

## Natural Selection and Evolution Lab with Teddy Grahams

**Question:** How does natural selection affect the frequency of a single trait in a population through successive generations?

**Materials:** Paper towel "habitat", small bathroom size cups, teddy grahams, graph paper, calculator

### Part 1: Natural Selection with Teddy Grahams

Work in pairs. Read the introductory story below:

"You are a bear-eating monster. There are two kinds of bears that you like to eat: Happy Bears (arms are up) and Sad Bears (arms are down). Happy Bears are easy to catch and taste sweet. Sad Bears are bitter, sneaky, and are hard to catch. Because of this, you eat only Happy Bears, if possible. New bears are born every "year" during hibernation, and the birth rate is one bear for every surviving bear left from the last year."

### **Procedure:**

1. Obtain a population (cup) of bears from your teacher. Be sure to pour them on the paper towel habitat so you know they are clean.
  
2. Record the number of Happy Bears and Sad Bears and the total population in your data table (before any predation/eating takes place!)
  
3. Eat three Happy Bears. If you do not have three Happy Bears, then eat the difference in Sad Bears- after all, the predator must have three bears to survive.
  
4. Add a new generation of bears to the population (equal in number to bear survivors-each has one offspring). Add these new bears to your habitat containing the old bears and chart your results for the entire population.
  
5. Repeat the steps above until you have five generations recorded in your data table.

**Hypothesis/Prediction:** What do you expect to happen to the number of Sad and Happy bears over time?

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**Data Table 1: Class Data for Five Bear Generations**

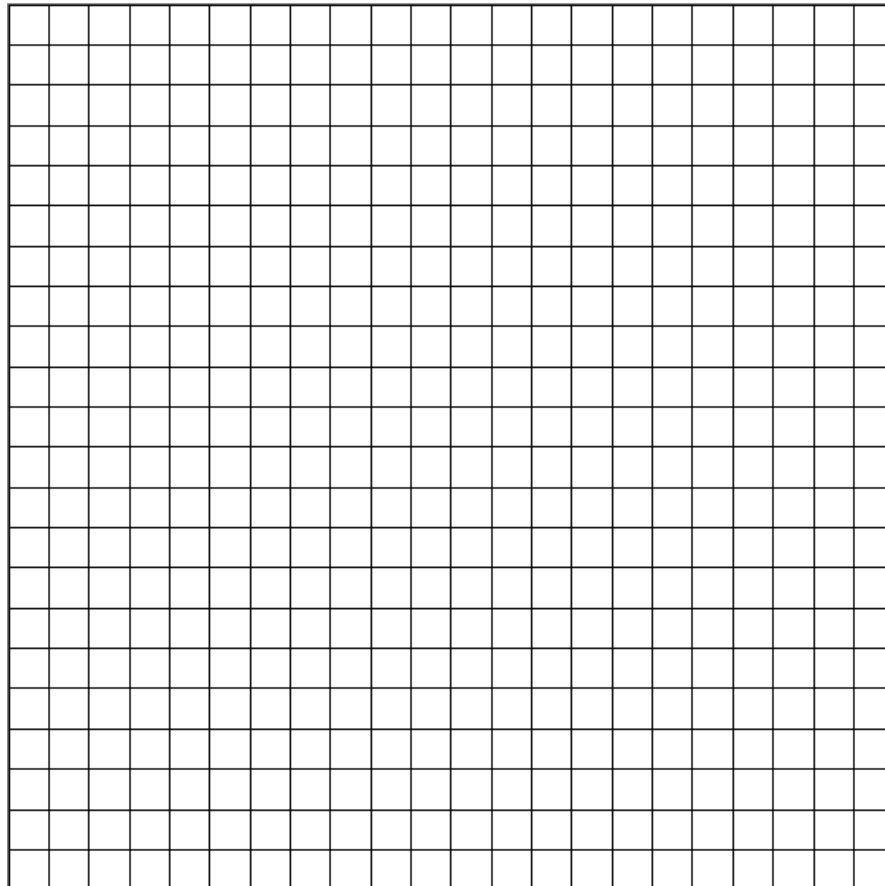
Generation	# of Happy Bears at start of generation	# of Sad Bears at start of generation	Total	% Happy Bears	% Sad Bears
1					
2					
3					
4					
5					

\*Once Part 1 is complete, you may eat all of your bears while you do Part 2.

Part 2: Calculations

Calculate % of happy and sad bears for each generation (use class data). Prepare a **line graph with the generation number on the x axis versus % of bears on the y axis**. Use different lines or colors to indicate the two populations of bears (happy and sad).

**Graph 1 Title** \_\_\_\_\_



**Data Analysis:**

1) In your small lab groups, how many new bears did you add for each generation?

- Generation 2 \_\_\_\_\_
- Generation 3 \_\_\_\_\_
- Generation 4 \_\_\_\_\_
- Generation 5 \_\_\_\_\_

2) What happened to the percentage of each type of bear over time?

- a. Happy?
- b. Sad?

3) How does this compare with your hypothesis?

**Conclusion:**

Claim (a statement that answers the original question/problem):

Evidence (site specific data that support your claim):

Reasoning (use scientific principles-natural selection, evolution, selective pressure- to explain how your evidence supports your claim):

**Student Evaluation Method:** You will be graded on completion of lab, accuracy of data collection and manipulation, graphing, response to analysis questions, and conclusion.