

## Chapter 32-1 Echinoderms

Animals develop in one of 2 ways

As the embryo goes through the gastrula stage it has an opening to the outside called the blastopore.

draw

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Protostomes- animals in which the mouth forms from or near the blastopore

Examples: Annelids, Mollusks, Arthropods, and Acoelomate animals

draw

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Deuterostomes- animals where the anus forms near or from the blastopore  
Examples: Echinoderms, and Chordates

draw

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Echinoderms share 4 characteristics



<http://www.perspective.com/nature/animalia/starfish.html>



[http://www.bynaturegallery.com/productpages/fossils/crinoid\\_holzmaden\\_germany.htm](http://www.bynaturegallery.com/productpages/fossils/crinoid_holzmaden_germany.htm)



<http://www.baylink.org/lessons/27.html>

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Endoskeleton- made of ossicles

Although it appears the animals have an exoskeleton, the ossicles actually have a thin layer of skin over them



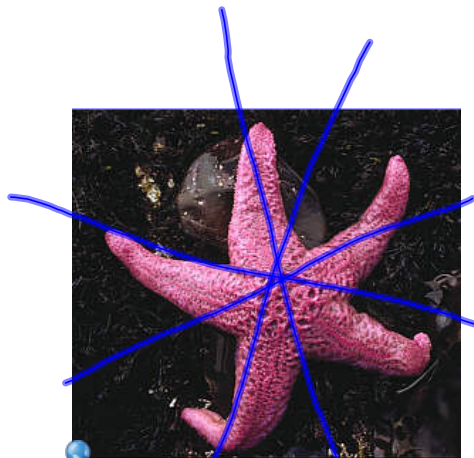
<http://www.perspective.com/nature/animalia/starfish.html>

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Five-part radial symmetry

All are bilaterally symmetrical as larvae

Most adults have a 5-part body plan



<http://www.perspective.com/nature/animalia/starfish.html>

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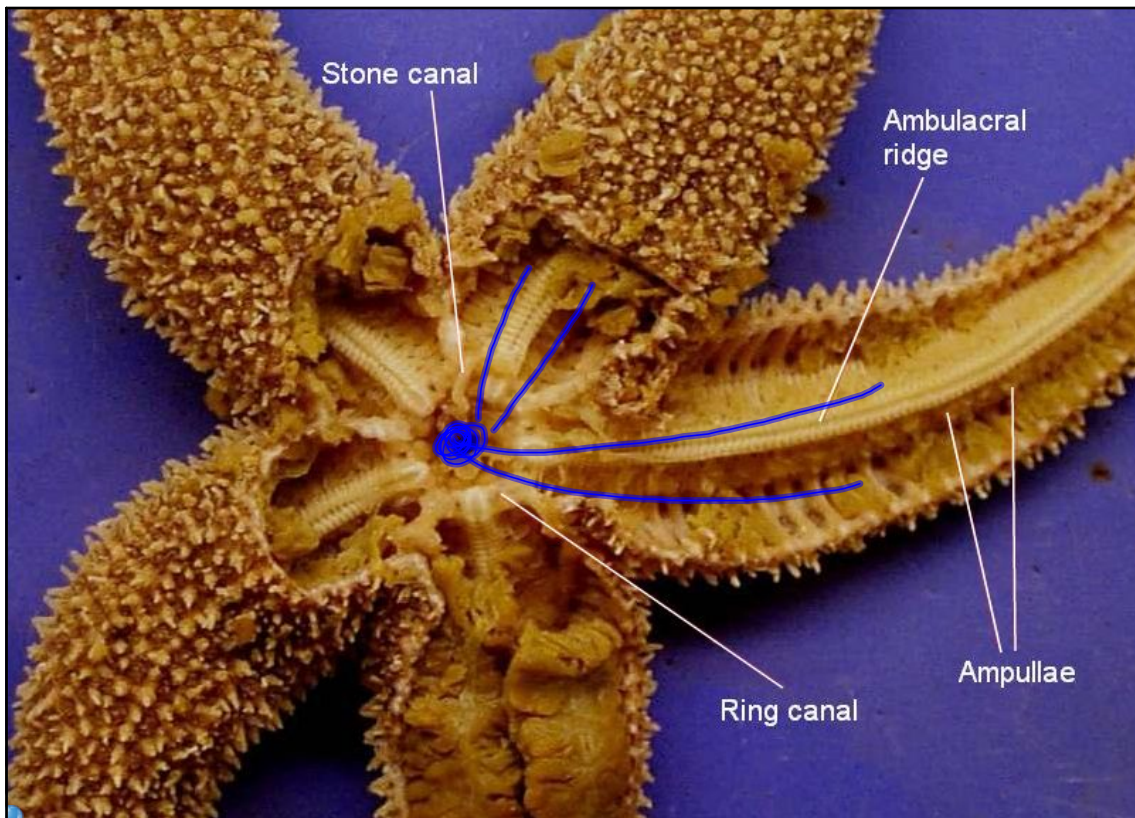
## Water-vascular system

