

# Tucson Botanical Gardens

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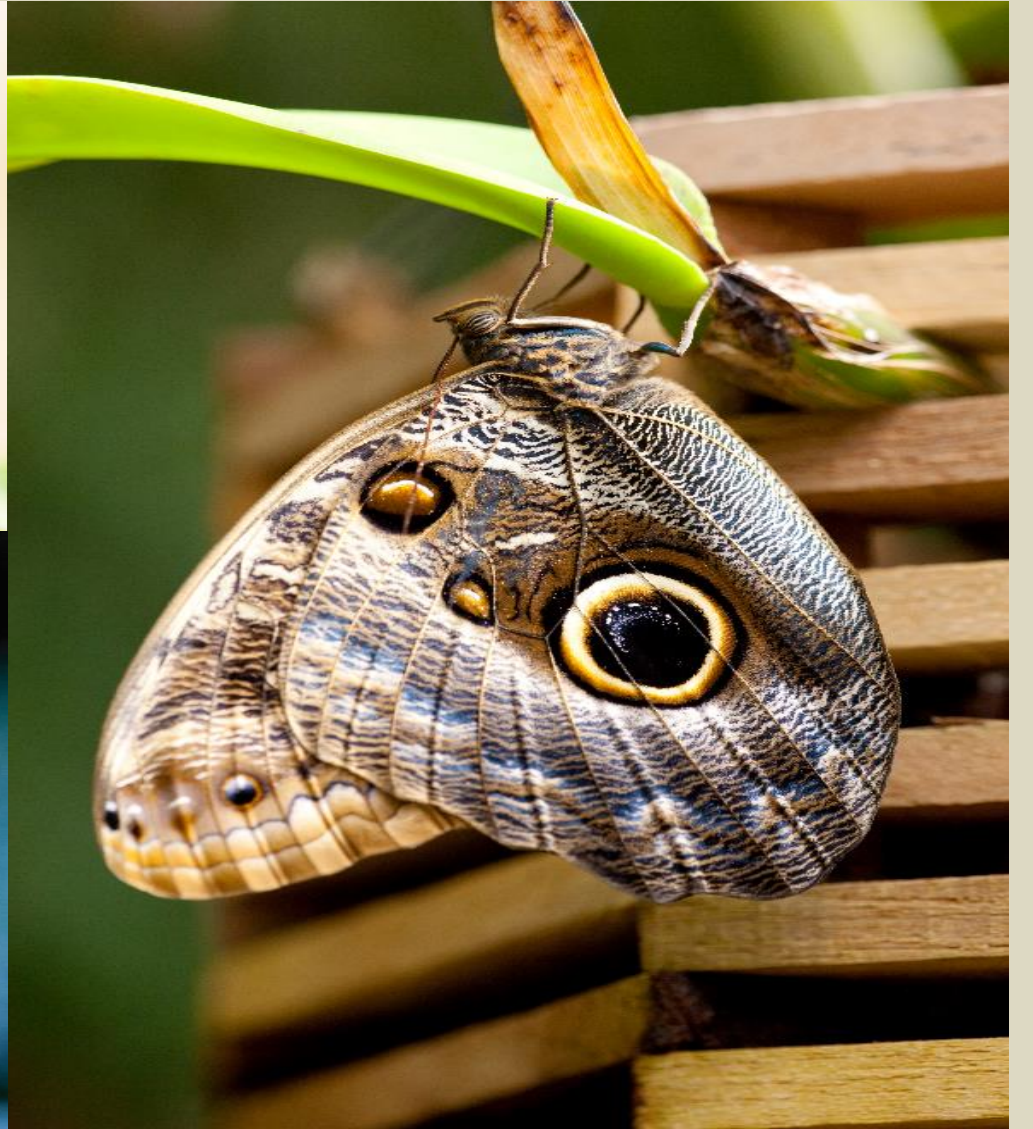
# Garden Facts

- 5.5 acres
- 1 FT and 2 PT education employees
- ~4,000 school children each year
- Limit of 85 people per day
- Kindergarten – 2<sup>nd</sup> Grade
- Come for Butterfly Magic











# Goals

- Make it easier for teachers
- Structure visit to Gardens
- Facilitate a better understanding of native butterflies before/after Butterfly Magic experience.



