Squid Dissection Lab

Name: _____ Date: _____ Core: _____

LT1: I can gain an understanding of mollusk anatomy and adaptations.
LT2: I can learn how to perform a dissection properly with respect
LT3: I can make connections between mollusk anatomy and human body systems.

Source:

"Lab: Squid Dissection." www.lake.k12.fl.us/cms/lib/FL01000799/Centricity/Domain/3762/Squid_Prelab_discussion.pdf.

Background Information:

The squid is one of the most highly developed **invertebrates**. It is in the phylum **Mollusca,** which is derived from the Latin word meaning "soft body". It belongs to the class **Cephalopoda**, meaning "head-footed", because its head is pushed down toward the foot. This class also includes the octopus, cuttlefish and ancient nautilus.

All mollusks have a soft body with a special covering called the mantle, which encloses all of the body organs such as heart, stomach and gills. Squid have a large mantle, eight arms with two longer feeding tentacles all with suckers, a beak and mouth, a siphon, a large head (with a brain), two large eyes, and three hearts. The tentacles are long and retractable and have suckers only at the tips. Their large eyes are very similar in structure to people's eyes. The shell has been reduced to a chitinous pen that is embedded in the upper surface of the mantle.

Squid breathe using gills. They move by squirting water from the mantle through the siphon, using a type of movement called jet propulsion. They can move both backward and forward just by changing the direction of the water flow through siphon.

Some of the animal's structures explored in this lesson illustrate the ways in which the squid has adapted to life in the ocean. Its streamlined body and jet propulsion make the squid a fast, active predator. This animal also has a very good defense mechanism.

Squid can change the color of their skin to mimic their environment and hide from predators. When in danger, squid release a cloud of dark ink from their inc sac in order to confuse their attacker and allow the squid to escape.

These fast-moving **carnivores** catch prey with their two feeding tentacles, then hold the prey with the eight arms and bite it into small pieces using a parrot-like beak. The esophagus runs through the brain, so the food must be in small pieces before swallowing. Squid feed on small crustaceans, fish, marine worms, and even their own kind!

Squid reproduce sexually by releasing eggs into the water. After mating, a female squid will produce 10-50 elongated egg strings, which contain hundreds of eggs in each string. In many species, the parents will soon die after leaving the spawning ground. The egg strings are attached to the ocean floor, are left to develop on their own, and hatch approximately ten days later.

Squid are an important part of the ocean food web. Squid are a major food source for many fishes, birds and marine mammals. Squid are gaining popularity as a food source for humans around the world (calamari). However, over-fishing is a growing concern because there are no regulations on squid harvesting.

Squid can be as small as a thumbnail, or as large as a house. The giant squid, *Architeuthis*, can measure 60 ft. in length and weigh three tons! Southern California squid populations spawn mainly in the winter (December to March). Squid are seined commercially at their spawning grounds. About 6,000 metric tons are taken yearly for human food and bait.

Pre-lab Preparation:

Watch the Squid Dissection Guide www.youtube.com/watch?v=2dzjX8qm-_s to help prepare you for the dissection.

Procedure:

Part I – External Anatomy

1. Place the squid on the dissecting mate with the dorsal side (darker side) up. Squid have counter shading – one side is darker than the other.
2. Notice the **chromatophores**. The "freckles" allow the squid to change colors. The spots change size to change the squid's color for camouflage. Draw and label the chormatophores on the external squid anatomy diagram.
3. Locate and look at the **fins**. The fins help the squid change direction when swimming. Label the fins on the external squid anatomy diagram.
4. Locate and label the **mantle**. Remember that the mantle is the main part of the squid's body. It houses all of the internal organs.
5. Locate and label the **pen**. The pen is all that is left of the shell that the squid's ancestors one had. The squid is related to other shelled animals like clams and snails.
6. Locate and label the **eyes** on the external squid anatomy diagram. Squid have big eyes compared to their head. In comparison, humans' eyes would be the size of dinner plates if the proportion were the same. They are positioned on the side. Being on the side gives them more peripheral vision, which is great for hunting.
7. Count and label the number of **tentacles** the squid has. The tentacles are longer than the arms and have suction cups only at the tips. These are used to pass food to the shorter arms and then to the mouth.
8. Count and label the number of **arms** the squid has. Arms have suctions all the way down. Label the **suction cups** as well on the diagram. The suction cups help the squid to hold onto food.
9. Hold your squid like a flower. Let the arms lay back so you can see the **mouth**. You will be able to see the **buccal bulb**. The buccal bulb attaches to the esophagus which is attached to the stomach. Draw the buccal bulb in on the external squid anatomy diagram.
10. Look and try to find the **beak**. The beak is hard and is a dark brownish color. Draw the beak in on the diagram and label it.
11. Now, lay your squid ventral side up (lighter colored side). Locate the **collar**. The collar is the opening of the mantle (like the collar of your shirt).
12. Locate and label the **siphon**. Water is pulled into the mantle. The mantle is squeezed forcing water out through the siphon. This type of movement is called jet propulsion. Squid are the fastest invertebrates swimming at approximately 30 mph.

Part 2 – Internal Anatomy

1. Carefully cut the mantel UPWARDS to avoid puncturing the internal organs. Cut all the way to the tip of the tail. Lay the flaps of the mantle to the sides.
2. Label and remove the **gills** from the body (place them on the side of the mat). The gills are feathery structures that absorb oxygen from the water. The feathery feature increases the amount of surface area for greater gas exchange.
3. Locate and label the **ink sac**. The ink sac lies on the top of the liver. Carefully pull it up with the tip of your scissors or finger and snip the ink sac away. Lay it aside for now. The squid releases ink from this gland in times of danger. The ink is pushed up through the siphon.
4. Locate and label the **heart(s)**. Squid have three hearts. The hearts are located at the bottom of the gills. The heart is for blood circulation.
5. Locate the **buccal bulb** again. Try pulling on it gently to show the trail of the esophagus and general area of the stomach.

