Pollinators, Meet Your Plants

Session Time:
30 minutes

Number of Participants:
best between 15-25

Materials Needed:
• fresh cut flowers of a variety of colors, sizes and shapes. (Optional - save flowers for a flower dissection at a later time).

• copies of the pollinator and flower cards (download at www.outdoornebraska.org/monarchsonamission. Fold cards in half to create a card with a picture on the front and information on the back. Laminate cards if possible.

Objectives:
Participants will:
1. Learn about pollination and pollinators.
2. Learn that certain pollinators prefer certain types of flowers.

Background

Pollination is the process by which pollen from one plant is transferred to another plant of the same species. By transferring pollen, plants can use pollen from both plants to create seeds with more genetic diversity. Genetic diversity is important to ensure the seed created grows into a new plant that can survive many different ecological conditions.

It should be noted that not all plants require pollen from another plant to create seeds. Some plants are able to self-pollinate. This means that one individual plants creates pollen that then is used by the same plant to produce seeds. Although this seems more efficient, it does not allow for the plant to create seeds with more genetic diversity.

Pollination, or the transfer of pollen from one plant to another, can take place through several means. Wind is terrific at moving pollen. Plants that rely on wind for pollination must produce vast quantities of pollen to ensure that at least some of this pollen travels through the air to another plant of the same species.

Some plants are pollinated not by wind but by pollinators. Pollinators are animals that help transfer pollen from one plant to another of the same species. Pollinators include bees, moths, butterflies, beetles, ants and bats. Some species of pollinators are more efficient at pollinating than others. For example, the legs of a bee are covered in tiny hairs. These hairs allow the bee to carry more pollen from plant to plant thus increasing its chance of pollinating a flower.

Ants are less efficient at carrying pollen, but they are present in huge quantities so they end up pollinating many flowers.

Some pollinators frequent specific plants more often than other plants. Just like some people prefer pizza for dinner and others prefer a salad, pollinators also have preferences. The topic of pollinator preferences are called “pollinator syndromes.”

For example, hummingbirds prefer bright red flowers that are long and narrow in shape. The long, narrow flowers allow them to stick their beak and long tongue inside to get the sweet nectar. This does not mean that hummingbirds will not go to other colored or shaped flowers, it simply means that they visit long, narrow, red flowers more often.

Another example is the hover or flower fly. This species has a large sponge-like mouth and prefers flowers that are wide-open with lots of nectar to soak up with their "sponge." Again, this does not mean that hover flies will not visit other kinds of flowers, they simply prefer wide-open flowers more.

Procedure

Before the Activity

• gather a wide variety of flowers in different sizes, shapes and colors.

• print each of the pollinator and flower pages. Fold in half to create a card with a picture on one side and information written on the other. Laminate cards if possible.

During the Activity

1. Show students the different flowers you have gathered. Ask them which one is their favorite. Go around the room and have several students share which flower is their favorite and why. Remember that students are providing their opinion and as long as they can justify their answer, there are no wrong answers.

2. Explain to students that just like they prefer some flowers over others, so do pollinators. For example, because a butterfly has a long, slender mouth part (proboscis), they prefer flowers that are long and tube-like. Some flies, on the other hand, have short, round mouth parts much like a sponge. For these pollinators, a wide-open flower is preferred. Or, for other pollinators, like moths, a flower that is open at night is preferred because that is when moths are active. The concept of pollinators preferring some plants over others is known as Pollinator Syndromes.

Just like we have symptoms or characteristics which are specific to a syndrome or illness, pollinators have characteristics that are specific to their preferred plants.

3. Brainstorm with students all the different kinds of pollinators we have - bees, butterflies, moths, beetles, ants, birds, bats (although bats are not pollinators in Nebraska, they are in other parts of the words).

4. Give each student one card (either a pollinator card or a plant card). Explain to them that they are to use the characteristics of their pollinator or plant to find their match - each plant has a specific pollinator. (NOTE: for several plants, the matching pollinator is not the only pollinator in the wild to help pollinate this plant).

Wrap-up & Evaluation

Once all students have found their match, have the pairs of students explain to the class why they are a match. Discuss with students what pollinators syndromes have to do with our environment. How would our environment change if there were no flowers preferred by a specific group of pollinators? What if there were no pollinators at all in our ecosystem? What would happen if some flowers started blooming earlier in the year before pollinators were active?

Extensions

• Have students work independently or in groups to create brochures for homeowners which details some of Nebraska's pollinators and the plants they prefer.

• Have students plan a pollinator garden for the school grounds. Be sure to include plants which bloom from spring through fall and flowers in all different colors and shapes. Have students create a map of their new garden. Be sure that the garden location will have the proper habitat requirements for the plants (water, sun/shade, etc.).

