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Biology

ENGLISH MEDIUM

Unit 3

Evolution and Diversity
Living Organisms

3.1.6 Explores the diversity within Kingdom Animalia



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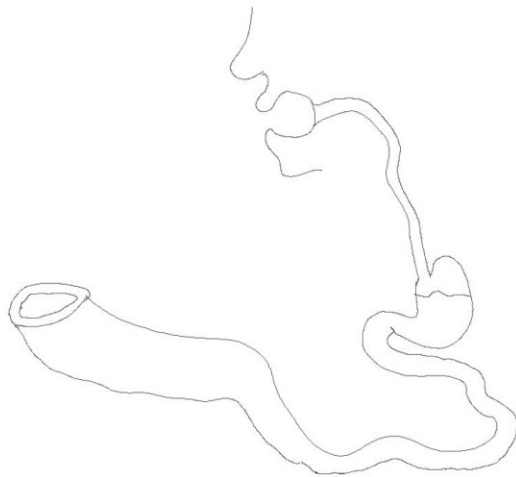
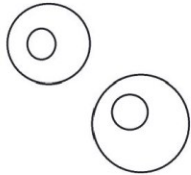
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Kingdom: Animalia

- Animals are multicellular, heterotrophic eukaryotes with tissues that develop from embryonic layers.

Characteristic Features of Kingdom: Animalia

- Multicellular
- Heterotrophic eukaryotes (They ingest food and digest them in the body using enzymes)
- Most of them reproduce by sexually.
- Cells of the animals are organized into tissues.
- Some show radial symmetry and some others show bilateral symmetry.

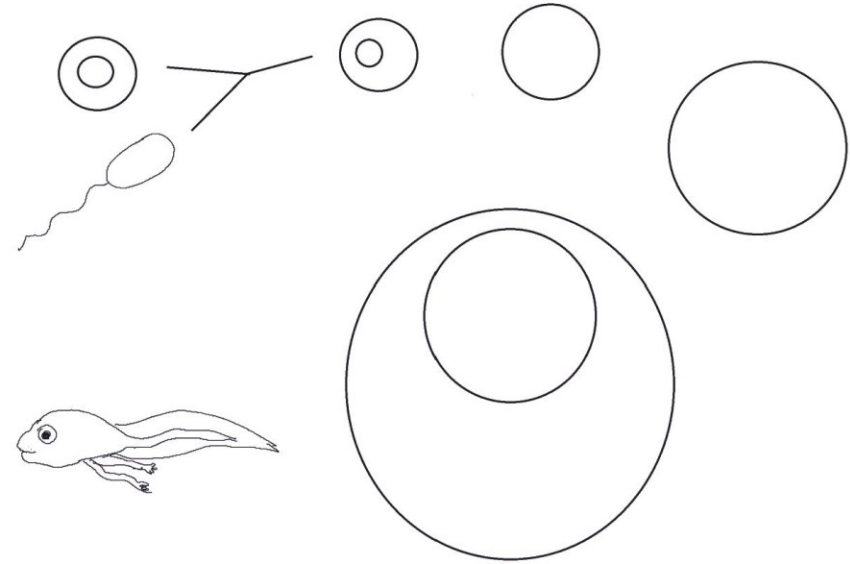


- Which of the following Phylum does not contain organisms attached to a surface
(1) Porifera. (2) Cnidaria (3) Nematoda (4) Arthropoda (5) Echinodermata
- (A) Cnidaria (B) Platyhelminthes (C) Nematoda (D) Annelida (E) Arthropoda
Which of the above organism is unisexual?
(1) (A) (2) (B) (3) (A), (B) and (C) (4) (C) and (E) (5) (D)
- Incorrect statement regarding mollusks.
(1) Majority are marine, some inhabit freshwater and land.
(2) Some are bilateral symmetrical and few are asymmetrical.
(3) They are soft bodied and non-segmented. (4) Body is divided into head foot and visceral mass
(5) Most mollusks have separated sexes and their gonads are located in visceral mass.
- A nematode can be easily distinguished from an annelid due to
(1) cylindrical shape (2) un-segmented body (3) absence of suckers (4) absence of external gills
(5) absence of appendages (AL 2000)
- During the evolution of organisms, coelom was first developed in
(1) Annelida. (2) Arthropoda. (3) Mollusca. (4) Echinodermata. (5) Chordata. (AL 2019/New)
- Which of the following structures can be seen in annelids as well as in arthropods?
(1) Clitellum (2) Parapodia (3) Ventral nerve cord (4) Capillaries (5) Chitinous exoskeleton (AL 2019 New)
- Some structures seen among animals are as follows. Protonephridia, mantle and nematocysts. Organisms showing each of the above structures in correct sequence are
(1) Obelia, hook worm and Fasciola. (2) Planaria, slug and jellyfish. (3) Taenia, pin worm and Obelia.
(4) Fasciola, earthworm and Hydra. (5) Sea cucumber, snail and Obelia. (AL 2020/10)
- Which of the following indicate two features found in the organisms of the same phylum?
A : Heart absent; endoskeleton present. B : Heart absent; jointed legs present.
C : Anus absent; tentacles present around the mouth. D : Anus absent; show asexual reproduction.
(1) A and B only. (2) A and C only. (3) A and D only. (4) A, B and C only. (5) A, C and D only.
- Which of the following are unique characteristics of some phyla of the kingdom Animalia?
A - Internal fertilization B - Parapodia C - Radula D - Nephridia
(1) A and C only. (2) A and D only. (3) B and C only. (4) B and D only. (5) C and D only. (AL 2023/10)

