



# Blue Swallow Farm Foundation

## LESSON PLAN

**Title:** Pollinators and Me

**Author:** Rebecca Bland

**Grade:** 5 (modifiable for other grade levels)

**Subject:** Environmental Science/Life Science

**Time:** 4, 1 Day Lessons

### Background Information and Student's Prior Knowledge

This lesson has been created to help students understand the crucial role of pollinators and ways to protect them. The lesson can be adapted for primary learners but was originally designed for a Grade 5 class.

In order to make optimum use of the content presented, students should be familiar with:

- the life cycle of plants
- the place of producers in a food chain

### Standards: Next Generation Science Standards

#### LS2.A: Interdependent Relationships in Ecosystems

Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.

#### LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die.

### Essential Questions

How do you know insects and plants depend on each other?

How do you know that humans can be both friend and foe to pollinators?





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### Learning Objectives

Students will identify the role of pollinators in a food chain.

Students will create a model to demonstrate the way matter is moved among plants and animals during pollination.

Students will analyze and interpret data to determine the greatest environmental dangers that pollinators face.

### Supporting materials and resources

- Kalman, B. (2010) *What is pollination?* Crabtree Classics.
- Notebooks for notetaking
- Digital device for photographing pollinators

Day 1:

PBS (2021). The power of pollinators [Video]. <https://www.pbs.org/video/power-pollinators-xr2zez/>  
five numbered, non-labeled seed cards per table group (teacher-created; use easily-identifiable seeds on hand, such as bean, beet, cucumber, watermelon, marigold, tomato, etc.);  
pictures of the plants that grow from the seeds chosen (teacher-generated)

Day 2: Pollinator Trait cards

Day 3: Chart paper and marker per table group, one pollinator population graph per table group (see Day 3 resource document); one copy of *Are Bats in Danger?* activity per student; one blank sheet of paper with large circle per student for pie chart activity

Day 4: One *Needs of Pollinators* half sheet per table group (see Day 4 resource document); one large sheet of poster paper per student

### Vocabulary

- Pollen-a powdery substance found in flowers that is needed to make fruit, seeds, and new plants
- Nectar-a sweet liquid found in flowers
- Species-a group of related living things that can have babies together
- Native-an animal or plant that is found in a certain place or area
- Pesticide-a chemical sprayed on plants to kill insects





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### Safety Considerations

Day 1: Be aware of possible student allergies to seeds. Cover the seeds on the cards with a layer of clear glue, so they can be easily seen but not directly touched.

Days 1-4: When students are working outdoors, be alert for those who are allergic to beestings.

### Formative and Summative Assessments

Day 1: Formative assessment-The student will write one or two summary sentences including the words *pollen*, *pollination*, and *pollinator* and be prepared to share with the whole group.

Day 2: Formative assessment-The student will draw a diagram or create a pop-up book illustrating how their pollinator accomplishes pollination.

Summative assessment-The student will complete the exit ticket to identify animals and insects by the traits that suit them for the work of pollination.

Day 3: Formative assessment-The student will create a pie chart to show the extinction risk for bat species in the United States. They will write summary sentences that explain what the data show about extinction risks for bats.

Formative assessment- The student will analyze pollinator population graphs and share what they have learned from the data.

Day 4: Summative assessment -The student will design and create a poster to hang in the school/community to let people know the importance of pollinators and what humans can do to protect them.

### Suggested accommodations for special education/504 students

- Students to listen to the [What is Pollination](#) read-aloud picture book on YouTube.
- Include pictures with labels whenever possible to illustrate vocabulary.
- Create word lists and/or note-taking outlines in advance for them to glue into their notebooks.
- Day 1-Students draw their (or their family's) favorite fruit, vegetable, or nut from those named on pages 12-13. The students could hold those drawings as they stand in the circle.
- Day 4-Consider creating a pie chart already divided into slices and allowing students to decide which slices correspond with which percentages and shade/label them accordingly.

### Suggested accommodations for English language learners

- Include pictures with labels whenever possible to illustrate vocabulary.
- Students listen to the [What is Pollination](#) read-aloud picture book on YouTube.
- Identify "cognates" to connect lesson vocabulary to their native language (e.g., Spanish for "pollen" is "polen" and French is "pollen." Spanish for "pollinator" is "polinizador," and French is "pollinisateur.").
- Day 1- Students draw their (or their family's) favorite fruit, vegetable, or nut from those named on pages 12-13. The students could hold those drawings as they stand in the circle.





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- Day 4- Consider creating a pie chart already divided into slices and allowing students to decide which slices correspond with which percentages and shade/label them accordingly.

### Suggested accommodations for highly able/ gifted and talented students

- Day 4- For highly gifted students, consider creating a set of directions that gives only the number of bat species in each category and challenging the students to calculate the percentages on their own.
- Highly gifted students research ways in which local organizations work to protect pollinators.

