

How Does Your Garden Grow?

Grade Level or Special Area: 2nd Grade

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Length of Unit: 12 Lessons

I. ABSTRACT

- A. This is a cross-curricular unit on the life cycle of a seed. Reading, writing, and math skills are incorporated throughout the unit. Activities in this unit will focus on the student's abilities to recall and comprehend details about the life cycle of a seed. Through this unit, students will gain an understanding of the importance of each step in the life cycle and what a seed needs in order to survive through the different stages of the life cycle. The students will have the opportunity to experience and investigate the different stages of the life cycle of a seed through various hands on activities.

II. OVERVIEW

- A. Concept Objectives
1. The students will develop an understanding that all living things are part of a life cycle.
 2. The students will develop an understanding of the necessary components for plant growth.
 3. The students will develop an understanding of the functions of the different parts of the seed and of the plant.
 4. The students will develop an understanding of pollination in a flower
- B. Content from the *Core Knowledge Sequence*
1. Language Arts
 - a. Reading Comprehension and Response
 - (1) Recall incidents, characters, facts, and details of stories and other texts. (p. 43)
 - (2) Discuss similarities in characters and events across stories. (p. 43)
 - (3) Gain answers to specific questions from reading nonfiction materials, and interpret information from simple diagrams, charts, and graphs. (p. 43)
 - (4) Demonstrate familiarity with a variety of fiction and nonfiction selections, including both read-aloud works and independent readings. (p. 43)
 - b. Writing
 - (1) Produce a variety of types of writing-such as stories, reports, letters, poems, descriptions-and make reasonable judgments about what to include in his or her own written works based on the purpose and type of composition. (p. 43)
 - (2) With assistance, produce written work with a beginning, middle, and end, and when appropriate organize material in paragraphs. (p. 43)
 - (3) With assistance, revise and edit to clarify and refine his or her meaning in writing, and attend to spelling, mechanics, and presentation in final drafts of selected works. (p. 43)
 - c. Spelling, Grammar, and Usage
 - (1) Consistently use correct end punctuation: period, question mark,

or exclamation point. (p. 44)

2. Science
 - a. Cycles in Nature/Life Cycles
 - (1) The life cycle: birth, growth, reproduction, death. (p. 59)
 - (2) Reproduction in plants and animals
*From seed to seed with a plant. (p. 59)
3. Math
 - a. Mathematics
 - (1) Make linear measurements in feet and inches, and in centimeters.
(p. 57)
 - (2) Solve basic word problems. (p. 57)

C. Skill Objectives from the Arizona State Standards

1. Reading /Language Arts
 - a. The students will use K-W-L chart to illustrate what the student knows (K), what the student wants to know (W), and what the student wants to learn (L). (ASSLA W-F1 PO1)
 - b. The students will restate information from a reading selection. (ASSLA R-F3)
 - c. The students will use the writing process to compose a first person narrative. (ASWS W-F1 PO3)
 - d. The students will use the writing process to edit their stories using appropriate resources. (ASWS W-F1 PO5)
 - e. The students will present their final copy. (ASWS W-F1 PO7)
 - f. The students will derive meaning from a written selection using reading/decoding skills. (ASRS R-F2 PO1)
 - g. The students will draw conclusions based on the text. (ASRS R-F3 PO1)
 - h. Students will write an introductory statement followed by details to support the main idea. (ASWS W-F5 PO2)
 - i. The students will record information gained from personal observations and experiences. (ASWS W-F4 PO1)
2. Mathematics
 - a. The students will collect and analyze data using the concepts of largest, smallest, most often, least often, and middle. (ASMS 2M-F1)
 - b. The students will formulate questions from organized data. (ASMS 2M-F1 PO4)
3. Science
 - a. The students will identify the stages in a life cycle. (ASSS 4SC-F2 PO1)
 - b. The students will identify basic plant structures. (ASSS 4SC-F3 PO3)
 - c. The students will describe the functions of basic plant structures. (ASSS 4SC-F3 PO4)
 - d. The students will identify the basic structures and function of plants and animals. (ASSS 4SC-F2)
 - e. The students will understand that science involves asking and answering questions and comparing results to what is already known. (ASSS 2SC-F3)
 - f. The students will conduct an experiment and report on the conclusion of the experiment. (ASSS 1SC-F1)
 - g. The students will identify cause and effect relationships in living systems. (ASSS 4SC-F1 PO1)

- h. The students will explain cause and effect relationships in living systems. (ASSS 4SC-F1 PO2)
- i. The students will trace the life cycles of various organisms. (ASSS 4SC-F2)
- j. The students will record the life cycle stages in sequence. (ASS 4SC-F2 PO2)
- k. The students will be able to explain the interactions and interdependence among specific populations, resources, and environments. (ASSS 3SC-F3 PO1)

III. BACKGROUND KNOWLEDGE

A. For Teachers

- 1. Bates, Ramona. *Flowers and Seeds*. Carson-Dellosa Publishing Company, Inc., Greensboro, 1994. ISBN 0-44222-11371-1
- 2. Hirsch, E.D., Jr. *What Your Second Grader Needs to Know*. Dell Publishing, New York, 1998. ISBN 0-385-31843-X
- 3. Schwartz, David M. *Bean*. Creative Teaching Press, Huntington Beach, 1999. ISBN 1-57471-580-1

B. For Students

- 1. Mathematics: graphing
- 2. Science: water cycle (A cycle is a never ending process.)
- 3. Reading Comprehension and Response: selecting important information from fiction and non-fiction text.
- 4. Writing: writing complete sentences using appropriate punctuation.

IV. RESOURCES

A. Equipment

- 1. Proxima Projector or Overhead Projector
- 2. Projection Camera

B. Books

- 1. Bates, Ramona. *Flowers and Seeds*. Carson-Dellosa Publishing Company, Inc., Greensboro, 1994. ISBN 0-44222-11371-1
- 2. Carle, Eric. *The Tiny Seed*. Scholastic Incorporated, New York, 1987. ISBN 0-590-42566-8
- 3. Heller, Ruth. *The Reason for a Flower*. Grossett & Dunlap, New York, 1983. ISBN 0-448-14495-6
- 4. Macmillan Early Science Activities. *Plants*. Newbridge Communications, Inc., 1991.
- 5. Moore, Jo Ellen & Evans, Joy. *Learning About Plants*. Evan-Moor Corp., Monterey, 1987. ISBN 1-55799-098-0
- 6. Schwartz, David M. *Bean*. Creative Teaching Press, Inc., Huntington Beach, 1999. ISBN 1-57471-580-1
- 7. Stevens, Janet. *Tops & Bottoms*. Harcourt, Inc., San Diego, 1995. ISBN 0-15-292851-0

V. LESSONS

Lesson One: The Circle of Life

A. Daily Objectives

- 1. Concept Objective(s)

- a. The students will develop an understanding that all living things are part of a life cycle.
 2. Lesson Content
 - a. Reading Comprehension and Response: Recall incidents, characters, facts, and details of stories and other texts. (p. 43)
 - b. The life cycle: birth, growth, reproduction, death (p. 59)
 - c. Life Cycles: From seed to seed with a plant. (p. 59)
 3. Skill Objective(s)
 - a. The students will use a K-W-L chart to illustrate what the student knows (K), what the student wants to know (W), and what the student wants to learn (L). (ASSLA W-F1 PO1)
 - b. The students will restate information from a reading selection. (ASSLA R-F3 PO2)
 - c. The students will identify the stages in a life cycle. (ASSS 4SC-F2 PO1)
- B. Materials
1. K-W-L chart using chart paper
 2. Student journal
 3. Flower paper (Appendix A)
 4. Book: *The Tiny Seed* by Eric Carle
- C. Key Vocabulary
1. cycle- A complete set of events that keep coming back in the same order.
 2. birth- The act of coming into life.
 3. sprout- To begin to grow.
 4. growth- The act or process of growing.
 5. reproduction- The process by which plant and animals produce new individuals like themselves.
 6. death- The end of life.
 7. season- One of the four parts into which the year is divided.
- D. Procedures/Activities
1. The teacher will ask students to share knowledge of what a plant is.
 2. The teacher will take students outside to do an observation walk around the school campus. The teacher will direct students to observe different types of plants and record observations in journals.
 3. The teacher will ask students to share what they recorded with the class.
 4. The teacher will complete the K-W-L chart with class.
 5. The teacher will ask students how they think the plants were planted, how they grow, and have survived. The teacher will accept all reasonable answers.
 6. The teacher will discuss with students that all living things follow a life cycle.
 7. The teacher will introduce key vocabulary. The words will be written on the board. Each group will receive a post-it note. Each group will be given a word to look up in the dictionary. Students will define their word on the post-it note and will also create a sentence using their word in context. The groups will then share their word with the class.
 8. The teacher will then read *The Tiny Seed* by Eric Carle. Students will be instructed to think about the different stages of the life cycle as the story is being read aloud.
 9. The teacher will then discuss the story with students by asking the students to identify the different stages of the life cycle of the seed in the story.

