



Adapt and Survive

Why do animals look the way they do? The answer is survival. Through this activity students learn about the predator/ prey relationship, and how and why external features of animals are key survival adaptations.

Time

- 45-60 min

Next Generation Science Standards

- 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Materials

- 1 spoon
- 1 fork
- 1 knife
- 1 cup
- 1 Lab Sheet
- 20 or more small items that are all the same size but 2-4 colors. (M&M's, smarties, un-cooked beans, rainbow goldfish, rainbow pasta, etc.) You must have the same amount of each color, i.e. 10 green and 10 brown M&Ms or 7 red, 7 yellow, and 7 green rainbow goldfish.

Background

Animals have internal and external structures that support their survival. Without these particular characteristics, or traits, their survival would be jeopardized. How do animals evolve these characteristics that help them to survive? Natural selection. All of life on Earth is made up from genes and DNA. Reproduction and natural gene mutations create small variations in populations. Some of these variations prove advantageous and those individuals survive well. Over time those characteristics, that have particular advantages, become widespread and normal adaptations. This is how natural selection works. We describe the physical attributes of natural selection as animal and plant adaptations. An adaptation is a trait that makes an individual successful in its environment.

Why is a certain animal a certain color? Does it help it survive? Why do certain animals have certain external features? Do they help with hunting, survival, growth, and reproduction? *Yes!* This activity will help your students understand how adaptations help animals to better survive in their environment.

Directions

- Review animal adaptations with your students. Today you'll be discussing physical adaptations— physical traits that help animals survive in their environment. You can share the fun Gray Adaptation Song Video to start or end this activity. Find it on the video tab (above) or here on the video tab: <https://greatbasinobservatory.org/lesson-plans/adapt-and-survive>
- Review the concepts of predator and prey. Prey are animals that other animals hunt and eat to survive. Predators must hunt and eat animals for survival.
- Introduce your students to the idea of natural selection. Natural selection is what allows animals that are best suited for an environment to survive, while others can not compete as well. These others may die off. Therefore the animals most well adapted to specific environments survive and thrive over time.
- Students will be looking at external features that predators have that help them survive. Ask, "*what features can you think of that help predators survive?*" Make a list. Features can be items such as— claws, sharp teeth, long legs for jumping, excellent eyes, ears, and nose for finding prey, fur that aids camouflage, etc. In this activity, students will be observing different types of mouths to eat prey, and different colors of prey, some of which may have camouflage.
- Now explain the at home activity. Set up the scenario. Students will be doing a fun activity to better understand how physical animal adaptations help them survive as both predator and prey. For the predators, the adaptation will be the beak shape for a bird. Students will use a knife, fork and spoon to "eat bugs". Whichever utensil works best for them is the best adapted physical beak shape for hunting the "bugs". Which bug color will help that animal survive?
- Show students the introductory video to the lesson activity. Find it on the video tab (above) or here on the video tab: <https://greatbasinobservatory.org/lesson-plans/adapt-and-survive>
- Tell students to find their needed materials, including their lab sheet, and then do the experiment. Before doing the experiment, be sure to tell students that they can only use their adaptation to hunt. Students may only use one hand with the fork, knife, and spoon. They may not use any other body part other than their one hand holding the utensil— or the experiment will not be accurate!
- Either have the students do the activity independently or together as a class. Remind students to start by writing in their bug colors and circling which mouth type they think will best be able to pick up the bugs and which color bug will best survive.
- If doing together, ask students to find a large space that is easy to clean up, and have student put the 40 bugs (tiny objects) on the table or floor. Students will do 3 rounds using 1 utensil per round. For each round they will have 30 seconds to pick up as many bugs as possible and placing them into a cup.
- Begin the first round using a knife. Try to pick up the bugs and place them in a cup. When the 30 seconds is over, count the number of each colored bug collected and record it on the lab sheet.
- Repeat this process with the spoon and fork.
- Now that the students have finished their scientific experiments, the Lab Sheet is their data. What do they observe? What can they conclude from looking at the results of the experiment? Was their prediction correct?
- Have students circle the beak adaptation that let them catch the most bugs. That adaptation let those birds survive the best. Have students circle which bug color that was eaten the least. That adaptation let that prey survive the best.
- Discuss which adaptations worked the best and why?

Extension

- Following the activity allow students to explore these ideas again using a virtual simulation. This evaluates the adaptation of the prey.

<https://www.biologysimulations.com/natural-selection>

- Click on the introduction button to get background about the environment, prey, and predators in the simulation.
- Select the 1st environment-- Grassland. Then click run simulation. This is the control environment to practice.
- Students will click on as many prey as they can during the time allotted. Students will then write down the Grey End and Brown End percentages. Circle the color that had the highest percentage left.
- Complete the same activity using the other 2 environments.
- Now students will analyze their data. What can they conclude from looking at the results of the experiment?
- In the Mountain Rock environment, which color prey survived the best? Which was eaten the most? Why?
- In the Desert Sand environment, which color prey survived the best? Which was eaten the most? Why?