

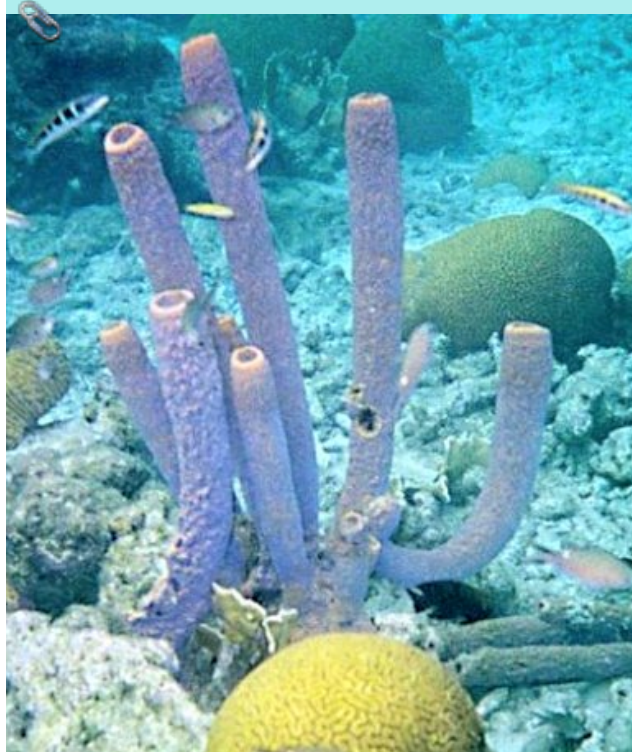
# SPONGES



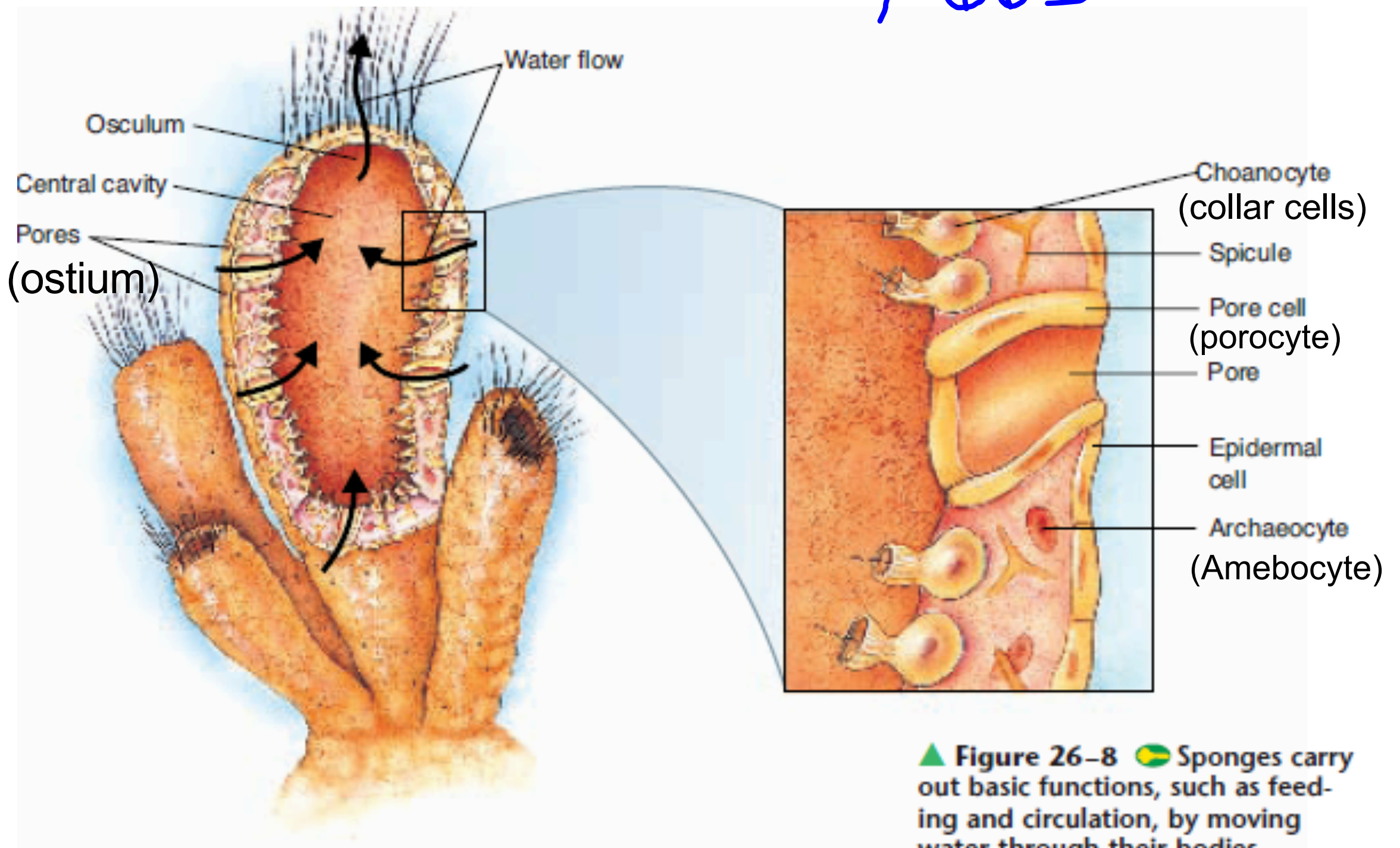
## Sponges (Phylum *Porifera*) pg 664

- Sponges are classified as animals because they are multicellular, heterotrophic, have no cell walls and contain a few specialized cells.
- "Porifera" means "pore-bearers." Sponges have tiny openings, or pores, all over their bodies.
- Sponges are sessile: they spend their entire adult life attached to one spot.

Phylum\_Porifera\_\_Sponges\_\_the\_Simplest\_Animals.asf



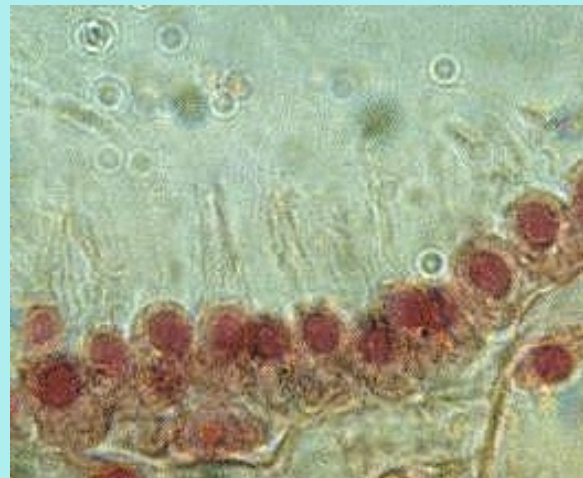
