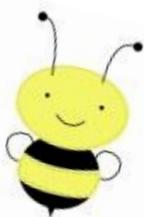


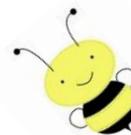
# Pollinators



# Activity



# Book



# TEXAS A&M AGRI LIFE EXTENSION

For more information please contact

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<http://bexar-tx.tamu.edu/youth-gardens-program/>

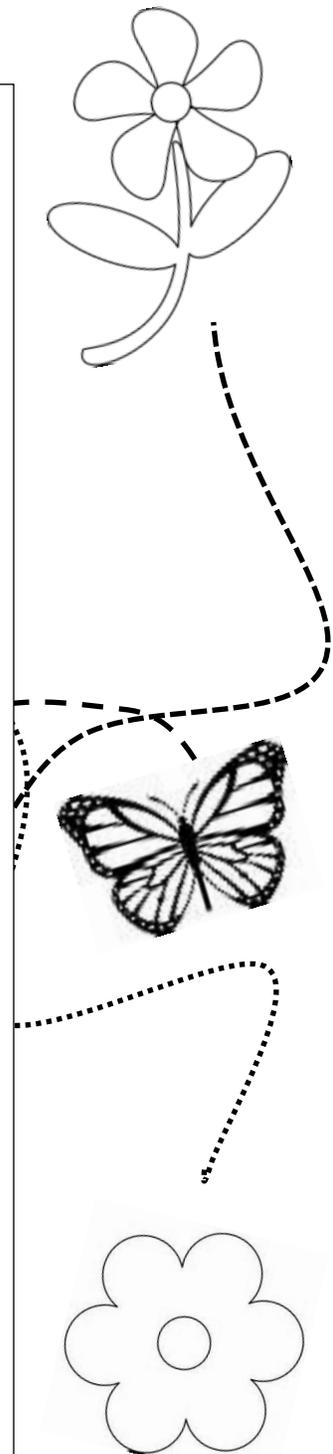
Art Work by Cindy De Jesus

Information provided by <http://www.life.illinois.edu/>

# What is Pollination?

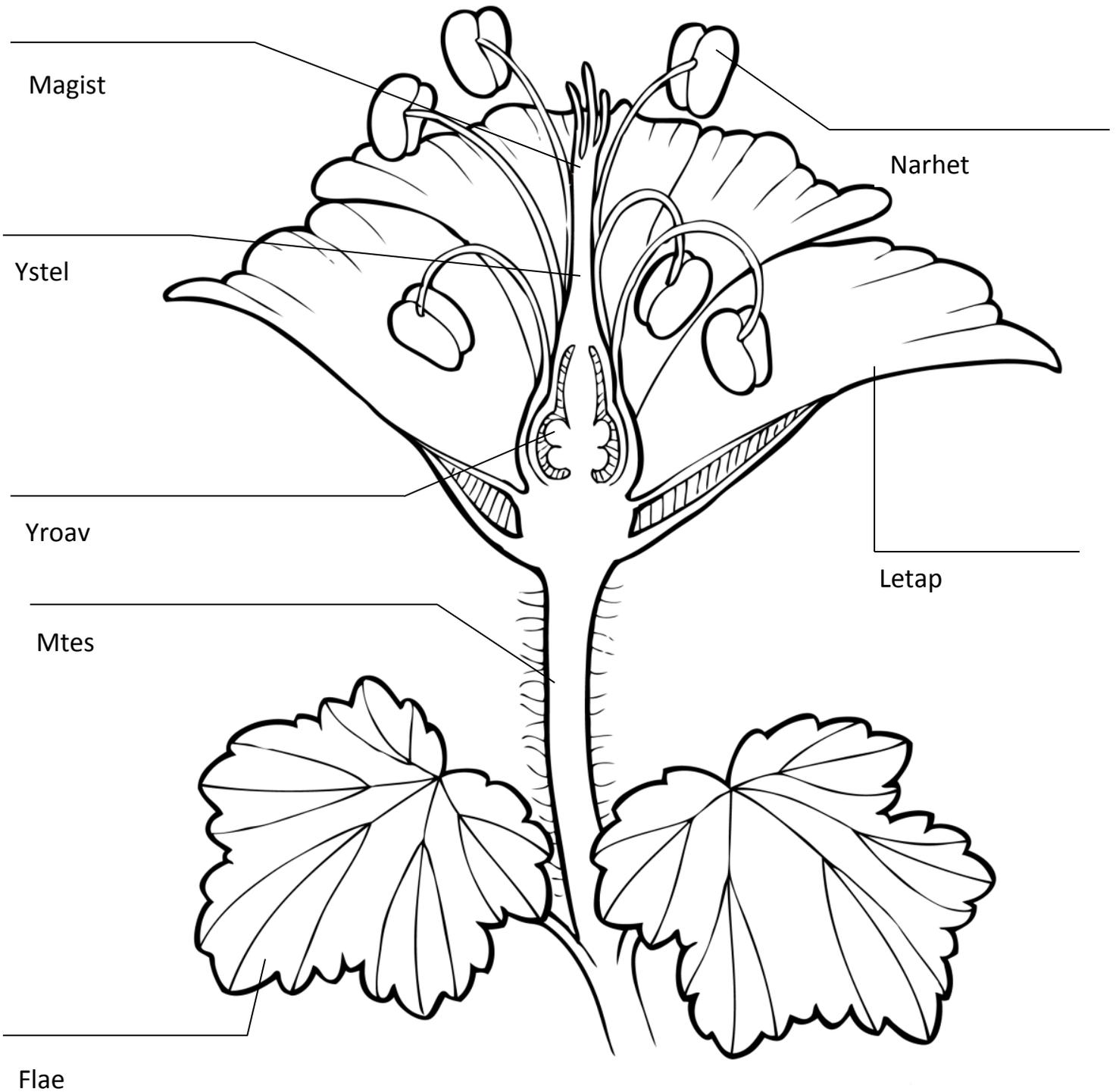


- Pollination takes place when pollen lands on the stigma of a plant.
- The pollen travels down to the ovary and fertilizes ovules. Seeds can then form.
- Flower pollen is produced and released from the anther.
- If no pollination occurs, then plants will not be able to grow seeds, and no other plants will be made
- Pollen is moved to another flower by the wind or animals called Pollinators.
- Plants mostly rely on insects, like Bees, to take the pollen from the anthers of one flower to the stigma of another flower.



# Can you name the different parts of a Flower?

Unscramble the letters to find each name.

