

Anolis Lizards in the Greater Antilles **Using phylogeny to test hypotheses**

Congratulations! You are about to journey to the Greater Antilles, several islands that include Cuba, Hispaniola, Puerto Rico, and Jamaica just south of Florida. Your goal is to study and collect *Anolis* lizards to learn where different species of *Anolis* lizards live and how they are related. Where they live (called their distribution) and how they are related will help you make hypotheses about how they evolved on the islands.

Here are your goals:

- I. Observe and describe what each species looks like.
- II. Look for patterns in where they live to make hypotheses about how they evolved.
- III. Use a phylogenetic tree to test your hypotheses.



Part I. Getting Started

Before you begin your research, learn a bit about the islands and the lizards. Your teacher will provide you a map of the islands and other resources to review.

1. Color code the islands on the map so that each island is a different color. (for example, color Cuba blue)
2. Answer questions 1-2 on the question sheet.



Part II. Looking for patterns

You travel from island to island observing the lizards that you find. You pay attention to their body shape, their habitat, and the island on which they are found. After several weeks of work you put your data in a data table called “Data Table: *Anolis* lizards.”

3. Get the data table and lizard icons.
4. Look closely at the data table to determine the type of information that it shows.
5. Answer questions 3-4.
6. Use the data table to color each lizard icon according to its body shape (for example, color all “slender body, very long tail” lizards green).
7. Cut out each lizard icon.

8. Use the data table to place each lizard icon in the correct place on the map. For example, place the “#1 slender body, very long tail” icon in the grass under the tree in Cuba.

9. Glue each lizard on the map.

10. Answer questions 5-9.



Part III. Testing your hypotheses

You decide to test your hypotheses by using the DNA from each *Anolis* species to create a phylogenetic tree. Your teacher will give this to you. The phylogenetic tree is a hypothesis of their relationships. The more similar their DNA is, the more closely related they are.

11. Look closely at the phylogenetic tree.

12. Color the name of each lizard on the phylogenetic tree the same color as its icon.

13. Color each branch on the tree the same color as the island the lizard is from.

14. Look carefully at the phylogenetic tree for the patterns that exist.

15. Answer questions 10-15.