SECOND GRADE
Lesson #1 Seeds

Title of Lesson: Seed Searching

CT Standards: 2.2 - Plants change their form as part of their lifecycles. Use senses and simple tools to collect data about the roots, stems, leaves, flowers and seeds of various plants, (including trees, vegetables, and grass.)

National Science Standard:
- Content Standard A: As a result of activities in grades K-4, all students should develop abilities necessary to do scientific inquiry and understanding about scientific inquiry.
- Content Standard C: As a result of activities in grades k-4, all students should develop understanding of the characteristics of organisms, life cycles of organisms, organisms and environments.

Length of Lesson: Two 40 minute periods.

Grade Level: 2

Grade Level Expectations: Students will understand the following:

1. Flowering plants produce plants.
2. Seeds come in many shapes and sizes.
3. New plants grow from these seeds.

**Performance Expectations:**

*(CMT Expected Performance)*

A.19 Describe the life cycles of flowering plants as they grow from seeds, proceed through maturation and produce new seeds.

**Materials:**

- variety of seeds including euphorbia seeds
- bag o' beans
- egg cartons
- plastic baggies
- "I Am A Seed" Hello Reader Level 1 by Jean Marzollo.
- Four (4) Lima Beans
- Chart/poster on plant or seed parts

**Background Information:** All seeds consist of two parts, the little plant or embryo and the seed coat. The seed coat protects the developing plant; the embryo is inside the seed. Cotyledons store food. They are the leaves that are attached to the little plant or embryo. When the seed begins to grow, one part of the embryo becomes the root and the rest becomes the upper stem and leaves.

**Inquiry**
Students will be *engaged* by examining what they already know about seeds. They will then *explore* the different characteristics of seeds. Following the activity the children will then *explain* the process in which plants grow. Students will further *elaborate* by developing experiments that show how seeds grow. The teacher can then use assessment material to *evaluate* the learning process.

**Procedure:**
**Before Lesson teacher needs to prepare four (4) sample cups of planted lima beans to be used in lesson #2.**
2. Read a storybook such as *I Am A Seed* by Jean Marzollo* (Kit) Hello Book #1
   Refer to chart or poster as needed.
3. Have a bowl full of assorted seeds. Give a sample (handful) to each group. Students will use their senses to inquire and discuss a variety of shapes and sizes.
4. Then students will sort seeds using physical properties. (Refer to “Searching for Seeds” worksheet). Teacher will chart vocabulary words.
5. Dissect a soaked lima bean to reveal the parts of a seed. Students will observe a seed coat, embryo and food storage tissue. ("Inside a Seed" page 3 and 4 Primarily plants).
6. Students will choose three (3) seeds from their sorted collection to grow. Using clear plastic cups and potting soil students will plant each seed in it's own cup.

**Evaluation:** Students will record observations by drawing in their science journal ("A Plant Begins" journal template pgs, 10 & 11) (AIMS Education Foundation 1990).

**Suggested Readings**


**From Seed to Plant.** Gibbons, Gail Holiday House, 1993.

**Web Links**
*www.canteach.com*
*www.enchantedlearning.com*
Vocabulary
Properties - qualities that can be identified and measured.
Embryo - the tiny plant within a seed.
Dissect - to cut apart or separate tissue.
Observe - looking and discovering.
Tissue - part of an organism consisting of cells having a similar structure and function.
Seedpod - covering of a several seeded leguminous plant. (such as a peapod)
Seedcoat - the touch outside cover found on new seeds.
Germinate - when a seed starts to grow and produces a new plant.

Credits
Primarily Plants A Plant Study for Grade K-8
Hoover, Evalyn and Mercier, Sheryl 1990 by the AIMS Education Foundation.
The Mailbox Primary April/May 2001 page 8 Seed Summary and Pattern pages 4 - 6
I Am a Seed by Jean Marzollo Hello Books
Extensions
"Little Brown Seeds" booklet
SEARCHING FOR SEEDS

Where you do find seeds? See how many examples you can find.

1. Fruits
2. Flowers
3. Vegetables
4. Trees

How Do They Compare?

