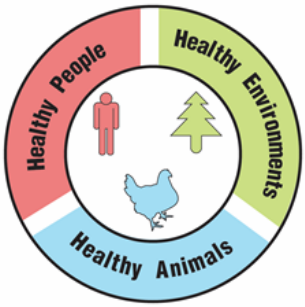
Do Bees Feed You?

Activity Guide



Overview:

Participants will learn what foods rely on pollination. Participants will also learn how they rely on pollinators in their own diets. This activity can be used on its own, or as context for a bee-friendly activity such as a native plant giveaway/planting, insect crafts such as bug hotels/bee baths, pesticide awareness/integrated pest management education, events showcasing local food or honey, and more!

Time Needed:

30-45 minutes. This activity can be adapted for tabling at public events.

Audience:

This activity is recommended for ages 6-adult and for groups of up to 20. It can be adapted for different sized groups and ages.

Objectives: Participants will…

- Classify common foods by pollination method.
- Identify how their own diet relies on pollinators.
- Identify and discuss the importance of pollinators for human food supplies.
- Recognize the connected nature of the health and well-being of humans, animals, and the environment.

Materials:

- ***Draw your favorite meal*** handout (or a piece of paper) for each participant
- Pencils with erasers
- Prepared set(s) of ***Pollination Method Cards***
- *Optional:* Small tokens such as pennies, bingo chips, or erasers
- *Optional:* Markers, crayons, or colored pencils
- *Optional*: Copies of ***How is my Food Pollinated****?* for each participant (recommended for older audiences or as a take-home at public events)

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Preparation:

- Print copies of the ***Draw your favorite meal*** handout (if you are using it).
- Print and cut out the ***Pollination Method Cards***. Print the cards double-sided. Laminating the cards is recommended if you plan to reuse the cards. You can also cover the cards in clear packing tape to increase longevity.
- Review the ***How is my food pollinated?*** handout as background information.
- **Note:** This activity assumes participants have a general understanding of what pollination is and why it is important. You may need to prepare your group with background knowledge about pollination.
- **Adaptation for outdoor education:** If doing this activity outdoors, metal baking sheets and small magnets can be used to keep the cards from blowing away during the sorting.

Optional assessment opportunity:

The ***One Health as a Tool for Informal Assessment*** activity can be easily integrated into this activity to provide an informal assessment opportunity. Check out the "One Health Connection" boxes throughout for related discussion prompts.

Description of Activity and Suggested Procedure:

1. Ask participants to think about their favorite meal. Provide the ***Draw your favorite meal*** handout (or paper) and pencils and ask participants to write a list of the foods or draw pictures of the meal.
    - **If food is a part of your program or setting**, you might ask participants to think about specific foods instead of their favorite meal. For example, if your group has enjoyed a meal or snack together, they can write a list or draw the items in this meal or snack.

    One Health Connection: What do you think might happen to your health if you only ate one type of food?

    - You may wish to support participants with additional supplies for drawing their favorite meals, such as markers, crayons, or colored pencils. If so, make sure to collect those supplies before moving on to Step 3.
    - **Quick variation for public events:** You may want to ask participants to close their eyes and visualize their favorite meal instead of writing or drawing.
2. Remind participants that pollination is needed for plants to make fruits and seeds. Ask participants what they know about pollination and about pollinators and allow a few minutes for sharing responses. If appropriate for your group, you can have this discussion while participants continue working on their drawings. Make sure that everyone understands the parts of a plant, how plants reproduce, what a pollinator is and what

pollination is before moving on to the next step. A diagram of parts of a plant may be helpful; you can find many free printables online.

3. Ask participants which of the food items they think depend on pollinators. Ask them to use a **pencil** to cross out food items on their list/drawing that they think rely on pollinators. Explain that they will be able to change their answers later and encourage them to make their best guess. It is OK if they are not sure. **Optional:** You can also use small tokens (pennies, bingo chips, erasers, etc.), that can be moved around and reused to place over the food items that depend on pollinators.

    - **A note on processed foods:** Participants' favorite meals may include processed foods, and it may be harder to recognize the ingredients. Depending on the age of your group and available time and resources, you may want to support researching the ingredient list. Another strategy is to help participants identify one recognizable ingredient to focus on. For example, is it made of corn or of wheat (flour)? Is there a recognizable flavor, such as chocolate, cheese, or fruit? Is it sweet (does it contain sugar)?

