Chapter 1 Primates Exploring Primates: Get a Grip! Experiment

Team Members: The team manager is responsible for overseeing the people, and the time manager is responsible for keeping the team on track, etc. All members are responsible for participating and completing the experiment cooperatively.

Team Manager _____
Time Manager_____
Subject #1_____
Subject #2_____

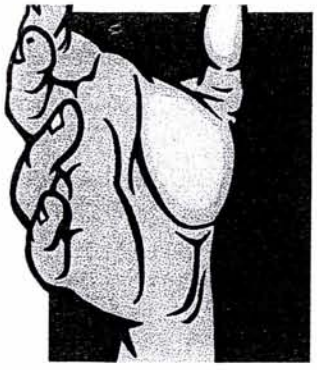
Testable Question:

Hypothesis:

Procedure: Use the protocol on textbook p.23 to help you write your step-by-step procedure. If you are a team of 2-3, you only to test one subject. If you have a team of 4 or more, you must have at least 2 subjects.

All team members must have the testable question, hypothesis, and data table in their notebooks. You may make a draft table on the back of this paper if you want.

[redacted] Stamp of Approval



Name_____ Date_____

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Chapter 1 Primates Exploring Primates: Get a Grip! Analysis

Your responses will be graded according to the lab report rubric criteria for these parts of a lab report and become a lab grade. If you need more space, continue on looseleaf. If you would prefer to type your answers, title each part and print it out to submit.

Conclusion: *Remember a conclusion is a direct statement answering your testable question.*

Discussion: *Remember the 2 parts of a discussion section 1) summarize the results; 2) explain the results using scientific principles; 3) address sources of error that may have affected your results. Use what you have learned about human and primate hand use to explain the results from your experiment.*

Analysis Questions: *Answer the following questions in complete sentences.*

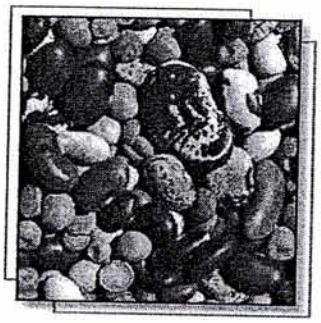
1. In what ways do you think the thumb is important to the way humans use their hands?

2. Look back in your notebook at the record of observations of the way other primates use their **hands**. In what ways do they use their thumbs? How are those ways **different** from what you just discovered about how humans use their thumbs?

3. Review the posture and stride observations you made for humans and other primates. How is human **movement and posture different** from that of other primates?

4. Why do you think humans and other primates have different hand structure and posture?

Natural Selection Record Sheet



Game Warden:_____

Predator 1:_____

Predator 2:_____

Predator 3:_____

Predator 4:_____

Hunt 1

Bean Color	**Black**	**White**	**Red**	**Pink**	**Spotted**
Starting Population	20	20	20	20	20
# eaten by Predator 1					
# eaten by Predator 2					
# eaten by Predator 3					
# eaten by Predator 4					
Total # Eaten in Hunt 1					
Number of Beans left "alive"					
Number of offspring to add for the next hunt (Beans left alive x 3)					
Starting Population for the next hunt (Beans left alive + added offspring)					

