

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Gen Bio 2 Lab #5: Rotifers, Platyhelminthes, Nematodes, Tardigrades and Annelids (oh my!)



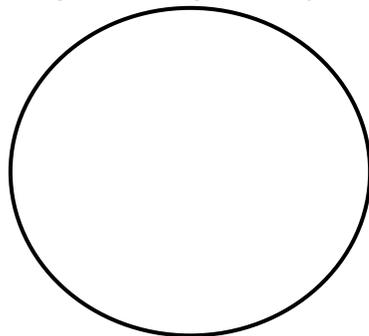
**Pre-Lab Reading:** Pages 656-662 (Pay attention to Figs. 31-18, 31-19, 31-22) - - **Bring your text to lab!**

### **Pre-Lab Vocabulary:**

1. Parthenogenesis –
2. Lophophore –
3. Bilateral symmetry –
4. Triploblastic –
5. Aceolomate –
6. Scolex –
7. Parapodia –
8. Nephridiopores –

### **Procedure 1: Phylum Rotifera**

1. **Observe a living Rotifer** by making a **wet mount** and looking at it under **low power**. **Draw a picture** of a Rotifer and **label as many external parts** as you can see, using **Figure 31-22** as a reference.



**Question:** What is a unique form of reproduction that Rotifers exhibit?

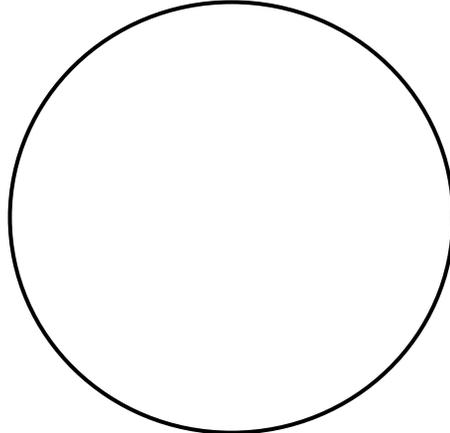
**Procedure 2: Phylum Platyhelminthes**

**Procedure 2A = Class Turbellaria**

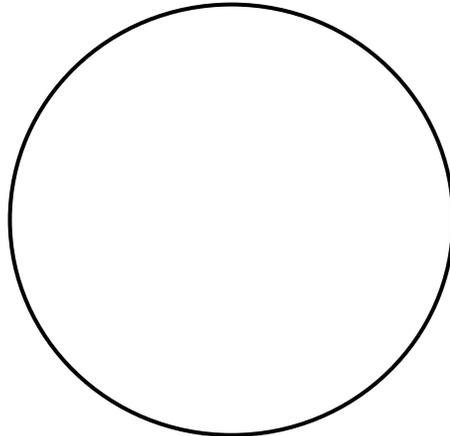
**Observe the model** of the free-living non-parasitic flatworm *Dugesia* (a Planerian). Also observe slides, wm, and cs and compare to Figure 31-8 in your textbook, using the spaces below for you notes and drawings.

**Make a drawing of each slide and label the following structures:**

**From the whole mount slide:** *Eyespots, gastrovascular cavity, and pharynx*



**From the cross-section slide:** *Epidermis, mesoderm, and endoderm*



**Procedure 2B: Class Turbellaria Live Specimen**

- a. Obtain a small petri dish and a live specimen of *Dugesia*. **Record your observations** about its movements **for at least 3 minutes**.
  
- b. Experiment with *Dugesia* and light. **Cover it up in darkness** then use your desk lamp to **shine light on one side of your dish**. Record your observations.

- c. Feed *Dugesia* some egg yolk. Record your observations of its feeding patterns for at least 3 minutes.

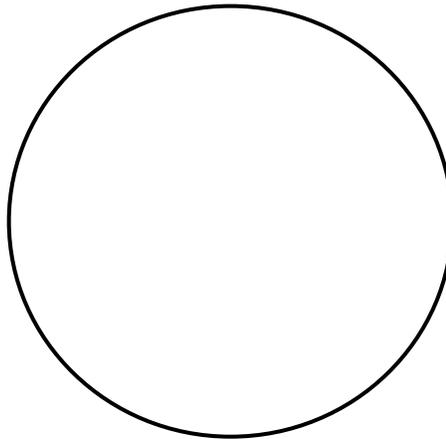
### Procedure 3: Class Trematoda

#### Procedure 3 A: Class Trematoda –Schistosome

- a. Observe the life cycle of *Schistosoma*, a blood fluke. Refer to *Figure 31-9 in your text*.
- b. What 2 hosts are involved in the life cycle?
- c. What are the symptoms of *Schistosoma* infection? (Look it up online)

#### Procedure 3 B: Class Trematoda-Other Flukes

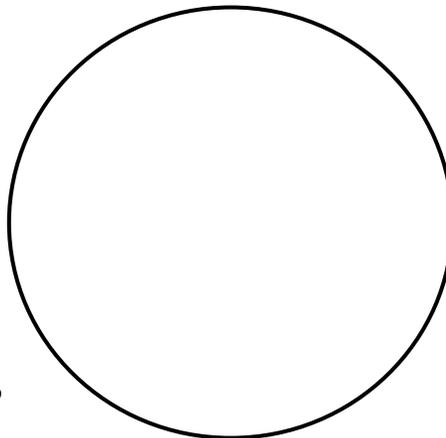
Look at the other parasitic flukes. Examine the whole mount of *Fasciola* and *Clonorchis*. Draw one of them.



