Pre-Lab #1: To Know A Snail **Name _____**

1. What is the purpose of this lab?

2. What precautions will you take to ensure the health of your snails?

3. What 4 things should your scientific drawings include?

4. Why do you include a control group in your snail experiment?

5. In your own words, what is a hypothesis?

Lab #1: To Know A Snail

Form groups of 3 or 4 students. In this lab, you will use the majestic snail as a model for the scientific inquiry into life. You will follow the scientific method: 1) Observation, 2) Hypothesis, 3) Experiment and 5) Conclusion. You will design and conduct experiments to test a hypothesis about snail biology. From this experience you will develop a greater appreciation for the scientific process.

Precautions: Keep your snails INTACT and HEALTHY throughout the entire lab. Do not grasp its shell too strongly as it can crack. Don't expose the snail to large amounts of sugar or salt as this can dehydrate the snail and cause it to foam. If your snail begins to foam, rinse it well in tap water.

Activity 1: Observation and Drawing

A prerequisite of any biological research is careful, thorough observation of a living organism or process. You can then use your observations to create hypotheses about the snail.

1. Obtain 2-3 snails, a tray or Petri dish, a glass rod, some water and a dissecting microscope. Place your snails in the tray and watch their movements and behavior. Use a few drops of water on the snail if it is inside its shell and not moving. Use a dissecting scope to see the detail of the shell, head, and skin surface. Watch the snail's movement and behavior for at least 5 minutes.

While watching your snail, describe it in detail (movement, behavior, size, color, speed, etc). Take note of anything interesting you observe or learn about snail biology.

2. Take about 20 minutes and make a large scientific drawing (a side view) of your snail (~1/2 page of an 8.5" x 11" sheet of paper). Your scientific drawing must include; your name and date, a scale bar, and labels of the prominent features of your specimen (see page 376 of your textbook as an example). *Submit this drawing with your lab report.*

Activity 2: Create a Hypothesis and Plan Your Experiment

Write down at least 3 questions about any aspect of snail biology that you might be able to answer by performing a scientific experiment.

1. Discuss and choose a hypothesis. A hypothesis is a tentative explanation, or educated guess. Your hypothesis should be a tentative explanation of a natural event or observation that can be tested using the scientific method.
Write down the hypothesis that your group wishes to test (i.e., snails are vegetarians and eat plants only or snails moves faster when on a smooth surface).

2. Your group will now design a scientific experiment to test a hypothesis. An array of experimental materials is available to you in the classroom (see the list below). Be creative, but keep it simple. For example, if you want to test your snail's response to sand, do not put food onto the tray at the same time. Test only one thing at a time, decide exactly what data you will collect (should include both observations and some measurements) and set a time limit for the actual experiment (~5 minutes should be adequate). Here are a few ideas for experiments that have been done in the past:

- Test speed of snails over a particular substrate
- Test response of snail to a food or stimulus
- Test response of snail to light or shade

- Test food preference of snail

Experimental materials:

- Petri dishes and trays
- Paper towels
- Thermometer
- Glass rods
- Squirt bottles with water
- Lamps to create heat at one end of a temperature gradient
- Variety of substrates for snails to crawl on (stones, sand, gravel)
- Selection of food items (e.g. lettuce, sprouts, sugar, tomato, carrot)

Each experiment needs to have an experimental group and a control group. The experimental group will be exposed to a variable that you wish to test (a substrate, food, or stimulus). The control group experiences the same conditions as the experimental group but does not have the one variable you are testing. So you might choose 4 snails of roughly the same size and activity level. Place two in an empty tray and wait for one minute, then record or measure the behavior of both snails (your control group). Place the other two snails in an identical tray and test them with a variable, recording or measuring the behavior of both of these snails (your experimental group). You can then compare your observations of both groups to see if there was any significant difference. The purpose of the control group is to have a set of results that you can compare to the results from the experimental group to see if there was a significant difference between the two groups.

Activity 3: Perform Your Experiment

1. Following your experimental design, gather the materials needed. Place your snails into trays (experimental group and control group) and give them time to adjust to their new environment. This will allow you to distinguish between the snail's response to being moved and it's response to the experimental variable. Remember, have only one factor that is being tested. In every other way the control group should be identical to the experimental group.

2. Perform the experiment and collect your data. Your data should include careful detailed notes of each group's responses and behaviors in the experiment. Each person should make their own observations and record results as they are happening. Record your experimental data (observations and measurements).

3. Reflect on the experimental data. Did the data support your hypothesis? Was your prediction supported by the experimental results? What can you conclude about snail biology from your experiment? What new experiments might be performed to answer any questions that arose from the experiment?

Lab #1: To Know a Snail
Lab Report Questions

1. Submit your properly labeled drawing.
2. From your observations, what 3 things did you learn about snail biology that was interesting or that you did not know before?
3. What was your hypothesis and describe how and why you came up with that particular hypothesis.
4. (2 pts) Describe your experimental design and procedure in detail. Include a list of all materials used, how you ran your experiment, what your control was, what was the variable being tested and what qualitative and quantitative data you collected.
5. (2 pts) Using a table or graph, present the results of your experiment (for both control and experimental groups).
6. (2 pts) Discuss your results. Compare the results from both control and experimental groups and discuss any differences/similarities. Were the differences due to the variable tested? Did your results support the hypothesis and was your prediction accurate?
7. Summarize what you learned from this lab activity. Was the experience what you expected (was it fun, difficult)?