MCQ Answers

1 (3)	2 (3)	3 (3)	4 (3)	5 (2)	6 (3)	7 (2)	8 (3)	9 (3)	10 (2)
11 (4)	12 (3)	13 (3)	14 (2)	15 (3)	16 (4)	17 (3)	18 (3)	19 (2)	20 (4)
21 (3)	22 (3)	23 (2)	24 (3)	25 (3)	26 (3)	27 (2)	28 (3)	29 (3)	30 (2)
31 (2)	32 (5)	33 (5)	34 (2)	35 (4)	36 (3)	37 (4)	38 (2)	39 (3)	40 (4)
41 (4)	42 (2)	43 (1)	44 (3)	45 (2)	46 (5)	47 (3)			

21. Which group of animals is exclusively marine? (1) Mollusca (2) Arthropoda (3) Echinodermata (4) Annelida (5) Platyhelminthes
 22. The digestive system in echinoderms is: (1) Incomplete (2) Complete with mouth on top (3) Complete with mouth on underside (4) Absent (5) Branched without anus
 23. Fertilization in echinoderms is: (1) Internal only (2) External only (3) Both internal and external (4) Asexual only (5) By budding
 24. The circulatory system in echinoderms is: (1) Open with heart (2) Closed with heart (3) Reduced and closed without heart (4) Open without heart (5) Completely absent
 25. Gas exchange in echinoderms occurs through: (1) Gills only (2) Body surface only (3) Body surface and tube feet (4) Specialized lungs (5) Tracheal system
 26. Which describes the nervous system of echinoderms? (1) Central brain only (2) Ventral nerve cord (3) Nerve ring and radial nerves (4) Diffuse nerve net (5) Dorsal nerve cord
 27. The skeletal system in echinoderms consists of: (1) Chitinous exoskeleton (2) Hard calcareous plates (3) Soft endoskeleton (4) No skeleton (5) Flexible exoskeleton
 28. Adult echinoderms are characterized by: (1) Bilateral symmetry (2) Asymmetry (3) Radial symmetry with no head (4) Spherical symmetry (5) Cylindrical symmetry
 29. The movement in echinoderms is primarily by: (1) Jointed appendages (2) Muscular foot (3) Tube feet (4) Cilia (5) Flagella
 30. The body covering in echinoderms consists of: (1) Thick epidermis (2) Thin epidermis with calcareous plates (3) Chitinous layer (4) Thick cuticle (5) Ciliated epithelium
 31. A nematode can be easily distinguished from an annelid due to
(1) cylindrical shape (2) unsegmented body (3) absence of suckers (4) absence of external gills (5) absence of appendages
 32. Which one of the following groups of animals has the closest evolutionary relationship with chordates?
(1) Annelids (2) Nematodes (3) Mollusca (4) Arthropods (5) Echinoderms
- Consider following properties to answer 34 and 35 questions.
(A) Segmentation (B) Jointed legs (C) Chitinous Exoskeleton (D) Cephalization (E) Setae (F) Malpighian tubules
33. Which of the above features present only in Phylum: Annelida.
(1) (A) and (B) (2) (A), (B) and (C) (3) (E) only (4) (A) (B) and (D) (5) (A), (D) and (E)
 34. Which of the above feature is only present in Arthropoda.
(1) (A) and (B) (2) (B) (C) and (F) (3) (A), (B) and (C) (4) (A) (B) (C) and (D) (5) (D) (E) and (F)
 35. Which of the following property/properties are not important to classify organisms under animals
(1) Multicellular organisms lack cell wall (2) They ingest food and digest them in the body using enzymes (3) Muscle and nerve tissues (4) Reproduce only sexually. (5) Some show radial symmetry and some others show bilateral symmetry
 36. Tissue level differentiation present 1st among,
(1) Platyhelminthes (2) Arthropoda (3) Cnidaria (4) Annelida (5) Nematoda
 37. An organism show following properties.
Free swimming organism/Sex organs /Larva stage present/Broad umbrella shapes body
(1) Cnidarians (2) Platyhelminthes (3) Jellyfish (4) 1 and 3 (5) Sea anemone
 38. Acoelomate, Pseudocoelomate and coelomate is given in the order.
(1) Liver fluke, Rag worm, Round worm (2) Liver fluke, Pinworm, Earthworm
(3) Liver fluke, Earthworm, Hookworm (4) *Taenia*, Leech, Round worm (5) *Planaria*, Pin worm, Liver fluke



