How Does Your Garden Grow?

Grade Level: Kindergarten
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Length of Unit: Three weeks

I. ABSTRACT

Kindergarten is a unique time in a child's life. All kindergarten students are new to the educational process, so it is important to teach them in a way they can learn. We think that one of the best strategies a teacher can employ is an integrated curriculum approach. In the unit *How Does Your Garden Grow,* we utilize this approach to teach plants. The unit not only has many classroom hands on activities, but also includes the actual preparation, growing, and harvesting of a garden culminating with a feast from our harvest!

II. OVERVIEW

A. Concept Objectives
1. Plants are living things.
2. Plants need air, water, sun, and nutrients to grow.
3. Plants have roots, stems, leaves, flowers, and seeds.
4. Roots and stems carry nutrients to the leaves, which make food.
5. Flowers make seeds.
6. Seeds of plants will reproduce only the same plant.
7. Some seeds are edible.
8. Some plants are a source of food.
9. Edible plants are called fruits and vegetables.
10. Plants are an important resource.

B. Core Knowledge Content
1. Plants and plant growth
2. Taking care of the earth
3. George Washington Carver
4. Classification
5. Sayings
   a. April showers bring May flowers.
   b. Great oaks from little acorns grow.
6. Familiar and Favorite Poems
   a. *Rain, Rain, Go Away*
   b. *April Rain* song
   c. *Roses Are Red*

C. Skills Taught
1. Sorting/Classification
2. Prediction
3. Comparison
4. Matching
5. Writing conveys a message
6. Stories have a beginning, middle, and end.
7. Observation
8. Identification

9. Graphing

III. BACKGROUND KNOWLEDGE

A. Teacher Resources

1. Taylor, Barbara. *Step Into Science Green Thumbs Up*! New York: Random House, 1991,ISBN 0-679-82042-6
2. Hirsch, Jr. E.D. *What Your Kindergartner Needs to Know.* New York: Dell Publishing, 1996, ISBN 0-385-48117-9

B. Prior knowledge for students: because they are kindergartners, we assume that the students have little prior knowledge. We established some prior knowledge during our Native American unit. We learned about corn and its importance to early settlers. We also planted corn seeds in our science center during that time. Additionally, during our seasons unit, we learned about deciduous and evergreen trees. We discussed the fact that trees are plants. Other prior knowledge will be established in our introductory lesson and through the use of KWL charts.

IV. RESOURCES

A. Ehlert, Lois. *Growing Vegetable Soup*. San Diego: Harcourt Brace Jovanovich, Publishers, Inc. ISBN 0-15-232580-8

B. Kuchalla, Susan. *Now I Know All About Seeds.* New Jersey: Troll Associates, 1982 ISBN 0-89375-659-8

C. Back, Christine. *Bean and Plant.* New Jersey: Silver Burdett, 1986, ISBN 0-382-24014-6

D. Carle, Eric. *The Tiny Seed*. New York: Simon Schuster, 1987, ISBN 0-887-08015

E. Marzollo, Jean. *I'm A Seed*. New York: Scholastic, 1996, ISBN 0-590-26586-5

F. Aliki. *A Weed is a Flower*. New York: Simon and Schuster, 1988, ISBN 0-671-66490-5

G. Silverstein, Shel. *The Giving Tree.* New York: HarperCollins, 1964, ISBN 006025665-6

H. Krauss, Ruth. *The Carrot Seed.* New York: Scholastic.1945, ISBN 0-590-73301-X

V. LESSONS

Lesson One: Introduction to plants

A. Objectives

1. Lesson Content: Students will build background knowledge about plants.
2. Concept Objective: Students will gather information about plants.
3. Skill objective
   a. Students will create a list of what they know about plants and what they want to learn about plants.
   b. The students will identify things associated with plants.

