AP Lab 11: Animal Behavior/Experimental Design

Introduction

Ethology is the study of animal behavior. Behavior is an animal's response to sensory input, and falls into two basic categories: learned and innate (inherited).

Orientation behaviors place the animal in its most favorable environment. In taxis, the animal moves toward or away from a stimulus. Taxis is often exhibited when the stimulus is light, heat, moisture, sound,or chemicals. Kinesis is a movement that is random and does not result in orientation with respect to a stimulus. If an organism responds to bright light by moving away, that is a taxis. If an animal responds to bright light by random movements in all directions, that is kinesis.

Agonistic behavior is exhibited when animals respond to each other by aggressive or submissive responses. Often the agonistic behavior is simply a display that makes the organism look big or threatening. It is sometimes studied in the laboratory with Bettas (Siamese Fighting Fish).

Mating behaviors may involve a complex series of activities that facilitate finding, courting, and mating with a member of the same species.

Exercise 11A: General Observation of Behaviors

In this lab, you will be working with Crickets. These organisms are members of the Phylum Arthropoda, Class Insecta. Insects outnumber all other forms of life combined (at species level)

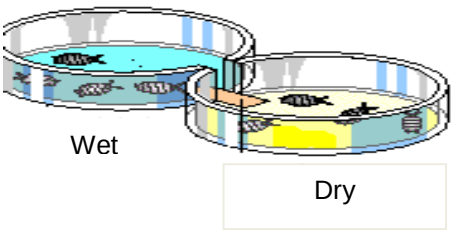
Procedure

1. Place 5 crickets in a small petri dish. They generally try to get out so cover the dish with plastic wrap or a petri dish cover.

2. Observe the crickets for 5 minutes. Make notes on their general appearance, movements about the dish, and interactions with each other. Notice if they seem to prefer one area over another, if they keep moving, settle down or move sporadically. Note any behaviors that involve 2 or more crickets. Do not interfere with the specimens in any way.

3. Make a detailed sketch of a cricket.

4. Prepare a choice chamber. The choice chamber may consist of two large plastic petri dishes taped together with an opening cut in between. Several alternatives to this concept can be produced. Take 2 plastic petri dishes and cut out 1 , 1/2 inch openings at the side. Place the petri dishes together, matching the cut ends. Now tape the petri dishes together by placing a strip of tape under each one. The dishes now can be used to test for the variables.



5. For this experiment create a moist and dry choice chamber. Later you will choose your own variables to be tested; light, food, bedding, heat, cold; and set up the choice chambers accordingly. Use a soft brush to transfer 5 crickets from the stock culture into the center choice chamber. Cover all chambers being used.

6. Count how many crickets are on each side of the choice chamber every 30 seconds for 10 minutes. Record your data in table below. Continue to record even if they all move to one side or stop moving.