MCQ

1. Which of these is NOT an example from Phylum Cnidaria?
(1) Hydra (2) Sea anemone (3) Planaria (4) Jellyfish (5) Obelia
2. The body organization in Cnidarians consists of: (1) Two cell layers only (2) Three cell layers
(3) Two cell layers with mesoglea (4) Four cell layers (5) Single cell layer
3. Nematocysts in Cnidarians are: (1) Respiratory organs (2) Digestive cells (3) Specialized stinging cells
(4) Reproductive structures (5) Locomotory organs
4. The body cavity in Platyhelminthes is: (1) True coelom (2) Pseudocoelom (3) No body cavity
(4) Partial coelom (5) Modified coelom
5. Excretion in flatworms (Platyhelminthes) occurs through: (1) Nephridia (2) Flame cells (protonephridia)
(3) Metanephridia (4) Body surface (5) Specialized glands
6. Which characteristic is common to both Platyhelminthes and Nematoda? (1) Segmented body
(2) Presence of a coelom (3) Bilateral symmetry (4) Radial symmetry (5) Presence of a respiratory system
7. The body wall of Nematodes is composed of: (1) Only circular muscles (2) Only longitudinal muscles
(3) Both circular and longitudinal muscles (4) Oblique muscles (5) No muscles
8. The excretory system in nematodes consists of: (1) Flame cells (2) Nephridia (3) Longitudinal excretory ducts
(4) Metanephridia (5) No specialized system
9. The females in nematodes are: (1) Smaller than males (2) Same size as males (3) Larger than males
(4) Variable in size (5) Not distinguishable from males
10. Which structure is used for locomotion and respiration in Annelids? (1) Setae (2) Parapodia (3) Suckers
(4) Cilia (5) Tentacles
11. The nervous system in Annelids consists of: (1) Nerve net only (2) Brain only (3) Ventral nerve cord only
(4) Dorsal cerebral ganglion, ventral nerve chord, and circumferential connectives (5) Radial nerves
12. Clitellum is found in: (1) Molluscs (2) Arthropods (3) Annelids (4) Echinoderms (5) Platyhelminthes
13. Molluscs are characterized by: (1) Segmented body (2) Jointed appendages (3) Three-part body division
(4) Bilateral symmetry only (5) Radial symmetry only
14. The structure used for feeding in most molluscs is: (1) Proboscis (2) Radula (3) Tentacles (4) Parapodia
(5) Setae
15. Gas exchange in molluscs occurs through: (1) Body surface only (2) Lungs only
(3) Gills located at mantle cavity or mantle (4) Trachea (5) Book lungs
16. Which phylum has the highest number of species? (1) Cnidaria (2) Platyhelminthes (3) Nematoda
(4) Arthropoda (5) Echinodermata
17. Arthropods are characterized by: (1) Soft body without segments (2) Hard internal skeleton
(3) Chitinous exoskeleton (4) Calcium carbonate shell (5) No skeleton
18. The respiratory system in terrestrial arthropods consists of: (1) Gills (2) Lungs (3) Tracheal system
(4) Body surface (5) Book gills
19. Which of these is a characteristic feature of Phylum Echinodermata? (1) Bilateral symmetry
(2) Penta radial symmetry (3) Asymmetry (4) Spherical symmetry (5) Cylindrical symmetry
20. Water vascular system in echinoderms is used for: (1) Reproduction only (2) Digestion only (3) Excretion only
(4) Locomotion and feeding (5) Gas exchange only

26. Which of the following properties are true regarding Phylum: Echinodermata

Exoskeleton present	
Open circulation present	
Segmentation present	
Nervous system present	
Excretion is by nephridia	
No parasitic members	

27. What is the system only seen in Echinoderms.

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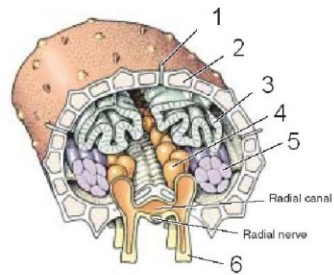
28. What is the system poorly developed in Echinoderms

.....

29. What is the system absent in Echinoderms.

.....

30. Diagram shows a cross section through limb of an Echinodermata. Label components.



20. What are the structures used for locomotion of most Annelids.

.....
.....

21. What are the most noticeable properties to identify a Mollusks.

.....
.....

22. Which of the following properties are correct regarding Phylum: Mollusca.

Majority live in terrestrial environment	
All have external shell	
Many possess radula present	
Gas exchange occur by gills	
Excretion by flame bulb	

23. Which of the following properties are shown by Phylum: Arthropoda

Segmented body in all	
Primitive ventral brain	
Dorsal nerve cord	
Body cavity a haemocoel	
Malpighian tubules for respiration	
Dioecious	

24. Underline properties common to arthropods and annelids.

Chitinous cuticle, Gills, Live in marine ecosystem, Parasitic nutrition

25. Write 6 common features present between Cnidaria and Echinodermata.

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12. What are the improved properties present in phylum : Platyhelminthes than cnidarians.