10. With the teacher's help, the students will record the information discussed onto flower paper. (Appendix A)
- E. Assessment/Evaluation
1. Students will be informally assessed during the completion of the K-W-L chart. The teacher will be looking for use of previously introduced vocabulary and concepts.
 2. The teacher will informally assess the student's comprehension of the stages of the life cycle while the students retell, discuss, and record details of *The Tiny Seed* by Eric Carle.

Lesson Two: Take Off Your Coat!

- A. Daily Objectives
1. Concept Objective(s)
 - a. The students will develop an understanding of the functions of the different parts of the seed and of the plant.
 - b. The students will develop an understanding that all living things are part of a life cycle.
 2. Lesson Content
 - a. The life cycle: birth, growth, reproduction, death. (p. 59)
 - b. Reproduction in plants and animals
*From seed to seed with a plant. (p. 59)
 3. Skill Objective(s)
 - a. Students will identify basic plant structures. (ASSS 4SC-F3 PO3)
 - b. Students will describe the functions of basic plant structures. (ASSS 4SC-F3 PO4)
- B. Materials
1. A small bag of lima beans which have been soaked overnight
 2. Toothpicks
 3. Magnifying glasses or small hand lenses
 4. Small paper plates
 5. *Take Off Your Coat!* Worksheet (Appendix B)
- C. Key Vocabulary
1. seed coat – A thin “skin” that covers the seed and protects what is inside.
 2. embryo – The tiny plant inside of the seed.
 3. cotyledon – Food that the embryo uses to grow into a plant.
- D. Procedures/Activities
1. The teacher will review the life cycle of a seed and the vocabulary from the previous day.
 2. The teacher will ask the students why they wear a coat. All answers will be acknowledged and accepted.
 3. The teacher will then explain that every seed also wears a coat. The vocabulary word, “seed coat” will be introduced and written on the board.
 4. The teacher will then explain that a seed coat offers warmth and protection to what is inside.
 5. The teacher will then ask the students what they think might be inside the seed. All answers will be acknowledged and accepted.
 6. The teacher will then explain that inside the seed is a tiny plant. The vocabulary word, “embryo” will be introduced and written on the board.

7. The teacher will then introduce the vocabulary word, “cotyledon” and explain that this is the food the plant uses as it is growing.
 8. Using a toothpick, the teacher will demonstrate how to take off the seed coat and open the lima bean.
 9. The teacher will then show the class the small embryo and the cotyledon inside the seed.
 10. The students will be given several soaked lima beans, a toothpick, and a small plate.
 11. Using their toothpicks, the students will remove the seed coat and open their seeds.
 12. Using a magnifying glass or a small hand lens, students will investigate the embryos in their seeds.
 13. The students will complete the *Take Off Your Coat!* worksheet (Appendix B)
- E. Assessment/Evaluation
1. The teacher will informally assess the students as they identify the seed parts during their investigation.
 2. The teacher will formally assess the students understanding of the key vocabulary and function of each seed part after they have completed the *Take Off Your Coat!* Worksheet. (Appendix B)

Lesson Three: Take Off Your Coat! Part 2

- A. Daily Objectives
1. Concept Objective(s)
 - a. The students will develop an understanding of the functions of the different parts of the seed and of the plant.
 - b. The students will develop an understanding that all living things are part of a life cycle.
 2. Lesson Content
 - a. The life cycle: birth, growth, reproduction, death. (p. 59)
 - b. Reproduction in plants and animals.
*From seed to seed with a plant. (p. 59)
 3. Skill Objective(s)
 - a. The student will identify the basic structures and functions of plants and animals. (ASSS 4SC-F2)
 - b. The students will understand that science involves asking and answering questions and comparing results to what is already known. (ASSS 2SC-F3)
 - c. The students will conduct an experiment and report on the conclusion of the experiment. (ASSS 1SC-F1)
- B. Materials
1. Ten lima beans per student that have been soaked in water overnight
 2. Magnifying glass
 3. Paper towels
 4. Self-sealing sandwich bags
 5. Sharpie marker
 6. Toothpicks
 7. Lima bean lab sheet (Appendix C)
 8. Data collection sheet (Appendix D)

C. Key Vocabulary

1. seed coat – A thin “skin” that covers the seed and protects what is inside.
2. embryo – The tiny plant inside of the seed.
3. cotyledon – Food that the embryo uses to grow into a plant.
4. observe- To see, watch, or notice.
5. record- Something written down and kept as evidence or history.
6. data- Facts and figures from which something can be learned.

D. Procedures/Activities

1. The teacher will review vocabulary previously learned in Lesson 2 by asking students to identify seed parts and their job.
2. Teacher will introduce new vocabulary (observe, record, data) by writing the words and their definition on the board. The teacher will ask the students to recall the definitions and share them with the class.
3. The teacher will give each student 10 lima beans that have been soaked overnight in water.
4. The teacher will demonstrate for the students how to carefully remove the seed coat of the lima bean using a toothpick.
5. The teacher will assist the students with removing the seed coat from 5 of the 10 lima beans. The other 5 seed coats will be left on the beans.
6. The teacher will tell the students to use the magnifying glass to observe the bean.
7. The Teacher will pass out two self-sealing sandwich bags to each student. Using the Sharpie marker the students will label one bag, “Seed Coat” and the other bag, “No Seed Coat.” The students will also label each baggie with their name.
8. The teacher will then hand out two moist paper towels to each student.
9. The teacher will model for the students how to wrap the 5 beans without their seed coats in one paper towel and the remaining 5 beans with their seed coats in the other paper towel.
10. The teacher will guide the students in placing the beans with the seed coats in the bag marked, “Seed Coats” and the remaining seeds will be placed in the bag marked, “No Seed Coat.”
11. The teacher will assist the students with sealing the baggies. Baggies will be hung on a bulletin board.
12. The students will then use their magnifying glass to observe the seeds each day for 4 days. Observations will be recorded on the Data Sheet. (Appendix D)
13. The students will predict the growth of the beans with and without the seed coat. Predictions will be recorded on the Data Sheet. (Appendix D)

E. Assessment/Evaluation

1. The teacher will informally assess students as they review the parts of the seed.
2. The teacher will formally assess students based on their application of prior knowledge on the prediction portion of the Data Sheet. (Appendix D)

Lesson Four: Wanted!! Big, strong plants!!

A. Daily Objectives

1. Concept Objective(s)
 - a. The students will develop an understanding of the necessary components for plant growth.
 - b. The students will develop an understanding that all living things are part of a life cycle.

2. Lesson Content
 - a. The life cycle: birth, growth, reproduction, death. (p. 59)
 - b. Reproduction in plants and animals
*From seed to seed with a plant. (p. 59)
 3. Skill Objective(s)
 - a. Students will identify cause and effect relationships in living systems. (ASSS 4SC-F1 PO1)
 - b. Students will explain cause and effect relationships in living systems. (ASSS 4SC-F1 PO2)
- B. Materials
1. Butcher paper folded into three sections labeled people, animals, plants.
 2. White construction paper – 9 inches by 18 inches
 3. Crayons, markers or colored pencils
- C. Key Vocabulary
1. minerals – A natural part of the soil that contains elements for plants to grow.
- D. Procedures/Activities
1. Before beginning today’s lesson, the teacher will have the students record the changes observed in the lima bean baggies.
 2. The teacher will ask the students what they need in order to grow big and strong. All answers are acknowledged and accepted. The teacher will record the student responses under the people heading on the butcher paper.
 3. The teacher will then ask the students what animals need to grow big and strong. All answers are acknowledged and accepted. The teacher will record the student responses under the animals heading on the butcher paper.
 4. The teacher will then ask the students what they think plants need to grow big and strong. All answers are acknowledged and accepted. The teacher will record the student responses on the butcher paper under the plants heading.
 5. The teacher will guide the students in recognizing that people, animals and plants need many of the same things in order to grow.
 6. Introduce the key vocabulary. Ask the students what section minerals should be listed, and add to the plant section.
 7. Discuss with the students that in order for plants to grow, they need four necessary components: water, sunlight, air and minerals. Ask the students what would happen if a plant did not receive enough water. (It would shrivel and die)
 8. Explain that plants use the sunshine to make their own food. Ask the students what would happen if a plant was kept in a dark closet. (It would not be able to make it’s own food and it would eventually die.)
 9. Ask the students if they think a plant breathes. Explain that plants breathe just like people. But instead of a nose, plants breathe through tiny openings found on the underside of the leaf. If these openings are blocked, the plant would be unable to breathe and it would die.
 10. Ask the students if they take vitamins and why. Explain that minerals are like vitamins for the plants. The plant uses the minerals in the soil to help make it healthier. The plant will not die without minerals, but it will not be as healthy as it could be.
 11. Divide the class into four groups. Group names will be water, sunlight, air and minerals.
 12. Using the white construction paper and crayons, each group will create a “wanted” poster for their specific component of plant growth. Each group’s

poster should tell why the plant needs their specific component to grow big and strong.

- E. Assessment/Evaluation
1. The teacher will informally assess the student's understanding during discussion times.
 2. The teacher will formally assess each group's "wanted" poster by checking to see if students could explain the need for their assigned growth component.

