



COLLEGE OF SOCIAL & BEHAVIORAL SCIENCES

Women in Science
& Engineering

The Bio/Diversity Project

Introduction to Sonoran Desert Pollinators

Teacher: Lily & Grace

Grade Level: 9th

Time Teaching: 50 mins

This lesson has been adapted from: [Flowers Seeking Pollinators](#) and [Pollination Investigation Field Journal](#)

AZ Science Standard:	Cheat sheet for AZ science standards <i>HS.L4U1.27</i> Obtain, evaluate, and communicate evidence that describes how changes in frequency of inherited traits in a population can lead to biological diversity
Learning Objectives:	- Students will be able to predict and confirm why flowers attract specific pollinators - Students will be able to explain to a friend why pollinators and plants need each other
Scientist of the Week:	<i>Dr. Kathleen Prudic</i>  - Entomologist, co-director of eButterfly, - Tucson, AZ "I study where pollinators are, what they are doing, and how we can help them in a rapidly changing world using citizen and data science techniques." - Dr. Prudic



Vocabulary		Materials		
● Pollination ● Biodiversity ● Fertilization ● Ecosystem ● Keystone species		● Google Slides Slideshow ● Class set of blank paper ● Blooket ● Fill in the blank worksheet for student journals (3 pages or one copy of this document per 2 students. Worksheets should be cut in half on the line, so each student gets 3 half sheets.) Data literacy activity: ● Printed sonoran desert-adapted data sheet ● Printed pollinator profile cards ● Printed constructing explanations worksheet Student count: 105		
Seasonality: Any seasonality				
<i>Monsoons</i> July-Sept.	<i>Autumn</i> Oct.-Nov.	<i>Winter</i> Dec.- Feb.	<i>Spring</i> Mar.-Apr.	<i>Dry Summer</i> May-June
Guiding Questions:				
● <i>What does pollinator diversity look like in the Sonoran Desert?</i> ● <i>What kind of impact do pollinators have on ecosystem function and productivity?</i>				

Engagement/Introductory Activity:

Ice breaker activity: Flower Competition

- Students gather into small groups of 3-5 people, with those at their desk pods.
- Pass out a blank piece of paper to each group.
- Students assign one writer per group.
- Teachers set a 2-minute timer.
- Students think and write as many types of flowers as they can until the timer goes off.
- Students grade their paper, counting up how many types of flowers they thought of.
- Student teachers ask the students reflecting questions: Why are there so many different flowers? What are some differences between the flowers they listed? How do these flowers spread/reproduce?

**Exploratory Activity:****Data Literacy**

- Split students into pairs and instruct them to sit together (if they are not already. It helps to use students sitting next to each other at a table already so students don't have to move seats.)
- Assign each pair of students a pollinator: bee, bat, bird, butterfly, moth, or fly.
- Pass out the **Pollinator Data Observation Sheet**
- Students should take the time to read the descriptions of all the flowers and look at the data before answering the questions. On the back, they will answer the following questions:
 - *Who is your pollinator?*
 - *What flower did your pollinator visit the most?*
 - *What are three flower traits that you think attract your pollinator?*
 - Let students know that they are beginning to construct explanations about what flower features attract their pollinator. Their current explanations are only based on observations in the field, which is exactly how research scientists build their explanations. Next, they will receive more information about their pollinator to modify or strengthen their explanations.
- Pass out the [Constructing Explanations sheets](#) (1 per student) and the [Pollinator Profile cards](#). Each group should get the Pollinator Profile that corresponds to their pollinator.
- Once students have read their Pollinator Profile, they will write down 3 flower traits that are attractive to their pollinator on the Constructing Explanations sheet. This time, they will have more information to use, so remind students to consider the following:
 - Compare the information in the profile to the data gathered from pollinator observations. This can indicate if it's a trait that the pollinator is attracted to, or is a trait the flower has for a different reason.
 - Encourage students to not just look at the data from the flower their pollinator visited the most but look at trends amongst all the flowers. For example, bees went to Flower 2 the most, but they also went to Flower 6 – do Flowers 2 and 6 have anything in common?
 - These may end up being the same 3 traits that they wrote down earlier, but they need to be supported by the information they just learned about their pollinator.

Explain:

- Bring the whole class back together and debrief.
- Present discussion questions.
 - *Why are pollinators important to ecosystems?*
 - *Why are pollinators important to humans?*
 - *Pollinators are important because they provide plants with the proper pollination, which is needed for plants to reproduce and produce flowers and any agricultural foods. When we overlook certain pollinators, we overlook the important work they do.*

Extension Activity/Questions:

- On the computer connected to a projector, open up the [blooket quiz](#).
- Select host, and then select the "classic" gamemode.
- Press "Host" again.



- Change the settings if you wish, but the default is okay. Press “Host now” to begin the game.
- Ask the students to navigate to play.blooket.com and enter the ID displayed on the screen.
- Once most/all students have joined, begin the game! Also, allow students to use their notes during the quiz to encourage note-taking during class.

Evaluation Activity:

- Have students discuss what answers they were surprised by, or what they got right.
- For example, the question about the weight of a Rufous Hummingbird- Ask students:
 - Why do you think they are so light? Did you think that they would weigh as much as a penny?
- The students should be able to explain why pollinators and flowers need each other. Ask them to think about why humans might need pollinators. Have them reflect on which of their favorite foods would not exist without pollinators! (Fruits, vegetables, nuts, etc.)