

Flower Talk: How Plants Use Color to Communicate

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MATERIALS & RESOURCES:

- [Read Aloud Link](#) - read by the author
- [5 of the Coolest Animal Partnerships](#) (symbiotic species) - video link
- [Parts of a Flower/Pollination](#) - video link
- [Flowers and Their Pollinators: A Perfect Match](#) - video link
- [Pollination: Trading Food for Fertilization](#) - video link (*should be used with students who know that pollination is "plant sex"*)
- Materials to build flowers, including but not limited to:
 - Colored paper
 - Chenille Stems
 - Cardboard tubes
 - Index cards
 - Masking Tape
 - Colored pom poms
 - Colored yarn
 - Scissors
 - Glue
 - Paper clips
 - Pony beads
 - Toothpicks
 - Markers
 - Glitter or baking soda - (*This will be needed for the activity*)

SUMMARY AND DETAILS

Want to know a secret? Flowers actually 'talk' to animals! This beautifully written and illustrated informational text is a delightful way to introduce the symbiotic relationship between plants and pollinators. Full of interesting facts and told from the perspective of a "prickly" cactus, this book will enlighten and entertain your audience.

Grade Level: 2nd-5th

Lexile Level: 570L

Guided Reading Level: Q

Genre: Informational Text

HOW TO IMPLEMENT THE HIGH FLIERS BOOK CLUB

- This book can be read aloud as an introduction to the pollinator and plant symbiotic relationship. The activity in this lesson provides an opportunity for students to demonstrate an understanding of how plants and pollinators interact with an exchange of pollen for food.
- This book can also be used as an Independent Reading Assignment for students based on their **Guided Reading Level** or **Lexile Level**. Use the following instructions for that course of action:
 - Determine if this book is the correct reading level for the students by Lexile Level or Guided Reading Level.
 - Create a schedule with the students for assignments, including how many pages need to be completed along with the Post-Reading Discussion Questions and Activity expectations.
 - Make a plan of how students will make up the work if they miss an assignment.
 - All content can be assigned digitally through LMS or in a face-to-face learning environment.

PRE-READING DISCUSSION QUESTIONS

- Read the title of the book, what do you think the author means by the term “flower talk?” How can flowers “talk”?
- Can you list some of the pollinators that might be in this book? (Educator - write down a list for the activity!)
- What do you already know about the relationship between plants and pollinators? What do you think plants want to communicate to pollinators?
- What do you think the smell of a flower might tell a pollinator?
- What do you think the color of a flower might tell a pollinator?

POST-READING DISCUSSION QUESTIONS

- Who is the narrator of this book? Why do you think the author chose this character as the narrator? How do you think the narrator feels about having to correct our human misunderstanding about plant/pollinator relationships? What is your evidence?
- When the cactus asks the reader to imagine what it would be like to be a plant having your legs stuck in the ground, he asks how you would eat, drink, and get your pajamas on. This is an example of a specific type of figurative language. What is it and why is the author using it in this book?
- Reread the four pages about how plants trick animals into visiting them. What do the flowers give? What do the flowers get? What type of relationship is this in the natural world?
- How do the colors “talk” to the different animals?
- How do white flowers “talk” to moths and bats?
- How do brown flowers trick flies?
- How do flower shapes help pollinators?
- If you were going to plant a garden, what flowers would you plant and why? What kind of pollinators would you hope to attract?
- What is the main idea of this book? What genre do you think this book falls under?

POST-READING DISCUSSION ANSWERS

- The cactus is the narrator. The author could have chosen this plant because, like a cactus, he has a “prickly” attitude at having to explain to the reader what is really going on in the natural world between plants and pollinators. Phrases like “what a load of fertilizer,” and “go

take a hike,” imply that the cactus is not thrilled about having to correct the misunderstanding humans have about plants. He assumes that we think flower color and smell are for humans, which is incorrect.

