

Pollinate Norcross Activity Workbook

3rd-5th Grade



Celebrate Pollinators with us!

Fun activities for young families - learn about pollinators, gardening,
and conservation.

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This workbook was created with the help/support of Gwinnett Soil and Water Conservation District

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NATIONAL POLLINATOR WEEK

WHAT
CAN YOU
DO TO
HELP?



1. **Be kind to your pollinator friends.** Pollinators like bugs and birds are small and fragile. It's easy for people to hurt them. Be gentle and quiet when they are near!
2. **Look, but don't touch!** When you see a butterfly, bee, beetle, or hummingbird outside, look, but don't touch! Pollinators won't hurt you if you leave them alone and are nice to them.
3. **Don't use poison sprays.** Bug your family to stop using poison sprays in your house and garden. This poison kills bad bugs, but it hurts pollinators too. Bug your family to buy ORGANIC fruit and vegetables. These are grown without poison sprays, so they keep pollinators safe and happy.
4. **Keep pollinators' homes safe.** And help make habitat for pollinators. Take care of a garden. Plant some flowers. When you find a bug in your house, gently take it outside to its natural habitat.
5. **Bug someone!** Bugs and pollinators are fun and interesting. Teach your family and friends about these important animals. Teach them to say "Thanks Bugs!" You can "bee" an expert! ★

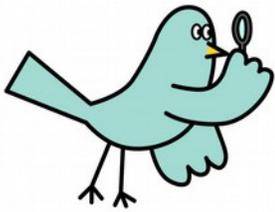
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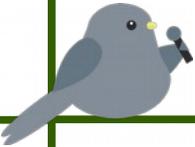
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Backyard NATURE HUNT



Can you find these things in your pollinator garden or backyard?

<p>A flower you didn't plant (wild flower)</p>	<p>Someone singing in a tree</p> 	<p>A pollinator who can lift 10 – 50 times her own weight (ant)</p>	<p>A place where wild bees might dig a hole to nest (bare patch of soil)</p>
<p>An insect with wings, who used to be a caterpillar (butterfly)</p>	<p>Something birds love to feed their babies (caterpillar)</p>	<p>A baby plant (seedling)</p>	<p>A tree leaf with lobed edges</p> 
<p>The seed pod from a pine tree</p> 	<p>Flowers with at least 2 pollinators visiting them</p>	<p>A large bee with a “furry rear” (bumblebee)</p>	<p>Something that provides shelter for insects and small animals (stick or log pile)</p>
<p>Tree bark that feels smooth when you touch it</p>	<p>A tiny red beetle with black spots who is good for gardens</p> 	<p>A shadow caused by a tree</p>	<p>A place where butterflies might stop to sip nutrients (mud puddle)</p>
<p>A pollinator originally brought from Europe by the colonists to make honey (honeybee)</p>	<p>An insect who resembles a bee but has a tiny waist (wasp)</p>	<p>Something trees provide that helps soil stay healthy (leaf mulch)</p>	<p>A bee with a “shiny hiney” (Carpenter Bee)</p>

Where are all the pollinators?

Look through the picture and see if you can find the hidden pollinators! When you find them, color them in. Hint: look for a bee, bat, and fly!





PLANT YOUR OWN POLLINATOR GARDEN

Necessary Ingredients

- An area with **soil** (in the ground or in containers)
- As much **sun** as possible
- Plenty of **water**
- **Rocks** (to taste)
- **Mulch** (straw, wood chips or bark)
- Pollinator **plants** (Native plants work best)
- Garden **tools** (ie. spade, trowel, shovel)
- A ceramic **bowl** (or clay pot)
- Long term **commitment**

Step 1. Preparation

Make sure your garden area is weed free and the soil is “loosened up.” *Hint: Wet the soil the day before to make weed pulling easier!* If need be, bring in fresh soil.

Step 2. Landscaping

If your garden site is very windy, a **wind block** may be necessary. **Rocks** are great for adding contrast to the garden and also provide warm places for butterflies to perch. A **bowl with mud** in the garden gives butterflies a place to drink and obtain minerals. (They need the mud in order to drink water, which they do through a process called “wicking”).

Step 3. Planting

Place plants **far enough apart** to allow for growth. **Water thoroughly**, immediately after planting. See the following list for food for butterflies and humming birds recommended plants, which provide food for butterflies and humming birds (**nectar**) and caterpillars (**leaves**). Gardens with a **high density of diverse plants** are most attractive to pollinators.

Step 4. Mulching

Mulching is a great way to **discourage weeds**. First, place a 3-ply layer of wet **newspaper** on the ground around plants (*The newspaper is optional, but acts as an extra biodegradable barrier against weeds.*). Pile on a thick layer of **mulch**. Try tree removal companies for a source for mulch. *When using paper, remember that it can help hold moisture in, but it will also necessitate more thorough watering in order to get water down to plant roots.*

Step 5. Maintenance

Pruning: Take out dead plant material (leaves, flowers, branches) to allow for new growth! (Make sure not to disturb birds’ nests, caterpillars or chrysalis)
Watering: New plants will need frequent water in order to establish strong roots. For established gardens, periodic deep waterings are a good idea, especially during the driest weeks of summer.

Planning your garden — think like a pollinator.

Go Native. Pollinators are "best" adapted to local, native plants, which often need less water than ornamentals.

Bee Showy. Flowers should bloom in your garden throughout the growing season. Plant willow, violet, and mayapple for spring and aster, joe-pye weed and goldenrod for fall flowers.

Bee Bountiful. Plant big patches of each plant species for better foraging efficiency.

Bee Patient. It takes time for native plants to grow and for pollinators to find your garden, especially if you live far from wild lands.

Bee Gentle. Most bees will avoid stinging and use that behavior only in self-defense. Male bees do not sting.

Bee Chemical Free. Pesticides and herbicides kill pollinators.

Bee Sunny. Provide areas with sunny, bare soil that's dry and well-drained, preferably with south-facing slopes.