Lesson Five: Flip to It! A Seed to Flower Flip Book

- A. Daily Objectives
1. Concept Objective(s)
 - a. The students will develop an understanding of the functions of the different parts of the seed and of the plant.
 - b. The students will develop an understanding that all living things are part of a life cycle.
 2. Lesson Content
 - a. The life cycle: birth, growth, reproduction, death. (p. 59)
 - b. Reproduction in plants and animals
*From seed to seed with a plant. (p. 59)
 - c. Consistently use correct end punctuation: period, comma, question mark, or exclamation point. (p. 44)
 3. Skill Objective(s)
 - a. Trace the life cycles of various organisms. (ASSS 4SC-F2)
Identify the stages in a life cycle. (ASSS PO1)
Record the life cycle stages in sequence. (ASSS PO2)
Identify basic plant structures. (ASSS PO3)
Describe the functions of basic plant structures. (ASSS PO4)
- B. Materials
1. (3) 9"x18" pieces of white construction paper per student.
 2. One flip book per student (Appendix O)
 3. Stapler and staples
 4. Colored pencils and crayons
 5. Pencils
 6. Post-it notes
- C. Key Vocabulary
1. embryo- A plant in its earliest stages of development.
 2. germinate- To start to grow from a seed.
 3. sprout(ing)- To begin to grow from a seed.
 4. seedling- A young developing plant.
 5. nutrients- Substances that provide nourishment for a plant.
 6. water- A clear liquid that is essential for a plant to grow.
 7. air- The atmosphere around the earth.
 8. cycle- A sequence of events that is repeated again and again.
 9. stem- The main axis of the stem that bears buds and shoots.
 10. leaves- A flat green part that grows on a plants stem.
 11. chlorophyll- The green pigment found in a plant.
- D. Procedures/Activities
- To create flip book ahead of time:

1. Place one sheet of white construction paper on table vertically.
2. Place second sheet of construction paper vertically on top of first sheet. Stagger second sheet to expose 1 1/2 to 2 inches of the first sheet.
3. Place third sheet vertically on top of second sheet. Stagger third sheet to expose 1 1/2 to 2 inches of second sheet. Be sure to stagger papers evenly.
4. Firmly grasp the sides of all three sheets of paper so as not to lose alignment of the pages.
5. While grasping the sides of all three sheets, fold the top portion of the papers towards the bottom making sure to continue to stagger the pages 1 1/2 to 2 inches apart.
6. Staple across the folded top. This will create 6 staggered areas in which the life cycle of the seed will be illustrated.
7. Before beginning today's lesson, the teacher will have students observe and record changes in their lima bean baggies.

Lesson:

8. The teacher will orally review the parts of the seed using the Take Off Your Coat! Part 1 worksheet with students in the class. (Appendix B)
9. The teacher will ask students what a seed needs to grow.
10. The teacher will introduce new vocabulary to the students.
11. The teacher will give each group a new vocabulary word. The groups will work together to look up the words in the dictionary. The students will record the meaning of the word on the post-it note. The students will also use the word correctly in a sentence.
12. The teacher will ask the students to share their word, definition, and sentence with the class.
13. The teacher will then ask the students to brainstorm with their group what they think the different jobs are of the different parts of the plant.
14. Teacher will accept all answers from students.
15. The teacher will ask the students to identify the parts of the flower. The teacher will label the drawing as the teacher and the students discuss the parts of the flower.
16. Teacher will pass out a flipbook to each student.
17. Starting with the seed. The students will draw the seed on the bottom layer. The teacher will discuss the job of the seed with the students. The students will then write, "The seed is the beginning of the plants life cycle. The seed needs nutrients, water, and sunshine to grow."
18. The teacher will then illustrate for the students how to draw the roots of the seed. The teacher will discuss with the students the job of the roots. The students will then write on the second flap, "The roots anchor the plant and they deliver nutrients and water to the plant to help it grow."
19. The teacher will then guide the students in drawing the stem on the third level of the flipbook. The teacher and the students will discuss the job of the stem and the students will write, "The stem holds the plant up. The stem is also used to deliver water and nutrients to the whole plant."
20. The teacher will then demonstrate how to draw leaves on the stem on the fourth level. The teacher and the students will discuss the job of the leaves. The students will then write, " The leaves help the plant to get water. The leaves also help the plant to transform the sunshine into chlorophyll."

21. The teacher will guide the students on how to draw a flower on the fifth level. The students and the teacher will discuss the job of the flower and the importance to the plant. The students will then write, “The flower holds the seeds. The flower also produces the pollen necessary for the plant to reproduce.”
 22. The students will write the word, “Plants,” across the top of the sixth level.
 23. The teacher will instruct the students on how to finish the rest of the flipbook by adding color and background to the pictures and the sentences. (Appendix O)
- E. Assessment/Evaluation
1. The teacher will collect the completed plant flipbook and formally assess to see that sentences are complete and legible.
 2. The teacher will informally assess the student’s dictionary skills when locating information on an unfamiliar word.

Lesson Six: I’m a Little Seed!

A. Daily Objectives

1. Concept Objective(s)
 - a. The students will develop an understanding of the functions of the different parts of the seed and of the plant.
 - b. The students will develop an understanding that all living things are part of a life cycle.
2. Lesson Content
 - a. The life cycle: birth, growth, reproduction, death. (p. 59)
 - b. Reproduction in plants and animals
*From seed to seed with a plant. (p. 59)
 - c. Produce a variety of types of writing-such as stories, reports, letters, poems, descriptions-and make reasonable judgments about what to include in his or her own written works based on the purpose and type of composition. (p. 43)
3. Skill Objective(s)
 - a. The student will be able to identify the basic structures of a plant. (ASSS 4SC-F3 PO3)
 - b. The students will be able to sequence the life cycle of a seed. (ASSS 4SC-F2 PO2)
 - c. The students will use the writing process to compose a first person narrative. (ASWS W-F1 PO3)

B. Materials

1. Student’s lima bean baggies
2. (1) Small clear plastic cup per student
3. Sharpie markers
4. Potting soil
5. Watering can
6. I’m a Little Seed writing paper (Appendix E)

C. Key Vocabulary

1. first-person narrative – A story that is told from the writer’s point of view.

D. Procedures/Activities

1. Before beginning the day’s lesson, the students will make their last observation of their bean and record their findings on their lab sheet. In this observation, students will identify the parts of a plant.

2. The teacher will pass out the clear plastic cups to each student.
 3. The teacher will instruct the students to write their names on the sides of their plastic cups using the Sharpie markers.
 4. The teacher will ask several students at a time to come and fill their cups about three-fourths full of potting soil.
 5. After all the students have filled their cups, the teacher will demonstrate how to plant their lima bean seed.
 6. Using her fingers, the teacher will make a small hole in the soil, and gently place the roots of the lima bean in the hole.
 7. The teacher will then firmly pat the soil around the lima bean plant.
 8. The teacher will then call several students at a time to come and get their bean baggie.
 9. Students will proceed to plant their lima bean seed in the cup.
 10. The teacher will call on several students at a time to put a small amount of water on their plant.
 11. Students will then place their plants in a designated place in the classroom.
 12. The teacher will explain that the students will continue to observe their plant's growth over the next few days.
 13. Introduce the key vocabulary. Explain that a story told in the first person means the story is told by the writer.
 14. Explain to the students that they will be writing a seed story in the first person. They will pretend to be a little seed. They may choose any kind of seed for their story.
 15. The teacher will instruct the students that their seed story should follow the life cycle of a seed, starting with the time when they are planted. Students need to include the things they need to grow and how and where they are growing.
 16. Students will compose a sloppy copy (rough draft) of their seed story using the I'm a Little Seed writing paper. (Appendix E)
- E. Assessment/Evaluation
1. The teacher will informally assess the student's understanding of the life cycle of a seed through their sloppy copy.

Lesson Seven: I'm a Little Seed! Part 2

- A. Daily Objectives
1. Concept Objective(s)
 - a. The students will develop an understanding of the functions of the different parts of the seed and of the plant.
 - b. The students will develop an understanding that all living things are part of a life cycle.
 2. Lesson Content
 - a. With assistance, revise and edit to clarify and refine his or her meaning in writing, and attend to spelling, mechanics, and presentation in final drafts of selected works. (p. 43)
 3. Skill Objective(s)
 - a. The students will use the writing process to edit their stories using appropriate resources. (ASWS W-F1 PO5)
 - b. The students will present their final copy. (ASWS W-F1 PO7)
- B. Materials
1. I'm a Little Seed writing paper (Appendix E)

2. Pencils
 3. Big seed pattern (Appendix F)
 4. Cardstock
 5. Yellow construction paper
 6. Green construction paper
 7. Scissors
 8. Markers or crayons
 9. Glue sticks
 10. Stapler
 11. Small metal fasteners
- C. Key Vocabulary
1. edit – To prepare a story by correcting errors in grammar, punctuation and clarity.
 2. final copy - The corrected, finished piece of writing.
- D. Procedures/Activities
1. The teacher will prepare a copy of the big seed pattern on cardstock and cut out the four pieces. (Appendix F)
 2. Before the lesson, the teacher will trace the seed pattern onto the yellow construction paper, and the stem and leaves onto the green construction paper. Each student will need two yellow seeds, one green stem, and one green leaf.
 3. Introduce the key vocabulary. The teacher will explain that when the students edit their story, they will be looking for mistakes to correct. After the mistakes are found, the students will write their final copy correcting their mistakes as they go.
 4. With help from the teacher, students will edit their sloppy copy seed story from the previous day.
 5. The students will re-write their seed stories using the I'm a Little Seed writing paper, incorporating the changes made during the editing process. (Appendix E)
 6. After composing the final copy, students should cut out their story along the seed outline. If more than one piece of paper was used, than all pieces should be cut out and stapled together at the top left edge.
 7. The students will cut out the two bean patterns, the stem and the leaf. The students may add veins in the leaf to make it look more realistic.
 8. Using a glue stick, the student will center and glue their seed story onto one of the yellow beans. If the story is more than one page long, the last page of the story should be glued to the yellow bean.
 9. The student should position the stem and leaf near the top left edge of the yellow bean containing the story. A second yellow bean should then be positioned on top of the story, stem and leaf.
 10. With the teacher's help, students will use a small metal fastener to attach all the pieces together.
 11. Students may title their story on the front bean cover.
- E. Assessment/Evaluation
1. The teacher will collect and formally assess the student's writing process.
 2. The teacher will formally assess the student's understanding of the life cycle of the seed.

