



Classroom Activities





Classroom Activities - Grades 2/3

Rapid Transit

Blow up a balloon, then without tying off the end let it go. What happens? Why? Octopuses use a similar technique to escape from predators or move quickly after their prey. By drawing water into its body an octopus can inflate itself with water like you inflated the balloon with air. By contracting strong muscles in its body the octopus then forces the water out through a small funnel located under the head. The large amount of water escaping from a small opening causes the octopus to jet backwards like the balloon did when the air quickly escaped through its narrow neck.

Make an Octopus

What you will need:

- a balloon
- 8 strips of paper or cloth about 1 cm wide length and width can vary depending on the size of your balloon
- tape
- a felt pen

Blow the balloon up until it is the size you want the body of your octopus to be and tie it off. Tape the 8 strips of cloth or paper around the balloon near the neck and draw eyes on your octopus. On a large piece of paper draw an underwater scene and put your octopus in front of it.



CLASSROOM ACTIVITIES - Grade 4

1. What do you think determines if a female octopus lives long enough to make sure her eggs are protected and cared for until they hatch?
2. What adaptations does an octopus have that help it survive?
3. Can you think of advantages of having no bones?
4. Name three ways an octopus could escape from a predator.
5. What do you think is the reason an octopus squirts ink when it is afraid or agitated?

Camouflage

One of the most amazing features of cephalopods is their ability to change body colour and texture to camouflage themselves against different backgrounds.

1. Draw a picture of an octopus under water with some other animals that might live in the same area. Colour the picture so the octopus is camouflaged.
2. In this activity, students will design and make a paper animal that can camouflage itself against a variety of backgrounds.

First, have the class create two or more habitats by colouring or cutting and pasting patterns onto sheets of paper. One background might be all brown, another could have green and white stripes, and another could have black circles on a white background. The backgrounds should be about 2 by 1.5 metres. To begin the activity, ask the students whether they know of any animals that blend in well with their surroundings and how these animals accomplish that feat. Then have your students create their own animals - using construction paper, tape, glue, and any other available materials - that will blend in against as many of the backgrounds

as possible. The paper animals must be at least 10 centimetres wide. Lay

the first background on a large table or floor, then select one or more students to act as predators. The predators should turn their backs while students place their animals against the first background. Once the animals are set, have the predators turn around quickly and point to the first two or three animals they see. Remove those animals from the pack. Next, repeat the process with the other backgrounds. When the easiest-to-spot animals have been removed, lead a class discussion about the characteristics that prevented the other animals from being spotted. Was it their shape? Was it their patterns? What kept them hidden and why? You can also ask your students to imagine what sorts of shapes and patterns might keep human beings camouflaged in a variety of environments.

Social Studies

Read - [Hunting the Devil \(attached\)](#) - by Grant Keddie, Curator of Archaeology at the Royal BC Museum.

1. Describe two techniques used by First Nations people of British Columbia to catch octopuses.
2. Would these techniques work if the octopus was in deep water?
3. Compare the techniques used by the Coast Salish people of Esquimalt Harbour to catch octopuses with the techniques described by Drucker for the Nuu-chah-nulth people.
4. What did First Nations people use the octopus for?
5. According to ethnologist Phillip Drucker, how did Nuu-chah-nulth hunters kill an octopus?

Hunting the Devil

by Grant Keddie

Aboriginal peoples, from the central coast of British Columbia to SW Alaska, represent the octopus in their art, myths and ceremonies. All First Nations peoples living along the coast also ate octopuses, which are high in protein. But while there are many historical accounts of skinned octopus arms being used to bait hooks for halibut fishing, there are few descriptions that have been uncovered about where and how octopuses were caught.

Some accounts have been found for the south end of Vancouver Island. In 1951, James Fraser of the Songhees told anthropologist Wilson Duff that the "big rock" in Gonzales Bay was called "devilfish rock" and "If you touch that rock, devilfish come up." It was also known as a location "where devilfish spawn."

There are also two early references to hunting octopuses in Esquimalt Harbour. One passage from the 1860s refers to an observation by Eleanor Smyth who lived above the bay east of the steep peninsula at the foot of Stewart Road, from 1861 to 1866:

"One day she saw our Indian handyman in his canoe pushing his spear into the rocks just below the sea level and close to where we lived. Presently he landed his catch, a large octopus, now lifeless, into his canoe, and then took it home to his village opposite."

