GEMS NET New Plants Kit 1st Grade Workshop

Background Knowledge: **(In most cases, background knowledge has been built through use of a science kit in the classroom and/or a prior visit by a member of AYERSfoundation to the classroom)**

Objective and Learning Standard:
The objective of this workshop is to use real world settings and practical applications to reinforce the classroom work undertaken and theories taught by schoolteachers working with the New Plants GEMS NET kit. The following learning standards that may be investigated are:

1. **S1 (K-4) INQ –1** Collect and organize data about physical properties in order to classify objects or draw conclusions about objects and their characteristic properties (e.g., temperature, color, size, shape, weight, texture, flexibility).
2. **LS1 (K-4) - INQ+POC –1** Sort/classify different living things using similar and different characteristics. Describe why organisms belong to each group or cite evidence about how they are alike or not alike.
3. **LS1 (K-4) SAE -2** Identify the basic needs of plants and animals in order to stay alive. (i.e., water, air, food, space).
4. **LS1 (K-4) POC –3** Predict, sequence or compare the life stages of organisms – plants and animals (e.g., put images of life stages of an organism in order, predict the next stage in sequence, compare two organisms).
5. **LS1 (K-4) FAF –4** Identify and explain how the physical structures of an organism (plants or animals) allow it to survive in its habitat/environment (e.g., roots for water; nose to smell fire).
6. **LS2 (K-4) SAE –5** Recognize that energy is needed for all organisms to stay alive and grow or identify where a plant or animal gets its energy.

Glossary of Terms:

(This list contains terms that could be applicable to and used in the workshop(s); however, all of them may not be incorporated into the activities)

Plant
Grow
Light
Sun
Carbon dioxide
Oxygen
Photosynthesize
Food (photosynthate)
Climate
Soil
Develop
Structure
Stem
Flower
Seed
Bulb
Germination
Roots
Cluster
Stem
Bud
Leaf
Nutrients (macro and micro)
Nitrogen
Potassium
Phosphorous
Water
Pests
Disease
Life Cycle
Pollen
Node
Cuttings
Environment
Sprouting
Pollination
Fruit
Cones
Evergreens
Broadleaf
Temperature
Beneficial Insects

The New Plants WORKSHOP aims to reinforce the following broad Objectives:

- Develop a curiosity and interest in plants as living things.
- Experience some of the diversity of forms in the plant kingdom.
- Provide for the needs of growing plants.
- Observe and describe the changes that occur as plants grow and develop.
- Become familiar with the structures and functions of flowering plants (root, stem, leaf, bud, flower, seed).
- Discover various ways that new plants can develop from mature plants
- Compare change over time in different kinds of plants
- Organize and communicate observations through drawing and writing.
- Acquire the vocabulary associated with the structures of plants.

POSSIBLE New Plants WORKSHOP STATIONS:

[Note: the activities listed below can be tailored to the classroom teacher's goals and plans. We will work with the teacher to ensure that our program(s) meet expectations and are customized to best enhance the learning of that teacher's particular students; all programs are flexible.]

[Note: We try to carry out program activities in small teams of students in order to maximize quality and depth of learning experiences.]

Seed Down Station

Objective: to reinforce the theories and classroom work of the New Plants GEMS NET kit by facilitating activities in which students determine:

a. the relationships between seed size and sowing depth.
b. the relationships between seed size and soil tilth.
c. the relationships between seedling size and seed spacing.

Possible Guiding Questions and Concepts:
(Numerous activities can be created surrounding 1 or more question(s) to activate prior/background knowledge):

- What provides (e.g. sand, peat, vermiculite, bone meal, worm casting) for the best soil mix?
- Define soil tilth.
- How does aeration, filtration, and moisture retention impact seed germination and early plant development?

Possible Activity- Seeding Down
Student will have the opportunity to participate in sol mixing, filling appropriate container with soil mix, and sow seeds. Students may work in pairs or teams.

Planting Root Vegetables

Objective: to reinforce the theories and classroom work of the New Plants GEMS NET kit by facilitating activities in which students determine:

a. the planting requirements of different root vegetables (depth, spacing,)
b. the planting techniques of various root vegetables.

Possible Guiding Questions and Concepts:
Numerous activities can be created surrounding 1 or more question(s) to activate prior/background knowledge):

- What are root vegetables? What are their attributes?
- Why is planting depth important? Why does planting depth vary for each root vegetable?

