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DARWIN'S FINCH BEAK LAB

Objective/Skills: You are going to mimic how the variations of Darwin's finches compete for three different types of food sources. Pretend that the different types of objects (pasta, beans and rice) are different types of seeds for the birds. Pretend that the different tools (fork, clothespin, spoon, and chopsticks) are different shaped finch beaks. You will simulate natural selection happening throughout the trials in this lab. Natural selection (survival of the fittest) occurs when a population changes in response to their environment.

Hypotheses:

Experiment 1:

- I believe that the _____ (type of tool) beak adaption will be the most fit for eating *pasta* because _____.

Experiment 2:

- I believe that the _____ (type of tool) beak adaption will be the most fit for eating *beans* because _____.

Experiment 3:

- I believe that the _____ (type of tool) beak adaption will be the most fit for eating *rice* because _____.

Materials:

Chopsticks
Fork
Clothespin
Spoon
Rice
Pasta

Beans
Paper for "Eating"
Paper Cups
Lab Write-up

Procedure:

1. There will be lab groups containing 4 scholars. Each group member will be assigned a different "beak adaptation" and must keep their "beak" for the entire lab (no switching between trials!)
2. Your lab groups needs to count out 20 pieces of pasta, 20 beans, and 20 grains of rice and place them into 3 individual cups (do not mix them).
3. You will have 45 seconds to do each trial, there will be 3 trials (1 for each of the "seeds" pasta, beans, and paper clips).
4. Start experiment #1 with 1 paper cup of 20 "seeds" of pasta. Toss the "seeds" on the desk carefully on the paper. You and your lab partners will have 45 seconds to "eat" as many "seeds" as you can with your "beaks." Once you "eat" and object, put it in your hand for counting later.
5. At the end of the time, record the number of "seeds" you ate (these are the number in your

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hand) and write down your data into your chart for that experiment. Copy the number of “seeds” your lab partners ate with their “beaks” on the chart for that experiment.

6. Put a circle in the data table around the number for the “beak” that collected the LEAST amount of “seeds” for each particular trial. Put a square in the data table around the number for the “beak” that collected the MOST amount of “seeds” for each particular trial.

7. Return “seeds” to the proper cup and then repeat steps 4-6 for experiment #2 (beans) and then experiment #3 (rice).

8. When you are done collecting, clean up the lab station and then total the number of each seed type eaten. Graph your results on a bar graph on the provided grid.

9. Answer the analysis and conclusion questions and make sure all components are completed in anticipation of your lab write-up.

Data: (make these charts on your lab write-up)

Circle the LOWEST performing “beak” for each trial (this represents extinction)