Lesson Eight: Incredible Edibles

- A. Daily Objectives

1. Concept Objective(s)
 - a. The students will develop an understanding of the functions of the different parts of the seed and of the plant.
 2. Lesson Content
 - a. Reproduction in plants and animals
*From seed to seed with a plant. (p. 59)
 3. Skill Objective(s)
 - a. The students will identify the basic structures and functions of plants and animals. (ASSS 4SC-F2 PO1)
 - b. The students will be able to explain the interactions and interdependence among specific populations, resources and environments. (ASSS 3SC-F3 PO1)
- B. Materials
1. Book: *Tops and Bottoms* by Janet Stevens
 2. Old magazines
 3. Scissors
 4. Glue
 5. (1) sheet of poster board for each group
- C. Key Vocabulary
1. garden- A plot of ground where plants such as fruits, vegetables, and flowers grow.
 2. roots- The part of the plant that usually grows underground. The root anchors the plant and delivers nutrients to the plant.
 3. fruit- A plant part that can be eaten.
 4. vegetable- A plant part that can be eaten.
 5. edible- Able to be eaten.
- D. Procedures/Activities
1. Introduce key vocabulary by asking students if they know what a garden is.
 2. The teacher will ask the students to discuss with their groups where they think a garden comes from. How did the garden get started? What do the plants in the garden need to grow? The group recorder will keep notes of the discussion in their journal.
 3. The group reporter will discuss the answers that were generated by their group with the whole class.
 4. The teacher will then ask the students what they think the purpose of a garden is and allow the groups 3 minutes to discuss and record their answers. The group reporter will share with the whole class their group discoveries.
 5. The teacher will look for answers that relate to the idea that the garden is used to give food to people or to animals.
 6. The teacher will then discuss with the students different ways that fruits and vegetables can grow.
 7. The teacher will then read and discuss *Tops and Bottoms* by Janet Stevens with the students. The teacher will discuss the different ways that plants grow and the different parts of the plants that we find valuable.
 8. The teacher will also discuss with the students how the different parts of plants can be a food source.
 9. The teacher will then tell the students that they are going to become investigators that are looking for different plant sources that we eat. The students will have to think about whether we eat the roots, the middle, or the tops of a plant.

10. The teacher will instruct the students to look for different types of plants in the magazines that will be given to the groups. The students will find a plant and then discuss with their group what part is edible. The students will then cut out the plant and place the plant in the proper category on a poster board that has been divided into three sections.
 11. The teacher will distribute supplies to the students.
 12. The students will work as a group to complete chart.
 13. Upon completion, the teacher will ask the students to share their discoveries with the whole group.
 14. The teacher will ask the students if they can identify any patterns in the types of fruits and vegetables that we eat in relation to the tops and bottoms.
- E. Assessment/Evaluation
1. The teacher will informally assess the students as they are working in groups to discover different types of plants that we eat. The teacher will be looking for group participation and discussion that is relevant to the unit.
 2. The teacher will informally assess the final project that is created by the group. The teacher will be looking for plants to be placed in the appropriate categories. The teacher will also be looking for a variety of discoveries.

Lesson Nine: The Mystery of the Traveling Acorn

- A. Daily Objectives
1. Concept Objective(s)
 - a. The students will develop an understanding that all living things are part of a cycle.
 2. Lesson Content
 - a. Recall incidents, characters, facts, and details of stories and other texts. (p. 43)
 - b. Produce a variety of types of writing-such as stories, reports, letters, poems, descriptions-and make reasonable judgments about what to include in his or her own written works based on the purpose and type of composition. (p. 43)
 3. Skill Objective(s)
 - a. Students will derive meaning from a written selection using reading/decoding skills. (ASRS R-F2 PO1)
 - b. Students will draw conclusions based on the text. (ASRS R-F3 PO1)
 - c. Students will explain a cause and effect relationship in living systems. (ASSS 4SC-F1 PO2)
 - d. Students will write an introductory statement followed by details to support the main idea. (ASWS W-F5 PO2)
- B. Materials
1. A class set of The Mystery of the Traveling Acorn (Appendix G)
 2. Suspect posters: Suzy Squirrel, Professor Storm Cloud, Little Donny copied on cardstock (Appendix H)
 3. Writing paper, pencils
- C. Procedures/Activities
1. Prior to beginning the lesson, the teacher will color the suspect posters.
 2. The teacher will tell the students that they will be detectives today in solving a very puzzling mystery.
 3. The teacher will tell the students that they will each be reading a mystery story.

4. The teacher will pass out the story to students and ask them to read it silently. (Appendix G)
 5. After students have read the story, the teacher will explain that they must solve the mystery of who moved the acorn.
 6. The teacher will present the suspect posters to the class. (Appendix H)
 7. The teacher will explain that student detectives must choose the most likely suspect and write a paragraph explaining their reasoning.
 8. After all paragraphs have been written, the teacher will group students by who they chose as their most likely suspect.
 9. Each group will then compare their reasoning and choose one representative to persuade the class that they solved the mystery correctly.
 10. Group representatives will present their theory to the class.
 11. After all groups have presented, the teacher will explain that all theories could be correct.
 12. The teacher will explain that seeds travel in many different ways, including animals, the wind or rain, or by humans.
- D. Assessment/Evaluation
1. The teacher will formally assess each student's paragraph for an introductory statement with supporting details.
 2. The teacher will informally assess students as they discuss their reasoning in solving the mystery.

Lesson Ten: Oh My, How You Have Grown!

- A. Daily Objectives
1. Concept Objective(s)
 - a. The students will develop an understanding of the functions of the different parts of the seed and of the plant.
 2. Lesson Content
 - a. Make linear measurements in feet and inches, and in centimeters. (p. 57)
 - b. Solve basic word problems. (p. 57)
 3. Skill Objective(s)
 - a. The students will collect and analyze data using the concepts of largest, smallest, most often, least often and middle. (ASMS 2M-F1)
 - b. The students will formulate questions from organized data. (ASMS 2M-F1 PO4)
- B. Materials
1. Lima bean plants
 2. 1 paper plate for each student
 3. 1 ruler (per student), yard stick, and tape measure for each group
 4. Graphing worksheet (Appendix I)
 5. Pencils
 6. Colored Pencils
 7. Proxima projector and screen (used to share group findings)
- C. Key Vocabulary
1. graph- To represent data by means of a graph.
 2. title- A name that identifies something or someone.
 3. x axis- The horizontal line on a graph.
 4. y axis- The vertical line on a graph.

5. root system- The network of roots that a plant develops.

D. Procedures/Activities

1. The teacher will begin the lesson by asking the students to share with the class the observations that they have previously made about their lima bean baggies.
2. The teacher will ask the students to review what their lima bean needed in order to grow efficiently. The teacher will revisit the question of whether or not the seed coat affected the growth of their seed. The students will discuss with the teacher their observations and previously made predictions.
3. The teacher will then ask the students to review with her what the job of a graph is. The teacher will also ask the students the necessary components in a graph. The students will have previously completed a unit on graphing.
4. The teacher will review graphing vocabulary orally with the students.
5. The teacher will tell the students that today they are going to become master gardeners and that they are going to carefully uproot their bean plant and then measure and graph the root system of their plants.
6. The teacher will inform the students that they will be working with their group to create a graph that will compare and contrast the differences in the root systems of the different plants.
7. The teacher will then demonstrate for the students how to carefully take the entire root system and the dirt out of the cup.
8. The teacher will then show the students how to carefully remove the dirt from the roots. As the teacher is doing this, he or she will generate a discussion with the class that will review the function of the root systems. The teacher will also discuss with the class the fragility of the roots.
9. The teacher will then review with the students how to accurately measure the root systems in inches. If the roots are too long then the teacher will model for the students how to use the tape measure or the yardstick to measure the roots.
10. The teacher will then review with the students how to record their findings on the graph. (Appendix I)
11. The students will then individually uproot their plants, measure their root systems, and graph their findings. (Appendix I)
12. After the graph is completed, the students will discuss their findings with their group.
13. The students will then write 4 questions about their graph.
14. The groups will use the Proxima projector to share their graph and questions with the whole class.
15. The groups will call on students to use their graph to answer the questions they have written.
16. The teacher will facilitate this part of the activity by asking students the differences and similarities that they see on their own graphs and the graphs of the other groups.