4. Pass out the ***Pollination Method Cards***. Ask participants to sort the cards into two piles: foods that depend on pollinators and foods that do not depend on pollinators.

    You can work as a group (**recommended for younger audiences**) by giving each participant a card to sort and by each person calling out the food listed on their card and having participants vote by giving a "thumbs up" if they think the food depends on pollinators or a "thumbs down" if they do not.

    One Health Connection: What do you notice about the types of foods that depend on pollinators? Are those foods easier or harder to find? Are they more or less expensive?

    Note: Ensure that participants do **not** flip over the cards.

    - **To incorporate physical movement**: If your space allows and you are working as a group, the facilitator can read out the food on each card and have participants move to a designated area (such as a corner of the room, either side of a line, or a specific landmark) based on whether they think the food depends on pollinators or not.
    - **For younger audiences**, instead of passing out the cards, the facilitator can read out the food on each card and have participants vote by giving a thumbs up if they think the food depends on pollinators or a thumbs down if they do not.
    - **Adaptation for larger groups:** Divide your group into several smaller groups of about 5 participants. Prepare one set of the ***Pollination Method Cards*** for each small group. Have participants work together in their small groups to sort the cards.
    - **Quick variation for public events:** Set the ***Pollination Method Cards*** out on a table (or another flat surface). Have designated spaces for cards that depend on pollinators and those that do not, such as small containers labeled with "Depend on

pollinators" and "Do not depend on pollinators". Ask participants to sort some or all of the cards, based on interest. Mix up the cards again in between participants.

5. If time permits, discuss the information in this list below with your participants. Some of the information may be surprising to participants!

   - **Animals** such as cows and pigs depend on pollinators for the feed crops that they eat (such as alfalfa). Therefore, **dairy products** and **meat** depend on pollinators.
   - Products made from **wheat**, **rice**, and **corn** do not depend on pollinators. These crops are wind pollinated.

   One Health Connection: How might wild animals depend on pollinators? What about plants? Do they need pollinators? What would happen to ecosystems without pollinators?

   - **Root vegetable plants** (such as carrots, potatoes and onions) and **leafy green vegetable plants** (such as lettuce, cabbage, and kale) produce the part of the plant that we eat without pollination. However, pollination may be required to produce seeds to grow additional plants. Facilitators may want to support both "depend on pollinators" and "don't depend on pollinators" answers for these types of foods and encourage participants to discuss their answers.

6. Ask participants to use what they learned to revise their food lists or drawings. For example: "Are there additional food items that should be crossed out?" and "Did you cross out any food items that don't depend on pollinators?" Have participants make any necessary updates to their list or drawing. **Remember**, the goal of this activity is for participants to understand that many foods rely on pollinators; it is OK if their responses are not exactly correct.

   One Health Connection: Do people living in different places have access to the same types of foods? What foods are available where you live?

   - **For younger participants,** you may want to combine Steps 4-6. Participants can cross off food items that DO depend on pollinators and circle foods that DO NOT depend on pollinators as you go through the cards.

7. **Wrap-up**: As an "exit ticket" or closing discussion prompt, ask participants what food they were surprised to learn did or did not rely on pollination.

8. **Optional:** Send participants home with the ***How is my food pollinated?*** handout.

Looking for more ideas?

- Consider having some local, bee-pollinated produce or local honey available for participants to taste!
- Learn about the food system and meet some of the bees that feed us with the ***Meet the Billion Dollar Bees*** activity.
- Explore the role of bees in the ecosystem with the ***Bees and Biodiversity*** activity.
- Experience the ups and downs of life as a bee by playing the game ***A Bee's Life***.
- Deepen your understanding of how bees are important for the health of humans, animals, and the environment with ***The One Health Approach: An Activity Tool***.

Do bees feed you?

Draw your favorite meal:

Pollination Method Cards

Print the following 6 pages double-sided and then cut to make 24 cards.

