

ATOMIC ENERGY CENTRAL SCHOOL, INDORE



CLASS XI
BIOLOGY



MODULE 4.1



UNIT – I / CHAPTER 4

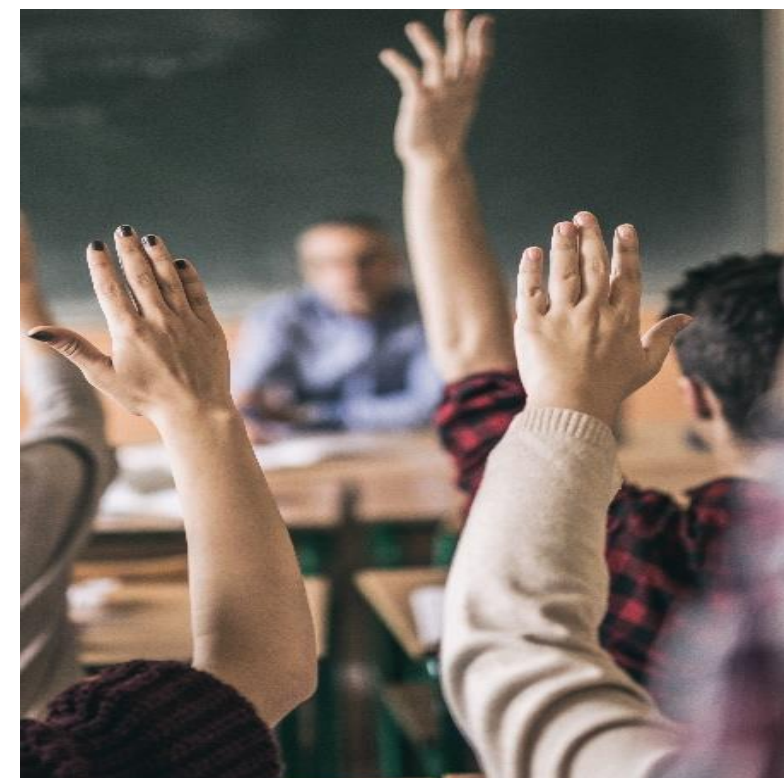
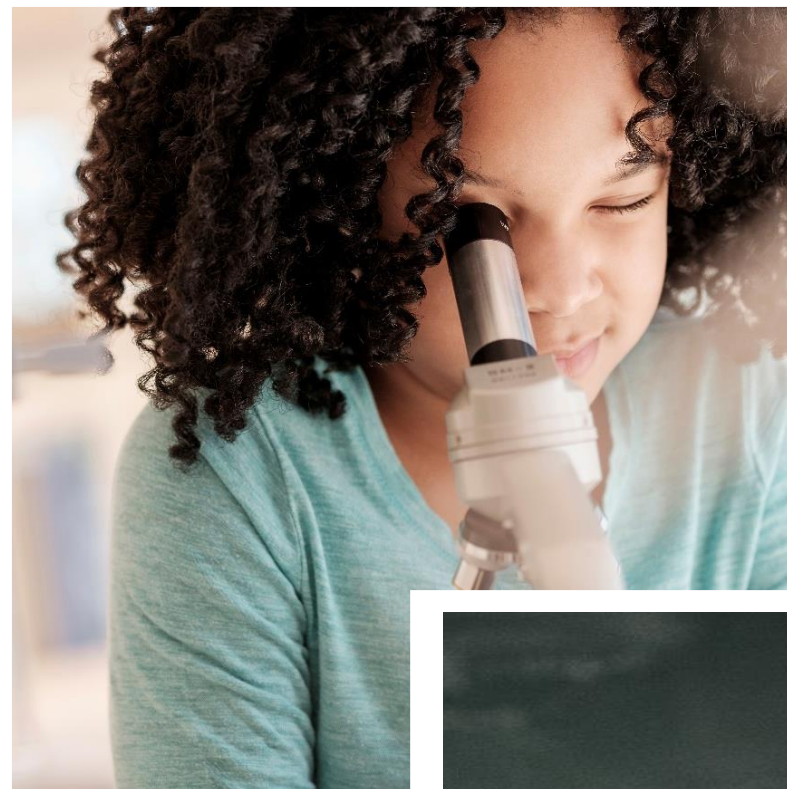