E. Assessment/Evaluation

1. The teacher will informally assess the students as they work in their groups to uproot, measure, and graph the root system of their plants.
2. The teacher will collect the graphing worksheet (Appendix I) and check for the student's understanding of recording information and accurately creating a graph.

Lesson Eleven: All We Are Is Pollen In The Wind

F. Daily Objectives

1. Concept Objective(s)

- a. The students will develop an understanding of pollination in a flower.
2. Lesson Content
 - a. The life cycle: birth, growth, reproduction, death. (p. 59)
 - b. Reproduction in plants and animals
*From seed to seed with a plant. (p. 59)
3. Skill Objective(s)
 - a. The students will identify the basic structures and functions of plants. (ASSS 4SC-F3 PO3)
 - b. The students will describe and explain cause-and-effect relationships in living systems. (4SC-F1 PO2)
 - c. The students will record information gained from personal observations and experiences. (ASWS W-F4 PO1)
- G. Materials
 1. Day lilies-one flower per group
 2. Magnifying glass
 3. Sheet of white paper-one per group
 4. Exacto knife (teacher use ONLY)
 5. Diagram of a day lily (Appendix J)
 6. Examples of other types of live flowers (rose, carnation, daisy)
 7. Writing Journal
- H. Key Vocabulary
 1. reproduce- To produce offspring.
 2. pollen- A powdery substance that contains reproductive cells.
 3. pistil- The female reproductive part of a plant.
 4. stamen- The male reproductive part of a plant.
 5. petal- A colored outer part of the flower.
 6. ovule (seed)- A small part of the plant that contains the seed of the plant.
 7. sepal- A part of the plant that holds the petals and other parts of the flower.
- I. Procedures/Activities
 1. The teacher will ask students what the word reproduction means. Students will have already developed an understanding of what reproduction is through prior lessons.
 2. The teacher will ask students how they think a flower reproduces. All answers will be acknowledged and accepted.
 3. The teacher will pass out live examples of flowers to each group excluding the day lily.
 4. The teacher will ask students where they think the seed might be in each of the flowers.
 5. The teacher will encourage the students to explain their answers to where the seed might be. All answers will be acknowledged and accepted.
 6. The teacher will ask the students if the flower must have a seed. All answers will be acknowledged and accepted.
 7. The teacher will pass out diagram of day lily to each student. (Appendix J)
 8. The teacher will introduce the key vocabulary by writing the words and the definition on the board. The teacher will discuss the words and their definitions with the students.
 9. The teacher will pass out day lilies to each group along with a white sheet of paper.

10. The students will turn the flower upside down and gently shake the flower over the piece of white paper.
11. The students will observe the dust with the magnifying glass. Teacher will ask what they think the product is that has fallen out of the flower. The product is pollen.
12. The teacher will ask what part of the flower the pollen comes from. The pollen comes from the stamen.
13. The students will carefully pull the sepal and petals off of the day lily and expose the area where the ovule is.
14. The teacher will have the students observe the petals of the flowers. The teacher will ask students if they think the color of the petal is important to pollination. The teacher will look for answers that state that the color of the petals attracts insects to the flower and ensures pollination.
15. The teacher will have students count the number of stamen. There should be six.
16. The teacher will have the students count the number of pistils. There should only be one.
17. The teacher will ask the students what they think the function of the pistil is. The students' answers should state that the pistil is the female part of the flower where the seeds are produced.
18. The teacher will use the exacto knife to cut the pistil of the flower lengthwise.
19. The teacher will ask the students what they see when using a magnifying glass to observe the base of the pistil. Students should see the ovules that become a seed when fertilized by the pollen.
20. The students will use their writing journal to report the observations made during the experiment.

J. Assessment/Evaluation

1. The teacher formally assesses the students by collecting their writing journals. The teacher will look for the use of complete sentences by the students. The teacher will also assess the students understanding of the vocabulary and the process of pollination.

**VI. CULMINATING ACTIVITY
PLANT-INGO!**

A. Daily Objectives

1. Concept Objective(s)
 - a. The students will develop an understanding that all living things are part of a life cycle.
 - b. The students will develop an understanding of the necessary components for plant growth.
 - c. The students will develop an understanding of the functions of the different parts of the seed and of the plant.
2. Lesson Content
 - a. The life cycle: birth, growth, reproduction, death. (p. 59)
 - b. Reproduction in plants and animals
*From seed to seed with a plant. (p. 59)
3. Skill Objective(s)
 - a. The students will trace the life cycles of various organisms. (ASSS 4SC-F2 PO1)

- b. The students will identify the basic structures and functions of plants. (ASSS 4SC-F3 PO1-4)
- B. Materials
 - 1. PLANT-INGO boards for each student (Appendix K)
 - 2. PLANT-INGO vocabulary for each student (Appendix L)
 - 3. Pencils
 - 4. Place markers
 - 5. PLANT-INGO song (Appendix M)
 - 6. PLANT-INGO clues (Appendix N)
- C. Procedure/Activities
 - 1. The teacher will pass out the PLANT-INGO song and teach the students how to sing the song to the tune of BINGO. (Appendix M)
 - 2. The teacher will distribute PLANT-INGO boards and vocabulary sheets. (Appendix K, L)
 - 3. The teacher will instruct the students to fill in their game boards using the vocabulary sheets. The teacher will encourage students to design their own PLANT-INGO card. (Appendix K, L)
 - 4. The teacher will explain to students that this is a quiet game. The students are not to share their answers with other students.
 - 5. The teacher will tell the students to mark their “Free Space.”
 - 6. The teacher will give a clue about a part of the life cycle of a plant using the PLANT-INGO clue page. (Appendix N) If the student has the word that matches the clue on their board then they mark that spot with their PLANT-INGO markers. If the student does not have the word then they do not mark any spaces.
 - 7. The game will continue until a student covers a whole row vertically, horizontally, or diagonally. The student(s) who does/do this first will yell, “PLANT-INGO,” to let the others know they have a row filled up.
 - 8. Once a student has PLANT-INGO, the game boards will be cleared and the game will start again from the beginning.
- D. Assessment/Evaluation
 - 1. The teacher will informally assess the student’s knowledge as they play PLANT-INGO.

VII. HANDOUTS/WORKSHEETS

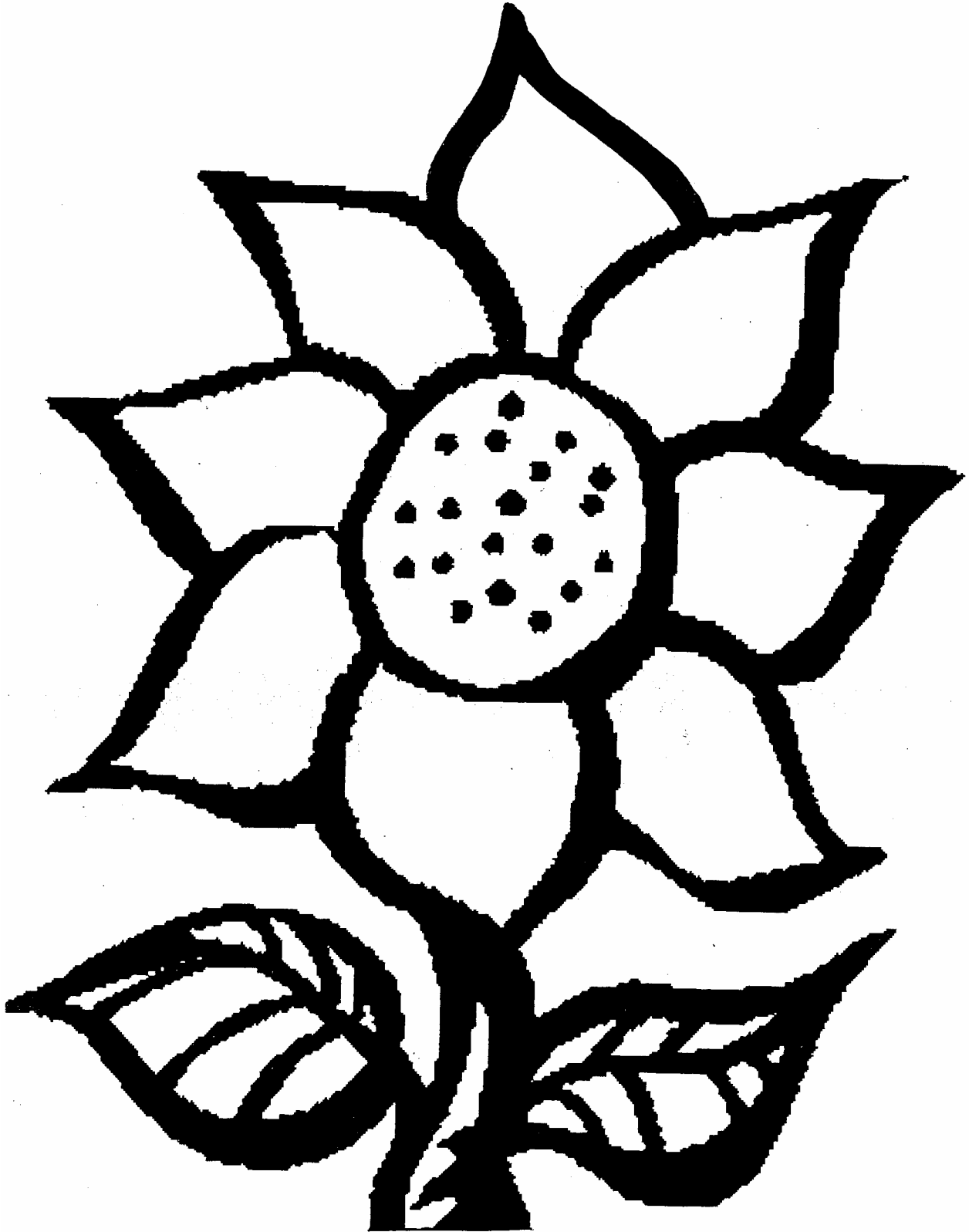
Appendices A, B, C, D, E, F, G, H, I, J, K, L, M, N, O

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Appendix A



Take Off Your Coat!!

