The Key to ID

Summary
Students construct and use dichotomous keys.

Learning Objectives
Students will be able to:
- Explain the purpose of an identification key.
- Use a key to identify weeds.
- Make a simple dichotomous key.

Curriculum Connections
Science, Living World and Nature of Science, Levels 3-4 (details below)

Vocabulary/concepts
Identification key, dichotomous key, characters

Time
1-2 hours

Materials
- Copies of Shape Identification Key
- Weed identification resources (see list below)
- Whiteboard
- Paper and pencils

Background information

Researchers, gardeners, land managers, and others regularly need to identify weeds.

For example, a school caretaker may want to identify weeds on the school grounds in order to ensure there are no poisonous plants at school. A gardener or a land manager might want to identify a new weed to find out if it is something they should worry about becoming invasive. If it is, a proper identification will help them determine how to most effectively manage the weed. A researcher might want to identify weeds to determine exactly what is present in an ecosystem, or to document the spread of weeds into new areas, or to help evaluate potential control methods.

An identification key is a tool that helps someone to identify an organism. A common type of key used in biology is a dichotomous key—a key that offers two choices at every step, and allows a user to systematically choose options at each step until they reach an identification.

Activity

Constructing a classroom key

Explain the idea of a dichotomous identification key. As an example of a very simple dichotomous key, hand out the Shape Identification Key and walk through identifying some of the shapes on it as a group.

As a class, create a key to identify every member of the class. What characters could they use to separate each other? Gender, hair colour, eye colour, and clothing are some of the possibilities. Discuss the pros and cons

of each character. If you created a key based on clothing, would it still work tomorrow? Discuss the idea that to be robust, a key has to use characters that are consistent from day to day, season to season, and among individuals.

Your finished key (for a hypothetical class of 7) might look something like this:

1	a	male	go to 2
	b	female	go to 3
2	a	straight hair	go to 4
	b	curly hair	John
3	a	black hair	Lisa
	b	hair not black	go to 5
4	a	brown eyes	Jeff
	b	blue eyes	Bill
5	a	freckles	Mary
	b	no freckles	go to 6
6	a	green eyes	Laura
	b	brown eyes	Jane

Making a key to schoolyard weeds

Have students collect weeds from the school grounds. Using field guides and the internet (some resources are listed below), have students identify as many weeds as possible. Once the weeds have been identified, ask the students to create a dichotomous key to the weeds on the school grounds so that future students can quickly identify what they find. Characters the students might use could include plant form (tree, shrub, grass-like, fern, vine, herb), leaf shape, leaf size, leaf arrangement (opposite, alternate, rosette), flower colour, flower type (daisy-like, pea-like, tube-like), or any other distinctive features students believe they can consistently observe.

Resources for weed identification

An Illustrated Guide to Common Weeds of New Zealand, Third Edition by Ian Popay, Paul Champion and Trevor James. 2010. New Zealand Plant Protection Society.

Landcare Research weed identification key:
http://www.landcareresearch.co.nz/resources/identification/plants/weeds-key

Massey University weeds database:
http://www.massey.ac.nz/massey/learning/colleges/college-of-sciences/clinics-and-services/weeds-database/weeds-database_home.cfm

Weedbusters weed list: http://www.weedbusters.org.nz/weed-information/weed-list/

Weeds on NatureWatch NZ:
http://naturewatch.org.nz/observations/project/2754

T.E.R:R.A.I.N. weeds and escapee plants list:
http://www.terrain.net.nz/friends-of-te-henui-group/weeds.html

AgPest (AgResearch) weed identification: http://agpest.co.nz/identify/

Royal New Zealand Institute of Horticulture common weeds list:
http://www.rnzih.org.nz/pages/imagesnzweeds1.htm

Specialty Seeds NZ, Identifying pasture weeds:
http://specseed.co.nz/downloads/IdentifyingPastureWeeds-SpecialtySeedsNZ.pdf

Curriculum Connections

Science—Living World
Levels 3 & 4

- Evolution: Begin to group plants, animals and other living things into science-based classifications.

Science—Nature of Science
Levels 3 & 4

- Investigating in science: Build on prior experiences, working together to share and examine their own and others' knowledge.
- Communicating in science: Begin to use a range of scientific symbols, conventions, and vocabulary.
- Communicating in science: Engage with a range of science texts and begin to question the purposes for which these texts are constructed.

Vocabulary/concepts

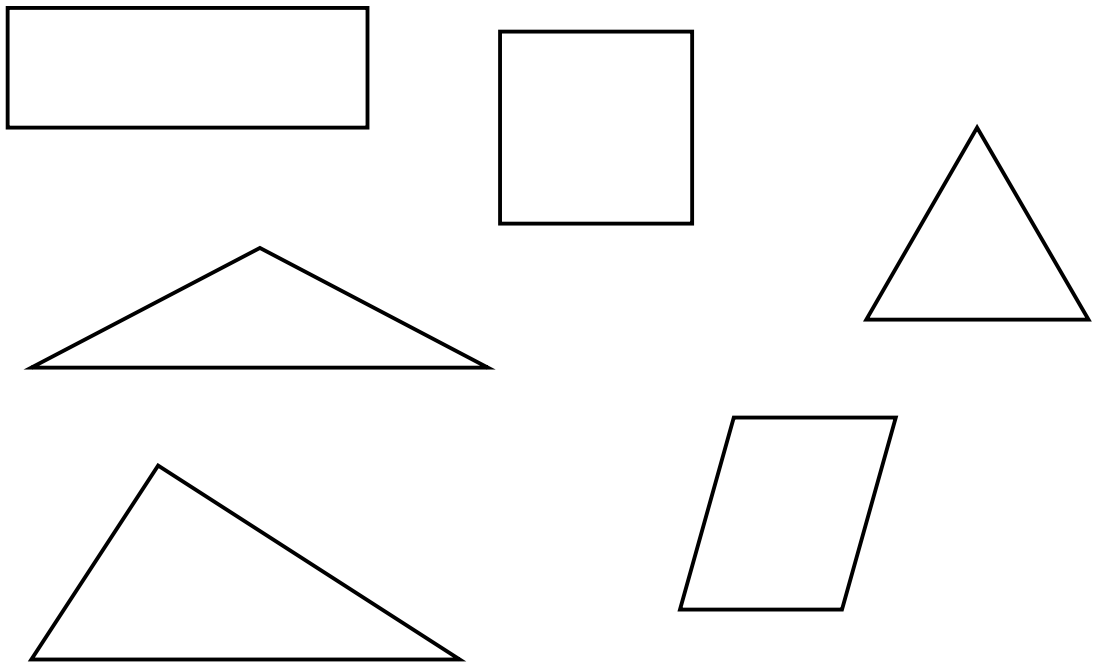
Identification key – a tool that allows people to consistently identify organisms.

Dichotomous key – an identification key that provides two choices at each step.

Characters – features of an organism that are used to aid in identification.

Shape Identification Key

Identify each of the shapes using the dichotomous key below.



1 -a has 4 sides ---------- go to 2
b has 3 sides ---------- go to 4

2 a all angles are 90° ---------- go to 3
b angles are not 90° ---------- parallelogram

3 a all sides are of the same length ---------- square
b sides are not all the same length ---------- rectangle

4 a all sides of equal length ---------- equilateral triangle
b not all sides are of equal length ---------- go to 5

5 a two sides are of equal length ---------- isosceles triangle
b all sides are different lengths ---------- scalene triangle