Explore the Bees of Oregon and how they help make our food
## Table of Contents

What Bees Do for Us ..................................................... 1
What Bees Do for Oregon Crops ............................. 2
Pollination: How Does It Work? .......................... 3
**Recipe:** Three Sisters Soup ........................................ 4
Pollination in Action ............................................... 5
Fruits vs Vegetables: What’s the Difference? ........ 6
All About Seeds ..................................................... 7
**Recipe:** Cherry Crumble ............................................. 8
**Mason Bees,** Genus: *Osmia* ...................................... 9
**Recipe:** Garden Herbal Tea ................................... 10
**Green Metallic Sweat Bees,** Genus: *Agapostemon* .......... 11
**Recipe:** Tasty Hamburger Skillet ......................... 12
**Leafcutter Bees,** Genus: *Megachile* ..................... 13
**Recipe:** Baked Tomatoes with Cheese .................. 14
**Bumble Bees,** Genus: *Bombus* .............................. 15
**Recipe:** Cranberry Oatmeal Balls ....................... 16
**Long-Horned Bees,** Genus: *Melissodes* ................. 17
**Recipe:** Healthy Carrot Cake Cookies ................... 18
**Honey Bees,** Genus: *Apis* ....................................... 19
**Cuckoo Bees,** Genus: *Nomada* ............................. 20
Wild Bees’ Nests .................................................. 21
Solitary Bees ...................................................... 22
Social Bees ........................................................ 23
Managed Bees of Oregon and Where They Live .... 24
Alkali Bee Nests .................................................... 25
What You Can Do for Bees .................................... 26
Bee Word Search .................................................. 27
Fun Facts About Bees and How to Watch Them Safely .... 28
In the Field with Bees: A Bee-Watching Worksheet .... 29
Parts of a Bee ........................................................ 30
Draw a Bee, Its Nest and a Flower to Pollinate ........ 31

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- download this book or view it as a digital flipbook.
- view short and fun video lessons connected to this book.
- color in the pages online, digitally!
- connect with the Oregon Bee Project and Food Hero social media pages.
- sign up for Grow This! to receive an email each month with garden tips and more.

We would love to hear from you!
Email us at [food.hero.@oregonstate.edu](mailto:food.hero.@oregonstate.edu).

Want to help us make more books like this one? Go to [www.foodhero.org/bees](http://www.foodhero.org/bees) and take our survey. Your feedback will help us decide what kinds of new projects to create to help kids learn about food, farms, and gardens!
Next time you take a bite out of an apple, or eat a tasty berry, thank a bee! Bees are a very important group of insects that help make some of our favorite foods. How do they do this? Through a process called pollination. Bees pollinate many different crops, including types of fruits, vegetables, grains, nuts and seeds. Many of these crops are grown in the state of Oregon, and Oregon bees pollinate them. Some crops in other states rely on Oregon bees, too! Every year, beekeepers from Oregon bring their bees to other states to help pollinate their crops. For instance, they bring honey-bee hives to California to pollinate the almonds that are grown there.

In Oregon, there are over 600 different types of bees. In this book, you will get to know some of these bees and learn why they are so important to farmers in Oregon, across the United States, and around the world.

Some of the many foods that bees help put on our table.
Bees pollinate many important crops in Oregon. This map of Oregon can give you an idea of the types of crops statewide that bees help produce. Use the legend below to connect each crop with the counties where it most often grows.

**Map Legend**
- Alfalfa seed
- Apples
- Beef
- Blackberries
- Blueberries
- Carrot seed
- Caneberries
- Cherries
- Clover seed
- Chickens/eggs
- Cranberries
- Crimson clover seed
- Dairy
- Meadowfoam
- Mustard seed
- Onions
- Peaches
- Pears
- Pumpkins
- Sheep
- Vegetable/flower seed
- Watermelon

**Crops Pollinated by Managed Oregon Bees**

Adapted from the Oregon Agriculture in the Classroom Foundation’s Grown in Oregon map.
Bees visit flowers to collect **pollen** and **nectar** to feed themselves and their **offspring** (babies).

**Pollen** is a powdery dust that forms on the **anthers** of flowers. Pollen provides bees with nutrients, including all the protein they need to feed their offspring. Pollen also helps plants make the seeds that grow into fruits we like to eat. Bees collect pollen in a process called **foraging**. When bees forage, the fuzzy hairs on their bodies help them pick up tiny grains of pollen. As bees travel from flower to flower, some of the pollen they’ve been collecting is left behind. If the pollen from one flower makes it to the **stigma** (a special pollen-catching platform) of another flower of the same type, and conditions are just right, the flower is **fertilized**. This process is called **pollination**. The flower then starts making seeds. Seeds are one of the ways that plants make more plants (reproduce).

**Nectar** is a sweet liquid that is most often produced at the base of flowers. Nectar provides bees with all the daily calories they need to fly around and look for pollen.

**Parts of a Flower**
What are first foods? First foods are traditional foods eaten by Indigenous Americans. Some important first foods include: squash, corn, beans, pumpkins, sunflowers, wild rice, sweet potatoes, tomatoes, peppers, cranberries, blueberries, salmon and turkey. Many first foods rely on wild bees like the squash bee to reproduce. Enjoy this Food Hero recipe, which includes some first foods.