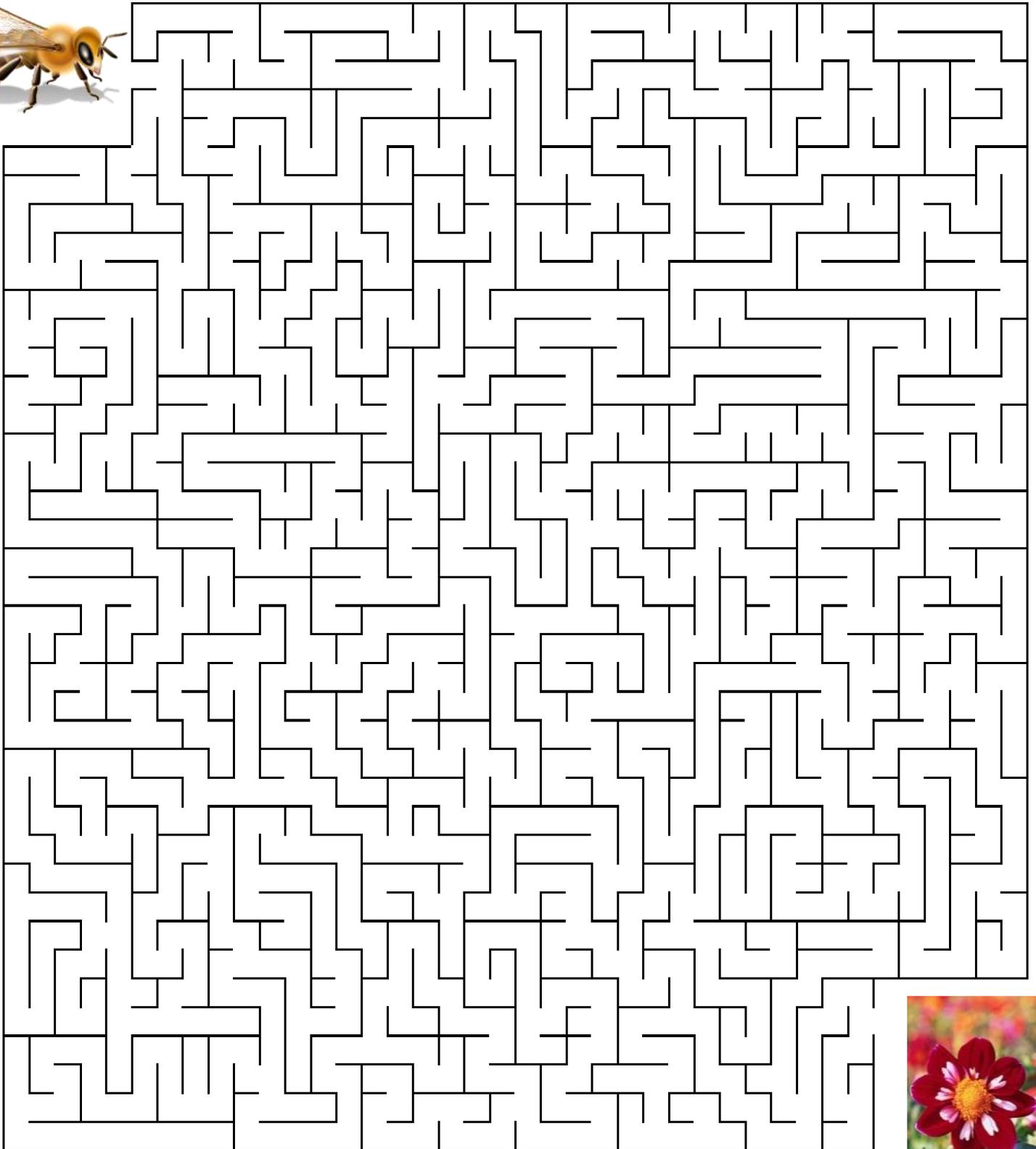


# The Foods We Eat Need Pollinators

**All the foods listed below depend on bee pollinators. Are these foods part of your favorite meal or snack? Think back on what you ate for breakfast, lunch or dinner today. Could you have eaten all those foods if bees were no longer around to pollinate our crops?**

<p><b>FRUIT CROPS:</b></p> <ul style="list-style-type: none"><li>* Apple</li><li>* Apricot</li><li>* Avocado</li><li>* Berry (blackberry, blueberry, cranberry, gooseberry, huckleberry, raspberry, strawberry)</li><li>* Cherry</li><li>* Citrus (grapefruit, lemon, mandarin)</li><li>* Currants</li><li>* Kiwi</li><li>* Litchi</li><li>* Mango</li><li>* Melons (cantaloupe, honeydew, watermelon)</li><li>* Peach</li><li>* Pears</li><li>* Plum</li></ul>	<p><b>VEGETABLE CROPS:</b></p> <ul style="list-style-type: none"><li>* Artichoke</li><li>* Chinese cabbage</li><li>* Asparagus</li><li>* Dill</li><li>* Pumpkin</li><li>* Broccoli</li><li>* Eggplant</li><li>* Radish</li><li>* Brussel sprouts</li><li>* Garlic</li><li>* Rutabaga</li><li>* Cabbage</li><li>* Kale</li><li>* Carrots</li><li>* Kohlrabi</li><li>* Squash</li><li>* Cauliflower</li><li>* Leek</li><li>* Turnip</li><li>* Mustard</li><li>* Celery</li><li>* Onion</li><li>* Parsley</li><li>* Pepper</li><li>* Lima beans</li><li>* Collards</li></ul>	<p><b>HERBS/SPICES:</b></p> <ul style="list-style-type: none"><li>* Annise</li><li>* Allspice</li><li>* Chives</li><li>* Cinnamon</li><li>* Coriander</li><li>* Fennel</li><li>* Lavender</li><li>* Mint</li><li>* Mustard</li><li>* Nutmeg</li><li>* Oregano</li></ul> <p><b>NUT CROPS:</b></p> <ul style="list-style-type: none"><li>* Almond</li><li>* Coconut</li><li>* Cacao</li><li>* Coffee</li><li>* Cashew</li><li>* Chestnut</li><li>* Macademia</li></ul> <p><b>OILSEED CROPS:</b></p> <ul style="list-style-type: none"><li>* Cotton</li><li>* Safflower</li><li>* Soybeans</li><li>* Sunflower</li></ul>
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# Help the Bee find the Flower