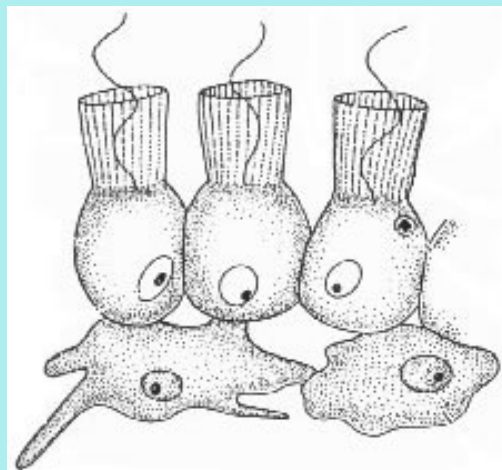
7.665



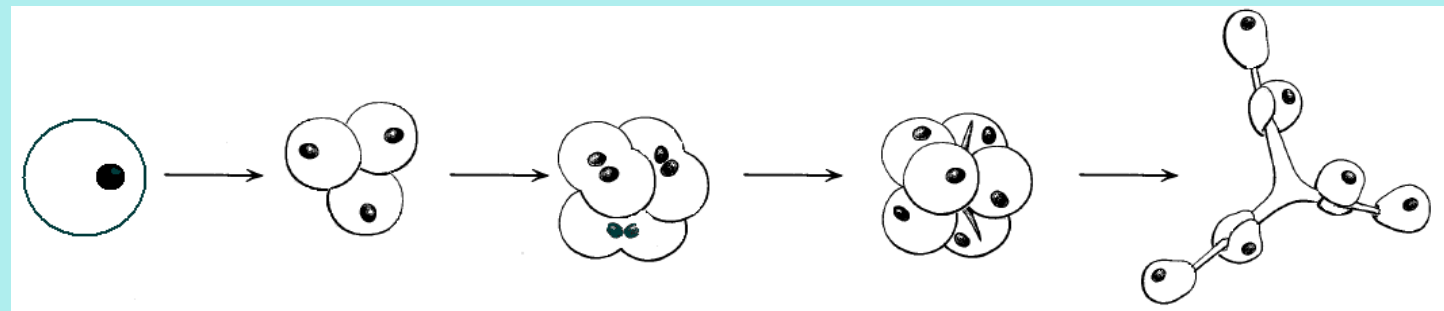
▲ Figure 26-8 🇧🇷 Sponges carry out basic functions, such as feeding and circulation, by moving water through their bodies.

## Form and Function in Sponges

- No mouth, gut, organs or tissues.
- Simple processes are carried out by a few specialized cells.
- Body plan: Assymetrical (no front or back, left or right)
- Body forms a wall around a large central cavity through which water circulates.
- Choanocytes:(collar cells) specialized cells that use flagella to move a current of water.



