

**Forkbird  
Feast**

Name \_\_\_\_\_  
Date \_\_\_\_\_ Period \_\_\_\_\_

**Objective:** *During the history of Earth, species have both evolved and become extinct. Why do some species survive to reproduce while others do not?*

What you will need: (groups of 4)

- 4 forks with 1 tine
- 4 forks with 2 tines
- 4 forks with 4 tines
- 4 plastic cups
- One number cube
- 1 flat tray
- 1 cup of wild loops

**The Forkbird Model**

In this activity, you will role-play a single species called “forkbirds.” Forkbirds feed by either spearing or scooping their food. During feeding time, each bird gathers “wild loops” and immediately deposits them in its “stomach” before gathering more food. Your goal is to gather enough food to survive and reproduce. This will allow you to pass your genes on to another generation. Occasionally, a forkbird offspring will have a genetic mutation that makes it look different from its parent.

**Procedure:**

1. The initial forkbird population only has beaks with only **two tines**. Each person in your group should begin the activity with a 2-tined fork. Record the initial population of each type of forkbird in the *Forkbird Populations Table*.
2. I will tell you when feeding time begins, and then all of the forkbirds may feast.
3. When feeding time ends, count the number of wild loops eaten by each forkbird. Within your group, the two forkbirds that gathered the most food survive to reproduce. (If there is a tie for second place, then three forkbirds survive. The two forkbirds that tie should keep their forks and skip Step 4.)
4. The two surviving forkbirds should each toss the number cube. Use the table below to determine the beak type of the offspring of each surviving forkbird. The group members whose forkbirds did not survive should now assume the roles of the offspring.

Number Cube Key	
Your Toss	Forkbird Offspring
1	1-tine forkbird
2	2-tined forkbird
4	4-tined forkbird
3, 5, 6	Same as parent forkbird

5. Record the new population of each type of forkbird in your group in the next row of your data table.
6. Return all of the wild loops to the “forest floor” (tray) to simulate the growth of wild loops.
7. Repeat steps 2-6 for nine more rounds to represent additional generations.

**Table 1: Group Forkbird Population Data**

<b>Generation</b>	<b>1-Tined Forkbird</b>	<b>2-Tined Forkbird</b>	<b>4-Tined Forkbird</b>
Initial			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

8. Share your data with the class. As a class, record the population of each type of forkbird over many generations in Table 2: Class Forkbird Population Data.

