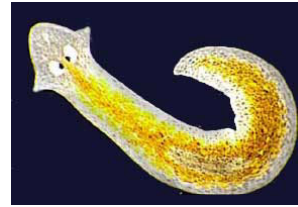


Name: _____

Pre IB Biology Summer Assignment

This summer assignment is directly related to the science fair project you will start in the fall. It will help you prepare for research and analyzing lab data.



Part 1: Organism Background Research

Background research, using books and/or appropriate (science-based) websites, is essential to answering scientific questions or problems, similar to what you will be doing for your science fair project.

Keep in mind that you will need to keep track of where you found the information to answer the questions below. On a scrap piece of paper record information like the name of the author, the name of the book/journal/website, the publisher, when the resource was published, website address, etc. We will revisit how to cite resources in Part 2.

1. Your science fair project will involve investigating a question and setting up an experiment using one of the following organisms. Circle the one that you would like to work with. Questions 2 – 6 will refer to the organism that you pick.

- a. Radish seeds
- b. Daphnia – a shrimp-like aquatic organism
- c. Planaria – a simple flat worm

2. How does your chosen organism obtain **energy** or food?
(What is its diet? Does it do photosynthesis?)

3. Describe how your organism is **adapted** to the environment.
What are its special features or physical characteristics (adaptations) that help it survive in its surroundings? (For example, a shark has fins to help it swim.)

4. Describe how your organism **grows and develops**.
(How does it start out? Does it change over time?)

5. Describe how your organism is **organized**.
(For example, humans are organized having organs and organ systems.)

6. How does your organism **reproduce**?
(For example - sexually or asexually, does it lay eggs?)

7. How does your organism **react** to its surroundings? What **stimuli** causes your organism to react? (For example, a pill bug will curl up when it is touched as a defense mechanism.)



Part 2: Resources

Wikipedia, Google and other search engines are **NOT** acceptable resources. You may use these websites to help you find other websites that are acceptable resources.

Why do you think search engines are not acceptable resources?

What characteristics do you think acceptable resources have?

In the spaces below, list 5 websites where you found information on your organisms.

- 1.
- 2.
- 3.
- 4.
- 5.

Part 3: Scientific Design & Analysis

In the fall you will get to decide what question you want to investigate. You will need to identify the different elements or parts of your experiment.

Sample Experiment:

Jocelyn's favorite flowers are daisies. She read that daisies would achieve optimal height if they are exposed to 8 hours of light.

In her experiment, Jocelyn planted 30 daisy seeds – 10 seeds in 3 identical pots. Jocelyn watered all the seeds with 50 ml of water every day and kept all of the pots in the same room.

She put Pot A in her closet and the seeds received no light.

She put Pot B under a lamp so the seeds received 24 hours of light.

She put Pot C under a lamp when she went to school, from 7am – 3pm so that the seeds received 8 hours of light.

Jocelyn recorded the height of the plants in centimeters every other day for a month. She recorded her data in the data table below.

Table 1: The Effect of Hours of Light Exposure on Plant Height

	Pot A plant height(0 hours)	Pot B plant height (24 hours)	Pot C plant height(8 hours)
Day 1	0.0 cm	0.0 cm	0.0 cm
Day 3	0.0 cm	0.0 cm	0.0 cm
Day 5	0.0 cm	0.0 cm	0.0 cm
Day 7	0.0 cm	0.1 cm	0.1 cm
Day 9	0.0 cm	0.1 cm	0.1 cm
Day 11	0.0 cm	0.2 cm	0.2 cm
Day 13	0.0 cm	0.6 cm	0.4 cm
Day 15	0.0 cm	0.9 cm	0.5 cm
Day 17	0.0 cm	1.0 cm	0.8 cm
Day 19	0.0 cm	1.4 cm	0.9 cm
Day 21	0.0 cm	1.5 cm	1.1 cm
Day 23	0.1 cm	1.8 cm	1.3 cm
Day 25	0.1 cm	2.2 cm	1.6 cm
Day 27	0.2 cm	2.8 cm	1.8 cm
Day 29	0.2 cm	3.2 cm	1.9 cm
Day 31	0.2 cm	3.5 cm	2.1 cm
Average height			

Identify each part of Jocelyn's experiment in the Experimental Design Diagram below.

Independent Variable (IV):

What condition did Jocelyn change in the experiment or what is she trying to see the effect of?

Dependent Variable (DV):

What is Jocelyn measuring or what happens as a result of her independent variable?

Title: *The Effect of [IV] on the [DV]*

Hypothesis: *If... then...* statement.

Write a sample hypothesis for Jocelyn's experiment.

Control Group:

The control group is a comparison group or the group that does not receive the independent variable. What is Jocelyn's control group? Does she have one?