- This type of figurative language is **personification**, *the attribution of a personal nature or human characteristics to something nonhuman, or the representation of an abstract quality in human form*. The author uses this type of figurative language to create humor in the story, as plants do not wear pajamas but humans do.
- The flowers provide nectar as a food source, the flowers receive the pollen they need to make more babies of their own kind of plant. This is called a symbiotic relationship of mutualism: *the intimate living together of two dissimilar organisms in a mutually beneficial **relationship***. Learn more about these types of relationships with this amazing video! [5 of the Coolest Animal Partnerships](#) (symbiotic species)
- Certain animals see only some colors. For example, birds see red, but bees see blue, purple, and yellow. Moths and bats see white, flies see brown flowers, and green flowers do not “talk” to any of the animals because they can wind-pollinate.
- White flowers are easier to see at night when bats and moths are awake. They also have a strong perfume that is an extra incentive to draw in these night pollinators. Brown flowers have a strong smell that makes the fly think that there is something dead or rotting nearby, and a fly loves to eat dead or rotting things. The fly hopes to lay her eggs near whatever is producing the strong odor so that her babies will have something to eat when they hatch. The brown flower is neither dead nor rotting but the fly will visit anyway and take some of the pollen with her to other brown flowers, therefore tricking her into pollination.
- A butterfly needs a flower that acts as a steady platform since its body is much bigger than a bee or fly. Flower shape also plays a part in how the pollinator gets the nectar out of the flower depending on their mouthparts. For more information, watch this video [Flowers and Their Pollinators: A Perfect Match](#).
- The answer will be different for each student.
- The main idea of this book is that plants need pollinators to help make more plants of the same species. The plants use color and smell to draw different kinds of pollinators. The plant then rewards the pollinators with nectar, a good food source. This book is informational text.

CREATING A FLOWER ACTIVITY

BACKGROUND INFORMATION:

This activity helps students understand the exchange of pollen and nectar as well as how a flower's shape matches the pollinator's body and mouth structure. The students will research one of the pollinators from the book and create a flower that would be able to feed a specific type of pollinator. The students should consider the shape and color of the flower based on which pollinator they are trying to attract as well as the placement of the pollen and nectar within the flower's structure.

The following videos will help the educator provide more information about how the mouthparts and body of the pollinator must match the shape of the flower.

- [Parts of a Flower/Pollination](#) - video link
- [Flowers and Their Pollinators: A Perfect Match](#) - video link
- [Pollination: Trading Food for Fertilization](#) - video link (*should be used with students who know that pollination is "plant sex"*)

PREPARING THE LESSON:

The students will need to "test" their flowers with pollinator models.

Here are a few examples of easy-to-make pollinator models. Be sure that whatever model you use has a correct length mouthpart. This can be done with chenille stems cut to an appropriate length.

- [DIY Pom Pom Hummingbird](#)
- [How to Make a Pom-Pom Bee](#) - (this can be used to create a flower fly with smaller pom-poms as a flower fly is smaller than a bee)
- [How to Make a Realistic Butterfly](#) (this can be used to make a moth with different colors and body shape)

Part of the student's challenge is to build a flower that his/her pollinator could successfully get nectar from while also getting pollen on the animal's body. The students can craft these pollinators **or** the educator can craft them **before the lesson**. Craft stores often have faux animals in the floral section that could be used as models.

STEPS:

1. After reading the book, lead the students in a discussion about the unique relationship between animals and flowers. Point out the importance of pollen and nectar exchange.

2. Watch [Flowers and Their Pollinators: A Perfect Match](#) and discuss how the flower's design supports the animals' body shape and mouthparts. Be sure to point out how the tube-lipped bat in the video is able to eat the nectar within the flower while simultaneously getting pollen on its head to take to the next flower.
3. Use the photos attached to discuss how each pollinator's mouthparts are different. Share the following information, as well:
 - **Hummingbirds** drink nectar using long **tongues**. The tongue is so long that when retracted, it coils up inside the birds' heads, around their skulls and eyes. The **tongue** divides in two at the tip and its outer edges curve inward, creating two tubes running side by side.
 - **Butterflies and moths** drink through a tube-like tongue called a **proboscis**. It uncoils to sip liquid food or nectar and then coils up again into a spiral when the **butterfly or moth** is not feeding.
 - Most **bee's tongues** are protected by a long, two-sided, beak of a sheath. It folds under the body while the **bee** flies. When eating from a flower, the **bee** unfolds the beaky maxilla and extends its **tongue** into the center of the flower, dipping and retracting it to lap up the nectar.
 - The typical **flower fly** mouth works like an extendible sponge that **can** soak up either **nectar** or **pollen**. This species can feed on open flowers with accessible nectar like a disk flower.
 - Some species of **flower flies** are specialized to eat from tubular **flowers** and have a modified mouth that forms a narrow tube-like straw.
4. Show the students the pollinator models (hummingbird, butterfly, moth, bee, and fly) and tell them they have the challenge to choose and research one of these pollinators. They will need to find out how their insect eats nectar from flowers and how it carries pollen to other flowers.
5. Watch [Parts of a Flower/Pollination](#), point out the flower parts that are necessary for pollen nectar exchange. The students should be encouraged to include these parts in their creation! (stamen, pistil)
6. After researching, the students should sketch their flower designs on paper and decide what types of materials they will use to build their flowers. Any materials can be used to build their flowers. They should consider color when designing their flower.
7. To test the nectar and pollen exchange, use either a small amount of glitter or chalk powder on the stamen of their flower. When the pollinator "drinks" the nectar, some of the glitter or chalk should come off onto its body to determine if pollination and nectar exchange was successful.