- Water enters through [ostia](#) (pores) in the body wall, then leaves through the osculum.
- [Osculum](#): large hole at the top of the sponge
- The movement of water through the sponge provides a simple mechanism for feeding, respiration, circulation and excretion.
- Sponges have [spicules](#): spike-shaped structures of hardened material.
- Spicules are made by [archaeocytes](#) (also called amebocytes): specialized cells that move around



## Feeding

- Filter feeders: sift microscopic food particles from the water.
- Digestion takes place in the cells.
- Particles in the water are trapped by choanocytes, and are then digested or passed on by archaeocytes.

<http://www2.biology.ualberta.ca/facilities/multimedia/uploads/zoology/Porifera.html>

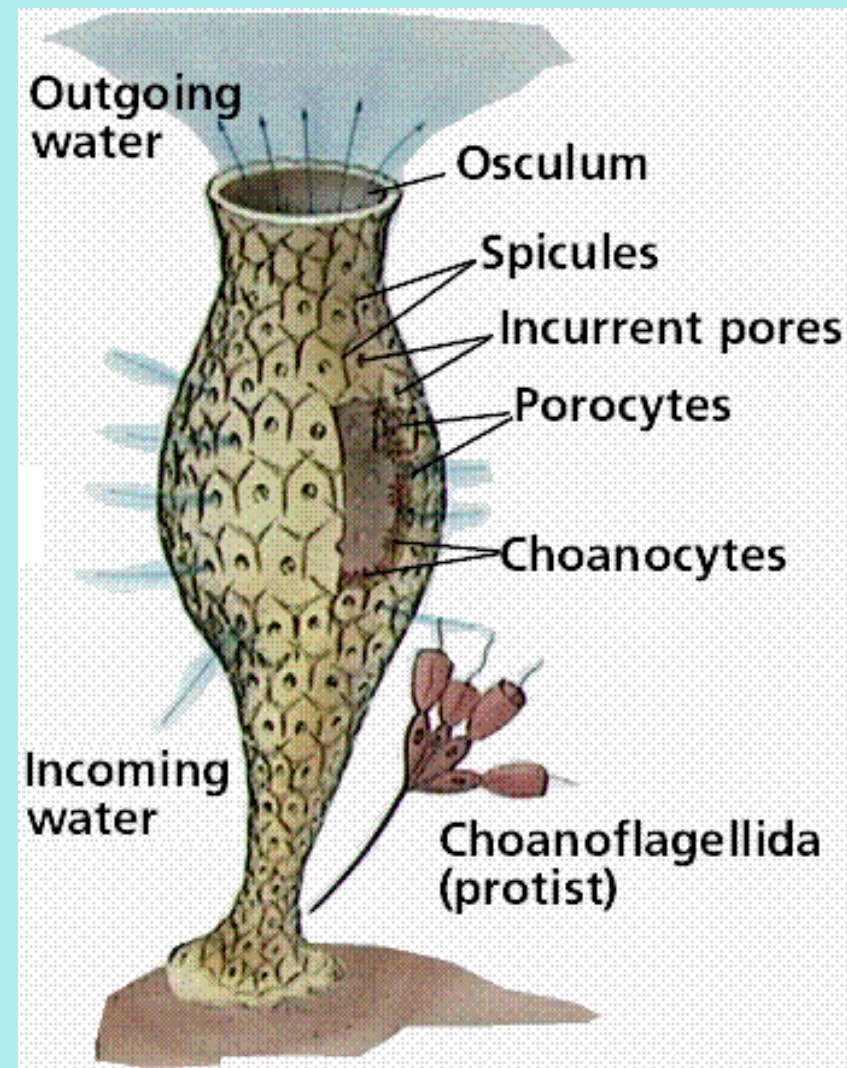


[http://biology.nebrwesleyan.edu/courses/labs/biology\\_of\\_animals/zoolab9/Sponge\\_Asconoid\\_animation.html](http://biology.nebrwesleyan.edu/courses/labs/biology_of_animals/zoolab9/Sponge_Asconoid_animation.html)



# Respiration, Circulation and Excretion

- Rely on movement of water.
- Oxygen dissolved in water diffuses into cells.
- Carbon dioxide and other wastes diffuse into water and carried away.



# Reproduction

reproduction



## *Sexual:*

- Single sponge can form both egg and sperm.
- Sperm released from one sponge and carried by water to pore of another.
- Archaeocytes carry sperm to egg cell.
- After fertilization, a larva develops.
- Larva: immature stage that looks different from adult form.
- Larvae of sponges are motile and carried by water currents.