ANIMAL KINGDOM

NEERAJ KUMAR BAMANIA

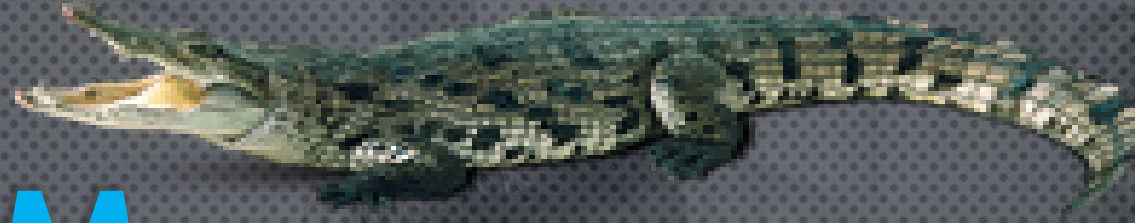
PGT(SS) - BIOLOGY

ATOMIC ENERGY CENTRAL SCHOOL, INDORE



ANIMAL KINGDOM

MODULE 4.1



WHAT IS AN ANIMAL?

- Animals are multicellular and heterotrophic organisms without cell wall and chlorophyll.

11 MAJOR PHYLA OF KINGDOM ANIMALIA

1.	Porifera		7.	Arthropoda	
2.	Cnidaria		8.	Mollusca	
3.	Ctenophora		9.	Echinodermata	
4.	Platyhelminthes		10.	Hemichordata	
5.	Aschelminthes		11.	Chordata	
6.	Annelida				

BASIS OF CLASSIFICATION

1. Levels of organisation

2. Body symmetry

3. Germinal (Embryonic) layers

4. Coelom (Body cavity)

5. Metamerism (Segmentation)

6. Notochord



BASIS OF CLASSIFICATION

1. LEVELS OF ORGANISATION

**BASED ON ORGANIZATION OF CELLS,
ANIMALS ARE GROUPED INTO 4 LEVELS:**

1. Cellular level of organization

2. Tissue level of organization

3. Organ level of organization

4. Organ system level of organization



BASIS OF CLASSIFICATION

1. LEVELS OF ORGANISATION

Cellular level of organization



Cells are arranged as loose cell aggregates.

E.g. **Porifera**.

Tissue level of organization



Cells are arranged into tissues.

E.g. **Cnidarians & Ctenophores**.

Organ level of organization



Tissues are arranged into organs.

E.g. **Higher animals (Platyhelminthes to chordates)**.

Organ system level of organization



organs are associated to organ system. Each system performs a **physiological function**.

E.g. **Higher animals**.

BASIS OF CLASSIFICATION

1. LEVELS OF ORGANISATION

ORGAN SYSTEMS OF DIFFERENT ANIMALS SHOW COMPLEXITIES. E.G.

- **DIGESTIVE SYSTEM IS 2 TYPES:**

- **INCOMPLETE:** IT HAS ONLY A SINGLE OPENING THAT ACTS AS MOUTH & ANUS. E.G. CNIDARIA & PLATYHELMINTHES.

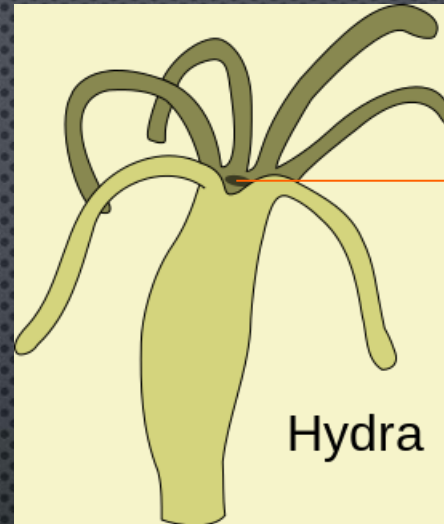
- **COMPLETE:** IT HAS 2 OPENINGS- MOUTH & ANUS.

