

Snapshots of adaptation: what nature's pictures tell us about evolution

ESEB Outreach Initiative

Project Report

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October 2016

Summary

Our workshop “Snapshots of Adaptation” combines art and scientific knowledge to bring kids into contact with their natural environment and to encourage their understanding about it. Specifically, photography is used to stimulate children’s curiosity towards local flora and fauna, and didactic activities on evolutionary biology familiarize them with basic concepts in evolution like adaptation and natural selection that can be linked to their own observations. The workshop was carried out in three different communities in Bogotá, Colombia, belonging to the localities Ciudad Bolívar, Kennedy and Usaquén. In total, 75 kids ranging from ages 4 to 15 took part.

A single workshop consisted of 3 sessions:

- Session 1: contact with nature through a guided visit and a photography activity in the wetland area “La Vaca” in Bogotá, Colombia.
- Session 2: didactic activities on adaptation and natural selection connecting these concepts to the experience and observations from session 1.
- Session 3: exhibition of photographs and pictures generated by the children

Content and Results

Day 1: Guided visit at “La Vaca” wetland area and photography

The children participated in a guided tour by an expert on this ecosystem, emphasizing on local flora and fauna.



After a brief introduction into picture-taking and in particular on natural life photography, children were organized in groups of two to three participants and given a digital camera per group. They were encouraged to take pictures of animals, plants and the environment in which the organisms were found. The kids were supervised by a photographer, a biologist and a team of adult volunteers.



Day 2: Didactic activities on basics of evolution

For this session, a series of games were designed to address the following question: why and how did the diversity in characteristics that we observe in living organisms arise? The main goal was to familiarize the children with basic concepts like adaptation, the relationship between an organism's traits and its environment, challenges for survival, and natural selection. Examples from session 1 were used throughout the activities to connect their recent observations with the new concepts from this session.

Activities (for detailed instructions in Spanish see Appendix 1)

1. Adaptation

Activity 1.1: The link between an organism and its environment

The goal of this game was to recognize that the characteristics of an organism are associated to its surrounding environment. The kids had images of different types of habitats as well as cards with different organisms. They had to associate each card with a habitat and discuss their choice.



Activity 1.2: Adaptation as a mechanism for survival

The aim of this activity was to understand the concept of adaptation as a trait in an organism that allows it to respond to a particular challenge. Kids were arranged in groups and each group received a list of particular challenges that an unknown organism has to face for survival. Each participant was then asked to draw an imaginary or real organism with specific characteristics that allow it to face these challenges successfully.



2. Natural selection

Activity 2.1: Searching for food: adaptations for drinking and feeding

The goal of this activity was to explain how, depending on the availability and context, certain characteristics can be more efficient than others for survival. The children were organized in two different groups and each was given different tools to obtain their food (straw and sponge or sticky cylinder and sieve). Two different kinds of food were available (water and hard candies). Each had the chance to use a given tool to get as much food as possible back to their group. In the end we discussed which tool was more efficient in each case and why each group specialized in a certain type of food. Also, examples of different adaptations in real organisms that resemble these tools were mentioned.



Activity 2.2: Natural selection in action: how can camouflage evolve?

The aim of this activity was to understand how an adaptation can fix over time in organisms. Camouflage was used as an example. For this purpose, red-paper and newspaper (cryptic) butterflies were placed on a newspaper background (forest) with distracting leaves (randomly shaped newspaper pieces). The kids represented birds feeding on the butterflies, and had discrete rounds of “feeding” by collecting butterflies in plastic cups. After each round, the surviving butterflies reproduced (i.e. a corresponding number of butterflies of each type was added). The variation in the number of each type of butterfly was recorded and represented graphically, illustrating the change in the population over time.



Day 3: Exposition with photographs and pictures from sessions 1 and 2

The participants were previously asked to select two pictures they took and comment on each based on what they learned or found particularly interesting. The photographs, in addition to the pictures and comments made by the children were mounted as an exposition that was visited by parents and neighbors.



Outlook

Finally, a video was created in collaboration with the participating organization (Somos CaPAZes) showing the purpose and content of the workshop. This will help us get further support in order to continue carrying out the workshop in the future. The video in Spanish is available at:

<https://www.youtube.com/watch?v=ScVsbywUV2Q>

Versions with subtitles in English, French and German are currently being prepared.

More information on the project and its development can be found at (currently in Spanish only):

<http://www.somoscapazes.org/instantaneas-de-adaptacion.php>