**Ingredients**

- 1 1/2 Tablespoons vegetable oil
- 3/4 cup diced carrot
- 1 cup chopped onion
- 1 teaspoon garlic powder or 4 cloves garlic, minced
- 2 cups diced summer or winter squash (fresh or frozen)
- 1 1/2 cups corn (fresh or frozen) or a 15-oz can (drained and rinsed)
- 1 1/2 cups cooked beans (any type) or a 15-oz can (drained and rinsed)
- 1 can (15 ounces) diced tomatoes or 2 cups diced fresh
- 3 1/2 cups low sodium broth (any type)
- 1 teaspoon cumin
- 1/4 teaspoon pepper

**Directions**

1. Wash hands with soap and water.
2. Heat oil in a large pan on medium heat. Add carrot and onion and sauté until onions have begun to turn slightly brown, about 8 to 10 minutes.
3. Add garlic, squash and corn and continue to stir for another 3 to 4 minutes.
4. Add beans, tomatoes, broth, cumin and pepper.
5. Allow soup to come to a boil and then turn heat down to a simmer until all vegetables are tender (15 to 30 minutes, depending on the vegetables used).
6. Refrigerate leftovers within 2 hours.

Thanks to the Food Hero Indigenous Peoples work group for this recipe.

**Nutrition Facts**

- Makes 8 cups
- Prep time: 15 minutes
- Cook time: 30 minutes

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*The % Daily Value (%DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.
Squash bees are medium-sized, fuzzy bees that feed only on the nectar and pollen of squash plants. Squash bees have a close link to Indigenous Peoples, who brought squash-growing to what is now North America from what is now Central and South America around 5,000 years ago. The bees followed Indigenous Peoples as they traveled north, planting squash as they moved. Indigenous Peoples and European colonizers for many years never grew enough squash in the Pacific Northwest (Idaho, Oregon and Washington) to attract the bee, so the squash bee had never been spotted in Oregon. In 2017, kids at a summer camp in Ashland spotted the squash bee in a garden for the first time. See if you can find this bee in your community!

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**The Pollination of a Squash Plant**

Follow this species of squash bee, *Peponapis pruinosa*, as it pollinates a squash flower.

1. A female squash bee collects pollen from an anther on a squash flower to feed her offspring.

2. The bee travels to another squash plant nearby.

3. Pollen collected from the first flower falls on the stigma of the second flower.

4. When conditions are just right, the squash plant starts growing a squash with seeds inside.

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**The Story of Squash and Squash Bees in Oregon**

Squash bees are medium-sized, fuzzy bees that feed only on the nectar and pollen of squash plants. Squash bees have a close link to Indigenous Peoples, who brought squash-growing to what is now North America from what is now Central and South America around 5,000 years ago. The bees followed Indigenous Peoples as they traveled north, planting squash as they moved. Indigenous Peoples and European colonizers for many years never grew enough squash in the Pacific Northwest (Idaho, Oregon and Washington) to attract the bee, so the squash bee had never been spotted in Oregon. In 2017, kids at a summer camp in Ashland spotted the squash bee in a garden for the first time. See if you can find this bee in your community!
Fruits and vegetables are plant parts that are good to eat. Vegetables include roots, leaves, stems, and even flower buds (see image below). Examples of vegetables are lettuce, potatoes and broccoli.

Fruits all start as flowers. After the flowers of some plants have been pollinated, the flower then grows around the seed and forms a fruit. Examples of fruit include apples, cherries, and squash. In nature, fruit helps plants spread their seeds for miles: animals come to the plant to eat the tasty fruit and then spread its seeds in their poop.

Some fruits, such as tomatoes, green beans, peppers, avocados, and squashes, also get called vegetables. We call them vegetables in cooking and nutrition because they are more similar to other vegetables than fruits when it comes to how they taste and the nutrients they provide.

**The Parts of a Plant**

Did you know that when you eat broccoli you are eating the plant’s little immature flower buds? Heads of broccoli are made up of many little flowers that have yet to open. Broccoli is botanically and nutritionally a vegetable, and people enjoy eating its stem and flowers.

**The Part of an Apple Flower that Turns into a Fruit**

Also called string beans, green beans are green, fleshy pods that grow around the seeds of a bean plant. Most people think of green beans as a vegetable; however, they are botanically a fruit.
A seed contains everything that is needed for a plant to grow except water, healthy soil, air and sunshine. Bees help make seeds. In return, seeds grow into plants that make pollen.

**Did you know that strawberries have their seeds on the outside?**
A strawberry flower is made of many tiny flowers fused into one big flower. The little dots on the surface of a strawberry are the seeds of each flower.

**How come some fruits don’t have seeds?**
There are two main reasons: Some fruits, like seedless watermelons, have been bred to produce as few tiny seeds as possible. Other plants, like pears, are able to produce fruit without being pollinated. When this happens, the resulting fruit won’t have any seeds.

**How big are seeds?**
Seeds come in all shapes and sizes. Avocados have one large seed.

**Can you think of some other seeds we can eat?**
How about sesame and sunflower seeds? Seeds are packed with nutrients our bodies can use because they have those nutrients stored inside them to grow into a plant!

Sunflowers are a plant with seeds we can eat.
Cherries bloom in early spring when the weather can still be cold and frosty. Mason bees do some of their best work pollinating cherry trees while most other bees are still sleeping in their warm nests. Think of mason bees hard at work while you enjoy this gooey, cherry-packed Food Hero recipe!

**Ingredients**

1/4 cup sugar  
1 Tablespoon cornstarch  
4 cups pitted tart cherries (fresh, frozen, or canned and drained)  
1/2 teaspoon vanilla  
1/3 cup whole-wheat flour  
1/3 cup old fashioned rolled oats  
2 Tablespoons packed brown sugar  
2 Tablespoons margarine or butter, melted

**Directions**

1. Preheat oven to 350 degrees F.  
2. In a large bowl, mix together the sugar and cornstarch. Add the cherries and vanilla and mix well.  
3. Pour the fruit into an 8x8-inch baking dish.  
4. In a medium bowl, mix together the flour, oats and brown sugar. Add the melted butter and stir until the texture is coarse with some clumps. Sprinkle the oat topping over the fruit.  
5. Bake for 30 to 45 minutes, or until the juices are bubbling and the oat topping is golden brown.  
6. Refrigerate leftovers within 2 hours.