Look carefully at this giant lima bean seed. Each part has an important job to do. Label each part and tell what its job is. Then color the lima bean.

Name _____

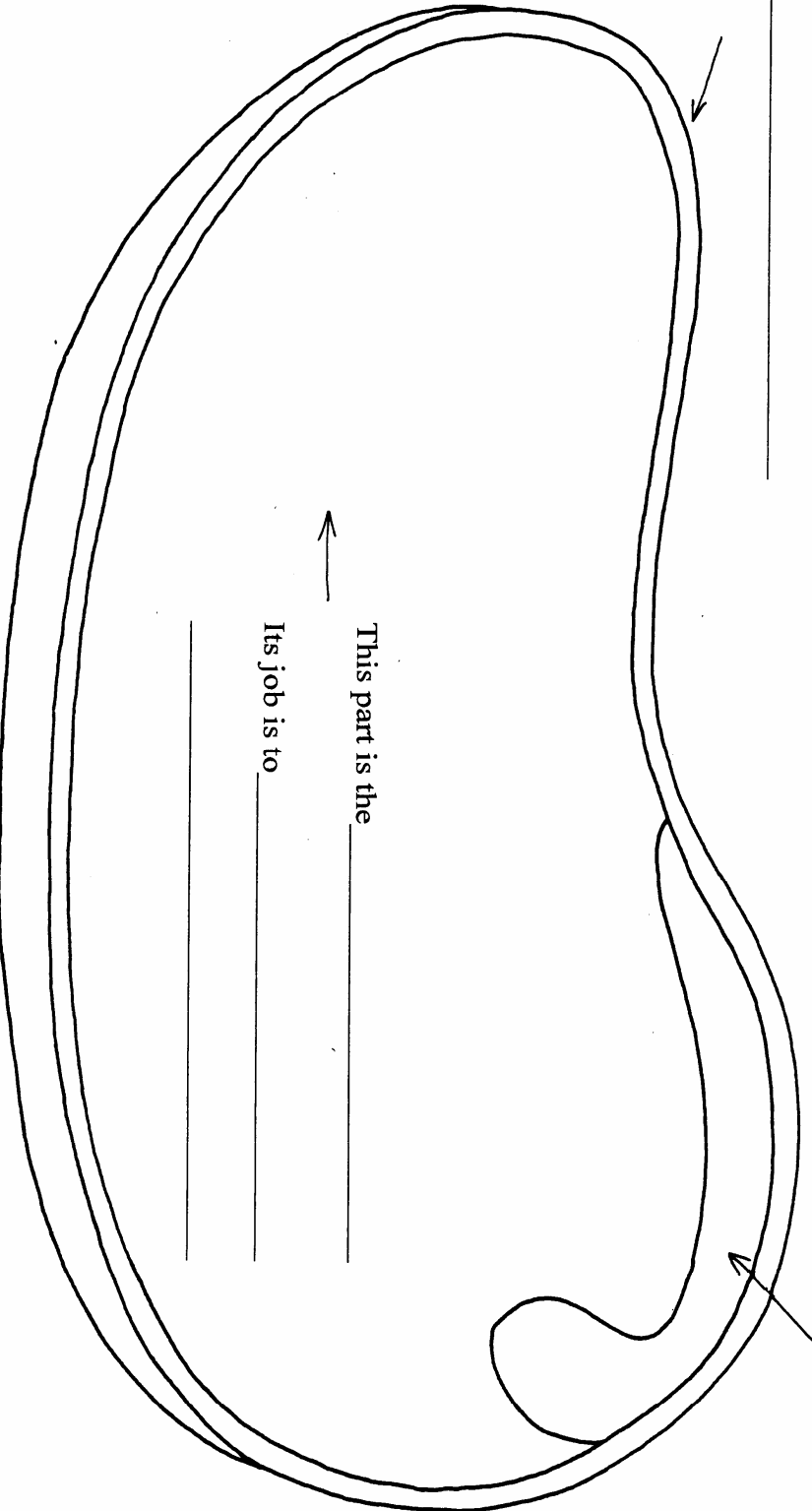
This part is the _____

Its job is to _____

This part is the _____

Its job is to _____

Appendix B





Appendix C

Name _____

Lab Sheet

Take Off Your Coat!

1. How do you think the removal of the seed coat will affect the growth of your lima beans?

Explain your answer. _____

2. What is the job of the seed coat? _____

3. Describe your lima beans. Be sure to use details. _____



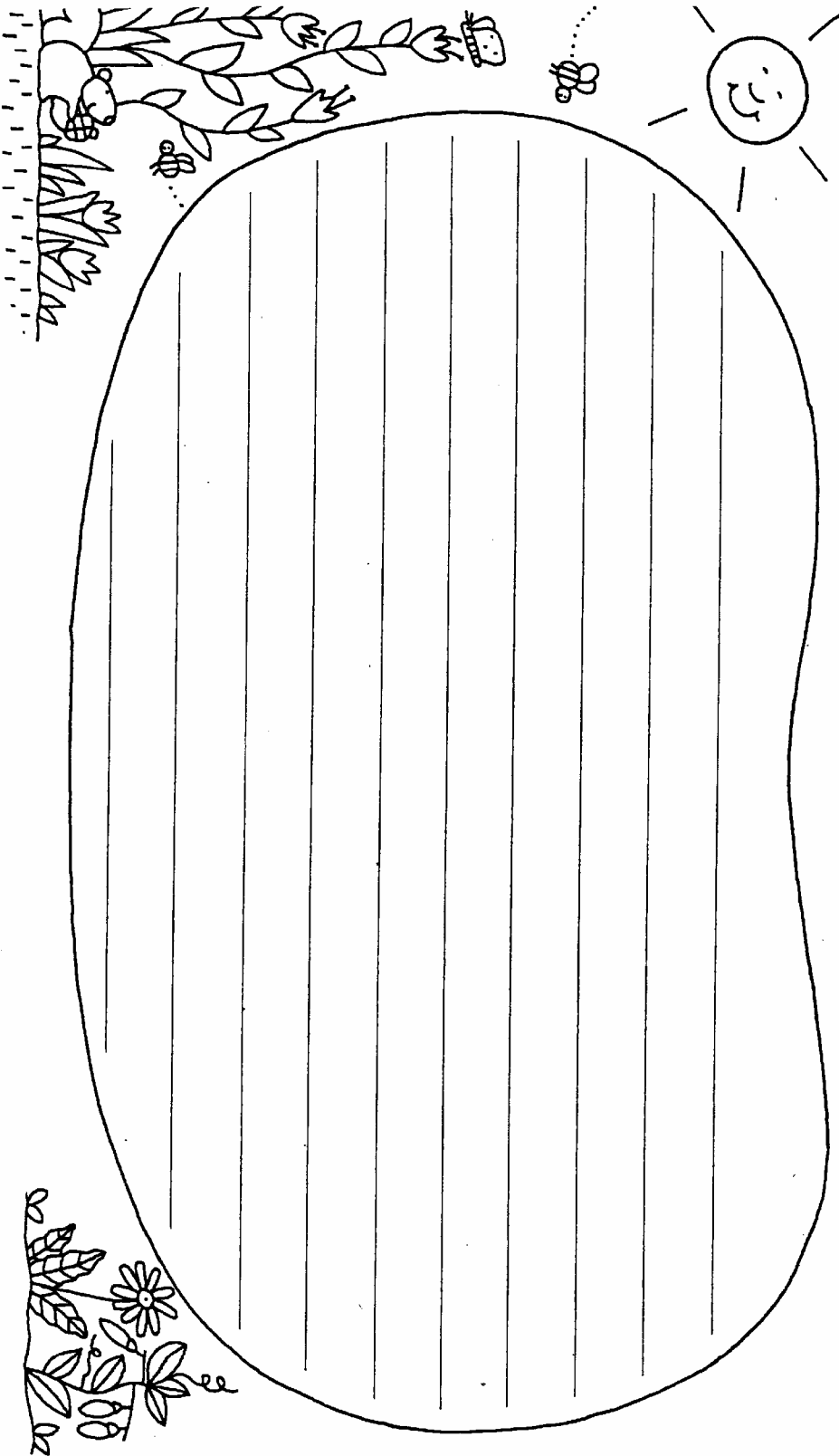
Appendix D

Name _____

Data Sheet

Take Off Your Coat!