## *Asexual:*

- Budding: part of the sponge breaks off, settles to the sea floor and develops into a new sponge.
- Gemmules: may be formed under harsh conditions; can eventually grow into a new sponge.



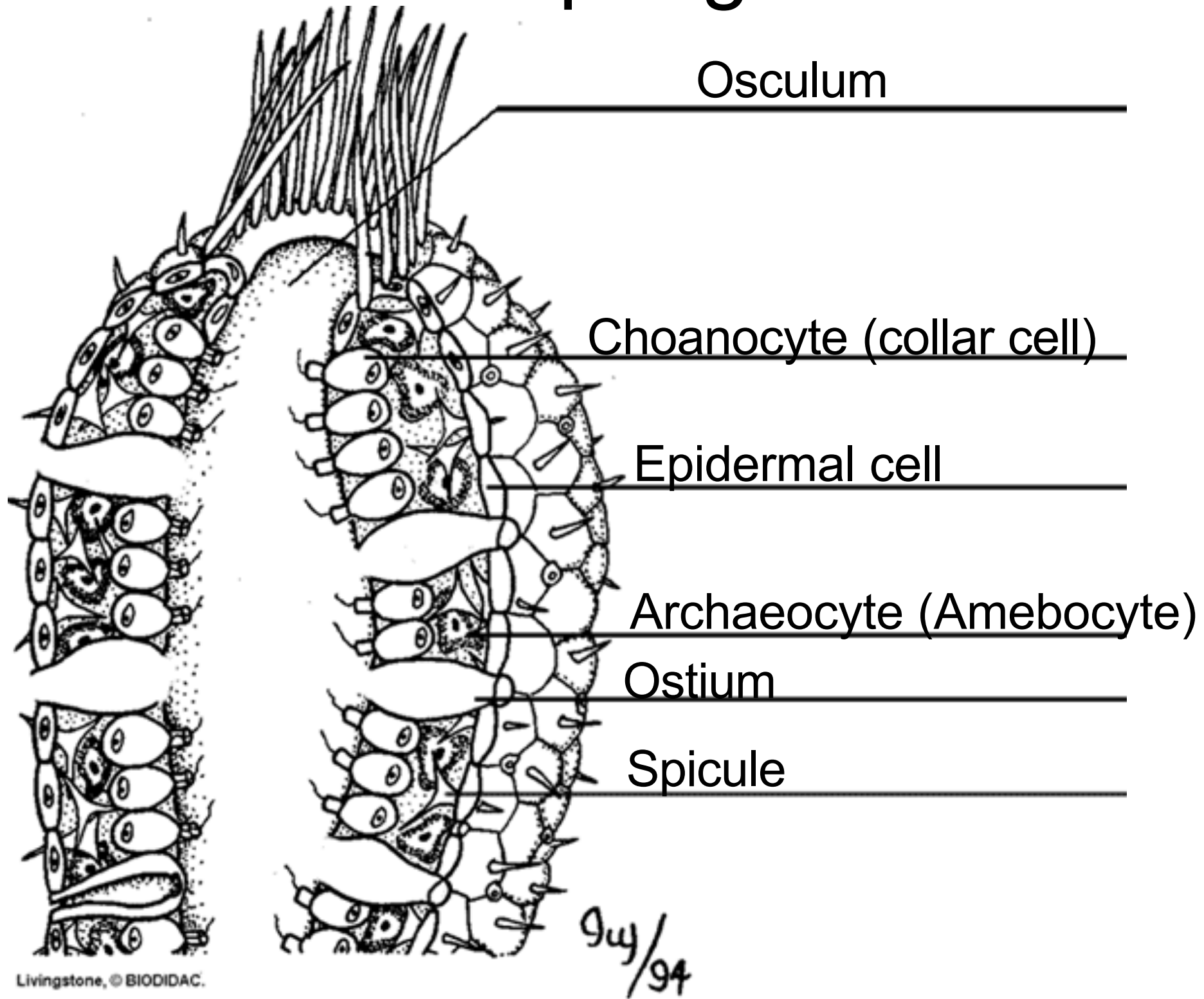
# Homework: Read

p. 664 - 667

p. 667 # 1 - 4

1. Read p. 664 - 667.
2. p. 667 Section Assessment: Questions #1 - 4
3. Handout: Sponge Study Questions. Complete all questions for tomorrow!

