**Exploring Populations: Wolves, Rabbits, and Plants**

**1. Observe:** Run the simulation twice with the preset populations of 20 rabbits, 20 plants and 5 wolves.

* Visit the site <http://www.shodor.org/interactivate/activities/RabbitsAndWolves/>
* Click the “View Population Graph” button and then click the “Step Simulation” button.
* Continue to click the “Step Simulation” button until you have reached 56 iterations on the graph (shown on the *x* axis)
* As you run the model, examine the data shown on grid and the graph.
* Run the model a second time.

2. **Analyze Data:** Describe the how the populations of wolves, rabbits, and plants change over time (iterations).

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3.  **Predict:** Based on your analysis, predict how *reducing* the wolf population in half will affect the populations of the other organisms. In the table below, write next to each prediction whether the population will increase, decrease, or stay the same.

|  |  |  |  |
| --- | --- | --- | --- |
| Change | Grass | Rabbits | Wolves |
| Halving Wolves (2) | \*Prediction:  Result: | \*Prediction:  Result: | \*Prediction:  Result: |

5. **Test:** Change the parameters so that there are half as many wolves.

* Click “View/ Modify Parameters.”
* Click “View/Modify Start-Up Parameters.”
* Change “Initial Number of Wolves” from 5 to 2.
* Click “Save My Changes.”
* Click “Return to Simulator.”
* **Click “Reset Simulation.”**
* Click “View Population Graph.”
* Run the model by clicking the “Step Simulation” button until you have reached 56 iterations on the graph (shown on the *x* axis)
* As you run the model, examine the data shown on grid and the graph.
* In the table above, record your results.

1. How did the decrease in wolf population affect the grass and rabbit populations?

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1. **Predict:** Predict how *increasing* the wolf population will affect the populations of the other organisms. The wolf population will be doubled for the first run and then increased to 10 times as many wolves for the second run. In the table below, write next to each prediction whether the population will increase, decrease, or stay the same.

|  |  |  |  |
| --- | --- | --- | --- |
| **Change** | **Grass** | **Rabbits** | **Wolves** |
| Doubling wolves (10) | \*Prediction:  Result: | \*Prediction:  Result: | \*Prediction:  Result: |
| Ten times more wolves (50) | \*Prediction:  Result: | \*Prediction:  Result: | \*Prediction:  Result: |

1. **Test:** Change the parameters so that there are twice as many wolves (10).

* Click “View/ Modify Parameters.”
* Click “View/Modify Start-Up Parameters.”
* Change “Initial Number of Wolves” to 10.
* Click “Save My Changes.”
* Click “Return to Simulator.”
* **Click “Reset Simulation.” button.**
* Click “View Population Graph.”
* Run the model by clicking the “Step Simulation” button until you have reached 56 iterations on the graph (shown on look along the *x* axis)
* As you run the model, examine the data shown on grid and the graph.
* In the table above, record your results.

1. **Test:** Run the simulation again, but change the starting wolf population to 50. **Don’t forget to click reset** before running the simulation. Record results in the table.
2. How did increasing the wolf population affect the grass and rabbit populations? How was it different when the starting wolf population was significantly larger (50)?

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1. **Interpreting the data.** In general, how would you describe the relationship between the wolf, rabbits, and plant populations?

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1. **Explain:** What explanation can you give for why the population of each organism changed the way it did?

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