



Evolution and Adaptation Investigation

In order to maximize your students' learning, these are suggested pre- and post-visit activities.

Recommended Reading

"To the Ends of the Earth" by Edward O. Wilson in the book *The Future of Life*.

Previsit: I will provide some background information. I am currently checking some sources but I will probably write a background up for the class to read because most of the sources I have found so far don't have the information in concise enough form to be useful for the project. Part of the background will be on the unique natural histories of Costa Rica and Madagascar and part of the background will talk about some of the adaptive advantages that can be found in the cloud forest and the spiny desert.

Visit: I will meet the students and lead them quickly through the biomes to show off some of the major places inside each biome (allotting approximately 20 minutes for this). They will then be given a comparison assignment, a plant observation assignment, and an animal story to complete through self-guided exploration (I will remain in the glasshouse as well as the volunteer staff to help the students if they have questions).

Comparison assignments are going to be attempts to focus on how the plants are shaped by the conditions. For example:

- Measure the leaf sizes of three plants in Madagascar and three plants in Costa Rica. It is okay to try to find the largest leaves in each biome and the smallest leaves in each biome but make sure whatever guidelines you use to choose your plants in one biome use the same guidelines in the other biome.
- Find three flowers in each biome and record the color, shape, and approximate size of the flower.
- Given color wheels record the leaf colors of three plants in each biome. The students will be given a specific comparison assignment to do in order to split the students up and have them work on different topics.
- Each student will have one plant assigned to them (or if you would prefer they could choose their own). They will make some general observations on the plant and then draw on the background reading on adaptations to focus in on the adaptations that are beneficial in the context of the biome.

For example:

Plush Plant in the Madagascar biome has fuzzy leaves which help reflect back light keeping the plant cooler. Its leaves are also succulent which help the plant through extended dry seasons.

- Finally they will be directed to a part of the biome to read about an evolution-related animal story or plant animal interaction. For example:

The will be a short description of lemurs. They are found only in Madagascar and the Comoro Islands. There are no other primates found in Madagascar and so they have filled just about every niche that primates would normally fill in an environment.

Postvisit: Back at John Carroll University the students can share their exploration and get a more complete picture of how the plants have been shaped by the conditions of the environments and then how in turn the animals have been shaped by the plants and competition or lack of competition.