B. Materials

1. Plant
2. Chart paper
3. Markers
4. KWL chart
5. Collection of plant-related objects (tools, seeds, gloves, soil, flowers, etc.)
6. Large bag to hold the items listed above
7. *Growing Vegetable Soup* by Lois Ehlert

C. Vocabulary

1. Rake
2. Shovel
3. Hoe

4. Seeds
5. Sprouts
6. Soil
7. Blossom
8. Bud
9. Stake
10. Weed

C. Procedures /Activities:

Introduce vocabulary words. Begin the lesson by showing the students the plant you have brought to class today. Talk briefly about the plant and ask the children about the color, texture, leaves, etc. Have the students brainstorm all of the things they know about plants and record this information on the KWL chart. Next, ask the children what they do not know about plants. Formulate questions about plants that they would like to find the answers. Record these questions on the KWL chart. Next, take out the bag filled with plant related items. Identify each item as a whole group activity. Discuss the relationship of the items in the bag to plants. Guide the students in a discussion about plants. Finally, read the story *Growing Vegetable Soup* by Lois Ehlert. Linger on pages allowing the students time to make comments. Reread the book taking time to read all the labels in the book. After completing the book, make an interactive chart entitled "Growing Vegetable Soup." Create sentence strips that the children match to the text. Make construction paper flowerpots and glue them to the bottom of the chart. Glue wooded Popsicle sticks in the center of each pot. Attach Velcro above the stick. Provide seed packets for the children to hang on the paper fasteners.

E. Evaluation/Assessments: Teacher Observations

Lesson Two: Plants living or non-living?

A. Objectives
   1. Lesson Content: Plants are living things.
   2. Concept Objective:
      a. The student will differentiate between living and non-living things.
      b. The student will identify plants as living things.
   3. Skill Objective: The student will sort and classify living and non-living things.

B. Materials:
   1. Pictures of things both living and non-living things
   2. Chart paper divided in half labeled living/non-living
   3. Plant
   4. Doll
   5. Chart paper
   6. Tongue depressors with a green paper leaf on one side, brown paper leaf on the other side
   7. Living/Non-living worksheet: see Appendix A

C. Vocabulary
   1. Living
   2. Non-living

D. Procedure: Introduce vocabulary words. Compare a person to a doll. Encourage children to tell how they know whether something is living or non-living. Write responses on chart paper. Tell children that they are going to play a game in which they will choose whether something is living or non-living. Tell children that if you show a living thing, they should show the green leaf. If you show a non-living thing, they should show the brown leaf. Display the pictures or

objects, and have children respond to it as either living or non-living. Place the object under the chosen label on chart paper. The last object shown is the plant. Discuss what makes a plant a living thing.

E. Evaluation/Assessment: Take the students outside and have them look around to locate a living item and a non-living item. Have students explain why each item is either living or non-living. Finally have students complete Living/Non-living **worksheet.**

Lesson Three: What a plant needs to grow

A. Objectives
   1. Lesson Content: Plants need air, water, sun, and soil
   2. Concept Objective: The student will label what a plant needs to grow.
   3. Skill Objective: The student will identify requirements for plant growth.

B. Materials
   1. Plastic bags
   2. Paper towels
   3. Lima bean seeds
   4. Stapler
   5. Water
   6. Mist spray bottle
   7. *Now I Know All About Seeds* by Susan Kuchalla
   8. Plant Needs Worksheet: see Appendix B

C. Vocabulary
   1. Air
   2. Water
   3. Soil
   4. Nutrients
   5. Germination
   6. Acorn
   7. Oak Tree

D. Procedures: Place folded paper towel in the bottom of a plastic bag. Staple in the middle. Gently place seed on stapled shelf. Dampen towel with a mist spray bottle. Close bag and label with names. Staple to bulletin board. Allow students to make predictions regarding plant growth. Introduce vocabulary words. Begin a plant growth diary and record daily entries showing observations of seed germination. Read *Now I Know All About Seeds* to the class. Follow with discussion about plant needs, highlighting air, sun, soil and water.

E. Evaluation/Assessment: Student will complete Plant Needs worksheet.

Lesson Four: Parts of a Plant

A. Objectives
   1. Lesson Content: Plants have many parts
   2. Concept objective: Student will identify plant parts.
   3. Skill objective: The student will distinguish the parts of a plant.

B. Materials
   1. *Bean and Plant* by Christine Back
   2. Parts of a Plant transparency copied from worksheet.
   3. Parts of a Plant worksheet: see appendix C
   4. Laser Disc player
   5. Cornet Laser series
   6. Sequence of a Life Cycle worksheet: see appendix D

C. Vocabulary
   1. Root

2. Stem
3. Leaves
4. Flower

D. Procedures: Read the book *Bean and Plant* to the class. Pay special attention to the pages explaining the parts of a plant. After completing the book, introduce new vocabulary. Put on the overhead transparency *Parts of a Plant.* Label the parts of a plant as a whole group activity. Introduce the laser disk player to the students. Show them how to scan the bar codes in the book *Bean and Plant.* Leave the laser disk out as a center with a Life Cycle sequencing paper in the center to be completed.