- **CIRCULATORY SYSTEM IS 2 TYPES:**

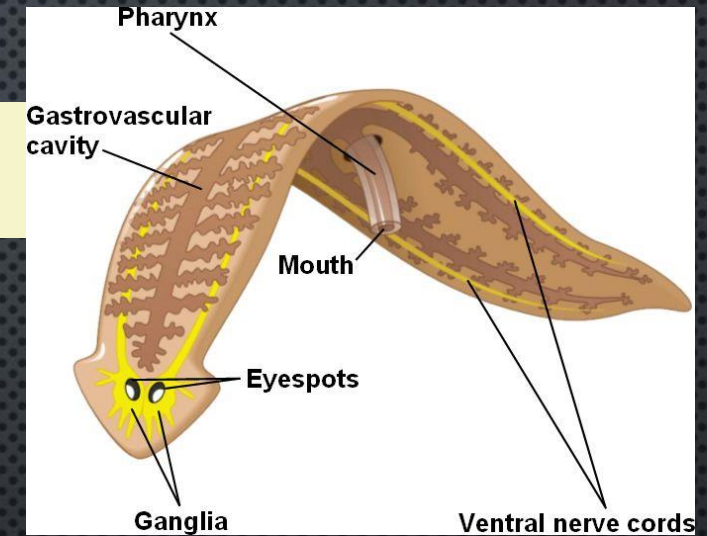
- **OPEN**

- **CLOSED**

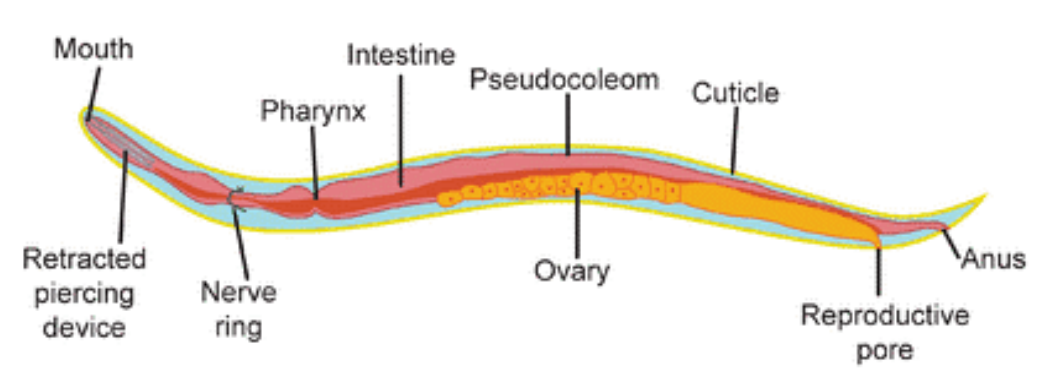
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Single opening



Incomplete digestive system in *Hydra* & *Planaria*



Complete digestive system in Roundworm

BASIS OF CLASSIFICATION

2. SYMMETRY

It is the arrangement of similar body parts on 2 sides of main axis of the body.

Based on symmetry, animals are 2 types:

1. Asymmetrical

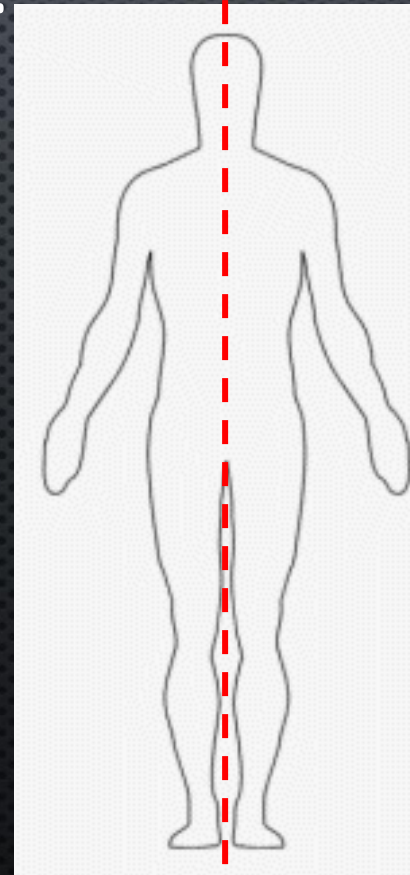
Body cannot be divided into 2 similar parts.

E.g. Most poriferans, Snails etc.

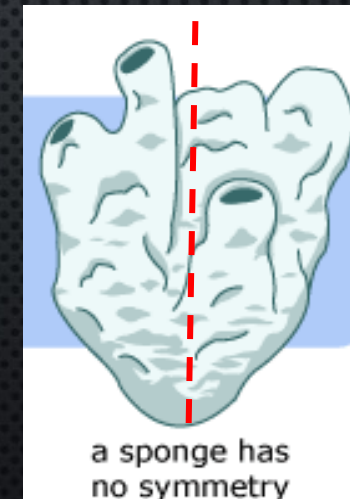
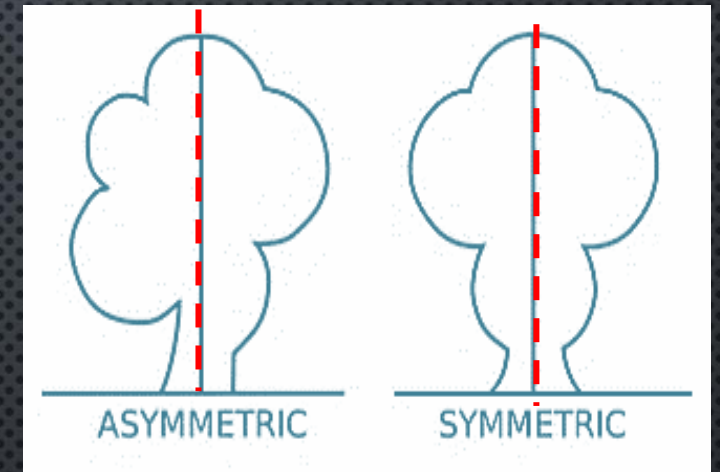
2. Symmetrical

Body can be divided into 2 similar parts.