<table>
<thead>
<tr>
<th>Smallest seed</th>
<th>Largest seed</th>
<th>Darkest color</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>Roundest</th>
<th>Most unusual</th>
<th>Lightest color</th>
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<tbody>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Flattest seed</th>
<th>Smoothest</th>
<th>Roughest</th>
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</thead>
<tbody>
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Lesson #2  Basic Needs of Plants and Parts of Plants

CT Science Standards (Content Standard)
2.2 Plants change their forms as part of their lifecycle.

- Student will use senses and simple tools to collect data about the roots, stems, leaves, flowers, and seeds of various plants, (including trees, vegetables and grass.)
- Use magnifiers to observe the parts of a flower and describe the interactions between pollinators and the flower that results in plant reproduction.
- Pose testable questions and design simple experiments to explore factors that affect seed germination and plant growth.

National Science Standards
- Content Standard A: As a result of activities in grades K-4, all students should develop abilities necessary to do scientific inquiry and understanding about scientific inquiry.
- Content Standard C: As a result of activities in grades k-4, all students should develop
understanding of the characteristics of organisms, life cycles of organisms, organisms and environments.

**Time:** Two 40-minute periods

**Grade level:** 2

**Grade Level Expectations (objectives)**
- Students will understand that in order to grow healthy plants, soil, water, light and air must be provided.

**Performance Expectations: (CMT Expected Performance)**

- **A.19** Describe the lifecycles of flowering plants as they grow from seeds, proceed through maturation and produce new seeds.
- **A.20** Explore and describe the effects of light and water on seed germination and plant growth.

**Materials**
- *The Carrot Seed* by Ruth Krauss (*kit*)
- One (1) large plastic bag gallon size
- One (1) cardboard box
Four (4) prepared plants from lesson #1
Several plant samples including euphorbs
Chart/Poster on Plant Parts catalog SK Elementary page 58.

**Teacher Information and Background Part 1 & 2**

**Basic Needs** - Plants require sunlight, water, soil and air in order to grow and be healthy. Energy received from the sun is used to convert carbon dioxide and water into food. When plants do not receive the things they need to live and grow, they will either die or be stunted in their growth.

**Plant Parts** - Each part of the plant plays a vital role in the survival and reproduction of the plant. The beautiful flower attracts insects and birds so that pollen will be carried from flower to flower. When a plant receives pollen from another plant, the flower is able to make seeds that will grow into new plants. The roots hold the plant firmly in the ground and absorb water and necessary nutrients from the soil. The stem carries water to different parts of the plant and holds the leaves up. The leaves trap energy from the sunlight to make food for the plant. (This process is called
photosynthesis.) The leaves take in carbon dioxide and release oxygen to fuel photosynthesis.

**Inquiry**

In this inquiry, students will be engaged by examining what they already know about plant parts. They will then explore the different characteristics of each part of plants following the activity. Students will elaborate by defining the function of each part of the plant. The teacher can then use students' drawings and completed flipbook to evaluate the learning process.

**Procedures**

**Part 1**

2. Read story, *The Carrot Seed* by Ruth Kauss
3. Discuss basic needs of living things and focus on plants.
4. The seeds should be sprouted, divide cups into four (4) groups to test growing conditions:

   - **Group 1**: NO AIR - Place cup in plastic bag
   - **Group 2**: NO LIGHT - Place in dark place
Group 3: NO WATER - do not water
Group 4: NEEDS MET - plant has soil, air, light and water.

5. Watch to see which plant grows best. A chart or class calendar can be made with the data collected. Discuss what plants need to grow.

**Evaluation:** Record data in science journal.

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**Procedure**

**Part 2**

Review Chart/Poster on Plant Parts

1. Read *From Seed to Plant* by Allan Fowler
2. Compare several types of flowering plants and euphorbs (poinsettia or see reference list)
   Observe and compare
3. Label and point out parts of each plant.
   Use the chart/poster and plant specimens to illustrate parts such as roots, stems, leaves and flowers.
4. Discuss function on each part. (See page 66 of Primary Plants)
5. Compare and contrast different kinds of plants by drawing and labeling two (2) types of plants a euphorbia and a flowering plant.