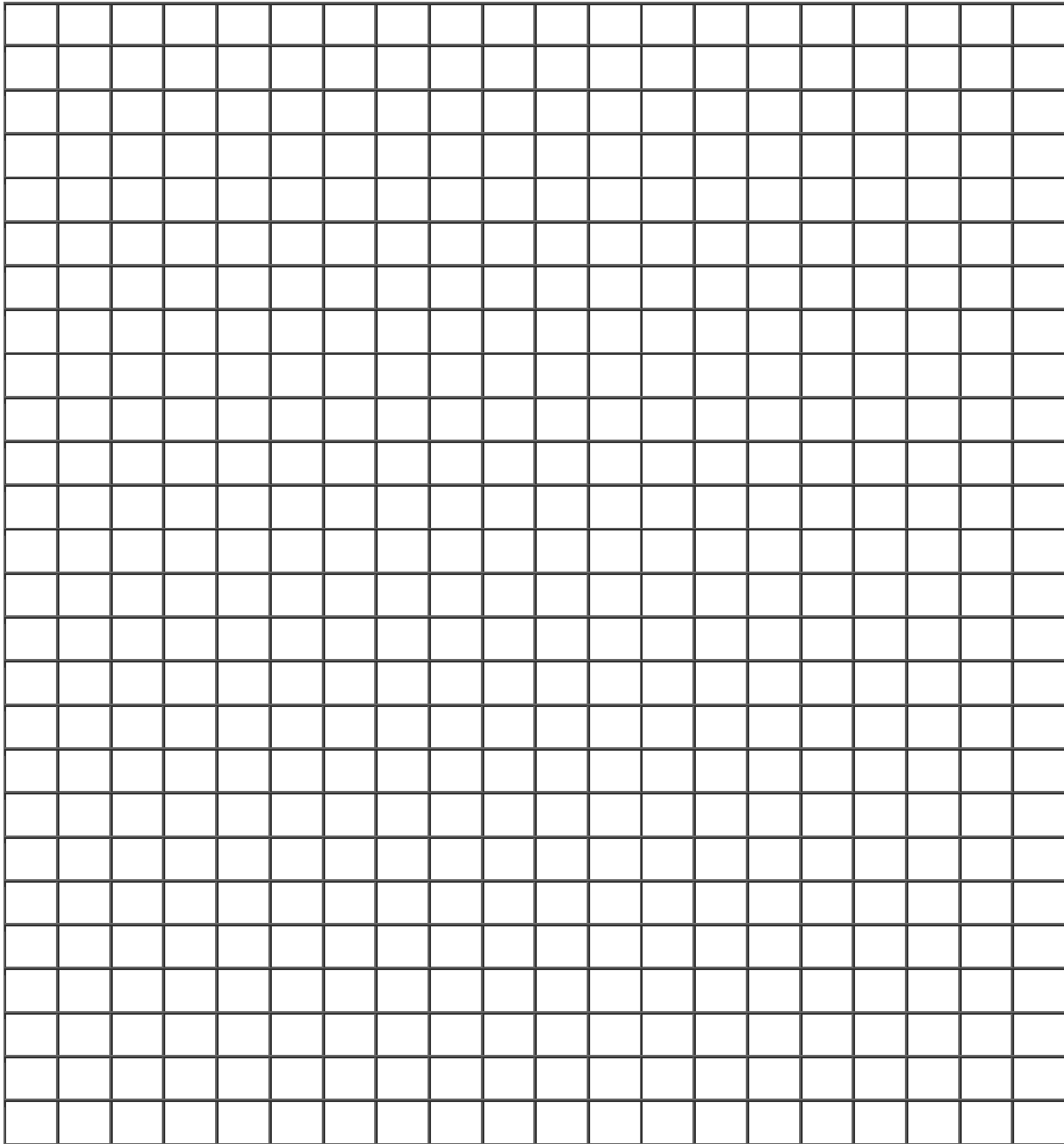
**Table 2: Class Forkbird Population Data**

<b>Generation</b>	<b>1-Tined Forkbird</b>	<b>2-Tined Forkbird</b>	<b>4-Tined Forkbird</b>
Initial			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

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9. Create a graph of the class totals of each type of forkbird over many generations. You can plot the data for all three types of forkbirds in the form of a **line graph**. *Be sure to title your graph, label your axes and provide a key.*



**Analysis:** Answer the following questions using complete sentences!

1. Which type of forkbird was the most successful? Explain how the class data supports this conclusion.

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2. Look at your graph of the class results. Describe what happened to the number of each type of forkbird over many generations.

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3. In the forkbird model, mutations at reproduction were much more common than they are in real life. Imagine that the number of mutations was lowered, so that the vast majority of offspring had beaks similar to those of their parents. Predict what you think would have happened to the numbers of each type of forkbird in future generations.

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4. How did the forkbird activity simulate/model the process of natural selection? Explain.

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5. The forkbirds that you studied are a single species. Although they look slightly different, they are a part of a single, interbreeding population. Imagine that a change in the food supply occurred.

a. As a result of heavy rains, the major source of forkbird food is now soft berries, like blueberries. After many, many generations, how many types of forkbirds do you think will be in the population? Explain your reasoning.

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b. As a result of a drought, the major source of forkbird food is now sunflower seeds. After many, many generations, how many types of forkbirds do you think will be in the population? Explain your reasoning.

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6. Does this model Darwin's or Lamarck's theory of evolution? Explain your answer.

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7. What are the strengths and weaknesses of this activity as a model for evolution?  
*(List two of each)*

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