#### Procedure 4: Class Cestoda

These are the Tapeworms. Observe whole specimens of *Taenia*, *Dipylidium* and *Moniezia* and locate the **scolex** in each worm.

*Make a drawing of one scolex and label the parts (suckers and hooks?).*



*What is the purpose of the scolex?*

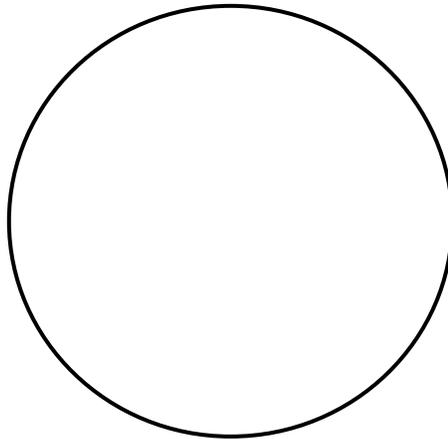
### Procedure 5: Phylum Nematoda

The Roundworms: Observe the wm slide of *Marcanthorynchus*. Also observe wm of the *Ancylostoma canium* (hookworm). A similar species infects humans. **Record your observations.**

Observe the slide of an encysted *Trichinella*; it is embedded in the muscle of a pig. These can cause Trichonosis in humans when they eat poorly cooked pork. **Record your observations.**

### Procedure 6 : Tardigrades

Make a **wet mount** of Tardigrades using the **well slides**. Cover your sample with a coverslip and **draw a picture** of this little “water bear”.

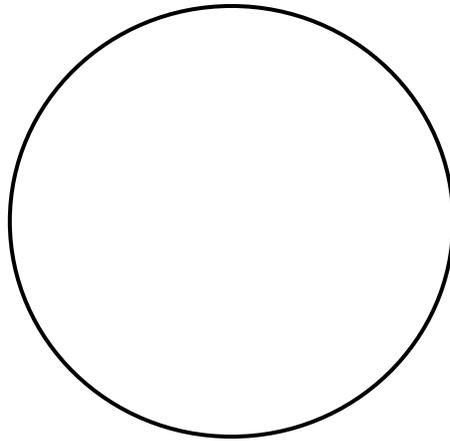


### Procedure 7: Annelida

**Procedure 7A: Annelida** Observe the various specimens from Phylum Annelida. **Compare and contrast the morphological differences you see among 3 specific worms in the case.**

**Procedure 7B: Annelida** Examine the leeches. **What Class do they belong to? Record your observations.**

**Procedure 7C: Annelida** Observe the slide of parapodia. Make a **drawing of the parapodia**.



**Procedure 7D:** Earthworm dissection. This is an independent dissection; each person in your lab group needs to perform this. \*\*\*See your instructor if you have serious issues with dissection. **Obtain a dissecting pan, preserved earthworm, and a small handful of dissecting pins.** See Figure 31-19.

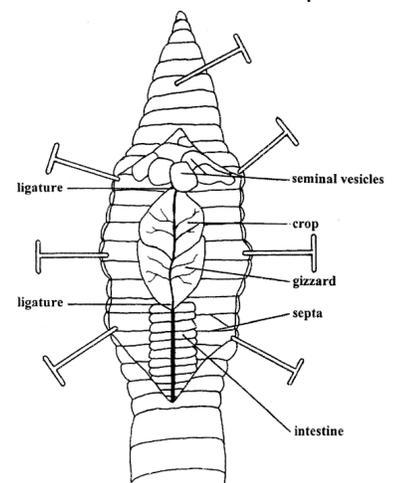
### Self-Guided Instructions:

#### Part A: Observation the external anatomy of the earthworm

1. Earthworms are annelids, or segmented worms that have bodies made up of a series of ring like segments. The earthworm has no head and no appendages, but does possess external characteristics to study. First, identify the anterior and posterior ends. The anterior end is somewhat larger than the posterior.
2. Pin the earthworm to the dissecting pan and **count and record** the number of segments. There may be as many as 100. \_\_\_\_\_
3. Observe each segment closely. **Note the tiny bristles** on the ventral surface. These setae help the worm move through soil.
4. Each segment also contains a pair of small excretory pores called **nephridiopores**. You may need to use a **hand lens** to see these openings clearly.
5. Openings to the **oviducts** are found at segment 14, counting from the anterior end. These female pores release the eggs. **Sperm ducts** can be found on segment 15. The **clitellum** is the enlarged structure that begins at segment 31. The clitellum secretes mucus that holds 2 earthworms together during **mating**. It also produces a **cocoon** in which eggs and sperm are deposited.