# Sponge



1. Why are sponges classified as animals?

---

---

---

2. Why is the movement of water key to a sponge's survival?

---

---

---

*Match the terms on the left with the definitions on the right.*

3. \_\_\_\_\_ osculum

4. \_\_\_\_\_ spiculus

5. \_\_\_\_\_ pores

6. \_\_\_\_\_ choanocytes

7. \_\_\_\_\_ archaeocytes

a. water moves into the central cavity through these small openings

b. spike-shaped structures that make up a simple skeleton

c. large opening at the top of the sponge where water exits

d. specialized cells that move around within the walls of the sponge, making spicules and digesting and transporting food

e. cells that use flagella to move water through the sponge to trap food

8. Describe how a sponge feeds.

---

---

---

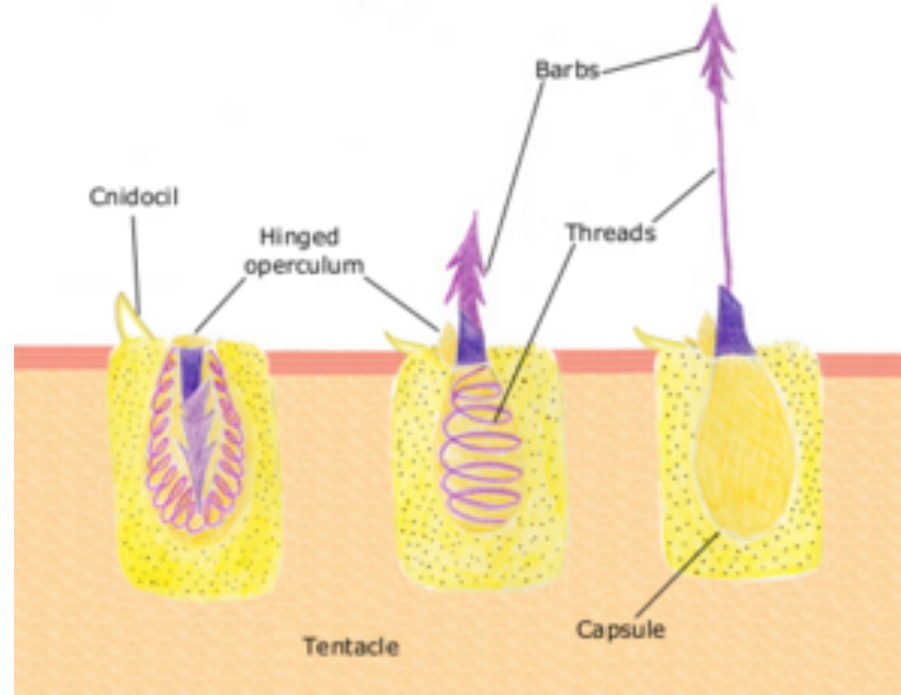
9. What triggers a sponge to produce gemmules?

---

---

## What is a Cnidarian? (*Phylum Cnidaria*)

- Cnidarians are soft-bodied, carnivorous animals that have stinging tentacles around their mouths.
- Cnidocytes: stinging cells located along tentacles used for defense and food capture
  - within each is a nematocyst: poison-filled, stinging structure that contains a tightly coiled dart.





Examples:

jellyfish

sea anemones

corals

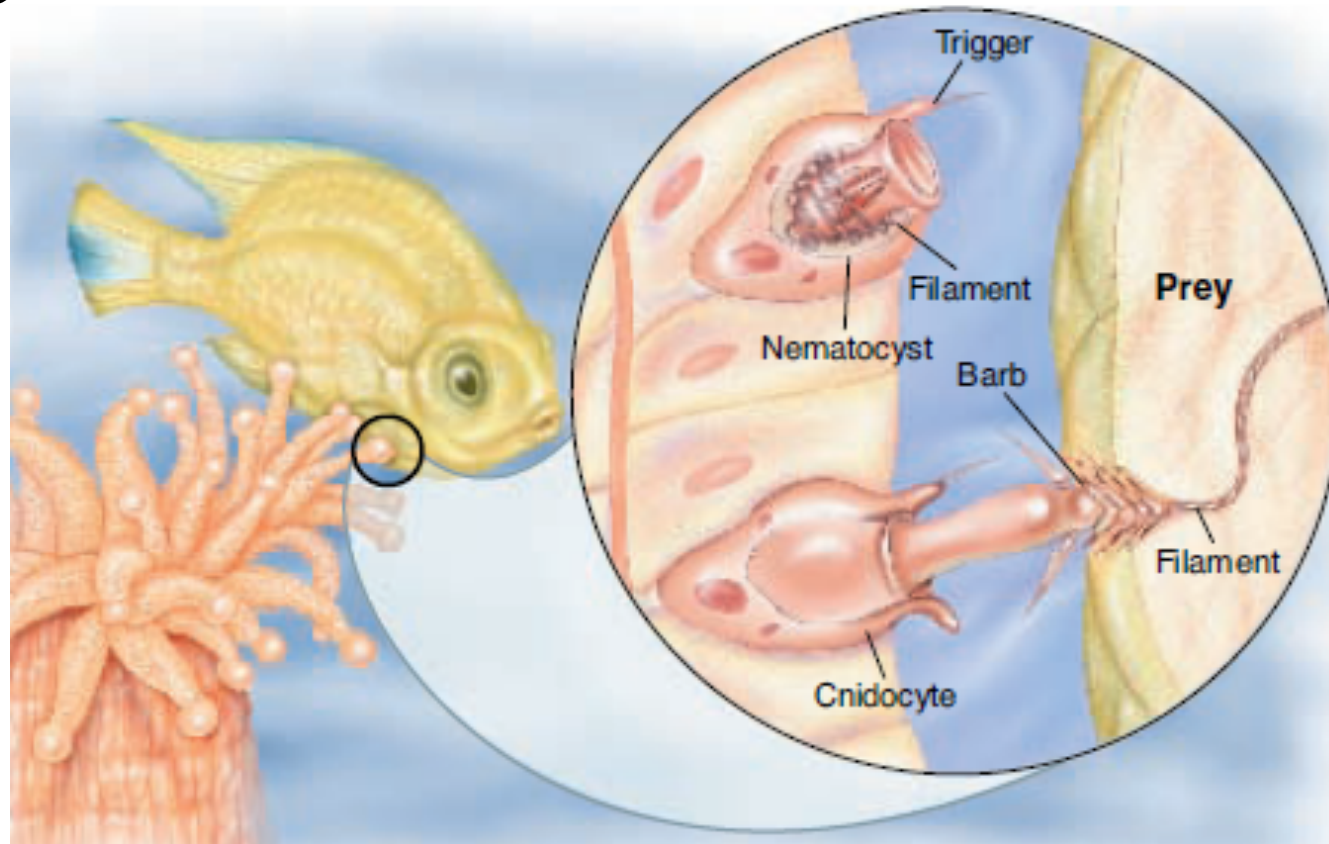
hydra

portuguese man-o-war



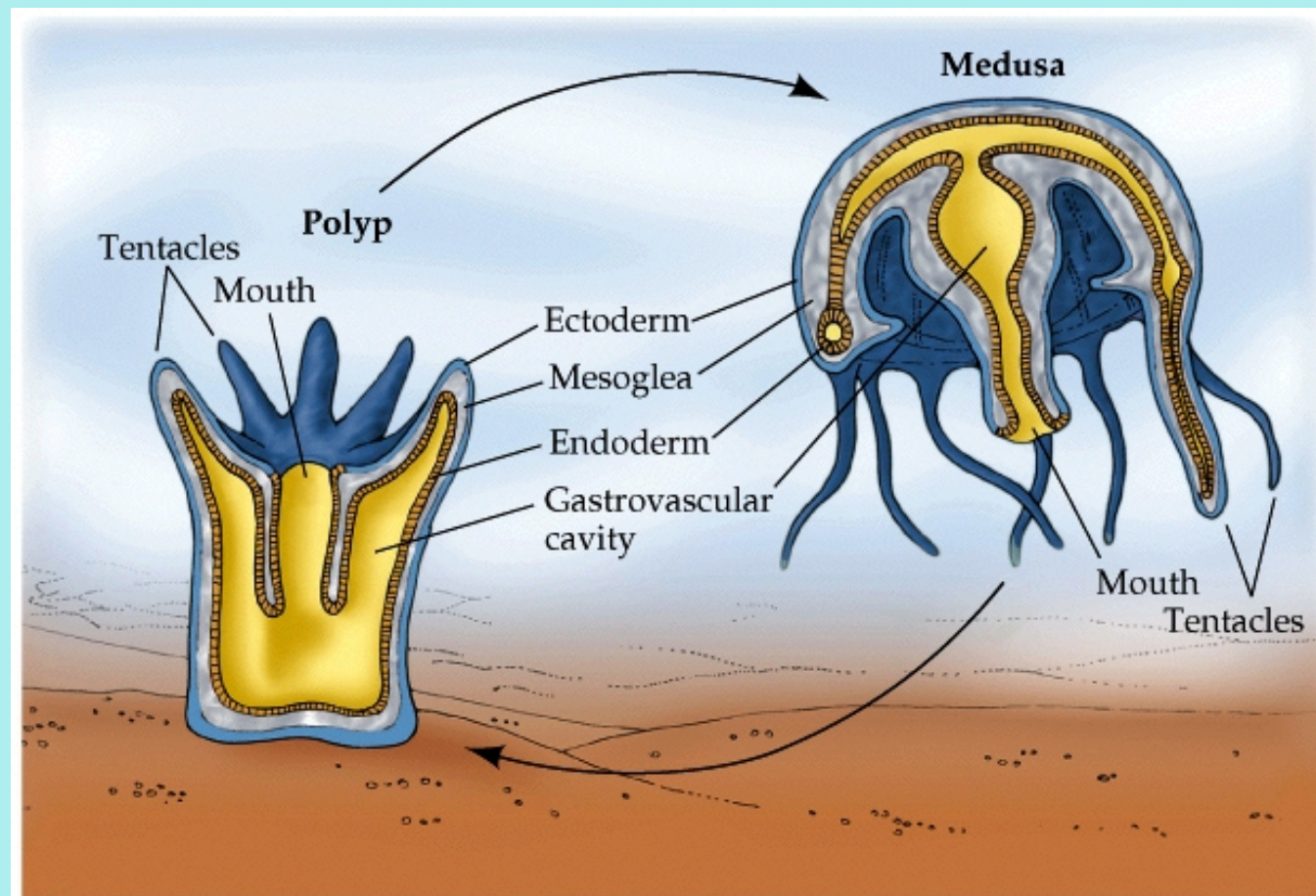
## Form and Function

- Cnidarians are only a few cells thick and have simple body systems.
- They have specialized tissues to carry out feeding and movement.



## Body Plan

- Radial symmetry
- Central mouth surrounded by tentacles
- Typically, life cycle includes 2 stages:
  - 1) **polyp**: cylindrical body with armlike tentacles; mouth points up; usually sessile
