

Lesson Title: GCE-LTER STEM Schoolyard Project – Native Plant Pollinator Garden

Lesson Inspiration: During my visit to Sapelo Island John Crawford “Crawfish” took us on a tour of the island. One of our first stops was at the ruins of the Sapelo Island Sugar Mill. Beside the Sugar Mill was a beautiful native plant pollinator garden. I was instantly inspired by this space and decided this would be a great project to extend at my school. Liberty Elementary is located approximately 15 miles inland from the coast. This project will allow students to observe native plants located on Sapelo (Scarlet Hibiscus, Seaside Goldenrod, Blazing Star, False White Indigo, Sweet Grass, Powderpuff, Passion Flower, and Beach Rosemary) and observe the sustainability of these plants inland. This project will begin in the classroom using our Alternative Gardens to sprout the seeds and transplant the young plants into our schoolyard garden outside.

This project will also incorporate raised garden beds like we built in the Hog Hammock Community. The students will help design and build raised garden beds in our schoolyard garden space.

See shared Google Drive folder for pictures of the Sapelo Island Pollinator Garden and Hog Hammock Community Garden, <https://drive.google.com/drive/folders/0B2pSQLCC-liLTJJdmk4dWVDam8?usp=sharing>.

Grade Level:

2nd

Quarter:

1st, 2nd, 3rd and 4th

Standards:

Science

S2L1: Obtain, evaluate, and communicate information about the life cycles of different living organisms.

Math

MGSE2.MD.1: Measure the length of an object by selecting and using appropriate tools

MGSE2.OA.4: Use addition to find the total number of objects arranged in rectangular arrays.

MGSE2.G.2: Partition a rectangle into rows and columns of same size squares and count to find the total number of them.

ELA

ELAGSE2SL1: Participate in collaborative conversations about 2nd grade topics with peers and adults in small and larger groups.

ELAGSE2W7: Participate in shared research and writing projects.

ELAGSE2RL1: and **ELAGSE2RI1:** Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.

Lesson Essential Question:

EQ: How can I create a sustainable habitat for pollinators using native plants grown in our LED Hydroponic Garden?

Vocabulary:

Sequence, life cycle, insect, butterfly, plant, native

Lesson Materials Garden Area Plants Seeds Soil Garden Tools Measuring Tape/yardstick/ruler/meter stick	Internet Resources: http://www.monarch-butterfly.com/ http://www.fs.fed.us/wildflowers/pollinators/monarchbutterfly/ http://www.ehow.com/info_8071063_flow-ers-butterfly-garden.html	Lesson Assessment: <ul style="list-style-type: none"> • Student research should lead students to create a habitat that includes: <ol style="list-style-type: none"> a) Milkweed, Scarlet Hibiscus, Seaside Goldenrod, Blazing Star, False White Indigo, Sweet Grass, Powderpuff, Passion Flower, and Beach Rosemary b) Brightly colored flowers that contain nectar c) A shallow, moist area for butterflies to drink d) A large rock for the butterfly to sun themselves • Students should complete a line plot that reflects the growth of their plants. • Student created habitat • Student Journal
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STEM Challenge Overview:
Globally, the population of pollinators has been declining for the past few years due to the lack of host plants and the overuse of pesticides. This has led to the decline of pollination of fruit and other flowers which affects our local food supply.

Teacher Background:
Students have been exploring, researching, and observing various plant and animal life cycles. In this challenge students will create a garden habitat that will help meet the needs of pollinators.

INSTRUCTION

1. Ask/Engage (Day 1, 30 minutes)

- Begin by showing the students the video, “How to Create a Monarch Butterfly Rest Stop”
<https://www.youtube.com/watch?v=6JpLR2hpfSk>
- During the video take time to discuss why it’s important we do not lose a population of insects.
- Now tell the students that they will be getting to create their very own Butterfly Garden.
- Read the overview, then challenge:

Globally, the population of pollinators has been declining for the past few years due to the lack of host plants and the overuse of pesticides. This has led to the decline of pollination of fruit and other flowers which affects our local food supply.

Challenge:
You will help to add to the population of pollinators in Georgia by creating a garden habitat at your school that meets the needs of each stage of their life cycle.

