Science Math

FLOWER TALK

Grade Level
2-5

Length of Lesson
30 minutes

Objective
By the end of this lesson, students will understand that some flowers attract insects using colors that humans cannot see.

Materials
- Invisible ink markers with lights
- Regular markers or colored pencils (optional)
- Copies of student worksheet

Standards
NGSS
2-LS2-2; 3-LS1-1; 4-LS1-1-2; 4-PS4; 5-LS2-1

Common Core
CCSS.M.P2

CSTA
IA-AP-08; IA-AP-09; IB-AP-08

Lesson Summary
This lesson is designed as a fun coding activity that helps students recognize how flowers use UV light to attract various insects like bees.

Suggested Sequence of Events:
1. Read the book Flowers Are Calling by Rita Gray to capture student interest.
2. Read through the IAITC Pollinator Ag Mag to learn more about pollination and native IL pollinator and plant species. Interactive online versions can be found on our website.
3. Complete the activity following the procedures:
    - Each student needs a copy of the student worksheet and an invisible ink marker. A regular marker or colored pencil of any color is optional, but a pencil would be just fine.
    - Read through the introduction paragraph. Students should already have a basic understanding of the process of pollination.
    - Read the intro paragraph on the student worksheet. Then explain the directions. Each worksheet will take three students to complete and each student will play the role of “Student 1”, “Student 2”, and “Student 3”.
        - “Student 1” - Creating the path of the bee: Use the invisible ink markers to mark an “X” on the flowers to make a path. When all students are ready, have them pass the worksheet to the next student. Students have to choose a flower above, below, or to the right of each flower the mark an “X” so that there are no gaps in the bee’s path. Students should not make an “X” on all flowers or it will be difficult to determine the path.
        - “Student 2” - Using directional coding: Use the blacklights to create an arrow code of the path from student 1. When all students are ready, have them pass the worksheet to the next student. Each new flower is another arrow.
        - “Student 3” - decoding: Use a pencil, colored pencil, or regular marker to color the flowers according to the arrow code from student 2. Students will pass their worksheets back to the original student to see if the paths match!
4. Whole class discussion and reflection of activity.

TEACHER RESOURCES

Extension Ideas

- Learn about the Waggle Dance of bees. In this activity, “Student 3” has to figure out what flowers the ‘bee’ visited and copy that path. The waggle dance and the arrow code are both forms of communication.
- Find pictures and videos online that show what UV light looks like on real flowers. There are many examples that show side-by-side comparisons of the same flower as how we see it vs. how insects see it.
- Read Flower Talk: How Plants Use Color to Communicate by Sara Levine to learn more about what attracts pollinators to different plants.
    - Talk more about the reasons why plants have evolved their color, shape, and scent to attract various species.
- Read Buzzing With Questions: The Inquisitive Mind of Charles Henry Turner by Janice Harrington and learn about an inspirational entomologist who studied insect behavior.
- Flowers and insects have a mutualistic relationship. Learn more about mutualism and what other plants and animals share this type of relationship.
- Have students create a comic strip showing the process of pollination.
- Learn more about flowers and pollinators that are native to Illinois. What does it mean for a plant or animal to be *native* to an area? Why is it important to learn about native species? How are native species beneficial to the ecosystem?
- Have students learn about the anatomy of honey bees by using the IAITC lesson “The Bees Knees and More”.
- Learn more about light waves and how light is on a spectrum. Are there other colors that humans can’t see?
- Go to agintheclassroom.org to contact your County Ag Literacy Coordinator for free classroom sets of IAITC Ag Mags.

Science

Math

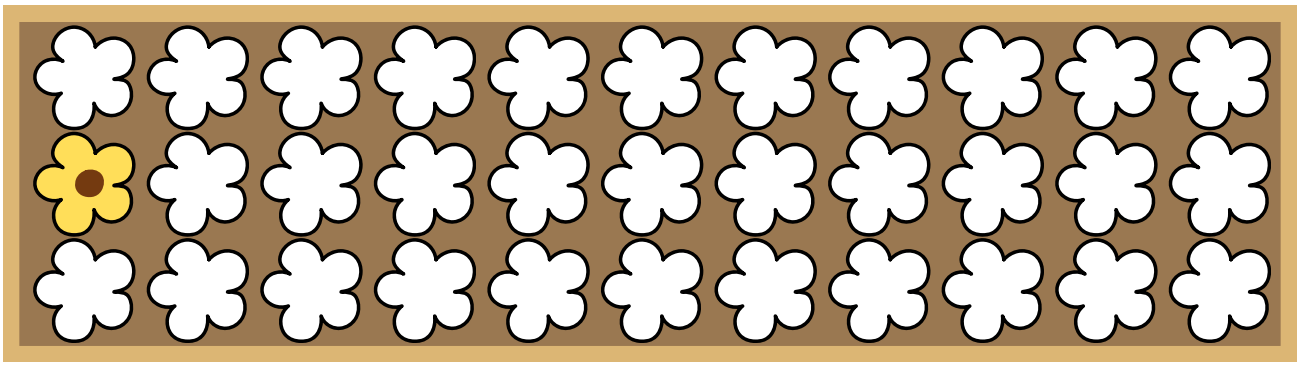
FLOWER TALK

STUDENT WORKSHEET

Since flowers can't move around, they rely on critters to help spread pollen to different flowers of the same type. In return, the flowers offer delicious nectar and pollen to those critters. Critters like birds, insects, and beetles are attracted to flowers because of their color, scent, and even their shape. Many insects are attracted to a color that humans can't see - ultra violet light (UV). Flowers have different patterns of UV light on them that are like little maps. These "maps" show bees and butterflies where the nectar and pollen is located!

STUDENT 1: _____

Starting at the yellow flower, use your invisible ink marker to make an "X" on the flowers the bee visited on its path across the garden. The bee can only travel **up**, **down**, and **right**.



STOP WAIT HERE!

STUDENT 2: _____

Use your flashlight to decode the path the bee took to get to the other side of the garden. Using a pencil, write only arrows to communicate which direction the bee went after it left the yellow flower.

STOP WAIT HERE!

STUDENT 3: _____

Use the arrows above to mark the path the bee took to get across the garden. Use a regular marker or colored pencil to color in the flowers on the path.