Berries

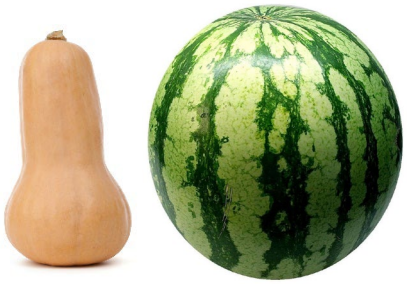
Fruit

Sugar

Root Vegetables

Chocolate

Beans

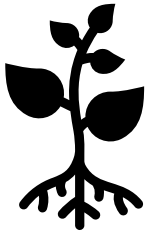


Squash and Melons

Broccoli

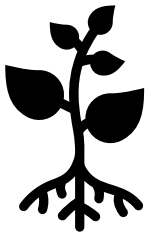
Fruit trees like apples and oranges are pollinated by **bees**. Wild bananas are pollinated by **bats**!

Berry plants are pollinated by **bees** and other **insects**.



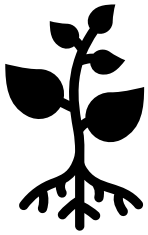
We eat the **root** of plants like carrots, potatoes, and onions. Plants can make roots without pollination.

Sugarcane is pollinated by **bees** and small insects called **thrips**.



Bean flowers **self-pollinate**. They don’t need help from pollinators.

Cacao plants are pollinated by **bees** and small flies called **midges**.

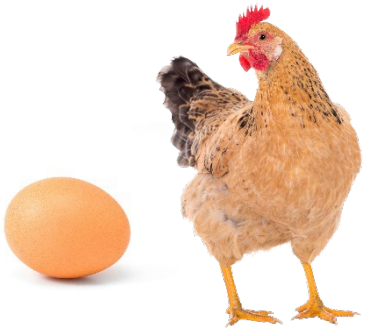


We eat the **flower** of the broccoli plant. Plants can make flowers without pollination.

Squash and melon plants are pollinated by **bees**. There are **squash bees** that specialize in squash plants!

Beef

Coffee



Chicken/Egg

Dairy

Rice

Corn

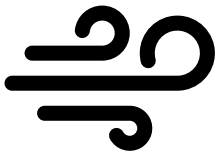
Wheat

Leafy Greens

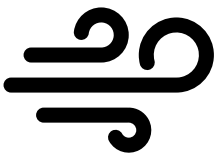
Coffee plants are pollinated by **bees** and **flies**.

Cows eat alfalfa. Alfalfa is pollinated by **bees**. The alfalfa leafcutting bee specializes in pollinating alfalfa!

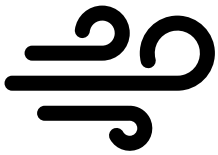
Dairy products come from animals like cows that eat alfalfa. Alfalfa is pollinated by **bees**.



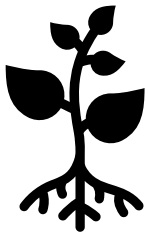
Chickens eat things like corn, wheat, and soybeans. These are pollinated by the **wind**.



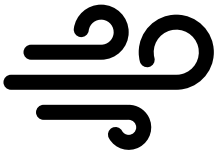
Corn is pollinated by the **wind**.



Rice is pollinated by the **wind**.



We eat the **leaves** of plants like lettuce, spinach, and kale. Plants can make leaves without pollination.



Wheat is pollinated by the **wind**.

Tomatoes

Peppers

Mushrooms

Eggplant

Walnuts, Pecans, Pistachios and Hazelnuts

Almonds, Cashews and Macadamia Nuts

Peanuts

Seafood

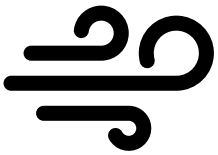
Peppers are pollinated by **bees**.

Tomatoes are pollinated by **bees**.

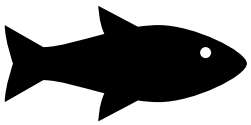
Eggplants are pollinated by **bees**.

Mushrooms are a **fungus**, not a plant. Fungi do not need pollinators.

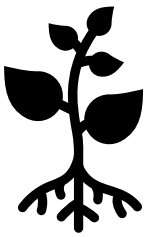
A few tree nuts, like almonds, cashews and macadamia nuts, are pollinated by **bees**.



Many tree nuts, like walnuts, pecans, pistachios and hazelnuts, are pollinated by the **wind**.



Seafood does not need pollinators. Seaweed is a type of **algae**, not a plant. Algae do not need pollinators.



Peanut flowers **self-pollinate**. They don’t need help from pollinators.