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13. What are the properties 1st shown by Phylum : Platyhelminthes?

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14. What is meant by cephalization?

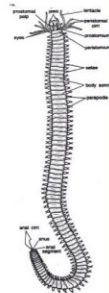
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15. What are protonephridia and flame bulb?

.....
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16. Identify the organism shown in the following diagram.

.....



17. Explain how a Nematode can be distinguished from an annelid by external morphology.

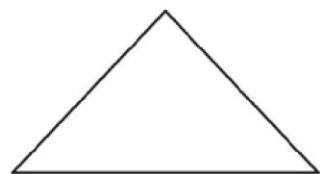
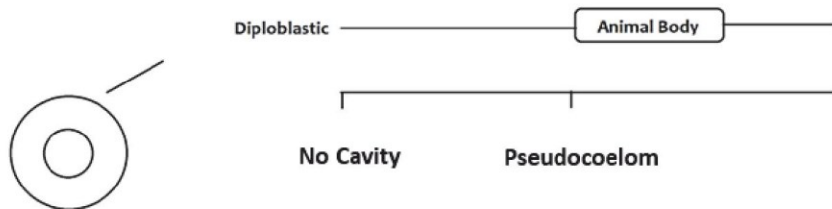
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18. Which of the following properties are correct regarding Phylum: Annelids.

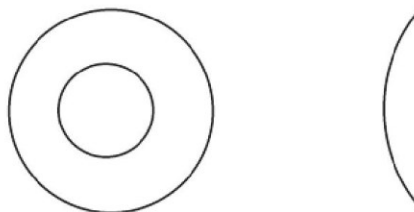
Segmented	
Clitellum present	
Parapodia present for excretion	
Some show parasitic nutrition.	

19. Make a list of properties shown 1st by Annelids

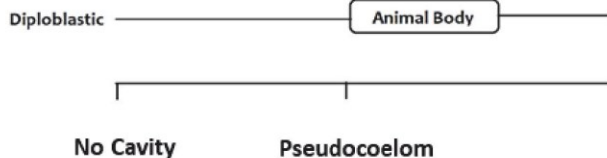
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Platyhelminthes



Nematoda



8. What are the systems not present in cnidaria but present in higher animals?

.....

10. Compare the main differences between Phylum: Cnidaria and Phylum: Platyhelminthes.

Cnidaria	Platyhelminthes

11. Which of the following properties given for phylum: Platyhelminthes is correct

All have elongated tape like bodies	
No body cavity	
Segmentation present	
Flame bulb present for respiration	
Circulatory system absent	
Asexual reproduction by regeneration	

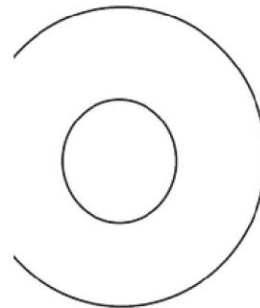
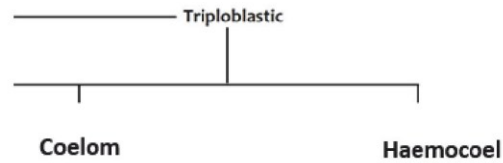
Structured Essay

1. What is the habitat of cnidarians.
.....
2. Why the digestive cavity of cnidarians is called as gastrovascular cavity.
.....
3. What is the asexual reproduction method of cnidaria.
.....
4. Briefly describe following properties of cnidaria.
Mesogloea
.....
Gastrovascular cavity
.....
Cnidocyte
.....
5. What is cnidae
.....
6. State whether following statements regarding cnidarians is true or false.

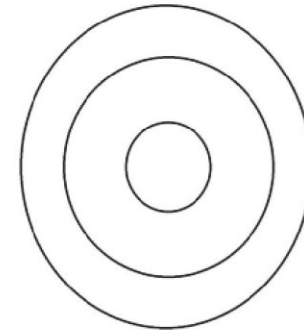
Live in terrestrial environment	
Reproduce sexually as well as asexually	
Nervous system present	
No respiratory organs	
No special excretory structure present	

7. Compare the main differences between polyp and Medusoid forms.

Polyp	Medusoid



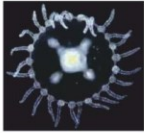
Annelida
Echnodermata
Chordata



Mollusca
Arthropoda

Phylum Cnidaria

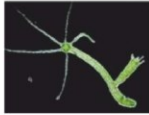
- Characteristic features of each example are not necessary
Eg. *Hydra*, Sea anemone, *Obelia*, Corals and Jelly fish



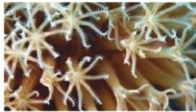
Obelia (Medusa stage)



