REEF ENVIRONMENTAL EDUCATION FOUNDATION

Grouper Moon Project Curriculum

Year 4

Coral Reef "Guess Who?" Game

CREDITS

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Coral Reef "Guess Who?"

OVERVIEW REFERENCE SHEET
YEAR 4

DURATION: 30-45 min	**METHOD:** Pairs
MATERIALS: • Animal Classification Chart • Marine Life Cards • Guess Who Game Board • Marine Life Cards PowerPoint • Dichotomous Key Example •	**SUBJECT(S):** • Science

RESOURCES:

- NPS Dichotomous Key Activity: "How to make and use a dichotomous key." https://www.nps.gov/teachers/classrooms/dichotomous-key.htm#:~:text=A%20dichotomous%20key%20is%20an,users%20to%20the%20correct%20identification.

- Learning To Make A Dichotomous Key: https://oregonaitc.org/lessonplan/learning-to-make-a-dichotomous-key/

- Animal Diversity Web (ADW) is an online database of animal natural history, distribution, classification, and conservation biology at the University of Michigan https://animaldiversity.org/

Coral Reef "Guess Who?"

Description:
In this activity, students will be developing their understanding of how and why scientists organize living things into different categories. This hands–on activity is essentially a mash–up of the game "Guess Who?," a two–person board game where players try and guess the identity of the other's chosen character and the game "20 Questions." For this activity, students will ask questions to determine the hidden identity of a marine life card. Players will ask "yes or no" questions related to the physical characteristics of the unknown organism, providing a systematic method for eliminating possible animals until only one is left. This game can be played as a whole class activity, in small groups or in pairs.

Learning Objectives:
- Develop deductive reasoning skills
- Practice animal classification and identification
- Students will classify animals into groups based on physical traits and characteristics
- Students will compare, contrast, and discuss the traits of different organisms

National Science Curriculum Alignment: Year 4
- Recognize that living things can be grouped in a number of ways.
- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.
- Observe similarities and differences among animals and among plants.

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Teacher Background Knowledge:
The following article will provide you with important background information about the scientific categorization of animals:

Organizing the animals — how it happened
Back in the 18th century, a Swedish man named Carolus Linnaeus thought it was important to organize living things, and he developed a system to do just that. He started out interested in plants, but he ended up ordering all life as he knew it. We still use the essence of his system today. Scientists are constantly refining the system based on new knowledge. Who knows? Maybe you will make a change in how animals are organized!
Putting animals in order like this is called taxonomy. The taxonomists — people who name animals — use a book called the International Code of Zoological Nomenclature, or ICZN, to tell them the rules for classifying animals.
Linnaeus's system has seven levels:

1. Kingdom
2. Phylum
3. Class
4. Order
5. Family
6. Genus
7. Species

Every animal on the planet, down to the most microscopic creature you can imagine, can be classified according to this system. You can remember the order the system comes in with one of the following phrases. The first letter of each word is the first letter of the level of classification.

Pick the one you like the best and practice saying it five times

King Phillip, come out, for goodness' sake!

King penguins congregate on frozen ground sometimes.

Keep ponds clean or frogs get sick.

