Interactive Classroom

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Glencoe Science

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Section 1: Flatworms

Section 2: Roundworms and Rotifers

Section 3: Mollusks

Section 4: Segmented Worms

Click on a lesson name to select.

EXIT

25.1 Flatworms

Body Structure of Flatworms

- Flatworms are on the acoelomate branch of the evolutionary tree.
- Bilateral symmetry
- Thin, flat bodies



Lack a coelom





Feeding and Digestion

- Free-living flatworms feed on dead or slow-moving organisms.
- Parasitic flatworms have modified feeding structures called hooks and suckers, which



enable them to stay attached to their hosts.



Respiration, Circulation, and Excretion

- Diffusion moves dissolved oxygen and nutrients to all parts of their bodies.
- Carbon dioxide and other wastes also are removed from flatworm cells by diffusion.



Flame cells move water out of the body to excrete waste products and maintain water balance.



Response to Stimuli

The nervous system regulates the body's response to stimuli.



Movement

- Move by contracting muscles in the body wall
- Glide by using cilia located on their undersides



Reproduction

- Flatworms are hermaphrodites.
- Two different flatworms exchange sperm, and the eggs are fertilized internally.



25.1 Flatworms

 Free-living flatworms can reproduce asexually by regeneration.













Turbellarians

- Live in marine or freshwater
- Have eyespots that can detect the presence or absence of light
- Sensory cells help them identify chemicals and water movement.



Trematodes

- Parasites that infect the blood or body organs of their hosts
- The parasitic fluke Schistosoma requires two hosts to complete its life cycle.
- These fluke eggs clog blood vessels, causing swelling and eventual tissue damage.



25.1 Flatworms



Cestodes

- Parasites adapted to life in the intestines of their hosts
- Proglottids form continuously; as new ones form near the scolex, older proglottids move farther back and mature.



25.2 Roundworms and Rotifers

Body Structure of Roundworms

- Found everywhere from marine and freshwater habitats to land
- Roundworms have adaptations that enable them to live in many places.





- **25.2 Roundworms and Rotifers**
 - **Feeding and Digestion**
 - Most roundworms are free-living.
 - The movement of food through the digestive tract is one-way.



25.2 Roundworms and Rotifers

Respiration, Circulation, Excretion, and Response to Stimuli

- Most roundworms exchange gases and excrete metabolic wastes through their moist outer body coverings.
- Ganglia and associated nerve cords coordinate nematode responses.



25.2 Roundworms and Rotifers

Movement

- Muscles cause their bodies to move in a thrashing manner as one muscle contracts and another relaxes.
- These muscles pull against the outside body wall and the pseudocoelom.



25.2 Roundworms and Rotifers

Reproduction

- Roundworms reproduce sexually.
- Fertilization is internal.
- Larva hatch from the fertilized eggs.



- **25.2 Roundworms and Rotifers**
 - **Diversity of Roundworms**
 - Trichinella worms
 - Hookworms
 - Ascarid worms
 - Pinworms
 - Filarial worms



25.2 Roundworms and Rotifers

Nematodes in Plants

 Nematodes can infect and kill pine trees, soybean crops, and food plants such as tomatoes.



25.2 Roundworms and Rotifers

 Certain nematodes are used to control the spread of cabbage worm caterpillars, Japanese beetle grubs, and many other pests of crop plants.

Nematodes eat flea larvae, controlling the flea population in yards.



25.2 Roundworms and Rotifers

Rotifers

- Bilateral symmetry
- Pseudocoelomates
- Exchange gases and excrete metabolic wastes by diffusion through body walls.
- Sensory structures include sensory bristles and eyespots on the head.



25.3 Mollusks

Body Structure of Mollusks

 Mollusks are coelomate animals with bilateral symmetry, a soft internal body, a digestive tract with two openings, a muscular foot, and a mantle.







Feeding and Digestion

 A radula scrapes food into their mouths.





Mollusks have complete guts with digestive glands, stomachs, and intestines.



Respiration

- Gills are parts of the mantle.
- Gills contain a rich supply of blood for the transport of oxygen to the blood and for the removal of carbon dioxide from the blood.