# **“Butterfly Magic” Emergence Kit & Lessons**

- What is an insect?
- Life Cycle of a Butterfly
- Caterpillar Observations
- Butterflies and Us
- Butterflies and Moths
- The Butterfly’s Job



## Lesson 6: The Butterfly's Job Pollination and Arizona Butterflies

**Objective:** Students will be able to describe the role of butterflies in pollination of flowers and identify 3 native Arizona butterflies

**Materials:** A Butterfly's Job Poster, Pollen on a Flower Poster, Spreading Pollen Poster, Native Arizona Butterflies Posters, Activity Pages: "Butterfly Pollination", "Native Arizona Butterflies", Glitter (not included)

**Approach:** Butterflies have an important job to do in our world and they do it all the while they are sipping up nectar. Do you know what it is? Look at this picture and tell me what this butterfly got on his proboscis while feeding? (pollen)

### Lesson:

1. "Pollen is a yellow powder that plants make – it might make you sneeze but plants make it because they need it in order to make seeds for more plants. Plants need to trade pollen with other flowers like it, but how can they do that? Maybe the wind will help, but insects like bees and butterflies help the most."
2. "When butterflies go from flower to flower sipping up nectar, they often get the pollen on their legs, wings and proboscis. When they land on the next flower, some of that pollen brushes off and helps that flower make seeds. Without butterflies, we would not have the wide variety of colorful flowers that we do."
3. "In Arizona, we have some very special native butterflies that help our wildflowers:

Queen Butterfly, Giant Swallowtail, Gulf Fritillary, Sleepy Orange, Pipevine Swallowtail"

### Practice:

1. Students may simulate butterfly pollination by using the Butterfly Pollination Page. Cut out the butterfly and fold along the outer wing edge. You may mount the butterfly and flowers on sticks if desired.

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## Butterfly Pollination



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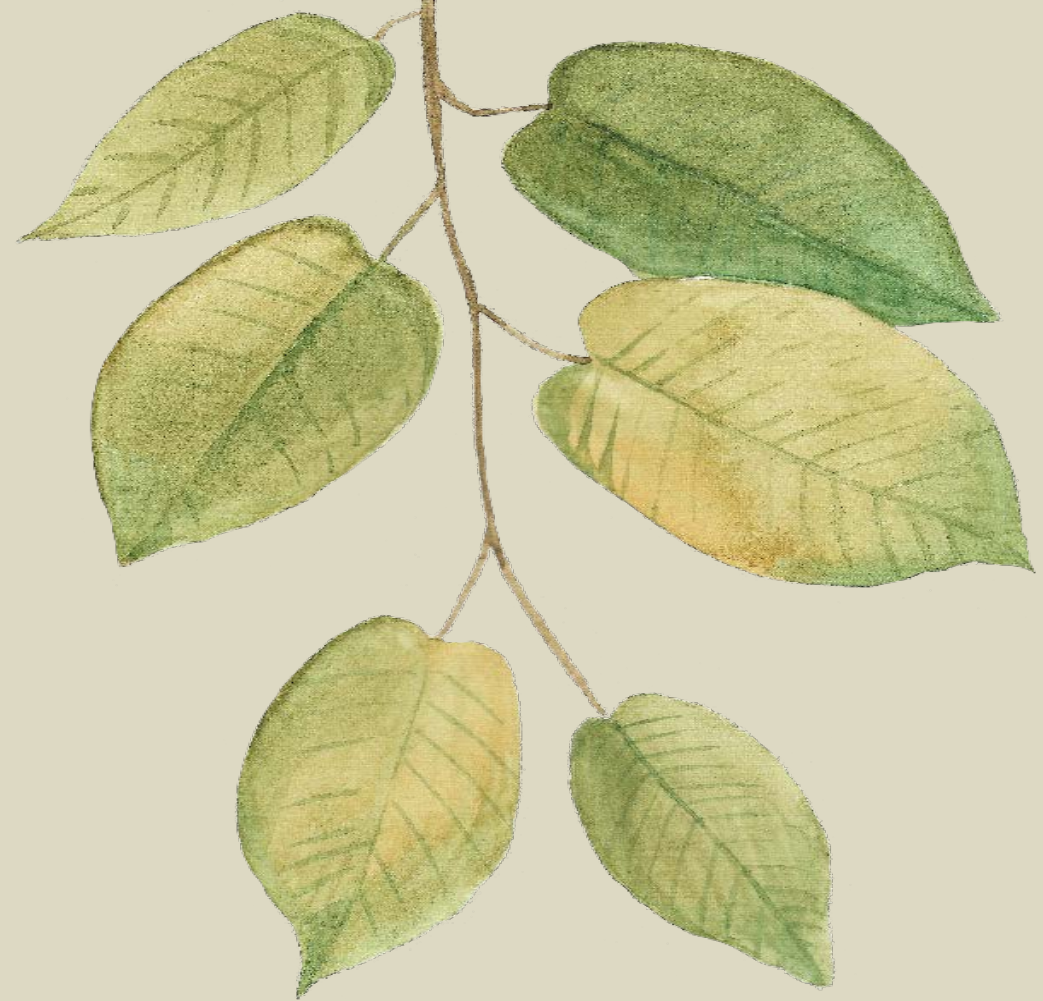
# Successes

