



This month . . .

Creating a Pollinator Garden *Preserving a Precious Partnership*

Animals can roam about and seek mates with whom to reproduce, but imagine the challenge for a plant, rooted firmly to the ground, to achieve the same end. Pollinators, which include thousands of insect species (bees, tiny wasps, butterflies, beetles, and flies) and other animals (such as hummingbirds and bats), unwittingly move pollen from the male anther of one flower to the female stigma of another as they search for sweet, nourishing nectar and fat- and protein-rich pollen.

The amazing diversity of flowers results in large part from their fascinating adaptations that have evolved to lure pollinators. After all, every aspect of a flower, from the designs on its petals to the timing of its blooming, is vital to the process! In this unique alliance, flowers become fertilized and capable of producing seeds, and everybody wins. But, what's it to us? For starters, one out of every three bites of food we eat is made possible by a pollinator, and 80 percent of all flowering plants rely on pollinators for survival. Without them, our gardens and lives would be less fruitful.

Plant scientists are concerned about our role in weakening pollinator/plant relationships. The overuse of pesticides, which often kill beneficial pollinators, is one factor. Another one, particularly serious for migrating pollinators such as monarch butterflies, is land fragmentation that results largely from development. Isolated plants can't attract a variety of pollinators or visitors frequent enough to sustain the plants and ultimately their partners.

By cultivating a garden, schoolyard, or even a few containers that allure these important plant partners, students can provide vital oases amidst deserts of buildings and concrete. They can, in turn, set up investigations of animal visitors and their sometimes flashy floral partners, and begin to understand how these threads of life connect. The [Curriculum Connections](#) section suggests ways to use your pollinator sanctuary to enrich learning, and the [Resources](#) section describes Web sites and other materials to help you dig deeper. Read on.



Photographer: Melissa Wenzel



Photographer: Laura Bauersfeld, 9th grade

Creating a Pollinator Garden

You don't need a lot of space to start a pollinator garden. Even a few containers can attract perusing pollinators. If you don't already have a garden site, have the class scope out a location that receives at least six hours of full sun each day. They should also have an idea about the basic needs of wildlife — food, water, shelter, and places to rear young — and a notion of what makes pollinators tick.

Consider launching the project by exploring who's already in the neighborhood and what plants they seem to prefer. Next, decide who you'd like to attract (a variety of pollinators? butterflies?) and what they need to thrive and reproduce. In general, the greater variety of plant types you have (trees, shrubs, perennials, annual flowers and herbs), the more pollinators you'll attract. Since pollinators have different needs during different life cycle stages, maintaining diversity will also make your site more of a full-service oasis!

1. Plant plenty of nectar- and pollen-rich flowers. (See [chart](#), below, for ideas.)

Use as many plants native to your region as possible.

Native plants have evolved closely with native insects and are well-suited to meet their needs. In fact, some pollinator species are entirely dependent on the availability of certain native plants. Whether using native or nonnative plants, shoot for old-fashioned varieties. Many garden varieties have been bred to look or smell nice for humans, but they often lack accessible nectar or pollen for animal partners. (Never dig plants from the wild unless the area is slated for destruction and development and you have permission from the landowner. The best source for native plants in a local nursery if they have been grown and not gathered.)



Try to put in flowers with a range of shapes and sizes. Trumpet or cup-shaped flowers, such as cardinal flower, honeysuckle, and bee balm, attract a wide range of

pollinators. Pollinators with shorter tongues, such as small native bees and wasps, feed on tightly packed clusters of small flowers, such as those found on milkweed, zinnia, phlox, and mint. Hummingbirds feed on red, purple, or orange flowers with lots of nectar, such as bee balm, fuchsia, sage, and nasturtium.

Include a variety of flowers that bloom throughout the season. By doing so, you will accommodate different pollinators' preferences and provide a sequence of pollen and nectar sources throughout different life cycle stages. Consider shrubs and trees, such as dogwood, blueberry, cherry, plum, and willow, that provide nectar or pollen in early spring when other food is scarce.

