



## Pollination Syndromes

### Content Connections:

Life Science - Plant and animal adaptations, behavior, and interactions

Visual Arts - Recognizing and using colors and patterns

**Grades:** 4<sup>th</sup>-8<sup>th</sup>

**Time:** 30-40 minutes

**Objective:** Students will use observation skills to complete a matching game that demonstrates an understanding of pollination syndromes.

### Materials:

- Flower pictures or collected specimens of a variety of flowers
- Student journals and pencils
- Meet Your Pollinator packet (see attached resource)
- Design Your Flower sheet (optional)

### Preparation:

Collect a variety of flowers or print off pictures to share with students. Print off enough copies of pictures from the Meet Your Pollinator packet (below) so that each student can have one pollinator or one plant picture and text.

### Background:

Flowers attract pollinators by offering them a reward (nectar and pollen) and then use the opportunity to distribute or gather pollen (the plant's male reproductive cell) via the pollinator. Different types of pollinators are typically attracted to specific types of flowers. This preference for certain flowers is known as a Pollination Syndrome.

Pollination Syndromes vary by types of pollinators. This table provides the flower characteristics for the pollination syndromes of common types of pollinators.

<b>Trait</b>	<b>Bats</b>	<b>Bees</b>	<b>Beetles</b>	<b>Bird</b>	<b>Butterflies</b>	<b>Flies</b>	<b>Moths</b>
<b>Color</b>	Dull white, green or purple	Bright white, yellow, blue, or UV	Dull white or green	Scarlet, orange, red or white	Bright, including red and purple	Pale and dull to dark brown or purple; speckled	Pale and dull red, purple, pink or white
<b>Nectar Guides</b>	Absent	Present	Absent	Absent	Present	Absent	Absent
<b>Odor</b>	Strong musty; emitted at night	Fresh, mild, pleasant	None to strongly fruity or fetid	None	Faint but fresh	Putrid	Strong sweet; emitted at night
<b>Nectar</b>	Abundant; somewhat hidden	Usually present	Sometimes present; not hidden	Ample; deeply hidden	Ample; deeply hidden	Usually absent	Ample; deeply hidden
<b>Pollen</b>	Ample	Limited; often sticky & scented	Ample	Modest in amount	Limited	Modest in amount	Limited
<b>Flower Shape</b>	Regular; bowl shaped – closed during day	Shallow; have landing platform; tubular	Large bowl-like, Magnolia	Large funnel like; strong perch support	Narrow tube with spur; wide landing pad	Shallow; funnel like or complex and trap-like	Regular; tubular without a lip

Reference: [Pollinator Syndromes \(U.S. Forest Service\)](#)

### **Procedure:**

1. Show students the different flowers (or pictures) you have gathered.
2. Give students 10-15 minutes to look at all the flowers and jot down a paragraph stating what their favorite flower is with supporting reasons for their point of view. Their rationale can include the size, shape, color, texture, and fragrance. Younger students may draw a picture and write down notes about aspects of the flower that makes it their favorite.
3. After students have had time to write, go around the room and have several students share which flower is their favorite and why.
4. Explain to students that just like they prefer some flowers over others, pollinators also prefer some flowers over others. A lot of times the flowers they like best are the ones



that are the right size or shape just for them. 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 mouthparts much like a sponge so they prefer wide-open flowers that are easy to access. Or, for other pollinators, like moths, a flower that is open at night is preferred because that is when most moths are active.

5. The idea that pollinators prefer some plants over others is called a Pollinator, or Pollination, Syndrome. The term “syndrome” refers to the idea that just like we have symptoms or characteristics specific to a syndrome or illness, pollinators have characteristics that are specific to their preferred plants.
6. To emphasize the plant-pollinator relationships, complete the Meet Your Pollinator activity. This activity can be done individually, in pairs, or in small groups. Give each student/group one card, either a plant or pollinator, from the “Meet Your Pollinator” packet. Explain to them that they are to use the characteristics of their pollinators and plants to find their match - each plant has a specific pollinator. (Note: for several plants, the matching pollinator is not the only pollinator to help pollinate this plant. Have students write their pairs in a notebook.
7. Once students have found their matches, have them write explanations for the pairings they chose. When all students are done with their explanations have them report to the class their pairings/explanations and reasoning behind their answers.

**Extension:** Draw the plant that will attract you as a pollinator!

1. Give one *Designer Flowers* activity sheet to each student. Let each student complete the worksheet and then trade with a partner.
2. Ask students to brainstorm the question, If you were a pollinator what would your flower partner look, smell and taste like? Then let them draw a “designer” flower just for their partner! Encourage lots of creativity and fun in this activity; their flowers might have pizza slice petals, a candy bar pistil, a favorite drink could be the nectar, etc.
3. Give students time to brainstorm and design, then choose a few students to share back with the class.