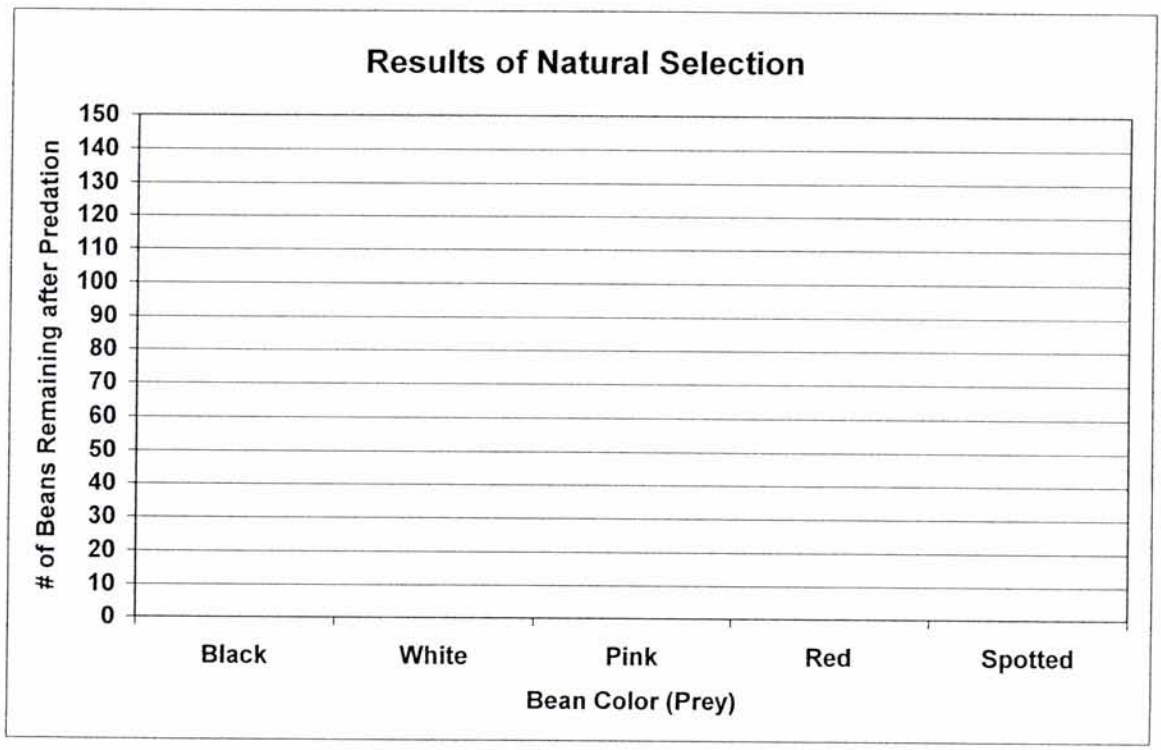
Hunt 2

Bean Color	**Black**	**White**	**Red**	**Pink**	**Spotted**
Starting Population					
# eaten by Predator 1					
# eaten by Predator 2					
# eaten by Predator 3					
# eaten by Predator 4					
Total # Eaten in Hunt 1					
Number of Beans left "alive"					
Number of offspring to add for the next hunt (Beans left alive x 3)					
Starting Population for the next hunt (Beans left alive + added offspring)					

Hunt 3

Bean Color	Black	White	Red	Pink	Spotted
Starting Population					
# eaten by Predator 1					
# eaten by Predator 2					
# eaten by Predator 3					
# eaten by Predator 4					
Total # Eaten in Hunt 1					
Number of Beans left "alive"					
Number of offspring to add for the next hunt (Beans left alive x 3)					
Starting Population for the next hunt (Beans left alive + added offspring)					

After completing Hunt 3, use graph paper and colored pencils to create a bar graph of your data showing the number of each color bean remaining.



Name_____ Date_____

[redacted] [redacted]

Natural Selection Activity Discussion & Analysis

1. **Discussion:** Write a scientific explanation of what happened in this natural selection hunting activity. Remember the testable question was: Which rabbit (bean) color would survive and reproduce at the highest rate in your given environment?

Claim (Conclusion)	
Evidence: Should be your data and/or class data. Be specific.	
Reasoning: This is where you should connect your data to the scientific concepts of natural selection and evolution that you learned.	

ANALYSIS QUESTIONS:

1. List at least one selective pressure in this environment. _____

   _____

2. Describe an adaptation in one of the species._____

   _____

3. How did the individual rabbits and foxes get their adaptations?

4. If your "environment" changed to a different color, how would you expect the results of the experiment to change?

5. Explain how one characteristic of the prey population (rabbits) might change in the future because of natural selection.

6. Explain how one characteristic of the predator population (foxes) might change because of natural selection.

Name_____ Date_____

[redacted]

Tony's Brain Analysis

Question: What is can you conclude about Tony's condition? Use the data you have collected to answer the question providing a claim, evidence, reasoning, and a rebuttal. The lab report rubric will be used to grade this writing.

Claim: Write a clear, direct statement that answers the question.

Evidence: In complete sentences, state the evidence that led you to your claim. You must have <u>sufficient</u> (enough) evidence to make your point.

