Predator and Prey

This demonstration works well as a introductory lesson on evolutionary adaptation. There are several ways to adapt this demonstration, so feel free to experiment with different kinds of environments!

Materials

- Poster Board (White)
- Optional: Green Tablecloth
- Red, Blue & White Poker Chips
- Rubber Mitt
- Foggy Goggles
- Green Filter Goggles

Safety Precautions

Please read the General Safety Precautions section of the Demonstration Safety page before performing this demonstration.

Demonstration

1. Set the poster board on one side of a table. Spread out the poker chips across the poker board. Set the mitt and goggles next to the poster board.
    - If you brought the green tablecloth, set it on the table with the poster board on top. Spread out half of the poker chips on the poster board, and the other half on the green tablecloth, making two areas to play the game in.

2. When students come up, ask them if they would like to play a game. The goal is to collect as many poker chips as they can in 30 seconds. If they want to play, explain the following rules:
    - You can only pick up one poker chip at a time. After you pick up a poker chip, you have to place it down in front of yourself before getting another one.
    - When you put a poker chip in your pile, you have to turn and look away from the table before getting another one.
    - You have to choose one of the "traits" to wear: the foggy goggles, the green filter goggles, or the rubber mitt. You have to wear them for the whole game.
    - You can only use one hand to pick up poker chips. If you are using the rubber mitt, you have to use the hand wearing it.

    - If you brought the green tablecloth, then they can choose which area to play on: the white board or the green cloth.

3. Get a timer on your phone or watch ready, and when the students are ready have them go! Stop after 30 seconds, and have them count out how many they got.
4. Have them compare how each performed. The student using the rubber mitt got the fewest, and both pairs of goggles seem to perform equally well. Ask them about what was easy to see and what wasn't. Were some poker chips hard to find?

Why This Works

Evolution is the process by which the traits of a species can adapt over the course of several generations. Animals can develop different traits due to minor mutations between generations. These traits can determine an animals likelihood of surviving and passing on its genes, and can be positive, neutral, or negative. Negative Traits are traits that hinder and animal, making it harder to eat or survive. In our game, the rubber mitt is a negative trait since it makes it hard to pick up the poker chips. This would be like finding a lion that had no teeth; it would be extremely hard for it to hunt prey, and harder still to chew food. Neutral Traits are traits that, although they do not hinder greatly, they can be adapted to. The foggy goggles are a neutral trait, since they make it harder to see but not so hard that you cannot see. On the poster board the foggy goggles trait can still get the red and blue chips easily, but the white chips have adapted to hide from it. Camouflage is when an organism has adapted how it looks so it can better blend in with its surroundings, allowing it to hide from predators or sneak up on prey. The white chips on the white background have camouflage against the foggy goggle trait, but the green goggle trait can see them. Positive Traits are traits that allow an animal to hunt better, hide better and survive longer, making the animal more likely to pass on the trait. The green goggles are a positive trait on the poster board, since they can see through the camouflage of the white poker chips and have no hindrances in that environment.

On the green tablecloth, however, we see that the green goggles become a neutral trait. This is because of a change in environment, and with it a change in what poker chips have camouflage. The blue and red chips become hard to see on the green background while wearing the green goggles, meaning that they have camouflage! This is because of a common evolutionary trait; colorblindness. The most common form of colorblindness is red-green, meaning that shades of red instead look green or brown. This means that a red bird, such as a cardinal, doesn't appear red to most of the animals that hunt it, but rather appears green or brown! The color blue can also appear to look blue-green, which makes it hard for a colorblind animal to spot bluebirds. If you put a foggy plastic filter over the green goggles, then they become a negative trait on the green tablecloth!

Additional Information

There are all kinds of ways to adapt this demonstration and show different types of traits! Ideas include:

- Making red-filter and blue-filter goggles to compare them to the green.
- Having different colors for the background, or even having students reach into a bowl of water!

- Having different objects to pick up, of varying color and size.
- Having different gloves, mitts or claws for students to use and compare effectiveness for the environment.

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