South Dakota State University Extension

**Level: PreK-K**

# GROW GETTERS

# INVESTIGATE POLLINATORS

**Overview:** In this lesson, youth will learn about the importance of pollinators and the plants they interact with.

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The Grow Getters Program originated as a Master Gardener project in 2020 and is now a multi-departmental effort among SDSU Extension staff and volunteers.

This material was funded by USDA's Supplemental Nutrition Assistance Program - SNAP.



S-0022-03-01

## Activities in this Lesson:

- **Science Activity:** Butterfly Pasta
- **Science Activity 2:** Seed Balls for Pollinators
- **Nutrition Activity:** Buzzing Bee Honey
- **Physical Activity:** Buzz, Buzz, Hive!

## SD Early Learning Guidelines and Kindergarten Content Standards

- **Science:**
  - **K-LS1-1** Describe patterns of what plants and animals (including humans) need to survive (Kindergarten Standard)
- **Health (Nutrition):**
  - **S3.E6.K** Recognize that food provides energy for physical activity (Kindergarten Standard)
- **Physical Education:**
  - **S4.E1.K** Follows directions in group setting (e.g., Following rules, taking turns) (Kindergarten Standard)

## Book:

Books may be available at school or community libraries.

### Flight of the Honey Bee, by Raymond Huber

Huber provides preschoolers with an informative picture book about honeybees. A glossary at the end includes information about protecting bees and an index.

- Purchase the book: Flight of the Honey Bee
- Watch: Flight of the Honey Bee read aloud by Carley Baggs
- Consider these follow-up questions:
  - Have you ever seen a honeybee?
  - What colors are seen on a honey bee?
    - » Yellow and brown
  - What is a hive?
    - » A hive is a house, a place where bees live

### Waiting for Wings, by Lois Ehlert

Ehlert talks about the lifecycle of four common butterflies and provides butterfly and flower facts and identification tips along with some pointers on growing a butterfly garden at the end of the book.

- Purchase the book: Waiting for Wings
- Watch: Waiting for Wings read aloud by Major Marquita Morgan
- Consider these follow-up questions:
  - Where do butterflies come from?
    - » Caterpillars
  - What do butterflies eat? And how do they eat?
    - » Nectar. Sipping through their mouthparts (proboscis)

# BUTTERFLY PASTA

**Science Activity**
**PreK-Kindergarten**

Students use different shapes of pasta to learn about the life cycle of a butterfly.

**Time:** 20 minutes

## Materials

- Food colors or watercolors (3 different colors)
- Bowtie pasta, at least one per student
- Rotini pasta, at least one per student
- Shell pasta, at least one per student
- Paper towels
- Sorting tray (bowls or plates)
- Sealable plastic bags
- Copies of "Worksheet: Matching Pasta to the Butterfly Lifecycle", enough for each student

## Instructions:

*Teacher Tip:*

The different pasta types represent different stages in the lifecycle of a butterfly. The curly rotini pasta is a "caterpillar", the shell pasta is a "chrysalis", and the bowtie pasta is a "butterfly." Discuss how the pasta matches each of these shapes and the order of the life cycle.

*Instructions for the students:*

1. Either before the lesson, or in front of the students, add one type of DRY (uncooked) pasta to a plastic bag.
2. Add one of the colors to the same bag and shake it to color the pasta.
3. Repeat steps 1 and 2 for the other two pastas so each pasta is a different color. Dry the pastas by laying them on a paper towel.
    a. Teacher tip: during this step, you can talk to your kids about water absorption. Have them observe how the pasta retains the color.
4. Have the children sort the pasta by color and shape into the sorting tray (bowls or plates could also be used). Have the kids count how many pasta pieces are in each group.
5. Give each student a "Worksheet: Matching Pasta to the Butterfly Lifecycle" and ask them to take one or each pasta-type to their seat. Then, let them match the pasta to the lifecycle photo and talk through the answers.

