Name: _____

Lab 5: Foraging Behavior Analysis

Due in lab March 3rd. Answer on this worksheet only. Pages must be stapled together.

1. Summarize the data for the **mean abundance** of birds at the three time intervals and the three treatments in the table below. Only present the data for all species combined (right column of data summary).

	Time Period			Treatment		
Feeder #	1st	2nd	3rd	control	unfamiliar	threat
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
Mean:						
St. Dev.:						

2. Record the results from the Repeated Measures Anovas testing for differences in the **number of foraging birds** at *the three time periods* **and** during *the three treatments* and indicate (yes or no) if the results are statistically significant.

		F-value	Deg. of freedom	P-value	Significant?
Testing the effect of:	Time period				
	Treatment				

3. Draw a line plot to illustrate the *mean* abundance of foraging birds in the three *time periods* (left side data in Question 1). [line plots are used to illustrate data that represent a sequence or progression, such as over time.] Include standard error bars to indicate +1 standard error*. Attach this graph to the back of this worksheet.

4. Prior to carrying out this experiment, during which time periods would you have *predicted* the least and most number of foraging birds? Briefly explain your reasoning.

5. Were the differences in bird foraging rates over time (Questions 2 & 3) what you expected? If not, explain why you might have gotten different results.

6. Draw a bar graph to illustrate the *mean* abundance of foraging birds in the three *treatments* (right side data in Question 1). Attach this graph to the back of this worksheet. Include error bars to indicate 1 standard error.*

7. Which treatments would you have predicted would have the least and most number of foraging birds? Briefly explain your reasoning.

8. Were the differences in bird foraging rates during the treatments (Questions 2 & 6) what you expected? If not, explain why you might have gotten different results.

* Warning: selecting standard error bars in MS Excel will NOT give the correct result. You must point to cells that have the standard error values; these should be aligned with the appropriate means.

9. Based on the results in Questions 2-8, do you think time of day or experimental treatment explains *more* of the variation in bird abundance? Explain.

Questions 10-13. In the questions above, we combined the data from all of the species of birds. However, it is possible that the various species behave differently. In particular, we might expect a predominantly arboreal species capable of rapid flight (such as doves) to behave differently from decent flying but small songbirds (e.g. sparrows and finches) or from a weak-flying terrestrial species (such as a quail). Repeat your analyses using just the data from **two** of the species of birds.

10. Which group of birds (doves, quail, song birds) would you *predict* to show the strongest response to new and/or threatening stimuli? Explain your answer.

11. Compare the effects of treatment on two of the more common species of bird observed in this study (such as mourning dove or house finch). The two species should come from different groups (e.g. dove, quail or song bird). Analyze each species separately. Record the results in the following table:

Species:	Mean (±SD) Abundance			F-value	Deg. of freedom	P-value	Signifi cant?
	control	unfamiliar	threat				

12. Graph the effect of treatment on foraging rates for the two species of birds that you selected. You may graph them separately or combine them into one graph. Be sure to clearly label your graphs. Attach these graphs the back of this worksheet

13. Do the results observed in Questions 11-12 support or contradict the prediction you made in Question 10? Explain.

14. Based on your knowledge of anti-predator strategies in animals, what treatment do you predict will result in birds being more likely to *visit the feeder in groups* (not necessarily the most abundant)?

15. How might the data *you already collected for this lab* be used to test this hypothesis? Explain what specific subset of the data you would use and what you comparisons you would make.