Bruce Museum Seaside Center Activity:
Let's Look at Pollinators!

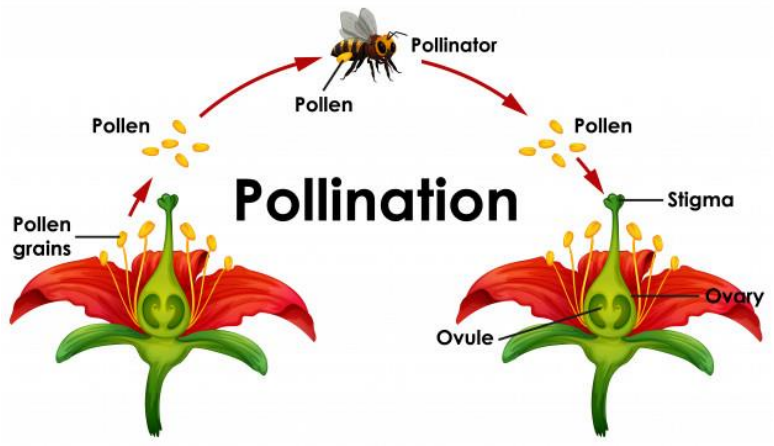
A guided exploration for use along the Long Island Sound
By Brendan Murtha, Seaside Center Naturalist 2020

**Note: This is part of a series of educational pamphlets and activities released as part of the Seaside Center's Digital 2020 Season. For access to all our content, please visit: http://www.storagetwo.com/seaside-center*

Introduction

In the heat of summer, many flowers are in bloom. They add color to our garden beds, our meadows and roadsides, even along the edges of lawns and beaches. If you're glad to see them, say a thank you to pollinators!

Pollinators are animals that engage in ***pollination*****,** the transfer of pollen from one flower to another. Many plants require pollination for reproduction, as pollen contains "male" genetic material from the flowers' *anthers* that must make it to "female" *stigma* on another flower of the same species.



When most people refer to pollination they are talking about **cross-pollination**, the transfer of pollen between different individuals of the same species. Some plants can

self-pollinate, but these plants generally lack showy flowers; the bright colors, and sweet smells of many flowers have evolved specifically to attract animal pollinators. Not all cross-pollination occurs via animal vectors, either: some plants are wind and/or water pollinated, meaning their pollen is dispersed randomly in the breeze and current. Whichever method a plant uses, they are ultimately dependent on it – pollination is essential for these plants' survival.

When self-pollination exists, you might wonder why cross-pollination would ever be preferred. Why would a plant put its reproduction in the hands of another species? Isn't that a huge risk?

Cross-pollination is helpful to plants because it introduces **genetic diversity** into the population, aiding a species' long-term survival. While cross-pollination is ultimately the job of the pollinators, plants are not helpless in the process – they have evolved many different ways to entice and reward pollinators for helping. Pollen itself can be a prized food, and many plants go a step beyond – they produce nectar, a sweet, sugary substance whose only role is to lure pollinators into visiting a plant's flowers.

The diversity of flowers we see outside is mirrored in a staggering diversity of pollinators. Common pollinators include bees, beetles, butterflies, moths, flies, hummingbirds, and bats. Some of these pollinators are *specialists*, adapted to pollinate just one type of flower, while others are *generalists* (they are not picky). On the flip-side, plants can be *specialists* or *generalists,* too: either dependent on specific pollinators or open to business from all. If you spend time looking at flower patches, you might observe these categories in action. Let's head outside and see for ourselves!

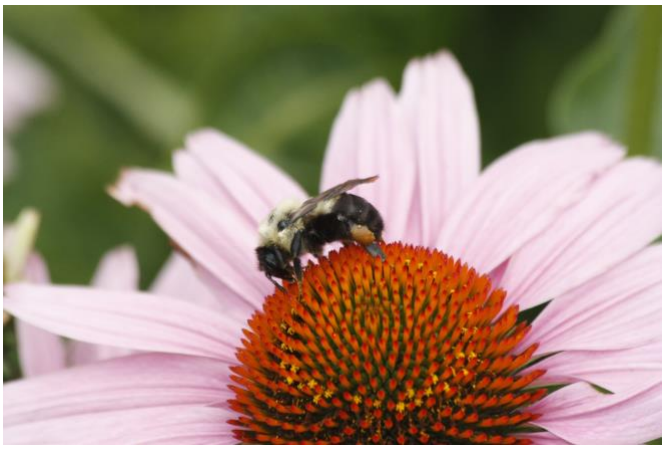
Let's look at pollinators!

When we stand in a garden bed or beside a patch of flowers, what pollinators should we look for? What behaviors or patterns will we notice?

A good first step is to learn what pollinators (or pollinator groups) may be around. The following guide runs through some of the most common options: not an exhaustive list, but a good starting point.