Around the same time, in the early 1860s, the British naturalist John Lord was in Esquimalt Harbour and described a hunt:

"The Indians were going after the Octopus, and I felt a strong curiosity to see how they caught him The Octopus of our own seas is a mere dwarf as compared to the gigantic size he obtains in the land-locked harbours so common to the east side of Vancouver Island. . . . [Aboriginal Peoples regard] Octopus as we do turtle, and devours him with as much gusto and relish, . . . roasts his glutinous carcass instead of boiling [it]. . . . The Indian well knows . . . that were the Octopus to get his huge arms over the side of the canoe, and at the same time a hold-fast on the wrack, he could . . . easily upset the canoe, . . . [so] paddling the canoe slowly and quietly amongst the wrack, he steadily looks through the crystal water until his practised eye detects the Octopus, his great arms stiffened out, patiently biding his prey. Armed with a formidable spear carefully barbed, and about twelve feet in length, . . . [the hunter] passes it carefully through the water until within an inch or so of his great pear-shaped centre, then sends it in as deep as he can plunge it. Twisting and writhing . . . the monster coils his terrible arms round the spear; . . . [then the hunter,] resting his spear on the side of the canoe, keeps him well away and raises him to the surface of the water. He must be dealt warily. . . . [Knowing this, the hunter] has ready another spear, long, smooth, unbarbed, and very sharp, and with this stabs the Octopus where the arms join the body. I imagine the spear must break down the nervous centres giving motive power, for the stabbed arm is at once deprived of its strength and tenacity."

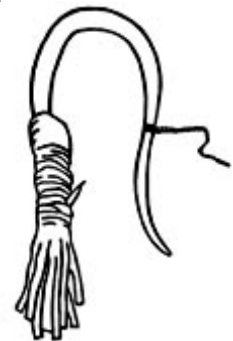
ASK THE “EXPERT” - The Giant Pacific Octopus

In the 1930s and 1940s, anthropologists recorded local aboriginal elders saying octopuses were boiled as well as roasted, that some octopuses were captured with a spear having two fixed, barbed points and that they were mainly hunted from a canoe in about one to three m (3 to 10 ft) of water at low tide.

Another record suggests that an adaptation of the European method of poisoning the water with copper sulphate may have been added to the traditional octopus-hunting practices of a Klallam group that was located 35 km (22 mi) from Esquimalt Harbour on the south side of the Strait of Juan de Fuca:

“Bait for halibut fishing was fresh devil-fish. These are caught near Pysht where their rocky lairs were made accessible at low tide. A stick is used as a probe which [is] thrust into the recesses where the octopuses are thought to be. Usually the sand and gravel around the opening was brushed clean and scattered with small shells, which were residue from the octopus’ feeding. If the probe struck something soft it was the body of the octopus. Subsequently, a bag . . . was filled with blue stone (copper sulphate) and introduced in the hole again. This quickly disintegrated and filled the water surrounding the octopus with a solution that irritated it, causing it to emerge from its lair. Immediately it was seized by the hunter, one hand grasping a leg near the body, the other the body so that the beak might be warded off. As soon as the devil-fish was taken its body was torn apart to kill it and release the ink. The remains were washed, then taken to a sandy part of the beach and rolled to remove the slime. After skinning and dismembering the parts were washed again until the flesh was white.

“The tentacles [arms] were chosen for bait and prepared by splitting lengthwise, tearing out the central nerve; then cut into lengths of about 3 to 4 inches [7.5 to 10 cm]. Each small section was fringed at one end. . . . Baiting a hook was accomplished by wrapping the piece of flesh around the lower end and over the barb so that it was concealed. The fringe was allowed to play out from the hook resembling a baby octopus. The bait roll was secured by several rounds of white string tied with half-hitch knots.”



A slab of octopus arm was cut in strips along one edge, rolled up and tied on the halibut hook to give the appearance of a baby octopus.