# Pollination by Honey Bees



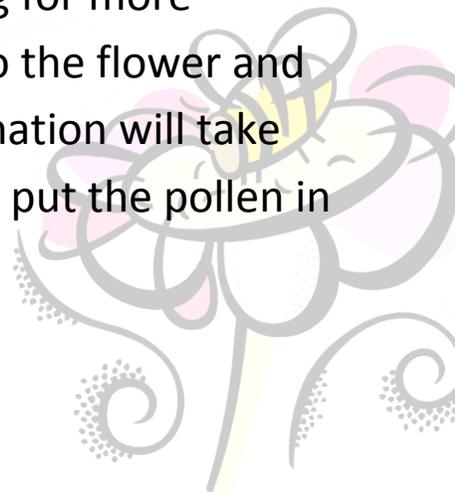
Honey Bees are very important insect pollinators. They have a mutualistic relationship with the flowers that they visit. While the bees get a drink of nectar, the plant gets pollinated.



When a honey bee is collecting pollen from the anthers of a flower, it puts the pollen in a special pollen basket on its hind legs. All that pollen will be taken back to the hive as a source of protein for the younger bees. While the honey bees dig in the flower for the nectar, some of the pollen gets stuck on the hairs of its body.



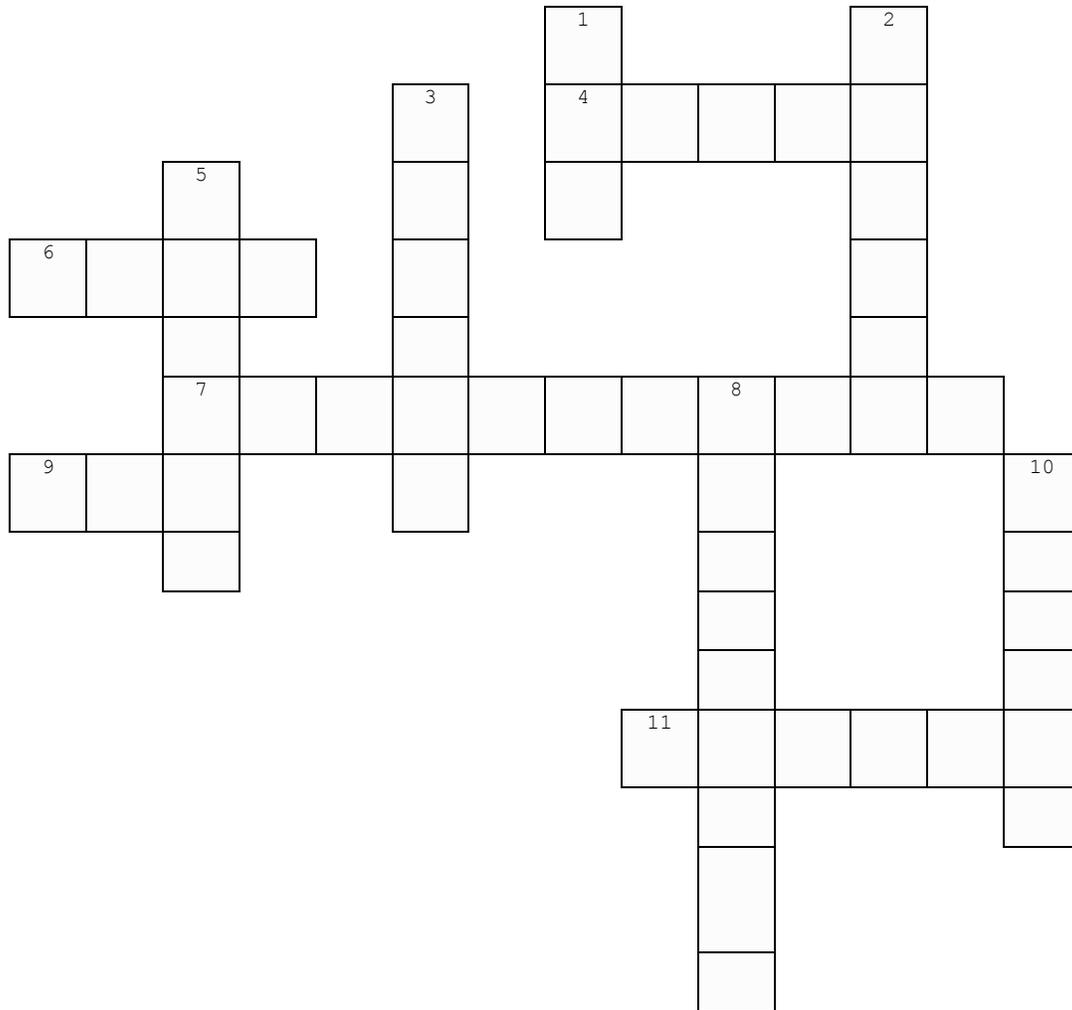
When the bee visits the next flower looking for more nectar, some of the pollen brushes off onto the flower and if it sticks to the stigma of the flower, pollination will take place. The bee does not make any effort to put the pollen in the right place.