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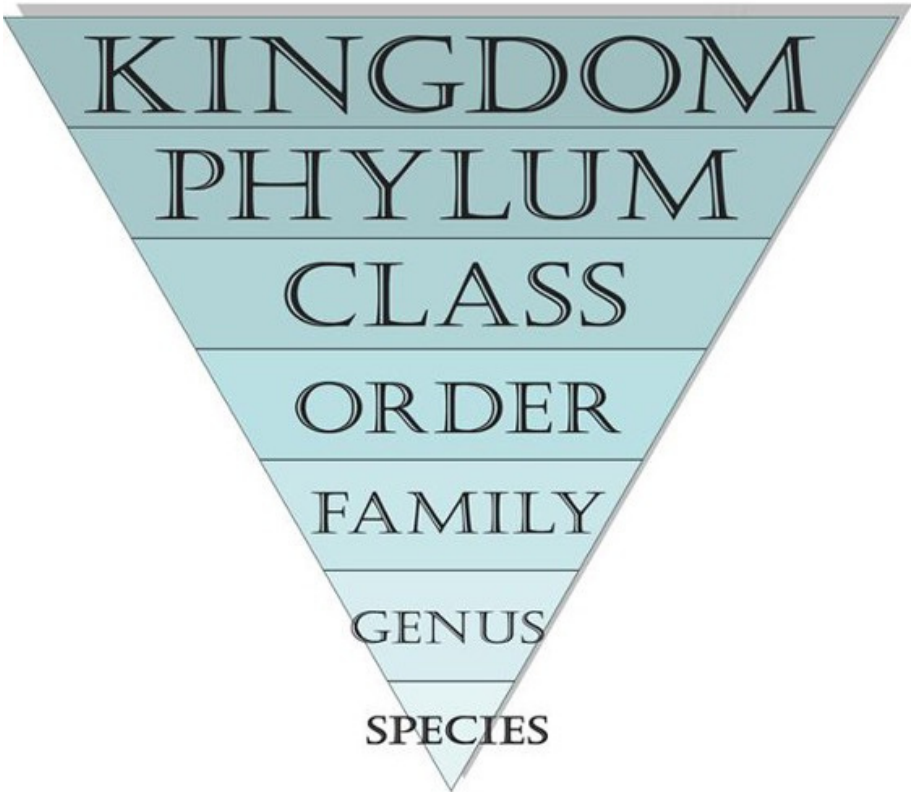

Let's look at each level and an example using one common animal.
These levels start out broadly – that means the top levels have the most animals, and they get narrower and narrower as you go down. So, by the time you get to the species, there is only one animal in the group. You can imagine these levels as an upside–down triangle.

Kingdom

Generally, scientists agree there are six kingdoms. The animal kingdom (called Kingdom Animalia) is just one of those. In case you're interested, the others are Archaebacteria, Eubacteria, Protists, Fungi and Plants. Originally, Linnaeus only identified two kingdoms: plant and animal. Some scientists think that viruses should have their own kingdom, but currently they are not included under this system.

Phylum

Within the animal kingdom, the animals are divided into more than 30 phyla (which is the plural of "phylum"). You might be interested in Phylum Chordata – it's the one humans and all animals with backbones are in (do you see how "chordata" looks like the word "cord" – like spinal cord?). Phylum Arthropoda contains insects, spiders and other animals with segmented bodies, like shrimp. Arthropods have their skeletons on the outside of their bodies (think of the hard shell of a lobster) and other characteristics in common.

Class

The third level of classification is class. For example, Phylum Chordata has classes in it like birds, mammals (Mammalia) and reptiles.

Order

The next level, or rank, is order. Orders are smaller groups within the different classes. Lepidoptera is the order of moths and butterflies. Carnivora is the order within Mammalia that has the most diversity in animal size.

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Family

The fifth rank of classification is family. (When you get to this rank, people sometimes disagree about which family an animal belongs to, so you may find that different sources tell you different things. This can even happen with orders.) The family for dogs is Canidae.

Genus

This rank looks like "genius," doesn't it? It's the second–to–last rank, and a genus may have only one or two animals in it. If animals are in the same genus, they are really closely related. In fact, you may not be able to tell them apart just by looking at them! When we write the name of the genus, we capitalize it and italicize it. For example, the genus of dogs (and wolves, too!) is Canis.

Species

If animals can breed together successfully, they are a species. When an animal is called by its scientific name, then that means it is being identified by its genus and species. We use a lowercase letter and italics for the species. The scientific name of dogs is Canis familiaris; however, the scientific name of wolves is Canis lupus.