**Evaluation**
Make plant flip book matching parts of plants with phrases. (See pages 13 and 14 Teacher’s Helper April/May/June 1999)

**Suggested Readings**
*From Pit to Peach Tree*, Ellen Weiss Children’s Press, 2007.

**Web Links**
www.desert-tropicals.com/plants/Euphorbiaceae
www.hhmi.org

**Vocabulary**
Nutrients - plants absorb nutrients from the soil.
Leaves - usually green flat structures attached and functioning as principal organs of photosynthesis.
Flower - the reproductive structure of some seed bearing plants.
Roots - the usual portion of a plant that draws minerals and water from soil.
Stem - the main ascending axis of a plant, a stalk or a trunk.

Credits
Primarily Plants: A Plant Study for K-3
Hoover, Evalyn and Mercier, Sheryl

Extensions
www.hhmi.org Howard Hughes Medical Institute
salad bowl activity
Make salad scavenger hunt activity
Celery Experiment - from Primarily Plants
Lesson #3  Life Cycle of Plants

Title of Lesson:

CT Science Standards (content standards)

2.2 Plants change their form as part of their lifecycles.
- Explain how roots, stems, leaves, flowers and seeds function to complete the plant's life cycle.
- Predict the sequenced stages of a flowering plant's life cycle.

National Science Standard:
- Content Standard A: As a result of activities in grades K-4, all students should develop abilities necessary to do scientific inquiry and understanding about scientific inquiry.
- Content Standard C: As a result of activities in grades k-4, all students should develop understanding of the characteristics of organisms, life cycles of organisms, organisms and environments.

Length of Lesson:  One 40 minute period.

Grade Level:  2

Grade Level Expections (objectives) -
Students will observe the changes that occur during plant growth and development.
Students will understand that the life cycle of plant growth and development.
Students will sequence the stages of plant life.

**Performance Expectations (CMT Expected Performance)**

- **A.19** Describe the lifecycles of flowering plants as they grow from seeds, proceed through maturation and produce new seeds. Explain how roots, stems, leaves, flowers and seeds function to complete the plant’s life cycle.

**Materials**
The Plant Life Cycle flow chart student worksheet. The Plant Life Cycle chart with drawings. *Lifecycles: Bean* by David M. Schwartz *(kit)*

**Teacher Information and Background**
All living things have life cycles. Plants have a life cycle that includes sprouting, developing roots, stems, leaves, and flowers; reproducing; and eventually dying. Nutrients from decaying plant material enrich the soil and allow the life cycle to continue.
**Inquiry**

Students will be **engaged** by examining what they already know about lifecycles. They will then **explore** the stages of a plant’s life cycle. Following the activity the children will then **explain** the process in which plants grow. Students will further **elaborate** by completing a life cycle worksheet with drawings of each stage. The teacher can then use the drawings and worksheet to **evaluate** the learning process.

**Procedure**

1. The teacher will read *LifeCycles Beans* by David M. Schwartz.
2. In a visible location, create a diagram of the generic “plant life cycle”. The plant lifecycle usually includes the following events: seeds germinate, roots and stems appear, leaves appear, flowers appear, flowers produce pollen, flowers receive pollen, plants produce fruit that contains seeds, seeds disperse.

**Evaluation**

Ask students to use the attached worksheet to create a diagram of the “plant life cycle”. Students may draw and color directly on the
worksheet, or may use the worksheet as a guide, creating their Plant Life Cycle Diagram on a larger separate sheet of paper.

**Suggested Readings**

*Usborne Mysteries and Marvels of Plant Life*, Barbara Cook, Scholastic, Inc.


*Sunflowers and Other Plants (Life Cycles)* Sally Morgan

*Chrysallis Children's Books* 2003.


*Plants - The Ontario Science Centre, Kids Can Press*


Web Links

Vocabulary
Lifecycle - the series occurring in each generation of a plant or animal’s life.
Decay - to rot or decompose.
Enrich - to make a soil more fertile for growing.
Germinate - cause to grow or sprout.

Credits
www.wpi.edu/images/CMS/PIEE/3d2.PDF

Extensions
Compare Plant Life Cycle to Human or Butterfly Life Cycles
Plant Life Cycles Reading Comprehension and questions