

AP Biology Summer Lab Assignment

Directions: Choose ONE option from the following list of biology summer homework experiences. In order to get credit for this assignment, you must follow the directions and submit the evidence that is required in the first week of classes at DMHS. All materials must be in non-electronic format for this particular assignment -- you should feel free to hand-write, type and print, or some combination. You will share your work with colleagues. **Make sure your work is intellectually your own!**... although your family and friends can pitch in.¹

1. OBSERVE A ROTTING LOG FOR A PERIOD OF 14 DAYS.

Find a rotting log to observe for a period of at least 14 days. Visit it each day. Make five quantitative (measurements, length, etc.) and qualitative (feels like, looks like, colors) observations and record them. Use colored pencils to sketch the log each day or, if you prefer, take a picture of it each day. Finally, record observations about any living creatures (insects, plants, etc.) you see on the log.

Required Evidence: (1) Pages with five observations each day, a daily sketch or photograph, and observations about living things around the log. (2) A 250-word summary of what happened and the implications of those changes.

2. DISCOVER COLOR IN NATURE.

Go to any store that sells paint and collect a sample paint strip (or strips) with at least a total of seven paint swatches of various natural colors. For each color, go outdoors to a natural area and find something in nature that is exactly the same color hue at the time of collection. Cut the color swatch from the store out and glue or tape it along with the color from nature to a small piece of white poster board. Try to identify the object. Write an essay or reflection (1 page or less) about what conclusions you can reach about “color in nature” as a result of engaging in this experience.

Required Evidence: (1) Poster board with seven color swatches and colored objects from nature taped together. (2) Attempted identification of the natural objects. (3) A one-page reflection or essay.

3. BURY IT.

Take an athletic sock and fill it with various forms of garbage (soft drink can, banana peel, paper, etc.). Record in a data table some descriptive observations of the things you put in the sock. Some time before June 16th, go outside and bury it approximately 2 feet deep. On the day before school starts, dig up the sock and examine the objects inside. In the same data table, record your descriptive observations of the objects. Write a 250-word summary of the results and compare the sock to what you think happens in landfills where our trash is taken.

Required Evidence: (1) A data table with descriptions of trash before and after burying including illustrations or pictures. (2) A 250-word summary of what happened and comparison to landfills.

¹ You must include a list of specific acknowledgements if you have assistance. What exactly did your helper(s) do?

4. CHICKEN-BONE RECONSTRUCTION.

Purchase a whole chicken at a grocery store. Once you've had dinner, boil the bones in a large pot with 3 Tablespoons of hydrogen peroxide added to bleach the bones. Separate the bones. Carefully observe the bones, especially noting the appearance of the inside structure of the bone marrow. Now, reconstruct the bird's skeleton using wire, glue, or any other materials you find that work. Compare and contrast the bird's anatomy with your own. How is it similar? How is it different? Write a 250-word essay comparing and contrasting the bird anatomy with mammalian (ahem, YOUR) anatomy.

Required Evidence: (1) *Your bird's skeleton (be careful bringing it to school! Maybe you could put it inside a shoebox?).* (2) *An essay comparing and contrasting the bird's anatomy to yours.*

5. ANTHILL INVESTIGATION.

Locate an anthill. Make some ant food by mixing a spoonful of sugar with a small amount of water. Pour the mix 6 inches away from the anthill. Make observations at the anthill for 1 week for 15 minutes each day. Create a data table where you collect data about the ant behavior. Use these questions to help you observe: What activity do you see? What changes are happening over time? What reactions do you see to the stimulus (sugar)? Do not do anything to harm the anthill or ants or to interfere with them beyond providing the food source. Prepare a 250-word conclusion summarizing your results and discussing what you've learned along with the data tables.

Required Evidence: (1) *Data tables for 1 week, recording your observations.* (2) *A 250-word conclusion.*

6. DECAYING FOODS.

Prepare three paper or plastic plates, each with a slice of bread and another food of your choice like a piece of cheese or a small container of a condiment. Place one of the plates in the refrigerator, the second plate in a dark, cool area of the house (a closet, for example), and the third plate in a well-lit windowsill. Observe the food every day for 14 days. Keep a list of observations. Try to make five different observations or measurements daily. Focus on which of the plates of food are showing signs of decay the most quickly or most slowly. Sketch the plates of food daily using colored pencils. At the end of the 14 days, write a 250-word summary of what you have observed. What overall trends did you see in food decay or mold growth?

Required Evidence: (1) *Data for 14 days, including observations and sketches.* (2) *A 250-word conclusion summarizing what you found.*

7. WHAT PROBLEMS DOES SALTING OF ROADS CAUSE? OBSERVE NAILS RUSTING OVER 14 DAYS.

Fill four small plastic cups with tap water and label them with numbers 0, 1, 2, and 3.

- In cup #3, put three Tablespoons of salt.
- In cup #2, put two Tablespoons of salt.
- In cup #1, put one Tablespoon of salt.
- In cup #0, do not put any salt.

Put an iron or steel nail into each cup. Each day, for 14 days, make observations about each nail. Use these questions to guide your data collection: What color changes have occurred?

How much rust is present? Which nails seem the most rusty? Finally, write a conclusion that summarizes the data that you have found. Focus on these questions: How does salt in the water seem to affect the rustiness of the nails? How might salting roads in the winter cause problems for people?

Required Evidence: (1) Data log for 14 days. (2) A 250-word conclusion summarizing what you found and discussing the practical implications related to salting roads. (3) Your four nails in small plastic bags. Make sure the nails are labeled with the cup number or the amount of salt added.

8. ENVIRONMENTAL SCIENCE ZOO OBSERVATION.

An animal's habitat is an environment that provides the food and shelter required for the animal to make its home. Take a trip to a zoo or animal rescue center. Make sure you get a receipt. Choose five animals. For each animal, visit the exhibit and observe the habitat created by the zoo and read about the natural habitat. Write a description of the habitat that they live in naturally. What adaptations help the animals survive in their environments? Each habitat description should be at least 150 words. Include at least picture or illustration for each.

Required Evidence: (1) A receipt showing zoo admission. (2) Five different 150-word descriptions and illustrations of an animal's habitat. Make sure you discuss how the animal is adapted to its real-life environment. (You might need to look up the biology meaning of the word "adapted.")

9. PICTORIAL 2-WEEK NATURE STUDY.

Use a digital camera or disposable camera and find a tree, shrub, insect activity, or nearby park. For 2 weeks, take a photo each day of this one thing in nature and make observations. Print the photos and create a timeline of changes and observations made during the 2-week period.

Required Evidence: (1) A series of 14 photos in chronological order. (2) Two-sentence observations about each day. (3) A 250-word reflection about the changes you observed during the 2 weeks.

10. DESIGN AN INVESTIGATION ABOUT NATURE.

Design an investigation around a question you have about something in nature (e.g., What seeds do cardinals prefer?). You should pick something to which you -- and the internet -- do not know the answer. Determine a method to investigate your question. Collect data, both numerical and observational. Prepare your results with at least two graphs or charts. Write a conclusion about your investigation (must be at least 250-words).

Required Evidence: (1) A lab report including the hypothesis, methods, results (text plus at least two graphs or charts) and a 250-word conclusion that includes questions for further research.