

Agree with Score

DE

GA

Storyline #5, Test 2, Part 2

SEP2: Developing and Using Models

4	3	2	1
I can develop and use models using all success criteria in unfamiliar contexts AND/OR making connections to related science concepts	I can develop and use models using all success criteria in familiar contexts <input type="checkbox"/> Accuracy of model (e.g., label/key, components) <input type="checkbox"/> Accurately describes a model to answer the prompt (e.g., explain, caption, critique) <input type="checkbox"/> Accurately applies scientific specific concepts (ELO content)	I can develop and use models using some success criteria	I can develop and use models with support

ELO Content: (LS 3-1) Describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects on the structure and function of the organism.

After studying the anole lizard on Turks and Caicos, scientists studied the gene difference between large toepads and small toepads. A stronger grip was associated with larger toepads. Transcribe and translate the following DNA sequences for anole lizards and their toepads.

Anole DNA with Small Toepads	DNA	T A C	G C A	A A C	T T G	A C T
	RNA	A U C	C G U	U U G	A A C	U G A
	AA	Met	Arg	Leu	Asn	Stop

Anole DNA with Large Toepads	DNA	T A C	G C A	A A A	T T G	G A C
	RNA	A U C	C G U	U U U	G A A	C U G
	AA	Met	Arg	Phe	Glu	Asp

1. What type of mutation occurred to produce large toepads? Insertion, deletion or substitution mutation? Use evidence of the DNA bases and amino acids to support your answer:

An insertion mutation happened in the DNA strand to produce large toepads. The lizard with the small toepad had AAC then TTG then ACT for this DNA bases which had the AA be Leu, Asn, STOP. With the lizard with large toepads there was a mutation in the AAC that inserted a A base which then was AAA, TTG, CAG which changed the AA to be Phe, Glu, Asp.

2. How do mutations in the DNA affect if an anole lizard will have the phenotype for small toepads or large toepads? Use specific evidence from the model above to help support your answer. May include the following in your explanation: protein, phenotype, gene, trait, DNA, mutation, protein shape.

Different mutations like the insertion in the DNA→RNA→AA model causes different phenotypes because of the different protein.

3. Which phenotype was beneficial after the hurricane? Circle answer. (**Small toepad** OR **large toepad**) Explain how this mutation was beneficial for anole lizard's fitness, survival, and reproduction after the hurricane

Looking at the evidence from the last part of the test, the large toepads were beneficial after the hurricane because they were better adapted to survive the hurricane and weather. Because more lizards with the large toepads had greater fitness they survived more, had more babies, and passed on their genes for large toepads.

Disagree with Score

AK: 2- missing evidence and content for question 2

JJ 2

ML: 2

ES- 2- missing evidence, does not talk about protein folding and protein shape = phenotype

CS (2)

AL 2

KK- 2

IO 2