| DAY | No Seed Coat | Seed Coat |
|-----|--------------|-----------|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

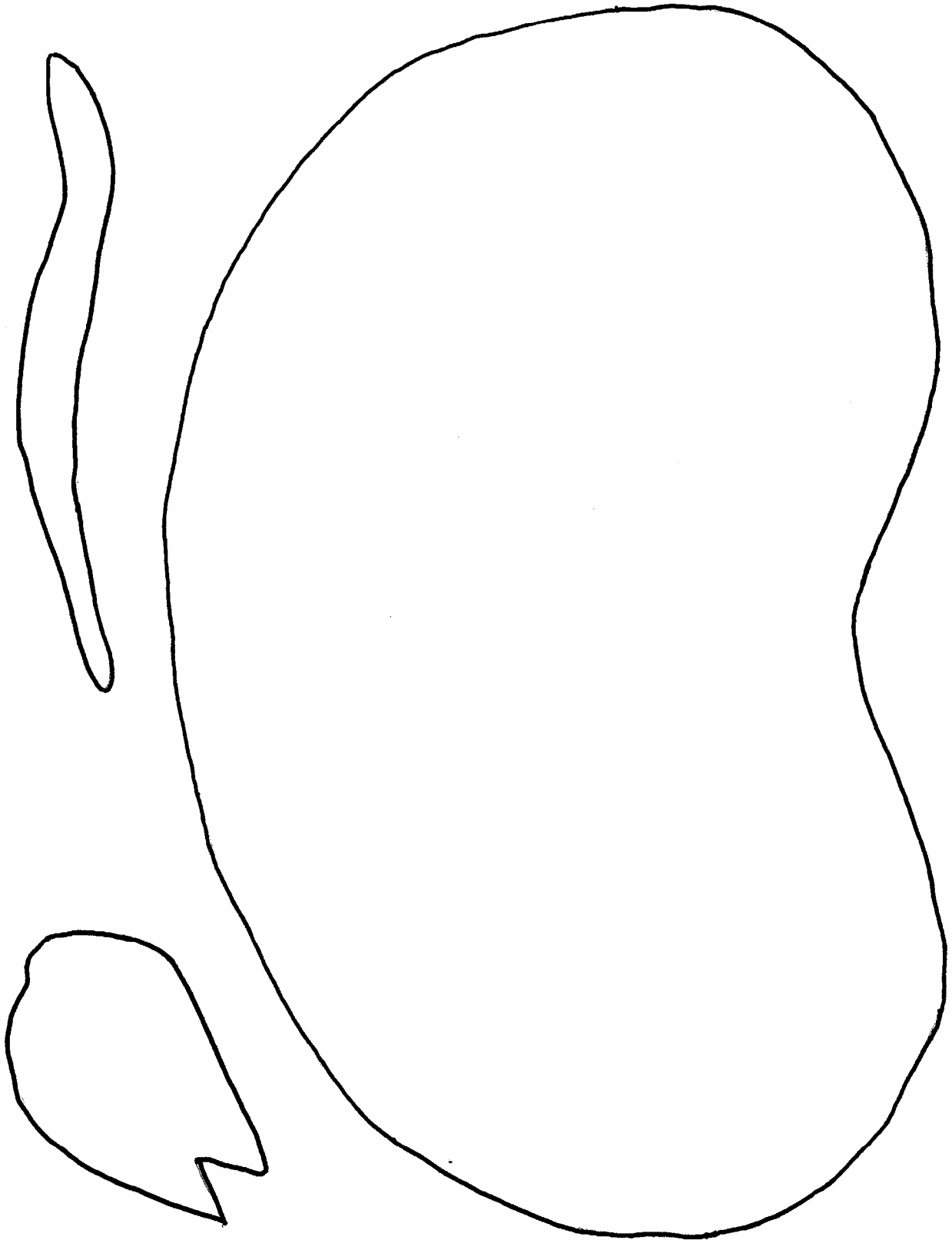


I'm A Little Seed!

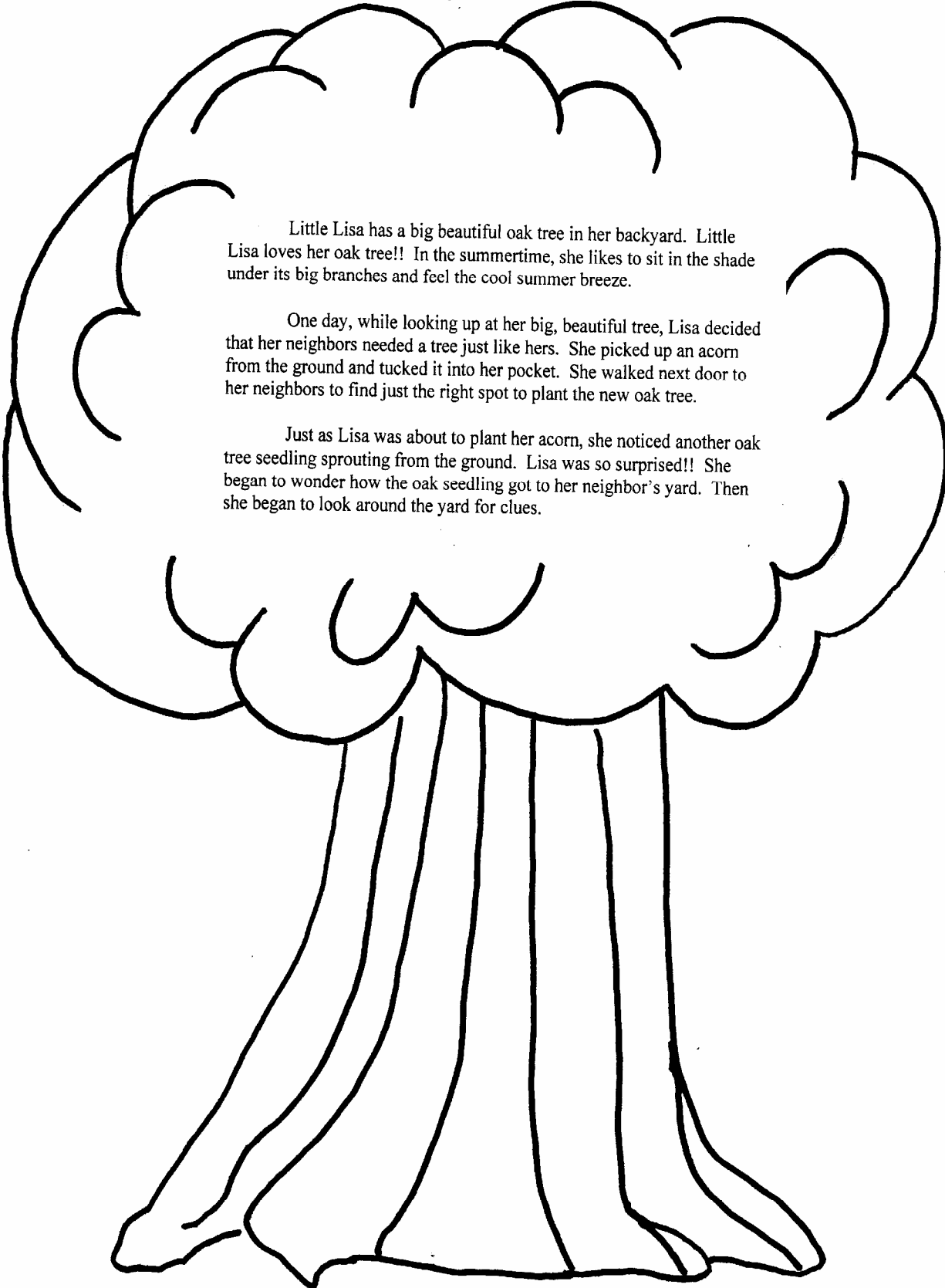
Imagine that you are a little seed. Tell what happens to you, starting with the time you are planted. Be sure to tell about the things you need and how and where you will grow.

Name _____

Appendix F



Appendix G



Little Lisa has a big beautiful oak tree in her backyard. Little Lisa loves her oak tree!! In the summertime, she likes to sit in the shade under its big branches and feel the cool summer breeze.

One day, while looking up at her big, beautiful tree, Lisa decided that her neighbors needed a tree just like hers. She picked up an acorn from the ground and tucked it into her pocket. She walked next door to her neighbors to find just the right spot to plant the new oak tree.