6. Locate and label the **gonads**. This is the reproductive organ. In males, it is a whitish mound (sperm sac). In females, it is a clear to yellow/orange mass of eggs.
7. Gently try to remove the **pen** as shown in the video. If you are able to you can take the pen and dip it into the ink sac. Then write your name on the line below:

   _____

8. If you have time, remove the eye and examine it. Carefully remove the cornea (film-like covering) and the lens (a hard silvery pearl-like structure).

Part 3 - Clean-up

1. Place the squid in the garbage can at the front of the classroom.
2. Place the dissecting tools in the designated tray.
3. Wipe table down with a paper towel.

Analysis:

1. Describe the function of each of the following parts of the squid.

Fin	
Chromatophores	
Eye	
Arms and Tentacles	
Suction Cups	
Pen	
Mantle	
Gonad	
Heart	
Gills	
Ink Sac	
Siphon	

2. How many arms does the squid have? _____ How many tentacles? _____

3. Based on the structure of the arms and the tentacles, describe how their purposes differ. (i.e. What do the arms do and what do the tentacles do?)

   _____

   _____

   _____

4. What structures did you observe in the squid that are similar to structures in the human body?

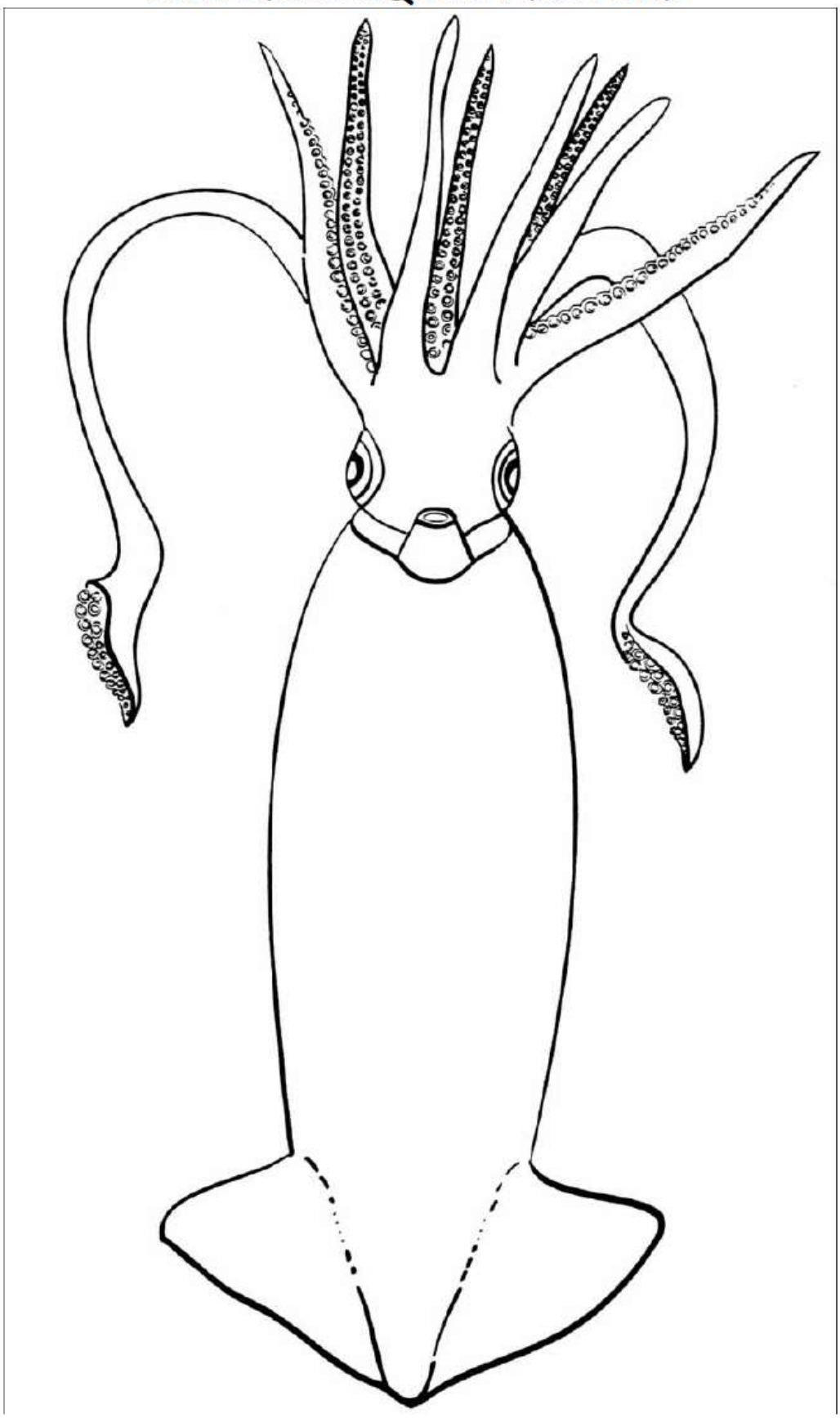
5. Do these structures have similar functions to those found in the human body? Explain.

6. What body systems did you observe in squid that are also seen in humans?

7. Do you think that squid have the same type of body organization that humans do? (i.e. cells form tissues which form organs which form systems) Why or why not?

8. What do you think is the most interesting feature of the squid? Why?

EXTERNAL SQUID ANATOMY



INTERNAL SQUID ANATOMY