- 25.3 Mollusks
 - Circulation
 - In an open circulatory system, blood
 is pumped out of vessels into open spaces surrounding the body organs. (•)

Stomach

Shell-

Mouth

Muscle-

Coelom

Heart

Nephridia

Muscle

Anus

Excurrent siphon

-Siphons

 Oxygen and nutrients diffuse into tissues that are bathed in blood and carbon dioxide diffuses from tissues into the blood.



25.3 Mollusks

In a closed circulatory system, blood is confined to vessels as it moves through the body.



 A closed system efficiently transports oxygen and nutrients to cells where they are converted to usable forms of energy.



Excretion

 Mollusks get rid of metabolic wastes from cellular processes through structures called nephridia.

Response to Stimuli

 Nervous systems coordinate their movements and behavior.



25.3 Mollusks

Reproduction

- Mollusks reproduce sexually.
- All mollusks share similar developmental patterns.





Diversity of Mollusks

- Gastropods
 - The largest class of mollusks is Gastropoda.
 - Most species of gastropods have a single shell.
 - Abalones, snails, conches, periwinkles, limpets, cowries, whelks, and cones
 - Slugs and nudibranchs do not have shells.



Bivalves

- Bivalves are two-shelled mollusks.
- Clams, mussels, oysters, and scallops
- Use a muscular foot to burrow into wet sand
- Mussels attach to rocks with byssal threads.



Cephalopods

- Cephalopods are the head-footed mollusks.
- Squid, octopus, chambered nautilus, and the cuttlefish
- The foot of a cephalopod is divided into arms and tentacles with suckers.



Cuttlefish


25.3 Mollusks

Cephalopod Protection

- Expel water to propel themselves away from threat
- Hide
- Shoot out an inky substance that forms a cloud
- Change color to blend in with their surroundings



- **25.4 Segmented Worms**
 - Body Structure of Segmented Worms
 - Annelids undergo protostome development.
 - Include earthworms, marine worms, and parasitic leeches
 - Segmented and have a coelom





25.4 Segmented Worms

- Rigidity in annelid segments creates a hydrostatic skeleton that muscles can push against.
- Segmentation also permits segments to move independently of each other and enables a worm to survive damage.
- Segments can be specialized.



Feeding and Digestion

Running through all earthworm segments from the mouth to the anus is the digestive tract.













25.4 Segmented Worms

Circulation

Most annelids have a closed circulatory system.





Respiration and Excretion

- Earthworms take in oxygen and give off carbon dioxide through their moist skin.
- Aquatic annelids have gills for the exchange of gases in the water.



 Segmented worms have two nephridia in almost every segment.



Response to Stimuli

The anterior segments are modified for sensing the environment.



Movement

- The earthworm contracts circular muscles running around each segment.
- This squeezes the segment and causes the fluid in the coelom to press outward like paste.



25.4 Segmented Worms

- The fluid pressure causes the segment to get longer and thinner.
- The earthworm contracts the longitudinal muscles that run the length of its body.
- This causes the segment to shorten and return to its original shape, pulling its posterior end forward and resulting in movement.



25.4 Segmented Worms

Reproduction

- Reproduce both sexually and asexually
- Sperm are passed between two worms near segments called the clitellum.



- **25.4 Segmented Worms**
 - **Diversity of Annelids**
- Earthworms and their relatives
- Marine annelids
- Leeches



Chapter Resource Menu



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Standardized Test Practice

Formative Test Questions

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Image Bank

<u>Vocabulary</u>



Animation

Click on a hyperlink to view the corresponding lesson.



Chapter Diagnostic Questions



Identify the method of asexual reproduction used by flatworms.

A. regeneration of body parts
B. production of both eggs and sperm
C. release of cocoons into the water

D. production of spores







To which phylum do roundworms belong?

A. Turbellaria
B. Cestoda
C. Trematoda
D. Nematoda





Chapter Diagnostic Questions



The mosquito is the intermediate host of which worm?

A. ascarid worm
B. filarial worm
C. hookworm
D. pinworm

Home Resources 🗲 🕯

25.1 Formative Questions



How do parasitic flatworms that lack a digestive system obtain nutrients?