  - 2) **medusa**: motile, bell-shaped body with mouth on the bottom





- Both polyp and medusa forms have a body wall that surrounds an internal space called the gastrovascular cavity: digestive chamber with one opening.

## Feeding

- Prey is paralyzed, then pulled into the mouth and the GVC.
- Food enters and waste also leaves through the GVC.
- Digestion is extracellular - it takes place outside the cells in the GVC and molecules are then absorbed.

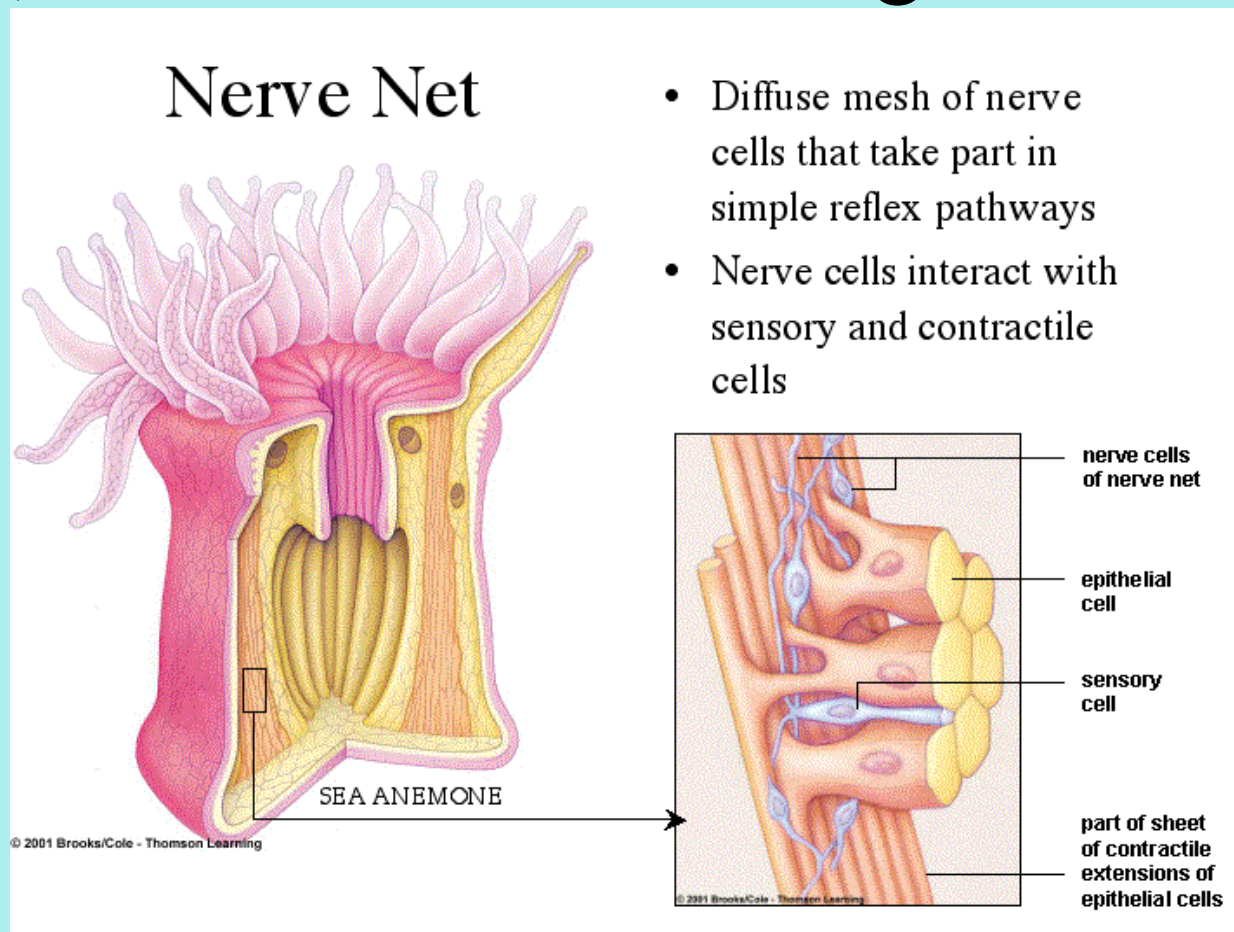
## Respiration, Circulation and Excretion

