

Activity adapted from Project WILD.

Background Info

In this activity, the butterflies are the focus in order to illustrate the importance of providing suitable habitat for wildlife. Even though we might not think of butterflies and other insects as wild animals, they do need the same things that all animals need to survive: food to eat, water to drink, and shelter to protect them and their young from inclement weather and predators. One or more components of habitat—food, water, and shelter—are emphasized as a way to help explain the concept of "limiting factors."

In some areas of the United States, components of the butterflies' habitats including their feeding and breeding grounds have been destroyed because of herbicides and the increased conversion of farm lands to urban developments (housing, shopping malls, etc). Loss of butterfly habitats **limit** the butterfly populations, especially through the lack of suitable **host plants** for laying their eggs, suitable **nectar plants** for food sources, and suitable **puddles** for drinking water and obtaining additional nutrients.

Shelter: Since butterfly larva (caterpillars) can only digest a specific type of plant foliage, the female butterfly only lays her eggs on this particular kind of plant. This plant is known as the **host plant**. (*See page 4 for a list of example host plants.*) Explain to your students that this is the caterpillar's home and food source at this point of the butterfly's life cycle. When the caterpillar hatches from an egg, it uses its chewing mouthpart to eat the leaves or flowers of the host plant exclusively, eating almost constantly as it molts (losing its old skin as it grows).

Food: After the caterpillar goes through metamorphosis as a chrysalis, it then emerges as a new butterfly which also has very specific food requirements. The plants that adult butterflies use for food are called **nectar plants**. Often the host plant for the caterpillar isn't the same as the nectar plant for the adult butterfly of the same species. (*See page 5 for a list of example nectar plants.*) Rather than the chewing mouthparts of immature caterpillars, adult butterflies have sucking mouthparts. The mouthparts are shaped into a long coiled tube, called a proboscis. The adult butterfly can uncoil its proboscis and use it to suck up nectar or tree sap much like you might use a drinking straw. Most fragrant, nectar-rich plants can grow in areas that receive as least five to six hours of sunlight, and will provide food for butterflies. You can explain to the students that nectar is much like sugar water.

Water: Lastly, butterflies cannot get their water from lakes, rivers or deep streams. They need shallow pools of water like **puddles**, which provide butterflies with the water and other essential salts and nutrients they need to survive. Many times, you can find numerous butterflies drinking from one mud puddle.

The "limiting factor" for any population of butterflies is the component of habitat (food, water or shelter) that is in shortest supply. If an area only has enough puddles to support 50 butterflies, then only 50 can live there, even if there are enough host and nectar plants to support 100. In this instance, water (puddles) is the limiting factor.

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Supplemental Information…

Host Plants and Nectar Plants for Alabama Butterflies		
Butterfly Species	**Host Plant**	**Nectar Plant**
Swallowtails		
Zebra Swallowtail	Paw-Paw	blueberry, blackberry, butterfly weed, butterfly bush, lilac, red bud, verbena
Black Swallowtail	parsley, dill, fennel, Queen Anne's Lace, celery, carrots	red clover, butterfly weed, thistle
Zebra Longtail	passionflower	blueberry, blackberry, butterfly weed, butterfly bush, lilac, red bud, verbena
Giant Swallowtail	trees and shrubs of the citrus family, hop tree, prickly ash	lantana, azalea, bougainvillea, goldenrod, butterfly bush, dianthus
Eastern Tiger Swallowtail	wild cherry, sweet bay, tulip tree, birch, ash, cottonwood, willow	wild cherry, butterfly bush, lilac, phlox, dianthus
Brush-footed Butterflies		
Monarch	butterfly weed and other milkweeds	nectar from all milkweeds, lilac, clover, lantana, thistle, goldenrods, blazing stars, coreopsis, butterfly bush, and mints
Painted Lady	thistle, white yarrow, daisy, hollyhock, mallow	aster, cosmos, blazing stars, coreopsis, joe-pye weed, red clover, butterfly bush, zinnia, privet, butterfly weed
Viceroy	willows, poplars, cottonwoods, apple	aster, goldenrod, joe-pye weed, thistle, butterfly weed
Gulf Fritillary	passionflower vine	butterfly weed, black-eyed susan, thistle, verbena, vetch, joe-pye weed, passionflower vine, purple coneflower
Red Admiral	nettle	prefers tree sap and fermenting fruit, but will also nectar at daisy, aster, goldenrod, butterfly bush, red clover, gaillardia
Whites and Sulphurs		
Cabbage White	cabbage, broccoli	mustards, clover, asters, mints
Clouded Sulphur	alphalpha, clover	flower nectar of many plants including butterfly bush, cosmos and gallardia
Gossamer-wing Butterflies		
Red-banded Hairstreak	wax myrtle, sumac, oak	yarrow, coreopsis, butterfly weed
Summer Azure	dogwood	most nectar producing flowers
Skippers		
Common Checkered Skipper	globe mallows, mallow, hollyhock	aster, red clover, dianthus
Horace's Duskywing	red oak, willow oak, water oak, white oak	goldenrod, peppermint

Information derived from: http://www.druidcityonline.com/oa-bc-butterfly%20garden.htm

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Habitat Lab Connection
Students will look for components of butterfly habitat in your habitat lab.

