

Lesson: Match That Pollinator

Grade Level: Third Grade, Life Sciences
Fifth Grade, Math- Measurements

Overview: Students will learn about the correlation between plants and pollinators. Students will review how plant growth is dependent on visiting animals and insects such as bees, beetles, hummingbirds, butterflies, and etc to pollinate. But just like humans, pollinators do enjoy the nectar from certain types of plants. Students will investigate and measure different pollinator's structures to predict what types of plants these pollinators collect nectar and/or pollen from. During the activity, students will model similar roles of an *Entomologist*. Scientists who study insects and the importance of pollination for species to thrive. Overall, students will gain knowledge of how both plants and animals need each other to survive in regards to food and reproduction.

Science Content:

Life Science: Biological Evolution: Unity and Diversity

Science standards:

3-LS4-2: Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

Science Practices:

APPENDIX F – Science and Engineering Practices in the NGSS www.nextgenscience.org

Practice 3 Planning and Carrying Out Investigations

- Evaluate appropriate methods and/or tools for collecting data.
- Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
- Make predictions about what would happen if a variable changes.

Math Content:

PA CORE STANDARDS Mathematics-

2.4 Measurement, Data, and Probability A) Measurement and Data

Math Standards:

Third Grade: CC.2.4.3.A.1- Solve problems involving measurement and estimation of temperature, liquid volume, mass, and length.

Fifth Grade: CC.2.4.5.A.1- Solve problems using conversions within a given measurement system.

Math Practices:

PA Core Standards Mathematical Content and Mathematical

- CCSS.MATH.PRACTICE.MP4:** Practice Model with mathematics.
CCSS.MATH.PRACTICE.MP5: Use appropriate tools strategically.
CCSS.MATH.PRACTICE.MP7: Look for and make use of structure.

Science & Math Connection:

Relationships and Convergences Found in the Common Core State Standards in Mathematics (practices), Common Core State Standards in ELA/Literacy*(student portraits), and A Framework for K-12 Science Education (science & engineering practices) *Venn Diagram NSTA Science, Math, & ELA*
<https://static.nsta.org/ngss/PracticesVennDiagram.pdf>

- S2. Develop and use models
- M4. Model with mathematics
- S5. Use mathematics & computational thinking

Materials:

- Pencils & paper
- Rulers
- Student flash cards (Two stacks A/B)
- Match That Pollinator Student worksheet

Resources:

- Optional resource: <https://entomology.unl.edu/scilit/Pollinators-meet-your-Plants.pdf>
- "Flowers and Their Pollinators: A Perfect Match" video, <https://youtu.be/pnBoM4idf1k>
- Read a-loud story, '*Evelyn the Adventurous Entomologist: The True Story of a World-Traveling Bug Hunter*' By: Christine Evans

Learning Objectives:

- Students will learn how pollinators collect nectar or pollen from different flowers and plants.
- Students will identify individual pollinators based on their external structures used to collect nectar and pollen.
- Students will discuss how individual pollinators can not collect nectar and or pollen from all types of plants and flowers.
- Students will learn about entomologists, scientists who study insects.

Key Vocabulary Terms:

- **Entomology:** The branch of zoology concerned with the study of insects.
- **Proboscis:** An elongated sucking mouthpart that is typically tubular and flexible.
- **Beak/Bill:** Hummingbirds have a beak or bill to reach deep down into tubular-like flowers to get nectar.

Procedure:

1. The teacher will start the lesson by introducing scientists who study insects, **entomologist**. The teacher will give students key vocabulary terms for this lesson.
2. The teacher will begin with the read aloud, "*Evelyn the Adventurous Entomologist: The True Story of a World-Traveling Bug Hunter*" By: Christine Evans.
3. The teacher will guide students into a class discussion about entomologists and why they study pollinators. The teacher can use the following guided questions-

- Why do you think entomologists study what plants pollinators visit?
 - Do you think pollinators visit every type of plant or choose what plants to collect nectar from?
 - When you go home and are looking for a snack, what would you choose from the fridge? Do you think pollinators are similar to you?
4. The teacher will give each student the *Match That Pollinator* student worksheet as well as rulers. Students will be given context clues and will have to find the correct pollinator based on their external structures and evidence given.
 5. **For third grade students, have students measure in inches or centimeters. For fifth grade students, have them measure both inches and centimeters OR have them convert centimeters to inches, vice versa.**
 - Example- (1 centimeter = 0.393 inch)**
 - Length of Hummingbird's beak = 3 centimeters**
 - Equation: $3 / 2.54 = 1.18$ inch.**
 - Conversion answer = 1.18 inch**
 6. When completed with the worksheet, the teacher will show the students a short video, "*Flowers and Their Pollinators: A Perfect Match*".
 7. For a final assessment, students will then continue as entomologists by using the identification cards, (A/B). Students can work together to complete the cards. Students will look at the pollinator cards (A) and match with the "best" option plant/flower cards (B). **Please note- a pollinator card can have more than one answer.**
 8. When students have completed the identification cards, the teacher will guide students in a class discussion and recap the lesson. The teacher can use the following prompted questions-
 - Do you think all pollinators visit every plant and flower? OR do pollinators have a preference for what plants and flowers they visit?
 - Do you think entomologists study and collect data on pollinators and what plants and flowers they visit? Why?

Answer Key:

(Please note- the answer key is based on the "best" option for each pollinator. Pollinators can visit more than one type of plant, students can select other options, as long as they use evidence to show why.)