Can you find the Pollen Basket on the Honey  
Bee's leg?



# Pollinator Puzzles!



## Across

4. This fruit is an iconic gift for a teacher.
6. This is what some trees and grasses use to pollinate without using actual pollinators
7. This cute little vertebrate pollinator can flap its wings over 40 times per second!
9. This pollinator lives in a hive and has one queen
11. This fruit's name is also its color

## Down

1. This flying mammal is a nocturnal pollinator and flies around sniffing the air to find a flower
2. This sweet treat is what attracts pollinators to flowers
3. The part of a flower where the pollen enters to fertilize the ovary in the flower
5. The part of a flower where the pollen is produced
8. This invertebrate pollinator has a unique life cycle that involves a complete metamorphosis
10. This is the yellow powder found in flowers

# Moths and Butterflies

If you look closely, you will notice that moths and butterflies look different from each other and have different behaviors. The flowers they pollinated are also different.



<b>Moth</b>	<b>Butterfly</b>
Antennae feathery or thin	Antennae have small clubs at their ends
Plump, fuzzy body	Slender, smooth body
Usually duller in color	Usually have some bright colors
Have a good sense of smell	Not such a good sense of smell
Cannot see very well	Have good vision
Feed on plant nectar while hovering	Like to perch on something while feeding

Flowers pollinated by \_\_\_\_\_ usually have white or pale colors. They open at night and release a strong sweet smell. Their petals are flat and bend back to give a hovering \_\_\_\_\_ enough room.

Flowers pollinated by \_\_\_\_\_ usually are brightly colored and have no smell. They often occur in clusters so that they form a landing platform.

The butterfly drinks the nectar  
through its Proboscis.



# How do pollinators help us?

Did you know.....

- One out of every 3 bites of food we eat is courtesy of a pollinator.
- Pollinators keep plant communities healthy and able to reproduce.
- Birds and other animals are even more dependent upon fruits and seeds than we are.
- Pollinator-supported plant communities bind the soil, helping to prevent erosion.





# Word Search



Can you find all of the hidden words?

P I V X Y T U P P O S I S  
M N H V W L L P J S P I A  
W S U P R A F X O O B P B  
C K M I N A E R L L N E W  
F H M T K K T L E K L H E  
L B I N W Y I C R T T E H  
O Z N Y Z N R S E L T Y N  
W U G B A I E N T N S U V  
E G B T L N H J E I K A B  
R C I E D S T U H E G B I  
Z O R F J E N B A T O M Y  
N J D Y A C A R S I E R A  
H D C A X T E H K K K J O

