

Building Dichotomous Keys Student Worksheet

Name:
Class:
Date:

Aim

To build a tabular dichotomous key that can be used to identify different species of plants by using their leaves.

Background Information

Dichotomous keys identify organisms by providing a series of choices that describe what the organism looks like. The key provides the organism's scientific name. This name is always *italicised*. It includes a species name and a capitalised genus name.

Dichotomous keys ask about an organism's observable characteristics. Good characteristics to use are structural features, such as the number of legs or the presence of feathers or fur. These are usually the same for all individuals in a species. Scientists avoid using features that can differ between individuals in a species, such as colour and size.

Pre-Practical Questions

- 1) What is a dichotomous key used for?

- 2) Dichotomous keys utilise structural features of organisms. These are things like how many legs an organism has, or if it has scales or feathers.

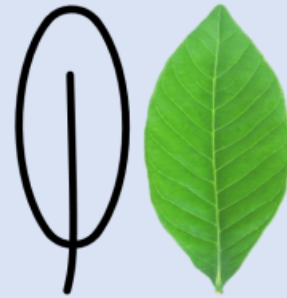
Why do keys ask about structural features, but *not* other traits, such as colour or size?

- 3) Your group has been given five leaves, each from a different species of plant. In the space below, write the scientific names of these plant species.

Selecting Leaf Structural Features

Look at the five leaves that your group has. Pick four structural features from the lists on this page and page 4 that you can use to sort these leaves.

Record your chosen structural features in the space below:



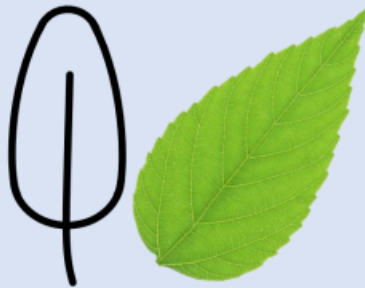
Elliptical

Shaped like an oval. This is different from ovate or obovate, because the tip and base of the leaf are about the same width.

Overall Shape

Ovate

Shaped like an egg, with the base being wider than the tip.



Obovate

Shaped like an egg, but the tip is wider than the base. This is the opposite of ovate.



Obcordate

The tip of the leaf looks like the top of a heart. Many clovers are obcordate.



Lanceolate

These leaves are long and thin, like a lance.



Selecting Leaf Structural Features

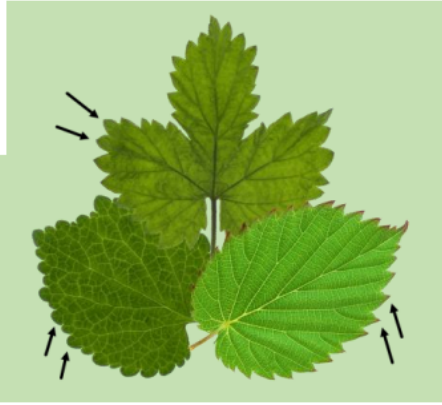
Look at the five leaves that your group has. Pick four structural features from the lists on this page and page 4 that you can use to sort these leaves. Record your chosen structural features in the space below:

Leaf Margins

(the edges of leaves)

Toothed

Leaves with little indents in the side, making teeth. The teeth can be sharp or rounded.



Entire

Leaves with a smooth edge and no lobes.

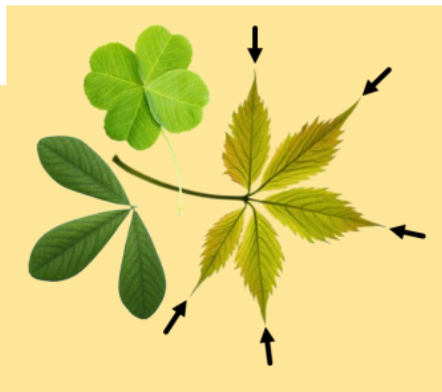
Lobed

Lobes are large indents that divide the leaf up. The lobes can be very deep or rather shallow. Do not use the number of lobes to sort leaves, since leaves from the same plant can have a different number of lobes.

Compounding

Compound

These leaves have many little leaflets that come off a single stem-like structure called a petiole. Ferns are a good example of compound leaves.



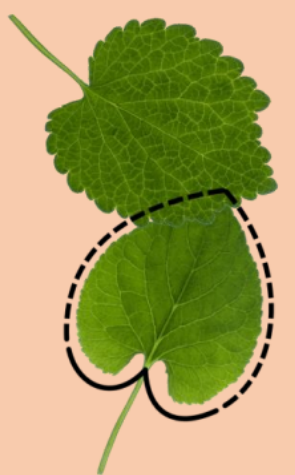
Simple

A leaf that is not compound is called simple.

Base

Cordate

The base of the leaf looks like the top of a heart.



Tapered

The base narrows to a point.



Rounded

The base of the leaf is round.

Building a Tabular Dichotomous Key

Start by splitting your leaves into two groups. One group should possess a structural feature that the other group does not. For example, one group might contain compound leaves, while the other group contains simple leaves. This makes the first choice in your key.

Continue to split your leaves into smaller and smaller groups. Each split becomes a new choice. Each time you split a group, use a new trait. Keep doing this until each type of leaf is alone.

Record the choices you made in the dichotomous key below. Make sure your dichotomous key includes instructions telling the reader what choice to go to next.

When enough choices have been answered to identify the plant, write the scientific name next to the last choice that leads to that identification.

Tabular Dichotomous Key

Choice Number	Options	Instructions or Scientific Names
Example	Compound	<i>Amphora canescens</i>
	Simple	Go to 2
1		
2		
3		
4		

Discussion Questions

- 1) What traits did you utilise in your key? Are there any traits you avoided using? If so, why?

- 2) Take a look at another group's key and compare it to your own. Did you use the same traits? Name any traits that one group used but not the other.

Do you think these are good or bad traits to use in a dichotomous key? Why?

- 3) Now switch keys with the other group. Try to identify one of your leaves using their key.

Did it work? Was the key confusing or was it clear? How could this key be improved?

- 4) Now that you have seen another group's key, is there anything you would change about your own? Could your key be improved by asking about different traits, or even just by making the wording clearer?

Extra for Experts

- 1) Try converting your tabular dichotomous key into a branching key.

Sketch the branching key on this page:

2) Now, try converting it into a circular key.

Sketch the circular key on this page: