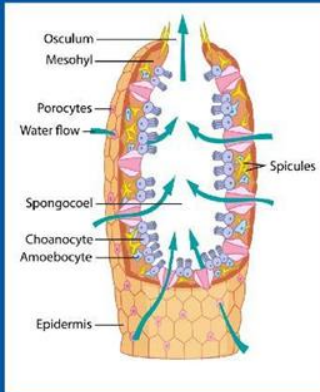


# BASIS OF CLASSIFICATIONS & PHYLUM PORIFERA



# ANIMAL KINGDOM - L1

2024  
2023

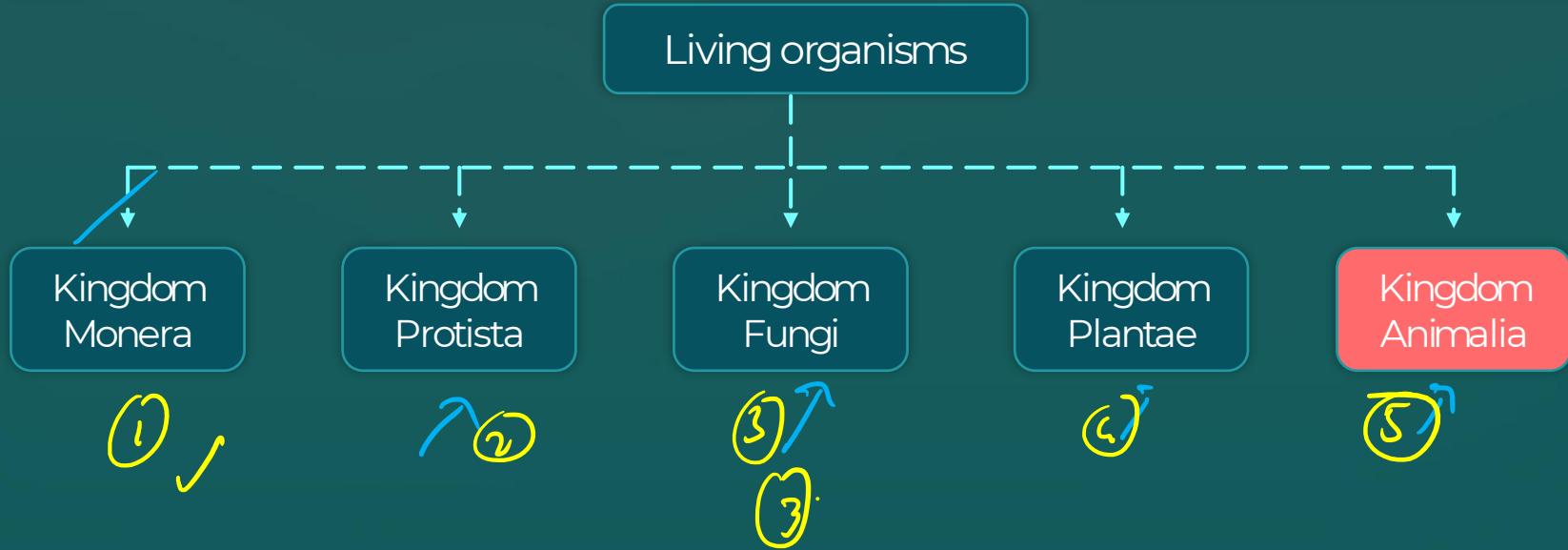


MISSION MBBS 11<sup>th</sup> | ZOOLOGY

PUSHPENDU SIR



## Recall ! Five Kingdom Classification





# Kingdom Animalia





## Kingdom Animalia



An animal has the following features

- **Eukaryotic:** Cell with well-defined nucleus and membrane-bound organelle.
- ✓ • **Lacks a cell wall**
- ✓ • **Multicellular:** Made up of more than one cell
- ✓ • **Heterotrophic:** Holozoic or parasitic

Key word



## Kingdom Animalia

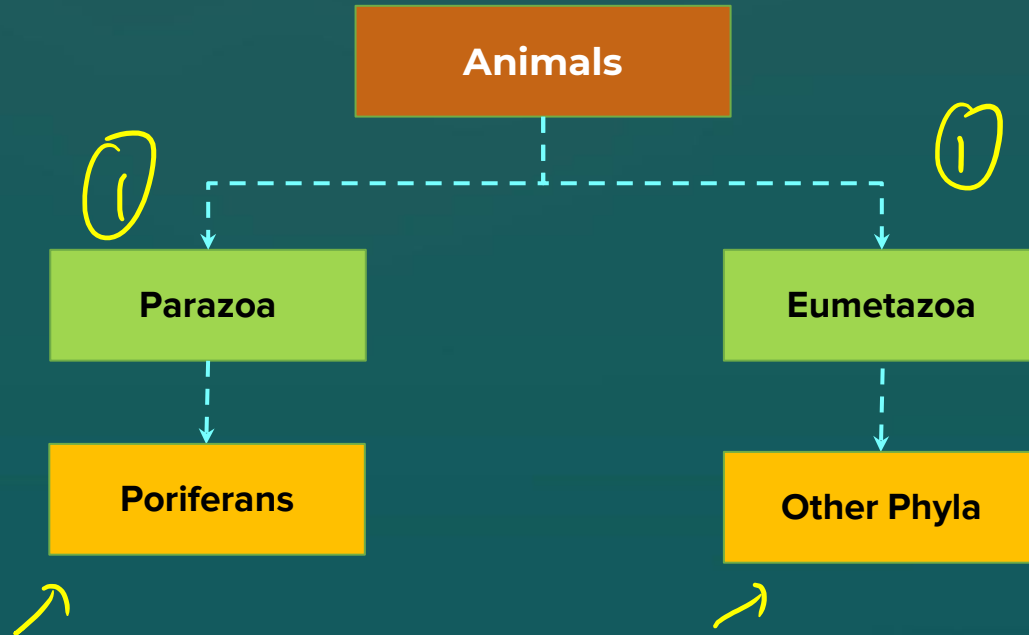


- **Metazoa :**

- Body may or may not be differentiated into tissues or organs
- Digestive cavity lined with specialised cells present



