**Sex and the Single Guppy**

The purpose of this activity is to analyze how guppy populations change over time. The simulation activity allows you to start with a pool of guppies and your choice of predators, you will be able to watch what happens to your guppy population and how the introduction of predators can affect the guppy's appearance. The simulation will help you understand what pressures drive guppy evolution.

Open the Guppy Sex Simulator!!! -- [**http://www.pbs.org/wgbh/evolution/sex/guppy/index.html**](http://www.pbs.org/wgbh/evolution/sex/guppy/index.html)

**Introduction**

First of all, familiarize yourself with the site, you should know each of the following before proceeding to the simulation.

* View the guppy gallery, know the color variations found among guppies
* View the predator gallery, know the types of predators of guppies
* Read about John Endler's experiment
* View the three types of pools and know what guppy colors are common in each area
* Read the three possible hypotheses for guppy coloration

**Experiment**

Sexual selection and predation both play roles in the evolution of guppies. Both can affect the coloration of male guppies. In this experiment, you will attempt to answer the following question:

QUESTION: To what degree do predation and sexual selection affect guppy coloration? (Which has a greater effect, or do they work equally to influence guppy populations?)

Open up a Word document to begin your lab report - for this activity, the lab report includes only 3 sections (you can also write this by hand)

1. Introduction - includes background information on guppies and your hypothesis

2. Data - a data table or graph that shows your guppy coloration over several generations

\*\*You can make a graph with microsoft exel, or you can go to an online graph-maker at [http://nces.ed.gov/nceskids/graphing](http://nces.ed.gov/nceskids/graphing/)

\*\*Make sure your data is defined - include beginning populations, number of generations, colorations and other pertinent labels

3. Conclusions - answer the experimental question. The conclusion can be written in about a paragraph. Be sure to include general information about the trends in the data to support your conclusion.

**The Simulation**

The simulation allows you to choose your starting population of guppies (coloration) and the number and types of predators in the habitat. Remember that you will need to compare 2 sets of data in order to make a clear determination about how predators and sex selection affect guppy populations. You will need 2 sets of data (and two graphs) to compare - in effect run 2 simulations. You may want to run more than 2 simulations if you cannot make a determination with only 2.

You will also need to make sure the simulation runs through enough generations to show patterns (5 minimum)

**See grading rubric on next page.**

**Grading**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Unsatisfactory (1 pt) | Good (2 pts) | Excellent (3 pts) |
| Introduction | Either background information or hypothesis is missing | Background information included, could be expanded upon, hypothesis included | Background information included and provides a context for the problem, hypothesis stated |
| Data | Data is not included as a chart or graph; not enough data is taken to draw conclusions, difficult to interpret | Data includes enough information to draw conclusions, some labels are missing or data is difficult to interpret | Data is extensive and clearly shows trends in the populations. All graphs and charts are labeled and easy to read |
| Conclusions | Conclusions do not follow data; experimental question is not answered; summary missing or incoherent | Conclusions appear to follow data, the experimental question is answered, summary of data missing or incoherent | Conclusions logically follow data, trends in data are summarized; the experimental question is answered and the hypothesis is addressed |
| Format | Organization lacking; not neat (0 pts) | Neat, organized and easy to read (1 pt) |

10 total points