

Invertebrate Casserole

Objectives:

Identify and differentiate marine organisms that belong to four invertebrate groups.

Learning Skills: Observation, analyzing, deduction

Information Base:

Invertebrates are animals that have no dorsal nerve chord and we often say they do not have an internal skeleton. The majority of the invertebrates have a shell or a hard carapace (exoskeleton) which provides protection and support.

Mollusks:

Mollusks are invertebrates with soft bodies that secrete an external shell of calcium carbonate which protects the animal, like clams and snails, or have internal shells for support like octopus, squids, and sea slugs. The majority are marine and can be found in all oceans of the world.

Echinoderms:

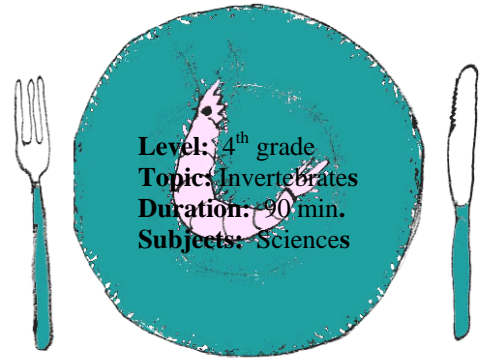
All the representatives of this group are marine. Their skeleton is found beneath a layer of skin and is formed by small calcium carbonate plates. The name echinoderm means "spiny skin". Within this group we find sea stars, sea cucumbers, sand dollars, and sea urchins.

Crustaceans:

All the members of this group have an exoskeleton made of a substance called chitin which is similar to our nails. This exoskeleton must be molted or changed periodically as the animal grows. Examples of this group are crabs, lobsters, and shrimp.

Cnidarians (formerly Coelenterates):

The cnidarians have simple sack-like bodies with a single opening in the center surrounded by tentacles. These marine organisms exist in colonies or can be solitary. Some forms secrete a skeleton of calcium carbonate or other softer substances while others have bodies made almost entirely of water. Within this group you will find the corals, jellyfish, and sea anemones.



Vocabulary:

Invertebrates, cnidarians, crustaceans, echinoderms, mollusks, sea star, sea cucumber, corals, anemone, jellyfish, octopus, sea urchin, snail, lobster, shrimp, oyster, squid, conch,

Materials: clipboard, blank sheet of paper, easel, markers, pencils, paper plates with riddles (see attached).

Procedure:

1. Welcome the students at the entrance.
2. Begin by inviting them to a marine feast. "What foods could be on the menu?" Possible answers: fish, turtle, shrimp, octopus, crab, snails, clams, and squid.
3. "I don't eat turtles because they are endangered and I don't like to eat fish because they have spines. What are spines? Why don't shrimp, octopus, crabs, etc. have spines? What is the difference between a vertebrate and an invertebrate animal?"
4. Allow them to answer but emphasize the dorsal nerve chord (vertebrae) that characterizes vertebrates.
5. Explain that during their visit they will learn to recognize many marine invertebrates and discover their importance in the human and animal food chain.
6. Make four (4) groups, each representing an invertebrate group: The Mollusks, The Echinoderms, The Crustaceans, and The Cnidarians.
7. Each group will receive a clipboard with a pencil for taking notes.
8. Each group is to take notes and create a list of all the invertebrates they observe today which belong to their group. They will have an opportunity to see invertebrates at the aquariums, on the beach, and in videos if time permits. For example: The Mollusks group will include snails, slugs, Nerites, etc. to their list.
9. Docents should reinforce and guide each group by providing characteristics of the organisms and questioning whether it would make good food for humans, if not for humans then for whom? Be sure to emphasize the exoskeleton, presence or absence of appendages, and body shape and composition for each group.

10. Take the groups to the tide pool area. Two groups will go with one docent and the other two with the other guide. If there are only two teachers, one will go with each group (beach time is 20 minutes).
11. Proceed to the aquariums and allow the students to observe and touch the animals. Help them with the names and check their lists frequently to be sure they do not mix the groups (as well as on the beach). 20 minutes.
12. Sit them on the floor and have one group member read the list while another writes the list on the easel (the idea is that the list be legible). Once completed, ask if anyone has any doubts about the animals placed in each list (15 minutes).
13. Have the four groups separate again. "Are all our lists ready for our marine feast? The cook says that we may only eat if we can guess the menu."
14. Give each student a paper plate with a riddle. Afterwards, list on the easel all the correct answers for each group.

Suggested Classroom Activities:

- ◆ Children can investigate at home and bring a recipe for seafood.
- ◆ The children can go on a fieldtrip to the local seafood market and differentiate between the invertebrates that are available.
- ◆ Each child can take home their list and create a mural depicting the animals that were observed.

Evaluation:

The final summary and the game function as our evaluation.

References:

Ciencias Naturales 4. Santillana Siglo XXI
Biology Coloring Book

Annex. Riddles to create the menu for the day:

1. To eat me you have to remove my armor.
2. Only sea turtles like to eat me.
3. Not only are we delicious but we make pearls.
4. More than being dinner, I prefer to be in the sky.
5. Although I'm an echinoderm, when you eat me my spines won't bother you.
6. To eat me you need a parrot-like beak.

7. Teeth eat me yet I don't have teeth.
8. You can cook me in my ink.
9. I can distribute my arms into eight dishes.
10. The most delicious part of my body is my tail.
11. After you eat me you can keep my shell.
12. Be careful when you eat me, I'm surrounded by spines!