# Kingdom Animalia





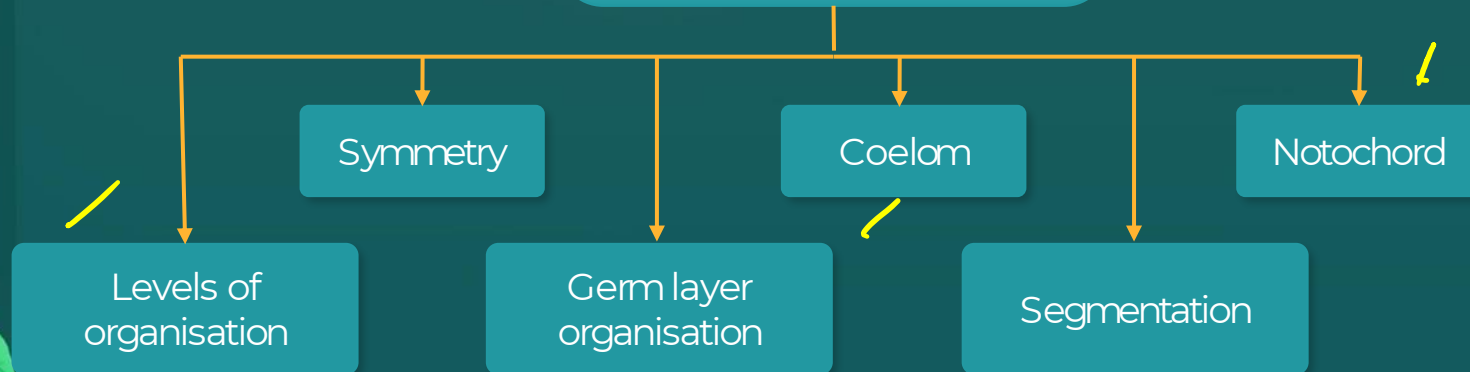


# Classification of Animals

# Classification of animals

- Classification of animals is important as the diversity of animals is huge
- It also helps in assigning a systematic position to a newly discovered species