Literature Connections:
- ⇒ *The Hungry Caterpillar* by Eric Carle (ISBN: 10-039925045X)
- ⇒ *Are you a Butterfly* by Judy Allen (ISBN: 10-0753456087)
- ⇒ *Where Butterflies Grow* by Joanne Ryder (ISBN: 10-0140558586)
- ⇒ *From Caterpillar to Butterfly* by Deborah Heiligman (ISBN: 10-0064451291)
- ⇒ *Caterpillar Spring Butterfly Summer* by Susan Hood (ISBN: 10-079440149X)

Butterfly Field Guides
- ⇒ *Field Guide to Insects and Spiders of North America* by National Wildlife Federation (ISBN: 10-1402741537)
- ⇒ *The National Audubon Society Field Guide to North American Butterflies* by Robert Michael Pyle (ISBN: 10-0394519140)
- ⇒ *Peterson Field Guide to Eastern Butterflies* by Paul A Opler (ISBN: 10-0395904536)
- ⇒ *Peterson First Guide to Caterpillars of North America* by Amy Bartlett Wright and Roger Tory Peterson (ISBN: 10-0395911842)
- ⇒ http://bugguide.net

Preparation

1. Create four sets of twenty-five (25) 2" x 2" cards (100 cards total) from the colored construction paper to represent the following:
Green for host plants: 25
Orange for nectar plants: 25
Red for nectar plants: 25
Blue for puddles: 25

2. Make up a set of envelopes with the following written on the front of the envelope (create enough so that each student gets an envelope):
Eastern Tiger Swallowtail (mark one as "damaged wing," two as "caterpillar," and the rest as "adults")
*You can add a drawing or sticker of an Eastern Tiger Swallowtail (or other type of butterfly) if you'd like to dress up the envelopes.

3. Cut pieces of yarn in 16" strips and attach each end of the string to the envelope with tape or glue, so that the students can wear the envelope around their necks like a necklace.

Procedure

1. In a fairly large open area (e.g., 50' x 50') in your habitat lab or schoolyard, place a jump rope in the shape of a circle (or use a hula hoop) in the middle of the open area and then scatter the colored pieces of paper throughout the area including the circle.

2. Pass out the envelopes (with yarn attached). Optional: Ask the students to write their names on the envelopes, or ask them to draw a butterfly (or caterpillar) on their envelopes.

3. Have the students put the yarn around their necks like a necklace so that the envelopes hang on their chests.

4. Ask all of the students to line up along a "starting line," except for the butterfly with a damaged wing; he/she must stand inside the circle.

5. Give them the following directions: "You are now all butterflies. Your job is to 'fly' around the butterfly garden to gather the colored pieces of paper, which represent your shelter, food and water sources. You'll need to collect the colored pieces of paper in your envelopes. Each time you collect a piece of paper, you must return to the starting line before 'searching' for another piece. All butterflies are not alike, just as you and I are not exactly alike. Among you is a butterfly with a damaged wing – you must stand inside the circle and you can only collect the pieces of paper that you can reach without leaving your circle. The rest of you must 'fly' around by 'flapping your wings.' Remember, butterflies do not run! *Optional:* Two of you are caterpillars, and you must crawl along the ground (*as long as the ground isn't too dirty*) to collect your shelter, food and water. "

6. Do not tell the students what the colors of the pieces of paper specifically represent—only that the pieces of paper represent various shelter, food and water sources for the butterflies.

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Procedure continued...

7. When all of the colored squares have been picked up, have the students return to the indoor classroom with their envelopes.

8. Ask the students to sort their pieces of paper by color in their envelopes (or on their desks).

9. Have the "caterpillars" raise their hands. Did all of the "caterpillars" collect a green piece of paper? Explain that the green pieces of paper represent host plants. Why do caterpillars need host plants? (for food) If the caterpillars don't have their host plant, they won't have anything to eat and they won't survive. Host plants are a limiting factor for caterpillar survival.

10. Are there any other "butterflies" who did not collect a green piece of paper? If so, these butterflies will not have shelter to lay their eggs to help protect them from inclement weather and predators. Thus, host plants are also limiting factor for butterflies to breed and continue their life cycle.

11. Explain that the red and orange pieces of paper represent nectar plants. Why do butterflies need nectar plants? (for food) Did all of the students collect a red or orange piece of paper? Those students who did not collect a red or orange piece of paper won't survive because they don't have food to eat. How many pieces of red or orange paper did the butterfly with the damaged wing pick up? How does that compare with the other butterflies?

12. Explain that the blue pieces of paper represent puddles. Why do butterflies need puddles? (for water and nutrients) Did all of the students collect a blue piece of paper? Those students who did not collect a blue piece of paper won't survive because they don't have water to drink.

Assessment
Define "limiting factor." Describe some of the factors that may limit the survival of an animal that lives in your area. What are the animal's habitat requirements?

Extensions
Discuss Species Specific Limiting Factors for butterflies. Write specific host plant and nectar plant names on the pieces of paper, and explain how different butterfly species need specific host plants and nectar plants to survive.

Discuss butterfly habitat needs. Place the green pieces of paper around the host plants in your butterfly garden, the red and orange pieces of paper around the nectar plants, and the blue pieces of paper around the puddles to help the students visualize the different components of butterfly habitat in the butterfly garden in your habitat lab.

Discuss other factors that impact butterfly survival such as cars, pesticides, and predators like spiders and birds. Include pieces of paper that represent these factors in the activity.

The Habitat Learning Lab Program is a partnership between:

Alabama Cooperative Extension System

Alabama Wildlife Federation
www.alabamawildlife.org/habitat-learning-lab/

Alabama Department of Conservation & Natural Resources

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