Repeated Trials:

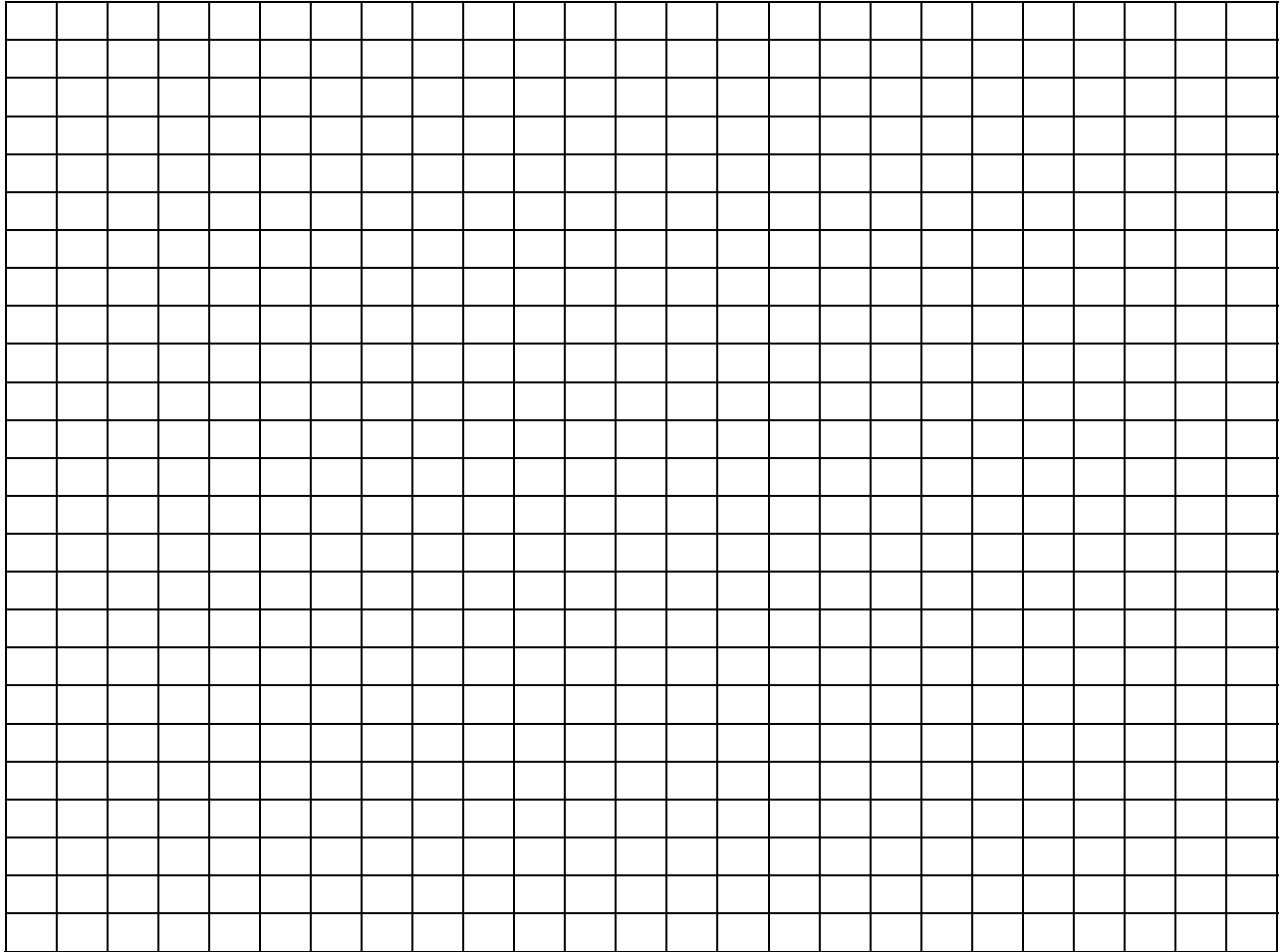
How is Jocelyn performing repeated trials?

Constants: *Include measurements where needed.*

The independent variable is the only condition that should be changed. Everything else should remain constant. What did Jocelyn keep the same in the experiment?

Use Jocelyn's data to make a line graph in the space below. Your graph should include:

- Title
- Labels for the X-axis and Y-axis (including units)
- Legend/Key
- Cover the entire grid and straight lines



On a separate sheet of paper (or typed), write a conclusion with at least 7 sentences that addresses the following questions:

1. What was the original purpose of the experiment?
2. What was the hypothesis?
3. What overall trend does the data show? (Summarize the data/results)
4. What is a possible explanation for the growth results? This explanation should be based on researched facts – not guesses!
5. What are some possible errors in the experiment?
6. How could this experiment be improved?
7. What are some related future experiments that could be done?