Standards

Life Science
- Knows about the diversity and unity that characterize life.
- Understands how species depend on one another and on the environment for survival.

Writing
- Demonstrates competence in the stylistic and rhetorical aspects of writing.
- Uses the general skills and strategies of the writing process.
- Uses grammatical and mechanical conventions in written compositions.
- Gathers and uses information for research purposes.

Reading
- Demonstrates competence in the general skills and strategies of the reading process.
- Demonstrates competence in the general skills and strategies for reading a variety of informational texts.

Thinking and Reasoning
- Understands and applies basic principles of logic and reasoning.
- Effectively uses mental processes that are based on identifying similarities and differences.
- Understands and applies basic principles of hypothesis testing and scientific inquiry.
- Applies basic troubleshooting and problem-solving techniques.
- Applies decision-making techniques.

Multiple Intelligences Utilized
- Spatial, linguistic, naturalistic, logical-mathematical, interpersonal, bodily kinesthetic, and intrapersonal
Lesson 1
Observing Nature

Purpose: Students make observational drawings of two different plants and compare how their parts are alike and different.

Materials
· Look Once, Look Again! Plants books
· lined paper
· pencils
· colored pencils
· Observational Drawing p. 9
· Alike and Different? p. 10
· drawing paper
· magnifying glasses
· rulers

Objectives
· List the plants observed in the text.
· Describe two plants and their parts.
· Illustrate details through observational drawings.
· Compose a paragraph about the observed plants.
· Prepare a drawing of each plant observed.
· Compare the parts of different plants.

Activity Procedures

Prepare (teacher)
· Review Look Once, Look Again! Plants books.
· Copy Observational Drawing p. 9 and Alike and Different? p. 10 for each student.
· Collect various plants or arrange for the class to go on a nature walk.

Pretest (student, class)
· List the parts of plants.

Read (student)
· Read Look Once, Look Again! Plants books.

Model (teacher)
· Explain how some plant parts are common to many kinds of plants. Explain how they are different for each plant.
· Show students how to measure and draw plant specimens.

Practice (student)
· Students should closely examine two plants.
· Follow the instructions on Observational Drawing p. 9.
· Complete Alike and Different? p. 10.

Discuss (class, teacher)
· Have students compare the two plants they observed.
· In as much detail as possible, describe how the parts of the two plants are similar and how they are different.

Evaluate (class, teacher)
· Have students share their observational drawings with the class.
· Collect and evaluate observational drawings and Alike and Different p. 10.
Lesson 2
Plant Vocabulary

Purpose: Students will learn vocabulary terms and functions of plant parts.

Materials
- Look Once, Look Again! Plants books
- Plant Vocabulary Worksheets pp. 14–16
- index cards
- scissors
- glue
- pencils
- colored pencils

Objectives
- Recognize parts of plants.
- Associate vocabulary terms with the plant parts they describe.
- Demonstrate knowledge of vocabulary terms.
- Identify the functions of various plant parts.
- Prepare vocabulary flash cards.
- Compare similarities and differences in plant parts.

Activity Procedures

Prepare (teacher)
- Copy Plant Vocabulary Worksheets pp. 14–16 for each student.

Pretest (class)
- What are some parts of plants?
- Explain the parts’ functions.

Read (students)
- Read Look Once, Look Again! Plants books.

Model (teacher)
- Show students Plant Vocabulary Worksheet 1 (p. 14). Explain how to color and cut out the images and definitions and glue them onto index cards. One term and image should be glued to the front of a card, with that term’s correct definition on the back of the card. Show students how to look up the terms in the books if necessary.

Practice (student)
- Each student will create a set of flashcards using Plant Vocabulary Worksheets pp. 14–16.

Discuss (class)
- Which vocabulary terms were new to you?
- Were any of the terms confusing?
- How are some of the plant parts similar but different?

Evaluate (student pairs)
- Students will quiz each other on plant vocabulary using the flashcards they created.
Lesson 3
Importance of Plants

Purpose: Students will learn how humans and animals use plants by researching information in the Look Once, Look Again! Plants books and by sorting and grouping pictures and objects.

Materials
- Look Once, Look Again! Plants books
- paper
- scissors
- glue or tape
- pencils
- magazines with pictures of plants and plant products
- plants or plant products
- Plants Are Important p. 11

Objectives
- Define plant product.
- Identify plants that humans or animals use.
- Collect plants and plant products, or pictures of these.
- Organize and arrange plants and plant products by use.
- Construct a diagram showing how plants are used.
- Determine which plant parts humans and animals use most often.

Activity Procedures

Prepare
(teacher)
- Collect magazines with pictures of plants.
- Collect plant products (cotton T-shirt, paper, rubber, vitamins, etc.).
- Copy Plants Are Important p. 11 for each student.

Pretest
(class, teacher)
- List plants and plant products and how humans or animals use them (e.g. for food, homes, clothing, recreation, fuel, etc.).

Read
(teacher, class)
- Read Look Once, Look Again! Plants books.