**Notes**

- No tart cherries? Use sweet cherries (or another fruit such as blueberries or chopped apricots, peaches or plums) and reduce the sugar added to the fruit in step two to 1 or 2 Tablespoons.
Mason bees belong to the genus *Osmia* (pronounced OZ-me-a). Some are pollinators of almonds, apples, blueberries, raspberries, and cherries, as well as many wild plants. They are called mason bees because they use mud or clay to build their nests, just like a mason, who uses bricks and mortar to build homes and other buildings. They are small to medium-sized bees that are colored in bright metallic blues and greens and sometimes black. In Oregon, they are most often used to pollinate cherries. They work quickly: In the same amount of time, one female mason bee can pollinate three times as many flowers as a single honey bee.

Next time you eat a cherry, thank a mason bee!
Garden Herbal Tea

The flowers of many common herbs, such as rosemary, thyme, basil and mint, provide great food for bees like the sweat bee. They also help make our food taste better!

A simple way to enjoy fresh herbs is by making tea.

**Ingredients**

1 to 2 Tablespoons dried or 2 to 4 Tablespoons fresh herbs (see Notes)

boiling water

**Directions**

1. Wash hands with soap and water.
2. Place herbs at the bottom of a drinking cup or mug.
3. Fill the cup with water to cover the herbs. Let sit for 10 minutes. This is called "steeping."
4. Strain the herbs from the water (see Notes) and enjoy the tea warm or cold.
5. Refrigerate leftovers within 2 hours.

**Notes**

- Ideas for tea ingredients:
  - Leaves: basil, bee balm, cilantro, lemon balm, lemon verbena, lavender, lemon grass, mint (any type), parsley, rosemary, sage, stevia, thyme
  - Flowers: calendula, chamomile, echinacea, hibiscus, lavender, rose (petals and hips), yarrow
  - Seeds: cardamom, coriander, fennel (grind or chop first)
  - Roots: chicory, ginger (chopped)
  - Fruit: fresh berries (any type), fresh or dried citrus peel (any type)
- Try blending ingredients, such as lemon balm and mint. Have fun trying new blends.
- Ways to strain tea: put ingredients into a tea strainer or any strainer that fits into your cup, such as a coffee filter, paper towel or empty tea bag, or pour steeped tea through a strainer into a clean cup.
- For a stronger or lighter flavor, try different amounts of ingredients and steeping time.
- Use only tea ingredients that you know are safe to consume.
- Try growing your own plants for tea, in the ground or in pots.

**Nutrition Facts**

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Vitamin A: 0mcg (0%)
Vitamin C: 0mg (0%)
Vitamin D: 0mcg (0%)
Calcium: 0mg (0%)
Iron: 0mg (0%)
Potassium: 0mg (0%)

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Makes 1 cup of tea
Prep time: 10-15 minutes

Green Metallic Sweat Bee and Mint Photo: US Department of Agriculture

This material was funded by USDA’s Supplemental Nutrition Assistance Program - SNAP. For information on nutrition assistance through Oregon SNAP, contact Oregon SafeNet at 211. USDA is an equal opportunity provider and employer.
Green metallic sweat bees belong to the genus *Agapostemon* (pronounced a-ga-POSS-ta-mon). They pollinate the flowers of many cultivated plants (plants grown on purpose) as well as many wildflowers. Sweat bees get their name from the fact that they collect salt by licking the sweat of mammals. They are medium-sized and have a bright metallic green color. These bees love open and flat-shaped flowers such as daisies, dandelions, wild roses, and blackberry and apple flowers. They love purple asters, a plant grown by many Oregon nurseries (places where plants are grown on purpose).
Many farmers and ranchers feed their livestock alfalfa hay. It’s loaded with nutrients like protein, vitamins and minerals that help the animals produce high-quality meat and dairy products. Oregon leafcutter bees help produce the alfalfa seed that these farms rely on. Think about all the hard work of leafcutter bees when you enjoy this Food Hero recipe.

**Ingredients**

1 pound lean **ground beef** (15% fat)
1/3 cup chopped **onion** (1/3 medium onion)
1/3 cup chopped **green pepper**
2 cups **water**
1 cup long grain **white rice**
1 teaspoon **garlic powder** or 4 cloves of garlic
1 Tablespoon **chili powder**
1/4 teaspoon **salt**
1/4 teaspoon ground **pepper**
1 can (15 ounces) **diced tomatoes**, with juice
1 1/2 cups **corn** (canned and drained, frozen, or fresh cooked)
1 can (15 ounces) **red kidney beans**, drained and rinsed
1/2 cup grated **cheddar cheese**

**Directions**

1. Cook ground beef, onion and green pepper in a large skillet over medium heat (300 degrees F in an electric skillet) until the hamburger is no longer pink. Drain excess fat from pan.
2. Add water, rice, garlic powder, chili powder, salt, pepper, tomatoes with juice, corn and beans.
3. Cook covered, for about 20 minutes or until rice is soft.
4. Remove from stove top, sprinkle with grated cheese, and serve hot.
5. Refrigerate leftovers within 2 hours.

**Notes**

- Garnish this dish with a Tablespoon of low-fat sour cream.
- Boost the flavor with: green chilis, jalapeños, more garlic, or other seasonings.