### References

Kalman, B. (2010) *What is pollination?* Crabtree Classics.

PBS (2021). The power of pollinators [Video]. <https://www.pbs.org/video/power-pollinators-xr2zez/>





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## LESSON PLAN

### DAY 1

*The Importance of  
Pollination and Pollinators*

### TEACHER

### STUDENT

Lesson delivery  
(5Es model)

- ENGAGEMENT
- EXPLORATION
- EXPLANATION
- ELABORATION
- EVALUATION

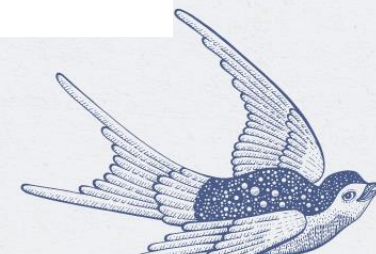
**Engagement (10 min.):** The teacher will distribute to each table group a set of five numbered cards with an unnamed seed glued/taped onto each card. Common seeds that might be used include bean, beet, cucumber, watermelon, marigold, tomato. Students at each table group will also be given a set of five cards, each with the name of one of the plants represented by the seeds. The teacher will give students 8 minutes to work together to match the seed with the name of the plant it produces. The teacher will circulate to observe students' prior knowledge, and to clarify directions. The teacher will direct fast-finishing groups to check with other groups to compare matches.

At the end of 8 minutes, the teacher will tell students which plant matches each seed and answer any questions about them.

**Exploration (5 min.):** The teacher will pose the question, "How is a seed created?" and give students 1 minute for reflection. The teacher will then have students turn and talk, sharing their ideas. After 2 minutes, the teacher will ask for student volunteers to share their thinking with the whole group. The teacher will lead students to understand that since seeds are necessary for the survival of plants, the creation of seeds is an important process.

**Engagement: (10 min.):** The students will work with tablemates to match each seed with its label. Students will explain to each other why they decided on the matches they made. Students in groups that finish early can check with other groups to compare matches.

**Exploration (5 min.):** The student will think about the question, "How is a seed created?" and then share their ideas with a partner.





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**Explanation (15 min.):** The teacher will read aloud (or have students read in table groups or with a partner) pp. 4-7 from the picture book, *What Is Pollination?* The teacher will ask students to listen for the words “pollen” and “pollination” during the read-aloud and write in their notes the definition of the words. After the reading, the teacher will give opportunity for student volunteers to share the definitions of “pollen” and “pollination”.

The teacher will read aloud (or have students read in table groups or with a partner) pages 8-9 from the book, *What Is Pollination?* The teacher will ask students to listen for three types of pollination and to put a check mark beside the type of pollination that requires help from animals and insects.

The teacher will explain that animals and insects that help pollinate plants are called “pollinators.”

The teacher will allow 5 minutes for students to go to an outdoor area to photograph insects they think may be pollinators.

The teacher will allocate time for students share their photographs with table groups upon returning to the classroom or meeting area.

**Explanation (15 min.):** The student will read/listen to information about pollination on pp. 4-7 and take notes about the meaning of “pollen” and “pollination.”

The student will read/listen to information and take notes about three types of pollination and indicate in their notes which type involves animals and insects.

The students will share the information in their notes with the whole group.

The students will photograph insects outdoors they think may be pollinators.

The students will share their photographs with table groups upon returning to the classroom or meeting area.





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**Elaboration (20 min.):** The teacher will read aloud (or have students read in table groups or with a partner) pp. 12-15 from *What Is Pollination?* The teacher will pause after page 13 to allow students to “picture the math” (e.g., “More than  $\frac{1}{3}$  of the food you eat depends on pollinators”). The teacher will have students stand in a circle. The teacher will ask them how they can calculate  $\frac{1}{3}$  of the group of students (divide total by 3). If there is a remainder, ask students whether they should round the quotient up or down. Have that number of students leave the circle. Explain that those students represent the amount of the world’s food that is dependent on pollinators.

The teacher will direct students to listen for the five groups of insect pollinators and list them in their notes. After the read-aloud, the teacher will ask student volunteers to share their lists.

The teacher will show the PBS video [\*The Power of Pollinators\*](#) from the beginning until minute 3:56 asking students to record five important facts they learn by watching the video. The teacher may need to show the video clip twice.

The teacher will facilitate student sharing of notes, first at table groups, and then with whole group.

**Elaboration (20 min.):** The student will calculate  $\frac{1}{3}$  of the total by using division. The student will picture  $\frac{1}{3}$  by allowing all the students in the class to represent the total amount of food produced, and  $\frac{1}{3}$  of the whole group to represent the amount of food produced from pollinator-dependent crops.