E. Evaluation/Assessment: Student will complete *Parts of a Plant* worksheet as an independent activity.

Lesson Five: How Plants Get Food

A. Objectives
   1. Lesson Content: Roots and stems carry nutrients to the leaves.
   2. Concept Objective: The student will observe the absorption of dye, representing nutrients, through the stem and into a plant.
   3. Skill Objective: The student will observe roots soaking up water containing food coloring.

B. Materials
   1. Several white carnations
   2. Food coloring (assorted colors)
   3. Clear vases or glasses to place carnations in
   4. *What Your Kindergartner Needs To Know* by E.D. Hirsch Jr.
   5. Chart Paper with the following Poems: *Rain, Rain Go Away*; *April Rain* Song; *It's Raining, It's Pouring*

C. Vocabulary
   1. Absorption
   2. Carnation

D. Procedure: Revisit the transparencies Parts of a Plant transparency. Review vocabulary words. Look specifically at the roots, stem, leaves, and flowers. Discussion on how nutrients are found in the soil and water should follow. Ask how the nutrients will enter the plant and feed it. Encourage student discussion about the absorption of the nutrients into the roots, through the stem and into the leaves and flowers. After discussion time, complete a class experiment. Fill several clear containers with food coloring and water. Place a carnation in each container. Observe for several hours. (This experiment should be performed in the morning so that the absorption has time to take place.) Petals of the flower will change to the color of the water. Another idea is to split the stem on one carnation and put each half of the stem into different cups containing different colored water. The split stem carnation will turn two colors! What fun! Finally, introduce your students to poems listed on chart paper.

E. Evaluation/Assessment: Teacher observations of student participation in discussion and class experiment.

Lesson Six: Where do seeds come from?

A. Objectives
   1. Lesson Content: Seeds come from flowering plants and are transported in a variety of ways.
   2. Concept Objective:
      a. The student will identify that seeds come from flowers.
      b. The student will recognize how seeds are transported.

3. Skill Objective:
    a. The student will create an illustration of the seed cycle.
    b. The student will dissect a flower and observe the seeds.

B. Material
1. *The Tiny Seed* by Eric Carle
2. Sunflowers or another similar flower with well defined centers or seed pods (Lilies, roses, iris work well)
3. Sentence strip containing the saying "April showers bring May flowers."
4. Pictures of: people planting seeds, birds eating seeds, squirrels hiding nuts

C. Vocabulary: Seed Pod

D. Procedures: Introduce vocabulary. Read *The Tiny Seed* by Eric Carle. Review the Parts of the Plant transparency. Emphasize that the job of the flower is to make seeds. In a whole group setting the teacher will dissect a large flower pointing out the seed. Place children in small groups giving each group a flower. Have groups dissect their flower to observe its seeds. Review *The Tiny Seed* by Eric Carle. Emphasize the seed coming out of the flower and growing into a plant of the same variety. Display pictures of ways seeds can be planted; discuss. Refer back to *The Tiny Seed* as needed. Finally, introduce the saying "April showers bring May flowers." As a culminating activity to the seed lesson, read *Carrot Seed* and create a class big book entitled Watermelon Seed. Make this a book in which the character is encouraged that his seed will grow.

E. Evaluation/Assessment: Students will make a beginning, middle, and end illustration of *The Tiny Seed* by Eric Carle.

Lesson Seven: From Acorns to Mighty Oaks

A. Objectives
1. Lesson Content: Seeds of plants reproduce like kinds
2. Concept Objective: The student will recognize that a seed can only reproduce a plant of the same species.
3. Skill Objective:
    a. The student will plant a garden and observe seed growth.
    b. The student will write and illustrate a garden journal.
    c. The student will graph seeds according to attributes.
    d. The student will construct an oak tree life cycle mobile.