## Guiding Questions:

*Immediately after the setup:*

- Ask: What happens to a caterpillar after it is out of its egg?
    - The caterpillar crawls out of the egg and immediately begins to start eating.
- Ask: What is the difference between a chrysalis and butterfly?
    - Chrysalis is the transitional stage between the caterpillar and butterfly where the caterpillar forms a protective covering around itself. The butterfly comes out of the chrysalis.

*During the activity:*

- Ask: How long is a butterfly a caterpillar vs chrysalis vs butterfly?
  - 2-5 weeks as a caterpillar, 1-3 weeks as chrysalis, 2-4 weeks as butterfly.
  - Note: This really depends on species. Monarchs that overwinter in Mexico spend months as a butterfly.

*After the activity:*

- Ask: What colors are found on caterpillars? How about chrysalis and butterflies?
  - Caterpillars come a wide variety of colors (common ones are: green, brown, black, or tan). Chrysalis are usually green or brown. Butterflies have a variety of colors, answers can vary.

## Modification notes:

- **Extension:** Reinforce knowledge by instructing students to make a picture of a butterfly flying, caterpillar crawling, and/or chrysalis hanging from a leaf using paper, scissors/glue, and/or crayons/markers.

This lesson adapted from: https://www.pre-kpages.com/butterfly-life-cycle-sensory-bin/

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Name(s): _____ Date: _____

## MATCHING PASTA TO THE BUTTERFLY LIFECYCLE

Instructions: Place the pasta (rotini, shell, or bowtie) on the left that matches the butterfly lifecycle phase on the right.


*Whitney Cranshaw, Colorado State University, Bugwood.org*


*Caterpillar: Ansel Oommen, Bugwood.org*


*Charles T. Bryson, USDA Agricultural Research Service, Bugwood.org*

This material was funded by USDA's Supplemental Nutrition Assistance Program - SNAP.



S-0022-03-01

# SEED BALLS FOR POLLINATORS

**Science Activity**
**PreK-3rd Grades**

In this activity, students will create seed balls to grow plants pollinators will love.

**Time:** 30 minutes

## Materials

*Teacher Tip:*
For estimating "parts", if one "part" is equal to one cup, this should make about 30 seed balls.

- 2 parts potting soil
- 5 parts pottery clay mix from your local art store
- 1-2 parts water
- 1-2 parts pollinator seeds of your choice
  - Examples of fast-growing annuals: Cosmos, bachelor's buttons, sweet alyssum, zinnia, dill, and sunflowers
  - Examples of native perennials: Bee balm, milkweed, liatris, and prairie clover
  - Recommendation: Try to provide 4-5 different types of seeds.
  - Seeds can be sourced from local garden centers, online native plant catalogs, and even local agricultural cooperatives may sell native perennial flower seeds.
  - Teacher Tip: For more information on native plants in South Dakota visit sdstate.edu/npi
- Liquid measuring cup
- Large tub to mix ingredient
- Large box to dry and store seed balls

## Instructions:

1. Lay out all of the materials in a way that students can reach everything and help.
2. Using the large tub, help students mix the soil, clay, and 1-part water well so that there are no lumps. You may want to have several tubs and encourage students to work in pairs or small groups.
3. Have the students slowly add more water until the mixture has the consistency of modeling clay.
4. Next, ask the students to add the seeds to their mixture. Encourage students to examine the different seeds as they are mixing them in. Have the students knead the dough with their hands until the seeds are well mixed and add more water if needed.
5. Instruct the students to make seed balls about one-inch in diameter (or about the size or a marble to golf ball) by taking some of the clay mixture and rolling it into a ball in their hands. Show them an example.
6. If storing: Place the seed balls in the box and let dry for 24-48 hours.
   a. Teacher tip: You may choose to have students check the seed balls each day to determine if they are dry. store seed balls in plastic containers with lids versus plastic bags so they don't get crushed.
7. If planting immediately: Plant the seed balls on bare ground by tossing them on top of the soil. Teacher tip: This can be a fun activity for students. Let them go one at a time to stretch out the fun. Don't bury or water the balls.