#### Part B: Observation the internal anatomy of the earthworm

6. Place the earthworm on its **ventral side**. (The ventral side is **more flattened** than the dorsal side.) Using a scalpel, make a **shallow incision** anterior to the clitellum and **continue the incision toward the mouth**. Be careful not to cut **too deep** or you will slice into the digestive system. Using forceps **spread the incision open and pin the body wall**

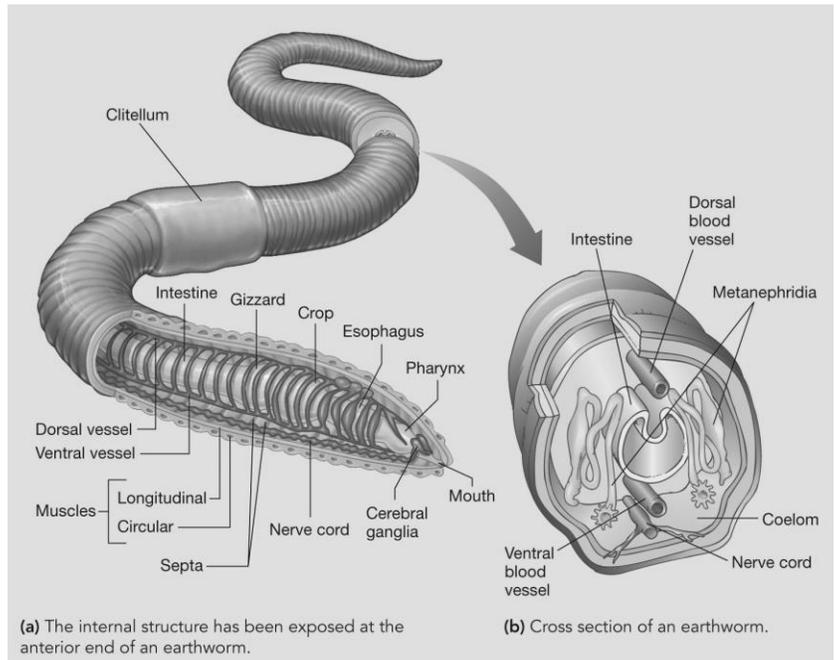


**to the dissection pan** as shown in the illustration. You may choose to add some water to the specimen to prevent it from drying out.

- Identify the thin walls between each segment. These are called **septa**.
- Identify the organs of the **digestive system**. Beginning at the mouth, locate the thick-walled **pharynx**. The **esophagus** extends from the pharynx. Next, 2 swollen structures can be seen, the **crop** and the **gizzard**. The crop temporarily stores food and the gizzard then grinds it. Leading from the gizzard is the **intestine**, which runs the length of the worm to its **anus**. The earthworm feeds on organic material in soil, pushing this material through its digestive tract and absorbing nutrients.

- Locate the **dorsal blood vessel**, which is found along the dorsal surface of the digestive tract. Identify the **5 pairs of aortic arches**, or hearts, which circle the esophagus.

- Identify the **cerebral ganglia**, which are found along the dorsal surface of the pharynx. A **ventral nerve cord** can be seen beginning at the cerebral ganglia and extending the length of the worm.



- Locate the excretory organs called **nephridia**. These paired organs are found in each segment. Nephridia remove nitrogenous waste.
- Earthworms are **hermaphroditic**, meaning they have both male and female sex organs. Eggs are produced in the ovaries, which can be found in segment 13. Eggs pass through the female genital pores. Sperm are produced in the testes, found in segments 9 to 12. Sperm pass through the male genital pores. Study the segments containing the gonads and try to identify each sex organ.
- During mating, sperm from one worm travel to the seminal receptacles of another worm. Once the 2 worms have separated, fertilization of the eggs occurs in the cocoon created by the clitellum. First the cocoon is moved over the outside body wall where eggs are deposited, and then it is moved over the seminal receptacles where sperm are deposited. Fertilization occurs outside the body.
- Once you have observed the structures of the earthworm, **draw a picture of your dissected-out worm and label the mouth, cerebral ganglia, pharynx, crop, esophagus, gizzard, intestine, aortic arches, nephridia (if visible), clitellum, and anus** on the next page.
- Dispose of your worm by un-pinning it and wrapping it well in paper towels before setting it into the trash can.

**Earthworm drawing space**



Questions to **e x p a n d** your mind.



1. **List and explain** 3 beneficial uses for, or environmental results, from members of class Annelida.
2. Which infection type would be **worse**: Trichinosis or Schistosomiasis? Explain **why** you think this?
3. Earthworms are a type of 'synchronous hermaphrodites,' which is also referred to as the condition of homogamy. **What does this mean? How does it affect reproduction? List and explain 2 other types of hermaphroditism.**
4. Tardigrades have been studied extensively for their fascinating ability to activate a particular form of cryptobiosis. **Describe what cryptobiosis is, define the specific form that tardigrades use, and explain how this benefits them.**