- After digestion, nutrients are transported throughout the body by diffusion.
- Cnidarians respire and eliminate wastes by diffusion through body walls.



# Response

- Nerve net: loosely organized network of nerve cells that allow them to detect stimuli (such as touch)
- Also have special cells that detect the direction of gravity, and cell that detect light



## Movement

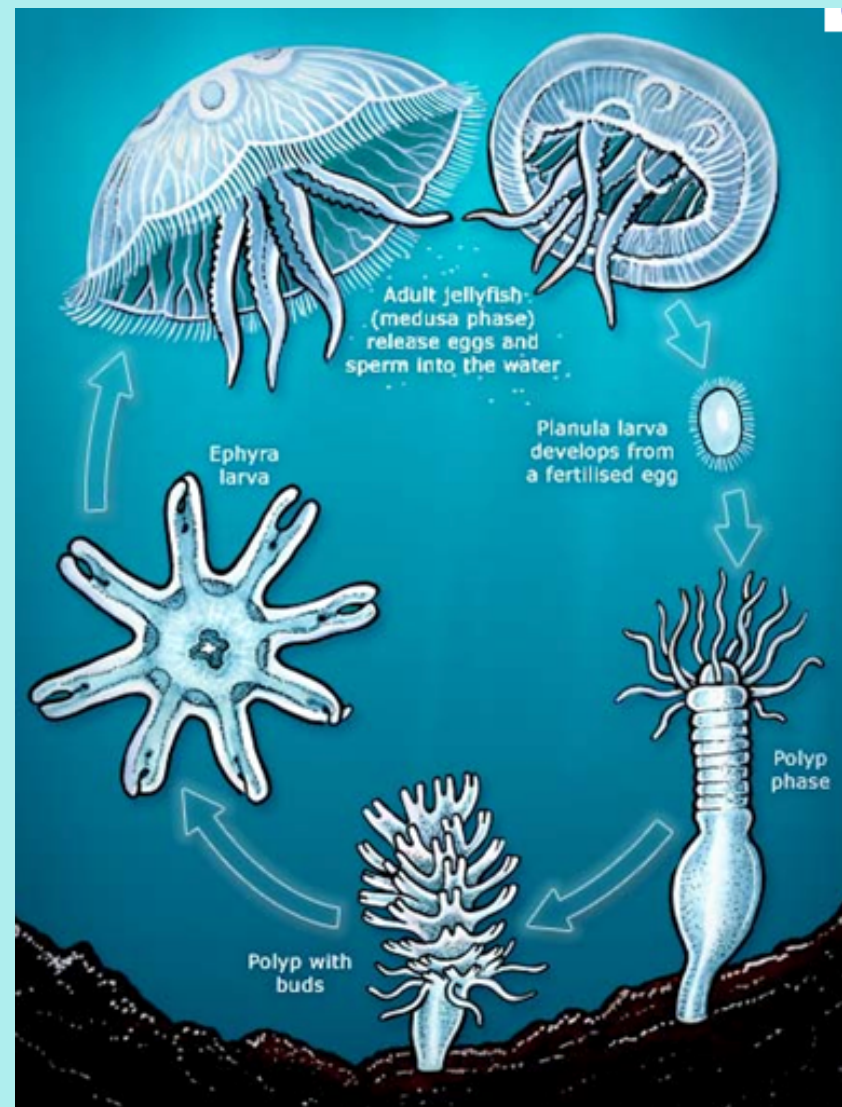
- Some have a [hydrostatic skeleton](#): consists of a layer of circular muscles and a layer of longitudinal muscles that, together with water in GVC, allow movement
- Medusas move by jet propulsion - muscle contractions that push water out.

Box\_Jellyfish\_\_World\_s\_Deadliest\_Creature.wmv



## Reproduction

- Most reproduce both sexually and asexually.
- Asexually: budding (similar to sponges)
- Sexually: [external fertilization](#)
- Separate sexes; female releases eggs into the water, and male releases sperm



1. Read p. 669-675

2. Section Assessment

#1-6 (p. 675)

**<http://www.biologycorner.com/worksheets.html>**