Put a box around the HIGHEST performing “beak” for each trial

Experiment #1 Pasta

Seed Type	Clothespin	Spoon	Fork	Chopsticks	TOTAL
# of Pasta eaten					

Seed Type	Clothespin	Spoon	Fork	Chopsticks	TOTAL
# of Beans eaten					

Experiment #2 Beans

Experiment #3 Rice

Seed Type	Clothespin	Spoon	Fork	Chopsticks	TOTAL
# of Beans eaten					

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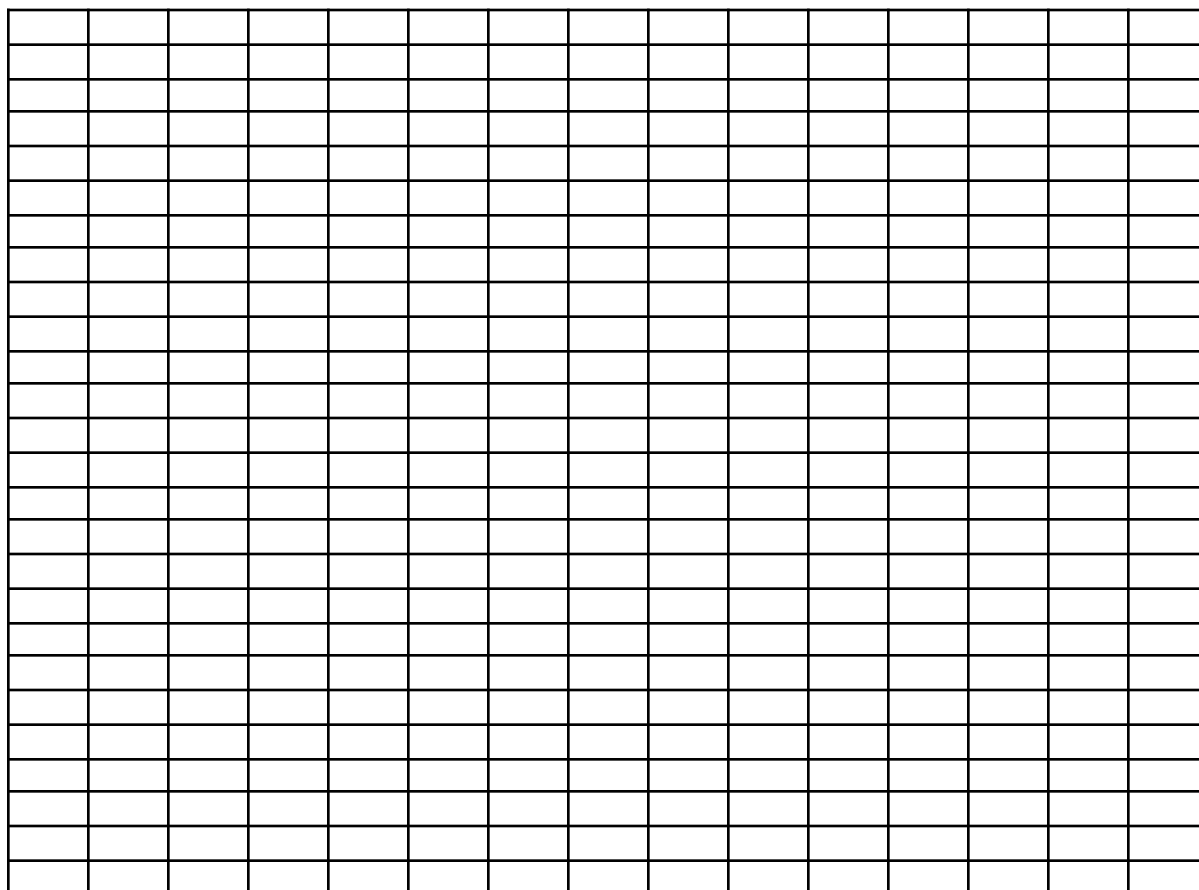
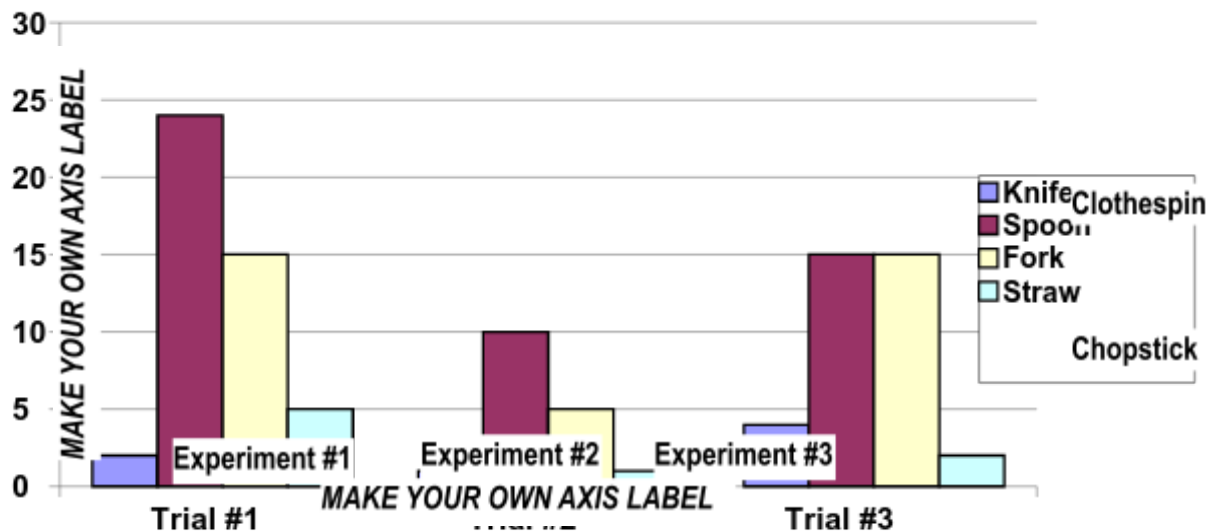
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Graph:

Create three separate bar graph clusters. Trial # (seed type) is on the x-axis and the total number of “seeds” collected in that trial is on the y-axis. Use a legend and colored pencils to graph all of the four beak adaptations for each trial cluster.

Example:

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Analysis:

Refer to your charts and bar graphs to answer the following questions

1. Which finch became extinct in **trial #1 pasta**? _____
2. Why did this finch become extinct? _____
3. Which finch was best fit for survival on this “seed” type? _____
4. Why was this finch best fit for survival? _____
5. Which finch became extinct in **trial #2 pinto beans**? _____
6. Why did this finch become extinct? _____
7. Which finch was best fit for survival on this “seed” type? _____
8. Why was this finch best fit for survival? _____
9. Which finch became extinct in **trial #3 paper clips**? _____
10. Why did this finch become extinct? _____
11. Which finch was best fit for survival on this “seed” type? _____
12. Why was this finch best fit for survival? _____

Conclusion Questions: *(Include answers to these in your conclusion paragraph)*

By analyzing all of the trials’ collected data:

15. Which finch “beak” performed best over all the trials? _____
16. Did this answer match your hypothesis? _____
17. Why did this finch “beak” perform best? _____

18. Which finch “beak” performed worst over all the trials? _____
19. Did this answer match your hypothesis? _____
20. Why did this finch “beak” perform worst? _____

21. What were some hidden factors (did you develop a strategy) you realized while doing these trials to help your “beak” eat more “seeds” during the trial? _____

22. How does this relate to animals in real life? _____

23. How might these finches avoid extinction due to competition? _____

24. What kind of evolution (e.g. convergent) did Darwin’s finches actually undergo? _____

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