Lesson Plan

Name: Alyssa McManaway  Date: 02/21/14
Subject: Biology  Grade: 9/10
Virginia SOL: Bio. 7 (c) (d) (e)  Start time: 8:42  Stop time: 10:21
Lesson Title: Darwin’s Finches – A exploration of natural selection

Objectives (What do you want students to know, understand, do, or feel as a result of your instruction?)

1. TSW discover how natural selection can develop adaptations in populations over time by participating in the Darwin’s finches activity
2. TSW demonstrate their understanding of adaptations and natural selection by answering 5 post activity questions.

Critical vocabulary: Charles Darwin  Finches  Evolution  Natural Selection
Adaptation

Materials/resources: Containers of different size “seeds” (pasta shells and beans), clips, plastic knives, spoons, tweezers, need to mark off food source square & stomach square on desk

Intro (how do you capture their attention and get them interested?):

Since this is a 15 min mini lesson Ms. Holcomb will first introduce the subject topic with a focus question: Explain how scientists use relative dating and radioactive dating? This question relates to material they learned last class and is a quick review to get them thinking scientifically and about evolution.

Next Ms. Holcomb will present notes on Lamarck and Darwin. In these notes she discusses Darwin’s voyage to the Galapagos Islands and the finches and tortoises that he saw there which helps to lead into the activity which I will be teaching.

Body (what comes after your interesting intro?)

After the notes I will explain to the students that today we are going to see natural selection in action. I will take the students back to the lab tables and explain that today everyone has been turned into a finch and that there are different types of beaks. I will explain that each of the “beaks” has different features just like the beaks on the finches in the Galapagos. I will show them how the spoon could represent a large beak, how the tweezers represent the small beak and the knife/clothespin represents the medium beak.

I will have the students fill out what instrument they have for their beak on the lab collection worksheet, and what beak they believe their instrument would have represented using the photo on the lab protocol (questions 1 and 2)

Next I will explain that on the lab tables there are paper plates with two different “food sources.” The paper plates represent different islands and that these islands have different food sources. On one island there are small seeds (beans) and on the other there is large nuts (pasta shells).

I will explain/demonstrate that each group first move food from the island to their food source (taped box on the lab table labeled food) and then will have 30 seconds to collect as much food as they could by using their beak to move the food from the food source to their stomach (box labeled stomach). They can only pick up one piece of food at a time and can only use one hand (which is operating the beak, the other hand should be behind their back). If they lose the piece of food in transit they cannot pick it back up as a scavenger grabbed it up before the finch could get back to it.

The students will record how many pieces of food their group collected in the data table for each of three trials. I will regulate the time with a “bomb timer” on the board. Once they have completed the three trials, they will move over to the other island and complete the same activity with a different food source using the same beak. For example if a student was first using tweezers to pick up beans for the first 3 trials they will continue to use the tweezers but they will complete the next three trials picking up pasta shells.

The students will complete the average for each of their three trials and record this on their data sheet.

When they have collected all their data they will draw conclusions as to which type of food they would need to survive (question 3).
Closure (purposeful summary—help them remember today or anticipate tomorrow):

When all the students have finished and cleaned up the lab activity we will go over each group's data as a class, drawing conclusions about how beak size affected the ability to pick up certain types of food and how this reflects natural selection. Then the students will complete the 5 post lab questions (individual or in groups based on student preference) to summarize what they have learned from the notes and from the activity.

Homework: Students will finish post-lab questions for homework if they were not completed in class.

Assessment: (How will you assess if they have mastered your objectives? Be specific.)

1. I will be keeping time as the students collect "food" with their "beaks." During this time I will be observing how the students are doing with the activity and if they are having any difficulty or have any questions (objective 1).
2. I will go over the results from each of the groups to help students draw conclusions about which food was better for each of the beak sizes and why this would have led to selection of beak size (objective 1).
3. I will be grading the post-lab questions based on completion, 5 points for completing each question for a total of 25 points (objective 2).

Pre-assessment: (How will you know if your students already know what you are teaching?)

When describing the lab I will gauge student interest and look for indications of confusion (facial expression, etc.) or if the students are giving expressions of boredom.

Are you differentiating lesson content, process, or product by readiness, interest, or learning profile? Explain below.

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<tr>
<th>content</th>
<th>process</th>
<th>product</th>
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<tr>
<td>The students are learning first by using a PowerPoint presentation and filling in notes, next they are completing a experiential hands-on learning lab</td>
<td></td>
<td>Having students first take notes on the subject and then complete the lab activity will help promote readiness for the material in the lab activity.</td>
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Students who learn visually will benefit from taking notes with a PowerPoint. Students who learn orally will benefit from orally presenting the information on the PowerPoint. Students who learn kinesthetically will benefit from the hands-on finch activity | readiness | interest | learning profile |

For cooperative learning explain how you have insured:

- **Positive interdependence** - groups must work together to collect as much "food" as possible, this helps provide a positive community effort in completing the task
- **Individual accountability** - Students are responsible for completing and turning in the post-lab questions individually
- **Group processing** - Students are working together in groups to complete the lab. This promotes
- **Social skills** - students must work together and interact socially to complete the lab activity
- **Face-to-face interaction** - students will be working face-to-face to complete the lab as a group

Notes (So, how did it go? What will you change to make it better? Do it now or you’ll forget.)
Because I completed the activity for three different classes I wrote out notes about each class and have typed them here)

A1: Good student engagement, need to model how to pick up seeds (make sure they physically pick them up not slide them over). Students enjoyed the activity, students were slightly competitive, which made the activity more engaging/fun

A3: Less student engagement => students seemed maxed out after notes/ they shut down. Maybe do lab first instead of lecture. Had to threaten to take away participation points to get their attention to go over post-lab questions.

Bridge: Best student engagement, third time I gave the best/most detailed demo, also I walked around and reiterated directions to each lab table, seemed to help reduce confusion and produced the best results. Students stayed engaged during questions however got a little chatty – also had to threaten participation points once to get them to settle down/focus.

I collaborated with Katie Holcomb (teacher) to refine the activity to be best appropriate in the classroom.