Natural Selection Activity NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

APES -

With over a million living species on earth, students cannot ignore the vast diversity of living things. Understanding evolution is the key to understanding diversity. And natural selection, being the mechanism (or cause) of evolution must also be understood.

Natural selection is a key mechanism of evolution, and over time changes the frequency of many traits within a population. It is the gradual, non-random, process by which biological traits become either more or less common in a population as a function of differential survival and reproduction of their bearers. In order for natural selection to operate on a trait, the trait must possess heritable variation and must confer an advantage in the competition for resources.

Procedure:

You will be in 4 groups of approximately 5 students each.

You will have a food resource (noodles) that you will individually have to obtain.

Each person will take turns walking the distance of your “field” where your resources are located.

At the end of each round/trial we collect the data for the tables below.

Table 1. Prey selection over time. Number of prey obtained by each group.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Noodles | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Totals |
| Group 1 | Yellow |  |  |  |  |  |  |
| Orange |  |  |  |  |  |  |
| Green |  |  |  |  |  |  |
| Group 2 | Yellow |  |  |  |  |  |  |
| Orange |  |  |  |  |  |  |
| Green |  |  |  |  |  |  |
| Group 3 | Yellow |  |  |  |  |  |  |
| Orange |  |  |  |  |  |  |
| Green |  |  |  |  |  |  |
| Group 4 | Yellow |  |  |  |  |  |  |
| Orange |  |  |  |  |  |  |
| Green |  |  |  |  |  |  |

Table 2. Predator survival over time. Number of predators that died.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Totals |
| Group 1 |  |  |  |  |  |  |
| Group 2 |  |  |  |  |  |  |
| Group 3 |  |  |  |  |  |  |
| Group 4 |  |  |  |  |  |  |

Analysis Questions:

1. Which variation of the prey (noodles) had the greatest survival? Explain what this means for the noodle in terms of its fitness?
2. What factors do you think determined which predators survived? Explain why?
3. In terms of population numbers, in what way was this simulation not realistic?
4. Phenotypically, how is the prey population changing over time? What does that tell you about the genotype frequencies?
5. Is this simulation an example of micro or macroevolution? Explain.
6. Create a graph for the prey survival over time if our starting population for the field is 1170 noodles and the noodle colors occurred in equal proportions.
7. Create a graph for predator survival over time.