



Vocabulary

- **Adaptation:** an alteration in the structure or function of an organism to become better fitted to survive & multiply in its environment
- **Caterpillar:** the wormlike larva of a butterfly or a moth
- **Chrysalis:** the hard-shelled pupa of a moth or butterfly
- **Conservation:** to preserve or carefully utilize natural resources in order to prevent depletion
- **Exoskeleton:** an external covering of crustaceans or insects
- **Habitat:** the natural environment of an organism
- **Hemolymph:** a fluid in the body cavities and tissues of invertebrates (animals that lack a backbone)
- **Host Plants:** plants that provide food and shelter for butterfly eggs and larvae
- **Lepidoptery:** the branch of zoology dealing with butterflies and moths
- **Metamorphosis:** a profound change in form from one stage to the next in the life cycle of an organism
- **Migration:** the process of moving from one place to another
- **Native plants:** plants that are indigenous to an area
- **Pollination:** to transfer pollen from the anthers to the stigma of a flower
- **Proboscis:** the elongate, protruding mouth parts of certain insects
- **Pupa:** an insect in the non-feeding stage of metamorphosis
- **Thorax:** part of the body between the head and the abdomen

By the end of this lesson, students will be able to:

- Identify butterfly & other pollinator-attracting plants
- Explain the importance of pollinators
- Plan and design a garden
- Find connections between art and science

National Education Standards:

- National Standards for Arts Education
 - [Making connections between visual arts and other disciplines](#)
 - [Reflecting upon and assessing the characteristics and merits of their work and the work of others](#)
- NSTA National Science Education Standards (9-12)
 - [LS2.C: Ecosystem Dynamics, Functioning, and Resilience](#)
 - [ESS3.C: Human Impacts on Earth Systems](#)

What you'll find in this packet:

- Step-by-Step Activity Guide
- Pre- and Post-Activity Discussion ideas
- Butterfly Gardening Fact Sheet

What you'll need:

- For Butterfly Garden
 - Plot of land
 - Topsoil
 - Plants
 - Water
- For Window Butterfly Garden
 - Sunny window
 - Potting Soil
 - Plants
 - Pots/Window Box
- [Butterfly Gardening Fact Sheet](#)

Teacher Preparation

- Print and pass out Fact Sheet (or share URL) to students
- Coordinate field trip to butterfly garden
- Work with school to create a class butterfly garden (if applicable)



Pre-Activity Discussion:

- Have students read Smithsonian Gardens' "[Butterfly Gardening Fact Sheet.](#)"
- Review the life cycle of a butterfly.
- Discuss pollinators and their roles in an ecosystem or garden.
- What does planning a garden entail? What special concerns should we have when planning a pollinator or butterfly garden?
- If possible, visit a butterfly garden near your school. (If your school is in or near D.C., plan a tour with the Smithsonian's Butterfly Habitat Garden horticulturist!) You can also [virtually experience](#) the Smithsonian Butterfly Habitat Garden through photos and videos.

Activity Procedure:

- Divide students into groups.
- Have groups design a Butterfly Habitat Garden. Be sure to include butterfly-attracting plants and a water feature.
- Groups will present and defend their designs to the class.
- Class will vote on the design that they would like to see implemented.
- If planning on actually creating a Butterfly Garden, plant based on the winning design.
- If a full garden is not possible, plant a window Butterfly Garden so that students may observe butterfly and other pollinator behaviors.
- Monitor which plants are frequented the most by various pollinators.
- Perform Biodiversity Observation hoop activity outlined in the 'In Good Company – Diversity in the Garden' lesson (or one similar) to measure the biodiversity of the garden.

Post-Activity Discussion:

(To be done either after garden designs are submitted and voted on, or after the garden is planted)

- What makes this garden design successful?
- Why is conservation important? How can urban/suburban gardening help with this?



Butterfly Gardening Tips

- Learn about the butterfly species in your area and encourage them to live in (not just visit) your garden by planting both nectar plants for adults and host plants that serve as food for caterpillars.
- Design your garden using information gathered on local butterflies, their nectar sources and larval food. Try to extend the bloom period by mixing native and non-native plant species into your design.
- Heirloom (old-fashioned, non-hybridized) species tend to have more nectar, more scent, and more appeal to butterflies. Many garden catalogues indicate which plants attract butterflies.
- Butterflies are extremely sensitive to pesticides and lawn chemicals. In fact, the presence of dandelions, clovers, and other “weeds” in your lawn may actually attract more butterflies. If possible, plant your butterfly garden far from your driveway and other possible sources of pollution and disturbance.
- Provide sunny areas for basking (such as heat absorbing rocks), shelter from wind, and wet areas (though not open water) for puddling.
- As some eggs, larvae, and pupae spend the winter on twigs, branches and dead leaves, it is better to cut back a garden early in the autumn to avoid discarding latent butterflies along with your yard waste.
- Even a small area will suffice if there are plants to provide the proper environment for all stages of the butterfly life cycle. Host and nectar plants are often too tall for a small garden. Encourage shorter plants and increase the number of blooms per plant by cutting the plant back when it reaches a height of approximately two feet.

Butterfly Larval Host Plants

Plant

Tulip Poplar – *Liriodendron tulipifera*
 Paw Paw – *Asimina triloba*
 Dogwood – *Cornus sp.*
 Viburnum – *Viburnum sp.*
 Wild Cherry – *Prunus serotina*
 Spice Bush – *Lindera benzoin*
 Black Willow – *Salix nigra*

Violet – *Viola sp.*
 Dutchman’s Pipe – *Aristolochia sp.*
 Milkweed – *Asclepias sp.*
 Pearly Everlasting – *Anaphalis margaritacea*
 Dill/Fennel/Parsley – *Apiaceae Family*
 Heath Aster – *Aster ericoides*
 White Clover – *Trifolium repens*

Butterfly

Tiger Swallowtail
 Zebra Swallowtail
 Azures
 Azures
 Red spotted Purple
 Spicebush Swallowtail
 Mourning Cloak,
 Viceroy
 Fritillaries
 Pipevine Swallowtail
 Monarch
 Painted Lady
 Black Swallowtail
 Pearl Crescent
 Eastern Tail Blue

Pollinator favorites here at the Smithsonian

Hummingbird Mint – *Agastache sp.*
 Boneset – *Eupatorium perfoliatum*
 Bee Balm – *Monarda sp.*
 Mountain Mint – *Pycnanthemum muticum*
 Salvia – *Salvia sp.*
 Pincushion Flower – *Scabiosa sp.*
 Goldenrod – *Solidago sp.*
 Verbena – *Verbena sp.*, especially *Verbena bonariensis*
 Lantana – *Lantana camara*
 Cardinal Flower – *Lobelia cardinalis*
 Great Blue Lobelia – *Lobelia siphilitica*