

Clipbirds: A Lesson in Natural Selection (Requires one 50 minute class period)

**Concept or conceptual understanding:**

Evolution results from selection acting on existing genetic variation in a population. Inherited characteristics affect the likelihood of an organism's survival and reproduction. Reproductive isolation is necessary for speciation to occur.

**Real world connections (Relevancy):**

Organisms change over time.

**AZ standards: (include grade level and text):**

**Grade 7**

Strand 4: Life Science

Concept 3: Populations of Organisms in an Ecosystem

PO 2. Explain how organisms obtain and use resources to develop and thrive in:

- niches

PO 3. Analyze the interactions of living organisms with their ecosystems:

- limiting factors

PO 5. Predict how environmental factors (e.g., floods, droughts, temperature changes) affect survival rates in living organisms.

PO 6. Create a model of the interactions of living organisms within an ecosystem.

**Grade 8**

Strand 4: Life Science

Concept 4: Diversity, Adaptation, and Behavior

PO 3. Determine characteristics of organisms that could change over several generations.

PO 6. Describe the following factors that allow for the survival of living organisms:

- beak design
- seed dispersal

**Incorporation of inquiry:**

Students will perform the activity on their own. Students will also analyze their data and draw conclusions based on the results of this activity.

**Behavior objectives:**

- 1) Students will model natural selection using an imaginary scenario.
- 2) Students will identify traits that are advantageous under certain environmental conditions.

**Prior knowledge necessary:**

Students should be familiar with the basic principles of heredity.

**Identify possible student preconceptions:**

Environmental changes cause changes in traits that help organisms cope with the new environment.

**Materials:**

1 1/2 lb unpopped popcorn  
1 1/4 lb lima beans  
255 marbles  
20 large bulldog binder clips No. 3 – 2 5/8 inches  
20 medium-sized bulldog binder clips No. 2 – 2 1/4 inches  
20 small-sized bulldog binder clips No. 1 – 1 1/4 inches  
30 plastic cups  
1 Food Values transparency\*  
1 Clipbird Populations transparency\*  
1 Clipland Scene transparency\*  
1 overhead transparency projector

\* Transparencies available at <http://www.ucmp.berkeley.edu/education/lessons/clipbirds/>

**Safety:**

Only use the clips to pick up food, not to pinch other students.  
Do not eat the popcorn or the lima beans.

**Lesson Description:**

This activity is designed to show beak size variation within a population and how natural selection acts on that variation. Over time, the proportion of small-, medium-, and large-beaked birds changes in relation to food availability. See <http://www.ucmp.berkeley.edu/education/lessons/clipbirds/> for more details about how to carry out the activity.

**Assessment:**

Class discussion will demonstrate students' understanding of how natural selection and speciation occur in real populations.