- Show students the seeds you will be planting.
- Students will begin growing the seeds in the classroom LED Hydroponic System. Plants will be transplanted to the school yard garden 3 weeks from the date of seed growth.
- After observing either a partially grown plant or seed discuss what the students have to be able to do.
- Have students complete the Ask part of their journal.

2. Imagine/Brainstorm (Day 2, 30-45 minutes)

- Introduce the constraints of the design plan. Define the criteria for success.

- Criteria:**
1. Using the internet, research the needs of a butterfly habitat and the types of plants and other structures that support each stage of their life cycle
 2. Measure the garden space that you will use and determine the maximum number of plants that you can plant in that area.
 3. Design and draw the layout of the garden space.
 4. Plant garden and monitor growth by measuring growth and recording information which will be used to construct a line plot.

- Constraints:**
1. Each group will be given 1 plant per person.
 2. You may only use materials that your teacher supplies.

- Ask each student to work independently to come up with 1-2 possible design solutions. Students should draw/label their designs.
- Have students get into groups of 4. Students could also do this project as a whole class since they are creating a garden or find area that can be used around your school grounds and give each group a certain number of square footage.

3. Plan/Design (Day 2 continued)

- Each student presents their ideas to their team.
- Student teams collaborate to come up with final design plan.
- Students draw final design plan and make a list of needed supplies.

4. Create / Test (Days 3-5) Research could be conducted in small groups during guided reading stations. It could also take place in the media center or a computer lab in your school. This part will need to be determined what is best for you and your class.

- Students will conduct their research about their garden habitat for a butterfly during this time.
- Once research has been conducted students will begin to create the habitat in your school grounds.
- Student teams build their design according to their design plan.
- Students test their design plan.

5. Evaluate/Improve – and repeat Steps 1-5

- Students evaluate their design for success. Did it meet the established criteria? Did their final design match their planned design? How would students improve their design?
- **Hopefully your butterflies have hatched that are in your classroom upon completion. Release them in your garden. Your butterflies will most likely be painted ladies.**

Name _____

Save the Pollinators! 2nd Grade



Challenge: You will help to add to the population of pollinators in Georgia by creating a garden habitat at Liberty Elementary School that meets the needs of each stage of their life cycle. How can we create a sustainable habitat for pollinators using plants grown in our LED Hydroponic Garden?

Criteria:

1. Using the internet, research the needs of a butterfly habitat and the types of plants and other structures that support each stage of their life cycle
2. Measure the garden space that you will use and determine the maximum number of plants that you can plant in that area.
3. Design and draw the layout of the garden space using an array.

4. Plant garden and monitor growth by measuring growth and recording information which will be used to construct a bar graph.

Constraints:

1. Each group will be given 1 plant per person.
2. You may only use materials that your teacher supplies.

Materials: Garden Area, Plants, Seeds, Soil, Garden Tools, Measuring Tape/yardstick/ruler/meter stick

Additional materials may be needed after conducting research

Internet Resources:

- <http://www.monarch-butterfly.com/>
- <http://www.fs.fed.us/wildflowers/pollinators/monarchbutterfly/>
- http://www.ehow.com/info_8071063_flowers-butterfly-garden.html

1. **ASK / ENGAGE:** What is the problem you are being asked to solve?

2. **IMAGINE/BRAINSTORM:** What are some possible solutions to the problem that you are trying to solve? After you brainstorm, draw and label your ideas below.

<p style="text-align: center;">Idea #1</p>	<p style="text-align: center;">Idea #2</p>
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3. **PLAN/DESIGN:** Share your ideas with your group and collaborate to decide on a final design plan. Draw your team's design below and make a list of the materials that you will need to complete your design.

<p style="text-align: center;">Team Design Plan</p>	<p style="text-align: center;">Materials List</p>
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4. **CREATE/TEST**: Use your Final Design Plan to create and build your solution. Test your design. Did it work? Why or Why not?

5. **EVAULATE/IMPROVE**: How well did your design work? Did your solution solve the problem within the given constraints?

How can you improve your design? How can you make it better? Draw and label your improved design below.

Improved Design Plan