**References:**

- To learn more about parts of this lesson, visit the activity [“Butterflies, Hummingbirds, and Bees Oh My! Pollinators on the Tallgrass Prairie”](#) by the National Park Service.

# Meet Your Pollinator!

**Directions:** Print enough copies for each student to have either one plant or one pollinator. Print each page and fold in half so picture is on one side and text is on the back side.

While many plants are pollinated by more than one of these pollinators, the idea is to have one pollinator match specifically with each plant. If students find a match other than the preferred pairs listed below, ask them to explain their reasoning. The intended matches are as follows:

## Pollinator

Bumble Bee  
Leafcutter Bee  
Bee Fly  
Southern Long-nosed Bat  
Fritillary Butterfly  
Ant  
Soldier Beetle  
Hummingbird  
Pollen Wasp  
Hawkmoth

## Plant

Snapdragon  
Aster  
Spring Beauty  
Saguaro Cactus  
Butterfly Milkweed  
Wild Strawberry  
Goldenrod  
Trumpet Vine  
Virginia Waterleaf  
Morning Glory



## 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 heavier pollinator, I pollinate plants that must “open” to reveal their nectar.
- I like lightly sweet-smelling flowers.





## 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.



## Ant

- I am not considered an important pollinator, but there are millions of me and we do visit flowers, so we do some pollinating.
- I cannot fly, so I visit flowers that are low to the ground.
- I often visit flowers with small, inconspicuous flowers.
- I only pollinate during the day.



## Soldier Beetle

- As a beetle, I am an extremely important pollinator. Beetles pollinate 86% of flowering plants!
- I often visit showy flowers that are yellow in color.
- I am not too particular on the type of flowers. I can pollinate large, solitary flowers like sunflowers, or small, cluster flowers like yarrow.





## Hawkmoth

- Unlike most moths, I am crepuscular, so I visit flowers at dawn and dusk. 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, but I would prefer to visit flowers rather than sting you!
- My tongue is not nearly as long as most 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, so 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.



## Southern Long-nosed Bat

- I fly at night to find food.
- I mostly eat nectar, pollen, fruit, and flowers.
- Since I feed at night, I like flowers that are pale-colored with a strong smell so they're easy to find.



## Saguaro Cactus

- I am big, sturdy and white.
- I grow high off the ground.
- I have a strong smell that attracts pollinators from far away.
- I open at night and then die by the end of the next day.





## Snapdragon

- I can be found in a wide variety of colors including yellow, white, pink, red, and orange.
- I must be “opened” by pushing down on my large petal for a pollinator to reach my nectar.
- I provide my pollinators with a large landing platform.
- My nectar is at the bottom of a long tube.



## Butterfly Milkweed

- I am brightly colored and have lots of small flowers that form in clusters.
- I can be found in a wide variety of habitats including prairies, wetlands, and roadsides.





## 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.





## Trumpet Vine

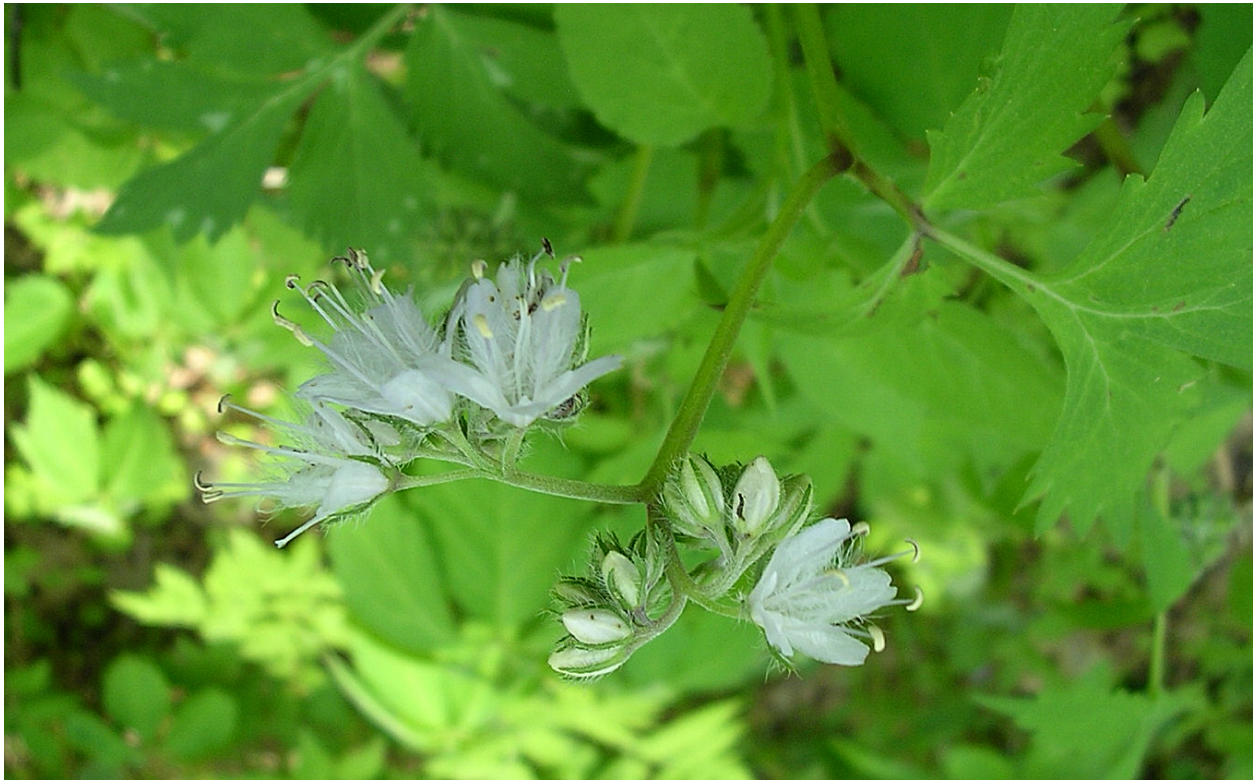
- I have no landing platform for my pollinators.
- I have a long funnel shaped flower.
- I can be red or orange in color.
- I can grow as a bush or a vine.