Group #1: Bees and Wasps (Order Hymenoptera)

1a. Bumblebees (genus Bombus)



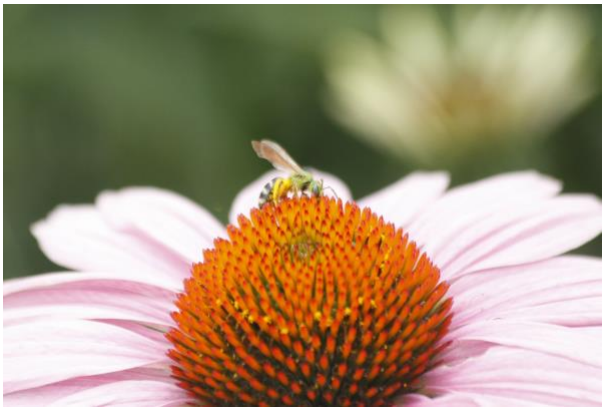
***ID**: Large, fuzzy bees, generally black and yellow.*
***Diet**: Adults feed on nectar and collect pollen to take back to young in the colony. Bumblebees tend to visit larger flowers with more difficult-to-access nectar, as they have longer "tongues" (proboscises) than other bees.*
***Pollinate**: A wide variety of flowering plants. "Buzz pollinators," bumblebees pick up pollen while trying to get at nectar, dislodging it through their wingbeats and clumsy movements. The pollen sticks to the hairs on their legs, abdomen, and thorax. This clinging pollen is carried with them to other flowers. Bumble Bees' (relatively) large size and fuzziness makes them quite effective at carrying large amounts of pollen, and they are among our most efficient and important pollinators. They can also buzz up underneath hanging flowers, unlike butterflies, who need an upward facing landing pad. Pictured: a brown-belted bumble bee (Bombus griseocollis) on a coneflower (Echinacea).*

1b. Honeybees (genus Apis)

***ID**: Mid-sized, "classic" bees, honey-colored, with a fuzzy thorax and somewhat shiny abdomen.*
***Diet**: Like bumblebees, adults generally feed on nectar and transport pollen back to the hive.*
Pollinate**: A wide diversity of flowering plants. Honeybees are not buzz pollinators, but collect the pollen intentionally for transport -- this makes them less efficient pollinators than bumblebees, as the stored-away pollen is less easily brushed off onto other flowers. **Bees are especially attracted to blue, pink, purple, and

yellow flowers. *Pictured: A European honey bee (Apis mellifera)* on a *Coreopsis flower.*

1c. Sweat Bees (family Halictidae)



ID*: Small, fly-like bees, generally with a metallic look. Can be dark (grays/blacks) or bright (shiny greens/blues).*
Diet*: Pollen and nectar. Short-tongued, sweat bees generally stick to smaller flowers with more easily accessible nectar (contrasting with bumblebees). They are named for their habit of being attracted to sweat, which they will lap up for salts.*
Pollinate*: Many small wildflowers with accessible nectar, but also some crops such as sunflower, apple, and alfalfa.*
These bees nest in burrows in the ground, so are most abundant in open areas with patches of undisturbed soil available. Gardens benefit greatly from having sweat bees, so don't till your soil more than is needed!
Pictured: A bicolored striped sweat bee (Agapostemon virescens) on coneflower (Echinacea).

1d. Wasps (suborder Apocrita)

ID*: Similar to bees, but hairless, narrow-waisted (base of abdomen is small), with long, more pointed wings.*
Diet*: Omnivorous. Some feed on insects and nectar, while others choose just one or the other. Many adult wasps will feed on nectar, but kill and collect insects that they bring back as food for their larval young.*
Pollinate*: Wasps are not covered in hairs and do not collect pollen for their young, so they are a much less efficient and important pollinator than bees. However, as they feed on nectar, they still pick up some pollen passively and pass it around from flower to flower. Some wasps are specialized to*

pollinate fig trees, while others are generalists. Pictured above is the great golden digger wasp (Sphex ichneumoneus) which can be a good pollinator of milkweed.

Group #2: Butterflies and Moths (Order Lepidoptera)

2a. Whites and Sulphurs (family Pieridae)

***ID**: This family of butterflies is generally mid-sized, pale in color (white, light green or yellow) without too much patterning.*
***Diet**: Adults feed on nectar. Caterpillars are often tied to a particular host plant or plants.*
***Pollinate:** Butterflies feed with a long proboscis on tubular flowers, generally those that are flat or clustered (facing upward) as butterflies must perch to feed. **They are generally attracted to the colors red, orange, yellow and pink**, and flowers with these colors are often butterfly pollinated. When perching on flowers to feed, butterflies pick up pollen on their "feet," which they then take to other plants. Pollen might also dust onto their wings. Pieridae butterflies in particular pollinate asters, clovers, etc. Pictured: Cabbage white (Pieris rapae) on purple vervain (Verbena bonariensis).*

