

A Teacher's Guide to Marine Life of the Gulf of Maine

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Education Division

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Red Chiton (*Ischonchiton ruber*)



Classification: Phylum: Mollusca; Class: Polyplacophora (Amphineura)

Description: Red chitons are small organisms that are flattened dorso-ventrally. Their bodies are protected by eight interlocking, rectangular or wing shaped, flexible plates.

Habitat: These organisms are found on rocky bottoms in both the lower intertidal and subtidal zones. These animals are negatively phototropic, i.e. move towards darkness, and are most commonly found in crevices and under rocks. Their range extends from the Arctic to Long Island Sound.

Movement: Chitons adhere to rocks and creep using a large, flat, ventral foot.

Respiration: Several pairs of ctenidium or gills are located in their lateral mantle cavities.

Ingestion: Chitons are browsers, feeding on the algal film that encrusts intertidal rocks. They use a rasping tongue called a radula to perform this task.

Growth: These animals grow slowly, reaching a length of up to 1 1/4 inches. The largest specimens are found in the northern part of their range.

Excretion: Digestive wastes exit the body through the anus. Liquid wastes are expelled via a pair of excretory pores located in the posterior mantle cavity.

Nervous System: Chitons have a ring of nerve tissue that encircles the mouth opening. A ladder-like system of nerve fibers runs from this ring to the posterior. Light sensitive cells are found along the edge of the girdle.

Circulation: Like most mollusks, the circulatory system is simple and open. The heart is located on the dorsal posterior side of the body beneath the seventh and eighth plates of their shell. Blood is pumped to the body's organs via an anterior aorta.

Reproduction: The sexes are separate but indistinguishable. Fertilization is external and the young develop into trochophore larvae before settling to the bottom.

Common Names: "sea cradle" and "chain of mail shell"

Predators: Carnivorous marine snails and sea stars prey on chitons.

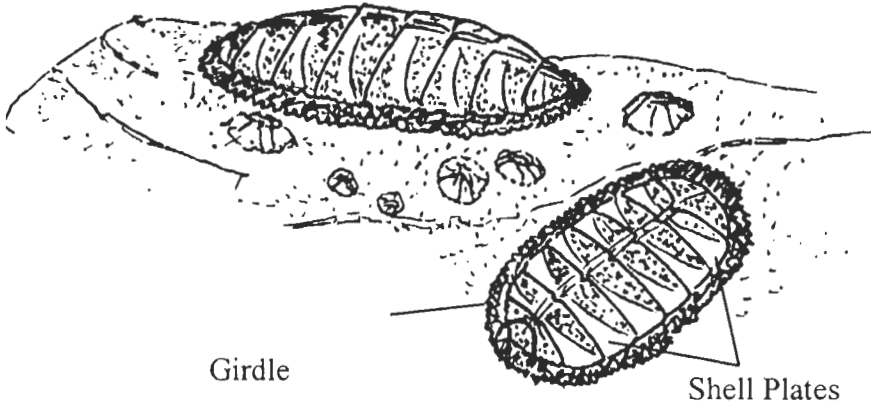
Commercial Value: None

Other Gulf of Maine Species: White Chiton (*Ischnochiton albus*), Bee Chiton (*Chaetopleura apiculata*) and Mottled Chiton (*Tonicella marmorea*)