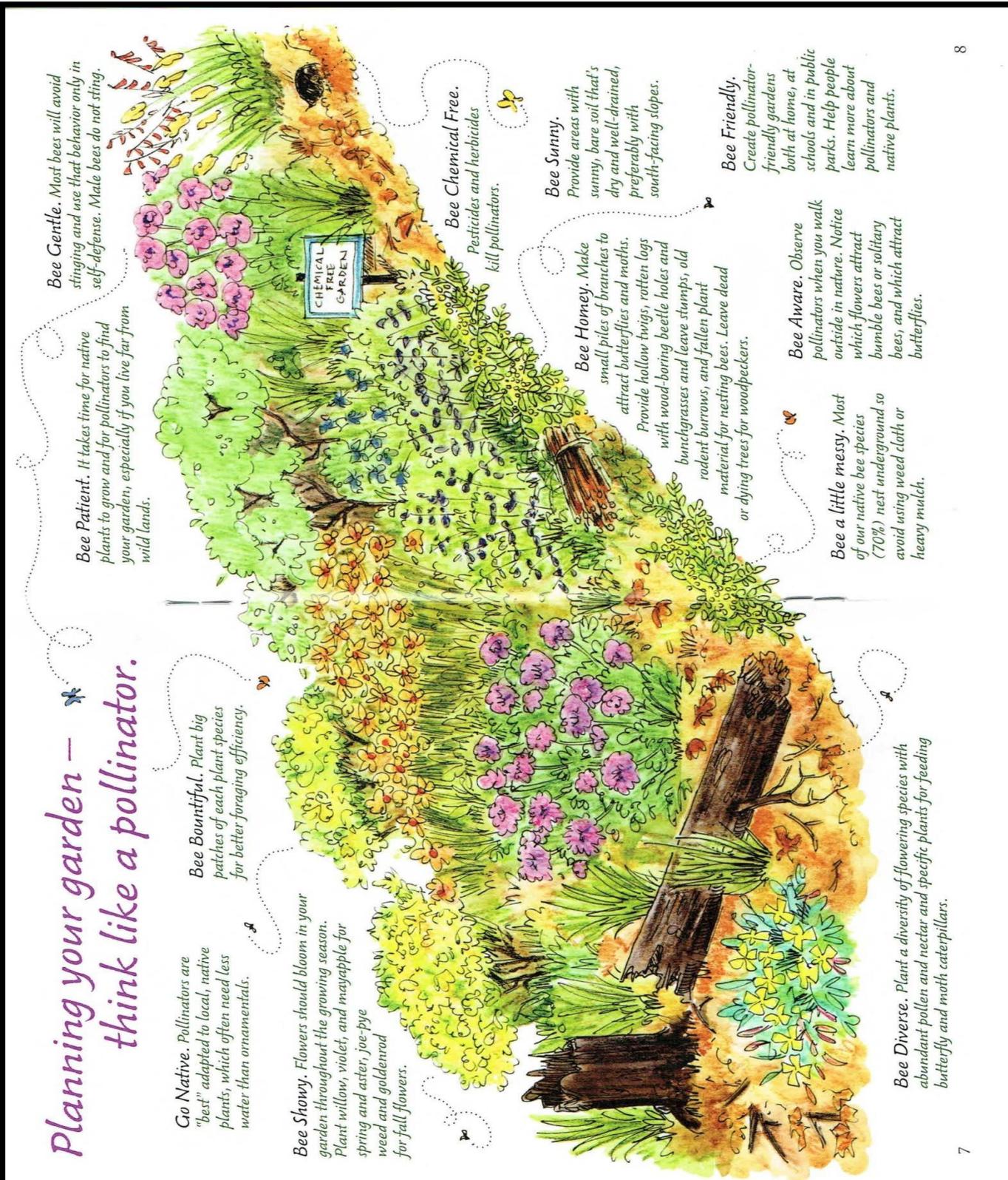
Bee Homey. Make small piles of branches to attract butterflies and moths. Provide hollow twigs, rotten logs with wood-boring beetle holes and bunchgrasses and leave stumps, old rodent burrows, and fallen plant material for nesting bees. Leave dead or dying trees for woodpeckers.

Bee Friendly. Create pollinator-friendly gardens both at home, at schools and in public parks. Help people learn more about pollinators and native plants.

Bee Aware. Observe pollinators when you walk outside in nature. Notice which flowers attract bumble bees or solitary bees, and which attract butterflies.

Bee a little messy. Most of our native bee species (70%) nest underground so avoid using weed cloth or heavy mulch.

Bee Diverse. Plant a diversity of flowering species with abundant pollen and nectar and specific plants for feeding butterfly and moth caterpillars.



INTRODUCTION:

- DO YOU KNOW THAT SOIL IS MADE UP OF LAYERS LIKE A CAKE? EACH LAYER IS STACKED ON TOP OF EACH OTHER AND EACH ONE IS MADE UP OF DIFFERENT MATERIALS. THE SOIL THAT WE SEE WHEN WE LOOK OUTSIDE IS USUALLY JUST THE VERY TOP LAYER AND IT IS THE SMALLEST LAYER! THERE ARE MUCH BIGGER LAYERS DEEP BENEATH THE EARTH.
- OBSERVE THE SOIL LAYER SHEET BELOW. POINT OUT EACH INDIVIDUAL LAYER AND HOW THEY LOOK DIFFERENT FROM EACH OTHER. DO YOU SEE DIFFERENCES BETWEEN THE LAYERS? WHAT IS DIFFERENT? WHICH ONES ARE BIG OR SMALL? DO YOU SEE ROCKS? WHAT ABOUT LIVING THINGS?

