# **BIOLOGY INVESTIGATION — THE PLANARIA**

For this task, you will create a formal lab report, studying whether or not planaria are able to regenerate. Your lab report will be typed, include a title page and will be evaluated using the science rubric.

**Introduction**

In multicellular organisms, cell division has several functions. One of these functions is regeneration. In *regeneration*, parts of organisms that have been damaged grow back or are replaced. For example, a starfish can grow a new arm if one is cut off. Do you know of any other animals that can replace lost parts? Some lizards can grow new tails, some species of worms can grow back a lost part, salamanders can grow new legs, crayfish can grow new claws, etc. A free-living flatworm called a planarian has an amazing ability of regeneration.

Another function of cell division is the healing of wounds which in a way is a type of regeneration. Whenever you have a cut or scrape on your skin, you can see the healing take place over a period of time. While the wound heals, new cells are made to replace the destroyed and damaged cells. The new cells are formed by cell division.

Another important result of cell division is the growing process. After a cell divides, both new cells grow and divide to form more new cells. Some cells can divide every few hours.

**Pre-Lab Questions**

1. Why is it necessary to bubble air into the water?
2. Why is “old” tap water used instead of water directly from the tap?
3. List three reasons why cells divide.
4. After the Planaria is cut, what part of the cell “cleans up” the cells that were too damaged to heal? Explain your answer.
5. Name one organelle that would not be found in Planaria cells. (Hint: Planaria are animals)
6. Give a brief description of the process of regeneration.

**Purpose:**

You will need to write the purpose.

**Materials:**

You will be required to list the materials that were used for this investigation.

**Procedure:**

You will be required to write the method that you devised. Use the following checklist to help you write your method:

* Includes the steps followed when cutting the Planaria
* Includes the steps taken to care for the Planaria
* The steps must be numbered
* The method must be written in past tense
* The method must be written in third person (no “Me”, “I”, etc.)
* The method must have an underlined title
* The method must be detailed

**Observations:**

For this section of the task, you will be required to make scientific observations of your Planaria. Your observations must be both qualitative and quantitative. You must make your observations on the chart provided by your teacher. Your diagrams must be accurate. You must have a minimum of 3 observations per day. Your observations can be hand written!

**Discussion:**

Your answers to the discussion questions must be typed and websites that you take information and pictures from must be referenced.

1. Of the three reasons why cells divide, which reasons apply to the Planaria? Explain your answer.
2. How do you know the Planaria were able to regenerate? Give evidence to support your answer, use can use the results from the entire class.
3. What evidence was there that the Planaria are carnivores (meat eaters)?
4. Identify the type of reproduction the Planaria cells underwent. Do the Planaria resulting from regeneration have the same genetic information as the original organism or is the genetic information changed in the process of regeneration? Explain your answer.
5. Is the colour of the regenerated parts different from the rest of the body? If so, describe the differences.
6. a) Using the internet, find a diagram of the digestive system of the Planaria.

b) Draw a Venn diagram comparing the Planaria digestive system to a human digestive system.

1. a) Using the internet, find a diagram of the nervous system of the Planaria.

b) What would happen to the Planaria if the nervous system stopped working? Explain your answer.

1. a) Using the internet, find a diagram of the reproductive system of the Planaria.

b) Planaria are hermaphrodites. Define this term.

1. Planaria do not have a circulatory or respiratory system. Explain how oxygen enters the planaria cells and how carbon dioxide leaves them.
2. Using words like diffusion, high concentration, low concentration, explain what would happen to the Planaria if they were placed in regular tap water, containing chlorine.
3. Explain why it is illegal to release Planaria into the wild.

**Conclusion:**

You will need to write a conclusion. The conclusion should state restate the purpose. It should then state what happened / what you found. Finally, it should mention any thing out of the ordinary that affected the outcome of the lab. If you have suggestions about how to make the lab better, you include them here.