## Basis of Classification



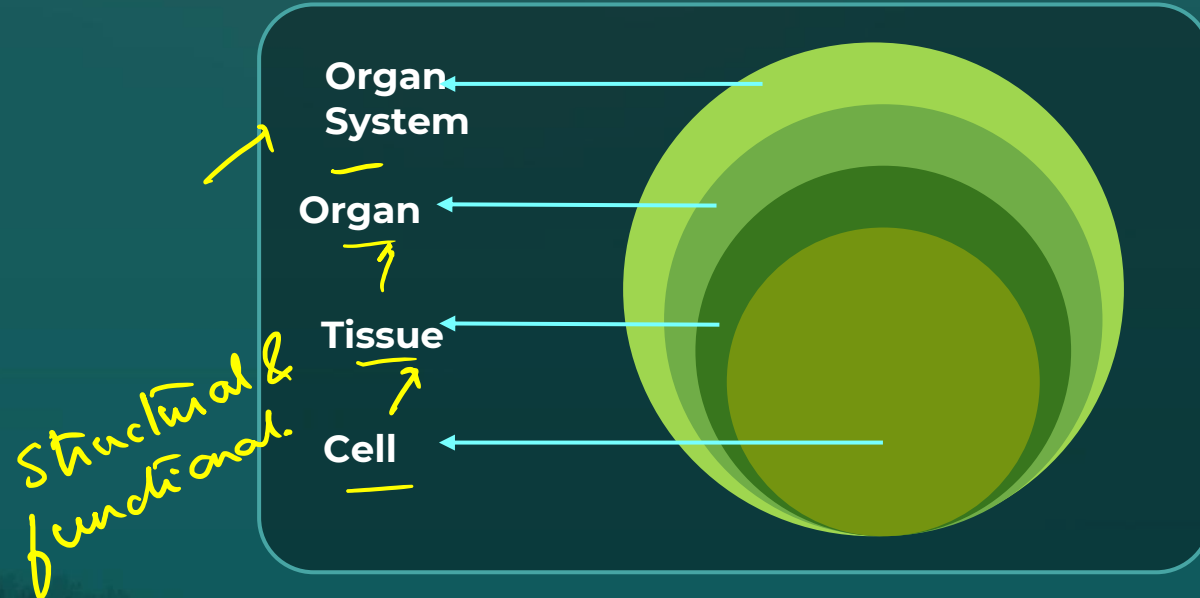




## Levels of Organisation



Different multicellular animals have different levels of organisation



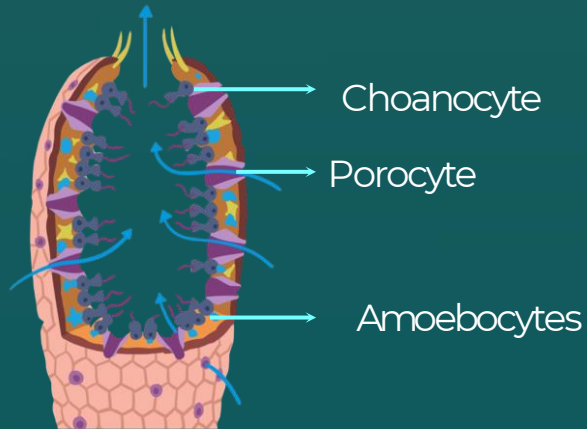


## Levels of Organisation



### Cellular level of organization:

- Cells are arranged as loose cell aggregates but they do not form any tissue
- Some division of labor occur among the cells
- Example : **Poriferans (sponges)**





## Levels of Organisation

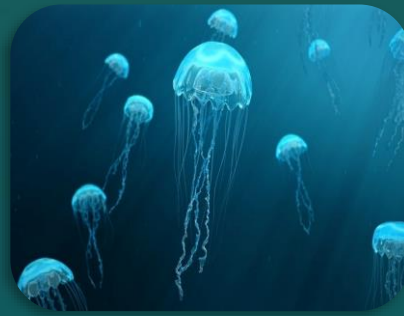


### Tissue level of organization:

- Cells having same functions and structure are arranged to form tissues
- Example : **Coelenterates and Ctenophores**



**Coelenterata**



**Ctenophora**



## Levels of Organisation



### Organ level of organization:

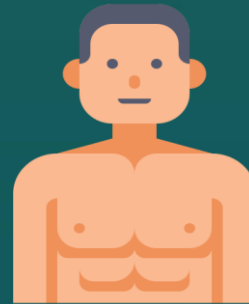
- Tissues are grouped together to form organs and each organ is specialized for a particular function
- Example : **Platyhelminthes (Flatworms), Aschelminthes, Chordates**