Reasoning: Explain HOW the evidence above supports your claim. This is the SO WHAT…? Different pieces of evidence may have different reasoning. Apply as much biology as you can in your reasoning.

Rebuttal: It is possible that another scientist would come to a different conclusion. Provide one possible alternate conclusion. Then defend your claim stating why it is a better conclusion that this one.

Analysis Questions (adapted from TB p.29). Attach looseleaf if you need more space.

1. It appears that Tony's mind was affected by his illness because his feelings and behaviors changed so dramatically. At the same time, there is medical evidence of physical changes in the brain. Given this information, explain whether or not you would now change your original definitions for brain and mind.

2. In this activity, you conducted an analysis using **inductive reasoning**. This means that you made observations and collected evidence in an effort to explain Tony's unusual behavior. How does new information affect the conclusions that people might draw through inductive reasoning? When can you be certain that you have arrived at the correct explanation for a problem like Tony's?

3. As humans age, there is a normal decline in memory due, generally, to a drop in the number of brain cells (neurons). In people suffering from memory loss due to Alzheimer's disease, however, there is a drop in the amount of neurotransmitters in the brain. In addition, the folds of the cerebrum shrink in a brain affected by Alzheimer's disease.
   Using what you have learned about the brain and mind in the last two activities, explain how the decline in neurotransmitters and shrunken folds relate to reduced functioning in the minds of Alzheimer's patients.

Copymaster: Personal Interview with Tony

Worried about your friend when he will not come to see you, you go over to his house. His parents are happy that you try to talk to him because he is not responding to them. You go up to his room to see him.

"Hey, Tony, how's it goin'?"

"Oh, OK I guess," Tony responds without enthusiasm.

"Are you sick or something? You seem kinda down."

"I don't think I'm sick, but about four months ago I was real sick for a few days and had a high fever."

"What about your soccer injury? You hit your head pretty hard in that game six or seven weeks ago. Does that still bother you?"

"Yeah, I got whacked pretty good, but the doctor said it was just a mild concussion. After two days, I didn't feel dizzy anymore. I think my head's OK. Until recently, I felt good. Lately, though, I'm either tired and restless or I have too much energy and can't relax." Tony sighs as if he, too, is bothered by his behavior.

"You're not doin' drugs or drinking, are you?" you ask tentatively.

"No way, man! You know what happened to my brother because of that stuff." Tony displays more emotion in this response than you've seen in weeks.

Tony also tells you that he is not worried about any particular problem, but he looks almost on the verge of tears when he says it.

Copymaster: Results of the Doctors' Investigation of Tony's Behavior

Finally, after several trips to the family doctor, Tony's family intervenes and has him hospitalized to see whether doctors can find a cause for his unusual behavior. When Tony arrives at the hospital, the physicians and nurses ask him questions and run a series of diagnostic tests. They obtain the following information from these procedures:

1. An interview by a general physician reveals no significant information beyond what you learned in your interview. Tony continues to report that he has no pain. Tony is aware of his surroundings but is disinterested, his speech patterns are normal, and he appears unhappy, as though his outlook is hopeless.
2. A psychiatric survey of family history reveals that Tony's family has a history of mental illness. Tony's great uncle was depressed and his great grandmother was committed to a mental institution for a short period of time when she was a young woman.
3. Psychiatric tests reveal a high intelligence level, good reasoning abilities, good pattern recognition, somewhat faulty short-term memory but good long-term memory.
4. A physical exam indicates good general health, normal vision, and good reflexes and sense of balance. Lab tests show no traces of drugs in Tony's urine, but they do show a somewhat impaired immune system, as indicated by a low white-blood-cell count. A brain scan for physical structure (MRI) shows no abnormalities such as tumors, blood clots, or inflammations. A brain activity scan (PET scan) shows slightly depressed levels of glucose utilization.