Use containers, if necessary. If your growing space is limited, consider growing the following types of pollinator plants in containers filled with a rich, well-drained soil mix: Aromatic herbs (coriander, catnip, mint, parsley, lavender); annuals (marigold, phlox, bachelor's button, zinnia, cosmos, salvia); perennials (bee balm, Shasta daisy, iris, coneflower, lobelia, delphinium).

2. Provide food sources (host plants) and overwintering places for eggs and larvae. Although pollinators in their



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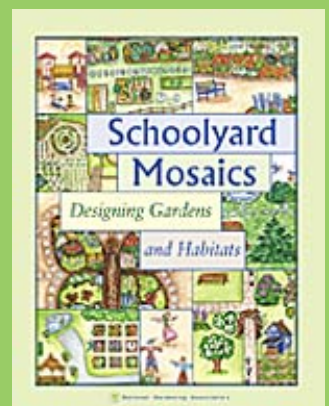
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Planning a Pollinator Garden

adult stages generally thrive on flower nectar and/or pollen, larval stages have more of a penchant for plant leaves.

Allow a section of your schoolyard to revert to wild grasses, weeds, and wildflowers (e.g., milkweed and Queen Anne's lace). The [chart](#), below, offers more suggestions.

- 3. Provide water.** Pollinators such as butterflies will gather and sip at shallow pools, mud puddles, and bird baths; bees and wasps can use mud as a home-building material. Mud puddles also provide important minerals for some pollinators.
- 4. Avoid using pesticides and herbicides.** Many can be harmful to pollinators as well as pests. Herbicides may wipe out key plants (weeds) that are important for pollinators' food mix. If you feel that you must control pests, judiciously use homemade remedies such as garlic spray, or pesticides derived from plants or microbes. Apply them only after sundown, when most pollinators have stopped their rounds.
- 5. Provide sites and materials for nesting and overwintering.** Leave cut plant stems exposed, turn flowerpots that have drainage holes upside down, leave twigs and brush in small piles, create mud puddles, or put out pieces of string or other light fibers. Students can build nesting structures for certain types of bees and bats. See the [Resources](#) section for links.

Pollinator Flower Preferences

Pollinators	Flower Preferences
Bees Did you know? There are about 4,000 species of native bees in the U.S. ranging in length from less than one eighth of an inch to more than one inch. Most of these bees are "solitary" nesting and, having no hive to defend (as do nonnative honeybees), they are unlikely to sting!	Yellow, blue, purple flowers. There are hundreds of types of bees that come in a variety of sizes and have a range of flower preferences. They can't see red, but are attracted to some red flowers, such as bee balm, that reflect ultraviolet light. Small bees, which have short tongues, prefer packed clusters of tiny flowers (e.g., marigold, daisy, butterfly weed, aromatic herbs).
Butterflies	Red, orange, yellow, pink, blue flowers. They need to land before feeding, so like flat-topped clusters (e.g., zinnia, calendula, butterfly weed, yarrow, daisy) in a sunny location. They also need food sources for larvae and places to lay eggs. These include milkweed, aster, lupine, thistle, fennel, violets, hollyhock, black-eyed Susan.
Moths	Light-colored flowers that open at dusk such as evening primrose.
Pollinating beetles	They prefer wide-open flowers, such as aster, sunflower, rose, and butterfly weed.
Flies	Green, white, or cream flowers. They have short tongues, so prefer simple-bowl shapes.
Hummingbirds	Red, orange, purple/red tubular flowers with lots of nectar (e.g., honeysuckle, sage, fuchsia, jewelweed, fireweed, cardinal flower, bee balm, nasturtium, century plant). No landing areas are needed since they hover while feeding.
Bats (Pollinating bats are found primarily in the Southwest)	Large, light-colored, night-blooming flowers with strong fruity odor (e.g., many types of cactus).

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