



Designing a Pollinator Garden Plan

OBJECTIVES

- Students will identify pollinators in their area.
- Students will develop a pollinator planting calendar.
- Students will design a pollinator garden plan.

ESSENTIAL QUESTIONS

- How can students support local pollinators?

MA STATE FRAMEWORK(S)

- 6.MS-ETS2-2(MA)
- HS-ESS3-3

MATERIALS NEEDED

Handouts

- [Pollinator Friendly Native Plants](http://bit.ly/3GcQJ2A) (<http://bit.ly/3GcQJ2A>)
- [Selecting Plants for Pollinators](http://bit.ly/3nDe8no) (<http://bit.ly/3nDe8no>)
- [Planting for Pollinators](http://bit.ly/3Ucgbej) (<http://bit.ly/3Ucgbej>)
- Plant a Native Pollinator Garden (see attached handout)
- [MDAR Pollinator Poster](http://bit.ly/3Mg3woG) (<http://bit.ly/3Mg3woG>)

INTRODUCTION

Not all plants bloom and have pollen or nectar at the same time or all season long. Purposeful planning will help you design an effective pollinator garden that will provide pollen/nectar from early spring until winter.

Note: Honey Bees prefer 2x2 or 4x4 plots of one type of plant, rather than patches of multiple plants. For example, honey bees prefer a plot dedicated to catmint, another to goldenrod, another for milkweed, rather than a garden bed with multiple flowers.

PROCEDURE

Use the resources listed above to identify pollinators that are common to your area.

Develop a calendar (some plants can be planted in late fall for early spring bloom. You want plants that provide food for pollinators for as much of the year as possible). Students can be split up into groups and responsible for researching plants to grow for a specific season.

For Each Season Consider:

a) Types of Plants

- what is already growing in the area?
- what are pollen producing plants
- what are nectar producing plants

b) Planting Timing

- when will the plant bloom?
- how long will blooming last?

c) Native/Non-Native Plants

- are any non-native plants invasive?

d) Planting Location

- where will the plant grow best?
- how much sunlight does it need?
- how much space does it need?
- what plants should be planted near each other?

e) Night vs. Day pollinators

- what plants bloom at night?

EXTENSIONS & VARIATIONS

Extension 1: Build a Pollinator Hotel

Students can build a Recycled Pollinator Hotel to encourage pollinators to visit your garden by providing them a place to stay! A simple pollinator hotel can be made using hollow cardboard tubes (less than 1/4" in diameter) or thin bamboo sticks (bamboo will last longer) that are hollowed out, at least 6" long and something to "nest" the tubes inside—teapot, 2x4s, mason jar, large can, etc. Whatever you use, you want to make sure the tubes will be protected from weather.

Pollinator hotels provide a solitary place for insects to visit, and with no hive or queen to protect, means they are less likely to sting! Fun fact: honeybees are naturally curious and most times when they approach you, they're just checking you out!

Directions:

Collect supplies (bamboo, dried plant tubes, hot glue, string, weatherproof container)

Attach the tubes using string or hot glue and put inside your container, tubes should be 5-6" long.

Hang or attach the bee hotel to a secure area in your garden.

Tip: Paper straws/cardboard tubes will last a little longer if coated with a natural protective substance like beeswax.

Examples of recycled materials to use:

Paper straws (will need to be changed more frequently), bamboo/plant stems (will need to be cleaned out yearly), twine, plastic bottles and cans. Students can think about other recycled household materials they can use. They will need hot glue to keep these materials together.

Variation: use a block of wood and drill various size holes into it. Place the wood in a weather protected spot or add a sloped roof to prevent water from getting inside.

Variation: In-depth engineering design activity can be found here: [Building Bee Houses](http://bit.ly/40BrFdP) (<http://bit.ly/40BrFdP>)

Extension 2: The Perfect Match Activity

Use this [Pollinators & Plants: The Perfect Match](http://bit.ly/3KvNVAk) (<http://bit.ly/3KvNVAk>) activity to increase thinking about why pollinators frequent the types of plants they do and which plants will be most beneficial for a particular pollinator.

ELEMENTS OF A POLLINATOR-FRIENDLY YARD

Host & Nectar Plants

While bees and butterflies feed on the nectar of native flowers, providing food for them is only the first step. Caterpillars and larvae feed on leaves, and many rely on a narrow range of plants that they're uniquely adapted to feeding on ("host plants"). Host plants can include shrubs and large trees like viburnums or oaks—in addition to perennials that also serve as nectar plants, like milkweeds and asters.

Nesting & Overwintering Habitat

Small, exposed patches of sand and mud are great for pollinators. Some ground-nesting insects like harmless digger bees and sweat bees will use them as breeding habitat, and butterflies like to gather on wet mud to lap up water and minerals.

Because some beneficial insects spend the winter as larvae or eggs inside plant stems or under the leaf litter, it's best to hold off on raking and cutting back stems in the fall. Postponing these activities until 2+ weeks after the last spring frost will give these insects a chance to come back for another year!