Anther

Bat

Bee

Butterfly

Flower

Hummingbird

Insect

Nectar

Plant

Pollen

Pollination

Stigma

# Pollination by Vertebrates



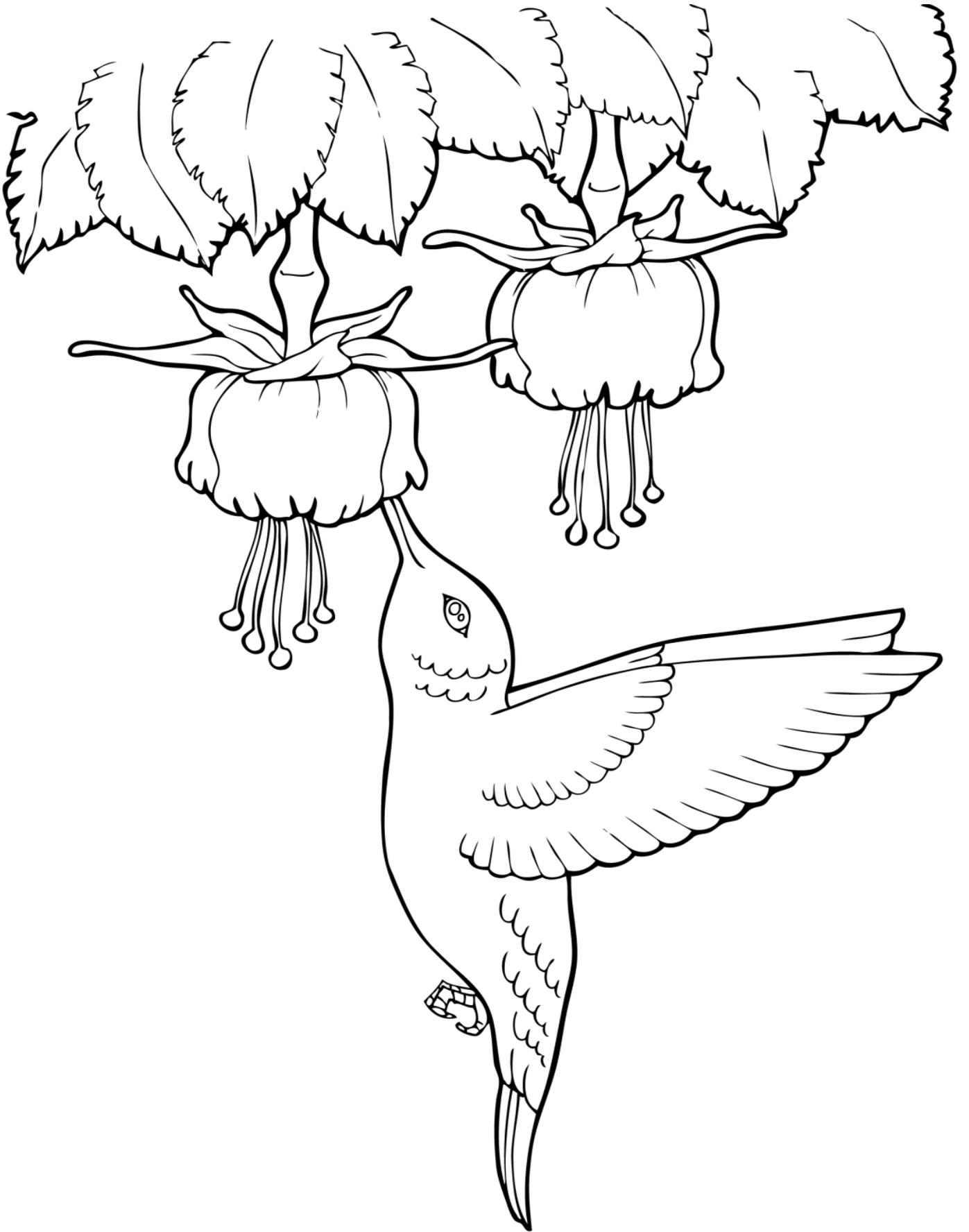
Pollen can also be transferred by vertebrates (animals with internal skeletons), particularly by hummingbirds and other birds, and bats. Other animals like monkeys, marsupials, lemurs, bears, rabbits, deer, rodents, lizards and other animals have also been known to help pollinate flowers in the tropics



Did you know? Hummingbirds use so much energy hovering in front of flowers that it would be like you needing to eat 300 lbs of hamburgers every day!