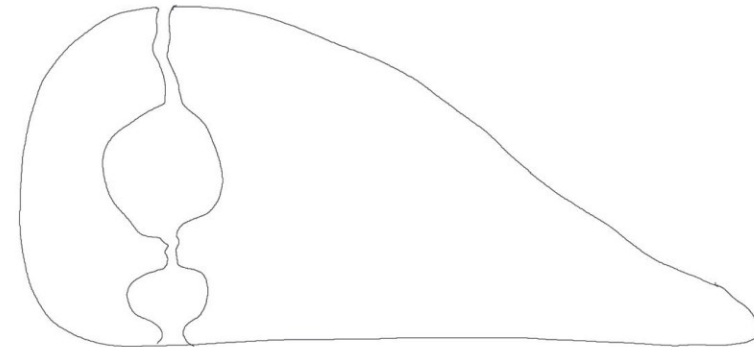
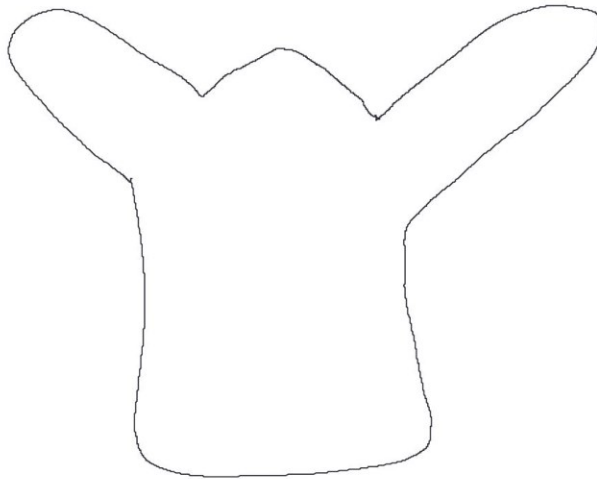
Jelly fish



Hydra



Coral polyp



- Majority of them are marine, except a few fresh water species Some are macroscopic.
-
- They have a simple gastrovascular cavity which is a sac with a central digestive compartment This cavity is lined by endoderm with a single opening (mouth) only.

- They are exclusively marine. Triploblastic and coelomic, slow moving or sessile.
- Adults are penta radial symmetrical without head and segmentation.
- Thin epidermis covers the endoskeleton of hard calcareous plates.
- Water vascular system is a network by hydraulic canals branching into tube feet which function in locomotion and feeding.
- Digestive system is usually complete, but the mouth is on the underside and the anus on the top surface of the animal.
- Circulatory system is reduced and closed Without a heart. Sexes are separated with external fertilization. Larval forms are bilaterally symmetrical.
- They consists of nerve ring and radial nerves.
- Most of the echinoderms do gas exchange through body surface and tube feet.
- Some respire through respiratory tree or papillae.
- No specialized excretory system present.

Phylum Echinodermata

- Characteristic features of each examples are not necessary
- Eg. sea stars, brittle stars, sea lily, feather star, sea cucumber, sea urchins and sand dollars



Sea star



Sea lily



Brittle star

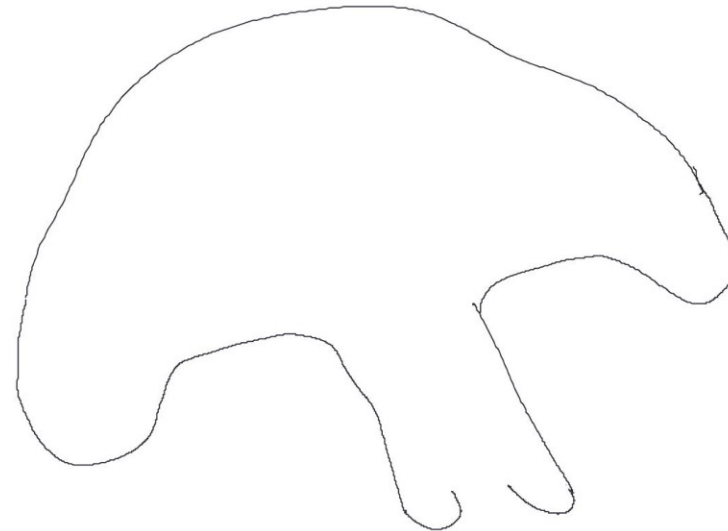


Sand dollar



Sea cucumber

- They respire through the body surface. No respiratory organs are present.
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- Tentacles are found around the mouth.
• Medusa resembles a flattened mouth down version of the polyps and they are free living.
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- Reproduce sexually as well as asexually. Asexual reproduction is by budding.



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- No special excretory system present. Excretion is through body surface.