- Why is mounding important?
- How do we plan for weed management in terms of space?

Possible Activity-Planting Root Vegetables
Students will participate trenching and planting root vegetables with potential opportunities to observe specialized tractor work for planting root vegetables.

Greenhouse Station 1 – Lifecycle and Structure & Function

Objective: to reinforce the theories and classroom work of the New Plants GEMS NET kit by facilitating activities in which students:

a. determine the relationship between plant parts and plant function.
b. determine the life cycle of the plant.
c. experience the stages of a plant's life cycle.

Possible Guiding Questions and Concepts:
(Numerous activities can be created surrounding 1 or more question(s) to activate prior/background knowledge):

- What is direct seeding and which vegetables are seeded directly versus transplanted? Why?
- Why do we introduce vegetables to a greenhouse at different stages of its lifecycle?
- What are the relationships between plant parts and overall plant function?

Possible Activity-Tomato Flowers to Fruit
Students will find a flower, stem, root, leaf. What do you think each part of the plant contributes to its survival? Look at the tomato plants and describe the clusters of fruit and flowers where tomatoes will grow. Based on what you see and discuss (i.e that the number of flowers signal the number of fruit to come), ask students to find the tomato plant that will most likely have the most tomatoes. Why? How many tomatoes might it have? How do you know? Now find the plant that will probably produce the least amount of fruit. How many? Why? (This math activity – Flowers for fruit- can be adapted to include other questions, explorations and depending on time can be extended to deepen the understanding of math in the greenhouse and fruit production).

Greenhouse Station 2 – What Plants Need/Seasons & Climate

Objective: to reinforce the theories and classroom work of the New Plants GEMS NET kit by facilitating activities in which students determine:
a. the best conditions (e.g. humidity, carbon dioxide, temperature, climate) to optimize plant growth and disease and insect management.

Possible Guiding Questions and Concepts:
(Numerous activities can be created surrounding 1 or more question(s) to activate prior/background knowledge):

- What are the relationships between plant parts and overall plant function?
- How and why does the climate impact the quality of the growing environment?
- How does climate affect the habitat of insects?
- How does a greenhouse provide more favorable conditions for plant growth and insect management?

Possibly Activity-What do Plants Need
Students will have the opportunity to work in pairs and determine what plants need for survival and optimal growth. Think Pair Share- Students can tell their partner what they think that plants need in order to survive. If they want they can keep track of the number of things they mention. Then they can share with the group to decide what plants need –water, care, love, sun, earth, etc. The activity can be extended to then with their partner think about what could be different in the seasons. Are there seasonal needs? What could be some potential problems for plants during the different seasons and weather conditions?

Mulching Station

Objective: to reinforce the theories and classroom work of the New Plants GEMS NET kit by facilitating activities in which students determine:
a. the components of mulch.
a. the benefits of mulching to plants.
c. when this practice is best used.

Possible Guiding Questions and Concepts:
(Numerous activities can be created surrounding 1 or more question(s) to activate prior/background knowledge):

- What does mulch mimic in the natural world (the duff layer of forest floor)?
- What is the duff layer of the forest?
- How does mulch affect the growing conditions of plants (e.g. moisture, temperature, barrier to bugs, soil protection)?

Possible Activity – Mulching
Students will have the opportunity to mulch using hay or plastic mulch and discuss and observe the differences between the two.

Art Station

Objective: to reinforce the theories and classroom work of the New Plants GEMS NET kit by facilitating activities in which students:
a. create an artistic representation of a plant at the farm.

Possible Activity-Drawing
Find a plant at the farm and draw it. Label some of the different parts. What colors are the leaves? The roots? Decide what the roots might look like and draw them?
Share your drawing with the group or with a partner and tell about the plant you drew.

Plant Health/Bugs

Objective: to reinforce the theories and classroom work of the New Plants GEMS NET kit by facilitating activities in which students determine:

a. good and bad bugs in terms of plant health
b. the ways in which bad bugs impacts plant health.
c. the ways in which good bugs interact with bad bugs to affect plant health.

Possible Guiding Questions and Concepts:
(Numerous activities can be created surrounding 1 or more question(s) to activate prior/background knowledge):

- What are beneficial insects?
- What is an insect pest?

- What are the various ways that beneficial insects reduce the population of insect pests?

Possible activity-Bug Release

Students will have the opportunity to release ladybugs and possibly other beneficial insects at various stages of their life cycle in the greenhouse.