

SQUID DISSECTION

NAME _____

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 molluscs have a soft body with a special covering called the **mantle**, which encloses all 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 an internal 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. Its streamlined body and jet propulsion make the squid a fast, active **predator**.

This animal also has very good **defence mechanisms**:

- Squid can **camouflage** by changing the colour of their skin (chromatophores) to mimic their environment and hide from predators.

- When in danger, squid release a cloud of dark **ink** from their ink 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 oesophagus runs through the brain, so the food must be in small pieces before swallowing. Squid feed on small crustaceans, fish, marine worms.

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. The egg strings are attached to the ocean floor, are left to develop on their own, and hatch approximately ten days later.

MATERIALS:

- 1) Dissecting plate, 2) Scissors, 3) Paper towels, 4) Probe, 5) Squid

PROCEDURE:

External Anatomy:

Diagram (biologists always record a specimen creating a labelled diagram of what they see before beginning a dissection)

- 1) Place the squid dorsal side up (darker side). Notice the counter shading. One side is darker than the other.
- 2) Notice and label on the squid diagram the chromatophores. The “freckles” allow the squid to change colours. These spots change size to change the squid’s colour for camouflage. Try rubbing them to see if you can see a change.
- 3) Look and label the fins. These help squid change direction when swimming.
- 4) Locate and label the mantle. The mantle is the main part of the squid’s body—all organs are inside.
- 5) Locate and label the pen (internal shell). The squid is related to other “shelled” animals like clams and snails. The pen is all that is left of the shell the squid’s ancestors once had.
- 6) Look and label the eyes on the squid diagram. Squid have big eyes compared to their head. 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 squid have. 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 a squid has. Arms have suction cups all the way down. Label the suction cups as well on the diagram. The suction cups help the squid to hold onto food.
- 9) Look and try to find the beak. The beak is hard and is a dark brownish colour. Draw the beak in on the internal anatomy squid diagram and label it.

Internal Anatomy

- 1) Place the squid on the ventral side (lighter side). Cut the mantle UPWARDS to avoid puncturing internal organs. Cut all the way to the tip of the tail. Lay the flaps of mantle to the sides and pin them if you can.
- 2) Label and remove the gills from the body (place them on the side of the plate). The gills are feathery structures that absorb oxygen from the water. Put them in a water dish and see how they spread out. Notice how in water the gills look feathery. This feature increases the amount of surface area potential for gas exchange.
- 3) Locate and label the ink sac. The ink sac lies on top of the liver. Carefully, pull it up with the tip of your scissors or finger and cut the ink sac out. Lay aside for now. The squid releases ink in times of danger, which is then pushed through the siphon.
- 4) Locate and label the heart. Squid have 3 hearts – 2 branchial and one systemic. The hearts are located at the bottom of the gills. The heart is for blood circulation.
- 5) Locate and label the gonads. This is the reproductive organ. In males, it is a white mound (sperm sac). In females, it is clear to yellow/orange mass of eggs. Is yours a male or female?
- 6) Place your fingers on your mantle (on either side of the head). Peel back head and guts from the mantle. Locate and remove the pen (internal shell).
- 7) Finally, take the pen and dip it into the ink sac. Then write your name at the top of your lab report.

SQUID DISSECTION LAB REPORT

1) Kingdom:_____

Phylum _____

Class _____

Order_____

Family_____

2) What are two ways that squid protect themselves from predators?

3) What did you observe when you rubbed the chromatophores?

4) Where does squid fit into the marine food web in WA? Find 2 examples of both predator and prey.

5) What features led to squid being classified as molluscs?

6) What adaptations does a squid have that help it to survive in its habitat?