# Animal Kingdom

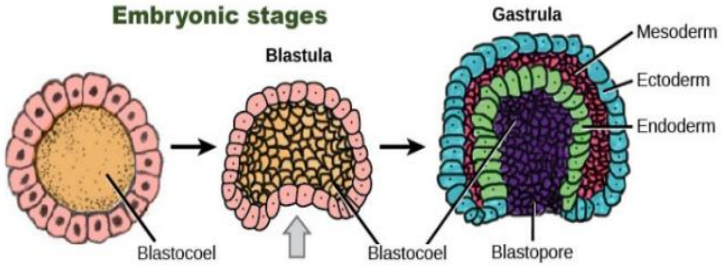
**Basis of Classification:**

**(i) Level of Organisation:**

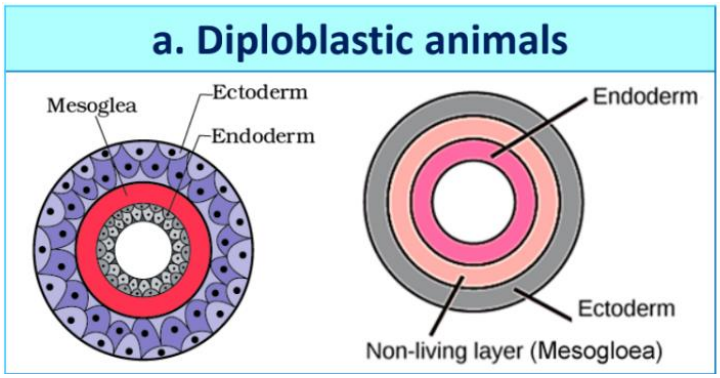
- **Cellular level:** cells arranged as loose aggregates, present in Porifera (sponges)
- **Tissue level:** cells performing the same function form tissues, present in coelenterates
- **Organ level:** tissues grouped together to form an organ, which performs particular function, e.g. Platyhelminthes
- **Organ system level:** A few organs coordinatively perform a certain physiological function, e.g. Annelids, Arthropods, Molluscs, Echinoderms and Chordates

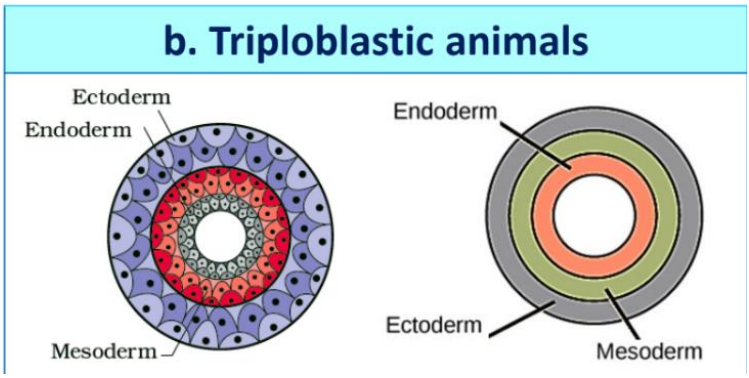
  **Eg: Circulatory System**
  - **Open:** cells and tissue directly receive the blood pumping out of the heart
  - **Closed:** blood is circulated through arteries, veins and capillaries

    Digestive system:
  - **Incomplete:** It has only one opening that act as mouth and anus. Eg: Cnidaria & platyhelminths
  - **Complete:** Two openings Mouth & Anus.




**Germ Layer:** Embryonic layers that give rise to all the body parts.



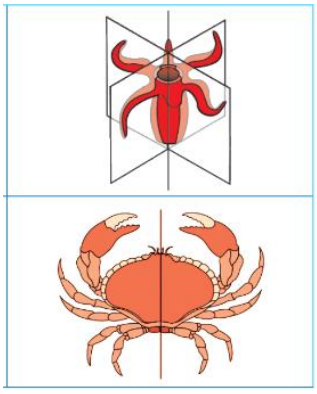




- **Diploblastic:** embryo with two germinal layers. external ectoderm and internal endoderm, Mesoglea (Undifferentiated jelly like layer) may be present between ectoderm and endoderm. e.g. Porifera, Cnidaria
- **Triploblastic:** embryo with three germinal layers, mesoderm between ectoderm and endoderm, e.g. Platyhelminthes to Chordates

| Ectoderm | Mesoderm | Endoderm |
|---|---|---|
| • Epidermis of Skin & its derivatives (Sweat Gland, Hair, sensory receptors etc)<br>• Epithelial lining of Mouth and Anus.<br>• Cornea & Lens of eye.<br>• Nervous System<br>• Adrenal Medulla<br>• Tooth Enamel<br>• Pineal and Pituitary gland. | • Endoskeleton<br>• Circulatory System<br>• Connective Tissue<br>• Renal System<br>• Reproductive System<br>• Urinary & Genital Ducts<br>• Eyes<br>• Spleen<br>• Adrenal Cortex<br>• Dermis of Skin | • Thyroid, Parathyroid, Pancreas & Thymus.<br>• Tongue<br>• Respiratory System<br>• Urinary Bladder<br>• Liver & Pancreas<br>• Eustachian Tube<br>• Epithelial lining of the Gastrointestinal tract. |

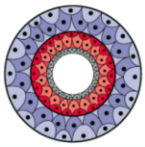
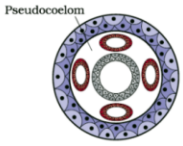
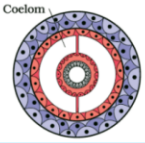
**(ii) Symmetry:** Body divided into two equal halves from a line of symmetry.

- **Asymmetrical:** No line of symmetry in the body, e.g. sponges
- **Radial symmetry:** any plane passing through centre divides the body in two symmetrical halves, e.g. coelenterates, ctenophores
- **Bilateral symmetry:** a plane divides the body in symmetrical left and right halves, e.g. annelids, arthropods, etc.



Echinoderms exhibit radial as well as bilateral symmetry at different stages of their life

**(iii) Coelom Cavity:** Body cavity between the body wall and gut wall, lined by mesoderm.

| | | |
|---|---|---|
| a. Acoelomate (No Coelom) |  | • The space between body wall and digestive cavity is filled with matrix (parenchyma).<br>• E.g. Porifera to Platyhelminthes. |
| b. Pseudocoelomate (False coelom) |  | • Here, the body cavity is not lined by mesoderm.<br>• Mesoderm is scattered pouches.<br>• E.g. Aschelminthes. |
| c. Coelomate (True coelom) |  | • Here, coelom arises from mesoderm.<br>• Coelom is lined by peritoneal layer and filled with coelomic fluid.<br>• E.g. Annelida to Chordata. |

**Function of Coelom:**
Accommodates visceral organs.

Coelomic fluid reduces friction between visceral organs.

It acts as shock absorber.

**(iv) Segmentation:** Presence of segments on the body. Annelida, Arthropoda & Some Chordata.

- Earthworm's shows Metameric segmentation- Body is externally & internally divided into repeated segments (metamers).

**(v) Notochord**

- Notochord is a mesodermally derived rod-like structure formed on the dorsal side during embryonic development in some animals.
- Notochord Present: Chordates
- Notochord Absent : Non-Chordates (Porifera to Echinodermata)