Flatworm



Grasshopper

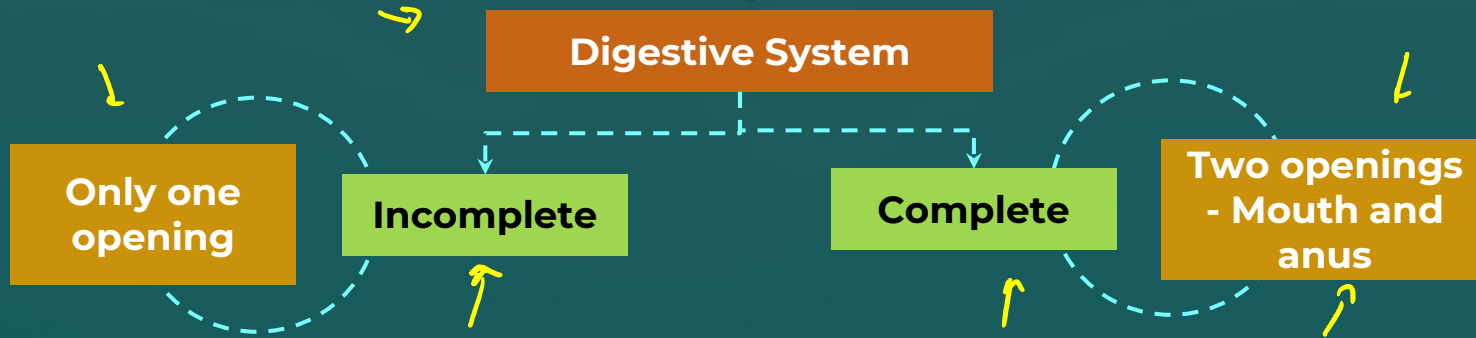


Human





## Levels of Organisation



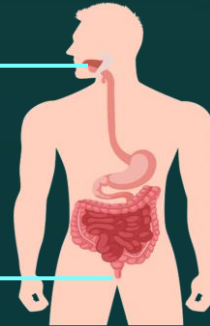
Branched gastrovascular cavity



**Flatworm**

Mouth

Anus

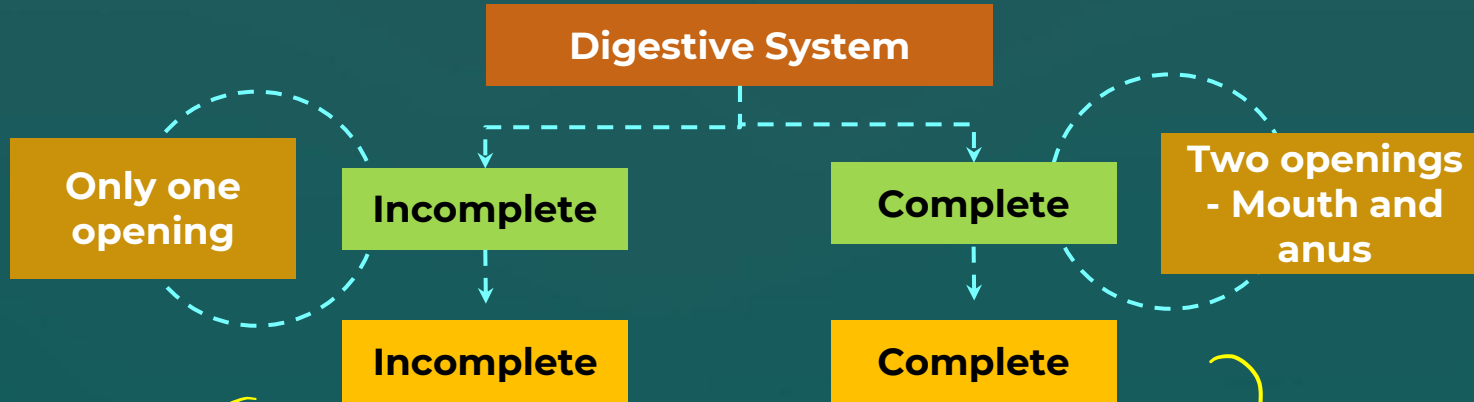


**Human**





## Levels of Organisation



(1) { Blind sac body plan  
Single opening in the  
alimentary canal serves  
the purpose of mouth and  
anus

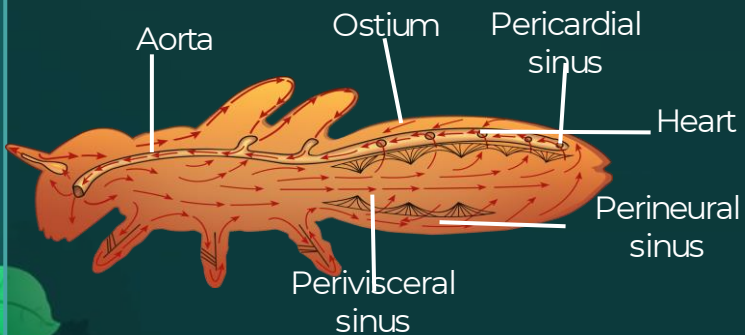
(2) { Tube within tube body  
plan  
• Two different openings of  
the alimentary canal  
serve the purpose of  
mouth and anus



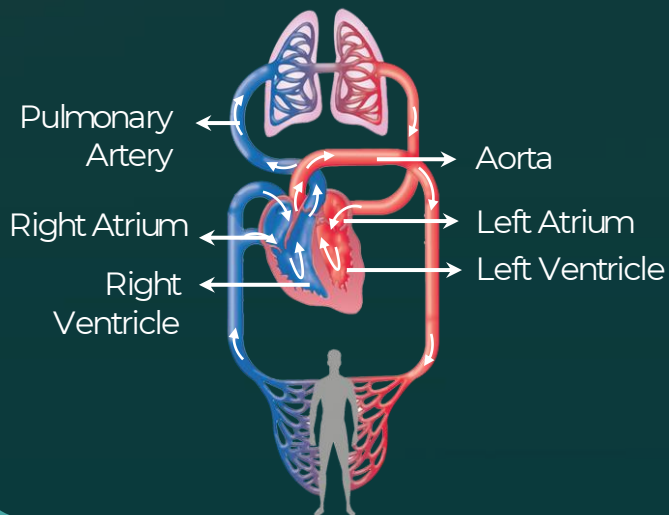
## Levels of Organisation

### Circulatory System

#### Open



#### Closed





# Symmetry

Symmetry refers to a correspondence of body parts, in size, shape and relative position, on opposite sides of a dividing line or distributed around a central point or axis

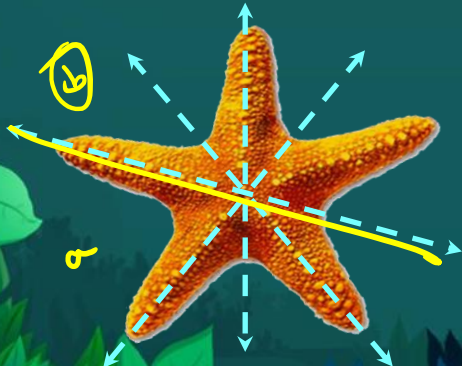


## Symmetry

②  
**Radial**

①  
**Asymmetrical**

③  
**Bilateral**





## Symmetry



### RADIAL SYMMETRY

- Example : **Coelenterates, Ctenophores, adult Echinoderms**
- There is one main axis around which the various body parts are arranged
- Body can be divided into two identical halves in any plane passing through the centre





## Symmetry



### BILATERAL SYMMETRY

- When only one plane passing through the central axis divides the animal into equal halves.
- Example: **Platyhelminthes to Chordates (except adult echinoderms)**







## Symmetry



### ASYMMETRICAL

- Sponges exhibit irregular shape
- Body cannot be divided into two equal halves in any plane



Sponges

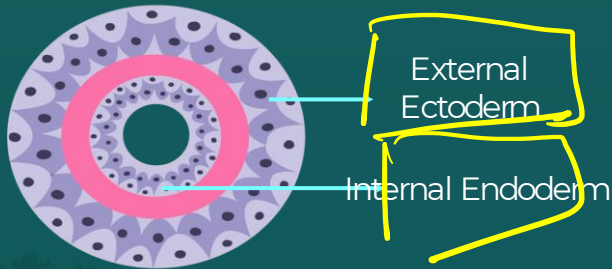


## Germ Layer Organisation

- Germ layer is a layer of cells in an embryo
- It contributes to the formation of all organs and tissues