Phylum Platyhelminthes

- Characteristic features of each examples are not necessary
Eg. *Planaria*, *Taenia*, *Fasciola*



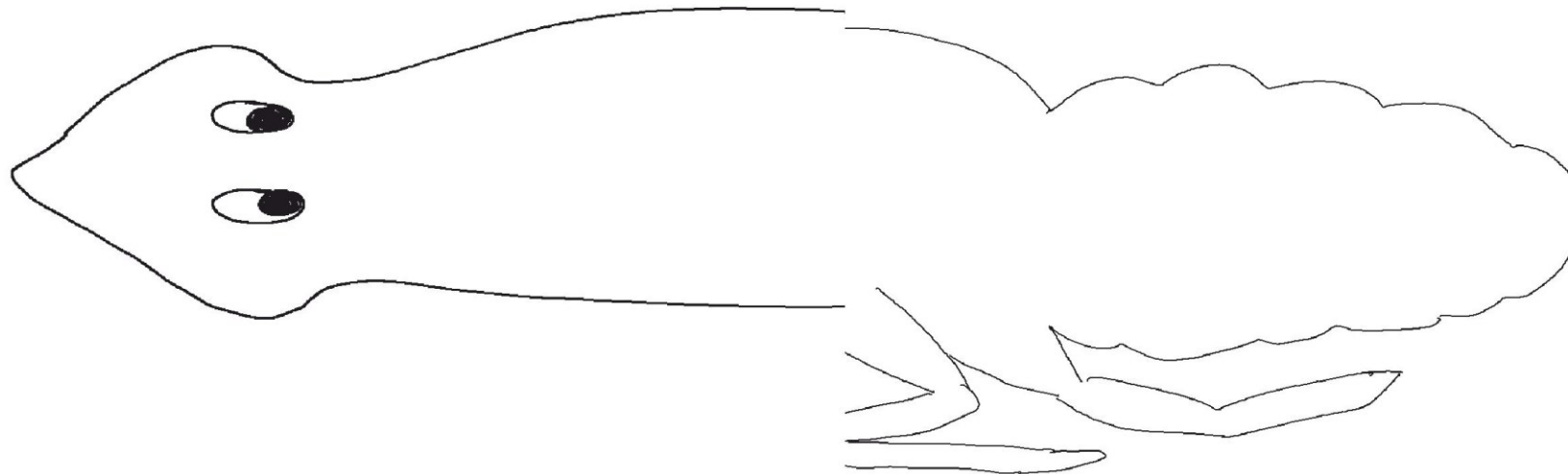
Planaria



Fasciola



Taenia



-
- They have segmented bodies with "jointed legs"
- They have a chitinous exoskeleton (skeleton on the outside) Because of exoskeleton these animals can't grow continuously and needs periodic molting
- The nervous system is well developed with primitive dorsal brain.
- The nerve cord is solid, segmented and ventrally located.
- They have many and varied sense organs.
-

- Respiration
- In aquatic animals- Gills
- In terrestrial animals- Tracheal system of chitinous tubes
- In arachnids - Book lungs
- Excretion is by Malphigian tubules They excrete uric acids
- Reproduction: Sexes separate [Dioecious]

Phylum Arthropoda

- Characteristic features of each examples are not necessary
Eg. Insects, Spiders, Prawns, Crabs, Scorpions, Ticks, Mites, Millipedes and Centipedes.



Spider



Scorpion



Mite



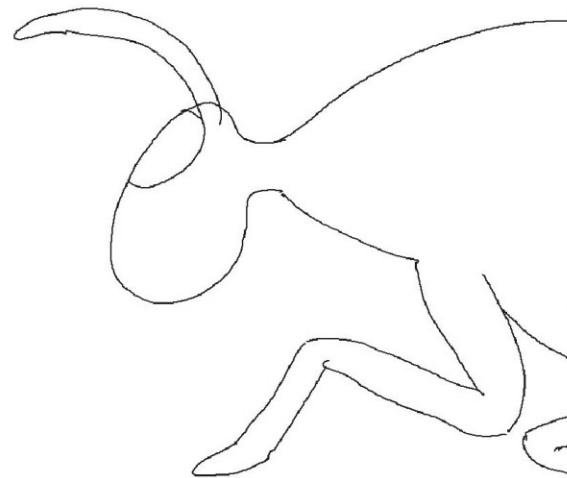
Tick



Centipede



Millipede



- Commonly known as flatworms.
- Free living (Planaria) or parasitic (flukes and tapeworms).
- They are found in marine, fresh water and in damp terrestrial habitats.
- Body is dorsoventrally flattened. Some have elongated tape like body forms without true segmentation.

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- Sensory organs are found only in free living examples. Eye spots are found in the head.

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- They have incomplete digestive system only with mouth without anus. Branched gastrovascular cavity is present for digestion. Some are having eversible pharynx.
- Free living examples have cilia for the locomotion.