Copymaster: Some Disorders of the Mind and Brain

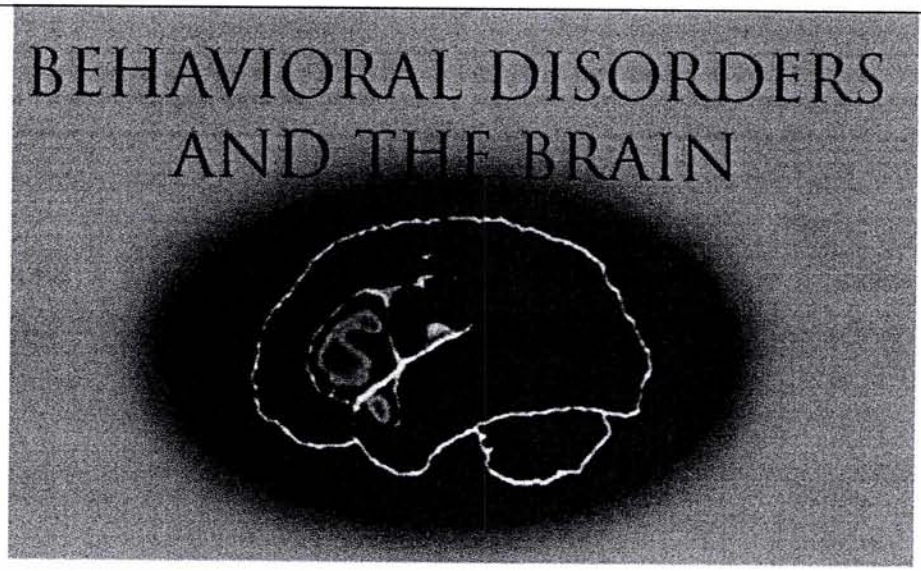
Disorder	Behavior May Include	Body Abnormalities May Include	Brain Abnormalities May Include	Tests and Treatment
Head injury	loss of memory lethargy depression "spacing out" resulting in periods of missing time loss of specific mental abilities	severe headaches neck pain nausea dizziness seizures	swelling depressed areas blood clots	EEG (electroencephalogram) may show electrical activity in injured portion of brain. Spinal tap may show blood in cerebrospinal fluid. *Treatment:* May require surgery to prevent bleeding and reduce swelling.
Alzheimer's disease	disorientation loss of memory depression hallucination gradual loss of memory and ability to reason	As disease progresses, patient exhibits tremors loss of body functions	decreased brain size enlarged fluid-filled ventricles regions of cell death	PET scan shows impaired brain activity occurs in middle-aged to elderly people. Family history show similar problems. *Treatment:* Drug therapy to improve memory helps for a small percentage of patients.
Bipolar manic-depressive illness	episodes of depression followed by episodes of mania (extreme activity and excitement; often includes compulsive behavior)	fatigue followed by nervousness and sleep disorders	reduction in size of temporal lobe or cerebrum	Family history shows similar problems. PET scan shows depressed glucose utilization levels. *Treatment:* The drug lithium helps eliminate mood swings.

(continued)

Copymaster: Some Disorders of the Mind and Brain (continued)

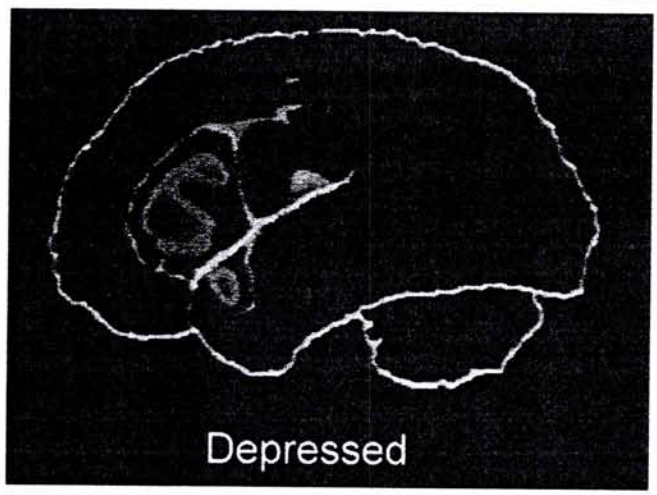
Disorder	Behavior May Include	Body Abnormalities May Include	Brain Abnormalities May Include	Tests and Treatment
Encephalitis	loss of awareness uncontrollable movement	severe headaches vomiting stiff neck sensitivity of eyes to light fever		Elevated-white blood-cell counts indicate some type of infection. Cerebrospinal fluid pressure greatly increases. Bacteria is not present.
Multiple sclerosis	slurred speech lack of balance intoxicated appearance	tingling across chest numbness in limbs tremors in hands heat increases symptoms	absence of myelin from neurons hard tissue plaques present in brain	Electrical activity in brain pathways slows. Change in antibodies found in cerebrospinal fluid.
Schizophrenia	disjointed thinking constant distraction socially withdrawn loss of interest in surroundings hallucinations		enlarged fluid-filled ventricles reduced blood flow in front portion of cerebrum	Family history shows similar problems. *Treatment:* Antipsychotic drugs and behavioral therapy.
Stroke	disorientation loss of memory mood changes	paralysis of portions of body	hemorrhages in brain	*Treatment:* Drug therapy reduces clots.
Tumor	loss of memory disorientation mood changes or mood swings loss of specific mental abilities	headaches loss of consciousness paralysis loss of specific abilities	growth in brain	MRI may detect tumors. *Treatment:* Surgery, radiation, or chemotherapy to remove or shrink tumor or kill tumor cells.