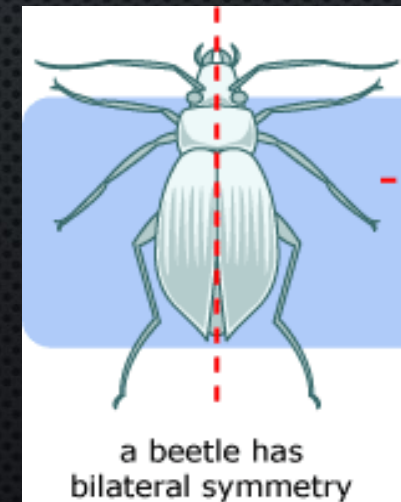
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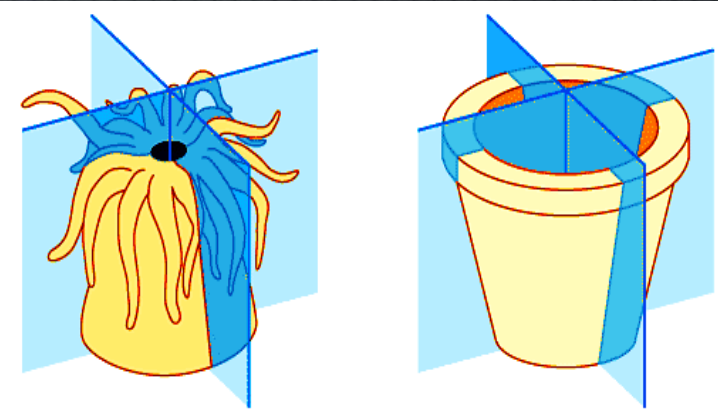
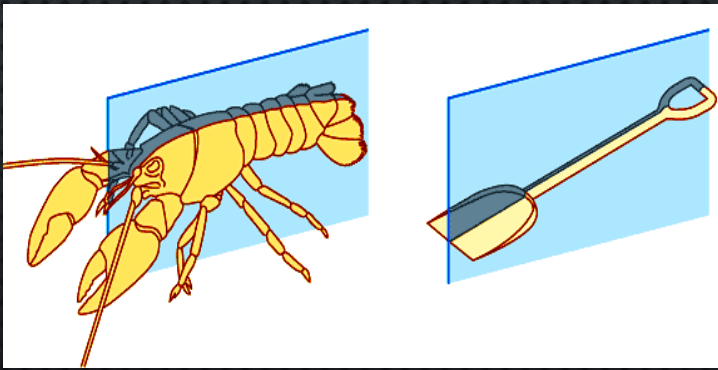


a sponge has no symmetry



a beetle has bilateral symmetry

Symmetry is 2 types:

<p>a. Radial Symmetry</p>	<ul style="list-style-type: none">• Here, body can be divided into 2 equal halves by any vertical plane along central axis (oral-aboral axis) of the body.• E.g. some Poriferans, Cnidarians, Ctenophores and Echinoderms (adult).	
<p>b. Bilateral Symmetry</p>	<ul style="list-style-type: none">• Here, body can be divided into right & left halves in only one plane.• E.g. Platyhelminthes to Chordata (except adult Echinodermata).	