Soil Layers

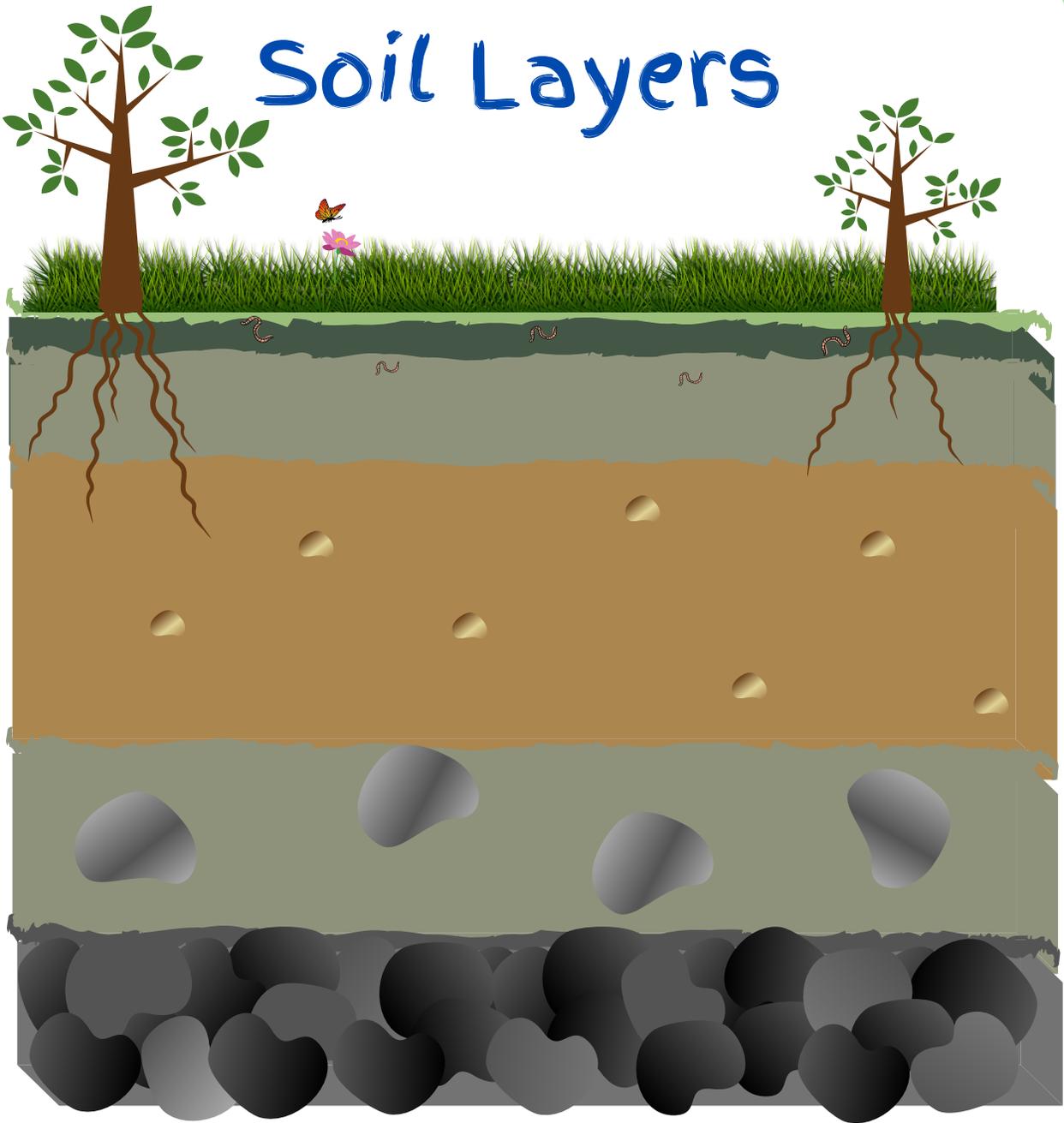
O Horizon
or Humus

A Horizon
or Topsoil

B Horizon
or Subsoil

C Horizon
or Parent
Material

Bedrock





MATERIAL PREP:

- GATHER YOUR MATERIALS FOR CREATING YOUR SOIL LAYERS. USE WHATEVER YOU HAVE AVAILABLE. THE FOLLOWING ARE EXAMPLES:
- BEDROCK: SOLID CHOCOLATE BAR OR ANYTHING HARD AND SOLID
- C HORIZON OR PARENT MATERIAL: CRUMBLD COOKIES IN LARGE CHUNKS, CHOCOLATE CHIPS/CHUNKS OR ANYTHING WITH STILL LARGE PIECES
- B HORIZON OR SUBSOIL: PUDDING OR OTHER IDEAS, PEANUT BUTTER, CHOCOLATE CREAM, OR ANYTHING SOMEWHAT SMOOTH AND THICK
- A HORIZON OR TOP SOIL: FINELY CRUSHED COOKIES OR ANYTHING WITH SMALL GRAIN TEXTURE
- O HORIZON OR HUMUS: GREEN SPRINKLES, SHREDDED COCONUT, EDIBLE SUGAR DECORATIONS, GUMMIES TO REPRESENT LIVE ORGANISMS

ACTIVITY:

NOW THAT YOU HAVE OVERVIEWED THE SOIL LAYERS, WORK WITH YOUR STUDENT TO GATHER EDIBLE ITEMS THAT WILL REPRESENT EACH LAYER. REFER TO THE MATERIAL PREP ABOVE FOR IDEAS. DISCUSS EACH LAYER AS YOU ADD IT!

- FIRST ADD THE BEDROCK LAYER TO THE BOTTOM OF YOUR CUP. THE BEDROCK LAYER IS THE DEEPEST LAYER OF SOIL. IT IS HARD AND MADE UP OF ROCK TIGHTLY COMPACTED TOGETHER.
- NEXT ADD THE C HORIZON OR PARENT MATERIAL LAYER. THIS LAYER RIGHT ABOVE THE BEDROCK LAYER IS WHAT MAKES THE B AND A HORIZONS THEREFORE IT IS CALLED THE "PARENT MATERIAL." IT HAS LOTS OF LARGE ROCKS FROM THE BEDROCK LAYER BUT IT ALSO IS LESS COMPACT.
- ADD THE B HORIZON. THE B HORIZON IS ALSO CALLED SUBSOIL. SUBSOIL HAS MINERALS AND LOTS OF CLAY WHICH IS A REDDISH BROWN COLORED SOIL. SOME ROOTS FROM LARGE TREES AND PLANTS CAN REACH DOWN INTO THE SUBSOIL LAYER. ****IF YOU ARE IN GEORGIA: THIS IS WHAT OUR SOIL MAINLY CONSISTS OF AND YOU CAN EASILY VIEW IT IN YOUR OWN YARD! OUR TOP SOIL AND O HORIZON WERE STRIPPED AWAY IN MANY AREAS.**
- ADD THE A HORIZON. THE A HORIZON IS ALSO CALLED TOP SOIL. TOP SOIL IS RICH WITH MINERALS AND SUPPORTS LIVING ORGANISMS.
- LASTLY ADD THE O HORIZON OR HUMUS. THE O HORIZON IS MADE UP OF ORGANIC MATTER FROM DECOMPOSING PLANTS AND ORGANISMS. IT IS RICH WITH NUTRIENTS AND WILL SEND SOME DOWN INTO THE BELOW LAYERS WHEN IT RAINS.
- ADD ANY "LIVING" ORGANISMS THAT YOU WANT ON TOP!

BEFORE YOU DIG IN TO YOUR TASTY SOIL, CHALLENGE YOUR STUDENT TO NAME THE SOIL LAYERS START TO FINISH!