The student will read/listen to information from a read-aloud picture book (pp. 12-15) and take notes about the five types of insect pollinators (bees, wasps, butterflies and moths, flies, beetles) and be prepared to share them.

The student will watch a 4-minute segment of a video called *The Power of Pollinators* and choose five important facts to record in science notes.

The students will share their notes, first at table groups, and then with the whole group.





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**Evaluation (10 min.):** The teacher will ask students to write one or two summary sentences including the words *pollen*, *pollination*, and *pollinator*. The teacher will check for student understanding of the essential question as the sentences are shared.

**Evaluation (10 min.):** The student will write one or two summary sentences including the words *pollen*, *pollination*, and *pollinator* and be prepared to share with the whole group.







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## LESSON PLAN

### DAY 2

#### Pollinator Traits and Preferences

### TEACHER

### STUDENT

Lesson delivery  
(5Es model)

- ENGAGEMENT
- EXPLORATION
- EXPLANATION
- ELABORATION
- EVALUATION

**Engagement (10 min.):** The teacher will post seven pollinator trait cards (in an outdoor setting, if possible) and divide students into seven small groups to visit and read the cards. After about 7 minutes, the teacher will ask students to return to the posted card that listed the traits that most interested them. Invite students to share, first in their chosen groups, and then with the whole group, why they thought the traits were interesting.

**Exploration (5 min.):** The teacher will remind students of what they have learned in language arts classes about the definition of “trait.” The teacher will ask students to give examples of traits, and will make a quick list, including both physical (e.g., wings) and behavioral (e.g., hops).

**Explanation (10 min.):** The teacher will place a large card at each station, naming the pollinator with those traits.

The teacher will send students to their seats to record and/or draw in their notes the pollinator that has a trait (or traits) similar to their own.

The teacher will ask the students to write three (or more) questions they have about their” pollinator followed by an explanation.

**Engagement (10 min.):** The student will visit and read the pollinator trait cards that have been posted. The students will return to the posted card that had the traits that most interested them.

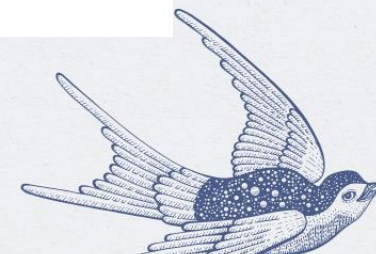
Students will share, first in their chosen groups, and then with the whole group, which traits on the card were most interesting to them and why.

**Exploration (5 min.):** The students will give the definition of “trait” as they understand it from their language arts studies. The students will give examples of traits of physical and behavioral traits of a cricket or a bee.

**Explanation (10 min.):** The student will record and/or draw in their notes the pollinator that has a trait (or traits) similar to their own.

The students will write three (or more) questions they have about “their” pollinator.

The students will learn that a pollinator’s traits make it uniquely suited to pollinating certain plants and working in specific environments.





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### Elaboration (25 min.):

The teacher will give students the opportunity to explore the outdoor area (with a digital device, if possible) to discover three insects with different physical traits.

The teacher will read aloud (or have students read in table groups or with a partner) pp. 16-27 from the book, *What Is Pollination?* Students will listen for pollinator traits.

The teacher will set a timer for 10 minutes for students to draw a diagram illustrating how one of the pollinators accomplishes pollination.

The teacher will direct students to share diagrams/pop-up books within table groups or with a self-selected partner.

**Evaluation (10 min.):** The teacher will administer the exit ticket (below) to identify animals and insects by the traits that suit them for the work of pollination. The teacher will review the responses with the whole group and allow students to self-score.

### Elaboration (25 min.):

The student will explore the outdoor area (with a digital device, if possible) to discover three insects with different physical traits.

The student will read/listen to pp. 16-27 from the book, *What Is Pollination?* The student will listen for pollinator traits.

The student will draw a diagram illustrating how one of the pollinators accomplishes pollination. Students will share their diagrams or pop-up books with other students.

### Evaluation (10 min.):

The student will take the "mini-quiz" to identify animals and insects by the traits that suit them for the work of pollination.

#### Mini-quiz

Which pollinator....

1. gets nectar on its long beak, enabling pollen to stick and be transferred to other flowers? (hummingbird)
2. has a furry body, enabling it to collect and transfer pollen? (bee, some beetles)
3. has a long proboscis to sip nectar deep in a flower; pollen sticks to its legs and is transferred? (butterfly, moth)
4. is a carnivore that hunts small insects on flowers, and transfers pollen while hunting? (wasp)