2b. Brush-footed Butterflies (family Nymphalidae)

***ID:** Varied, but often large, bright, starkly patterned butterflies. Browns, blacks, and oranges are predominant colors.*
***Diet:** Much like Pieridae.*
***Pollinate**: Larger butterflies, with larger proboscises, can generally get at deeper flower tubes (a pattern we saw too among the bees). Pictured: monarch (Danaus plexippus) on butterfly weed (Asclepias tuberosa).*

2c. Skippers (family Hesperiidae)

***ID**: Tiny, cryptically colored/patterned butterflies who more closely resemble moths. Big-eyed, often shades of brown and yellow. Although often overlooked, this diverse family makes up over one-third of the butterfly species in our area.*
***Diet**: Nectar.*
***Pollinate**: Skippers feed in the same style as other butterflies, although with their small size they are limited in their options. Interestingly, skippers are generally considered ineffective pollinators, engaging in little pollen transfer due to their small size and unobtrusive behavior. While they certainly do transfer some pollen, and are better than no pollinators at all, they are functional **nectar thieves** -- prospective pollinators who take the reward without doing the expected work. Plants try to prevent thieving, so this may be an evolutionary arms race at work… Pictured: Zabulon skipper (Lon zabulon) on purple vervain (Verbena bonariensis).*

2d. Moths

***ID**: An enormously diverse and varied group, moths are all Lepidopterans not considered butterflies. Look for clubbed antennae -- if there is a club, it's a butterfly. If not, it's a moth.*
***Diet**: Enormously varied. Only some moths feed on nectar, but those that do can be important pollinators.*
***Pollinate**: Many moths are nocturnal, and plants that attract moth pollinators tend to open at night (just like the plants that attract bats, although our local bats do not pollinate -- they eat only insects). Moths feed with a long proboscis, and, similar to butterflies, prefer deep flower tubes. Pictured above is the snowberry clearwing (Hemaris diffinis), a type of "hummingbird moth" that feeds during the day. It's an important pollinator of plants like wild bergamot (Monarda fistulosa), which has long, tubular flowers. These kinds of flowers are difficult to access for butterflies, which must perch.*

These groups include most of the major pollinators in our area.

- **Beetles** (order Coleoptera): often pollinate bowl-shaped flowers with accessible nectar, such as magnolia.
- **Hummingbirds**: Attracted by the color red; come to hanging, tubular flowers. Like the “hummingbird moth,” the birds’ ability to feed while hovering allows them to come up from *beneath* hanging flowers, and probe them with a long bill. In Latin America, where hummingbirds are very important pollinators, many plants have long and droopy tubular flowers.

After you identify what sort of pollinator you’re looking at, begin to take notes on its behavior.

Some questions you can ask:

- *Is this pollinator visiting more than one flower type?*
- *How many different flowers will this individual pollinator visit?*
- *What is this pollinator feeding on? Pollen, nectar, or something else?*
- *How does it appear to be collecting its food?*
- *Is it carrying more food than it can eat?*
- *If the answer to the last question was yes, where might this animal be taking the food*

On the flip side, even if you’re looking at flowers and see *no* pollinators around, a knowledge of pollinator preferences might tell you what organisms are likely to visit these flowers.

- **Blue, yellow, purple,** and **white** flowers attract **bees.** These flowers are often oddly shaped and open at an angle, to provide a **landing strip** for incoming bees.
- **Red, orange, yellow** and **pink** flowers attract **butterflies**. These flowers are often flat-topped or clustered for an easy landing, and have nectar contained in tubes.
- **White, green, and yellow** flowers attract **beetles**. These flowers are often cupped and simple.
- **Red** flowers attract **hummingbirds**. These flowers are often tubular and hanging, to be probed during hovering flight.

- In our area, flowers that **open at night** often attract **moths.**

Conclusion

Pollination is an essential process in most ecosystems, and pollinators play an irreplaceable role. While this role may finally be receiving the attention and praise it deserves, the context is unfortunate – all over the world, pollinators are in decline. Pesticides and habitat loss are some of the major culprits. With the loss of pollinators, whole ecosystems are threatened. It's not just that bees and other insects are disappearing: as we've seen, many flowering plants are dependent on them for reproduction.

Educating people about their local pollinators is a good way of raising awareness, especially if it encourages them to start a garden or be mindful of what organisms they can find in their backyards. Effective gardening can be a great way to increase the number of pollinators in your neighborhood, which benefits everyone.

Hopefully this guided exploration has given you the tools and information you need to go out and start looking at pollinators. There are many online resources available describing how to create a pollinator garden -- I encourage you to continue your exploration there!

In the meantime, head out and see what you can find!

Cheers!

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Summer 2020