



# Teacher Guide

## UNIT 1 LESSON 1: NATURAL SELECTION

### Theme

Organisms with traits better suited to their environment tend to survive and reproduce.

### Missouri Science Standards: LS4.B.1

### Vocabulary

**Natural Selection** - The process of organisms changing over time.. Organisms with traits better suited to their environment tend to survive and reproduce.



**Variation** - The different occurrences of the same trait among individuals of the same species (hair color, eye color, height, etc.)

**Trait** - A characteristic belonging to a population or organism.

### Common Misconceptions to Watch Out For:



- **Populations do not change.** Shifts in population can happen in many ways. Some changes can happen slowly and take hundreds of years, like the gradual shift in traits from genetic change. Some changes can happen more quickly, such as a shift in population because of environmental changes like pollution.
- **Humans cannot control natural selection.** Both plants and animals can be modified genetically by humans in a way that produces an organism with desired traits, but humans do not control natural selection. When humans modify a plant or animal genetically it is called artificial selection, and it is done for many reasons such as to create disease-resistance crops, bigger animals for food, and desired looks for specific dog breeds.
- **Environmental factors cannot change traits.** Environmental factors can affect traits in both plants and animals. For example, the sunlight can affect the color of your skin, and it can also affect your health. Too much sun exposure can lead to skin damage, but not enough can lead to a vitamin D deficiency.

## Video 1: What is Natural Selection?

*Video Description: Video lesson covers all vocabulary terms and uses the Missouri example of the Oblong-winged Katydid to help describe the process of natural selection. Video is made by the Missouri River Bird Observatory (MRBO) staff.*

Follow- up Questions:

- 1.Fill in the blank. The process by which populations become adapted to their environment over time is called \_\_\_\_\_.
- 2.True or False? Blue is an example of variation in the eye color trait in humans.
- 3.True or False? Muscle tone is an example of variation in the eye color trait in humans.

## Activity: A Game of Selection

*Activity Summary: In this activity students will explore traits that help organisms be better camouflaged to their environment and how that increases their chances of survival and reproduction.*

Teacher Notes:

- Preparation will take the most time for this activity (~25 minutes)
- Try to use easily biodegradable objects if the students choose an outdoor setting (which is recommended)

## Video 2: Myths and Misconceptions about Evolution

*Video Description: How does evolution really work Actually, not how some of our common evolutionary metaphors would have us believe. Alex Gendler sets the record straight on the finer points of evolution. Video made by TED Ed.*

Video Link: <https://ed.ted.com/lessons/myths-and-misconceptions-about-evolution-alex-gendler>

Follow- up Questions:

- 1.Who is John Baptist Lamarck and what was his theory?
- 2.True or False? The term 'Survival of the Fittest' refers to how evolution favors the biggest, strongest, or fastest creatures.
- 3.Is survival or reproduction how evolution occurs?



## Video 3: Crash Course Biology: Natural Selection

*Video Description: Hank (Crash Course Teacher) guides us through the process of natural selection, the key mechanism of evolution. Video made by Crash Course.*

Video Link: [https://www.youtube.com/watch?time\\_continue=1&v=aTftyFboC\\_M&feature=emb\\_logo](https://www.youtube.com/watch?time_continue=1&v=aTftyFboC_M&feature=emb_logo)

Teacher Notes:

- Optional video if further reinforcement of concepts is needed.
- Video brilliantly lays out natural selection but does not use a Missouri example.
- For these grade levels only need to watch through the 6-min. mark.

Follow- up Questions:

1. What change gave the dark-colored peppered moth the advantage?
2. Who wrote, "*On the Origin of Species by Means of Natural Selection*"?
3. What is the term for the ways in which organisms seemed to be ideally shaped to enhance their survival and reproduction in specific environments?
4. Fill in the blank. The finches increased \_\_\_\_\_ for their environment or their relative ability to survive and create offspring.
5. What does it mean when a trait is heritable?

## Concluding Questions/Assessment

\*Student worksheet included in packet.

1. Give an example of an inherited trait and its variations.
2. What is an adaptation? Give an example.
3. Define natural selection. Use an example.
4. What is required for natural selection to take place?
5. Describe a common misconception about evolution.

