**Creating a Successful Population**

**Objective**: Students will be able to teach natural selection by manipulating simulations and predicting and observing the results.

To access the simulation (simulation requires Java):

1. Click on the link: <https://phet.colorado.edu/en/simulation/natural-selection>
2. Click “Run Now!”

Get to know the simulation:

1. Click “Add a friend”
2. Select combinations of a mutation under the Add Mutation section and any item under the Selection Factor section
3. Observe the results on the graph and the animation
4. To change the environment, select “Arctic” or “Equator” under the Environment section
5. To observe long-term changes, click the “Step” button at the bottom of simulation
6. To look at a specific rabbit’s family tree, click on the “Pedigree” button under the Chart section.
7. Select whether certain characteristics are “Dominant” or “Recessive” under the Edit Genes section

Investigation Activity:

1. Click “Add a friend”
2. Select “Equator” for the environment
3. Select “Brow fur” as a mutation
4. Select “Wolves” as a selection factor

Make a prediction about who the survivors will be.

Observe the survivors in the next few generations and take note of which characteristics persisted and speculate why.

Discussion Questions:

After running the simulation the with brown fur mutation:

1. What characteristics did you observe that helped with the survival of rabbits throughout generations?

2. After the demise in rabbits with white fur, did you see an increase in the number of rabbits with brown fur? If so, why?

3. What would allow the rabbits to overpopulate to the point where they “take over the world”?

Answer Sheet

Discussion Questions:

1. The characteristic is brown fur due to the environment allowing them to blend in compared to the white fur.
2. There is an increase in rabbits with brown fur due to the parents with brown fur passing down their traits.
3. Taking away the presence of predators will allow the bunnies the overpopulate the world.