Is Natural Selection Fur-real?!

LO1: Students will be able to understand how individual characteristics affect survivorship of species (natural selection) by manipulating variables including physiology and environment.

LO2: Students will be able to understand how natural selection drives the process of evolution by running simulations in PhET.

Instructions

· Google Search “PhET Natural Selection Simulation”

· Click “Run Now”

· Manipulate variables available in the dashboard of the program to edit traits, selection factors, and environment.

· Get familiar with the program. Add friends, add a food source/predators, add mutations, etc… Reset all to start the tasks.

Task 1:

a) Add a friend

b) Allow simulation to run for more than 3 generations

c) Introduce a predator.

d) Let the simulation run for more than 3 generations

**Question**: How did the population grow before you introduced the predator? What happened to the population after you introduced the predator?

Task 2:

a) Remove the predator.

b) Add the mutation for brown fur. Let this mutation remain dominant.

c) Let the simulation run for more than 3 generations.

d) Introduce a predator.

e) Let the simulation run for more than 3 generations.

**Question:** What has happened to the bunny population? Why? Are the more desirable traits being passed onto offspring?

Task 3:

1. Change the environment to the arctic.
2. Let the simulation run for more than 3 generations.

 **Question:** What happened to the bunny population? Why? Are the more desirable traits being passed onto the offspring?

**Analysis:**

1. Are mutations good or bad? Explain your reasoning.
2. What does it mean to be fit? (as in survival of the fittest)
3. What is natural selection?
4. What caused the brown mutation?
5. Would running the same simulation but making the mutation for brown fur recessive instead of dominant have the same outcome? Why or why not?