Phylum Nematoda (characteristic features of each examples are not necessary)
 Eg. Round worms, Hook worms, Pin worms



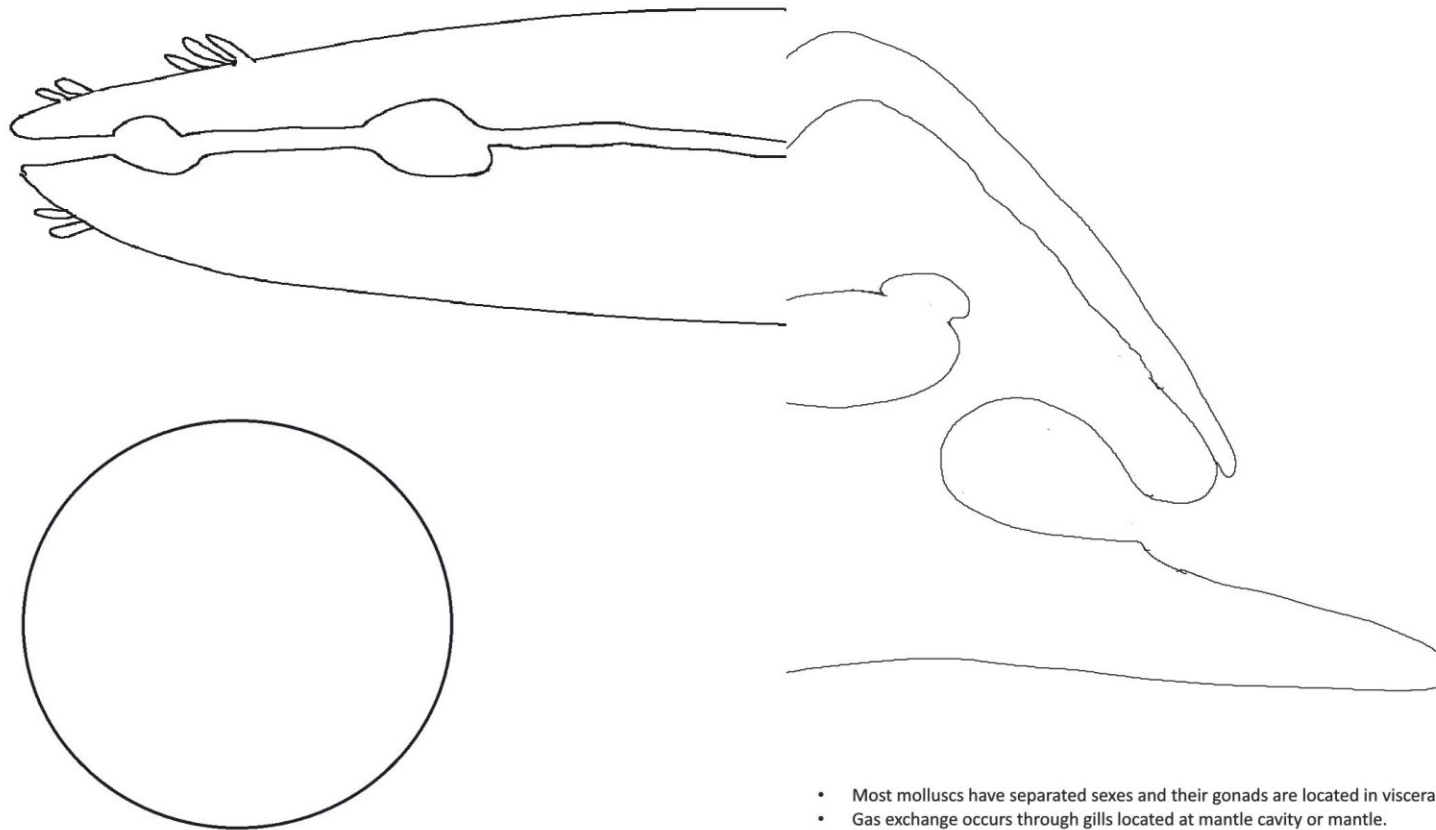
round worm



hook worm



pin worm



-
- They are soft bodied and non-segmented. Calcareous shell is secreted as a protective exoskeleton. Coelomic.
- Body is divided into three parts:
 1.
 2.
 3.
- Shell could be internal or external.
-

- Most molluscs have separated sexes and their gonads are located in visceral mass.
- Gas exchange occurs through gills located at mantle cavity or mantle.
- Excretion is through the metanephridia.

Phylum Mollusca

- Characteristic features of each examples are not necessary
Eg. Oysters, Clams, Slugs, Snails, Octopus, Squids, Chitons and tusks shells



