Built for Dry Land

How reptile adaptations support life away from water

ZOO.8.3 "Describe adaptations that have led to reptiles living on land successfully."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline four different reptile adaptations in the passage. Circle a phrase that explains how each one helps a reptile live or reproduce on land, then give each adaptation and its matching explanation the same number.

A Lizard's Life on Land

1. At midday, a desert lizard darts from the shade of a rock onto hot sand. Its dry, overlapping scales contain keratin, a tough protein that helps slow water loss through the skin. Scales do not make the animal waterproof, so the lizard still needs water from food or its surroundings. Unlike an amphibian that relies partly on moist skin for gas exchange, the lizard takes in oxygen through its lungs. Muscles move its ribs to expand the chest and draw air in. This way of breathing works while its skin stays relatively dry.

2. The lizard's ancestors also faced a problem on land: how could their young develop without a pond? In most reptiles, fertilization occurs inside the female before she lays eggs or gives birth. In species that lay eggs, an embryo develops within an amniotic egg. Membranes surround the embryo with fluid, so its tissues do not need to sit in open water. A shell helps protect the egg and slows water loss while allowing gases to pass through. Eggs still need suitable temperatures and enough moisture, which is why many reptiles place them in sheltered spots.

3. Water conservation continues after a reptile eats. Many land reptiles release much of their nitrogen waste as uric acid, a substance that can leave the body in a thick paste with relatively little water. Producing uric acid uses energy, but it reduces the water lost with waste compared with releasing nitrogen mainly as dilute urine. These traits work together rather than acting as a single desert superpower. Scales limit water loss at the surface, lungs allow breathing without wet skin, and protected embryos can develop away from ponds. Still, reptiles must avoid overheating and find food, shelter, and water.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do the lizard's scales help it live on land, and what can they not prevent completely?

2. How do lungs and rib movement help the lizard breathe while its skin stays dry?

3. How do the membranes and shell of an amniotic egg help a reptile reproduce away from a pond?

4. Why does releasing nitrogen waste as uric acid help many land reptiles conserve water?

3 YOUR TURN

Your own words

Imagine a reptile species moving into a rocky desert where rain falls only a few days each year. In 5 to 6 sentences, explain how three different adaptations from the passage would help it survive and reproduce there, and identify one challenge those adaptations do not solve.

Built for Dry Land

PART 1 · READ AND MARK

Underline four different reptile adaptations in the passage. Circle a phrase that explains how each one helps a reptile live or reproduce on land, then give each adaptation and its matching explanation the same number. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do the lizard's scales help it live on land, and what can they not prevent completely?	**Keratin-containing scales slow water loss through the skin, but they do not prevent all water loss.**
2	How do lungs and rib movement help the lizard breathe while its skin stays dry?	**Rib movement expands the chest and draws air into the lungs, so the lizard does not have to rely on moist skin for gas exchange.**
3	How do the membranes and shell of an amniotic egg help a reptile reproduce away from a pond?	**The membranes keep the embryo surrounded by fluid. The shell protects it and slows water loss while allowing gases to pass through.**
4	Why does releasing nitrogen waste as uric acid help many land reptiles conserve water?	**Uric acid can leave the body in a thick paste, using less water than dilute urine.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

In the rocky desert, keratin-containing scales would slow the reptile's water loss through its skin. Releasing uric acid as a thick paste would help it conserve water after eating. If it laid amniotic eggs, the fluid-filled membranes would let embryos develop without a pond. The eggshell would also slow water loss while letting gases pass through. These adaptations would not keep the reptile from overheating, so it would still need to find shade.

Accept equivalent explanations that connect each adaptation to a land-based challenge. For the open task, look for three distinct adaptations, accurate cause-and-effect explanations, and a challenge the named adaptations do not solve.