Phylum Echinodermata

(5 Classes) Oh I ACHE!
Asteroids CRashed Here On Earth
Ophiuroidea
Asteroidea
Crinoidea
Holothuroidea
Echinoidea
Echinodermata Basics

• Water vascular system for gas exchange & excretion
• Exclusively marine

• MOST are dioecious. Boy & girl sea stars and urchins.....

• Phylum typically has pentaradial symmetry
Class **Holothuroidea**  
- **Sea Cucumbers**

- Respiratory Structure?  
- Term for releasing insides?  
- Symmetry as adult?
Holothuroidea
- Sea Cucumbers

Respiratory Tree
Evisceration
Secondarily bilateral as adults
**Asteroidea**
- **Sea Stars**

**Path of Water Flow:**
Madreporite -> stone canal -> ring canal -> radial canals -> ambulacral groove -> lateral / transverse canals -> tube feet/ampullae

Surface features visible in some sea stars but more so in Echinoids:
- **Pedicellariae** - for cleaning the surface
- **Papulae** = dermal branchiae - for respiration
Cross Sections through Ray of a Sea Star

**A**
- **Ambulacral Groove**
- **Ambulacral Ridge**
- **Podium**
- **Ampulla**
- **Sucker** Enables locomotion – but in Ophiuroidea this is replaced by a platelet, preventing tube feet being used for movement.

**B**
- **Pyloric Stomach**
- **Cardiac Stomach** can be evverted in some seastars!
- **Hepatic or pyloric caecum**
- **Radial Canal and tube feet**
- **Gonad**
- **Perivisceral Coelom**
- **Pyloric Caecum**

**FOOD**
http://www.k-state.edu/organismic/echinoderms_and_protochordates.htm
Class **Echinoidea**
- **Sea Urchins, Sand Dollars**

What is the test used for? What is it made of?
Aristotle’s Lantern is used for what?
Name the other surface features. Functions?
Echinoidea
- Sea Urchins, Sand Dollars

Test – Support Made up of ossicles
Aristotle’s Lantern – Feeding
Pedicellariae are for cleaning the surface
Papulae are dermal branchia for respiration
Class **Crinoidea**
- *Sea Lilies and Feather Stars*
Mouth on upper surface of body
Madreporite is oral instead of aboral
Tube feet used mainly for feeding

Sounds (and are) much prettier than our specimens would have you believe!
Class **Ophiuroidea**  
- Brittle Stars, Basket Stars

No Anus, all organs in central disk

What is the advantage of having an anus?

First phylum to have an anus?

What is special about a brittle star’s tube feet?
Class **Ophiuroidea**
- **Brittle Stars, Basket Stars**

No Anus, all organs in central disk

More efficient digestion – can specialize function

Nemertina?

No sucker but a plate on end of the podia (tube). Cannot be used for locomotion.