

Module 1 ~ Silent Invaders (UE/MS, HS)

Magnify It!



Essential Questions:

1. What characteristics are needed to describe or identify a plant?
2. How would YOU describe various plant characteristics?
3. Why is it useful to use botanical terminology? (ex: leaf blade, ovate, etc)

Science Subject: biology, botany, environmental science, life science

Grade Level: 4th – 12th

Science Concepts: See suggested state standards at the end of this document.

Overall Time Estimate: 1 hour (4 plants @ 15 minutes each)

Learning Styles: visual, kinesthetic

Vocabulary: Refer to separate document

Lesson Summary: Students will work together to identify parts of plants (including root structures, leaf shapes, and flower parts) using correct scientific terminology. They will learn the function of these plant parts, and how plants are classified according to shared characteristics.

Student Learning Objectives:

1. Identify plants' leaf shapes, leaf arrangements, structures, and habits.
2. Use scientific terminology to identify plant characteristics (i.e., for leaves, roots, and flowers).
3. Describe why correctly describing plant parts/characteristics helps us to identify plant species.

Materials:

- Magnify It Cards – Distribute one type of card per student, per plant
 - For UE/MS: There are 3 different cards: leaf shapes, roots, and flower parts
 - For HS: There is one card with all plant parts listed (leaf shapes, roots, and flower parts)
- Several plant specimens (4-6, real or artificial). Real plants are best for this activity, as many artificial plants do not have the amount of detail students will need to complete the Magnify It Cards.
 - Collect pieces about 10" long for smaller plants (1-2 for each student). Include roots when possible. Be sure there are enough leaves, branches, etc. to show leaf arrangement.
 - Place samples in clear plastic bags and label ahead of time.
- Classroom set of magnifiers (available free to teachers, email caip-education@ufl.edu)
- Handout Illustrated Plant Structures PDF (12 pages)
- OPTIONAL: Invasive and Non-Native Plants Recognition Cards and Native Plants Recognition Cards



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Advance Preparation:

1. Gather enough samples for each group to have one of each of 3 different terrestrial plant species and a flower. Make sure your samples include the root structure.
 - a. Suggestions for flower: Potted lily plants do well anytime. In the summer daylilies work very well; in spring – easter lilies or tulips.
2. Download Illustrated Plant Structures handout and Magnify It Card Answer Keys from <http://plants.ifas.ufl.edu/education/> to project on board for students to follow along with. Magnify It Card Answer Keys are available as active PDFs, so they can be filled out while viewing as a class.
3. If using recognition cards or flashcards, download specific plant cards from the resources section of our site: <http://plants.ifas.ufl.edu/education/> and print or display.

Procedure and Discussion:

1. Separate the class into groups.
2. Pass out magnifiers, Magnify It! cards, Illustrated Plant Structures handout, and recognition cards (if using).
3. Go over the vocabulary, using Illustrated Plant Structures.
4. Examine one of the plants with the class, discussing the parts of the plant and their function (what makes them suitable for their environment).
5. Pass out the samples of the plant to each group. As a class, go through the process of filling out the magnify it card, identifying the leaf shape, root structure, stem, habitat, and flower, if applicable.
Note: Use the active PDF Magnify It Card Answer Key projected on screen to demonstrate how to fill out the cards/keep students answers on track.
6. Continue for all 3 samples as a class or in groups, depending on grade level

Reference: Recognition cards or Flashcards can help for developing answer keys for other plants.

The following is a list of suggested standards that pertain to this activity. This list is provided as a reference to incorporate and expand upon as needed.

Next Generation Sunshine State Standards

5th Grade

SC.5.L.14.2: Compare and contrast the function of organs and other physical structures of plants and animals, including humans, for example: some animals have skeletons for support -- some with internal skeletons others with exoskeletons -- while some plants have stems for support.

SC.5.L.17.1: Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.

9th - 12th Grades

SC.912.L.14.7: Relate the structure of each of the major plant organs and tissues to physiological processes.

SC.912.L.14.53: Discuss basic classification and characteristics of plants. Identify bryophytes, pteridophytes, gymnosperms, and angiosperms.



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Common Core State Standards

4th Grade

Common Core Code	FL Common Core Code	Common Core Standard
RF.4.3	LAFS.4.RF.3.3	Know and apply grade-level phonics and word analysis skills in decoding words.
L.4.4	LAFS.4.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.
L.4.6	LAFS.4.L.3.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation).

5th Grade

RF.5.3	LAFS.5.RF.3.3	Know and apply grade-level phonics and word analysis skills in decoding words.
L.5.4	LAFS.5.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.
L.5.6	LAFS.5.L.3.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).

6th Grade

L.6.4	LAFS.6.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 6 reading and content, choosing flexibly from a range of strategies.
L.6.6	LAFS.6.L.3.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.
RST.6-8.4	LAFS.68.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

7th Grade

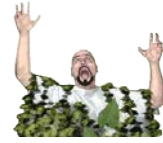
L.7.4	LAFS.7.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 7 reading and content, choosing flexibly from a range of strategies.
L.7.6	LAFS.7.L.3.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.
RST.6-8.4	LAFS.68.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

8th Grade

L.8.4	LAFS.8.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words or phrases based on grade 8 reading and content, choosing flexibly from a range of strategies.
L.8.6	LAFS.8.L.3.6	Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.
RST.6-8.4	LAFS.68.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.



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9-10th Grade

L.9-10.4	LAFS.910.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies.
L.9-10.6	LAFS.910.L.3.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression
RST.9-10.4	LAFS.910.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.
RST.9-10.7	LAFS.910.RST.3.7	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

11-12th Grade

L.11-12.4	LAFS.1112.L.3.4	Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies.
L.11-12.6	LAFS.1112.L.3.6	Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.
RST.11-12.4	LAFS.1112.RST.2.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.
RST.11-12.7	LAFS.1112.RST.3.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.



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