MODELING NATURAL SELECTION: *TOOTHUS PICKII*

**OBJECTIVE**: MS-LS4-4: Explore how an expressed trait can impact the survival of an organism by completing an experimental simulation in natural selection.

**PRE-LAB**: Read *The Theory of Evolution* on pages 126-128 in *Sciencesaurus*, stop at the “extinction” section. Use what you read to explain the following terms:

Adaptation:

Natural Selection:

**LAB ACTIVITY**:

**BACKGROUND**: You are a fearsome hawk (*Hawkus Predatorus*) on your daily search for food. Your main food source is the short, skinny, but sometimes elusive Wood Worm (*Toothus pickii*). There are four varieties of the Wood Worm- Greenish, Yellowish, Bluish, and Reddish- but *Hawkus Predatorus* likes them all. Like any predator, they will hunt the easiest Wood Worm to catch.

**PROCEDURE**:

1. Before predation by the hawks begins, the worm population numbered exactly thirty (30) worms for each variety.
2. During this simulation, you will hunt (as *Hawkus Predatorus*) for the Wood Worm in a designated habitat.
3. During the time determined by your teacher, you will try and locate and capture all of the Wood Worms you see.
4. As soon as you hear the command to stop, return to your “perch” with all the worms you captured.
5. Once back at the nest (your classroom), we will sort the captured worms by color and **record the total number of each color collected by the class**.

Record your prediction (using an “If... then... because statement) for which Wood worms will be caught more frequently:__________________________

__________________________
Results: (Class Results Data Table, we will record data upon return to the “nest”)

<table>
<thead>
<tr>
<th>Toothus pickii</th>
<th>RED</th>
<th>GREEN</th>
<th>BLUE</th>
<th>YELLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # Present in field</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Total # Captured</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total # NOT Captured</td>
<td>(# Total present – Total Captured)=</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Captured</td>
<td>(# captured ÷ 30) X 100=</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Survived</td>
<td>(# not captured ÷ 30) X 100=</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusion Questions, Answer in complete sentences, support your statements:

1. Describe the trend your data shows based on the “Class Results” for the % and kinds of Wood Worms captured.

2. Were all variations of Wood Worm preyed upon equally? Explain why or why not this occurred.

3. Explain what the Wood Worm population looks like now (after predation by Hawkus predatorus) in terms of number and types of worms.
Assuming that each Wood Worm in the population now has two offspring (baby wood worms) that look exactly like the parent, what will the population look like (in terms of number and type)? Complete the data table:

<table>
<thead>
<tr>
<th>Toothus pickii</th>
<th>RED</th>
<th>GREEN</th>
<th>BLUE</th>
<th>YELLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # NOT Captured by predator (aka 1st generation)</td>
<td>(Ex: 10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New offspring (2) + parent (aka 2nd generation)</td>
<td>(Ex: 20 +10=30)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd generation</td>
<td>(Ex: 60+30=90)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th generation</td>
<td>(Ex: 180+90=270)</td>
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</tr>
</tbody>
</table>

Describe how the population of Wood Worms has changed after the four generations, support your statements with data from your simulation.

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OVER
Consider that during each generation, the Wood Worms would be hunted; therefore, the data for future generations is not accurate. Suggest a more accurate description for what the Wood Worm population would be after the fourth generation based on the same percentage of each color of Wood Worm was caught during each generation. Create a data chart that shows the population for each generation.

Explain how this simulation modeled the process of natural selection of a prey species by a predator. Consider how some variations of the Wood Worm were hunted more frequently than other variations.