

LIFE SCIENCES 11

ECHINODERMS

Phylum	Echinodermata
Level of Organization	Organ
Digestive System	Tube
Symmetry	Radial
Coelom	Coelomate
Cavity Development	Deuterostome
Segmentation	Yes

Echinoderms

- 6000 marine species
- examples include sea stars, sea urchins, sand dollars and sea cucumbers
- have a spiny endoskeleton composed of calcium carbonate plates covered by a layer of skin
- radial symmetry as adults, but bilateral symmetry as larvae
- body is built around a central disc
- water-vascular system
 - system of fluid-filled closed tubes that are used for movement and feeding
 - tube feet
 - small tubes with suction cuplike ends
 - use a muscular sac called an ampulla to force water into the tube feet to create suction
- circulation
 - open circulatory system
 - cilia move water and body fluids around the body cavity
- excretion
 - cellular wastes diffuse through the thin membranes
- reproduction
 - eggs and sperm are released into the water for external fertilization
 - eggs develop into free-swimming larvae
- 6 main classes
 1. Class Asteroidea
 - sea stars
 - feed by prying open bivalves, everting their stomach into the shell, then releasing digestive enzymes onto the visceral mass
 - can reproduce asexually by fragmentation
 2. Class Ophiuroidea
 - brittle stars
 - have thin, flexible arms
 - do not have tube feet

3. Class Echinoidea

- sea urchins and sand dollars
- burrow into rock or sand
- do not have arms
- sand dollars filter organic particles from sand
- sea urchins may be predators, but most feed by scraping algae off rocks

4. Class Crinoidea

- sea lilies and feather stars
- flower shaped body on top of a stalk
- feed by extending their tube feet and arms into the water to capture suspended organic material

5. Class Holothuroidea

- sea cucumbers
- reduced calcium carbonate plates in a leathery body
- able to extend sticky tentacles (modified tube feet) to capture food particles
- exchange gases using a respiratory tree
 - water is pumped in through the anus into the respiratory trees
 - used to remove cellular wastes
 - able to push out some of its internal organs to escape from predators, then regenerate the lost parts

6. Class Concentricycloidea

- sea daisies
- recently discovered off New Zealand (1986)
- not many found – hard to study