Model
(teacher)
- Give examples of plants and their uses. Show students various kinds of plant products.
- Demonstrate how to complete Plants Are Important p. 11.

Practice
(student)
- Complete Plants Are Important p. 11. Include plants or plant products found in the Look Once, Look Again! Plants books.
- Cut out magazine pictures of plant products.
- Group the pictures by their uses.

Discuss
(teacher, class, student)
- Discuss the uses and importance of plants.
- Share information found in the books. Explain how you grouped your pictures.

Evaluate
(teacher, class)
- Construct a class chart or bulletin board that displays plant products and the categories they fit in.
Lesson 4
Experiment with Plants

Purpose: Students will conduct experiments to show fundamental concepts related to plants.

Materials
· Look Once, Look Again! Plants books
· Science Log pp. 12–13
· beans or seeds
· soil
· clear plastic cups
· food coloring
· celery stalk or carnation
· two house plants
· cardboard box
· unusual fruits or vegetables (kiwi, mango, pomegranate, etc.)
· plastic bags
· paper towels
· knife
· spray bottle with water
· pencils
· lined paper

Objectives
· Identify plant needs.
· Discover how plants’ needs are met.
· Explain how plants meet their needs.
· Examine how invisible chemical and physical changes occur.
· Conduct experiments.
· Measure and record experiment results.

Activity Procedures

Prepare
(teacher)
· Collect materials for experiments.
· Copy Science Log pp. 12–13 for each student.

Pretest
(student)
· List the things that plants need in order to live.

Read
(student, class)
· Read Look Once, Look Again! Plants books.

Model
(teacher)
· Demonstrate how to assemble each science experiment.

Practice
(student, small group, partner)
· Conduct one or all of the following experiments.
· Write a description of the scientific principles demonstrated by the experiment.
· Present the experiment and description to the class.

WHAT MAKES SEEDS START TO GROW?
Step 1. Collect beans, three paper towels, three plastic bags, and a spray bottle with water.
Step 2. Spray a paper towel with water and place a few beans on the towel.
Step 3. Roll the beans into the wet towel and place it in a plastic bag. Place the bag in a desk drawer.
Step 4. Roll a few beans in a dry paper towel and place it in another plastic bag. Place this bag in a desk drawer.
Step 5. Spray a paper towel with water. Roll a few beans into the towel. Place in a plastic bag. Place this bag in a freezer.
Step 6. In two or three days, observe and compare what happened to each set of seeds.

WILL ROOTS GROW UPSIDE DOWN?
Step 1. Collect two clear plastic cups, soil, and beans or other seeds.
Step 2. Fill the cups with soil.
Step 3. Plant the seeds in the soil, with each seed facing a different direction in the soil.
Step 4. Water the seeds and place the cups in a warm, sunny location.
Step 5. Observe the direction of root and stem growth.
DO LEAVES NEED LIGHT?
Step 1. Collect two houseplants and a cardboard box.
Step 2. Place one of the houseplants inside the cardboard box.
Step 3. Place the other houseplant in a sunny location.
Step 4. Observe the two plants over a period of days.
Step 5. Compare the plants’ growth patterns and physical characteristics.

HOW DO PLANTS GET WATER?
Step 1. Collect a celery stalk or carnation, a cup of water, a knife, and some food coloring.
Step 2. Cut the end off of the celery or carnation stalk.
Step 3. Place the stem in a cup of water.
Step 4. Put several drops of food coloring in the cup of water.
Step 5. Observe the celery or carnation over a period of several hours.

WHAT IS AT THE CORE OF IT ALL?
Step 1. Collect several unusual kinds of fruits or vegetables and a knife.
Step 2. Predict what the center of each fruit or vegetable looks like.
Step 3. Cut the fruits or vegetables in half and observe the seeds and fiber at the core.
Step 4. Observe the appearance of the core.
Step 5. Compare the appearance of the fruits and their cores.

Discuss
(class, teacher)
· In your experiment, what did you expect to happen?
· What actually happened?
· Explain why you think you got the results you did.

Evaluate
(student, teacher)
· Assess completed Science Logs pp. 12–13 to determine that the correct scientific method was used and that the student understood the concepts.
**Additional Resources**

**BOOKS**
This book defines 50 words related to plants.
In the style of the DK eyewitness books, this book uses photographs and text to examine various parts of plants.
Follow Mrs. Frizzle and her class as they plant a garden, learn about plants, and travel through a flower.
These books use colorful photographs to explore the world of plants. Each title includes activities, experiments, diagrams, and charts.
This book presents basic information about plants, by looking at the work that botanists do.
This book uses photographs, text, and diagrams to look at plant life cycles. Included is information about how humans impact plants.
This picture book gives readers information about seeds and how they grow into plants.
The illustrations on each foldout page show the growing seasons of six fruits and vegetables.