Caution with Yard Chemicals

Using insecticides in or near a pollinator garden can erase the benefit of native landscaping in the first place. Weigh the ecological risks and benefits of any yard fertilizers or herbicides carefully, or avoid them if you're not sure.

Which Plants are the "Best" Plants?

There's no magic bullet! All plants have a set of conditions they thrive in—some narrower than others— so look up the requirements of any species before planting (for example, even a native wetland plant will struggle in dry soil).

[The Native Plant Trust's Plant Finder](https://plantfinder.nativeplanttrust.org/Plant-Search) (<https://plantfinder.nativeplanttrust.org/Plant-Search>) can help narrow down your search for the best native Northeast plants given your local conditions and goals. Alternatively, you can check out a list of some of the plants we recommend below (see next page).

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HANDOUT: Mass Audubon's Elements of a Pollinator-Friendly Yard

ELEMENTS OF A POLLINATOR-FRIENDLY YARD

Top Wildlife-friendly Plants for Sale
**native to Northeast but non-native to MA*

NEW ENGLAND NATIVES

Smooth beardtongue, *Penstemon digitalis*
Wild Columbine, *Aquilegia canadensis*
Coral bells, *Heuchera americana**
Goat's Beard, *Aruncus dioicus*
Wild Geranium, *Geranium maculatum*
Canada anemone, *Anemone canadensis*
Rue Anemone, *Thalictrum thalictroides*
Wild Lupine, *Lupinus perennis*
Bird's Foot (and other Violets), *Viola pedata*, etc.
Lowbush blueberry, *Vaccinium angustifolium*
Bearberry, *Arctostaphylos uva-ursi*
Golden groundsel, *Packera aurea*
Swamp Milkweed, *Asclepias incarnata*
Butterfly Weed, *Asclepias tuberosa*
New Jersey Tea, *Ceanothus americanus*
Hoary Mountain Mint, *Pycnanthemum incanum*
Narrow-leaved Mountain Mint, *Pycnanthemum tenuifolium*
Clustered Mountain Mint, *Pycnanthemum muticum*
Obedient Plant, *Physostegia virginiana** (can spread aggressively)
Northern Blazing Star, *Liatris scariosa*
Wild Bergamot, *Monarda fistulosa*
Spotted Beebalm, *Monarda punctata*
Culver's Root, *Veronicastrum virginicum*
Golden alexanders, *Zizia aurea*
American spikenard, *Aralia racemosa*
Ohio spiderwort, *Tradescantia ohioensis*
Cardinal Flower, *Lobelia cardinalis*
Trumpet honeysuckle, *Lonicera sempervirens*
Wild Indigo, *Baptisia tinctoria*
Virginia Rose, *Rosa virginiana*
New England Aster, *Symphyotrichum novae-angliae*
Aromatic Aster, *Symphyotrichum oblongifolius* (formerly *Aster oblongifolius*)
Smooth Aster, *Symphyotrichum laeve* (formerly *Aster laevis*)
Calico Aster, *Symphyotrichum lateriflorum* (formerly *Aster lateriflorus*)
White Woodland Aster, *Eurybia divaricata* (formerly *Aster divaricatus*)
Woodland Sunflower, *Helianthus divaricatus*

Pale-leaved Sunflower, *Helianthus strumosus*
Turtlehead, *Chelone glabra*
Great Blue Lobelia, *Lobelia siphilitica*
Cut-leaf Coneflower, *Rudbeckia laciniata*
New York Ironweed, *Vernonia novebracensis*
Joe Pye Weed, *Eupatorium maculatum*
Boneset, *Eupatorium perfoliatum*
Sneezeweed/Helen's Flower, *Helenium autumnale*
Dwarf honeysuckle/Bush honeysuckle, *Diervilla lonicera*
Foamflower, *Tiarella cordifolia*
Wild strawberry, *Fragaria virginiana*
Common Yarrow, *Achillea millefolium*
Barren strawberry, *Geum fragarioides* (formerly *Waldsteinia fragarioides*)
Goldenrods, various, *Solidago* spp.

NEW ENGLAND NATIVE GRASSES

Prairie dropseed, *Sporobolus heterolepis*
Little bluestem, *Schizachyrium scoparium*
Switchgrass, *Panicum virgatum*
Sideoats Grama, *Bouteloua curtipendula*
Tufted Hairgrass, *Deschampsia cespitosa*
Wavy Hairgrass, *Deschampsia flexuosa*
Pennsylvania Sedge, *Carex pennsylvanica*

NEW ENGLAND NATIVE SHRUBS & SMALL TREES

Winterberry Holly, *Ilex verticillata*
Inkberry
Sweet Pepperbush, *Clethra alnifolia*
Swamp Azalea, *Rhododendron viscosum*
Chokeberries, *Aronia* spp.
American Hazelnut
Spicebush
Viburnums – several native options
Dogwoods – Gray, Silky, Red-twig, Pagoda, Flowering
Redbud
Buttonbush, *Cephalanthus occidentalis*

Source: <https://www.massaudubon.org/learn/nature-wildlife/help-pollinators-thrive/plant-a-pollinator-garden>

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www.massfarmtoschool.org