EXTRA:

THE [GEORGIA ASSOCIATION OF CONSERVATION DISTRICTS \(GACD\)](http://www.gacd.us) PARTNERS WITH LOCAL SOIL AND WATER CONSERVATION DISTRICTS TO PROVIDE EDUCATION ON KEEPING OUR SOIL CLEAN AND HEALTHY.

FOR MORE INFORMATION ON GACD AND TO FIND YOUR GEORGIA CONSERVATION DISTRICT PLEASE VISIT: [WWW.GACD.US](http://www.gacd.us)
FOR MORE LESSON PLANS VISIT: [WWW.GACD.US/LESSONPLANS](http://www.gacd.us/lessonplans)

CARROT

Daucus carota



SPICEBUSH SWALLOWTAIL

Papilio troilus

Carrots are veggies that most everyone likes. When carrots are planted in soft soil and have plenty of room to grow, their roots will be crunchy and sweet! Carrots are **biennial** plants, meaning they take two years to complete their life cycle. In the first year of growth, a carrot plant will develop a thick **taproot**, which stores energy for producing a flower stalk and seeds the following year. The tiny white flowers are held in large clusters that attract butterflies like the Spicebush Swallowtail, giving them a platform to balance on as they sip nectar. Most people do not keep carrots in the ground long enough to see their beautiful blooms, because the root becomes tough and is not as sweet as it was in the first year. Though the root of the carrot does not require pollination to develop, we wouldn't have the plant without the seeds that the pollinators help to create!

Growing carrots in your garden also provides food for butterflies (nectar) and caterpillars of the Black Swallowtail, a close relative of the Spicebush Swallowtail, which eat the leaves of carrots, and others in the carrot family (such as parsley, dill, and fennel). Spicebush Swallowtail butterflies mainly pollinate native plants, such as the Cardinal Flower. They can detect the bold red color of Cardinal Flower blooms, as can the Ruby-throated Hummingbird, the most important pollinator of the Cardinal Flower.

Honeyed Carrots

Servings: 4

Estimated Time: 20 minutes

Ingredients:

- 1 pound carrots, any color (about 5), cut diagonally into ¼ inch rounds
- 2 teaspoons butter + 1 tablespoon olive oil
- 1 tablespoon water (more if needed)
- 2 teaspoons apple cider vinegar
- 1-2 tablespoons honey
- 1 tablespoon chopped parsley or mint (1 teaspoon if dried)
- Salt and pepper to taste

Instructions:

1. Heat butter in medium-large skillet.
2. Add carrots and stir to coat with butter.
3. Add salt, water and apple cider vinegar, stir, and cover with a lid to steam the carrots until they are **al dente**, stirring every 5 minutes and adding water if liquid evaporates (you can turn the heat down a bit).
4. Drizzle honey over carrots, and cook uncovered until they start to caramelize and soften to desired tenderness.
5. Remove from heat, sprinkle with black pepper to taste and mix in herbs while still hot.

CARDINAL FLOWER

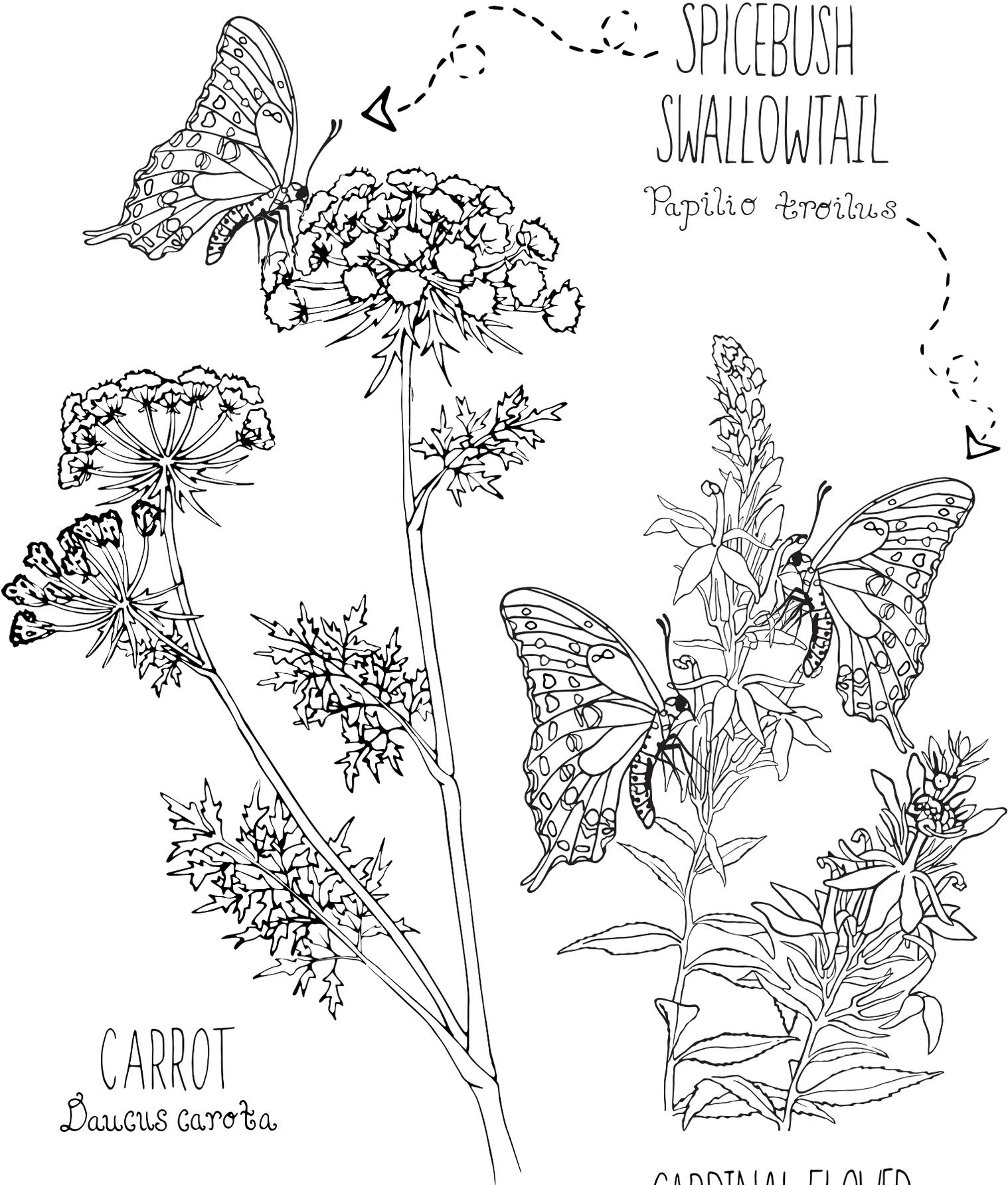
Lobelia cardinalis



Can you find the sweat bee foraging for pollen in these Cardinal Flower blooms?

