Thank you for your interest in the Container Conspiracy Project and its STEM education initiative, the **Metal Petal Patch.** Our collective is a passionate group of small business owners and educators committed to making an impact in Houston communities. What began as a simple community garden at The Shack in Sunnyside has blossomed into a larger mission; connecting students with hands-on learning through sustainability, science, and innovation.

01. Elementary School (Pre-K to 5th): The Amazing World of Plants

a. Unit 1: Plant Life Cycle

A. Lesson 1: Parts of a Plant (roots, stems, leaves, flowers, fruits/seeds) – hands-on dissection of a plant.

1. **Overview[1]:**
   This interactive science lesson introduces students to the five main parts of a plant; roots, stems, leaves, flowers, and fruits/seeds, through a hands-on plant dissection activity. Students will explore real plants, identify each part, and learn their functions in a fun and engaging way.

   Key Features
   - Students work in small groups to dissect and observe a real plant.
   - Emphasis on tactile learning, scientific observation, and vocabulary building.
   - Supports state science standards for plant biology and life cycles.
   - Encourages curiosity, teamwork, and respect for nature.

   Learning Objectives
   - Identify and label the major parts of a plant.
   - Understand the function of each plant part.
   - Practice observation and scientific inquiry through exploration.

   Potential Materials Used[2]: Fruiting Plants, child-safe garden tools.

[1] This is an example of the lesson plans provided by The Metallic Sunflower Foundation if you/your school decided to partner with us. Lesson plans would include materials, books, etc. to help aid with the educational experience.

[2] This is based on the resources available to the Metallic Sunflower Foundation through donations from sponsors, the public, and members of our collective.

B. Lesson 2: Plant Needs (sunlight, water, nutrients, air) – simple hydroponic setup demonstration.
C. Lesson 3: Germination Experiment – planting seeds in hydroponic and soil environments, comparing growth.
D. Lesson 4: The Life Cycle (seed, sprout, seedling, plant, flower, fruit/seed) – creating a class timeline and observations.

b. *Unit 2: Water Wonders*
   A. Lesson 5: Water Absorption – observing how plants absorb water through their roots using colored water.
   B. Lesson 6: Water Conservation – discussing water usage and conservation strategies in gardening.
   C. Lesson 7: The Water Cycle – demonstrating the water cycle using a simple model.
   D. Lesson 8: Water Testing – testing the pH of water and its impact on plant growth.

c. *Unit 3: Nutrients and Growth*
   A. Lesson 9: Plant Food – introducing the concept of nutrients and their importance for plant growth.
   B. Lesson 10: Nutrient Deficiency Experiments – observing the effects of nutrient deficiencies on plant growth in hydroponic systems.
   C. Lesson 11: Healthy Eating – connecting plant nutrients to human nutrition.
   D. Lesson 12: Hydroponic System Design – building a small-scale hydroponic system.

Suggested Duration: 6–8 weeks (1-2 session per week)

Unit 1: Plant Life Cycles

Students explore how plants grow, change, and reproduce through hands-on observation and experimentation.

Lesson Topics:

- Parts of a plant (roots, stems, leaves, flowers, fruits/seeds)
- Plant needs (sunlight, water, air, nutrients)
- Germination and early growth
- Stages of the plant life cycle

Key Outcomes:

- Students identify major plant parts and their functions
- Students explain what plants need to survive
- Students understand the basic plant life cycle

Hands-On Workshops:

- Plant dissection and observation
- Seed planting in soil and hydroponic systems
- Life cycle timelines and class observations

Unit 2: Water Wonders

Students investigate how water supports plant life and learn why water conservation matters.

Lesson Topics:

- How plants absorb and transport water
- Water conservation in gardening
- The water cycle
- Water quality and pH

Key Outcomes:

- Students explain how plants use water
- Students understand the water cycle
- Students recognize how water quality affects plant health

Hands-On Workshops:

- Colored water absorption experiments
- Water cycle models
- Basic pH testing activities

Unit 3: Nutrients and Growth

Students learn how nutrients support healthy plants and apply their knowledge through system design.

Lesson Topics:

- Plant nutrients and plant food
- Effects of nutrient deficiencies
- Connecting plant health to human nutrition
- Introduction to hydroponic systems

Key Outcomes:

- Students explain why plants need nutrients
- Students observe cause-and-effect relationships in plant growth
- Students connect food systems to human health

Hands-On Workshops:

- Nutrient comparison experiments
- Observing plant growth in hydroponic systems
- Building a mini hydroponic setup