## Lesson Plan - What is a Dichotomous Key?

## Summary

Scientists have identified and classified over one and a half million species of animals, plants, fungi, and other organisms on the earth. Species are identified by scientists all over the world by a uniform classification and naming system. A dichotomous key is a process of identifying an organism with a series of steps, each containing two questions. The answers lead you along a path until the organism is identified.

## Content Area

Biology, Botany, Zoology

## Grade Level

3-5

## Key Concept(s)

- With well over 1.5 million species of organisms on earth described, scientists around the world have developed a uniform process of identifying and naming species.
- One species may have many different common names but each species has only one scientific name.


## Lesson Plan - What is a Dichotomous Key?

## Key Concept(s)

- Binomial nomenclature gives each described named species a two part name; the genus and species.
- A dichotomous key is a guide in which you progress through steps, each with two questions, until you identify an organism.


## Objectives

Students will be able to:

- Describe the difference between a common name and a scientific name.
- Understand that scientist sort living things into groups for classification from large Kingdoms down to individual species.
- Explain and demonstrate how to use a dichotomous key.


## Lesson Plan - What is a Dichotomous Key?

## National Science Education Standard or Ocean Literacy Essential Principle

Unifying Concepts and Processes

1. Systems, order, and organization

## Life Science

C.1. Characteristics of organisms

## Principle 5 (3-5, B.)

The ocean supports a great diversity of life and ecosystems.
Diversity of Life

## Learning Goals

Types and levels of organization provide useful ways of thinking about the world. Types of organization include the periodic table of elements and the classification of organisms.

Each plant or animal has different structures that serve different functions in growth, survival, and reproduction. For example, humans have distinct body structures for walking, holding, seeing, and talking.

The ocean provides most of Earth's living space and supports a great diversity of life from the surface, through the water column, and down to the sea floor.

GCOOS


GCOOS

People have many names for the same thing.

What would you call it?


People have many names
For the same things.

What would you call it?

## Car

Truck
Transportation
Automobile
Motor Vehicle


Vehicle
Bucket of Bolts

Pick-up truck
2015 Toyota Tacoma pick-up truck

## Scientists Need to Speak the Same Language!

- Confusion over words may not seem like a big deal, but it can be!


GCOOS

Nomenclature: How scientists name living things by sorting into groups.

- Kingdom
- Phylum
- Class
- Order
- Family
- Genus
- Species

Carl Linnaeus, 1758


Created the system of naming living things.

Binominal nomenclature
Ursus arctos, Linnaeus, 1758


Ursus maritimus, Phipps, 1774


## YES or NO: The key to naming living things is asking the right questions!

- Dichotomous (dī'kätəməs) means divided in two parts.
- When you use a dichotomous key, you follow a path. Each choice along the path has only two questions. The answer is always YES or NO.

1. Does it have a shell?

YES, go to question 2
NO, go to question 3
2. Does it have two shell halves that fit together?
3. Does it have wings?

YES, it is a butterfly NO, go to question 4
4. Does it have 8 legs? YES, it is a spider

YES, it is a clam


## Let's Practice!



We will divide into groups.
I have five bags with supplies.
How many can be in each group?

GCOOS
GULF OF MEXICO COASTAL OCEAN
OBSERVING SYSTEM


Groups:
wisegek
3 groups of 4
2 groups of 3

## Let's Practice!

1. Is it an animal

$$
\begin{aligned}
& \text { Yes, go to } 2 \\
& \text { No, go to } 7
\end{aligned}
$$

2. Does it have feathers

> Yes, it's a bird No, go to 3
3. Does it have fins

Yes, go to 4 No, go to 6
4. Does it have gills Yes, it's a fish No, go to 5
5. Does it have a blowhole

Yes, it's a whale
6. Does it have a long trunk

Yes, it's an elephant
7. Does it have leaves

> Yes, it's a plant

## Test your 'Yes' and 'No’ Questioning Skills!

- Asking the right questions is key to figuring out what things are.
- We are going to play a game.
- You will have the picture of a living thing taped to your back. YOU cannot look at it. Your classmates can.
- You can ask them questions about what it is, BUT you can only ask Yes or No questions.


## Let's Practice First!

- Does it live in the water?
- Does it live on land?
- Can it fly?
- Does it have fur?
- Is it a mammal?
- Is it wild?
- Can it be a pet?
- Is it a dog?
- Is it a cat?



## Make Your Own Dichotomous Key

- Work in groups of two or more people.
- Each team take a paper bag.
- Choose at least five items from your bag. You can use all of the items if you are feeling inspired!
- Using "yes" or "no" questions, make a key that leads to the identification of each of the items you selected.
- Use the practice sheet from before as a guide. There are also real identification keys to view if you need ideas.




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Questions, comments, edits? Contact Dr. Chris: chris.Simoniello@gcoos.org