## Guiding Questions:

*Immediately after setup*

- Ask: What is a seed ball?
  - A seed ball is a ball made of clay, earth, and seeds which is used to replant areas where there are little to no flowering plants.

*During the Activity:*

- Ask: How would you describe the different seeds?
  - Encourage students to discuss the colors, shapes, and sizes of the seeds.

*After the activity*

- Ask: What do flowers provide to pollinators?
  - Food, water, and shelter.

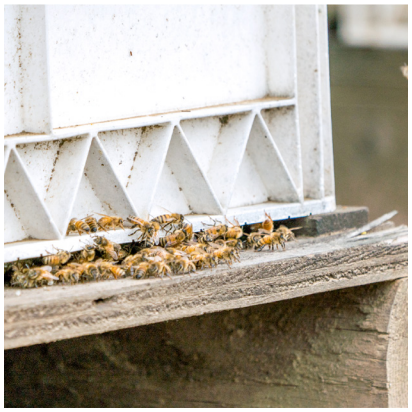
- Ask: Where can you plant your seed ball?
  - Discuss placing it in the garden or somewhere in their yard or placing it somewhere on the school grounds (with permission) to watch for seeds in the future.

# BUZZING BEE HONEY

**Nutrition Activity**
**PreK-3rd Grades**

In this activity, students will sample honeys from different sources to observe differences.

**Time:** 20 minutes



## Materials

- Different types of honey, small or sample-size bottles (4-5 are recommended)
  - Sourcing: State and regionally produced honey can be found at local food or gift shops, restaurants, farms, food hubs, or farmer's markets. Many grocery stores do also sell local honey or honey produced across the US.
  - Teacher tip: Some honey producers list the type of plants the bees used for making the honey; the different plants result in unique honey flavors. Consider looking at the honey websites ahead of time to see if you can find this information for comparison.
- Craft sticks or spoons
- Note taking supplies: Paper and pencils

## Instructions:

Teacher Tip: start with a helpful video on how bees make honey, such as one of the following:

- "How Do Bees Make Honey?" by Peekaboo Kidz on YouTube
- "Busy Bees!" by SciShow Kids on YouTube

1. Before removing the honey from the jars or bottles, have the students observe the different honeys to notice any differences, such as color or transparency.
2. Instruct the students to dip spoons or craft sticks into one honey jar.
3. For younger learners, have them describe verbally the taste, texture, consistency, etc. For older learners, ask them to quietly write down their observations on a piece of paper.
4. Repeat steps 3 and 4 for each honey. Teacher tip: This could also be accomplished with rotating through the different honeys as stations in small groups.
5. When through all the honeys, discuss the differences the studetns noticed. Students could also discuss or vote on the honey they like the least or the most.

## Guiding Questions:

*Immediately after setup:*

- Ask: What is honeybee farming called?
  - Apiculture or beekeeping

- Optional: show a photo of a honeybee farm/hive. Ask: does this look like what you expected a honeybee hive to look like? Have you seen a honeybee hive in a field when they drive through the country?
  - Answers will vary.

- Ask: What is the state insect of South Dakota?
  - The Honeybee

*During the Activity:*

- Ask: Can you guess how many different types of honey there are in the US?
  - More than 300!

*After the activity*

- Ask: Why do you think bees that eat from different plants produce different flavors of honey?
  - The color and flavor of kinds of honey differ depending on the nectar source (the blossoms) visited by the honey bees.

**Modification notes:**

- **Advanced:** Engage the students in a discussion of differences among the honey by where it is was produced using a map of SD or the region or country.
- **Advanced:** Share any information about the honey farms that come from the labels or your own research to help the children understand more about local farming practices and the difference between honeys.
- **Extension:** Walk through the "Fun Facts About Bees" sheet.
- **Extension:** Print and color the "South Dakota State Symbols Activity Map" from Simple Living Creative Learning.

