**Modeling Chokfi (rabbit) and Nashoba (wolf)**

**Interactions in the Wild**

We just heard a story about a trickster rabbit who pulled one over on a jealous wolf.

Next, we will be using a computer program to model some other interactions between rabbits and wolves in the wild.

To get started, let’s first define the **variables** that we want to include in our simulation (‘our model’).

Define:

The predator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The prey: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The resource (what the prey eats): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

We will use the “Nashoba Chokfi” model in the computer program NetLogo to investigate rabbit-wolf interactions.

Models also have **parameters**, or rules that govern how the variables in the model interact.

List and define three of model parameters that are interesting to you:

1.

2.

3.

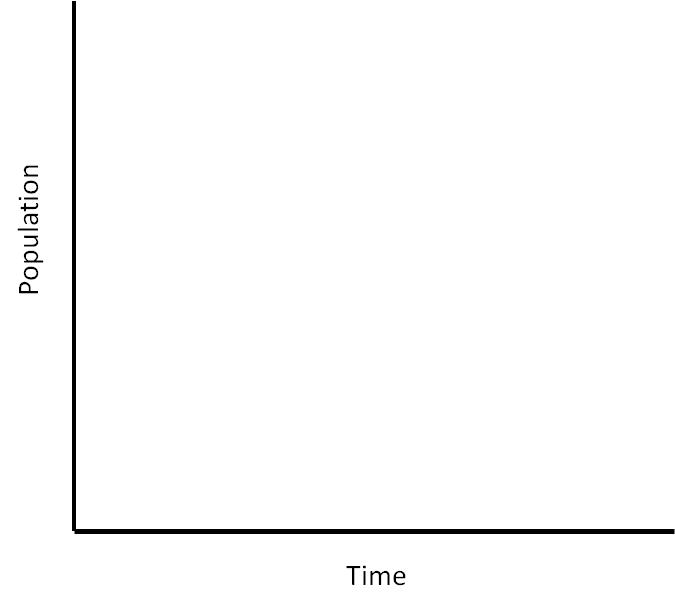
**Experiment #1:** The first experiment (simulation) we will do is in absence of any resource.

Step 1: Set the hashshok? switch to ‘Off’

Step 2: Press the “Setup” button to set up the model

Step 3: Press “Go”

Draw what happened (include a legend):



How did the nashoba (predators) and chokfi (prey) influence each other?

What eventually happened to both populations?

Would you describe what happened to in this experiment as unstable or stable?

**Experiment #2:** With a food source (hashshok) for the chukfi.

Step 1: Set the hashshok? switch to On

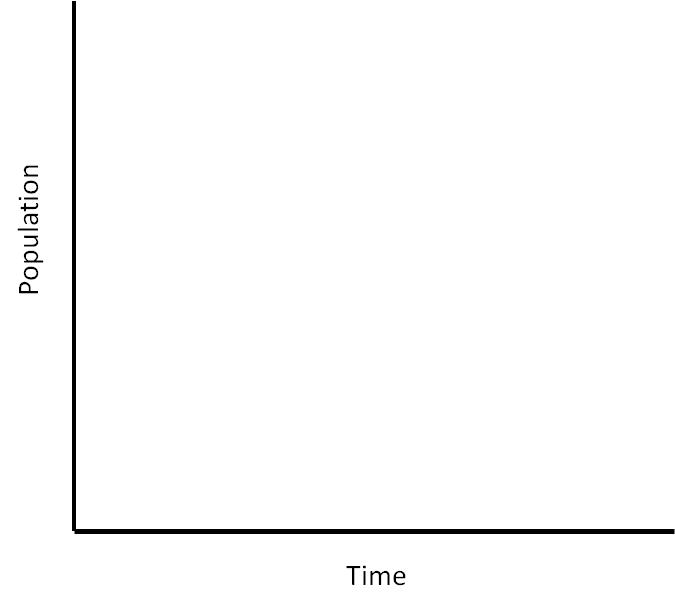
Step 2: Press the “Setup” Bottom to set up the model

Step 3: Press “Go”

Step 4: Allow the model to go for 1,000 time counts, then press “Go” again to stop.

\*Notice the green line, which indicates the hashshok, has been added to the graph.

Draw what happened (include a legend)



How do the sizes of the three populations relate now? What is the explanation of this?

Would you describe what happened to in this experiment as unstable or stable?

***In Experiment #2, we see an example of balance between the three populations. While there are patterns in the changes to the populations over time, no one population dies out or takes over.***

Using the model to predict changes to predator-prey interactions.

Models provide a powerful way to test how a change to one thing in the environment (i.e. a model parameter) impact all of the various components in the environment (i.e. the model variables).

1. Select one parameter in the model: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. If you INCREASE this parameter and keep all other parameters the same, what do you think will happen to model variables?
3. If you DECREASE this parameter and keep all other parameters the same, what do think will happen to the model variables?
4. What happened when you simulated the change described in (2)? Does this seem realistic or not?
5. What happened when you simulated the change described in (3)? Does this seem realistic or not?
6. If the variables change dramatically in response to a change in the parameter, then the model is said to be ‘sensitive’ to the parameter. Based on what happened in your analysis, is the model sensitive or not sensitive to the parameter?