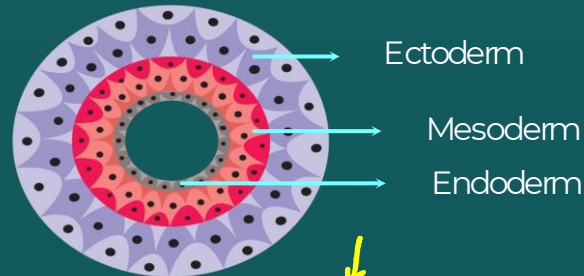
### Germ Layer Organisation

Diploblastic



eg- *Hydra*

Triploblastic



eg- *Homo sapiens*

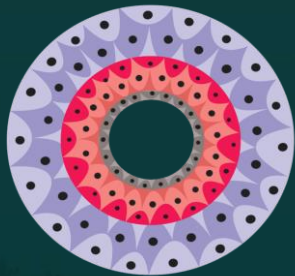


## Coelom

✓ Coelom is a fluid filled cavity between the alimentary canal and body wall

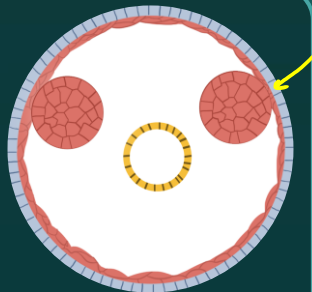
- It is lined by the mesoderm on all sides
- Present only in triploblastic animals

### Acoelomate



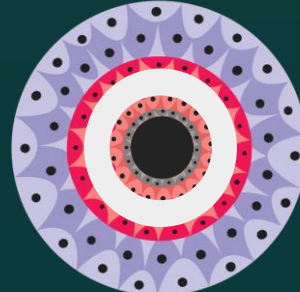
Platyhelminthes

### Pseudocoelomate



Aschelminthes

### Eucoelomate



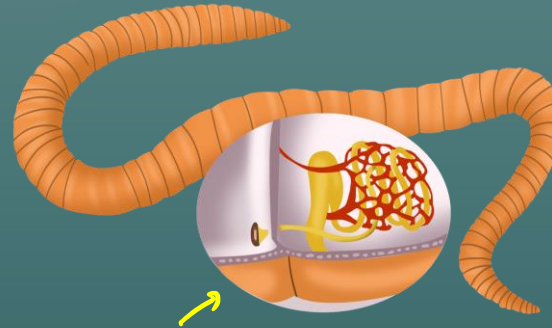
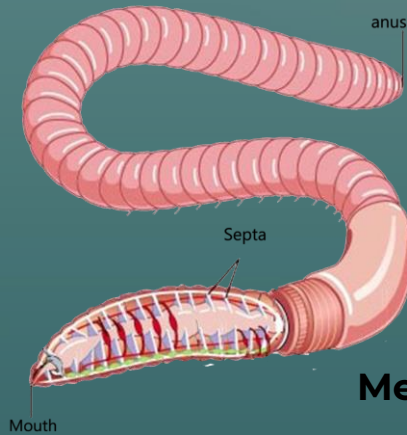
Annelida to chordata



## Segmentation



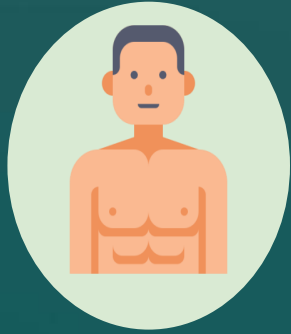
- Segmentation is defined as division of body into parts or segments.