**Nutrition Facts**

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*The % Daily Value (%DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Makes 9 cups
Prep time: 10 minutes
Cook time: 30 minutes
Leafcutter bees, which belong to the genus *Megachile* (pronounced mega-KY-lee), are pollinators of alfalfa and many wild plants. They are called leafcutter bees because they cut out small pieces of leaves to use to build their nests. Leafcutter bees are darkly colored, small to medium-sized bees. In Oregon, they are important pollinators of alfalfa grown for seed. Farmers buy the seed to grow alfalfa plants, which are fed to cows and other livestock (animals raised on a farm) that give us milk and meat.

**Field Notes:**

Leafcutter bees and mason bees belong to a family of bees called Megachilidae (Meg-a-kill-E-de), meaning “large jaw,” referring to their large mandibles that act like teeth.

The next time you eat beef, thank a leafcutter bee!
Baked Tomatoes with Cheese

Bumble bees not only help produce cheese, but also pollinate many crops grown in greenhouses, such as tomatoes and peppers. Enjoy bumble bees' hard work with this Food Hero recipe.

**Ingredients**

- 2 large tomatoes, cut into 1-inch thick slices
- 1/3 cup shredded cheese (any type)
- 1 teaspoon oregano
- 1/4 teaspoon salt
- 1/4 teaspoon pepper
- 1/4 teaspoon garlic powder or 1 clove of garlic, minced

**Directions**

1. Wash hands with soap and water.
2. Preheat oven to 400 degrees F.
3. Lightly grease a shallow baking dish and place the tomato slices in a single layer on the bottom of the dish.
4. In a small bowl, combine the rest of the ingredients. Sprinkle the mixture over the tomatoes.
5. Bake 5 to 10 minutes, or until the cheese turns golden brown and starts to bubble. Serve warm.
6. Refrigerate leftovers within 2 hours.

**Notes**

- Try parmesan, Swiss or cheddar cheese.
- Try other herbs, such as basil or dill.

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*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Makes 8 1-inch slices
Prep time: 5 minutes
Cook time: 10 minutes
Bumble bees belong to the genus *Bombus* (pronounced BOM-bus). They are important pollinators of many wild and agricultural plants (plants grown by farmers). Some of the crops they pollinate include cranberries and other berries, apples, tomatoes, peppers, and squash. They are large and fuzzy bees, and their bodies are most often colored with a mixture of black, yellow, orange, brown, or white. In Oregon, they are important pollinators of red clover. Oregon is one of the largest growers of clover seed in the world. Farmers buy the seed to grow clover plants, which are fed to cows and other livestock (animals raised on a farm) that give us milk and meat.

Field Notes:

Bumble bees belong to the genus *Bombus* (pronounced BOM-bus). They are important pollinators of many wild and agricultural plants (plants grown by farmers). Some of the crops they pollinate include cranberries and other berries, apples, tomatoes, peppers and squash. They are large and fuzzy bees, and their bodies are most often colored with a mixture of black, yellow, orange, brown or white. In Oregon they are important pollinators of red clover. Oregon is one of the largest growers of clover seed in the world. Farmers buy the seed to grow clover plants, which are fed to cows and other livestock (animals raised on a farm) that give us milk and meat.

Field Notes:

Next time you eat some cheese, thank a bumble bee!
Cranberry Oatmeal Balls

Ingredients
1 cup oats (quick-cooking or old fashioned rolled)
1/3 cup sunflower seeds
1/3 cup peanut butter
3 Tablespoons honey (see Notes)
1/3 cup dried cranberries

Instructions
1. Wash hands with soap and water.
2. In a medium bowl, combine all ingredients until well mixed.
3. Form mixture into 18 balls about 1-inch wide.
4. Place balls on a baking sheet. Refrigerate for 30 minutes.

Notes
• Honey is not recommended for children under 1 year old.
• To avoid sticky fingers, keep the oatmeal balls cool until ready to eat.
• Use sunflower seed butter or other nut butters instead of peanut butter.

Makes 16 balls
Prep time: 15 minutes
Chill time: 30 minutes

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*The % Daily Value (%DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.
Long-horned bees belong to the genus *Melissodes* (pronounced mel-eh-soh-dees). They are beautiful medium-sized bees that are very fuzzy. They are dark colored with yellow, black, or white hairs. Males have long antennae (horns) like the bee shown. Females have large, brush-like hairs on their back legs that they use to carry pollen. Bees in the genus *Melissodes* only visit plants in the sunflower family. Planting sunflowers in your community, and watching the blooms, is the best way to find these bees in Oregon.

Field Notes: Only female bees collect pollen. Male bees of all species lack structures to carry pollen: corbicula, and scopa (hair) on legs and abdomen.

This picture is of a male long-horned bee (you can tell because of the long antennae). Did you also notice that it’s missing hair (scopa) on its back legs?

The next time you eat a sunflower seed, thank a long-horned bee!
Much of the carrot seed used to grow carrots across the United States comes from Jefferson County, Oregon. Enjoy this tasty cookie recipe thinking about the honey bees of Oregon!

**Ingredients**

1/2 cup packed brown sugar
1/2 cup sugar
1/2 cup vegetable oil
1/2 cup unsweetened applesauce or fruit puree
2 eggs
1 teaspoon vanilla
1 cup all-purpose flour
1 cup whole-wheat flour
1 teaspoon baking soda
1 teaspoon baking powder
1/4 teaspoon salt
1 teaspoon cinnamon
1/2 teaspoon nutmeg
1/2 teaspoon ground ginger
2 cups old fashioned rolled oats
1 1/2 cups finely grated carrot (about 3 large carrots)
1 cup raisins (or any type of dried fruit)

**Directions**

1. Wash hands with soap and water.
2. Preheat oven to 350 degrees F. Lightly grease a baking sheet.
3. In a large bowl, stir together the sugars, oil, applesauce, eggs and vanilla. Mix well.
4. In a separate bowl, stir together the dry ingredients.
5. Blend the dry ingredients into the wet mixture. Stir in the carrots and raisins.
6. Drop the dough by teaspoon onto the baking sheet.
7. Bake 12 to 15 minutes until golden brown.
8. Store in an airtight container.

