

Plant Classification

Emily Rogers

Standards Addressed:

Science: A12 diversity; A15 local knowledge; B1 classifying; D3 everyday problems

Language: A4 Oral Communication; D4 Writing

Cultural: B2 ways of knowing; E2 ecology

Science Concept:

Plants are classified according to specific criteria by use of a dichotomous key. A new scientific vocabulary is needed to correctly classify plants.

Grade levels: 5-8

Process Skills:

Observation, classification, communication, questioning, inference

Vocabulary: (Imbedded as part of the lesson – students will research and define words, then teach words to classmates)

Simple	Compound	Alternate	Opposite
Serrated	Entire	Spike-like	Umbel-shaped
Pinnately	Palmately	Lanceolate	Oblanceolate
Raceme	Spike	Rhizome	J-root
Elliptic	Dissected	Panicle	Trifoliate
Sessile	Pediceal	Parallel veins	

Materials:

Each group will have a plant glossary (A-Z) and be assigned a picture of one Mystery Plant. Teacher will have a packet for each of the five Mystery Plants. Each packet contains a page for each step of dichotomous key questions and a page if they answer a key question incorrectly to redirect them so they can proceed to the next step.

Gear Up:

Teacher says: We have learned how to use a dichotomous key in prior lessons by sorting students in our class and by sorting gym shoes. We learned that in a dichotomous key, everything could be placed into a specific category through a series of Yes/No-type of questions.

Teacher gives each group a small pile of bulk mixed candy. Teacher says: Separate the candy into piles using a dichotomous key (e.g. chocolate/not chocolate, smooth surfaced/bumpy, etc.).

Teacher draws a dichotomous key on the board to remind students of prior lessons. Teacher circulates and checks methodology as they work.

Teacher says: Once the candy is sorted correctly, write up a dichotomous key that explains your sorting method. The keys are then checked for accuracy before proceeding with the lesson.

Explore:

Class is divided into five groups. Each group is assigned a detailed drawing of one Mystery Plant. (Lower ability students could be assigned Plant #3, higher ability students Plant #5.) That picture page contains the first step in the dichotomous key (such as, does it have simple or compound leaves). Each group studies their plant to answer the first question. Most questions will have one or two new vocabulary words, so they will need to consult the glossary, learn the new definitions, and then correctly apply that new vocabulary to determine in which category their plant belongs. They must rewrite the new vocabulary words and their definitions into their own age-appropriate language on a separate sheet of paper. When they have adequately researched the question, they check the appropriate box and take it to the teacher.

Generalize:

The teacher will check to see if their answer is correct and ask them how they know their answer is correct. If their answer was indeed correct, the teacher hands them the next step on the dichotomous key for that plant and they repeat the process until arriving at the plant name. If at any point their answer is incorrect, the teacher will give them a sheet that redirects them by giving them more information about the

definition of the terms used. When they return to the teacher, they must then convince the teacher that they now understand the vocabulary and their prior error. Any student who appears to be off-task will be the one responsible to answer the questions. If they don't have the answers and demonstrate understanding of them, that student must go back, research, and return to the teacher to explain the correct response before their group can move onto the next step, keeping each group member accountable for all of the content. (Other group members are encouraged to assist or to teach that formerly off-task student the material.)

Apply/Assess:

Upon arriving at the name of their Mystery Plant, they should work together in their group to write the correct dichotomous key for their plant using words from their own vocabulary and in the correct key format. After rewording the key, they will first test it on themselves, edit any language, and then give their Mystery Plant packet back to the teacher for final approval and assessment.

Extensions:

- Students will each enter his or her newly created dichotomous key onto Microsoft Word using text boxes and lines.
- Each key will be given a Letter (A, B, C, D, or E) or symbol that does NOT correspond with the Plant numbers. The five Mystery Plant pictures and the five student-language dichotomous keys will be copied so each group can have one of each (25 c. each). Students must match the Mystery Plants with the correct key.
- Class will make a field trip to an upper-grade biology class that has collected, mounted, identified, and correctly labeled local plant samples. Included in their plant labels are traditional native uses for the plants. The upper-grade class members will share their process and information with the younger students. They will be encouraged to use their new vocabulary during the lesson so they can make direct connections between use of a dichotomous key and these local samples.
- Upon return to the classroom, students will write in their journals about the lesson. They will give at least one example of how one step on their dichotomous key might have been used for one of the local plants they were shown. They will also reflect in general about the whole lesson.

Reference:

"Dichotomous Plant Key." National Park Labs. <http://www.nps.gov/goga/parklabs/library/plantkey.htm>

Assessment:

Most of the assessment in the lesson is conducted as students answer each step on the dichotomous key for their plant. However, this rubric might help students focus throughout.

1	2	3 (meets standard)	4
Many errors in steps for determining Mystery Plant	One error in any step for determining Mystery Plant	No errors in any step for Mystery Plant	No errors in any step for Mystery Plant, and completed quickly
Rewritten key is inaccurate or so poorly done that it cannot be used	Rewritten key is difficult to follow	Rewritten key functional and correctly formatted	Rewritten key very easy to follow and format is easy to read
Little work done by student, seemed happy to let others do the work	Student off task one or two times	Cooperated consistently with teammates	Effective leader or proactive team member