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## FUN FACTS ABOUT BEES AND HONEY

**South Dakota is the second leading honey producer in the US.**

**Properly sealed and stored honey can last thousands of years because most microorganisms can't grow in it. Honey that was discovered in Egyptian Tombs and over 5,000 years old was still edible!**

**A single bee will produce less than a teaspoonful of honey in her lifetime.**

**In the United States, the month of September is known as Honey Month. Honey Month was created to help promote and celebrate beekeepers and beekeeping.**

This material was funded by USDA's Supplemental Nutrition Assistance Program - SNAP.



S-0022-03-01

# BUZZ, BUZZ, HIVE!

**Physical Activity**
**PreK-3rd Grades**

Students play a Honeybee version of the popular game “Duck, Duck, Goose”.

**Time:** 15 minutes

## Materials

- Wings and antennae costume pieces or other items to identify two teams (e.g., jerseys, or stickers)

## Instructions

Teacher tip: Start with the following video to get students thinking about how bees fly. “How do Bees Fly” by FoxAndBeeMedia on YouTube.

1. Ask students to sit in a circle, either inside or outside. Tell them they are now sitting in their “hive”.
2. Place students in two groups of “honeybees” by giving every other student either antennae or wings, or other team identifiers. Let them know they are all now “honeybees” on two different teams.
3. Select one student to go first. This student “flies around the hive” (walks laps around the circle of students) and taps each “honeybee” on the shoulder, saying “BUZZ”.
4. At any point while “flying around the hive,” (on the first lap or after several laps) the student exclaims “HIVE!” while tapping on a student of the opposite team and begins to run around the hive. Ensure that students know to only select someone from the other honeybee team.
5. The honeybee selected gets up and attempts to tag the first honeybee before the first honeybee sits down into the open spot in the “hive” (circle).
   a. If the honeybee gets back before getting tagged the new honeybee becomes “it” and continues by selecting another honeybee (from the other team).
   b. If the honeybee is tagged before getting to the open spot in the hive, they are now “out of the hive” and sit off to the side.
6. The game continues until only members of one honeybee team remain in the hive. This team has now won and “rules the hive”.

## Modifications

- **Modification:** For a group of students including students with mobility impairments, a ball or other soft object could be passed around the “hive” in place or walking/running laps. A timer could be used to simulate a runner’s speed, and a specific time limit would provide the goal necessary to complete the activity, or “tagging”. For example, a student selected as the honeybee would begin passing the ball around the circle and announce Hive. Then, the group would have 15 seconds to get the ball around the circle and back to the honeybee’s space.

## Additional Resources

If you liked this lesson, you may also like these other educational materials from SDSU Extension.

### Nutrition and Physical Activity

- Pick it! Try it! Like it! Preserve it! materials are filled with tips for selecting, preparing, and preserving a wide variety of fruits and vegetables. Colorful fact sheets, recipe cards, and educational videos provide educators and families with fun, engaging tools to enhance any dietary curriculum!
- Growing Active Readers is a series of book-based lessons to help young children understand the benefits of making healthy decisions involving nutrition and physical activity.
- South Dakota Farm to School Resource Guide walks through the basics of starting farm to school programs in South Dakota, including local food selling/purchasing, school gardens, and in-class education.
- Preservation this page provides a suite of educational materials and programs offered by SDSU Extension related to food preservation.
- Physical Activity View all SDSU Extension physical activity content.

### Horticulture

- Garden and Yard this page provides easy access to all the educational materials and programs related to garden and yard by SDSU Extension. This frequently updated landing page includes sections for fruits, vegetables, problems and solutions, master gardener volunteer program, garden hour, and more.
- Vegetable Gardening in South Dakota this booklet will help you with basic vegetable gardening information and tips to get started.
- Fertilizing Gardens in South Dakota this booklet by SDSU Extension provides information on soil testing, types of fertilizers, and methods of application.
- An Identification Guide to Native Pollinator Plants of South Dakota for Managed Landscapes In this guide, learn about the perennial plants native to South Dakota that attract pollinators and can be incorporated in to gardens.
- Tree Pest Alert stay updated and informed with this weekly resource for selecting, planting, and caring for trees and shrubs all year round.