

**9. Ph. MOLLUSCA, Cl. Bivalvia (= Cl. Pelecypoda) & Cl. Cephalopoda**

**MAJOR TAXA**

Ph. Mollusca (50-100,000 spp.)

Cl. Polyplacophora

Cl. Gastropoda

**Cl. Bivalvia ("two-valved")**

**Subcl. Protobranchia ("first gill")**

**Subcl. Lamellibranchia ("plate gill")**

**Subcl. Septibranchia ("fence gill")**

**Cl. Cephalopoda ("head-foot"): nautilus,  
squid, octopus, cuttlefish**

**MAJOR THEMES**

The hinged bivalve shell

Ligaments (tensilium and resilium)

Siphons

The crystalline style

Burrowing, boring, and swimming

Bivalve gill structure and function

Deposit, filter, and suction feeding

Propulsive locomotion

Buoyancy and shell reduction

---

**OUTLINE**

Recap: Generalized molluscan bauplan, differences between classes in shell type, ctenidia, and body shape; differences among gastropod classes

- 1) Gastropods continued: locomotion, consequences of torsion for respiration
- 2) Bivalve body form: lifestyle opportunities when compressed between two shells
- 3) Bivalve subclasses: the evolution of gill form and its roles in respiration and feeding
- 4) Cephalopods: body reorientation and patterns of shell reduction
- 5) A review of modifications among mollusc classes

**GOALS**

After studying from lecture notes and the associated reading, you should be able to:

- Describe the body orientation with respect to different axes (dorsal-ventral, left-right, anterior-posterior) and the location of molluscan body parts in a typical bivalve
- Describe the formation and function of siphons in some gastropods and bivalves
- Explain the operation of the bivalve shell, including the functions of adductor muscles, inner and outer ligaments, the catch-fiber mechanism, and patterns of growth
- Explain how a bivalve typically burrows into soft substrates and hard substrates, and how scallops swim
- Describe the function of the crystalline style in feeding by bivalves and gastropods
- Explain variation in bivalve gills, including how the gill has been modified among different subclasses for its roles in respiration, filter feeding, and suction feeding
- Explain how body features have been modified for propulsive locomotion in active and mobile cephalopods
- Describe the structure of the nautilus shell and its function in buoyancy regulation
- Describe patterns of shell retention and reduction among cephalopods, and possible alternative anti-predator defenses
- Compare and contrast modifications among molluscan classes in main body features and functions, including body parts and orientation, paths of water flow and respiration, feeding, locomotion, and defense