

## Plant Identification: Compare and Contrast Lesson

Abby Phillips

In order to address New Jersey Core Curriculum Content Standard 5.5 (Characteristics of Life) that states, “All students will gain an understanding of the structure, characteristics, and basic needs of organisms and will investigate the diversity of life,” sixty sixth grade students will authentically investigate observable characteristics of local flowering and fruiting plants. To do this, students will collect a plant sample from a local park and identify it utilizing all of its observable characteristics, in conjunction with taxonomic keys and reference books. Then an Ecuadorian plant will be chosen from a gallery of photographs, taken in the field, as a point of contrast. The students will juxtapose the local plant sample with the photograph of the Ecuadorian plant. A PowerPoint presentation will be created to display the similarities and differences between the plants, as well as the conclusions drawn about how climate may affect plant characteristics.

This lesson closely coincides with the botanical research conducted at the Santa Lucia Cloudforest Reserve. Ana Mariscal, a botanist at the National Herbarium (QNCE), led the botanical fieldwork teams by organizing transects at one hundred meter intervals along various trails, collecting plant samples within the transects and identifying samples using Ecuadorian reference books and taxonomic keys. This research supported habitat assessments for target areas within the reserve.

Lesson Title: Plant Identification: New Jersey vs. Ecuador

Grade Level: 6<sup>th</sup> Grade

Content Area: Science

Time Allotted: Four 90-minute class periods

- Day 1: PowerPoint presentation and project description; Group research of local flora
- Day 2: Specimen collection
- Day 3: Group specimen identification; Juxtapose specimen with a native Ecuadorian plant; Prepare PowerPoint presentation
- Day 4: Group PowerPoint presentations

Academic Standards: New Jersey Core Curriculum Content Standards

- STANDARD 5.5 (Characteristics of Life): All students will gain an understanding of the structure, characteristics, and basic needs of organisms and will investigate the diversity of life.

Abstract: Students will research the various characteristics, such as life form (bush, tree, etc.), height, color, network or parallel veins, number of flowering parts, alternate or opposite leaves, etc., of local flowering and fruiting plants. Students will then collect one sample per group of a fruiting or flowering plant from a local park. The specimen will be taken back to class and the students will use taxonomic keys and other reference books to classify their plant to the species level (if possible). Once the sample is identified, students will choose a plant native to northwest Ecuador, from actual photographs taken while in the field and compare and contrast it with the sample. Students will then create a PowerPoint slideshow describing the similarities and differences between the plants, using words and pictures to illustrate their findings and present it to the class.

Goal: Students will be able to...

- Use a taxonomic key to identify a plant sample to the species level
- Compare and contrast plants native to New Jersey and Ecuador
- Draw conclusions about how climate may affect plant characteristics

Performance Indicators:

- Correctly identifies the plant sample to the species level
- PowerPoint Presentation
  - Uses descriptive words and accurate pictures
  - Compares and contrasts plants
  - Clear and understandable presentation
  - Uses good speaking skills

Background information: Students need to have knowledge of the taxonomic classification system and simple plants.

Materials:

- Plant Identification PowerPoint
- Reference books
- Access to a local park
- Scissors to collect samples
- Bag
- Magnifying glasses

Technology:

- SMART Board for PowerPoint presentations
- Computers for research

Instructional Procedure:

1. Students should complete a unit on the taxonomic classification system and a unit on simple plants prior to the implementation of this lesson.
2. Plant Identification: New Jersey vs. Ecuador PowerPoint presentation
  - a. Pictures of Ecuadorian countryside
  - b. Pictures of Ecuadorian flora and fauna
  - c. Detailed pictures pointing out observable characteristics of plants
  - d. Discussion of techniques for observing plants (how to use your senses)
  - e. List of observable characteristics of plants (veins, color, height, etc.)
  - f. Review of the classification system and taxonomic keys
  - g. Example of how to classify a plant using its observable characteristics
  - h. Pictures of local New Jersey flora
  - i. Statement of the task
3. Description of project and group work
  - a. Distribute project guidelines and read through together
  - b. Place students in research groups
  - c. Assign group responsibilities at the beginning of each period (posted in class each day)

- i. Day 1: Cyber Scientist (Internet research), Book Worm (reference book research), 2 Recorders
  - ii. Day 2: Specimen finder, cutter, labeler, carrier
  - iii. Day 3: Cyber Scientist (Internet research for identification), Book Worm (reference book research for identification), Recorder, PowerPoint Preparer
  - iv. Day 4: Presenters
4. Conduct research on local fruiting and flowering plants paying close attention to observable characteristics and recording all information
  5. Collect a specimen
  6. Record all observable characteristics about the plant and then use keys and reference books to identify it to the species level
  7. Choose a plant from Ecuador to juxtapose with the local plant
  8. Prepare a PowerPoint presentation that compares and contrasts the two different plants and draws conclusions about the affects of climate on plant characteristics
  9. Present PowerPoint presentations

Assessment: PowerPoint presentations, Group work/participation, Plant identification, Compare and contrast worksheet, Observable characteristics worksheet

Connection to Other Content Areas:

- English: Students need to incorporate descriptive writing in their PowerPoint presentation.
- Technology: Students must use PowerPoint software to develop a slideshow to share their research.