**Nutrition Facts**

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*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.
Honey bees, which belong to the genus *Apis* (pronounced AY-pis), are pollinators of agricultural crops worldwide. That’s because 1) they pollinate many different types of plants (some other bee species are very picky eaters), and 2) they are so easy to manage. For hundreds of years beekeepers have known how to raise them in portable nests that they can move from field to field. Honey bees make tasty honey, too, which is how they got their name. They are a medium-sized bee that ranges in color from black to pale yellow. Colonizing Europeans brought honey bees to North America starting in the 1620s. In Oregon, they are one of the only pollinators of carrots, which Oregon farmers mainly grow not for the vegetable, but for the seeds produced by carrot flowers. Farmers from around the world grow carrots from Oregon carrot seeds.

Field Notes:

Honey bees, which belong to the genus *Apis* (pronounced AY-pis), are pollinators of agricultural crops worldwide. That’s because 1) they pollinate many different types of plants (some other bee species are very picky eaters), and 2) they are so easy to manage. For hundreds of years beekeepers have known how to raise them in portable nests that they can move from field to field. Honey bees make tasty honey, too, which is how they got their name. They are a medium-sized bee that ranges in color from black to pale yellow. Colonizing Europeans brought honey bees to North America starting in the 1620s. In Oregon, they are one of the only pollinators of carrots, which Oregon farmers mainly grow not for the vegetable, but for the seeds produced by carrot flowers. Farmers from around the world grow carrots from Oregon carrot seeds.

The average honey bee-hive contains around 25,000 bees.

Did you know that one honey-bee hive can produce up to 80 pounds of honey a year?

The next time you eat a carrot, thank a honey bee!
Not all bees are pollinators or help make food. For example, bees in the genus Nomada (pronounced no-MA-da) are a type of bee called a cleptoparasite. Clepto means “to steal” and a parasite is a living creature that feeds off another living creature. These bees don’t forage for pollen. Instead, they have found a way to steal it from others. When it comes time for a Nomada female to reproduce (have babies), she looks for a nest that is being built by a female bee closely related to her. Once she finds a nest, the Nomada female waits for the female bee who made the nest to go forage for pollen and nectar. When she does, the Nomada female sneaks inside and quickly lays her own eggs, right next to some of the other bee’s eggs. Each one of her eggs will hatch into a larva (the immature stage of a bee that looks like a caterpillar or grub) and will destroy the offspring of the other female. The Nomada larvae are then free to eat up all the pollen left by the female who made the nest. As they grow, the Nomada bees take over the nest. Cuckoo bees got their name from cuckoo birds, which lay their eggs in other birds’ nests.
**Where do bees live?**
In Oregon, most of our wild bees prefer to nest in the ground, making their nests in small tunnels. Some of the other places that bees like to nest include: in old beetle holes, hollowed-out plant stems, tree cavities, cliff faces, rodent nests and in between rocks.

**What do bees use to make their nests?**
Depending on the species, bees use all kinds of different materials for nest building, such as: twigs, leaves, flower petals, mud, stones, wax, plant resin, and even snail shells!
Solitary bees are bees that live alone—not in a hive or with other bees.

Mason, leafcutter, long-horned bees, and alkali bees are some examples of solitary bees. Most bees found in Oregon are solitary bees. After mating, a solitary female bee, all on her own, will build her nest, forage for pollen and nectar, and lay her eggs. The solitary female bees below are making their nests in three different places: (A) a plant stem, (B) a tunnel in the ground, and (C) an old tree stump.

No matter where a solitary female bee nests, these steps happen:
1. The female bee creates a chamber or cell where she can safely lay an egg.
2. In any chamber she creates, she mixes a ball of pollen and nectar to feed her offspring.
3. She lays an egg on each ball, seals up the nest, and then leaves.
4. When an egg hatches, out comes a tiny larva (the first growth stage of a bee). The larvae all feed on their pollen balls and grow bigger.
5. When the larvae have grown big enough, they undergo metamorphosis, a word that means a change in shape. The bee larvae slowly change from immature grubs to adult bees. Just like caterpillars, some spin silk cocoons before they go through this process.
6. When the adult bees come out of their cells, males and females will mate with bees from other nests. Mated females start new nests of their own.

Common dandelions (Taraxacum officinale)
Some species of dandelion are native to North America. The common dandelion, however, is not. European colonizers brought it with them. Indigenous People then and now use the sweet and tender young leaves, stems and roots of dandelions medicinally and for foods such as tea and salads. Dandelions are also an important food source for bees early in the spring when few other flowers are in bloom.
**Social bees are bees that live together.**
They share the work of building a nest, foraging for food, and caring for young. Honey bees and bumble bees are examples of social bees.

**The Life of a Honey Bee**
Honey bees live together in a hive. A hive is an above-ground structure where a group of bees nest together. A hive can be made by people (look on the Managed Bees page for a picture), or it can be made by bees themselves in the wild. Inside the hive, honey bees use wax to make honeycomb that they use to raise their young and store honey and pollen.

Honey bees living in a hive have a caste system made up of a queen bee, drones, and worker bees. These three types of bees play different roles in the hive.

