

Anolis Lizards of the Greater Antilles Questions **Teacher's Key**

Part I. Introduction

1. Where are the Greater Antilles? **They are islands located south of Florida.**
Which Islands make up the Greater Antilles? **They are made up of Cuba, Hispaniola, Puerto Rico, and Jamaica.**
2. What is the goal of this research? **To use data, such as body shape and habitat to make hypotheses about how different species of *Anolis* lizards are related then to test these hypotheses using a phylogenetic tree.**

Part II. Looking for patterns

3. What type of information does the data table show? **Identification number, name of lizard species found, island each lizard was found, its habitat, and body shape.**
4. Describe the six different types of body shapes that the lizards have.
 - **slender body, very long tail**
 - **short body, slender legs and tail**
 - **large toe pads, can change color**
 - **large body, large toe pads**
 - **stocky body, long hind limbs**
 - **long fore limbs, flattened body**
5. What patterns do you see between the type of body shape a lizard has and the habitat it lives in?
 - **Lizards with similar body shape live in similar habitats. For example, all slender body, very long tail lizards live in grasses and bushes.**
 - **There are more lizards on the larger islands. For example, Jamaica only has four species of lizard, where as Cuba has all six species.**
 - **Students may suggest patterns that relate to how the different body shapes may be adapted for the habitat that it lives in. For example, the lizards that live on twigs have short bodies and slender legs and tails. The smaller, lighter body may be advantageous when living on fragile vegetation.**
6. Does this pattern exist on all islands? Explain. **Yes, however not all islands have all of the species of lizards. For example, Jamaica has only four species and Puerto Rico has only five.**
7. Which lizards do you think are more closely related; those that live on the same island but in different habitats, or those that live on different islands but have the same body features and live in the same type of habitat? Explain. **Answers will vary.**
8. Write two alternative hypotheses about how these lizards might have speciated/evolved on and between these islands. **Answers will vary.**

9. How could you test your hypotheses? **Answers will vary. Students may suggest looking at fossils, using DNA, using other observations to determine how they are related to each other.**

Part III. Testing your hypotheses

10. Explain the different patterns that you see in the phylogenetic tree. Look at their body shape, habitat, and the island on which they are found. Write down as many observations as you can. **Answers will vary.**

11. Based on the phylogenetic tree, which lizards do you think are more closely related: those that live on the same island but in different habitats, or those that live on different islands but have the same body shape and live in the same type of habitat? Explain using specific examples. **Answers may vary, but in general students should recognize that lizards on the same island are more closely related to each other than lizards that have similar body shapes and live in the same type of habitat.**

12. Look back at your original hypotheses (question 8). Explain how these new data support or do not support your hypotheses about how these lizards might have speciated/evolved. **Answers will vary.**

13. How could you further test your hypotheses? What type of information would you want to have? **Answers will vary. It would be possible to use fossil data, or create a new phylogenetic tree based on different features.**

14. How could fossil evidence help you test your hypotheses? **Fossils could suggest which body type existed the earliest to most recent, suggesting which lizards may have inhabited the islands first. A comparison with fossils from lizards on the mainland may also help us understand how the group evolved and speciated.**

15. How do you think the lizards could have gotten from one island to another? **Answers will vary. They may have swam, floated on natural rafts, the islands may have been connected at one point.**