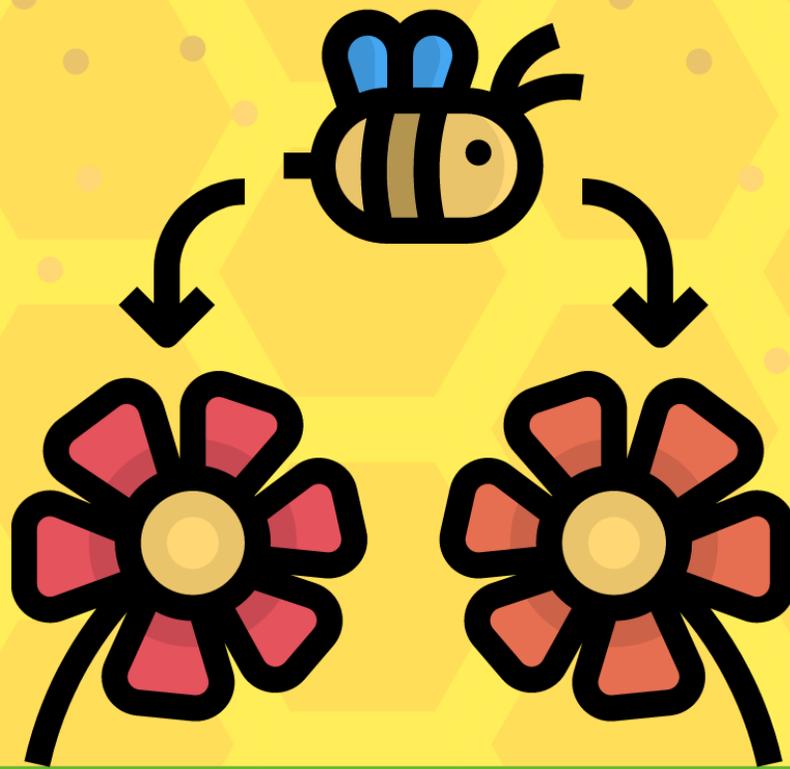
SPICEBUSH
SWALLOWTAIL

Papilio troilus



CARROT
Daucus carota

CARDINAL FLOWER
Lobelia cardinalis



POLLINATOR SEED LOLLIPOPS

What you will need:

- 4 Parts Air Dry Clay
- 1 Part Compost/Soil
- 3 Packs of Native Pollinator Seeds
- Popsicle Sticks
- Glue Gun



Directions:

- Combine four parts of clay and add 1 part of compost/soil in a bowl.
- Once mixed add two packs of seeds to the clay mix and combine.
- When seeds are evenly distributed throughout the clay, pinch a small piece off of the clay mix and roll into a ball then flatten to about a 1/4in round.
- Add hot glue to the popsicle stick and insert the stick inside of the flattened round.
- Lay flat and allow 24 hours to dry.





MAKE YOUR OWN BEE MASK

Instructions:

Materials Needed: colored pencils, scissors, and string

Step 1: Color the mask

Step 2: Cut out the mask along the outside (watch out for the tags on the side!) and eye slots

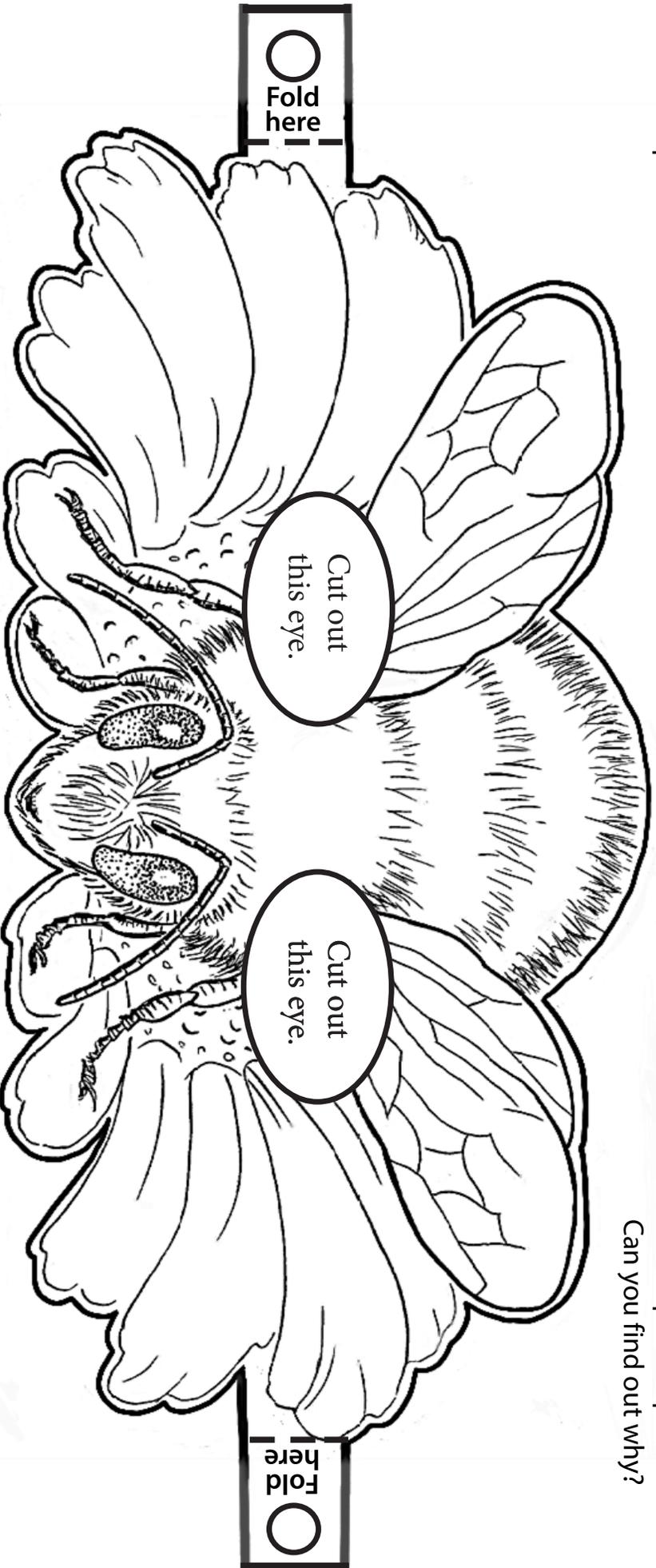
Step 3: Fold the side tags and tie a string through each side

Step 4: Be a Bee!

