

STUDENT PACKET

Penguin Behavior & Adaptations — Riverbanks Zoo Video Investigation (9-12)

Name:	Class / Period:
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Part A — Before You Watch

With a partner, predict: what problems does a penguin need to solve to survive in a cold, ocean-facing environment (staying warm, moving on land vs. in water, finding food, avoiding predators, raising young)? Jot down one idea for each.

Part B — Video Observation Log

While you watch the Riverbanks Zoo video, record at least 6 specific behaviors you observe. For each, note which species (King or Rockhopper) and describe the behavior in enough detail that a classmate could picture it. Look for things like: diving and swimming, entering the water, moving across land (waddling, hopping, or tobogganing), vocalizing or using body language, interacting with a keeper, gathering nest material or balancing an egg, and being fed or examined during a health check. In the last column, make your best inference about the purpose of that behavior.

Time in video	Species observed	Behavior described	What might this behavior help the penguin do?

Part C — Comparing Adaptations

Using your observation log and the background table, fill in at least one example of a structural, a behavioral, and a physiological adaptation for each species. Some cells may draw on the background reading rather than the video alone (for example, physiological adaptations are rarely visible on camera).

Type of adaptation	King Penguin	Rockhopper Penguin
Structural (body part / physical feature)		
Behavioral (something it does)		
Physiological (internal body process)		

Analysis Questions

1. Choose one adaptation described in the video — such as a penguin's solid, dense bones, its countershading coloring, its salt glands, or its layer of fat and tightly packed feathers — and explain how it likely evolved through natural selection. Be sure to describe the trait, the environmental pressure it addresses, and why individuals with that trait would out-survive or out-reproduce individuals without it. [\[B-LS4-4\]](#)

2. King and Rockhopper penguins share sub-antarctic habitats but move very differently — Rockhoppers hop between rocks and leap feet-first into the water, while King penguins waddle slowly on land and can toboggan across snow and ice. Using this evidence, explain how genetic variation and competition for resources could allow two different-looking penguin species to both succeed in a similar environment. [\[B-LS4-2\]](#)

3. The video explains that each penguin has its own unique call, and that keepers can also read a penguin's body language — its posture, walk, and neck movements — to understand how it's feeling. Evaluate the evidence for how this kind of individual recognition and communication could affect a penguin's chances of survival and reproduction within a large colony. [\[B-LS2-8\]](#)

4. Many penguin colonies are very large, with individuals competing for nesting space and for fish within swimming range. Explain how biotic factors (such as food availability and competition) and abiotic factors (such as nesting space and climate) could limit the carrying capacity of a penguin colony's island habitat. [B-LS2-1]

5. The video notes that more than half of the world's penguin species face growing challenges from habitat loss, pollution, changing ocean conditions, and declining food sources. Choose one of these threats and predict how it could affect King and Rockhopper penguin populations. Then propose one conservation action that could help reduce human impact on these species. [B-LS2-7 / B-LS4-5]

Part D — Biology 2 Extension: Evidence & Ecosystem Stability

This section asks students to reason with evidence at a higher level of rigor. Assign it to Biology 2 classes, or use it as an enrichment option for advanced Biology 1 students.

6. IUCN status differs between the two species: King penguins are currently listed as a species of Least Concern with a growing population, while Southern Rockhopper penguins are listed as Vulnerable with a declining population. Using the concept of ecosystem stability, propose at least two possible reasons why two penguin species with overlapping ranges could be experiencing such different population trends, and explain what additional evidence would help confirm your reasoning. [B-LS2-6]

7. Design a simple monitoring plan a field biologist could use to detect an early warning sign that a Rockhopper penguin colony is being affected by a changing ecosystem (for example, what data would you collect, how often, and what result would concern you?). [B-LS2-6 / B-LS4-5]

Optional data connection: if your class has access to real population datasets (e.g., from published seabird monitoring programs), have students graph King vs. Rockhopper population trends over the last 20–30 years and write a claim-evidence-reasoning paragraph explaining the pattern.

Part E — Wrap-Up / Exit Ticket

Revisit the Essential Question: Why do two penguin species living in the same environment move, communicate, and survive in such different ways — and what does that tell us about how adaptations evolve?

In 2–3 sentences, answer: What is one adaptation — structural, behavioral, or physiological — that most surprised you, and why does it give that penguin species an advantage in its environment?