An account by ethnologist Phillip Drucker also describes how the northern Nuu-chah-nulth hunted octopuses for use as bait during the halibut fishing season:

“The fisherman searched along rocky stretches of the shore which were exposed at low tide, looking for cracks and caves in which devil-fish might be hiding. He had two long, sharpened poles, one with a backward projecting barb. He poked about under the rocks until he felt a devil-fish, then stabbed it with the barbed pole. Then he inserted the other pole, stabbing at the creature, whose movements were indicated by the first rod. Sometimes it was possible to kill the devil-fish in its den and drag it out; more often it

ASK THE "EXPERT" - The Giant Pacific Octopus

was worried until it emerged of itself, when it was killed by biting it on the head. The animal could not be pulled out while it lived. When he killed it, the fisherman tied the

devil-fish on a withe and carried or dragged it home. There he skinned the tentacles and hung it outside the house on the wall. The meat would keep for several days this way. . . . To bait the hook, a piece of devil-fish tentacle was split lengthwise and carefully tied over the back of the shank of the hook from the leader to the end of the barbed arm. Some men preferred to put it over the hook from the inside, covering the tip to the barb with a separate piece."

Among the stories about octopuses, there is an interesting one that shows that they also were able to recognize a good protein source. The *Victoria Daily Colonist* of December 24, 1888 reports in "In the Grasp of a Devil Fish" that the body of T. J. Hughes, who had "evidently drown," was found floating in Puget Sound "clasped in the embrace of a huge octopus."

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Bibliography

Drucker, Philip. 1951. *The Northern and Central Nootkan Tribes*. Bulletin 144, pp. 480. Washington: Smithsonian Institution, Bureau of American Ethnology. (ref. pp. 43-44)

Duff, Wilson. 1951. *Field Note Book #11*. (on microfilm, BC Archives)

Jeness, Diamond. c. 1938. *The Saanich Indians of Vancouver Island*. Manuscript 1103-6. New York: American Museum of Natural History. (ref.p. 65)

Lord, John Keats. 1866. *Gossip About Man-Suckers*. *Hardwicke's Science Gossip: An Illustrated Medium of Interchange and Gossip for Students and Lovers of Nature*, ed. Robert Hardwicke. London.

Lugrin, N. de Bertrand. 1928. *The Pioneer Women of Vancouver Island, 1843-1866*, ed. John Hosie. Victoria: The Women's Canadian Club of Victoria.

Suttles, Wayne. 1974. *The Economic Life of the Coast Salish of Haro and Rosario Straits*. *Coast Salish and Western Washington Indians 1*. New York: Garland Publishing Inc. (refs. pp. 116 and 132)

Washington Archaeological Society (author unknown). 1961. *Washington Archaeologist*. Vol. 5, no.10. Seattle: Washington Archaeological Society, Washington State Museum.



CLASSROOM ACTIVITIES - Grade 5

Female octopuses can lay over 50,000 eggs. Very few of these will live to be adults. Draw a picture of octopus eggs and around them draw some of the predators that you think may eat them. Also suggest other reasons why they may not hatch. (Activity Sheet)

Draw a picture of a newly hatched octopus swimming near the surface of the ocean. What predators do you think might eat them.

Draw a picture of an adult and its predators. Are they different than the predators of the juveniles? Do they live in a different habitat than predators on the juveniles?

Why do you think the eggs hatch at night?

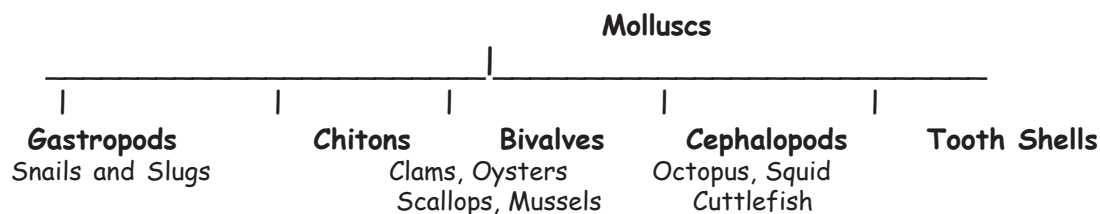


CLASSROOM ACTIVITIES - Grade 6

Classification

Classification consists of putting things that resemble each other into categories. People use a form of classification in all aspects of their lives to organize things and put names on them so they can communicate with other people. For example pets are all animals but are put into categories like dog, cat, bird, and fish so we have a name that we can call them that everyone understands. These categories have smaller categories within them like Golden Retriever, Cocker Spaniel, and Poodle to indicate what kind of dog it is.