**Queen bee:** The queen is the mother of all the bees in the hive. Her job is to lay eggs to make more bees. Typically, she only leaves the hive once in her life to mate.

**Drones:** Drones are all male. They are produced in the summer and their job is to mate with queens from other hives.

**Worker bees:** Worker bees are all female. When they are young, they start off cleaning the hive and then caring for and feeding young larvae. Once they are older, they become foragers, bringing in nectar and pollen to feed the bees in the hive.

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**Honey bees have a superpower. Can you guess what it is?**

They make honey, and they are some of the only bees that can do this!

1. Older worker bees collect nectar from flowers and take it back to the hive. There, they spit out the nectar into an open honeycomb.

2. The worker bees’ spit contains special enzymes (chemicals that change molecules). As the nectar sits in the honeycomb, these enzymes make its sugars easier to digest.

3. Young worker bees take turns fanning the nectar with their wings. This causes water in the nectar to evaporate. The nectar becomes sweeter and stickier, turning into honey after a few days. Unlike nectar, which can spoil easily, honey can stay good to eat for a very long time if it is sealed.

4. Worker bees cover the honey in the honeycomb with wax to keep it safe for the winter. The honey will provide all the food the bees need to make it through the winter when no flowers are in bloom and it is too cold to go outside. Storing honey allows honey bees to stay active year round. That is why we sometimes see a honey bee flying on a warm day in December. Because honey bees never “go to sleep,” they can be ready to pollinate some of our earliest crops, like almonds.
For over 9,000 years, humans have been collecting wild bee nests. From these nests they would gather things like wax and honey. The bees in the nests would also help them pollinate their crops. Over time, people figured out how to raise some wild bee species using structures they built themselves. These bees are called managed bees. In Oregon we have four types of managed bees: honey bees, leaf-cutter bees, mason bees, and alkali bees. Honey bees are raised to make honey and wax and to pollinate crops. Oregon’s other managed bees are raised only for pollination.

Below are three types of structures used to manage bees:

1. **Tubes or blocks**
   Managed leafcutter bees and mason bees nest in small tubes or in blocks with many holes in them. Hundreds of blocks or tubes are often stored next to each other in a bee shelter that protects the nests from rain and wind.

2. **Hives**
   Honey bees are kept in boxes called hives and are the most common managed bee worldwide.

3. **Underground nests**
   Alkali bees are raised in underground nests.

**Fun Fact!**
Honey comes in different colors, depending on which flower’s the nectar comes from.
Alkali bees, like alfalfa leafcutting bees, pollinate alfalfa flowers to make alfalfa seed. These bees nest in the ground and are very picky; they love salty, moist and crumbly soil. Some farmers have figured out how to create the same conditions on their farms that these bees like in the wild. At these sites, thousands of females build nests side-by-side, packing their nests with alfalfa pollen. After the females lay an egg, the hungry alkali bee larvae consume the pollen and complete their development underground. The alkali bees of the Pacific Northwest region (Oregon, Washington, Idaho) are the only ground-nesting bees in the world managed by farmers.
Now that you know how amazing bees are and how much we need them to produce healthy foods, here are four things you can do to help them:

1. Plant flowers and flowering trees. If possible, choose types that produce lots of pollen and nectar. Some of our favorite easy-to-grow plants that bees love are clover, sunflowers, phacelia, purple aster, oregano, thyme, cilantro, mint, California lilac, big leaf maple trees, apple, cherry and willow trees.

2. Leave sticks, twigs, and woody debris in your yard to provide a place for bees to nest.

3. When plants that flower are healthy, they help keep bees healthy! Make sure to plant pollinator plants in parts of your garden with the right amount of sunlight and drainage. If any of your plants have pest or disease problems, reach out to your local Master Gardener (https://beav.es/JxN) for advice on how to bring them back to health using methods that don’t harm bees.

4. Learn more about bees! For example, when plants are flowering, take a walk outside, find a bee and watch it work! Visit www.foodhero.org/bees for more kid-friendly bee info.
Bee Word Search

Instructions: Use the word bank to find the hidden names of Oregon bees. Words can be horizontal, vertical, or diagonal.

Word Bank:

Bumble Bee
Honey Bee
Mason Bee
Leafcutter Bee
Sweat Bee

Long-Horned Bee
Cuckoo Bee
Alkali Bee
Squash Bee

Bees make healthy food!

Talk with your family and friends about how bees make healthy food!

Find recipes by ingredient at www.FoodHero.org

This material was funded in part by USDA’s Supplemental Nutrition Assistance Program - SNAP. For information on nutrition assistance through Oregon SNAP, contact Oregon SafeNet at 211. USDA is an equal opportunity provider and employer.

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Watching bees is a great way to learn about the amazing things they do, like how they help make healthy food!

Too afraid to think about going near a bee?
You are not alone – it makes sense to feel afraid of insects that can sting. Let’s go over a few facts that might help you and your friends feel more confident around bees and observe them safely.

Bees would rather not sting you!
Bees sting to protect themselves from creatures that want to eat them. You may not have thought about it, but many animals in the wild eat bees. Birds, frogs, toads, lizards, spiders and some larger insects depend on bees for protein and other nutrients. Most humans do not threaten bees, so bees rarely sting them. When stings do happen, it’s often because someone accidently swats or steps on a bee, or is standing too close to a nest. Most of the time, though, it is safe to observe bees around you.

Bees help make food.
Bees help make lots of our foods, from fruits and vegetables to nuts and even cheese! When bees pollinate plants in the wild, they also help make the flowers, fruits and seeds that many animals depend on for food.