Help pollinators!

Grow pollinator-friendly flowers.
Protect nest sites and host plants.
Avoid using pesticides.
Spread the word!

Bumble bees have a lot of hair that makes them fuzzy. They have stripes on their body in the colors black, yellow, and sometimes even orange. Bumble bees are important pollinators.
Can you find out why?



Hives and Honey - "Bee" a Beekeeper

Beekeepers have the important job of making sure bees have plenty of food and a good "hive" to live in so the bees continue their work making honey and pollinating fruits and flowers.

If you decide you would someday like to become a beekeeper, there are a few things you will need to get started: a hive (or house) for the bees; bees (buy or collect them from trees and walls); protective clothing (which should be white or tan in color) to keep you from getting stung by the bees; and special tools (to harvest and handle the honey crop). You must keep your hives at least three miles away from other beekeepers' hives. Hives should not be placed near homes or children's play areas. Hives do need to be near fresh water and fruit and pollen sources. The best time to start your bee colonies is in the spring or early summer.

Bee Facts

-  Montana is one of the top 10 honey-producing states in the nation.
-  There are about 200 beekeepers in Montana.
-  Bees raised by at least 36 Montana beekeepers are sent to growers in California, Oregon, Washington, and other states to help pollinate almond, orange, apple, and other crops.
-  Montana beekeepers produced over 9.1 million pounds of honey in 2007 with a value of \$8.6 million!
-  Honeybees visit about 2 million flowers just to make one pound of honey.



All these words have something to do with beekeeping. Find and circle them in the word puzzle.

- NECTAR
- FRUIT
- PRODUCTION
- FLOWERS
- POLLINATE
- BEEKEEPER
- APPLE
- POLLEN
- STUNG
- POUNDS
- MILLION
- HONEY

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



BEE SMART SNACKS

Delicious Pollinated Treats!

Enjoy your pollinator-inspired snacks! Consider pairing the snack portion of this lesson with fun optional educational extensions:

Optional extension 1: Before students are allowed to take/eat a snack, they have to try to name the pollinator that helped bring it to us. (ie. If there is a plate of fig newtons, the student would say “Wasps helped the figs to grow so we can have fig newtons.”)

Optional extension 2: In groups (one group for each snack item), have students create small signs or thank you cards for each snack telling the reader what pollinator(s) made it possible. (ie. “Thanks to the bees that brought us these strawberries.”)

Optional extension 3: Have students create their own recipe and bring in a snack for a potluck pollinator party to celebrate pollinators!

Simple Snacks

- **Honey graham “sandwich”** - honey graham crackers spread with cashew or almond butter topped with dried cranberries and chocolate chips
- **Stuffed tomatoes** - cherry tomatoes cut in half stuffed with cream cheese and chopped chives sprinkled with toasted sesame seeds
- **Simple guacamole** - mash 1 ripe avocado, sprinkle with salt and pepper, squeeze lemon juice and put a dollop on a cucumber slice and top with a piece of roasted red pepper
- **Fruit salad** - cut slices of apples, blueberries, grapefruit, kiwi, melons, orange, peaches, pears, and strawberries to create a healthy snack
- **S’mores** - honey graham crackers, chocolate, and marshmallows

Apiscotti (bee-enabled biscotti)

1/2 C butter

1/2 C sugar

1/4 C honey

3 eggs

1/2 t salt

1 t almond extract

1/ 4 t nutmeg

2 t baking powder

2 1/2 to 3 C flour

1/2 C dried cranberries, chopped

1/2 C dried cherries, chopped

1/2 C blanched sliced almonds, chopped

1. Preheat oven to 350 degrees. Cream sugar and butter together; mix in honey until smooth. Beat eggs until frothy and then add salt, almond extract, nutmeg and baking powder. Combine sugar/butter mixture with egg mixture. Add flour until dough is a consistency that can be handled.

2. Refrigerate dough for one hour or more. Divide chilled dough into three parts and flatten each third into rectangles (use additional flour if needed).

3. Place in a line in the center of each flattened section of dough and fill with chopped cherries, cranberries, and nuts. Fold the sides of each rectangle over to form a loaf with filling in center and seal. Place loaves on greased cookie sheet at 350 degrees for 45 minutes to one hour or until golden brown. Slice on a slant while hot into 1/2 inch slices. For crispier slices, return to oven for 15-20 minutes or until golden-brown (the color of a honey bee).

****Of the 12 ingredients in this recipe, 7 depend on the pollination services of *Apis mellifera* (butter, honey, almond extract, nutmeg, cranberries, cherries, almonds)—hence the name “Apiscotti.” Without *Apis mellifera* (European honey bee), breakfast (and every other meal) would be infinitely less interesting and colorful.**

It's not just honey! We can thank pollinators for giving us many of the ingredients we use to satisfy our sweet tooth. The Pollinator Partnership thanks Dr. May Berenbaum for sharing her original recipe with us.

“I became acutely aware of the plight of pollinators as a result of chairing the National Academy of Sciences study on the status of pollinators a few years ago and have gained a new appreciation in particular of bees and ALL that they do for us, and I've been doing everything I can to raise awareness in the general public ever since....It's not hard to do – honey bees, as you know, contribute on average to about one-third of what we eat and with Apiscotti, I just effortlessly upped the percentage. What was hard to do was to decide which honey bee-related items NOT to include in the recipe—there are so many delicious things that bees bring to our tables!” - May Berenbaum, Ph. D., Professor & Department Head, University of Illinois



Cranberry-Chocolate Tart (10 to 12 servings)

Thank you to *Bon Appetit* magazine for this recipe.

