

The Animal Kingdom

Animals are multicellular, eukaryotic heterotrophs whose cells lack cell walls.

• Animals carry out the following essential functions:

- | | | |
|--------------|-------------|-------------|
| feeding | respiration | circulation |
| excretion | response | movement |
| reproduction | | |

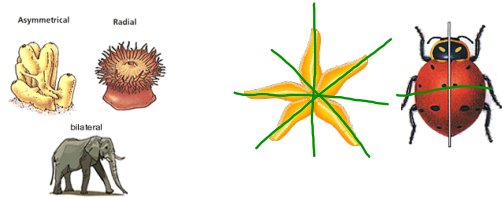


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Characteristics used to help classify animals:

1) Body Symmetry

- Except for sponges, all animals have some type of symmetry.
- **Radial symmetry:** any number of imaginary planes can be drawn through the centre, dividing the body into equal halves.
- **Bilateral symmetry:** only a single imaginary plane of symmetry can divide the body in half.



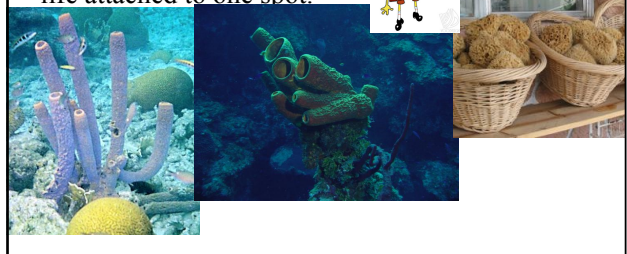
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2) Body Cavity Formation

- Most animals have a **body cavity** - a fluid-filled space that lies between the digestive tract and the body wall.
- A body cavity is important because it provided space for internal organs to be suspended.
- They also allow for specialized regions to develop.

Phylum Porifera (Sponges)

- **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.



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Form and Function in Sponges

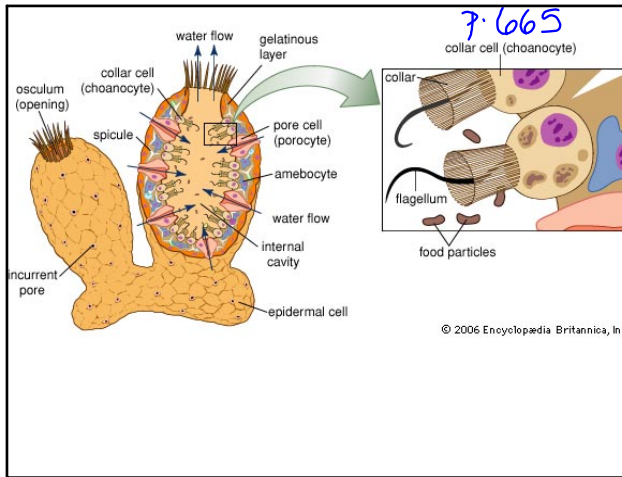
- No mouth, gut, organs or tissues.
- Simple processes are carried out by a few specialized cells.
- Body plan: **Assymetrical** (no front or back, left or right)
- Body forms a wall around a large central cavity through which water circulates.
- **Choanocytes:** specialized cells that use **flagella**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

- Water enters through pores in the body wall, then leaves through the osculum.
- **Osculum:** large hole at the top of the sponge
- Sponges have **spicules:** spike-shaped structures of hardened material.
- Spicules are made by **archaeocytes** (also called amoebocytes): specialized cells that move around



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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.

Xestopongia muta

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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.

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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.

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To complete your notes:

Figure 26 - 8 p. 665: Sketch in notebook, and label using the correct terms.

p. 667 Section Assessment: Questions #1 - 4

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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	a. water moves into the central cavity through these small openings
4. _____ spiculus	b. spike-shaped structures that make up a simple skeleton
5. _____ pores	c. large opening at the top of the sponge where water exits
6. _____ choanocytes	d. specialized cells that move around within the walls of the sponge, making spicules and digesting and transporting food
7. _____ archaeocytes	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?

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Attachments

Phylum_Porifera__Sponges__the_Simplest_Animals.asf

Porifera.asf

World of Animals Major Phyla.asx