- Teacher Workshops
- Easy to Fund
- Observationally, groups seem more engaged

# Challenges

(aka Opportunities)

- Virtually no evaluation
- Sick caterpillars



# Adapting for Your Garden

- What are your internal priorities?
- Nearly all lessons work without the emergence kit
- Lots of other opportunities with materials within the kit



# United States Botanic Garden



# Why A New Curriculum

- Engage students who we otherwise might not be able to work with due to capacity issues
- Pull in expertise from the outside – curriculum specialists – in this case who work with Title I schools in DC
- Contract for facilitation and teacher trainings

Hello, my name is Violet and I am a botanist at the United States Botanic Garden. I study plants and learn how they are able to survive in different environments.



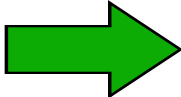


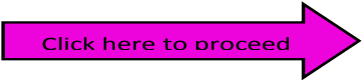



UNITED STATES BOTANIC GARDEN

## Pre- and Post-Lesson Facilitation Guide Overview

The purpose of this guide is to help you facilitate the pre- and post-lessons for your upcoming trip to the U.S. Botanic Garden. This curriculum is designed for easy use. This guide includes:

- Tips about certain questions to ask or content to cover
- Tips for facilitating the hands-on experiences (if applicable)
- Tips for facilitating the assessment (after you complete the trip)
- Additional tips:
  - Slides contain audio recordings. Be sure to project in “slideshow” mode and enable volume.
  - When Violet asks a question or makes a statement, allow students time to discuss before moving forward.

Key to Symbols in Slideshows	
	Click anywhere to move forward
	Each student should write in his/her Botanist's Journal
	Click to play video
	Click directly on this arrow to advance (you will see  when you hover over the arrow)

### Timing

Pre-lesson: ≈ 75 min (can be taught in two sessions if desired)

Post-lesson: ≈ 45 min (plus additional teacher time for evaluating assessments)



We will conduct an experiment:

- Discuss what each part might represent and what plant lessons you could teach with these simple supplies.
- In your team, build a plant model.
- When it rains, where do you think most of the water will go?
- Now let's make it rain.
- Which part of the plant do you think will absorb the most water?



## Learning Goals and Standards

The unit is most appropriate for students in grades 3-5.

### LEARNING GOALS

Participation in this lesson will enable students to...

- Identify plant parts on different species of plants
- Describe how plants' roots, stems, and leaves help them access water and sunlight
- Make observations about plants and the environments in which they grow
- Collect evidence from experiments and observations
- Make hypotheses about plant adaptations based on collected evidence

### STANDARDS

This unit supports student learning consistent with both local and national science education standards.

For example:

- *Asking questions and defining problems:* Ask questions that can be investigated and predict reasonable outcomes based on patterns.
- *Developing and using models:* Develop and/or use models to describe and/or predict phenomena.
- *Planning and carrying out investigations:* 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.



learn more...

**The Cultural Landscape Foundation:  
Landslide, Heroes of Horticulture**

The Museum of Horticulture exhibit has been part of the Cultural Landscape Foundation's Landslide project in partnership with the U.S. Botanic Garden. The exhibit features a collection of plants and a series of photographs as part of the Landslide project. The exhibit is a public awareness of the importance of cultural landscapes and the role of the Cultural Landscape Foundation.

Learn more about the Landslide project at [tclf.org/landslide](http://tclf.org/landslide)