• Invite a garden expert, landscape designer or insect biologist into the class to talk about their career and how insects and pollinators play a role in their job.

Websites

• Pollinator Partnership
www.pollinator.org

• U.S. Forest Service - Pollinators
www.fs.fed.us/wildflowers/pollinators

• Xerces Society - Education & Outreach
www.xerces.org/education-and-outreach

ANSWERS:

Hummingbird ..... Cardinal Flower
Bumble Bee ..... Snapdragon
Regal Fritillary Butterfly..... Butterfly Milkweed
Bat ..... Saguaro Cactus
Ant ..... Wild Strawberry
Soldier Beetle ..... Goldenrod
Flower Fly ..... Apple Tree Flower
Hawk Moth ..... Morning Glory
Pollen Wasp ..... Virginia Waterleaf
Bee Fly ..... Spring Beauty
Leafcutter Bee ..... Aster

Ruby-throated Hummingbird

• I prefer flowers that are red in color.

• I do not land on the flower when drinking nectar, so I do not need a large landing spot.

• I seek flowers that are funnel shaped for my long, slender beak.

• I want flowers with plenty of nectar... I need a lot of energy to flap my wings this fast!

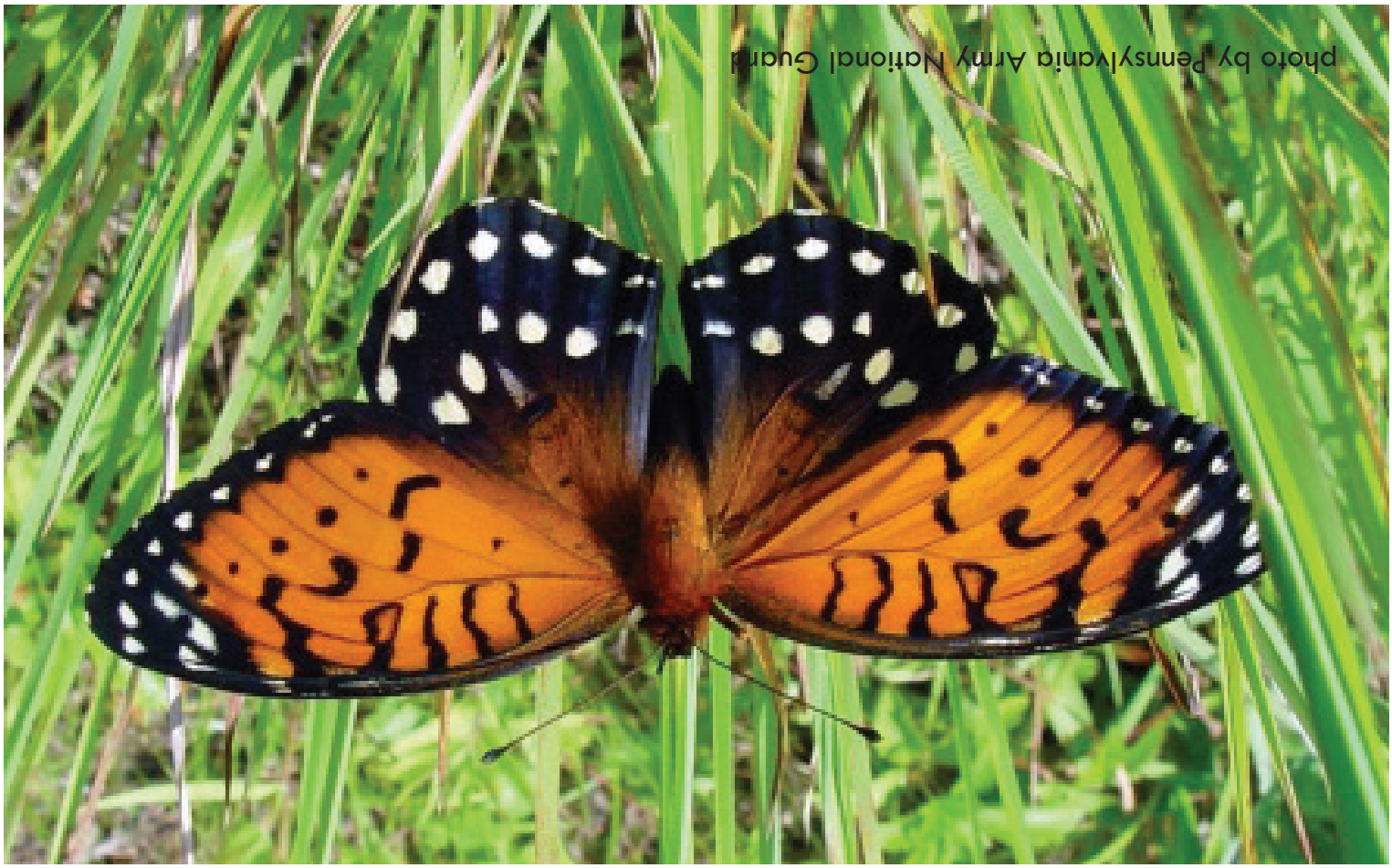
Bumble Bee

• I am able to regulate my own body temperature through shivering and basking in the sun. Many early spring and fall blooming plants rely on me for pollination.

