

Magnify It!

Activity Overview

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.

Science Subjects: biology, botany, environmental science, and life science

Grade Levels: 4th - 12th

There are separate materials for upper elementary/middle school and high school

Time Estimate: 1 hour

(4 plants at about 15 minutes each)

Materials

- Magnify it! Cards - two versions available depending on grade level.
- Plant samples (4-6 real or artificial). Real plants are best as they have the most detail for students to complete the cards.
- Magnifying glasses as a class set or enough for each group.
- Illustrated plant structures handout

Preparation

- Gather enough samples for each group to have one of each of the plants and a flower.
Flower Plant Suggestion: Potted lily plants or tulips work well.
- Download the illustrated plant structures handout and Magnify it! cards (answer keys also available).

Learning Objectives

- Identify plants' leaf shapes, leaf arrangements, structures, and habits.
- Use scientific terminology to identify plant characteristics.
- Describe why correctly describing plant parts/characteristics helps us to identify plant species.

Key Questions

- What characteristics are needed to describe or identify a plant?
- How would you describe various plant characteristics?
- Why is it useful to use botanical terminology?

Instructions

- 1 Separate the class into several work groups.
- 2 Pass out magnifying glasses, Magnify it! cards, and the illustrated plant structures handout.
- 3 Go over the vocabulary on the illustrated plant structures handout.
- 4 Pass out the plant samples to the groups. Examine one of the plant samples with the class and start discussing the plant parts.
- 5 As a class, go through the process of filling out one of the Magnify it! cards identifying: leaf shape, root structures, stem, habitat, and flowers (if applicable).
- 6 Continue filling out the cards as a class or in groups, depending on the grade level.

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TURNING SCIENCE INTO SOLUTIONS

Module 1 ~ Silent Invaders (HS)
Magnify It! Answer Key (air potato)



air potato

See *Invasive and Non-native Plants You Should Know--Recognition Cards (or Flash Cards)* as a reference.

Herbaceous plants are plants that are not "woody."

Woody plants are plants that contain lignified tissues (cells with lignin in them); containing woody or wood fibers.

Is the plant (circle answer): **herbaceous** OR woody • If it is **woody** is it a: tree shrub vine

If it is **herbaceous**, what is its habit? (Circle best answer) ascending **climbing** creeping erect sprawling

If it is a vine... Does it climb? Yes What does it use to climb? Twining counter clockwise

ROOTS: **fibrous** taproot **tubers** bulb corm rhizome (below-ground runner) stolon (above-ground runner)

LEAVES: What is the leaf arrangement (alternate, opposite, whorled, etc.)? Alternate

Is there a leaf stalk? Long Stalked Is the leaf simple or divided? Simple

If the leaf is simple, what is the shape of the: blade: Ovate/Heart blade tip: Acuminate blade base: Cordate

Is the blade margin (circle answer): **smooth** toothed

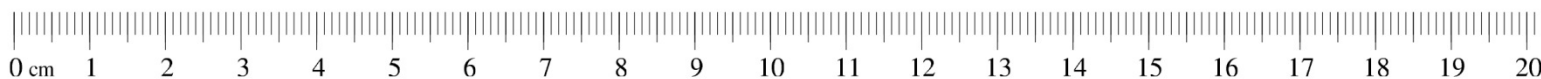
Hairs on top of the blade (circle answer): all over on the veins on the midvein

Hairs on the bottom of the blade (circle answer): all over on the veins on the midvein

Measure largest blade: length = width = Measure smallest blade: length = width =

If leaf is divided: once divided twice divided three times divided How many leaflets? Number of leaflets: even odd

Scientific name: Dioscorea bulbifera Circle one: native **non-native** **invasive**



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Module 1 ~ Silent Invaders (HS)
Magnify It! Answer Key (coral ardisia)



coral ardisia

See *Invasive and Non-native Plants You Should Know--Recognition Cards (or Flash Cards)* as a reference.

Herbaceous plants are plants that are not "woody."

Woody plants are plants that contain lignified tissues (cells with lignin in them); containing woody or wood fibers.

Is the plant (circle answer): herbaceous OR **woody** • If it is **woody** is it a: tree **shrub** vine

If it is **herbaceous**, what is its habit? (Circle best answer) ascending climbing creeping erect sprawling

If it is a vine... Does it climb? _____ What does it use to climb? _____

ROOTS: fibrous taproot **tubers** bulb corm rhizome (below-ground runner) stolon (above-ground runner)

LEAVES: What is the leaf arrangement (alternate, opposite, whorled, etc.)? Alternate

Is there a leaf stalk? Yes Is the leaf simple or divided? Simple

If the leaf is simple, what is the shape of the: blade: Elliptic blade tip: Acute blade base: Acute, Tapered

Is the blade margin (circle answer): smooth **toothed**

Hairs on top of the blade (circle answer): all over on the veins on the midvein

Hairs on the bottom of the blade (circle answer): all over on the veins on the midvein

Measure largest blade: length = _____ width = _____ Measure smallest blade: length = _____ width = _____

If leaf is divided: once divided twice divided three times divided How many leaflets? _____ Number of leaflets: even odd

Scientific name: Ardisia crenata Circle one: native **non-native** **invasive**

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Magnify It! Answer Key (Japanese climbing fern)



Japanese climbing fern

See *Invasive and Non-native Plants You Should Know--Recognition Cards (or Flash Cards)* as a reference.

Herbaceous plants are plants that are not "woody."

Woody plants are plants that contain lignified tissues (cells with lignin in them); containing woody or wood fibers.