**Metameric segmentation in Earthworm**



# Notochord



## Animals

### Chordates

### Non chordates



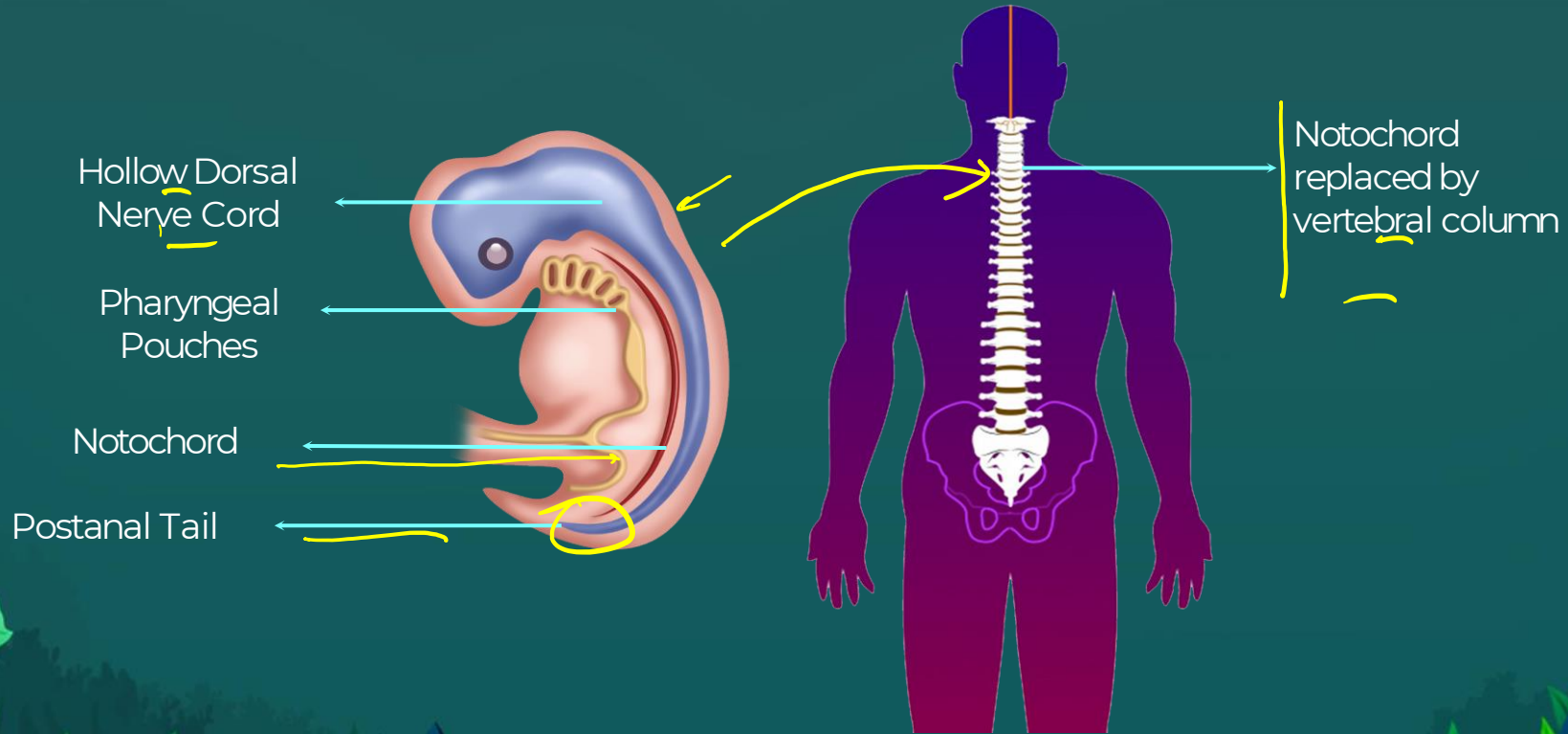
- With notochord
- Notochord is replaced by vertebral column in adults of some chordates which are known as vertebrates.

- Without notochord
- Hemichordates contain a notochord like structure, stomochord