BASIS OF CLASSIFICATION

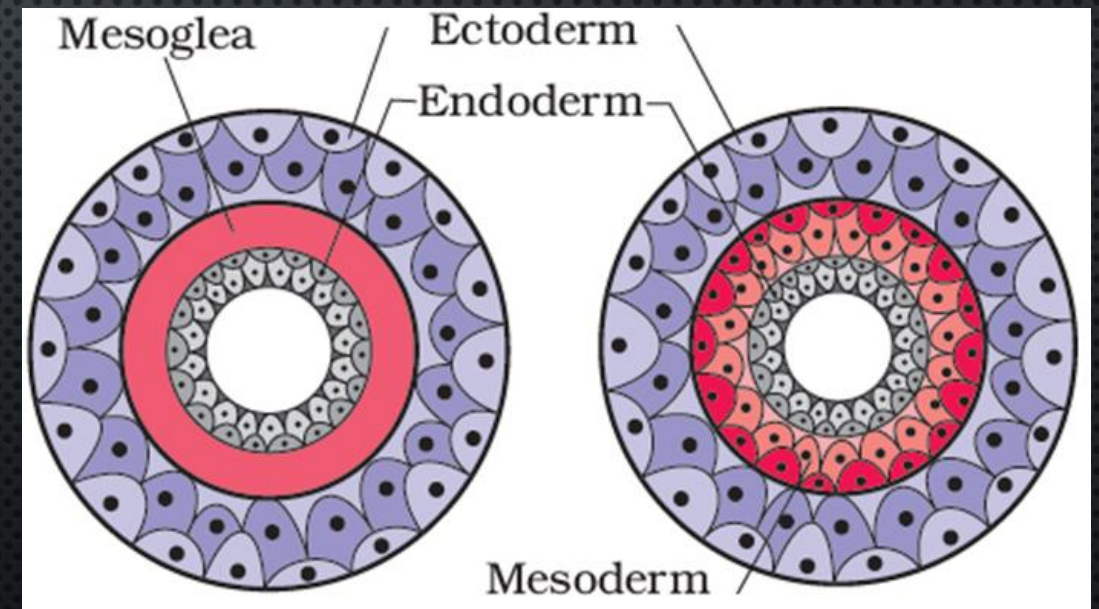
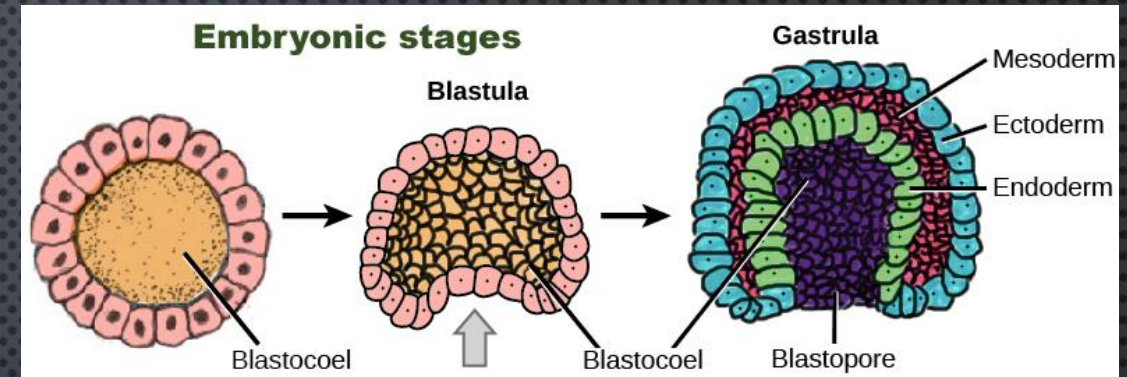
3. GERMINAL LAYERS

- THESE ARE LAYERS OF EMBRYO FROM WHICH ALL THE BODY ORGANS ARE FORMED.
- BASED ON THE NUMBER OF GERM LAYERS, ANIMALS ARE 2 TYPES:

➤ **Diploblastic animals**

❖ **Triploblastic animals**

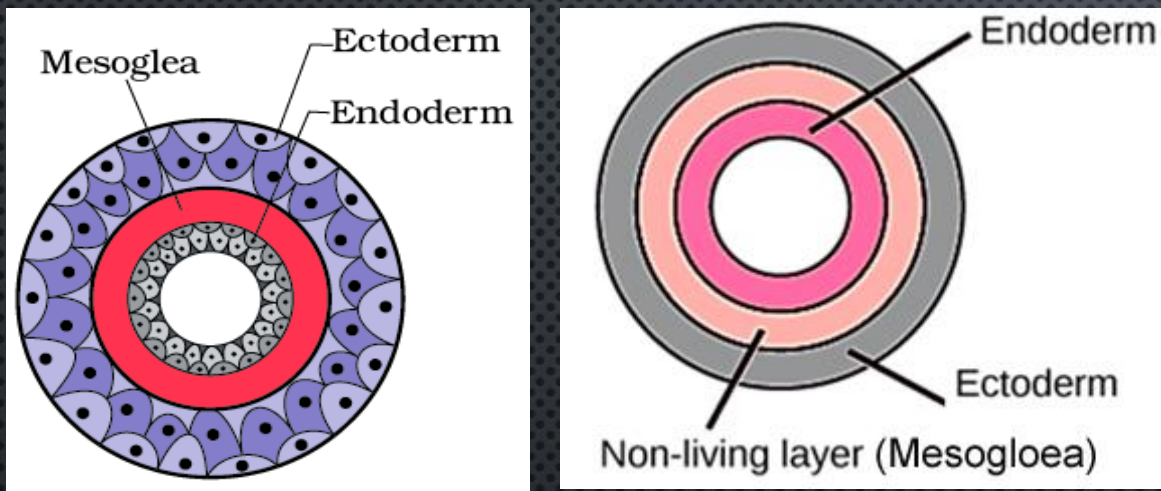
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BASIS OF CLASSIFICATION