JOURNAL PROMPT

- Honey bees have a behavior called ‘flower fidelity,’ which means that they will only visit one type of flower on any given foraging mission. Here are two links to articles that explain more about how ‘flower fidelity’ causes bees to be incredibly successful pollinators. Read [Pollination by Honey Bees](#) and [Good To Be a Beekeeper](#) and explain in your own words how ‘flower fidelity’ is beneficial to the plant kingdom.
- Design your own garden to invite a certain type of pollinator. What types of flowers will you have? Who are you inviting to your garden and why?
- *I Wonder Journal Prompts - I wonder what flowers with many colors are telling pollinators? I wonder what it would be like to be a pollinator? I wonder if I were a pollinator, what kinds of flowers I would be drawn to and why? I wonder what it would be like to be a flower?*

The High Fliers Book Club - Flower Talk: How Plants Use Color to Communicate

ELA COMMON CORE

WRITING STANDARDS FOR INFORMATIONAL TEXT

2nd Grade: RI.2.1, RI.2.2, RI.2.6, W.2.2, W.2.7, W.2.8

3rd Grade: RI.3.1, RI.3.2, RI.3.6, W.3.2, W.3.7, W.3.8

4th Grade: RI.4.1, RI.4.2, RI.4.6, RI.4.9, W.4.2, W.4.7, W.4.8, W.4.9

5th Grade: RI.5.1, RI.5.2, RI.5.6, RI.5.9, W.5.2, W.5.7, W.5.8, W.5.9

NEXT GENERATION SCIENCE STANDARDS

2nd Grade: 2-LS2-2,

3rd Grade: 3-LS3-2,

4th Grade: 4-LS1-1,

5th Grade: 5-LS2-1,



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"Hummingbird Moth AKA White-lined Sphinx Moth" by Chicago Manis is licensed under CC BY NC 2.0



"super-close-up-honey-bee-drinking-macro" by Dennis Goedegebuure is licensed under CC BY-NC-ND 2.0



"Flower Fly on Tasselflower" by bob in swamp is licensed under CC BY 2.0



"Hummingbird drinking nectar" by Joshua Tree National Park is marked with CC PDM 1.0

TERMS	DEFINITION OR MEANING
Disk Flower	A radially symmetric (i.e., with identical shaped petals arranged in circle around the center) individual flower in the head, which is ringed by ray flowers when both are present.
Flower Fidelity	When bees visit the same type of flower in a single foraging mission due to their preference for nectars having sugar contents and pollens with higher nutritive values.
Foraging	A wide search over an area in order to obtain a food source such as nectar and pollen.
Nectar	Sweet fluid produced by flowers that is 60% water and 40% solids; it is the raw material from which honey is made, a food source for pollinators.
Ovary	The part of the pistil that holds the eggs awaiting fertilization; it becomes the fruit.
Petal	Modified leaves that have a unique shapes and color to attract pollinators.
Pistil	The female parts of a flower including the stigma, ovary, and eggs or ovules.
Pollen	Very small dust-like grains produced by flowers, these are the male germ cells of the plant; it also provides a protein source for some pollinators.
Pollination	The transfer of pollen from the anther (the male part) of one flower to the stigma (female) of another flower in the same species; this process ensures fertilization of the plant.
Proboscis	An elongated sucking mouthpart that is typically tubular and flexible.
Stamen	The male parts of a flower including the stamen which produces the pollen.
Stigma	Part of the female parts of the flower, the sticky part at the top that catches the pollen from another plant.
Symbiotic Relationship	The intimate living together of two dissimilar organisms in a mutually beneficial relationship.
Wind Pollination (Anemophily)	The process where the wind carries pollen from one plant to another which is then fertilized; common in wheat, rice, corn, and oats.