A. by diffusion
B. by releasing enzymes
C. through their ganglia
D. through their flame cells



25.1 Formative Questions



Which organs does a flatworm lack?

A. muscles
B. respiratory organs
C. digestive organs
D. excretory organs



25.1 Formative Questions



Which flatworm is not a parasite?

A. fluke B. planarian C. tapeworm D. trematode



25.2 Formative Questions



What body plan do roundworms and rotifers have?

A. acoelomate

B. coelomate

C. protocoelomate

D.pseudocoelomate



25.2 Formative Questions



What is the term for the fluid force that provides support in the body of a roundworm?

A. coelomical
B. hydraulic
C. hydrostatic
D. osmotic



25.2 Formative Questions



Which is a general cause of roundworm infections in humans?

A. contaminated fruit
B. poor sanitation
C. uncooked beef
D. unwashed vegetables



25.2 Formative Questions



What is the intermediate host for the roundworms that cause elephantiasis in humans and heartworm in dogs and cats?

A. ascarids B. mosquitoes C. snails D. weeds



25.3 Formative Questions



What organ does a mollusk use to feed? A. foot B. mantle C. radula D. tentacle



25.3 Formative Questions



What type of circulatory system do highly active animals require?

A. open circulatory system
B. closed circulatory system



25.3 Formative Questions



Which is the most intelligent invertebrate?

A. leech B. nematode C. octopus D. snail



25.3 Formative Questions



What is the term for an animal whose health influences the health of an entire ecosystem?

- A. foundation species B. keystone species C. pioneer species
 - D. stabilizing species



25.3 Formative Questions



Why do scientists examine mussels to monitor water quality?

A. They siphon water.
B. They store water.
C. They accumulate toxins.
D. They filter microorganisms.



25.4 Formative Questions



In what group of animals are the earthworms, polychaetes, and leeches?

A. annelids B. nematodes C. trematodes

D. rotifers



25.4 Formative Questions



Which muscles in an earthworm cause its segments to shorten, pulling the posterior of the earthworm forward?

A. circular muscles
B. latitudinal muscles
C. longitudinal muscles
D. ventral muscles







Which annelids are parasites?

A. earthworms
B. leeches
C. lumbriculid worms
D. tubifex worms



25.4 Formative Questions



How are leeches different from parasitic flatworms and roundworms?

A. Leeches have a mouth.
B. Leeches feed on humans.
C. Leeches do not have setae.

(D.) Leeches are external parasites.



Chapter Assessment Questions



Identify the body structure that free-living flatworms use for feeding.

A. hooks B. sucker C. pharynx D. cilia





Chapter Assessment Questions

Setae are useful to earthworms in what function?

A. circulation
 B. response to stimuli
 C. movement
 D. excretion







Chapter Assessment Questions





Flatworms have radial symmetry.






Standardized Test Practice



Which step in the life cycle of this parasite will be broken if proper sewage treatment is implemented?





Standardized Test Practice



What is a key adaptation in the digestive systems of free-living roundworms?

A. digestive enzymes
B. an advanced stomach
C. multiple digestive organs
D. one-way movement of food



Standardized Test Practice



How do nephridia enable mollusks to efficiently maintain homeostasis in their body fluids?

- A. They filter the blood and excrete wastes.
- B. They take in water and expel it from the body.
- C. They pump blood to open spaces surrounding organs.
- D. They transport a rich supply of nutrients to tissues.



Standardized Test Practice



Which organism is a cephalopod?











Standardized Test Practice



Which body system in mollusks is absent in flatworms, roundworms, and rotifers?

A. circulatory B. digestive C. excretory

D. nervous



Standardized Test Practice



Which organ is involved in producing of offspring?





Glencoe Biology Transparencies





Section 1

- e pharynx
- 🚯 flame cell
- ganglion
- regeneration
- scolex
- A proglottid



Section 2



) hydrostatic skeleton

trichinosis



Section 3

- mantle
- radula
- 🕑 gill
- open circulatory system
- closed circulatory system

Home

Resources

- l nephridium
- 🕑 siphon

Section 4

- Crop
- gizzard
- 🚯 seta
- Clitellum



Animation



- A Planarian
- Visualizing Movement in Mollusks
- An Earthworm

