Owl Family Natural Selection

Introduction
There are four owl species commonly found in Virginia: Great Horned Owl, Barred Owl, Screech Owl, and Barn Owl. Of the three, only the Barn Owl doesn’t live in the forest. Barn Owls eat small mammals, insects, birds, amphibians, fish, and crustaceans. Each owl needs between 1.5 and 5.5 km of space for hunting.

The Barn Owl population in many states has been declining over the past 50 years. Competition for food is one threat as Barn Owls and hawks often hunt for the same food. Owls do not migrate and live year round in Virginia which means that their food sources may be hard to find in winter. Long, cold winters tend to reduce their population. Additional threats to the owl’s survival come from habitat loss due to farming and development. When owls eat insects and rodents they often ingest insecticides. Accumulated insecticides in the owl’s body reduce the number of owl eggs that hatch.

Questions for Investigation
• What adaptations would best enable an owl to survive within a specific ecosystem?
• Which factors might increase or decrease an owl’s population’s size?
• How do owls respond to daily, seasonal, and long-term changes in their environment?
• How do environmental influences, as well as genetic variation, lead to diversity of within an owl population?
• What are the possible relationships between mutation, adaptation, natural selection, and extinction in an owl population over time?

Directions
1. Each group of 4-5 students will represent an owl family consisting of parent birds (mother & father) and two or three young owlets not yet able to fly.

2. Parent birds are assigned one set of talons to use in collecting food for their young. Only the assigned talons may be used.

3. Young owls are to remain in their seat and hold a cup to collect food brought by the parent owls.

4. After 1 minute, young owlets will be instructed to count and record the number of food pieces they have received.

5. Construct a graph to compare the amount of food received by each young owl.
Discussion Questions
1. Which nest had the highest survival rate? What are some possible explanations as to why this group was so successful?

2. Which nest had the lowest survival rate? What are some possible explanations as to why this group was not successful?

3. What might account for the fact that the parent owl’s talons were shaped in different ways?

4. Which talons were most successful in delivering food to the nests?

5. How does the location of the food source affect the amount of food available for each nest?

6. Do you think there is a possibility for baby owls to be poisoned in their natural environment? Is it possible to fall from the nest? How would these events affect the survival rate for the species?

7. What adaptations would best enable an owl to survive within a specific ecosystem?

8. Which factors might increase or decrease an owl’s population’s size?

9. How do owls respond to daily, seasonal, and long-term changes in their environment?

10. How do environmental influences, as well as genetic variation, lead to diversity of within an owl population?

11. What are the possible relationships between mutation, adaptation, natural selection, and extinction in an owl population over time?

Assessment
Create a short graphic novel to illustrate and explain what you have learned about the relationships between the following: mutations, genetic variation within a population, adaptations, competition, diversity within a population, natural selection, population size, extinction, response to change, etc.
<table>
<thead>
<tr>
<th></th>
<th>Blue Owl Mom</th>
<th>Green Owl Mom</th>
<th>Yellow Owl Mom</th>
<th>Red Owl Mom</th>
<th>Orange Owl Mom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prongs</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Blue Owl Dad</td>
<td>Green Owl Dad</td>
<td>Yellow Owl Dad</td>
<td>Red Owl Dad</td>
<td>Orange Owl Dad</td>
</tr>
<tr>
<td>Prongs</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Blue Baby 1</td>
<td>Green Baby 1</td>
<td>Yellow Baby 1</td>
<td>Red Baby 1</td>
<td>Orange Baby 1</td>
</tr>
<tr>
<td></td>
<td>Blue Baby 2</td>
<td>Green Baby 2</td>
<td>Yellow Baby 2</td>
<td>Red Baby 2</td>
<td>Orange Baby 2</td>
</tr>
<tr>
<td></td>
<td>Blue Baby 3</td>
<td>Green Baby 3</td>
<td>Yellow Baby 3</td>
<td>Red Baby 3</td>
<td>Orange Baby 3</td>
</tr>
</tbody>
</table>
# Owl Family Natural Selection Data Collection

**Name:** ___________________________  **Date:** ___________________________

## Amount of Food Received

<table>
<thead>
<tr>
<th>Number of food pieces collected in cup</th>
<th>Baby Owls</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>B2</td>
</tr>
</tbody>
</table>

### Survival Rates

- **Blue Nest** 
  
- **Green Nest** 
  
- **Yellow Nest** 
  
- **Red Nest** 
  
- **Orange Nest** 

**Survival Rates**

Blue Nest ____/____ or ____%  
Green Nest ____/____ or ____%  
Yellow Nest ____/____ or ____%  
Red Nest ____/____ or ____%  
Orange Nest ____/____ or ____%