A water-filled interconnected series of canals and tiny hollow tube feet

Functions as a place for feeding and gas exchange

The tube feet can be used for locomotion

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<http://harrington.biology.colostate.edu/Dissections/asterwvs.htm>

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## Coelomic circulation and respiration

The body cavity functions as a simple circulatory and respiratory system

Some echinoderms have skin gills - small finger-like projections that increase the surface area for gas exchange

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## Chapter 32-2 Invertebrate Chordates

The 2nd major group of deuterostomes is the chordates

Spine  
cord

4

### Characteristics of Chordates

Have a completely internal endoskeleton including a notochord

Muscles can attach to this rod increasing the movement an animal can accomplish

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Single, hollow, dorsal nerve cord with nerves attached to it

Pharyngeal slits- the develop in the wall of the pharynx

Postanal tail- a tail that extends beyond the anus

All chordates have these characteristics at some point or stage in life

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The Phylum Chordata has three subphyla.

Vertebrata- is the major phylum

Urochordata

Cephalochordata

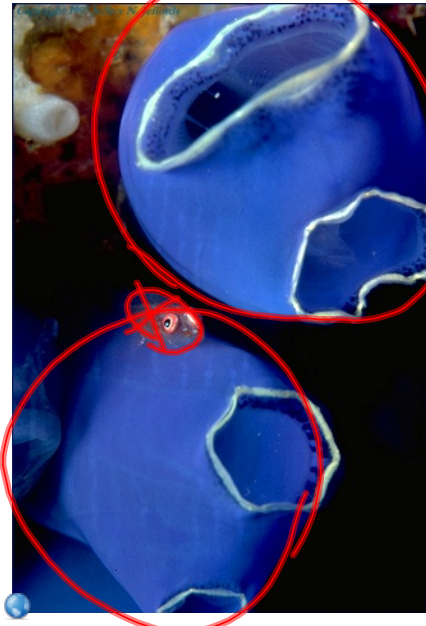
Urochordata and Cephalochordata are considered invertebrates

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## Urochordata (tunicates)

Sessile, filter feeding animals

A tough sac called a tunic surrounds the animal



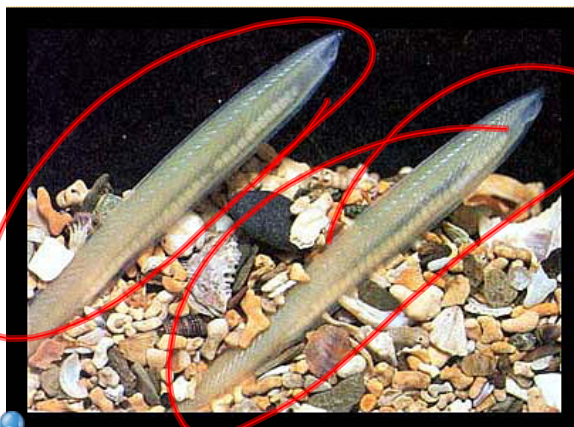
<http://www.divegallery.com/tunicate.htm>

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## Cephalochordata (lancelets)

Only a few centimeters long

Spend most of their time with their tail burrowed in mud or soil



[http://bioweb.uwlax.edu/zoolab/Table\\_of\\_Contents/Lab-9a/Lancelets/lancelets.htm](http://bioweb.uwlax.edu/zoolab/Table_of_Contents/Lab-9a/Lancelets/lancelets.htm)

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