• I like to land on the flower when seeking nectar, I do not hover.

• Because I am a heaver pollinator, I am good at pollinating plants that must “open” to reveal their nectar.

• I like lightly sweet smelling flowers.



Regal Fritillary Butterfly

• I like flowers that grow in clusters so I have plenty of room to land.

• I prefer brightly colored flowers, mainly red, yellow, and orange.

• I want flowers with lots of nectar.

• Because I have a long tongue, I often visit flowers with the nectar hidden deep inside.

Bat

• Although bats in Nebraska are not pollinators, bats in southern climates are important pollinators.

• Because I am nocturnal, I need flowers that are open at night.

• I am a rather large pollinator, so I need large flowers like large desert flowers.

• I like flowers that are white or pale in color... and I like flowers that are very fragrant and smell like fruit.

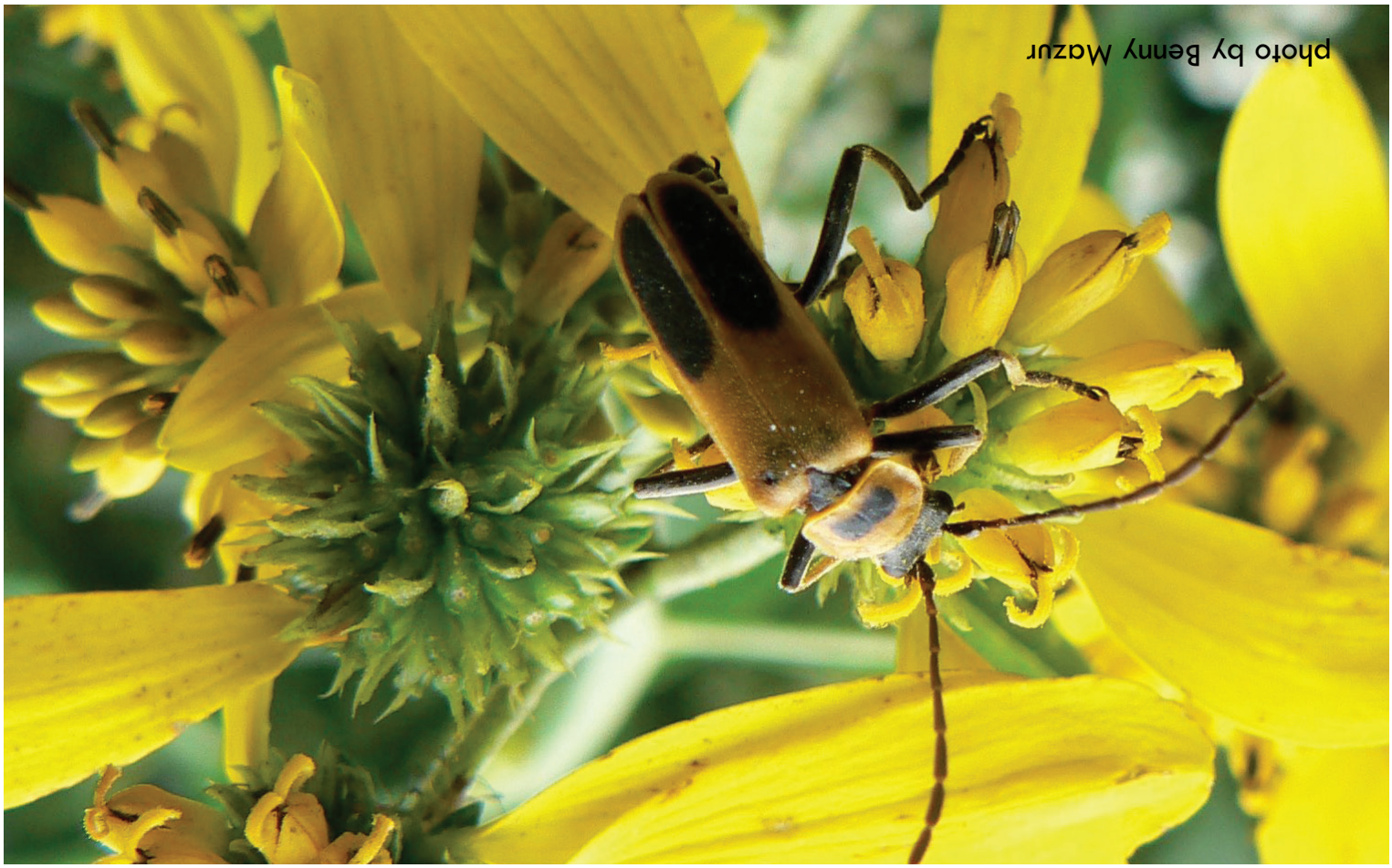
Ant

• I am not considered an important pollinator, but there are millions of us and we do visit flowers, so in the end we do some pollinating.