Bees help make new plants.
Bees help make seeds, which provide the world with new plants. Farmers use seeds to help grow our food. Seeds are also important to forests, prairies, wetlands, riverways and other ecosystems in Oregon and around the world. Ecosystems depend on new plant growth every year and could not survive without bees!

Fun Facts About Bees and How to Safely Watch Them

An ecosystem is a group of living and non-living things that share an environment.

True or False – Fun Bee Facts
1. Only female bees can sting.
   True! The body part bees sting with (the stinger) is the same body part bees use to lay their eggs. Since only females lay eggs, only females can sting.

2. Bees can only sting one time.
   True and False! This is true only for honey bees. All other bees can sting more than once. When a honey bee stings you, its stinger, along with a special venom sack, rips off the bee and sticks into you. This kills the bee.

3. Some people are allergic to bee stings.
   True! Bee stings hurt for a few minutes, but most people are not harmed by them. Some people are allergic to bee stings and need to be extra careful when they are around bees.
You can learn a lot about bees by watching them!
A good way to start watching bees is to first find a patch of blooming flowers. Take a few minutes to watch the flowers to see if any bees appear. If they do, observe what they are doing. Remember to follow the tips below to keep you and the bees safe!

Here are four tips for watching bees safely:

A. Move slowly and watch what’s going on around you so you avoid crushing or stepping on the bees.
B. Do not pick bees up! If one lands on you, wait for it to leave on its own or gently brush it away.
C. Do not run away from bees or swat them.
D. Stay at least 10 feet away from bees if you see them coming in and out of a hole in the ground, a hole in a tree, or a hole in a building.

Questions to ask while watching bees:
sketch or write down what you observe as you sit near flowers!

How many types of bees do you see in this spot? Do different bees prefer different types of flowers?

How do bees collect pollen? How do bees drink nectar?
In Oregon there are over 600 unique types of bees. Each type of bee is called a species. Scientists who study bees use the parts of a bee to identify them. To help understand how alike or different they are, scientists put similar species together into a group called a genus. In this book, you learned about a few of the most common genera (plural of genus) in Oregon.

### Three Different Types of Pollen-Carrying Structures:

1. **Corbicula (pollen basket)**
   - Honey bee
2. **Scopa (hairs on back leg)**
   - Mining bee
3. **Scopa (hairs beneath the abdomen)**
   - Leafcutter bee

All bees have 3 body segments (head, thorax, abdomen), 6 legs, and 4 wings.
What is your favorite bee of Oregon?

Draw it here, along with a plant it loves to pollinate.

Add a nest if you want!

Bee Body-Part Checklist

3 body segments
- Head
- Thorax
- Abdomen

3 sets of legs

2 sets of wings

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Waggle dancer is the well-known worker honey bee. Brought from Europe to the Americas in the 1600s, she lives in the most complex society of any bee in Oregon. She can have 50,000 sisters, all sharing the same mom (called “the queen”). She is also the only bee that makes honey. The taste and color of honey varies depending on what flowers she visits (and Oregon has some delicious honey). Incredibly, she uses a waggle dance to give her sisters directions to the best flowers in the neighborhood.

The Salty Dog is also known as the alkali bee. She has lovely yellow-green stripes and she makes her nests in a tough place, alkali salt beds in Eastern Oregon. Thousands of females flock to these beds to build underground nests. Each female rolls pollen into 12 to 24 little balls and lays an egg on each. Alfalfa seed growers have learned to build these beds for the bees, helping them set more seed, which turns into hay that is fed to livestock to make things like smoothies (with milk or yogurt) and meatballs. Cool!

Grumpbee is a mining bee. Females dig a hole in bare ground and build their nests in the soil. Males have markings on their face. The marking on this species looks like a frown. But like Grumpy Cat, he isn’t grumpy at all. He is gentle and kind-natured. Some people even call the bees in this family “tickle bees.” There are over 200 species of mining bees in Oregon, making his the biggest family in the state. This specific bee was found by Atlas volunteer Debra Brimacombe, in her efforts to help inventory all the bee species in Oregon.

Bumbles is a bumble bee queen. She is one of the biggest bees in Oregon. The queens of Morrison Bumble Bees, which are found in Eastern Oregon, are particularly big. Like other bumble bees, these queens will build a small nest, helped a month later by their daughters (called “workers”), in an abandoned mouse nest. Workers are a lot smaller and may even have different color patterns than queens. The nest dies out by the end of summer, but not before new queens fly off to hibernate. Oregon has over 25 different species of bumble bees.
**Bees help make healthy food**

**Bumbles** pollinate clover for dairy cows.

**Grumpbees** pollinate apple and pear trees.

**Salty Dogs** pollinate alfalfa for beef cows.

**WAGGLE DANCERS** pollinate carrots.

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**Plain yogurt + peanut butter = Food Hero Peanut Butter Yogurt Dip**

Serve with apple or pear slices.

https://foodhero.org/recipes/peanut-butter-yogurt-dip

**Tomato + cheese + seasoning = Food Hero Baked Tomato with Cheese**

https://foodhero.org/recipes/baked-tomatoes-cheese

**Tomato + cheese + seasoning = Food Hero Baked Tomato with Cheese**

https://foodhero.org/recipes/baked-tomatoes-cheese

**Sauteed vegetables + protein choice + brown rice + shredded cheese = Food Hero Rice Bowl Southwestern Style**

https://foodhero.org/recipes/rice-bowl-southwestern-style
We hope you enjoy these bee trading/recipe cards! Cut them out and keep them for recipe ideas and to help you identify bees you see outdoors, or trade them. For more about bees, and to see all the cards and more great recipes, visit www.foodhero.org/bees.