Snail



clam



Squid



Octopus



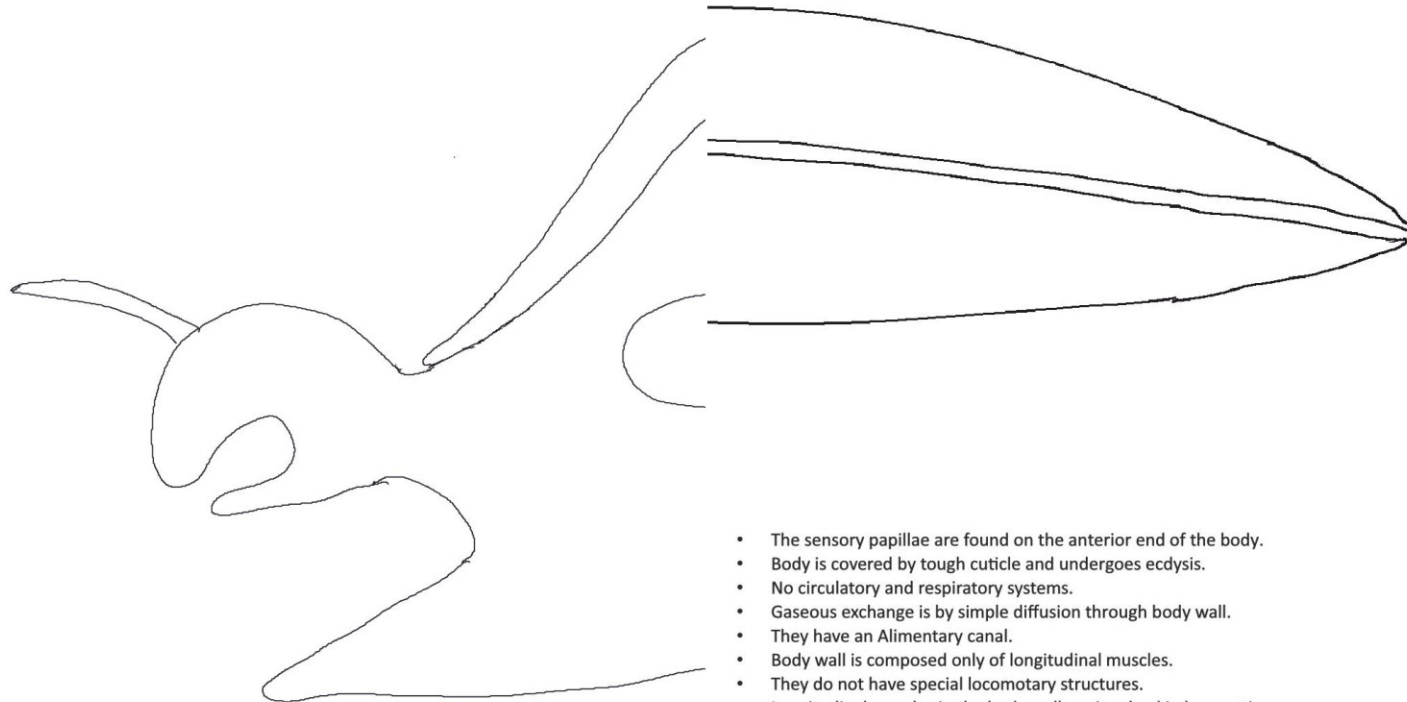
chiton



tusk shell



Oyster



-
- They are bilateral symmetrical.
-
-
- Body size varies from microscopic to macroscopic.
- They do not show distinct cephalization and segmentation.

- The sensory papillae are found on the anterior end of the body.
- Body is covered by tough cuticle and undergoes ecdysis.
- No circulatory and respiratory systems.
- Gaseous exchange is by simple diffusion through body wall.
- They have an Alimentary canal.
- Body wall is composed only of longitudinal muscles.
- They do not have special locomotory structures.
- Longitudinal muscles in the body wall are involved in locomotion.

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Phylum Annelida

- Characteristic features of each examples are not necessary
Eg. Earthworms, Leeches and ragworms.



Earth worm

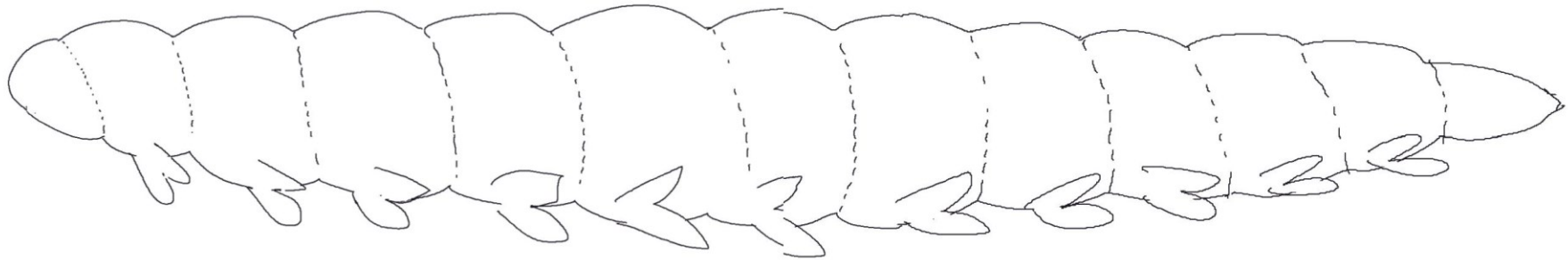


Leech



- They can be marine, freshwater or in damp soil.
- They are segmented worms with cylindrical bodies
- They are Triploblastic.
- Coelom (true body cavity) is present for the first time.
- The first animals to show cephalization.

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- Parapodia are used for locomotion and respiration.

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