**WEBSITES**
All About Plants
http://library.thinkquest.org/3608/index.html
This site uses students’ original art to illustrate how plants grow, make food, and reproduce.
The Great Plant Escape
http://www.urbanext.uiuc.edu/gpe/
This site explores plants with Detective Leplant and his partners Sprout and Bud. This site can be explored in both English and Spanish.
Plants and Our Environment
http://library.thinkquest.org/3715/
This student created site looks at many aspects of plants including seeds and growth.
Why Do Leaves Change Color in the Fall?
http://www.sciencemadesimple.com/leaves.html
This site includes two explanations for why leaves change color in the fall. One is written for adults and older readers and the second is written for younger readers.
Observational Drawing

Name________________________________________

Date________________________________________

1. 👀 Find a plant.

2. 👀 Carefully observe the plant for several minutes with a magnifying glass.

3. 👀 Look at the tiny features in/on the plant, like texture, colors, lines, bumps, grooves, etc.

4. Measure what you see. Use a ruler to measure length, width, and height. Count the number of parts, divisions, angles, etc.

5. On a piece of paper, write what you measured.

6. Draw exactly what you see. You should look at your plant over and over as you draw. This is called an observational drawing.
   *Use a whole sheet of drawing paper even if your object is very small.

7. Label your drawing with the data you collected while measuring and counting.
Alike and Different?

Name ________________________________ Date ____________________

Directions: Write the labels below on your observational drawings. Check the boxes as you label the pictures with the following parts:

- [ ] bud
- [ ] flower or blossom
- [ ] leaf or needle
- [ ] root
- [ ] seed or fruit
- [ ] stem or trunk

Directions: Write down what you learned about the parts.

<table>
<thead>
<tr>
<th>How are the parts alike?</th>
<th>How are the parts different?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bud:</td>
<td></td>
</tr>
<tr>
<td>Flower or blossom:</td>
<td></td>
</tr>
<tr>
<td>Leaf or needle:</td>
<td></td>
</tr>
<tr>
<td>Root:</td>
<td></td>
</tr>
<tr>
<td>Seed or fruit:</td>
<td></td>
</tr>
<tr>
<td>Stem or trunk:</td>
<td></td>
</tr>
</tbody>
</table>
Plants Are Important

Name ________________________________ Date ____________________

Directions: Look for facts about how humans and animals use plants. Write each fact under the word that describes its use. Write the facts that don’t fit in any of the categories under OTHER.

FOOD __________________________________________

HOMES _______________________________________

CLOTHES _______________________________________

OTHER ________________________________________

Teaching Look Once, Look Again! Plants
Science Log

Name ________________________________ Date ________________

Topic __________________________________________________________

Predict:  What do you think will happen? What do you think you will see?
_______________________________________________________________
_______________________________________________________________

Hypothesize:  I think this will happen or I will see this because . . .
_______________________________________________________________
_______________________________________________________________

Observe and Record:  Write or draw what you saw.

The materials I used were . . .

The first thing I did was . . .

First I saw . . .

Then I saw . . .
Results: My final experiment looked like this . . .

Conclusion: I learned that . . .

__________________________________________________________________________________________________________________________

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Teaching Look Once, Look Again! Plants
**Plant Vocabulary Worksheet 1**

Name ________________________________________ Date ________________________

**Directions:** Color and cut out the pictures and definitions. Paste a picture on one side of an index card. Paste its correct definition on the other side.

- **The flower of a seed plant**
- **The part of a plant that contains seeds**
- **The part of a plant found on the ends of branches that will make young leaves or flowers**
- **The flat part of a plant that sticks off of a stem. It makes food for the plant.**
- **A woody plant with a trunk and branches**
- **The part of a plant that makes new plants**
- **The frilly, pointy leaves of ferns**
- **Clusters of tiny flowers often found on trees**

**Definitions:**
- Tree
- Seed
- Blossom
- Leaf
- Bud
- Fruit
- Catkin
- Frond

**Images:**
- Tree
- Seed
- Blossom
- Leaf
- Bud
- Fruit
- Catkin
- Frond
Plant Vocabulary Worksheet 2

Name __________________________ Date ______________________

Directions: Color and cut out the pictures and definitions. Paste a picture on one side of an index card. Paste its correct definition on the other side.

The part of a fruit that contains the seeds

Long narrow leaves on evergreen trees

The part of a tree branch that divides into two parts

Trees that do not lose their leaves all at once

The outer covering of some fruits or seeds

The watery food that flows through a plant

A long seed case that holds the seeds of some plants

The part of a plant in the soil that soaks up water and minerals
Plant Vocabulary Worksheet 3

Directions: Color and cut out the pictures and definitions. Paste a picture on one side of an index card. Paste its correct definition on the other side.

A kind of root above the ground that helps plants stand up against wind

Little brown balls on the roots of some plants

A fine yellow powder found in the middle of flowers

The main stalk of a plant that grows up out of the soil

The part of the flower that holds the pollen

The woody stem of a tree

When a fruit or seed is ready to eat or is done growing

When a plant begins to grow from a seed

Long creeping stems of some kinds of plants

pollen

trunk

stem

nODULES

prop root

runner

sprout

green

ripe

rotten

ripe