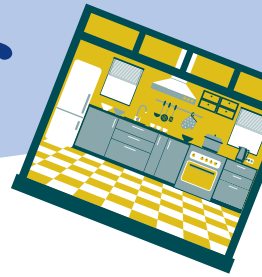
Student Worksheet

- A. Purple Coneflower = Butterfly
- B. Moon Flower = Bat
- C. White Aster = Fly
- D. Trumpet Vine = Hummingbird

Task Cards-

- A. Moth = Morning Glory
- B. Hummingbird = Trumpet Creeper
- C. Honey Bee = Apple Tree
- D. Fly = Skunk Cabbage
- E. Butterfly = Milkweed
- F. Wind = Corn

Match That Pollinator



Name: _____

When you open your fridge, do you prefer certain types of food? For example, would you rather eat an apple or an orange?! **Just as you have favorite foods**, pollinators have flowers that they **prefer** to feed from over others! There are many reasons why a flower may be liked or disliked by a pollinator. For example, the **color, shape, size, or nutrition** of a flower all matter to pollinators. Scientists research which flowers are favored by pollinators to support pollinator diversity. Below are a few types of pollinators and their notable preferences.



Bats have a long tongue that slightly curves. The tongue is also covered in tiny hairs to help drag up tasty nectar from large tubular shaped flowers. Bats are nocturnal and therefore tend to visit flowers that bloom at night.



Butterflies have a tongue called a proboscis. They will uncoil and extend into the flower. Butterflies like large, flat flowers that they can land on.



Hummingbirds have long, slender beaks used to probe deep into tubular-shaped flowers. Hummingbirds prefer bright colored flowers including shades of red and purple. Due to their large bodies, they need a lot of nectar and therefore visit large flowers.



Flies have small and straw-like shaped proboscis. Flies enjoy small clustered flowers. Flies prefer white and yellow flowers.



Match That Pollinator

Direction: Use a ruler to **measure** centimeters (CM) and inches (in) for the following flowers and pollinator's beaks and/or tongues. **Then draw a line** to match the pollinator with the best preferred flower option based on the pollinator's beak/tongue measurement.

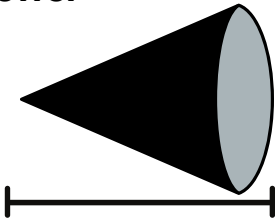
Type of Flower

Purple Coneflower



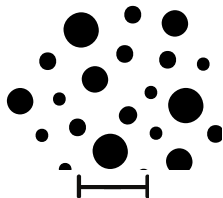
cm: in:

Moon Flower



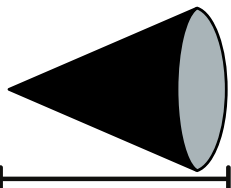
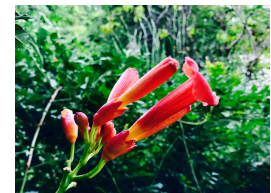
cm: in:

White Aster



cm: in:

Trumpet Vine



cm: in:

Type of Pollinator



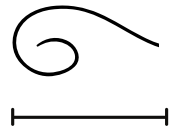
cm: in:



cm: in:



cm: in:



cm: in:

A

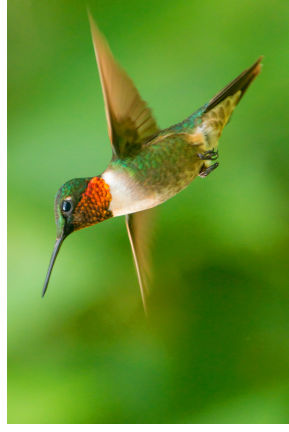
MOTH



- Visits night-blooming plants.
- Attracted to pale or white flowers.
- Attracted to open cup or tubular shape flowers
- Likes heavy fragrance flowers.

A

HUMMINGBIRD



- Attracted to red-hued flowers brightly-colored flowers.
- Able to access tubular shape flowers.
- Needs flowers that produce high volumes of nectar.

A

HONEY BEE



- Prefers white, violet-blue, and yellow color flowers.
- Attracted to flat or shallow blossoms.
- Prefers symmetrical shaped flowers.

A

FLY



- Attracted to green, white, brown, purple or cream flowers.
- Attracted to plants that have a "stinky" smell.
- Drawn to moist areas.

A

WIND



- Can pollinate a large area of plants at the same time.
- Can pick up parts of a plant that are lightweight.

A

BUTTERFLY



- Attracted to blooms that are flat-topped.
- Attracted to flowers that bloom in clusters.
- Attracted to red, yellow, orange, pink, and purple flowers.
- Enjoys nectar, tree sap, and over ripe or rotting fruit.

B

MORNING-GLORY
(MOON FLOWER)



- Large flower with pure white blooms.
- Blooms at night.
- Has a fragrant smell.

B

CORN



- Is a type of grass plant.
- The corn kernels are a type of fruit.
- Lightweight dusty pollen.
- Does not produce nectar.

B

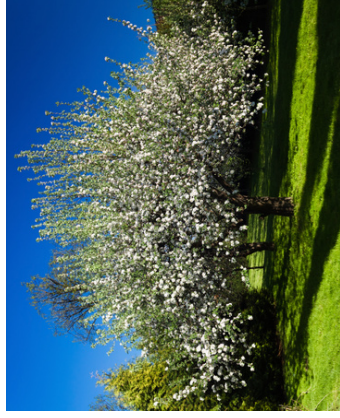
TRUMPET CREEPER



- Known for its showy yellow, orange, or red flowers.
- Shaped tubular.
- Has a vanilla-scented smell.

B

APPLE TREE



- white & pink type blossoms.
- Open faced-flat flowers.
- Symmetrical shaped like flowers.

B

SKUNK CABBAGE



- Has usually purple pedals.
- Grows in moist forest floors.
- Has a "stinky" odor when in bloom.

B

MILKWEED



- Has a fragrant light smell.
- Flowers bloom in clusters.
- Has a great source of nectar.