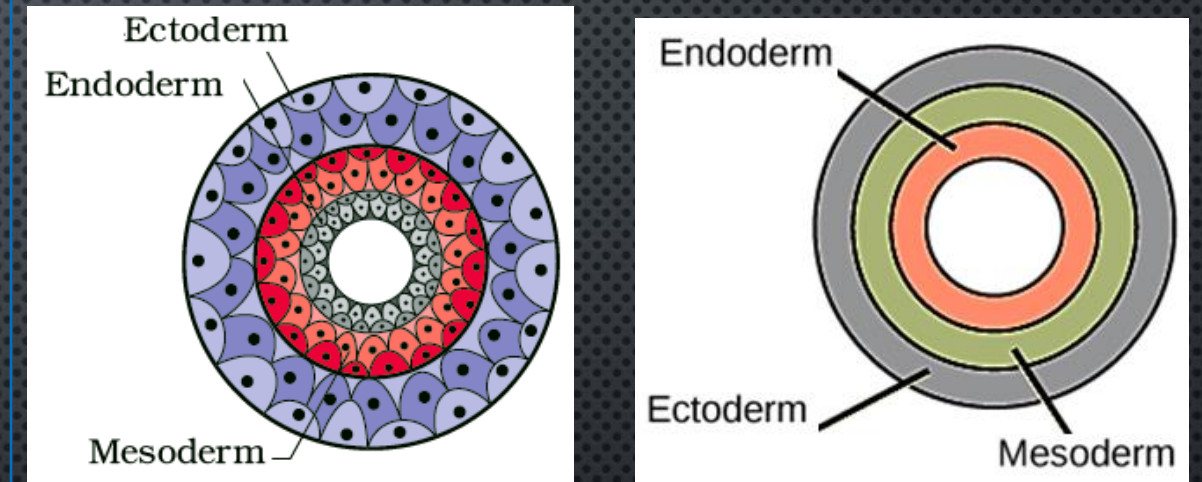
3. GERMINAL LAYERS

a. Diploblastic animals



- 2 germ layers- outer **ectoderm** and inner **endoderm**.
- In between these layers, an undifferentiated jelly-like layer called **mesoglea** is present.
- E.g. Cnidaria & Ctenophora.

b. Triploblastic animals



- 3 germ layers- Outer **ectoderm**, middle **mesoderm** and inner **endoderm**.
- E.g. Platyhelminthes to Chordata.

BASIS OF CLASSIFICATION

4. COELOM (BODY CAVITY)

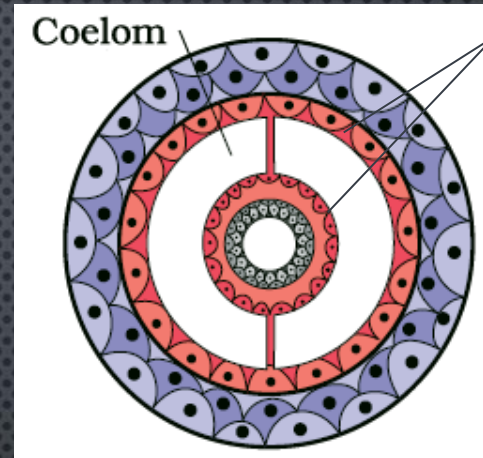
- IT IS THE **CAVITY LINED BY MESODERM.**
- IT IS SEEN BETWEEN **BODY WALL & GUT WALL.**
- COELOM SEPARATES THE MUSCLES OF GUT & BODY WALL.
- BASED ON THE NATURE OF COELOM, ANIMALS ARE 3 TYPES:

a. Acoelomate

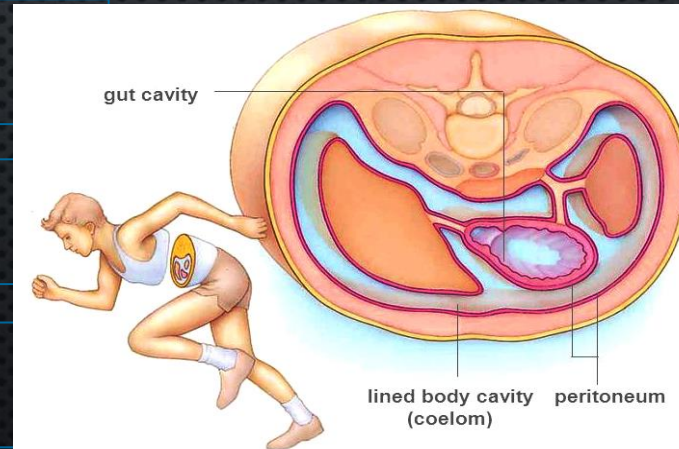
b. Pseudocoelomate

c. Coelomate

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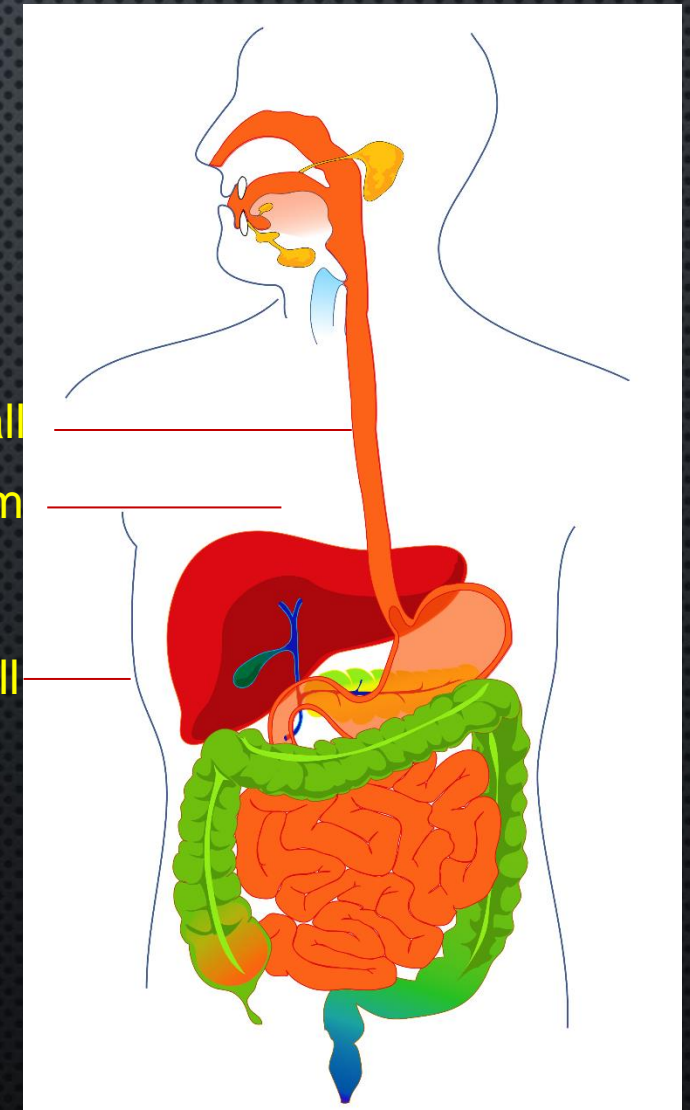
Mesoderm



Gut wall

Coelom

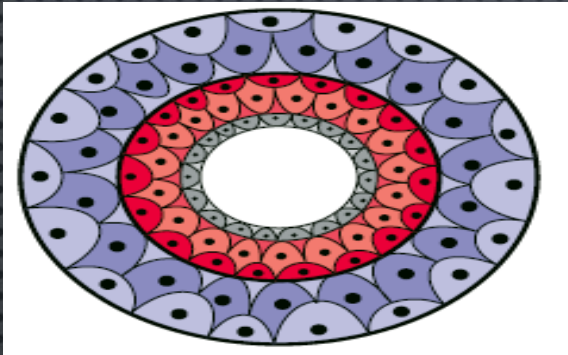
Body wall



BASIS OF CLASSIFICATION

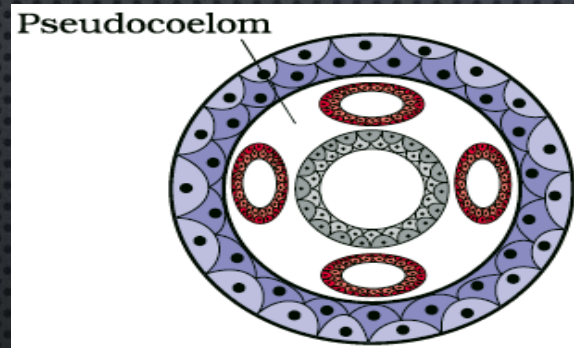
4. COELOM (BODY CAVITY)

a) Acoelomate (No Coelom)