Did you know? Hummingbirds are the only kinds of birds that can fly forward and backwards

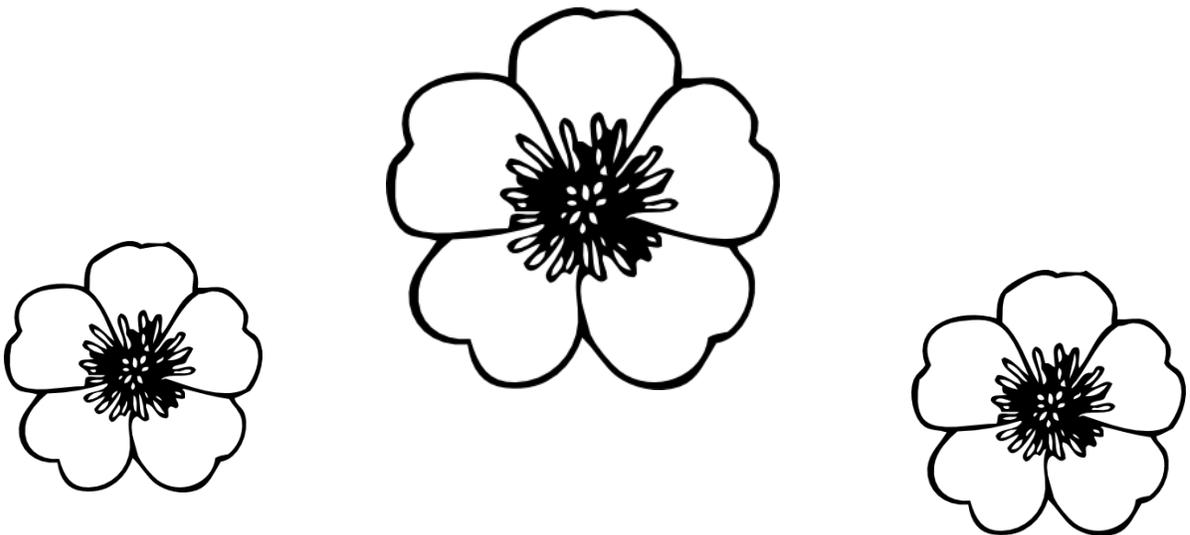




# Bats Bats Everywhere!

- Bats are often the main pollinators of desert plants and big trees in the tropics.
- They are also very important pollinators of many fruit plants

- Bat pollinated flowers are usually white or pale yellow in color and open at night.  
Why do you think the flowers have this adaptation?



# **Going Batty!**

## **Puns and Jokes**

- ❖ **What did the alien dandelion say to the Earth Dandelion?**  
***Take me to your WEEDER!***
  
- ❖ **What do you get when you throw a stick of butter out the window?**  
***A Butterfly!***
  
- ❖ **What do bats do at night?**  
***AcroBATics!***
  
- ❖ **When I bought a tomato plant the other day, the nursery owner gave me some free insects to help pollinate**  
***They were FREE BEES!***



# About Youth Gardens Program

The Bexar County Youth Gardens Program is one of the many programs of the Texas A&M AgriLife Extension Service and is designed to provide educators, volunteers, and community leaders with an innovative method for using gardens as outdoor classrooms. The garden supplements efforts to improve S.T.A.A.R. (State of Texas Assessments of Academic Readiness) scores by using the garden as an alternative to the typical classroom setting and through utilization of the award-winning Junior Master Gardener curricula. This program strives to create an environment that brings together parents, educators, and the community to educate urban youth about agricultural commodities and an array of other subjects while, at the same time, promoting community involvement. Research has shown gardening is an effective way to help children gain a respect for nature and the environment, learn about nutrition and improved food choices, develop interpersonal skills, and enhance classroom learning with practical hands-on experience — all of which help them to become well-rounded, socially aware and productive members of their communities.

The Bexar County Youth Gardens Program is made possible through a generous grant from the San Antonio Livestock Exposition Inc.

# TEXAS A&M AGRI LIFE EXTENSION



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