Octopuses are molluscs. Can you name other molluscs? What characteristics do octopuses have that make them molluscs? People, cats, dogs and whales are all mammals because they all breathe air, are warm blooded, all have hair at some time in their life and feed their young with milk.



Taxonomy

Taxonomy is the science of classifying plants and animals according to their presumed natural relationships.

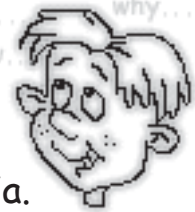
Biologists that identify, describe and name the millions of organisms that inhabit Earth are called taxonomists. One of the tools they use to identify a plant or animal is the dichotomous key. These keys give the identifier a choice of (usually) two options such as "animal has 6 legs or animal has 8 legs" or "is it bigger than a bread box or smaller than a bread box?" By answering a series of questions in a key written by specialists, taxonomists can identify an organism they are not familiar with.

Give students a copy of the activity sheet "A Taxonomic Key For Clothes". Have them choose one article of clothing and key it out.

Microscopic World

When octopuses hatch from eggs they are very tiny, about 6 mm. long. They move to the surface of the ocean where they drift about and feed on even smaller animals, many of which you can only see with a microscope or magnifying glass. These microscopic animals feed on organisms even smaller than themselves called phytoplankton (plant plankton)

Draw a food web containing a baby octopus, phytoplankton, bacteria, zooplankton (**copepods**), a **jellyfish**, and a blue whale, indicating what would eat what.



CLASSROOM ACTIVITIES - Grade 7

With an octopus in the centre create a food web that contains the following organisms - an adult octopus, crab, shrimp, seaweed, seal, killer whale, salmon, herring, plankton, clam, jellyfish and bacteria.

- What do you think would be the effect of removing the octopus from the food web?

Octopuses hatch from eggs as miniatures of their parents and spend several months swimming and feeding near the surface of the ocean before they settle to the bottom and take up a benthic (bottom-dwelling) life style.

- How do you think the above food web would change if the octopus was a newly hatched individual?

What do you think the result would be if one of the organisms was removed? Split into groups and pick an organism from the above food web. Discuss the effect of removing that organism from the food web. Which organisms in the food web would be affected? How would they be affected?

Reproduction Growth and Change

- Why does the mother octopus stay in the den?
- How does she make sure the eggs get enough oxygen?
- How does the life-style of the octopus change as it grows?

Octopuses can grow very large even though they only live a few years. An octopus is the size of a grain of rice and weighs approximately 0.03 grams when it is born. They can weigh as much as 270 kilograms when it reaches adult size in its third year and have an arm span of 10 metres.

- On average, how much weight does an octopus gain each month if it lives to be three years old and weighs 50 kg? (see activity sheet)
- How much weight would it gain each day?

Octopus Communication

Octopuses are thought to communicate by changing the colours of their skin. The following activity will demonstrate how animals can give messages to one another using only changing colours.

You will need

- A number of cards in three different colour - the number depends on the size of your class.
- A picture of a crab, shrimp, clam or other octopus prey
- Pictures of octopus predators (seals, salmon, ling cod, rockfish, etc.).

Divide your class into groups and give each group a set of three different coloured cards. Ask each group to develop a system of communication using only the coloured cards that will allow one group leader to guide other group members around the room. Once they have developed their systems, choose one group to go first. While only the group leader remains in the room, hide the prey animal and several predator animals throughout in the room. Then ask the group members to search for the hidden prey animal, guided by instructions from the leader using only the coloured cards. None of the students involved in the search should speak. Their goal is to find the prey without accidentally stumbling upon one of the predators. A student who gets “killed” by a predator, has to stop looking. If one member finds the prey animal, the search is over. Repeat the search with each group, timing them to see which one is the quickest in finding the prey animal with the fewest losses. When the activity is complete, lead a discussion about the various colour languages that the students developed. Which were most efficient? How could they have been more effective? What innovative strategies did they use?