BEHAVIORAL DISORDERS AND THE BRAIN

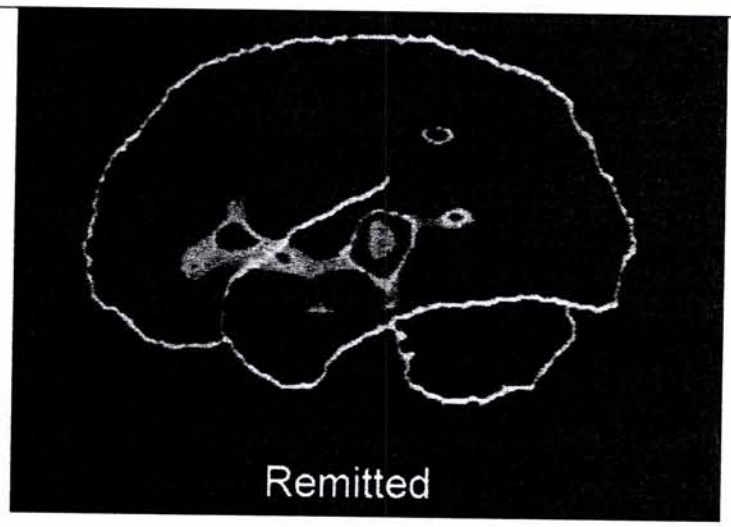


The following PET scans show glucose metabolism in the brain in a patient with different stages of manic depressive disorder. The brighter the color, the more active that part of the brain is.

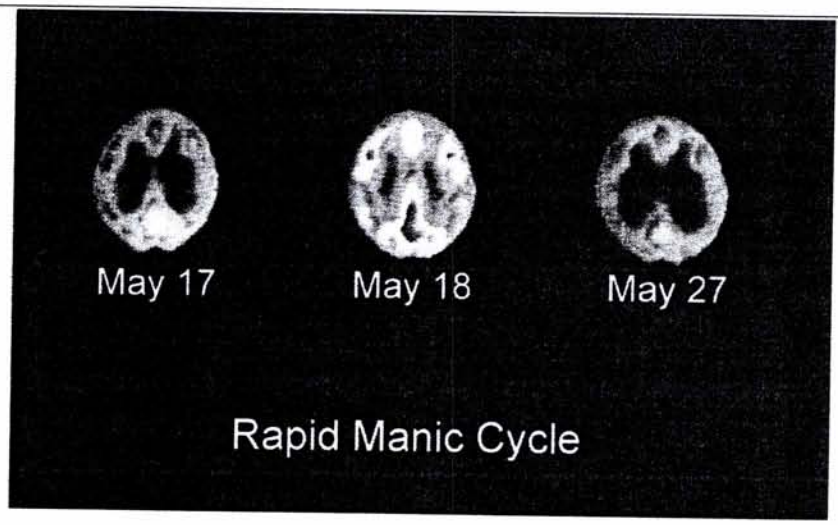
These images are used to help confirm diagnoses but are themselves a diagnosis.



Notice that the bright part of the image is near the front of the brain. There is little activity in the central part of the brain.



This individual has emerged from a depressive state. Notice that there is now more activity in the center part of the brain.



May 17	May 18	May 27
Depressed state	Manic state What do you notice about overall activity?	Depressed state