The Mason is a female blue orchard bee. She emerges in the spring from a cocoon hidden in a raspberry stem. She collects pollen from thousands of apple, pear and cherry flowers, causing them to fill up with fruit. She takes this pollen back to a new hollow stem, piles it up and then lays an egg on it. To protect her offspring, she builds a little mud house around each cell, using her fancy mouth-parts to collect and shape the mud. Secure, the baby eats the pollen, turns into an adult and flies out the following year.

Scissor Head Bee (Megachile rotundata) knows how to cut perfect circles on the edge of a leaf. She can do this because of her scissor-like mouth-parts. She will take the cut leaf back to her nest. As many as 50 leaf discs harden into a nest around each developing bee, protecting them from parasites. Alfalfa seed growers remove the nests in fall. The following spring they incubate the nests just in time for the bees to emerge and pollinate alfalfa flowers. The cleverness of alfalfa seed growers has made the scissor head bee the most widely managed solitary bee in the U.S.

Bling Bee stands out in a crowd! Oddly, she belongs to a family of bees (Halictidae, or the sweat bees) that are rather drab. There are five different species of these brilliant emerald bees in Oregon (all in the genus Agopostemon). A single female will dig a long, narrow tunnel in the ground to nest. She makes holes in the walls of these tunnels where she leaves a ball of pollen for her young to eat. These bees are very common and are some of the last bees you will see at the end of the summer. Look for them on purple asters in your garden.

Lil’ Lumberjack is a bee you might miss if you’re not paying attention. This metallic-colored bee (in the genus Ceratina) is literally everywhere, but it’s so small that you are likely to miss it. The bees live in dead twigs. They bore into the twigs and use the sawdust to make little chambers to protect their young. The mothers also raise one small daughter—a Cinderella daughter—who helps with the housekeeping and protects the nest from predators while the mother is out gathering nectar and pollen. Oregon has five different species of Lil’ Lumberjacks.
Scissor Heads pollinate alfalfa for dairy cows.

Cauliflower + egg + flour + cheese = Food Hero Baked Cauliflower Tots
https://www.foodhero.org/recipes/baked-cauliflower-tots

The Masons pollinate cherries.

Banana + cereal + yogurt = Food Hero Breakfast Banana Split
Top with fresh cherries.
https://foodhero.org/recipes/breakfast-banana-split

Lil’ Lumberjacks pollinate berries.

Berries + yogurt = Food Hero Raspberry Fruit Dip
Serve with fresh fruit.
https://foodhero.org/recipes/raspberry-fruit-dip

Bling Bees pollinate radishes.

Yogurt + radishes + cucumber + seasoning = Food Hero Radish and Cucumber Salad
https://foodhero.org/recipes/radish-and-cucumber-salad
“Bee” a Food Hero!

A Food Hero leads by example! Food Heroes teach their friends and family members about the importance of bees, and help to prepare meals and snacks using a variety of fruits and vegetables that depend on bees. This bee activity book is a great tool for Food Heroes! It was created by experts on bees, gardens and healthy eating. It includes:

• Lots of information about bees, how they help us, and how you can help them!

• Coloring pages for seven Oregon bees. Learn how to “ID the bee” and match it to the healthy foods it helps make. Plus, each bee is paired with a recipe!

• Four activity sheets, including a Bee Word Search, a drawing page, and more.

• On the inside back cover, you’ll find four Bee Trading/Recipe Cards. They’ll help you identify the bees you see outdoors and give you ideas for easy, tasty recipes. You can also trade them with your friends!

Recipes Connected to Bees

Ingredients:

For the recipe below, you will need:

• Alkali Bee

Directions:

1. Preheat oven to 350°F.
2. In a large mixing bowl, combine flour, sugar, baking powder, and salt. Add eggs, milk, and oil and mix well.
3. Add in the flavoring and mix until smooth.
4. Pour into greased baking dish and bake for 30 minutes or until toothpick inserted in center comes out clean.
5. Serve warm or let cool and store in an airtight container.

Field Notes:

Bee word search and activity pages are included within the book. Bees provide nectar for many fruits and vegetables we eat. Explore Oregon’s honey bees and find recipes connected to them.

Honey Bees

Genus: Apis

- The honeybee is a social insect that lives in colonies.
- They have two sets of wings and are known for their ability to fly long distances.

Mason Bees

Genus: Osmia

- They are solitary and do not live in colonies.
- They are effective pollinators and are used in many gardening activities.

Bumble Bees

Genus: Bombus

- They are large, round-bodied bees with fluffy hair.
- They are important pollinators and are often found in gardens.

Cuckoo Bees

Genus: Nomia

- They are solitary bees that lay their eggs in the nests of other bees.
- They are effective pollinators and are used in many gardening activities.

Long-Horned Bees

Genus: Melissodes

- They are long-horned bees with very long antennae.
- They are effective pollinators and are used in many gardening activities.

Squash Bees

Genus: Xylocopa

- They are large, yellow bees with black spots on their wings.
- They are important pollinators and are often found in gardens.

Leafcutter Bees

Genus: Megachile

- They are small, round-bodied bees that are known for their ability to cut leaves.
- They are effective pollinators and are used in many gardening activities.

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Genus: Xylocopa

- They are round-bodied bees that are known for their ability to cut leaves.
- They are effective pollinators and are used in many gardening activities.

Cuckoo Bees

Genus: Nomia

- They are solitary bees that lay their eggs in the nests of other bees.
- They are effective pollinators and are used in many gardening activities.

Long-Horned Bees

Genus: Melissodes

- They are long-horned bees with very long antennae.
- They are effective pollinators and are used in many gardening activities.