Fur, Food, and Fate

Explain how inherited traits and environmental conditions work together.

L.8.4A.2 "Construct explanations about how genetic factors and environmental factors (e.g., food intake, interactions with other organisms, etc.) lead to the growth, survival, and reproduction of organisms in natural selection."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline mentions of inherited fur color, circle mentions of owls or food supply, and write G, S, or R beside sentences that explain growth, survival, or reproduction.

Mice on the Lava

1. At dusk, rock pocket mice leave cracks in a desert lava field to search for seeds. Their fur varies: some mice have dark coats, and others have light coats. Fur color is influenced by genes passed from parents to offspring. A dark mouse is harder for an owl to spot against black lava, while a light mouse stands out. On nearby pale sand, the advantage reverses. An owl can more easily see a dark mouse there. Color does not help a mouse find seeds or make it immune to an owl.

2. Imagine a dry year when fewer plants produce seeds. Mice of either color may have trouble getting enough food to grow and survive. A mouse that avoids an owl still needs food before it can raise young. If seeds are scarce, fewer mice may live long enough to reproduce. Some dark mice on the lava survive owl attacks, but they do not all reproduce. Food supply, an environmental factor, affects survival and reproduction alongside the inherited fur color that influences which mice owls notice.

3. After several years with enough seeds, dark mice on the lava may leave more offspring than light mice because owls catch fewer of them. Those offspring can inherit genes linked to dark fur. Over generations, dark fur may become more common in the lava population. On pale sand, light fur may become more common instead. Individual mice do not choose to change their genes when they step onto a new surface. Natural selection occurs when inherited differences affect which mice survive and reproduce in a particular environment.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do inherited fur color and black lava together affect a mouse's chance of surviving an owl attack?

2. During a dry year, how could the seed supply affect the growth and reproduction of mice of either color?

3. Why might dark fur help mice leave more offspring on lava but not on pale sand?

4. If seeds are plentiful for several years, explain how dark fur could become more common in the lava population.

3 YOUR TURN

Your own words

Suppose owls stop hunting in the lava field, but a dry year sharply reduces the seeds there. In four sentences, explain how inherited fur color and these changes could affect mouse growth, survival, and reproduction, and predict whether dark fur would still have the same advantage.

ANSWER KEY

Fur, Food, and Fate

GRADE 8 · L.8.4A.2

PART 1 · READ AND MARK

Underline mentions of inherited fur color, circle mentions of owls or food supply, and write G, S, or R beside sentences that explain growth, survival, or reproduction. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do inherited fur color and black lava together affect a mouse's chance of surviving an owl attack?	**Genes influence fur color. On black lava, dark fur makes a mouse harder for an owl to spot, so it is more likely to survive than a light mouse.**
2	During a dry year, how could the seed supply affect the growth and reproduction of mice of either color?	**With fewer seeds, mice of either color may not get enough food to grow and survive. Fewer may live long enough to raise young.**
3	Why might dark fur help mice leave more offspring on lava but not on pale sand?	**Dark fur hides mice from owls on lava, helping them survive to reproduce. On pale sand, dark mice are easier for owls to see.**
4	If seeds are plentiful for several years, explain how dark fur could become more common in the lava population.	**Owls may catch fewer dark mice on the lava, allowing more of them to survive and reproduce. Their offspring can inherit genes linked to dark fur, so dark fur may become more common over generations.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Dark and light mice can still pass on genes linked to their fur colors. Without hunting owls, dark fur would no longer give mice its usual protection on black lava. With fewer seeds, mice of either color may struggle to grow, survive, and raise young. Since fur color does not help them find food, there is no clear reason to expect dark mice to leave more offspring than light mice under these conditions.

Accept explanations that connect inherited fur color with visibility to owls and connect seed supply with growth or reproduction. For Your Turn, students should not claim that a food shortage changes an individual mouse's genes.