B. Materials
1. *I'm A Seed* by Jean Marzollo
2. Garden tools
3. Variety of seed packets
4. Chart paper
5. Teacher made individual garden journals: see Appendix E
6. Seed Graph
7. Oak leaf pattern: see Appendix F
8. Acorn pattern: see Appendix F
9. Scissors
10. Tag board
11. Yarn
12. Pencil
13. Glue
14. Ruler
15. Hole punch
16. Fall color construction paper

17. Sentence Strip containing the saying "Great oaks from little acorns grow."

C. Vocabulary: Review of past concept related vocabulary

D. Procedure: Display a variety of seeds. Discuss differences in color, texture, and size. Introduce vocabulary words. Give each student an assortment of seeds (approx. 25). Have students graph their seeds by various attributes including size, texture, etc. Next, have students make predictions about what plants will grow from these seeds. Chart responses. Read the book *I'm a Seed* by Jean Marzollo. Develop a diagram for garden layout on chart paper. Reinforce the concept that seeds reproduce like kinds. Create an oak tree life cycle mobile as seen in appendix. Introduce the saying "Great oaks from little acorns grow" to the class. Go outside and plant the class garden!

E. Evaluation/Assessment: Students will illustrate the planting of the garden for the first entry in their individual garden journal.

Lesson Eight: Seeds as Food

A. Objectives
   1. Lesson Content: We get food from seeds.
   2. Concept Objective: The student will discover that many seeds are food.
   3. Skill Objective: The student will make peanut butter.

B. Materials:
   1. *A Weed is a Flower* by Aliki
   2. Egg carton for each student
   3. Variety of edible seeds (corn, beans, peas, green beans, peanuts)
   4. Sheath of wheat and wheat flour
   5. Blender
   6. Raw peanuts
   7. Vegetable oil
   8. Salt
   9. Magnifying glasses for each student.
   10. Recipe for peanut butter on chart paper: see Appendix G
   11. Wheat cracker

C. Vocabulary: Sheath

D. Procedures: Introduce vocabulary. Discuss with the students the various seeds that humans use as a food source. Show them a display of edible seeds (corn, peas, green beans, and peanut). Read the story *A Weed is a Flower* by Aliki. Give each child ten raw peanuts to shell. Have each student break open several peanuts and look at the sprout inside using a magnifying glass. After examination time, place all peanuts into the blender. Add remaining ingredients and follow charted recipe to make homemade peanut butter. Serve each child some on a wheat cracker. Show the students the wheat sheath. Tell the students that the cracker was made from wheat seeds. Wheat seeds are so hard that we would crack our teeth if we tried to chew them. They must be ground into flour to be used as a food.

E. Evaluation/Assessment: The students will bring in a variety of edible seeds from home and make their own seed display in an egg carton as modeled.

Lesson Nine: Fruits and Vegetables

A. Objectives
   1. Lesson Content: We eat many plant parts.
   2. Concept Objective: The student will recognize that, in addition to the seed, many other parts of the plant are edible.
   3. Skill Objective:
      a. The student will develop an awareness of fruits and vegetable.

c. The student will develop a list of fruits and vegetables.
d. The student will identify what part of the plant is vegetable or fruit.
e. The student will select a fruit or vegetable at the produce department.
f. The student will formulate an opinion about his/her favorite fruit or vegetable.

B. Materials
1. Any necessary materials and preparations required by your school for a field trip to the produce department of a local grocery store or farmers market. Students will need enough money to purchase a fruit or vegetable.
2. Chart paper
3. Markers
4. Pictures of fruits and vegetables
5. Chart that depicts the five parts of a plant (root, stem, leaf, flower, and seeds)
6. Fruit and vegetable dips
7. Notebook paper

C. Vocabulary
1. Fruit
2. Vegetable

D. Procedures: Introduce vocabulary words. Develop a list of fruits and vegetables on chart paper. Review children's responses and list them under the correct categories on the plant part chart. At this point, you will take your class on an enriching learning experience to the produce department. While there, the students will have the opportunity to purchase a fruit or vegetable that they would like to taste. When you return, have a taste test of vegetables and fruits. Each child will log his/her like or dislike of a fruit or vegetable by marking it with a smiley face or sad face on notebook paper. Dips for the fruits and vegetables should be provided.

E. Evaluation/Assessment: Students will formulate an opinion as to their favorite fruit or vegetable and illustrate it.

Lesson Ten: We need plants!

A. Objectives
1. Lesson Content: Plants are valuable resources.
2. Concept Objective: The student will recognize plants as valuable resources.
3. Skill Objective: The student will create a graphic organizer of plant resources.

