Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Evolution Game

Objective:

Collect as much food as you can within the 15 second rounds with the utensil chosen for you at random.

Playing the Game:

* Join the group assigned to you by your instructor
* Roll the dice to determine at random your utensil (phenotype).
  + Rolling a 1 or 2- Chopstick
  + Rolling 3 or 4- Spoon
  + Rolling 5 or 6- Fork
* In front of every group will be an assortment of paperclips, pebbles, and pipe cleaners that will be used as food supply.
* You will have 15 seconds to collect as much of the food supply with the utensil.
* After the food supply is collected, record the values in the table below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Your Utensil | Total Pebbles | Total Pipe Cleaners | Total Paperclips | Mutation |
| Round 1 |  |  |  |  |  |
| Round 2 |  |  |  |  |  |
| Round 3 |  |  |  |  |  |
| Round 4 |  |  |  |  |  |
| Round 5 |  |  |  |  |  |
| Round 6 |  |  |  |  |  |
| Round 7 |  |  |  |  |  |
| Round 8 |  |  |  |  |  |
| Round 9 |  |  |  |  |  |
| Round 10 |  |  |  |  |  |

* Your instructor will ask for your data and add it to the class totals.
* After data is entered for the first round, roll the dice to determine whether you have mutated for the second round. If you roll a 6, then you are allowed to mutate. Roll again to determine the mutation that you will have for the second round.
  + Rolling a 1 or 2- Chopstick
  + Rolling 3 or 4- Spoon
  + Rolling 5 or 6- Fork
* Repeat the steps above for each round played. Your instructor will determine the number of rounds played.

**Scenario 2 - A disease wipes out one of the food resources**

* Continue to play the game in these new conditions

**Scenario 3 -Presence of a Predator:**

* Avoid being eaten by the predator. If the predator comes close enough to signal to you, then you have been eaten
* You will be given the opportunity to rejoin the game as a new individual. Roll the die to determine the phenotype of the new individual.
* Continue to play the game in these new conditions

1. In Scenario 1:
   1. Which phenotype(s) increased in numbers? Why?
   2. Which decreased and why? (See your graph)
2. In Scenario 2:
   1. Which phenotype(s) increased in numbers? Why?
   2. Which decreased and why? (See your graph)
3. In Scenario 3:
   1. Which phenotype(s) increased in numbers? Why?
   2. Which decreased and why? (See your graph)
4. What features of this activity are similar to processes that take place in evolution?

OR

How is natural selection represented in this game?

1. Now imagine that the food resources (for example: pipe cleaners) could evolve too. What effect might this have had on this evolution exercise?
2. When some utensils randomly changed after dice were rolled, this was an example of \_\_\_\_\_?
3. What is the importance of mutations in evolution?
4. If the food resources used by different groups in class each were placed in different substrate (i.e. in trays of sand, black gravel, red rocks, etc.) how would this affect the outcome of the game? Would we see different dominant phenotypes? What about multiple dominant phenotypes?
5. What are some of the limitations and/or assumptions made in this game? How does it differ from a real population?