## 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 grow on forest floors.
- I stay 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.



## Wild Strawberry

- I grow low to the ground and am often visited by crawling insects.
- I have small white flowers that are not very showy.
- I am usually found in shaded areas with plenty of indirect sunlight.





## 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.

# Designer Flowers

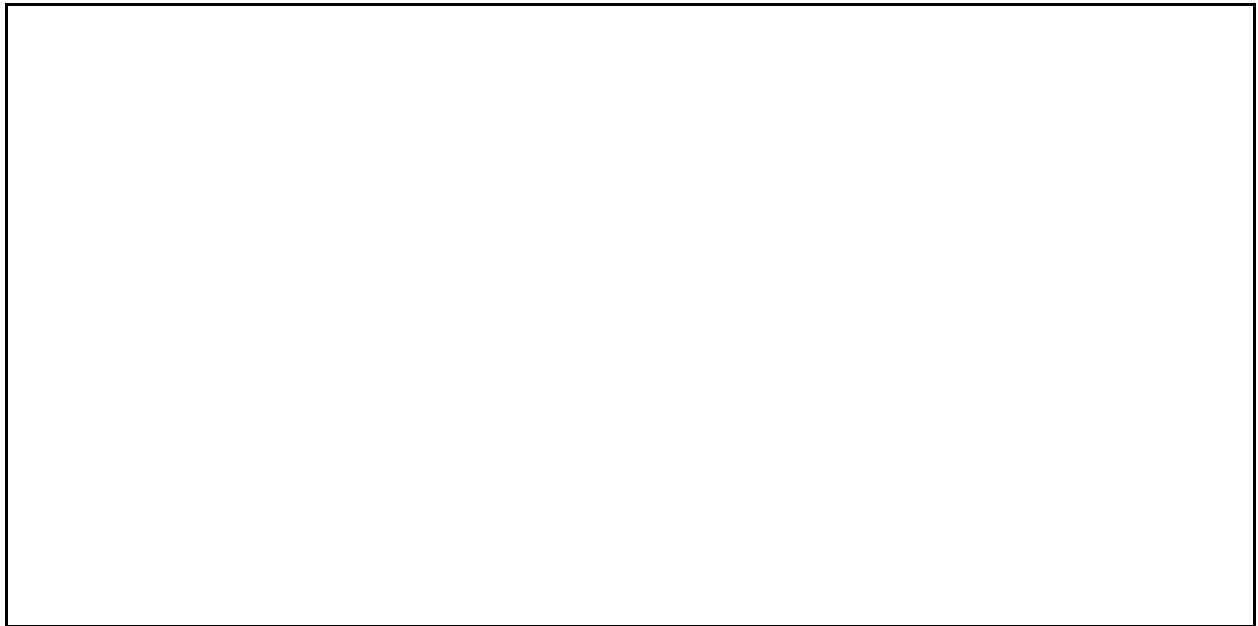
Fill out your preferences and give them to your partner:

Your favorite color: \_\_\_\_\_

Your favorite shape: \_\_\_\_\_

A smell you like: \_\_\_\_\_

Your favorite snack: \_\_\_\_\_



Imagine you are a flower adapting to your partner's preferences. In the area above, draw a "designer" flower to suit these preferences. Then, describe why the flower you created would appeal to your partner:

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