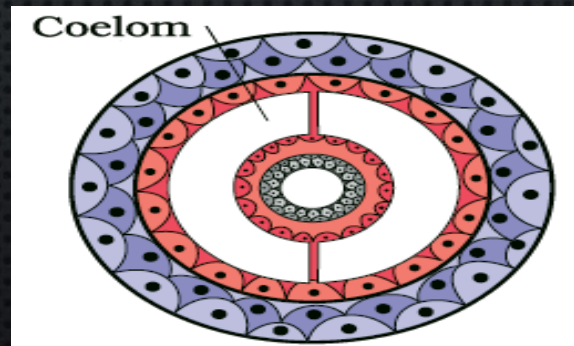
- The space between body wall and digestive cavity is filled with **matrix (parenchyma)**.
- E.g. Porifera to Platyhelminthes.

b) Pseudocoelomate (False coelom)



- Here, the body cavity is **not lined by mesoderm**.
- Mesoderm is scattered pouches.
- E.g. Aschelminthes.

c) Coelomate (True coelom)

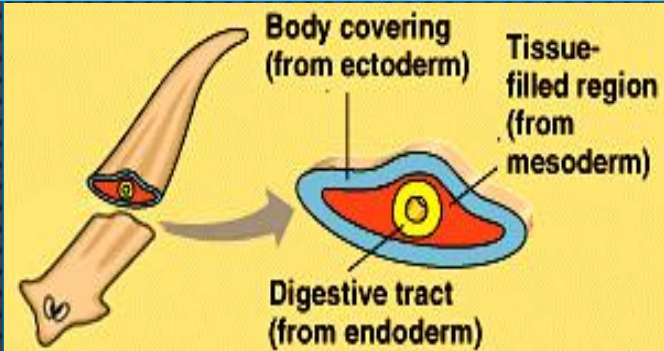


- Here, **coelom arises from mesoderm**.
- Coelom is lined by **peritoneal layer** and filled with **coelomic fluid**.
- E.g. Annelida to Chordata.

BASIS OF CLASSIFICATION

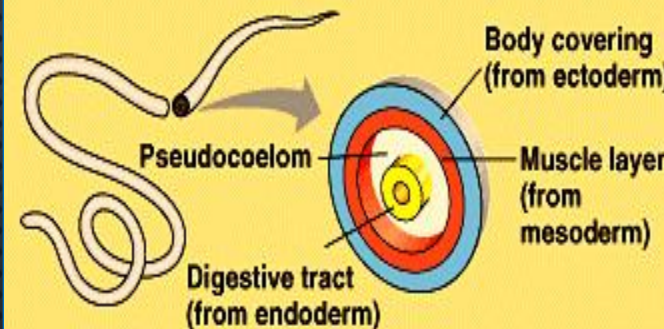
4. COELOM (BODY CAVITY)

a) Acoelomate (No Coelom)



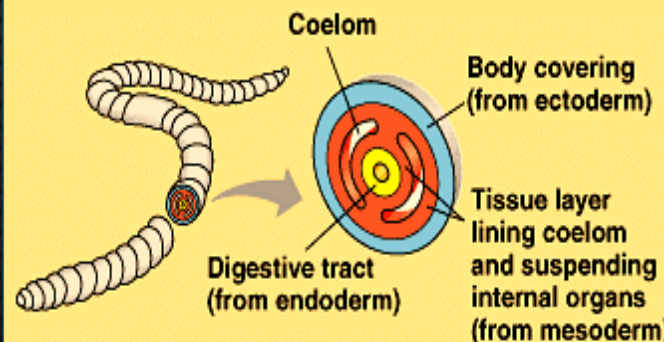
- The space between body wall and digestive cavity is filled with matrix (parenchyma).
- E.g. Porifera to Platyhelminthes.

b) Pseudocoelomate (False coelom)



- Here, the body cavity is not lined by mesoderm.
- Mesoderm is scattered pouches.
- E.g. Aschelminthes.

c) Coelomate (True coelom)



- Here, coelom arises from mesoderm.
- Coelom is lined by peritoneal layer and filled with coelomic fluid.
- E.g. Annelida to Chordata.

Embryonic Development

Applies to organisms with bilateral symmetry, primarily coelomates

Protostomes

- Spiral cleavage
- Schizocoelous
- Opening formed during gastrulation (blastopore) becomes mouth
- Mollusks, annelids, arthropods

Deuterostomes

- Radial cleavage
- Enterocoelous
- Blastopore develops into anus
- Echinoderms, chordates

