

Natural Selection Interactive Simulation; SB5d; SB2c,d

**Purpose:** to simulate how the effects of variation in survival and reproduction can lead to genetic change.  
**Directions:** Google “natural selection PHET”. Click on first link. Click on “Run Now!”

Exploration

1. What are some interesting things that you have control over in the simulation?
2. What happens to the bunny population if a friend is never added? Why is this?
3. What happens when you add a friend?
4. What happens to the population if the food is super abundant and there are no predators?
5. What is a genetic mutation? Write the definition.



Experiment A (record results in your data table)

- Add a friend and a brown fur mutation to the bunny population.
- Add the (natural) selection factor\* of wolves after F3 offspring appear.

Experiment B

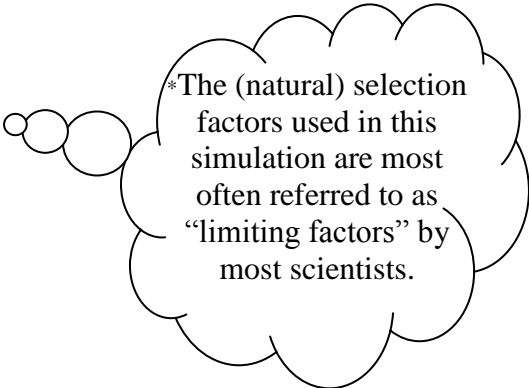
- Add a friend and a brown fur mutation to the bunny population.
- Add the (natural) selection factor of food after F3 offspring appear.

Experiment C

- Add a friend and a long teeth mutation to the bunny population.
- Add the (natural) selection factor of wolves after F3 offspring appear.

Experiment D

- Add a friend and a long teeth mutation to the bunny population.
- Add the (natural) selection factor of food after F3 offspring appear.



Experiment E

- Repeat Experiment A in the Arctic Environment.

Experiment F

- Repeat Experiment B in the Arctic Environment.

Experiment G

- Repeat Experiment C in the Arctic Environment.

Experiment H

- Repeat Experiment D in the Arctic Environment.



Results

(copy on your own paper)

Experiment	Bunnies lived <input checked="" type="checkbox"/>	Bunnies died <input checked="" type="checkbox"/>	Stable <input checked="" type="checkbox"/> Population	Comment on population changes during simulation
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
C	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
D	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
F	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

6. Define variation. What genetic variations are presented during this simulation?
7. Define adaptation. Give examples when an adaptation is beneficial to the bunnies.
8. What are 3 other natural section factors which effect animal populations in the real world?
9. How has this simulation added to your knowledge of evolution (the study of life’s history)?
10. In which conditions in the simulation would a long tail be considered an adaptation?
11. Big Picture: Write a short essay that uses the following terms and concepts: natural selection, evolution, protein synthesis, genetics, meiosis, phenotype, genes, DNA, fitness, viable, adaptation, alleles, gene flow, mutation, codon