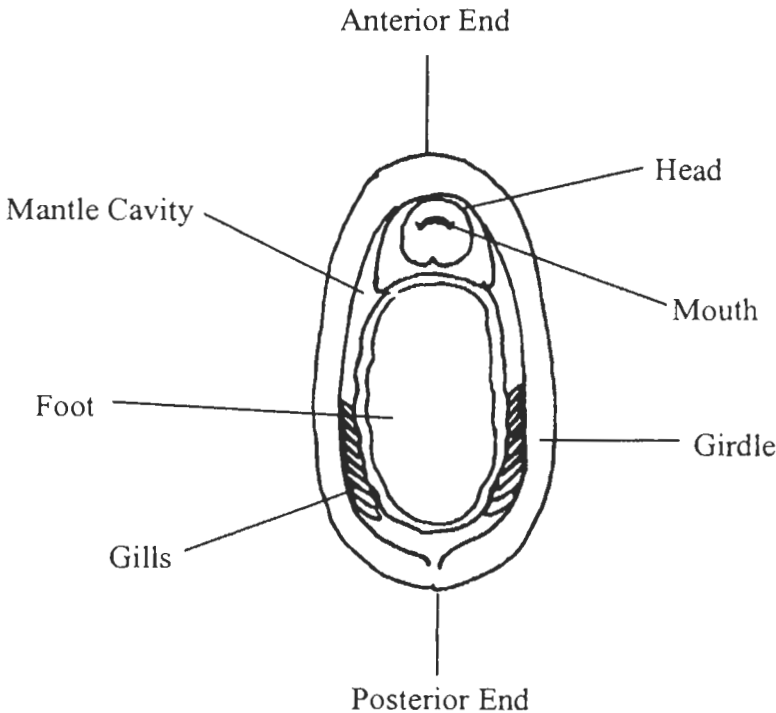
Red Chiton

External Anatomy

Dorsal View

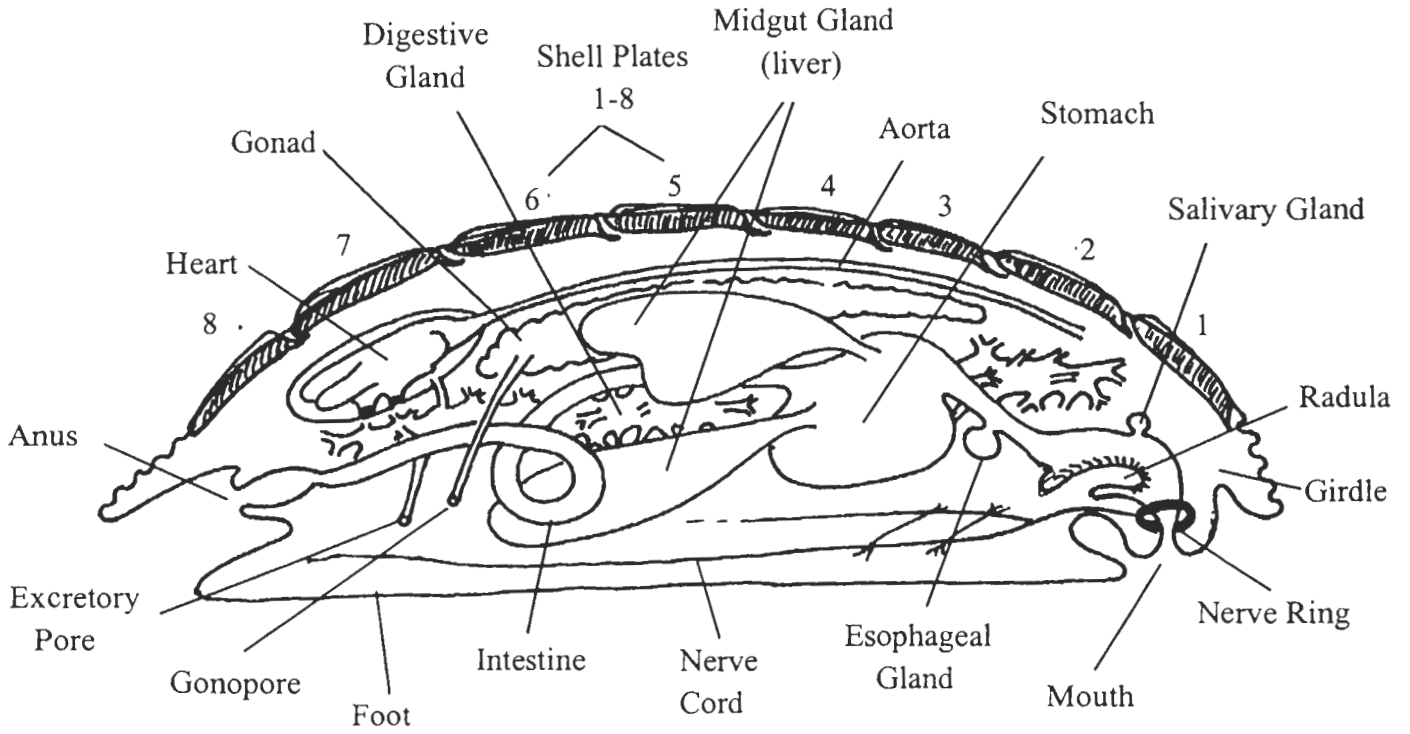


Ventral View



Chiton

Internal Anatomy



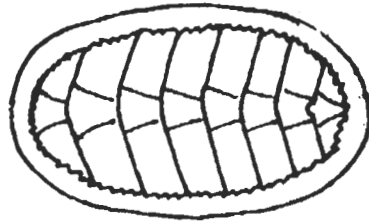
Chiton Activities

1. Observations of live chitons

- Place a live chiton in a clear container of seawater. Be sure that the water covers the chiton.
- Observe and describe its size, color, shape and protective adaptations.
- How does it move? Hold the container above your head and observe its actions.
- Can you see its mouth? What might it like to eat?
- Gently try to remove it from the bottom. What did it do? Use a knife to gently pry it off, if necessary.
- How many shell plates does it have? How would these overlapping plates help the chiton?

2. Chiton print

- Use a meat tray from the grocery store
- Using a pencil, firmly draw the outline of the chiton including its eight plates.
- Use an ink roller to apply a washable printers ink onto the surface.
- Lay a piece of paper on top and rub it with the back of your hand.



3. Tide pool diorama

- Paint a tide pool scene onto a piece of corrugated cardboard. This will serve as the base for a three dimensional diorama where poster board tags of plants and animals will be placed.
- Draw (or glue) pictures of intertidal plants and animals to the tags. On the back of each tag, give a description of each organism. Example: Chiton - I have eight overlapping plates which allows me to roll up like an armadillo.
- Place all of the tags into slots cut into the cardboard base.

4. Stuffed chiton

- Draw and cut out two outlines of the chiton. These will become the top and bottom surfaces.
- Draw and color the details of its eight plates on the top piece.
- Staple the edges of the chiton leaving a space where you will be able to stuff it with newspaper.
- Finish off the remaining edges with staples.

5. Name connection

- Often times it is difficult to remember the names of certain marine organisms. Why not connect its name with that of your students?
- Examples: Kyla chiton, Linda limpet, Joey Jellyfish, etc.