Cranberry Topping

$\frac{1}{2}$ cup cranberry juice, divided
1 teaspoon unflavored gelatin
1 12-ounce bag fresh or frozen cranberries
 $\frac{3}{4}$ cup sugar
2 teaspoons fresh lemon juice
1 teaspoon finely grated lemon peel
1 teaspoon grated peeled fresh ginger
Pinch of salt
4 tablespoons finely chopped crystallized ginger

Pour $\frac{1}{4}$ cup cranberry juice into small bowl; sprinkle gelatin over. Let stand until softened, 15 minutes. Combine $\frac{1}{4}$ cup cranberry juice, cranberries, and next 5 ingredients in medium saucepan; bring to boil, stirring until sugar dissolves. Reduce heat to medium; simmer until cranberries are tender but plump, 5 minutes. Strain into bowl; set cranberries aside. Add gelatin mixture to hot juice in bowl; stir until gelatin dissolves. Stir cranberries back into juice. Chill until cranberry mixture is cold and slightly thickened, at least 8 hours or overnight.

Do Ahead: Can be made 2 days ahead. Cover and chill. Stir chopped crystallized ginger into cranberry mixture.

Crust

1 $\frac{1}{4}$ cups chocolate wafer cookie crumbs (made from about 6 $\frac{1}{2}$ ounces cookies, finely ground in processor)
 $\frac{1}{4}$ cup sugar
 $\frac{1}{8}$ teaspoon salt
5 to 6 tablespoons unsalted butter, melted

Position rack in center of oven and preheat to 350 degrees F. Combine chocolate wafer cookie crumbs, sugar, and salt in medium bowl; add 5 tablespoons melted butter and stir until crumbs feel moist when pressed together with fingertips, adding remaining 1 tablespoon melted butter if mixture is dry. Press crumb mixture firmly onto bottom and up sides of 9-inch-diameter tart pan with removable bottom. Bake chocolate crust until beginning to set and slightly crisp, pressing with spoon if crust puffs during baking, about 14 minutes. Transfer tart pan to rack and cool crust completely before filling.

Marscapone Filling

1 8-ounce container marscapone cheese
 $\frac{1}{2}$ cup powdered sugar
 $\frac{1}{2}$ cup chilled whipping cream
1 teaspoon vanilla extract
Thin strips of crystallized ginger (optional garnish)

Using electric mixer, beat all ingredients except ginger in medium bowl just until thick enough to spread (do not overbeat or mixture may curdle). Spread filling in cooled crust.

Do Ahead: Can be made 1 day ahead. Cover and Chill.

Spoon cranberry mixture evenly over marscapone filling. Chill at least 2 hours and up to 6 hours. Garnish with crystallized ginger strips, if desired. Cut tart into wedges and serve cold.

BUILDING A BEE HOTEL



1. Cut untreated wood to the desired size.
2. Add a roof to the structure. A roof will help to protect the nesting sites from rain.
3. Attach the roof to the structure with a few nails.
4. Select the appropriate drill bit size, from 5/16 to 3/8 of an inch. Holes can be drilled in various sizes.
5. Check the depth of the holes, which should be about the length of most drill bits.
6. Begin drilling the holes. The number of holes depends on the size of the nesting box, but a dozen should suffice for a small nesting box.
7. Gently sand the nesting holes. Splinters can remain after drilling, but removing splinters will make the nesting box more appealing for bees.
8. As desired, paint the sides that do not have holes.
9. The nesting box is ready to be placed in your yard.