Name \_\_\_\_\_

Date \_\_\_\_\_

Class \_\_\_\_\_

Plant Identification: New Jersey vs. Ecuador

Observable Characteristics

Have you ever wondered why some plants only grow in certain places? Why don't we have cactuses in New Jersey? Why don't plants that grow in the rainforest grow here? Well, in order to determine the answers to these questions you first have to be able to identify plants based on their observable characteristics.

Observe – to recognize

Characteristic – a distinguishing trait or quality

Observable characteristics vary greatly among many plants, even plants in New Jersey. Use the following sheet to record the traits of your plant sample.

Plant Characteristics

Life form (plant, bush, tree): \_\_\_\_\_

Height of life form: \_\_\_\_\_

Color of stem: \_\_\_\_\_

Color of leaves: \_\_\_\_\_

Size of leaves: \_\_\_\_\_

Veins in leaves (network or parallel): \_\_\_\_\_

Leaf orientation (opposite or alternate): \_\_\_\_\_

Color of flowers or fruit: \_\_\_\_\_

Size of flowers or fruit: \_\_\_\_\_

Number of flowers or fruit: \_\_\_\_\_

Shape of flowers or fruit: \_\_\_\_\_

Number of petals: \_\_\_\_\_

Number of stamen: \_\_\_\_\_

Any other defining characteristics: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Draw a picture of your plant sample:

Name \_\_\_\_\_

Date \_\_\_\_\_

Class \_\_\_\_\_

Compare and Contrast: New Jersey vs. Ecuador

New Jersey Plant

Name of plant: \_\_\_\_\_

Common name: \_\_\_\_\_

Life Form: \_\_\_\_\_

Plant use: \_\_\_\_\_

Ecuadorian Plant

Name of plant: \_\_\_\_\_

Common name: \_\_\_\_\_

Life Form: \_\_\_\_\_

Plant use: \_\_\_\_\_

Similarities	Differences

Think about the climate here in New Jersey and the climate in the rainforest of Ecuador. How do you think climate affects plant characteristics?

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# Plant Identification: New Jersey vs. Ecuador

## Rubric

	1	2	3	4
Plant Identification	Student completes less than 70% of the observable characteristic sheet and/or most information is inaccurate. Plant may or may not be identified to the species level.	Student completes some (70% - 80%) of the observable characteristic sheet and/or some information is inaccurate. Plant is identified to the species level.	Student completes most (80% - 90%) of the observable characteristic sheet accurately. Plant is identified to the species level.	Student completes entire observable characteristic sheet accurately. Plant is identified to the species level.
PowerPoint Presentation	PowerPoint describes 1 similarity and 1 difference. 1 picture is used to illustrate research. No conclusion is drawn about the effect of climate on plant characteristics. Information is inaccurate at times. Presentation is confusing and disorganized. Good speaking skills are not used.	PowerPoint describes 2 similarities and 2 differences. 2 pictures are used to illustrate research. A conclusion is drawn about the effect of climate on plant characteristics but no evidence from research is given. Information is accurate. Presentation is sometimes confusing. Good speaking skills are not used consistently.	PowerPoint describes 3 similarities and 3 differences. 3 pictures are used to illustrate research. A conclusion is drawn about the effect of climate on plant characteristics that include evidence from research. Information is accurate and detailed. Presentation is clear and organized. Good speaking skills are used.	PowerPoint describes 4 similarities and 4 differences. 4 or more pictures are used to illustrate research. A solid conclusion is drawn about the effect of climate on plant characteristics that include evidence from research. Information is accurate and detailed. Presentation is clear and organized. Good speaking skills are used.
Group Work/ Participation	Does not participate. Does not fulfill responsibilities. Does not collaborate.	Participates some of the time. Fulfills some responsibilities. Collaborates with team members during 2 of the 4 phases of the project.	Actively participates at all times. Fulfills each responsibility. Collaborates effectively with team members during 3 of the 4 phases of the project.	Actively participates at all times, going above and beyond the required work. Fulfills each responsibility to its potential. Collaborates effectively with team members throughout each phase of the project.

\_\_\_\_\_ / 16 points total