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## LESSON PLAN

DAY 3 <i>Pollinators in Danger</i>	TEACHER	STUDENT
<p>Lesson delivery (5Es model)</p> <ul style="list-style-type: none"><li>• ENGAGEMENT</li><li>• EXPLORATION</li><li>• EXPLANATION</li><li>• ELABORATION</li><li>• EVALUATION</li></ul>	<p><b>Engagement (3 min.):</b> The teacher will pose the question: “What common ideas do people have about bats?” After a minute of reflection, ask students to turn and talk, and then share with whole group.</p> <p><b>Exploration (12 min.):</b> The teacher will remind students that some bats are helpful pollinators. The teacher will distribute the activity: “Are Bats in Danger?” Students will have 10 minutes to use bat population data to create a pie chart and complete a summary sentence to analyze the data.</p> <p>The teacher will give students 2 minutes to share their summary sentences with the whole group</p> <p><b>Explanation (15 min.):</b> The teacher will explain that bats are not the only pollinators that are at risk. The teacher will read aloud (or have students read in table groups or with a partner) pp. 28-29 from the book, <i>What Is Pollination?</i></p> <p>The teacher will ask students to make a chart in their table groups, listing the dangers to pollinators. The teacher will add “climate change” to the list (a factor not mentioned in the text).</p> <p>The teacher will ask students to place a star next to any dangers that are the result of human actions.</p>	<p><b>Engagement (3 min.):</b> The students will state what they know about common ideas people have about bats in small groups and then with the whole group.</p> <p><b>Exploration (12 min.):</b> The students will use bat population data to create a pie chart and complete a summary sentence analyzing the data.</p> <p><b>Explanation (15 min.):</b> The students will read/listen to pp. 28-29 from the book, <i>What Is Pollination?</i></p> <p>The students will create a chart (in table groups) listing the dangers facing pollinators. The students will decide in their table groups which dangers are the result of human actions.</p>





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**Elaboration (20 min.):** The teacher will distribute a pollinator population graph to each table group. (Small table groups will have the same graph.)

The teacher will ask students to study their graphs in their table groups and answer the questions listed below each graph.

**Evaluation (10 min.):** The teacher will ask the table groups to share what they have learned about pollinator populations with the whole group.

**Elaboration (20 min.):** The students will analyze pollinator population graphs in table groups and answer the questions listed below each graph.

**Evaluation (10 min.):** The students will share what they have learned about pollinator populations with the whole group.





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## LESSON PLAN

DAY 4 <i>Protecting Pollinators</i>	TEACHER	STUDENT
<p>Lesson delivery (5Es model)</p> <ul style="list-style-type: none"><li>• ENGAGEMENT</li><li>• EXPLORATION</li><li>• EXPLANATION</li><li>• ELABORATION</li><li>• EVALUATION</li></ul>	<p><b>Engagement (5 min.):</b> The teacher will distribute “Needs of Pollinators” half-sheets and ask table groups to discuss, decide, and record the three needs of pollinators.</p> <p>The teacher will post the list of pollinator needs, helping students understand they are the same as the basic needs of all living things: food, shelter, living space.</p> <p><b>Exploration (10 min.):</b> The teacher will take students to an outdoor site and direct them to make a T-chart on the back of their “Needs of Pollinators” half-sheets with the headings: “Helps Pollinators” and “Hurts Pollinators.” The teacher will give students 10 minutes to explore and complete their charts.</p> <p><b>Explanation (5 min.):</b> The teacher will show the rest of <a href="#">The Power of Pollinators</a> (from minute 3:56 until the end) and remind students to listen for ways humans can help pollinators.</p>	<p><b>Engagement (5 min.):</b> The students will discuss, decide, and record (in table groups) the three needs of pollinators.</p> <p><b>Exploration (10 min.):</b> The students will visit an outdoor site and make a T-chart on the back of their “needs of Pollinators” half-sheets with the headings: “Helps Pollinators” and “Hurts Pollinators.”</p> <p>The students will share their ideas with the whole group.</p> <p><b>Explanation (5 min.):</b> The student will watch the rest of <i>The Power of Pollinators</i> (from minute 3:56 until the end) and listen for ways humans can help pollinators.</p>





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**Elaboration (30 min.):** The teacher will read aloud (or have students read in table groups or with a partner) pp. 30-31 from the book, *What Is Pollination?* (“Helping Pollinators”).

The teacher will give each table group 3 minutes to design a poster to hang in the school/community to let people know the importance of pollinators and what humans can do to protect them.

The teacher will give students 20 minutes to work in their table groups to create their posters. The teacher will monitor the work to answer questions and assess student learning. The teacher will give students the opportunity to do a “gallery walk” to view each table group’s poster and provide feedback.

**Evaluation (5 min.):** The teacher will give students time to self-assess their completed posters, using the scoring tool provided.

**Elaboration (30 min.):** The student will read/listen to pp. 30-31 from the book, *What Is Pollination?* (“Helping Pollinators”).

The student will design and create a poster to hang in the school/community to let people know the importance of pollinators and what humans can do to protect them.

**Evaluation (5 min.):** The student will self-assess, using the scoring tool provided.