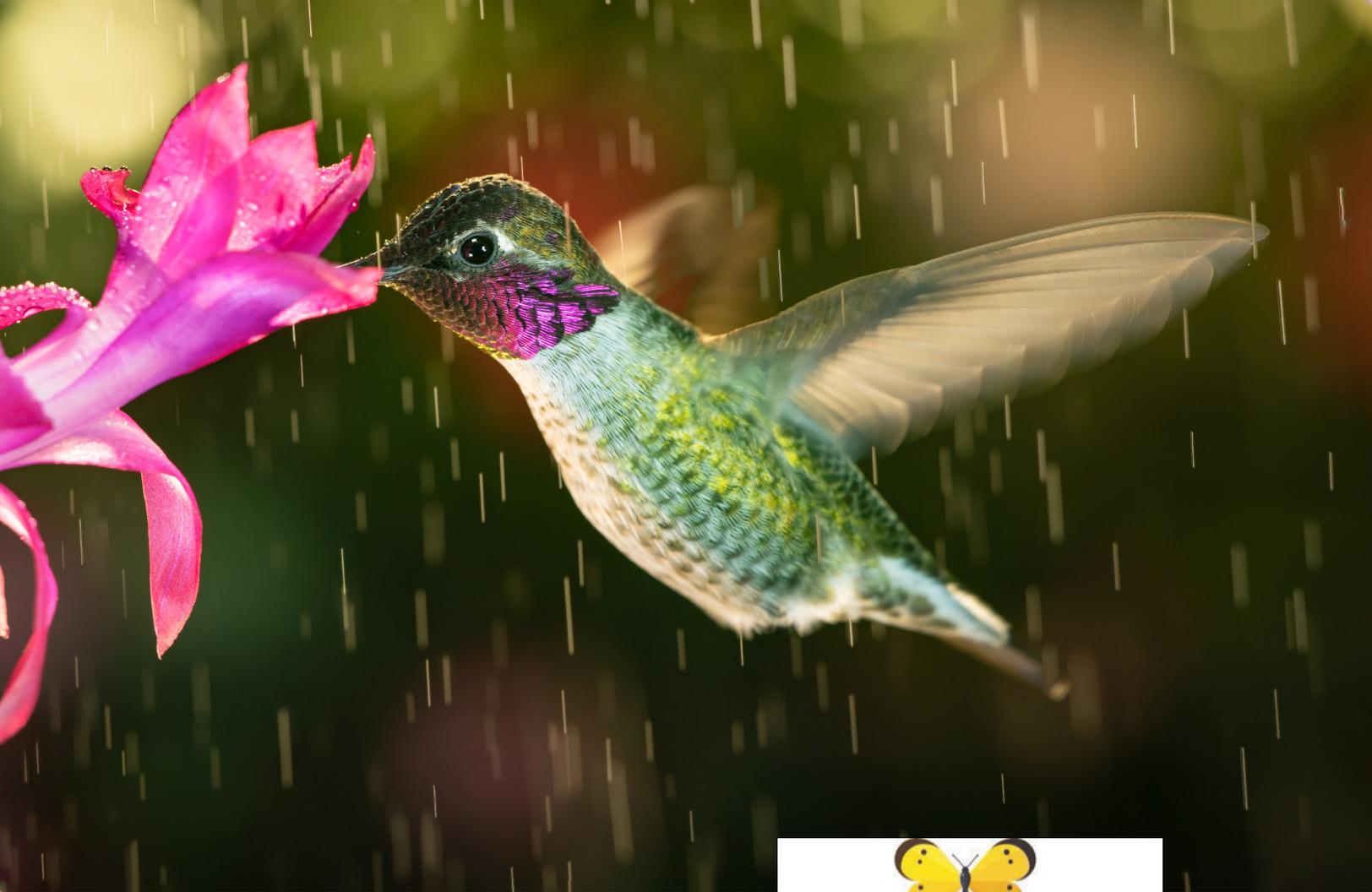
Installing a Bee Hotel

Place bee nesting boxes in the yard during early spring so that they will be available for the first bees of the season to lay eggs. February should be appropriate for most places. Be sure that the boxes are installed at least 3 feet above the ground in a location protected from wind and rain. It is best to install the nesting boxes facing south. Secure the top and bottom of the boxes to a surface like a tree or fence. If the bottom of the box is not secured, it will blow around in the wind. Place multiple nesting boxes throughout your yard to give bees plenty of nesting locations. The bees that use nesting boxes have one generation each year, so do not remove the nesting boxes during the winter. Leave them out and bees will exit the holes in the spring.



Nesting boxes require some maintenance. Pollinators have pesky pathogens and parasites that harm them. Once a box has been in use for a couple of years, the wood will begin to degrade and the pathogens and parasites that find the box can become a problem. Depending on your design, plan to replace nesting boxes or the wood bolts in the boxes every two years.

Once your nesting boxes are installed, it is time to relax and enjoy your pollinator visitors. Keep your eyes open for leafcutter bees and mason bees that will use the holes that you drilled in the wood. Carpenter bees may show up as well, but they will drill their own holes into the wood nesting boxes.



GREAT GEORGIA Pollinator Census

Answers to Frequently Asked Questions:

Can anyone participate? The census is designed for Georgia citizens, of all ages, to participate. School groups, garden groups, families, as well as individuals are encouraged to be a part of the project. This year, during the COVID crisis, we feel most people will be counting at home with their families.

When is the census? This year's census takes place on August 20th and 21st, 2021.

Do I have to be an entomologist to participate? Absolutely NOT! We are asking for only basic insect identification and we will host training prior to the event through this website. You will be asked to categorize the insects you see into these categories:

- Bumble bees
- Carpenter bees
- Honey bees
- Small bees
- Wasps
- Flies
- Butterflies
- Other Insects

How exactly will we do the counts? You will be asked to choose a favorite pollinator plant (a plant from your garden that shows a lot of insect activity) for counting. You should count and identify the insects that land on the flowers of that plant for 15 minutes. A page on this website will be open starting early on August 20th for you to upload your counts.

Can I participate more than once during the two day counting period? Absolutely!

Is this event an appropriate project for schools doing STEM work? Yes, we have lesson plans and ideas for teachers who are teaching virtually as well as ideas for those who are physically in the classroom.

Who do I contact with any questions or for more information? Becky Griffin, of University of Georgia Extension's Urban Ag Center, is the project coordinator. Contact her at beckygri@uga.edu

Want to Learn More?

Go to the Norcross Library and pickup some books! Order online or over the phone with curbside pickup.

6025 Buford Hwy
Norcross, GA 30071
(770) 978-5154

Kid's Books

How to Bee

By: MacDibble, Bren

Flowers

By: Gibbons, Gail

Flower Talk: How Plants Use Color to Communicate

By: Levine, Sara

You Wouldn't Want to Live Without Bees!

By: Woolf, Alex

The Thing about Bee's: A Love Letter

By: Larkin, Shabazz

A Sunflower's Life Cycle

By: Thomson, Ruth

The Honey Bee's Hive: A Thriving City

By: Joyce L. Markovics

The ABC's of Plants

By: Kalman, Bobbie

Science

Protecting Pollinators: How to Save the Creatures That Feed Our World

By: Helmer, Jodi

Our Native Bees: North America's Endangered Pollinators and the Fight to Save Them

By: Embry, Paige

Storey's Guide to Keeping Honey Bees: Honey Production, Pollination, Bee Health

By: Sanford, Malcolm T.

Pollen: Darwin's 130 Year Prediction

By: Pattison, Darcy

Wildlife Heroes: 40 Leading Conservationists and the Animals They Are Committed to Saving

By: Scardina, Julie

Deceptive Beauties: The World of Wild Orchids

By: Ziegler, Christian

Where Have All the Bees Gone?: Pollinators in Crisis

By: Hirsch, Rebecca E

Gardening

Gardening for Butterflies: How You Can Attract and Protect Beautiful, Beneficial Insects

By: Black, Scott Hoffman

Good Bug, Bad Bug: Who's Who, What They Do, and How to Manage Them Organically - All You Need to Know about the Insects in your Garden

By: Walliser, Jessica

Attracting Beneficial Bugs to your Garden: A Natural Approach to Pest Control

By: Walliser, Jessica

Attracting Native Pollinators: Protecting North America's Bees and Butterflies

By: The Xerces Society

How to Grow More Vegetables: (and Fruits, Nuts, Berries, Grains, and Other Crops) Than You Ever Thought Possible on Less Land than You Can Imagine

By: Jeavons, John

The Wildlife-friendly Vegetable Gardener: How to Grow Food in Harmony with Nature

By: Hartung, Tammi

The Fruit Gardener's Bible: A Complete Guide to Growing Fruits and Nuts in the Home Garden

By: Hill, Lewis

Cooking

Eat the Beetles! An Exploration Into Our Conflicted Relationship With Insects

By: Waltner-Toews, David

Online

GCPL's [Daily Distraction](#)

ASU Honey Bee Hive [Virtual Tour](#)

eRead Kids - [Books about Bees](#)

OverDrive for Kids - [Nature](#)

Non-fiction eBooks on [Tumblebooks](#)



Photographed by Eli Miller at the Chattahoochee River National Recreation Area



Register Your At-Home Pollinator Garden

with the City of Norcross to receive your own "Pollinator Friendly Garden" sign and to be highlighted on a City-wide, Pollinator Garden Map. Scan the QR Code below, or visit <https://arcg.is/11GfGn> to complete the registration application!