B. Materials
1. *The Giving Tree* by Shel Silverstein
2. Chart paper
3. Markers

C. Vocabulary
1. Valuable
2. Resources

D. Procedures: Introduce the vocabulary words. Read the book *The Giving Tree* by Shel Silverstein. Discuss how the tree was a valuable resource to the boy throughout his life. Create a graphic organizer (web) entitled "How Plants Help Us." List student responses on the web. Display a collection of plant resources like fruits, wood, paper, dye for clothing, vegetables, furniture,

cotton clothing, and medicine. Use these items to broaden children's understanding of ways in which plants help people and animals.

E. Evaluation/Assessment: Create a class mural of resources provided by plants.

VI. Culminating Activity

One of the best features of this unit is our outdoor classroom. Early in this three-week unit, the class goes outside and begins to prepare the ground for a garden. You might consider recruiting the help of a father or two! This is done in place of a lesson for one or two days. It is best for this activity to coincide with lessons 1 –5. These lessons include content related to plant needs. After the garden site is readied, it will be planting time. Again, this event will occur over one or two days in place of specific lessons. The time frame is approximate but does coincide nicely in lessons 6 and 7. For about 60 days, we take care of the garden and write in journals about its growth. A schedule of care can be set up to share the job with other kindergarten classes. Finally, harvesting day comes. As you collect things from the garden, remember to review all the different concepts taught through out the three-week unit. A feast is the final activity. We have had several different feasts over the years. We've enjoyed salads, soups, and vegetable platters. It is amazing what kindergartners will eat when they grow it themselves!

VII. Handouts/Worksheets

VIII. Bibliography

Taylor, Barbara. *Step Into Science Green Thumbs Up*! New York: Random House, 1991,ISBN 0-679-82042-6

Hirsch, Jr. E.D. *What Your Kindergartner Needs To Know.* New York: Dell Publishing, 1996, ISBN 0-385-48117-9

Ehlert, Lois. *Growing Vegetable Soup*. San Diego: Harcourt Brace Jovanovich, Publishers, Inc. ISBN 0-15-232580-8

Kuchalla, Susan. *Now I Know All About Seeds.* New Jersey: Troll Associates, 1982 ISBN 0-89375-659-8

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Marzollo, Jean. *I'm A Seed*. New York: Scholastic, 1996, ISBN 0-590-26586-5

Aliki. *A Weed is a Flower*. New York: Simon and Schuster, 1988,ISBN 0-671-66490-5

Silverstein, Shel. *The Giving Tree.* New York: HarperCollins, 1964, ISBN 006025665-6

Rylant, Cynthia. *This Year's Garden.* New York: Simon Schuster, 1984 ISBN 0-689-71122-0

Schreiber, Anne. *Log Hotel.* New York: Scholastic, 1994 ISBN 0-590-273892

Peterson, John. *Tulips.* New York: Holt, Reinhart, and Winston, 1963.

Westcott, Nadine. *Peanut Butter and Jelly*. New York: Penguin Books. 1987. ISN 0-14-054852-1

Cole, Johanna. *Magic School Bus Plants Seeds*. New York: Scholastic 1995. ISBN 0-590-22296-1

Ehlert, Lois. *Planting A Rainbow.* Singapore: HBJ 1988. ISBN 0-15-262609-3

Cole, Joan. *The Showery, Flowery, Spring Book*. New York: McGraw Hill.1988. ISBN 0-07-064002-5

McGuire, Richard. *The Orange Book*. New York: Puffing Books, 1992. ISBN 0-14-055342-8

Selsam, Millicent. *A First Look At Leaves*. New York: Scholastic, 1972

Dickinson, Jane. *All About Trees*. New Jersey: Troll Assoc. 1983. ISBN 0-89375-893-0

Farte, Imogene. *April Patterns, Projects, and Plans.* Nashville: Incentive Publications, Inc. 1990. ISBN 0-86530-139-5
National Geographic Society. *Kingdom of Plants: What Is A Plant?* Washington, DC. 1991 Video.
National Geographic Society. *Kingdom of Plants: What is a Seed?* Washington, DC. 1991 Video.
The Children's Video Encyclopedia Vol.III. *Flowers, Plants, and Tree.* California: Penguin Productions 1987.
Favorite Authors: Eric Carle. Teacher Created Materials, Inc. 1992.
Krauss, Ruth. *The Carrot Seed.* New York: Scholastic, 1945 ISBN 0-590-73301-X