NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4/22 Score \_\_\_\_/20 Understand Evolution Through Models

**POPULATIONS EVOLVE – NOT INDIVIDUALS**. Computer models show some of the factors that make populations evolve.

**I. Bunny Evolution Exploration:** [**https://phet.colorado.edu/en/simulation/natural-selection**](https://phet.colorado.edu/en/simulation/natural-selection) **click start arrow, keep, run**

1. What are the three mutations you can add to your bunny population?

2. What happens to the bunny population if a friend is never added? What happens when you add a friend?



3. What happens when you add food as a selection factor?

4. What is the difference between the arctic and equator environment?

**Experiment A - Does brown fur provide an advantage?**

a. Add a friend and a brown fur mutation to the bunny population 🡪 what happens?

b. Add brown fur mutation but add a selection factor of wolves when your bunnies start to get overpopulated. How do the rabbit and wolf populations interact?

c. Remove the wolves and make the selection factor be food. 🡪 What happens?

d. Reset and change the settings so that you have brown fur mutation in an arctic environment, use wolves as your selection factor. 🡪 What happens?

6. Based on the four simulations you ran, "Does brown fur provide an advantage?" What’s the evidence that brown fur helps bunnies survive?

**Experiment B - Does long teeth provide an advantage?**

7. Following the guidelines from the Experiment A, determine if long teeth provides an advantage to the bunny population. What’s the evidence that long teeth help bunnies survive?

**II. Mice on the Beach Evolution** <http://lbc.msu.edu/evo-ed/pages/Mice/Beach/Beach.html>

1. Describe the mouse population at the start. What is the phenotype of the mice?

2. Introduce some mutations. How does the population phenotype change?

3. Remove the barrier, speed things up. Add an owl. What happens to the mouse population?

4. Try your own experiment. What did you do and how did the mouse population change?

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| --- | --- |
| **Steps You Took that Affected the Mouse Population** | **Ways that the population evolved (changed)** |
|  |  |

5. You can play the predator: <http://lbc.msu.edu/evo-ed/pages/Mice/OwlandMice/OwlandMice.html>

 What helps you catch the most LIGHT colored mice?

**III. Dazzlebug Model:** <http://www.dazzle-bug.co.uk/>

Try to click on the rectangular “bugs” as fast as you can. Watch them evolve to avoid you.

Q/A According to the website data, what traits help the bugs survive the most?

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