Source: https://www.mensaforkids.org/teach/lesson-plans/classifying-animals/

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Introducing the Game:
Post the animal classification chart where all students can view it. Help the students read the printed chart on animal classification, pointing out the names of the divisions that you are studying in class. Practice with a few animals, finding them on the chart and tracing their classification up the chart.

Demonstrate the Twenty Questions game format with your students; say you are thinking of an animal. Students will at first ask in their yes–no questions if it is a gorilla, a squirrel, etc., any animal that pops into their head. Explain that they are going to learn a more efficient way of asking questions so that one can guess the answer in less than twenty guesses.

Using the chart, point out that one can eliminate lots of animal types by asking if the animal belongs to a certain phylum or class. Each group of students should use what classifications and terminology is understandable to them at their level.

Guide them in first asking question about certain classifications near the top of the chart (the hierarchy of classification); e.g., "Is it a vertebrate?" If the answer is yes, then all invertebrates are eliminated. The next question might be, "Is it a mammal?"; then all birds, reptiles and amphibians are removed. Family may be the last category in some lower grades: "Is it a squirrel (or rabbit)?" Students will have to be taught about Orders, too.

In higher grades, the concepts of genus and species are better understood. An example of the dog could be used to introduce here. Other questions that relate to habitat or appearance also help eliminate suspects: "Does it eat plants (meat, everything)?"; "Is its home underground (up a tree)?"; "Does it have fur (hair)?"; and closing in on a species, "Is it brown (spotted, striped)?"

Adapted from Illinois State Museum: https://www.museum.state.il.us/muslink/pdfs/pr_class.pdf

Coral Reef "Guess Who?" Game Procedures

Step 1:
Provide students with access to all the marine life cards using the Marine Life PowerPoint or print out the premade "Guess Who?" game board we have provided.

Step 2.
Display the animal classification game board for the class to see.

Step 3.
The teacher will randomly choose a marine life card, without telling the students what it is. Next, ask students to raise their hands to ask yes or no questions about the organism. If someone immediately tries to randomly guess the marine life card, refer them to the classification chart. Point out the classifications near the top of the chart. Point out how this is a more efficient, systematic method for identifying unknown species. Referring to the key example of the key ask: "What question would you ask first?" A student asks: "Is it a vertebrate?" Then point out how, depending on the answer, they can now eliminate a number of the options on their game board. Lead the students into asking more questions about the characteristics and structure, e.g., "Is it a mammal?" "Does it have scales?" "Is it a predator?" "Does it have stripes or spots?" etc.

Step 4:
Keep track of how many questions the students needed to ask before someone figured out the answer. Survey the students and ask them which questions were the most effective in helping find the correct answer. Make a list of those questions on the board.

Step 5:
You can continue to play as a whole group, having the student who chose correctly to come up to the front of the class and pick the next card. Challenge your students to see if they can figure out the answer with less questions.

OR
Step 6. Have the class play with each other, in pairs or small groups. Ask each team keep track of their most helpful questions to share out with the class after the game.

EXTENSION ACTIVITY:

Source: https://www.nps.gov/teachers/classrooms/dichotomous-key.htm#:~:text=A%20dichotomous%20key%20is%20an,users%20to%20the%20correct%20identification.

Step 7:
Share the sample Dichotomous Key with each student. Read the brief description of a dichotomous key. Ask them to study the key and find similarities and differences to the questions they had been asking during the game.

Step 8:
Have students create their own dichotomous key for the marine life cards.

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ASSESSMENT:
The teacher should be able to tell by the questions asked and the ability to answer if the students need more work with the chart or names of divisions. When students can play the game without hesitations and with animals other than prairie, they have the concept down.

Coral Reef "GUESS WHO?" Synthesizing Questions:

1. Why do scientists classify living things into different groups?
2. List two of the "yes or no" questions that were most effective at helping you identify the unknown species?
3. Describe what a dichotomous key is and how they are used.