Is the plant (circle answer): **herbaceous** OR woody • If it is woody is it a: tree shrub vine

If it is **herbaceous**, what is its habit? (Circle best answer) ascending **climbing** creeping erect sprawling

If it is a vine... Does it climb? Yes What does it use to climb? Twining stem

ROOTS: **fibrous** taproot tubers bulb corm rhizome (below-ground runner) stolon (above-ground runner)

LEAVES: What is the leaf arrangement (alternate, opposite, whorled, etc.) ? Alternate

Is there a leaf stalk? Fronds: long stalk Is the leaf simple or divided? Divided
Leaflets: short stalk

If the leaf is simple, what is the shape of the: blade: Lanceolate/ Triangular blade tip: Acute, obtuse, emarginate blade base: Various

Is the blade margin (circle answer): smooth **toothed** Note: margin lobed, and leaflet like

Hairs on top of the blade (circle answer): all over on the veins on the midvein

Hairs on the bottom of the blade (circle answer): all over on the veins on the midvein

Measure largest blade: length = width = Measure smallest blade: length = width =

If leaf is divided: once divided twice divided **three times divided** How many leaflets? Many Number of leaflets: even **odd**

Scientific name: Lygodium japonicum Circle one: native **non-native** **invasive**



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Module 1 ~ Silent Invaders (HS)
Magnify It! Answer Key (day-lily)



Day-lily

See *Invasive and Non-native Plants You Should Know--Recognition Cards (or Flash Cards)* as a reference.

Herbaceous plants are plants that are not "woody."

Woody plants are plants that contain lignified tissues (cells with lignin in them); containing woody or wood fibers.

Is the plant (circle answer): herbaceous OR woody • If it is **woody** is it a: tree shrub vine

If it is **herbaceous**, what is its habit? (Circle best answer) ascending climbing creeping erect sprawling

If it is a vine... Does it climb? _____ What does it use to climb? _____

ROOTS: fibrous ← fleshy, with tuberous swellings corm rhizome (below-ground runner) stolon (above-ground runner)

LEAVES: What is the leaf arrangement (alternate, opposite, whorled, etc.)? alternate

Is there a leaf stalk? no Is the leaf simple or divided? simple

If the leaf is simple, what is the shape of the: blade: narrowly lanceolate blade tip: Acute blade base: sessile

Is the blade margin (circle answer): smooth toothed

Hairs on top of the blade (circle answer): all over on the veins on the midvein

Hairs on the bottom of the blade (circle answer): all over on the veins on the midvein

Measure largest blade: length = ? width = ? Measure smallest blade: length = ? width = ?

If leaf is divided: once divided twice divided three times divided How many leaflets? _____ Number of leaflets: even odd

Scientific name: Hemerocallis hybrid Circle one: native non-native invasive



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Module 1 ~ Silent Invaders (HS)
Magnify It! Answer Key (day-lily)



Does your plant sample have FLOWERS? See *Illustrated Plant Structures* to answer questions.

See *Invasive and Non-native Plants You Should Know--Recognition Cards (or Flash Cards)* as a reference.

Where is flower located on plant ? (circle answer): tip of branch tip of stem in axils of leaves both

Is flower in a "cluster" or head? no (If yes, see "aster family below") If flower is NOT in a cluster: (circle best answer) an individual flower on a stalk

Sepals: how many 3 how long ? color ? joined (at any point, partially or wholly) At base

Petals: how many 3 how long ? color ? joined (at any point, partially or wholly) At base

Stamens: how many 3 how long ? filament (stalk) 1/stamen anther (pollen sac) 1/stamen, attached in middle

How does pollen exit? Yellow and exits from slits Pistil (how many stigmas catch pollen): 1

How many styles (stalk between ovary and stigma): 1 How many lobes in ovary (holds ovules) 3-parted

Aster FAMILY: flowers are in cluster of several, small flowers (a "flowering head")

Does head have BOTH ray and disc flowers? _____ Does head have only ray flowers? _____ Only disc flowers? _____

DISC FLOWER: Number of petals _____ Color _____ Length _____ Width _____

Does tip of fruit have bristles or papery projections? _____ How many? _____

RAY FLOWER: Number of petals _____ Color _____ Length _____ Width _____

Does tip of fruit have bristles or papery projections? _____ How many? _____

Scientific name: Hemerocallis hybrid Circle one: native non-native invasive



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Module 1 ~ Silent Invaders (HS)
Magnify It! Answer Key (tuberous sword fern)



tuberous sword fern

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Herbaceous plants are plants that are not “woody.”

Woody plants are plants that contain lignified tissues (cells with lignin in them); containing woody or wood fibers.

Is the plant (circle answer): **herbaceous** OR woody • If it is **woody** is it a: tree shrub vine

If it is **herbaceous**, what is its habit? (Circle best answer) **ascending** climbing creeping erect sprawling

If it is a vine... Does it climb? _____ What does it use to climb? _____

ROOTS: **fibrous** taproot **tubers** bulb corm **rhizome** (below-ground runner) **stolon** (above-ground runner)

LEAVES: What is the leaf arrangement (alternate, opposite, whorled, etc.)? Alternate

Is there a leaf stalk? Yes Is the leaf simple or divided? Divided

If the leaf is simple, what is the shape of the: blade: oblong/lanceolate blade tip: Bluntly acute to obtuse blade base: oblique

Is the blade margin (circle answer): smooth **toothed**

Hairs on top of the blade (circle answer): all over on the veins on the midvein **Leaflet Information**

Hairs on the bottom of the blade (circle answer): all over on the veins on the midvein

Measure largest blade: length = _____ width = _____ Measure smallest blade: length = _____ width = _____

If leaf is divided: **once divided** twice divided three times divided How many leaflets? 40-100 Number of leaflets: even **odd**

Scientific name: Nephrolepis cordifolia Circle one: native **non-native** **invasive**



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