

Grade Level: 9-12
Reef Survey
Post Lesson

Time Allotment

90 total minutes over the course of two or three days

Materials

Per group:

- Computer/internet
- Pacific Fish ID books

Per student:

- Paper
- Colored pencils

Advance Preparation

Using five common Atlantic families (Jacks, Angelfish, Grunts, Groupers and Damselfish) research Pacific fish in the same families. Make a list of the five families and list at least five individual species under each family.

Lesson Objectives Students Will:

- Further understand taxonomy.
- Extend their knowledge of fishes in the Pacific.
- Advance their skills in reading, writing and art.

Sunshine State Standards for Late Elementary

Category:

SC.912.L.15.6, SC.912.L.15.4

Vocabulary

Taxonomy
Carolus Linnaeus
Coelacanth
Genetics
Diversity
Mimicry
Disruptive coloration

Background Information

To categorize living things, scientists rely on the basic form of the Linnaean system of classification. This system illustrates the diversity of life forms and helps scientists and others to understand the relationship between different living organisms.

Taxonomy shows how all living organisms are divided into like categories based on similar physical characteristics. Most living animals, for example, are divided into kingdom, phylum, class, order, family, genus, and species. Kingdom is the broadest classification category and the category species is the most specific.

Karl von Linne, Carolus Linnaeus, is considered the 18th century founder of the basic classification system we use today. He outlined a scheme for classifying all organisms based on the extent of their similarities. To designate each organism, the Linnaean system uses two Latin name categories, genus and species. Humans for example are *Homo sapiens*. Using Latin in science is accepted and used worldwide.

The purpose of classification is to illustrate the diversity of life. Currently, about 1.8 million species have been classified and given scientific names. Some organisms may become extinct before being classified and some organisms do not produce a fossil record, preventing scientists from ever classifying them.

Even though scientists began classifying organisms in the 18th century, taxonomy is undergoing constant change. With advancements in genetics, scientists can now trace present day animals with extinct common ancestors. Advancements in

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genetic technology have created an ever changing and detail enriched taxonomy.

One change to the taxonomic system happened when scientists re-discovered the coelacanth in 1938, a fish that was thought to be extinct. Scientists exploring the oceans, deep sea vents and the rainforests are still in the initial stages of classifying organisms. There could be millions of organisms, most of which are smaller than a pea, that have yet to be discovered or classified.

There are many characteristics to observe when classifying or identifying a fish. Disruptive coloration, a type of camouflage, breaks up the outline of a fish's body, helping it to blend in. Mimicry is another form of camouflage that allows a fish to copy a different species. Certain species of fish resemble cleaner fish and actually feed on the larger fish requesting to be cleaned. Another form of mimicry is eye spots, large dark circles toward the tail that give the fish the appearance of having very large eyes, making other animals mistake it for a larger fish.

Initial Discussion

1. Individually, or in pairs, have the students pick a Pacific fish name out of a hat.
2. Discuss the importance of classifying species and the taxonomic chart: kingdom, phylum, class, order, family, genus, and species.
3. Discuss how animals like Pacific fish may appear different based on where they live but still belong in the same family as fish living in the Atlantic Ocean.

Hands-On Activity

(example below)

4. Have each student pick a Pacific fish name out of a hat. Give them a couple of minutes to look up the family and a picture of that fish.
5. Have the students divide into families based on their fishes.
6. Have each group of students draw their fish body shape on the board. Next, have the students draw in the correct mouth shape and position, fin shapes, tail fin and distinguishing characteristics.
7. Have the group of students correctly label the parts of the fish (ex: dorsal, secondary dorsal, pectoral, etc.).
8. Discuss with the class why that particular body shape is beneficial to the family (ex: fusiform/torpedo shaped body is good for speed).
9. Repeat this process for each student group and have them verbally report on their fish and show an illustration.
10. Once everyone has reported on their species, do a classroom quiz to see how well the students know the fish families. The quiz should show pictures of species that have been discussed in class. Provide a blank next to each fish for the students to write in the family name.

Relate Activity to Concept

(example below)

11. Keeping the same Pacific fish species, explain to the student the assignment is

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to research as much as they can find about that particular species and create a factual information book about that fish.

12. Instruct students to create a factual book illustrating the taxonomic chart from Kingdom down to species.
13. In the book, instruct students to include a realistic hand drawn illustration of their particular fish. Highlighting body shape, mouth position, fin placement and shape, caudal fin shape and distinct body markings.
14. On a separate page of the book, have the students label the parts of the fish (ex: pectoral fins, caudal fin, lateral line).
15. Instruct students to write a description of the fish. Include information about diet, habitat, distinguishing markings, size, and behaviors. If the description is well written then a fellow classmate should be able to identify the fish.
16. Have students turn in their illustrated fish factual information books!

Assessment

Grade the quiz to determine if students understand the concept of taxonomy and can correctly identify fish families.

Apply the same taxonomic concepts to other animals.

Extension

In small groups have the students create a children's book about the species. Provide a proper description and correct information about the fish's diet, behaviors and habitat.

Have the students do a similar project for endangered species in Florida waters.

Conservation Extension

Research an Atlantic or Pacific fish species and provide information on legal catch size, population status, and species range. Provide reasons why this information is important to scientists, commercial fishermen and recreational sport fishing.