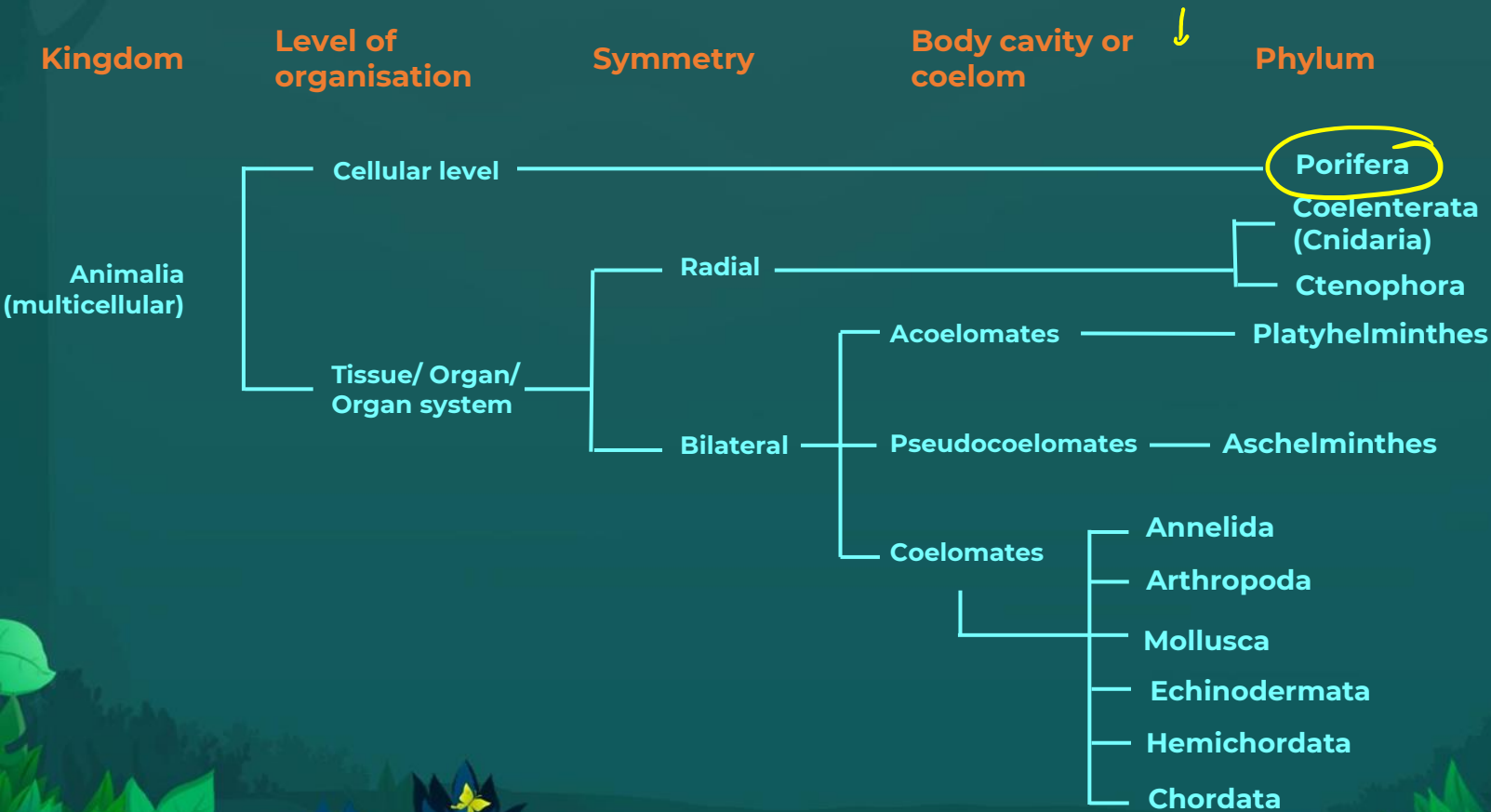


## Notochord





# Classification of Animals





# Phylum Porifera



## Phylum Porifera

NCERT →

Phylum Porifera	
Habitat	Aquatic habitat (mostly marine)
Level of organization	Cellular
Body symmetry	Asymmetrical
Germ layer	No germ layer
Coelom	Acoelomate
Segmentation	Unsegmented



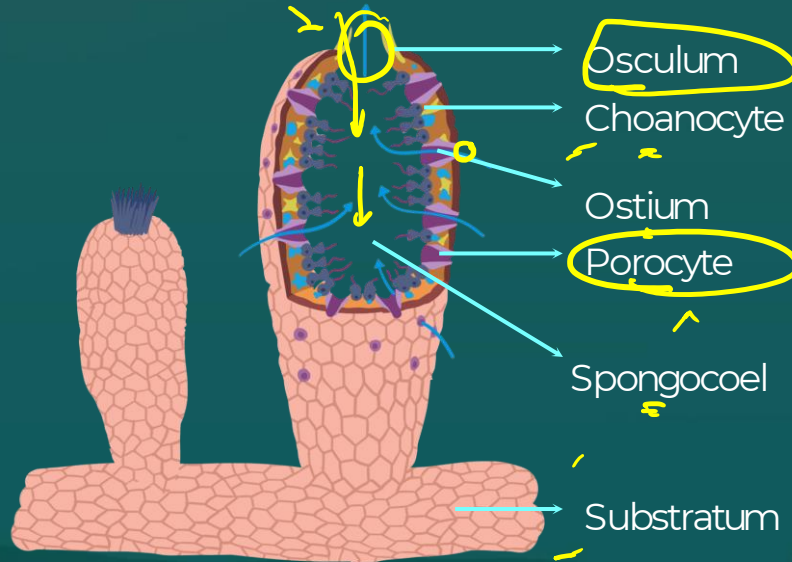
# Phylum Porifera

- Porifera includes more than 5,000 species
- The term '**Porifera**' means 'pore bearing' organisms and commonly known as **sponges**.
- All sponges are sessile and **attached to substratum**.
- Two types of pores are present on sponges body i.e.:

Ostia

○ **Ostia (sing. ostium)**

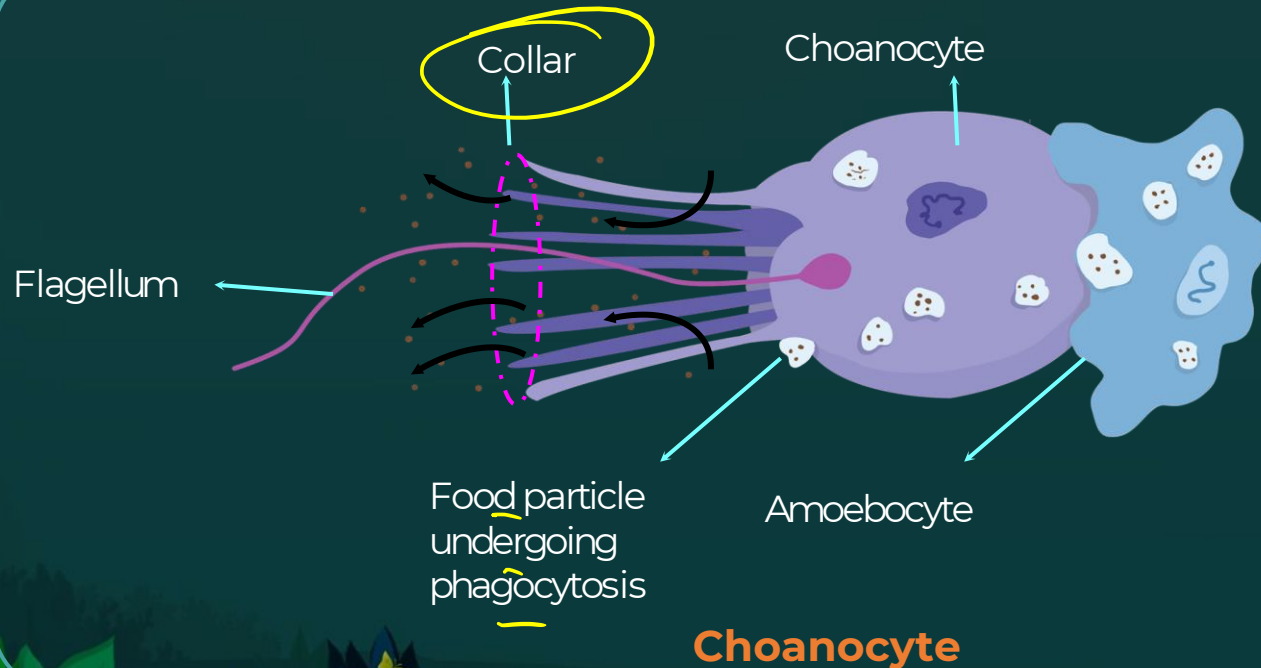
○ **Osculum**



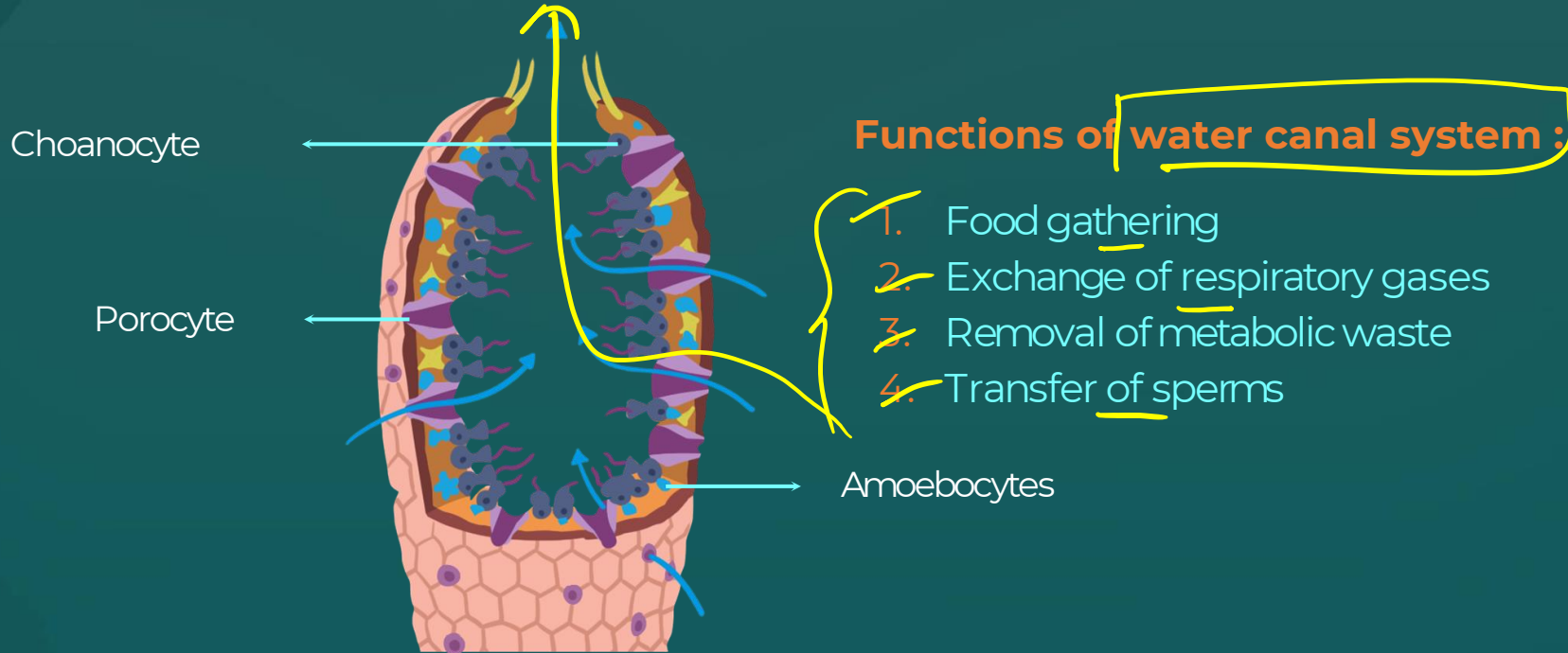


## Phylum Porifera

- Digestion is intracellular and occurs in the food vacuole of **choanocytes**



## Phylum Porifera



**Water Circulation in Sponges**

## Phylum Porifera

- They have **great power of regeneration**.
- Body is supported by an endoskeleton which is made up of **spicules or spongin fibres**.



## Phylum Porifera

- **Reproduction:**

- ✓ ○ Asexual through fragmentation
- ✓ ○ Sexual by gamete formation

2 type

- ✓ ● **Hermaphrodites** showing protandry (male gametes mature first)

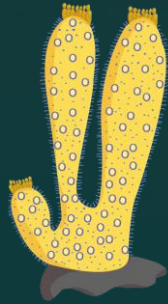
- Fertilization: Cross and internal

- Development is indirect i.e. larval stage is included

- Larval stage is morphologically different from adult and freely swimming i.e. motile

# Phylum Porifera

## Asexual Reproduction



Parts spitted and thrown off the parental body



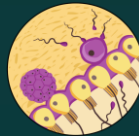
Development of the new individual

## Sexual Reproduction

Sperm cells  
+  
Egg cell



Fertilisation (Internal)



Embryo



Larva

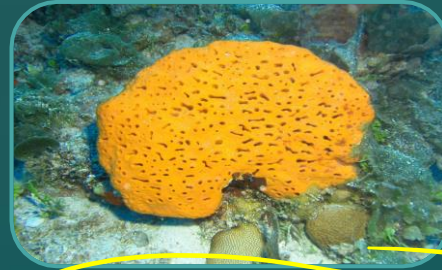


## Phylum Porifera

Examples:



*Spongilla*  
(Freshwater sponge)



*Euspongia*  
(Bath sponge)



*Sycon*  
(Scypha)



*Euplectella*  
(Venus flower  
basket)





**Keep  
Learning!**