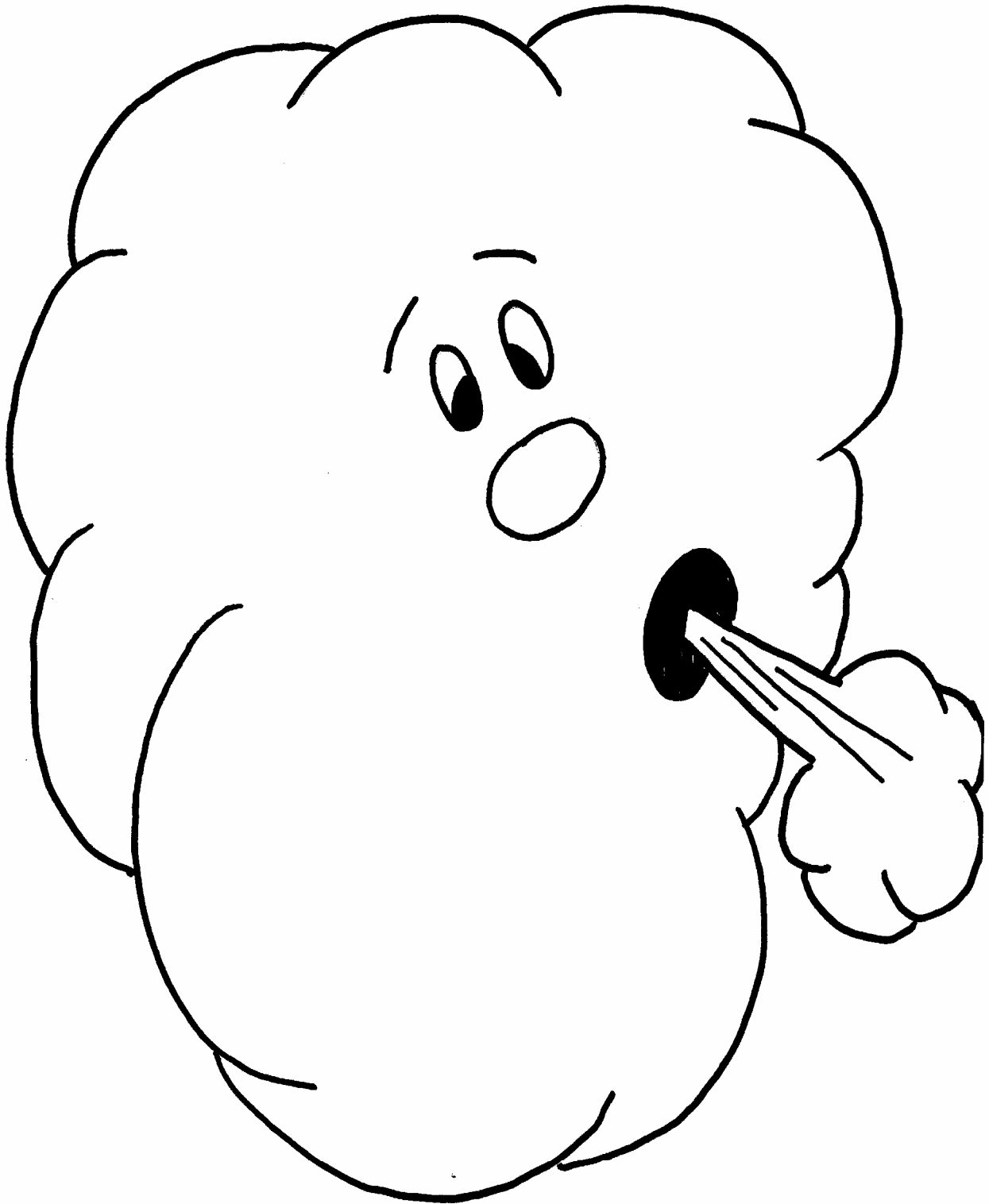
Just as Lisa was about to plant her acorn, she noticed another oak tree seedling sprouting from the ground. Lisa was so surprised!! She began to wonder how the oak seedling got to her neighbor's yard. Then she began to look around the yard for clues.



Little Donny



Suzy Squirrel



Professor Storm Cloud

Appendix I

Name _____

| | | | | | |
|--|--|--|--|--|--|
| | | | | | |
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Graph Questions:

1. _____

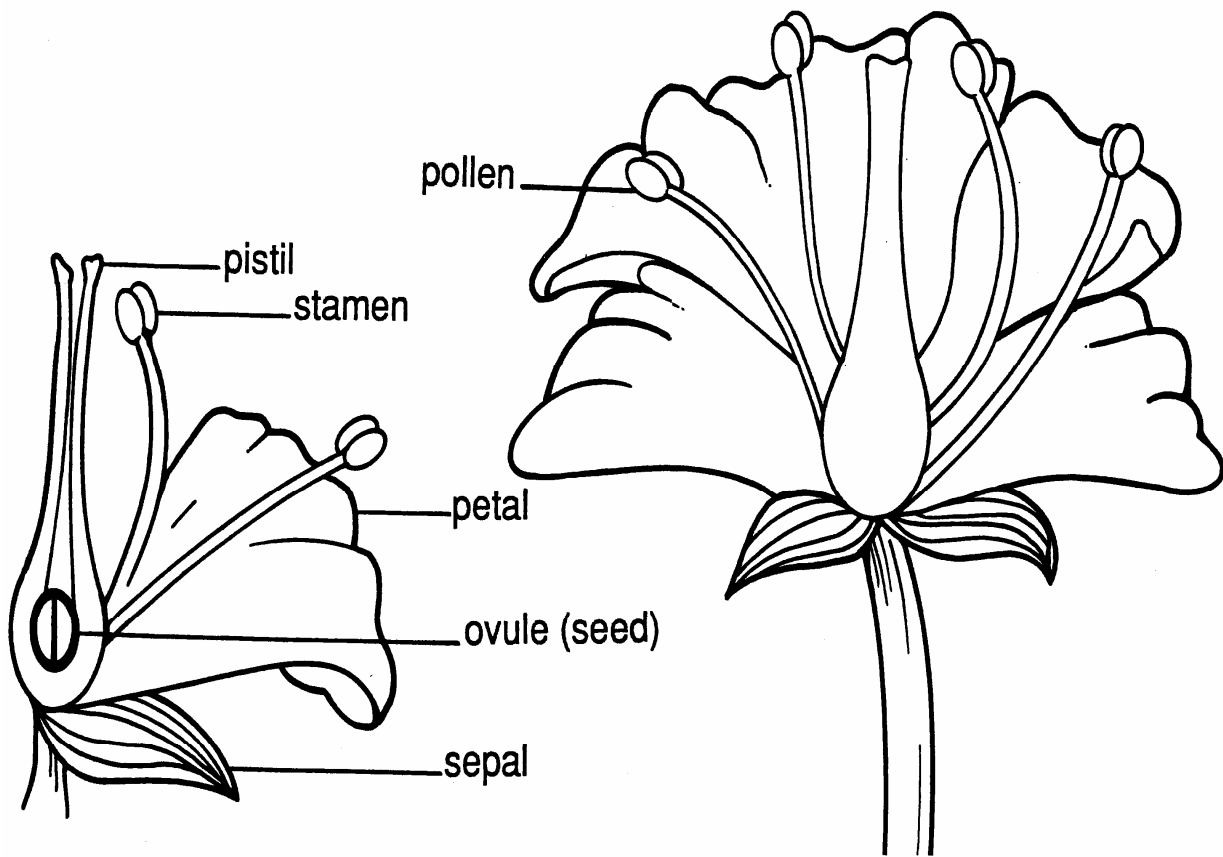
2. _____

3. _____

4. _____

Appendix J

Parts of a Lily



Plant – Ingo!!

| | | |
|--|-----------------------|--|
| | | |
| | Free Space | |
| | | |

Appendix L

Plant-Ingo

Directions: Using the words below, design your own Plant-Ingo card. Place one word in each square, except your Free Space. You will have extra words when you have filled all your squares.

Roots

water

Stem

air

Leaves

soil

flower

cycle

seed coat

cotyledon

embryo

sunlight

minerals

Appendix M

PLANT-INGO SONG (Sing to the tune of BINGO)

Today we're going to play a game,
PLANT-INGO is its name-o!
P-L-A-N-T
P-L-A-N-T
P-L-A-N-T
And don't forget the INGO!

There was a seed deep in the ground,
sprouting some roots-o!
P-L-A-N-T
P-L-A-N-T
P-L-A-N-T
And don't forget the INGO!

And next to grow was the stem,
breaking through the ground-o!
P-L-A-N-T
P-L-A-N-T
P-L-A-N-T
And don't forget the INGO!

Big green leaves did then appear,
reaching for the sun-o!
P-L-A-N-T
P-L-A-N-T
P-L-A-N-T
And don't forget the INGO!

A big flower bloom did then unfold,
attracting all the bees-o!
P-L-A-N-T
P-L-A-N-T
P-L-A-N-T
And don't forget the INGO!

A hummingbird came buzzing by,
to pass along the pollin-o!
P-L-A-N-T
P-L-A-N-T
P-L-A-N-T
And that's the plant's life cycle!

Appendix N

????Clues for Plant-Ingo????

I hold the plant up straight and carry water from the roots.

I make the seeds for another plant to grow.

I work with the sun to make food for the plant.

I take up water and minerals from the soil.

I am the outer covering of a seed.

I am the young plant inside the seed.

I am the food the seed uses to grow.

I help the plant make it's own food.

I am the natural vitamins in the soil.

I am what all living things follow-I never end!

I am what the plant breathes.

I am what the plant drinks.

I hold the plant's roots in place.