• I can not fly, so I visit flowers that are low to the ground.

• I often visit plants with small, inconspicuous flowers.

• I only pollinate during the day.



Soldier Beetle

- As a beetle, I am an extremely important pollinator.

- I often visit showy flowers and yellow in color.

- I am not too particular on the type of flowers... I can pollinate large, solitary flowers like sunflowers and coneflowers or small, cluster flowers like the Nebraska state flower.

Flower Fly

• I am often referred to as a hover fly.

• Most flower flies have sponge-like mouth parts for “soaking-up” nectar and pollen. Thus, I like wide-open flowers.

• There are over 900 species of Flower Flies in North America.

• I am an important pollinator in orchards.

Hawkmoth

• Unlike most moths, I am crepuscular. This means I visit flowers first thing in the morning or in the early evening.

• I am often mistaken for a hummingbird.

• I want flowers that have ample nectar. And, with my long tongue, I like the nectar to be hidden deep inside.

• I can be found feeding on hummingbird feeders, but I also like flowers that are purple, pink, white, or even blue.

Pollen Wasp

• I am a wasp yes, but I would prefer to visit flowers than sting you!

• My tongue is not nearly as long as bees or butterflies, so I need shallow flowers.

• I will visit a wide variety of flowers, but prefer flowers from the Waterleaf and Figwort families.

Bee Fly

• I am actually a fly that mimics a bee.

• I do not land on the flower when drinking nectar to avoid predators (like spiders) lurking on the flowers. This means I do not need a large landing spot.

• I am often one of the first pollinators out in the spring.

• Although I do not land on the flowers I pollinate, I do get some pollen on my legs to pass to other flowers.

Leafcutter Bee

• I am a solitary bee, not a colony bee like bumble bees and honey bees.

• I am named because I chew perfect circles out of leaves. I use this material to seal my eggs in their nest chamber.

• Although most leafcutter bees visit a wide variety of flowers, some species specialize in pollinating asters and pea flowers.

Apple Tree Flower

• I am a pale pink to white flower.

• My flower petals are wide open to allow easy access for pollinators.

• When pollinated, my flower will form an apple. I am often found in large apple orchards.

Saguaro Cactus Flower

- My flowers are white with a yellow center.

- My flowers are a cone shape with the pollen deep inside.

- My flowers are very fragrant.

- I am often found in warm climates such as deserts.

- My flowers are open both day and night.

Butterfly Milkweed

• I am bright orange colored and have lots of small flowers... this is called cluster flowers.

• I can be found in a wide variety of habitats including prairies, wetlands, and even roadsides.

• Although my individual flowers are small, the nectar is hidden inside.

Snapdragon

• I can be found in a wide variety of colors including yellow, white, pink, red, and orange.

• I must be “opened” ... my large petal must be pushed down for pollinators to reach my nectar.

• I provide my pollinators with a large landing platform.

• My nectar is at the bottom of a long tube.

Cardinal Flower

- I have no landing platform for my pollinators.

- I have a long funnel shaped flower.

- Unlike many flowers which come in a variety of colors, I am always scarlet red in color.

Goldenrod

• I have clusters of flowers.

• Although there are lots of kinds of Goldenrod, my flowers are always bright, showy yellow.

• I bloom in the late summer.

• I am the state flower of Nebraska.

Morning Glory

• I can be blue, white, deep pink, or pale pink in color.

• I close my flowers at night, I open them first thing in the morning.

• I am a common garden flower and can be found climbing on fences or trellises.

Virginia Waterleaf

- I am a common forest flower in Nebraska.

- I grow low to the ground.

- My flowers are not too deep, which allows many pollinators to get to my nectar.

Spring Beauty

- I am one of the first wildflowers to bloom in the spring.
- My flowers can be white, pink, or even striped.
- I am a small plant and do not grow very tall.
- My delicate petals do not provide much room for a large pollinator to land.

Wild Strawberry

• I am usually found in shaded areas with plenty of indirect sunlight.

• I grow low to the ground and am often visited by crawling insects.

• I have small white flowers that are not very showy.

Aster

• I am a small flower, but a single flower... I do not form clusters.

• I can be yellow, white, pink or purple in color.

• My petals are long and narrow, and although small, I have plenty of pollen and nectar.