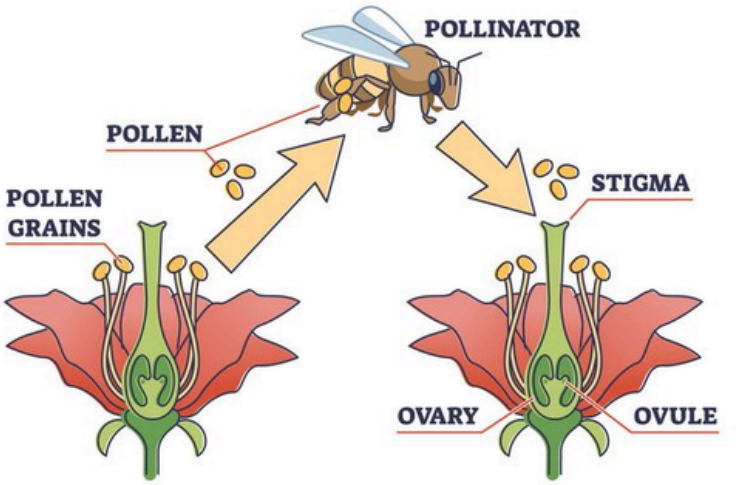
How is my food pollinated?

Pollination is the movement of pollen from the anther to the stigma of a flower.

Once a flower has been pollinated, it can produce seeds and fruit.

Some plants need animals to move pollen from flower to flower. These animals are called **pollinators**.

Without help from these pollinators, many plants could not make the fruits and seeds that people and wildlife eat.



About **80%** of flowering plant species rely on pollinators to make seeds. This includes many plants that we don't eat, and many that we do. About **30%, or one out of three**, crops depend on pollinators.

Some plants, like beans, can **pollinate themselves**.

Plants like wheat, rice, and corn are **pollinated by the wind**.

For some foods, we eat the leaf, stem, or flower of the plant. Plants can make these parts without pollination. **However, plants still need pollinators to make fruits and seeds to grow new plants**.

Carrots are **roots**

Celery is a **stem**

Broccoli is a **flower**

Spinach is a **leaf**

Pollinators also pollinate crops that are used to feed farm animals.

Alfalfa (hay) is pollinated by bees. Cows eat alfalfa, and cows produce milk, dairy products (such as cheese and butter), and meat. **Up to 60,000 bees are needed to pollinate 1 acre of alfalfa!**

More about pollinators

Pollinators aren't just important for human food supplies. Many wild animals also eat food that depends on pollinators, such as nuts, berries, and other plants. The lifecycle of many different plants in many ecosystems depends on pollinators.

There are many types of pollinators, and some are better at pollinating certain types of plants (called "**specialists**").

For example, honey bees can't pollinate tomatoes, but bumble bees can! Plants like tomatoes have tightly packed pollen. Bumble bees can vibrate their wings at a frequency that knocks the pollen loose, called "**buzz pollination**."

Bumble bee species are important native pollinators in the United States

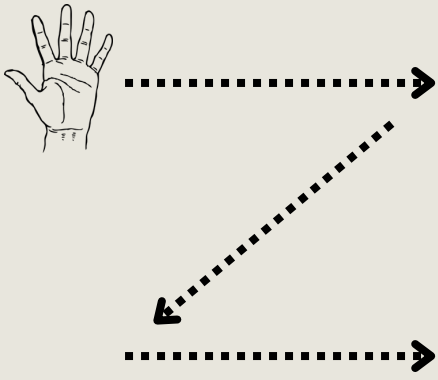
The European honey bee is the most common domesticated bee used for crop pollination. Native to Europe, they are found on every continent but Antarctica.

Bees, wasps, bats, butterflies, beetles, and more can all be pollinators. The cacao plant, which makes chocolate, is pollinated by flies called midges!

Bees, specifically honey bees, are the most common pollinator.

Plants like ferns and mosses grow from spores instead of seeds. Plants that don't flower don't make seeds and don't need pollinators.

To make enough food to feed everyone, farmers sometimes rent bees (usually honey bees). The rented bee hives are moved on trucks across the country—to California for almond tree pollination, to Florida to pollinate orange trees, and to the Northeast to pollinate many different fruits and vegetables.



Bee safety tip:

The next time you see a bee buzzing around, remember it may be carrying pollen from one flower to another! Stay calm and still, and the bee will likely pass you by. If you want to help it along faster, slowly move your hand in a large "Z" shape in front of you. The breeze will encourage the bee to continue on.