NO PREP

Mollusks

From Snails to Squid

Includes: Student reading, case study, differentiated questions, teacher key

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Name: Period: Date:

Mollusks: From Snails to Squid

A Diverse Phylum

Mollusks are one of the most diverse groups of animals in the ocean, ranging from slow-moving snails and clams to highly intelligent octopuses and squid. They belong to the phylum Mollusca, which is second only to arthropods in species richness. While their shapes and behaviors differ widely, mollusks share several key features. Most have a muscular foot used for movement or attachment, a mantle that secretes shells, and a radula, a rasping organ used for feeding (except in bivalves). Mollusks exhibit different body plans adapted to their ecological niches. Gastropods, such as snails and limpets, often have coiled shells and crawl using their muscular foot. Bivalves, including clams and mussels, possess two hinged shells and filter feed by drawing in water. Cephalopods, like squid, cuttlefish, and octopuses, are the most advanced mollusks, with tentacles, excellent vision, and remarkable intelligence. Together, mollusks occupy nearly every marine environment, from shallow tidepools to the deep sea.

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Feeding and Adaptations

Mollusks use a variety of feeding strategies. Gastropods are often grazers, scraping algae from rocks with their radula. Some, like cone snails, are predators equipped with venomous harpoons for capturing prey. Bivalves are essential filter feeders, removing plankton and detritus from the water and improving water clarity. Cephalopods are active predators, using tentacles and beak-like jaws to capture fish, crabs, and even other mollusks. Adaptations also set mollusks apart. Many gastropods and bivalves rely on protective shells, while cephalopods developed soft bodies but compensate with camouflage, ink release, and extraordinary intelligence. Some cephalopods can change both color and texture almost instantly, blending into their surroundings or startling predators. These adaptations highlight how evolution has shaped mollusks for survival in diverse ocean habitats.

Cephalopod Intelligence and Behavior

Among invertebrates, cephalopods are unique for their advanced nervous systems and large brains. Octopuses are capable of problem-solving, escaping enclosures, and even using tools. Squid and cuttlefish exhibit complex communication through body coloration and patterns. These abilities suggest a high level of learning and memory not commonly found in invertebrates. Cephalopods also have remarkable vision. Unlike most invertebrates, they possess camera-like eyes that rival those of vertebrates. This, combined with their camouflage skills and rapid movement, makes them highly effective hunters. Their short lifespans, often only a few years, are balanced by rapid growth and high reproductive rates.

Case Study: The Giant Squid Mystery

For centuries, sailors told tales of enormous sea monsters capable of dragging ships beneath the waves. These legends were inspired by encounters with giant squid (genus Architeuthis). Growing up to 40 feet long, giant squid remained elusive because they live in deep, dark waters. In the past, scientists only studied them when specimens washed ashore. It was not until 2004 that researchers captured the first live images of a giant squid in its natural habitat. Later, in 2012, video footage revealed a massive squid hunting in the deep sea off Japan. These rare glimpses show how much of the ocean remains unexplored. The giant squid's size, large eyes, and deep-sea adaptations highlight the extremes of mollusk diversity, while also reminding us how little we know about life in the deep ocean.

1. Why did giant squid remain mysterious for so long, and what does their study reveal about ocean exploration?

_____

_____

2. What features of giant squid demonstrate the adaptability of mollusks?

_____

_____

Multiple Choice

1. What organ do most mollusks (except bivalves) use for feeding?

    a) Siphon

    b) Foot

    c) Mantle

    d) Radula

2. Which group of mollusks includes octopuses and squid?

    a) Bivalves

    b) Polychaetes

    c) Cephalopods

    d) Gastropods

3. What is one adaptation that allows cephalopods to avoid predators?

    a) Developing external shells

    b) Producing ink and camouflage

    c) Burrowing into sediments

    d) Building calcium carbonate skeletons

Matching

Write the letter of the correct definition on the line next to each term.

Term	Definition
1. ___ Gastropods	A) Organ that secretes shell material
2. ___ Cephalopods	B) Includes clams and mussels; filter feeders with hinged shells
3. ___ Bivalves	C) Snails and limpets with coiled shells and a radula
4. ___ Radula	D) Tentacled predators with advanced vision and intelligence
5. ___ Mantle	E) Rasping organ that scrapes algae from rocks

Fill-in-the-Blank

1. Bivalves feed by filtering _____ from the water.

2. Cephalopods can change both _____ and texture to camouflage.

3. The _____ secretes shell material in most mollusks.

Short Answer

Answer each question in 2-4 complete sentences.

1. Why are bivalves important for maintaining healthy marine environments?

_____

_____

_____

2. How do cephalopods' eyes and nervous systems make them unique among invertebrates?

_____

_____

_____

3. Compare the protective strategies of shelled mollusks and cephalopods.

_____

_____

_____