

DIRECT INSTRUCTION: DICHOTOMOUS KEYS

HOW IS LIFE ORGANIZED?

Life is organized at all levels
from cells to biosphere

SB3. b All Organisms and systems are organized from simple parts into complex systems that must maintain homeostasis in order to survive.

But what if we find things we don't know and we want to know what they are?



We use something's characteristics in a similar way using...

Dichotomous Keys

- A **dichotomous key** is a tool that allows the user to determine the **identity of items** in the natural world **based on the items characteristics**
- "Dichotomous" means
 "divided into two parts" Greek origin
- dichotomous keys always give **two distinct choices in each step**, often they are opposites
 - Black/white; good/evil; pointed/rounded

How to use a dichotomous key?



HA! HA!
Dichotomous
Keys



How to use a Dichotomous Key?

Here are creatures we don't know!



Lets choose one

How to use a Dichotomous Key?

Choose only one creature at a time.



How to use a Dichotomous Key?

Read steps 1a and 1b



- 1 a. The creature has two eyes.
b. The creature has one eye.

Decide which statement is true

1b is true

How to use a Dichotomous Key?

Then follow the directions after that step.

- 1 a. The creature has two eyes.  Go to step 2.
b. The creature has one eye. Go to step 5.



Go to step 5!

How to use a Dichotomous Key?

At choice 5, you make another dichotomous choice

- 5 a. The creature has one or more antennae. Go to step 6.
b. The creature has no antennae. Its name is "A."



5a is true

Go to step 6!

How to use a Dichotomous Key?

Keep going until you come to a step that gives you the creature's name.

- 6 a. The creature has one antennae. Go to Step 7.
b. The creature has two antennae. Its name is "C."



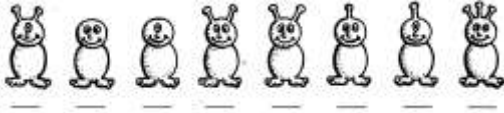
How to use a Dichotomous Key?

Choose a new creature and start at step 1a and 1b again. Continue until you find the creature's name.



Where do you start Again?

Then, find the names of all the creatures



1. a. wings covered by an exoskeleton – go to step 2
b. wings freely observed – Go to step 3
2. a. body has a round shapeladybug, a red beetle with black spots
b. body has an elongated shapegrasshopper, a green insect that hops
3. a. wings point out from the side of the bodydragonfly, an insect that is 10- 15 cm long and lives in marshes
b. wings point to the posterior of the bodyhousefly, a flying insect with red eyes and an annoying buzz

What if I needed to make a key:

- Use **constant characteristics** rather than variable ones. (Flowers change with the seasons)
- Use **measurements** rather than terms like "large" and "small".
- **Make the choice a positive one**
 - something "is" instead of "is not".
 - Ex: snake ears are internal only
- If possible, **start both choices of a pair with the same word or item.**
 - the body is "round" vs the body is "square"
- **Finish the dichotomous key with a full description of the organism**

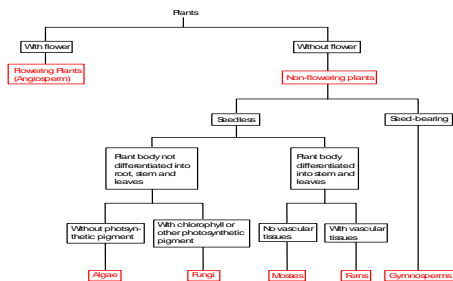
Dichotomous key

Another Example of a dichotomous key...

- | | |
|--|-------------|
| 1 With flower. | Angiosperms |
| Without flower | Go to 2 |
| 2 Seedless. | Go to 3 |
| Seed bearing | Gymnosperms |
| 3 Plant body do not differentiated into root, stem and leaves. | Go to 4 |
| Plant body differentiated into root, stem and leaves | Go to 5 |
| 4 Without photosynthetic pigment. | Algae |
| With chlorophyll or other photosynthetic pigment | Fungi |
| 5 No vascular tissues. | Mosses |
| With vascular tissues | Fern |

Dichotomous key

the dichotomous key can also be expressed in a diagram form



A Familiar Dichotomous Division:

Biotic

- Homeostasis
- Organization
- Reproduction
- Development (organism)
- Stimulus response
- Adaptation (species)
- Cell

Abiotic

- Not all 7 characteristics

DICHOTOMOUS KEYS

**SHORTHAND/
MNEMONICS/
MAIN IDEAS
ON 10R**