7. Return your crickets to the stock chamber.

8. Graph both the number of crickets in chamber 1 and the number in chamber 2 using the graph provided.

Data/Observations

Time (Mins)	Number in Chamber 1 Moisture	Number in Chamber 2 Dry	Other Notes (center chamber)
0			
0.5			
1.0			
1.5			
2.0			
2.5			
3.0			
3.5			
4.0			
4.5			
5.0			
5.5			
6.0			
6.5			
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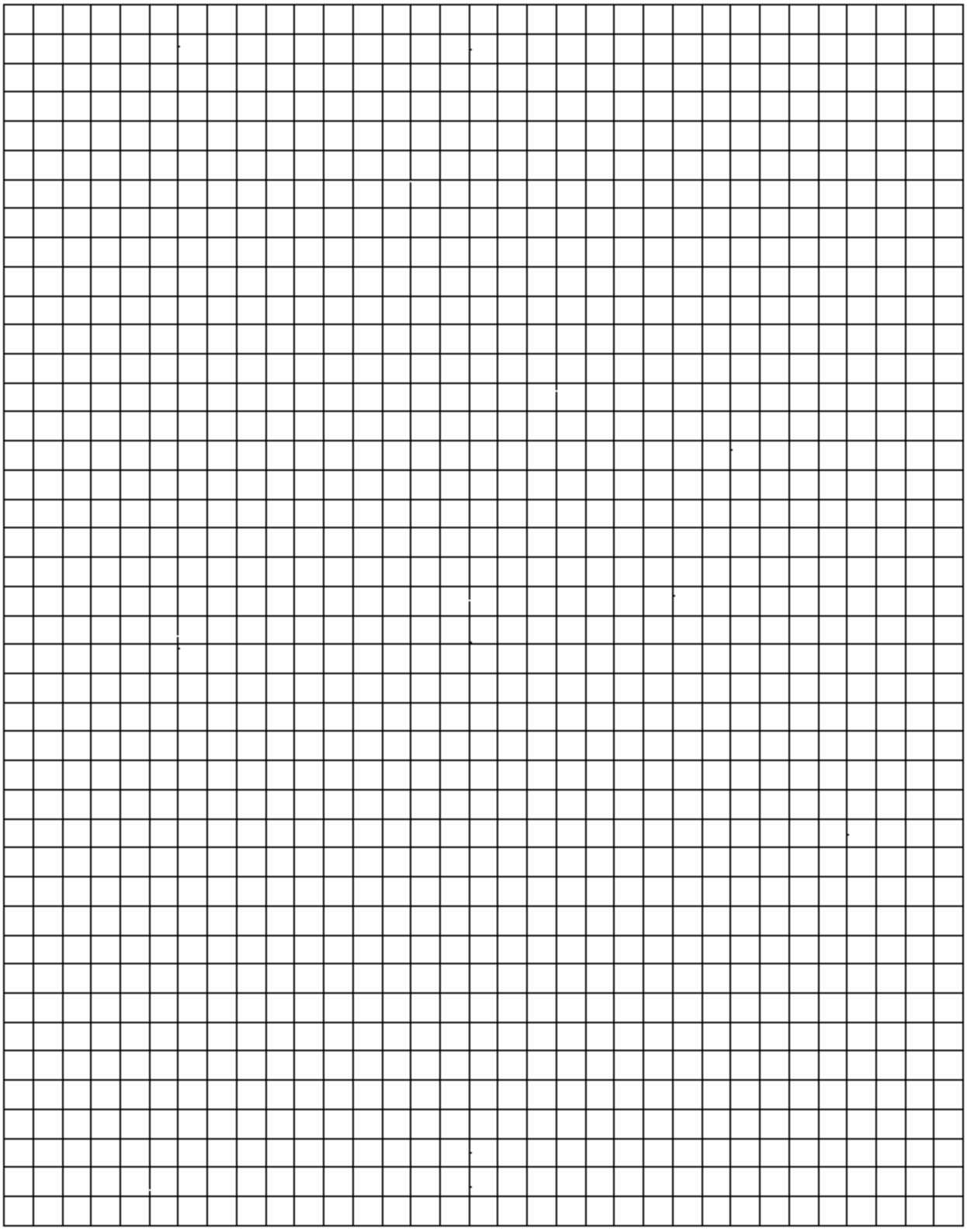

Analysis Questions

1. What conclusions do you draw from your data? Explain physiological reasons for the behavior observed in this activity.

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2. How do crickets locate appropriate environments?

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3. If you suddenly turn a rock over and found crickets under it, what would you expect them to be doing? If you watch the crickets for a few minutes, how would you expect to see their behavior change?

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4. Is the cricket's response to moisture best classified as kinesis, or taxis? Explain your response.

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5. Identify the control(s), independent variable, and dependent variable in this experiment and explain why you have identified the factor you chose as each.

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Inquiry Lab: Design your own experiment to Investigate Crickets' Response to Temperature, Background Color, Light, Food, Bedding or other Variable.

1. Select one of the variable factors above, and develop a problem and hypothesis concerning the cricket's response to the factor.

2. Use the material available in your classroom to design an experiment. Remember that heat is generated by lamps. List the materials you will use and outline your procedure in detail.

3. Decide what data you will collect, and design your data sheet.

4. Run your experiment and collect your data. Graph your results and write a conclusion about why you think the crickets made their choices.