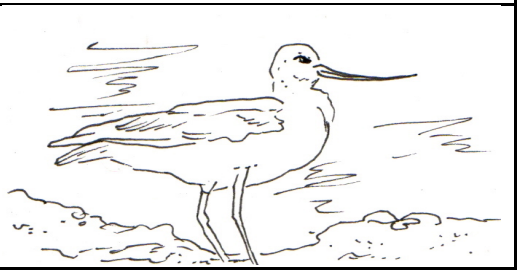
Exploring The Field
Chaperone Guide

The Field Museum

SURVIVAL OF THE BIRDS		
Grade Level	Ideal for 9th-12th grade Appropriate for ages 12-18	
Exhibition	*Gidwitz Hall of Birds*	
Time	1 hour	

Overview
In this exploration, students will infer whether or not a bird can survive in a specific environment by observing its physical features such as beak, feathers, legs, and feet.

Guiding Question
How do physical features such as beaks, feathers, and feet help birds survive in a specific environment?

Key Words
Adaptation - a change or process of change by which an organism becomes better suited to its environment. We often see this as a genetic change that results in a change in the physical features that makes an organism better able to live in its environment.
Environment - the surrounding physical and biological conditions
Population - the total number of organisms that live in one place

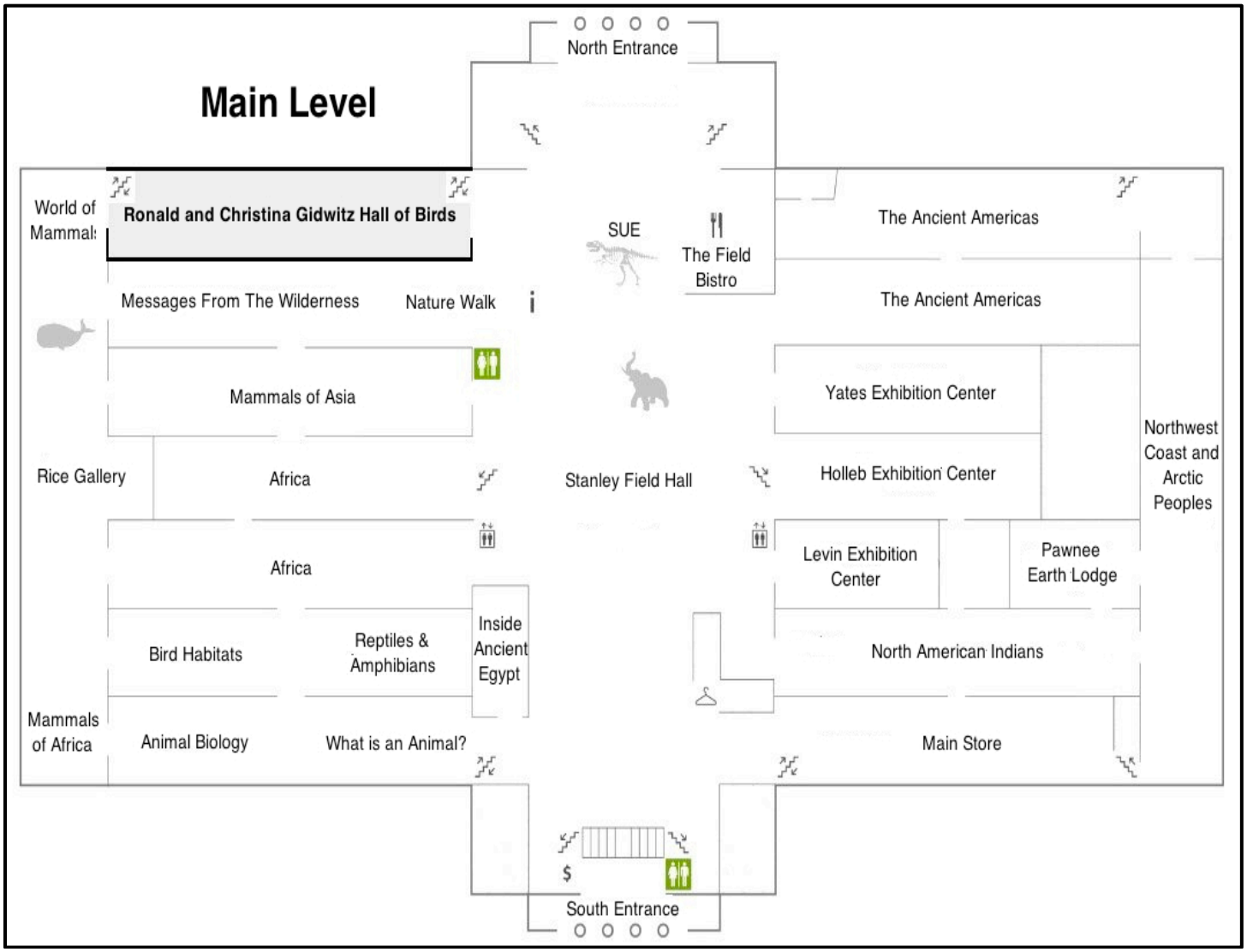
Connections to Standards
Next Generations Science Standard
Disciplinary Core Idea LS4.C: Adaptation
Evolution is the consequence of the interaction of four factors: (1) the potential for a species to increase in number, (2) the genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for an environment's limited supply of the resources that individuals need in order to survive and reproduce, and (4) the ensuing proliferation of those organisms that are better able to survive and reproduce in the environment. (HS-LS4-2)

Trip Tip: When students first enter an exhibition, encourage them to look around freely before asking them to concentrate on completing this guide. Becoming familiar with their learning space will help students focus.

Map

Exhibition:

Gidwitz Hall of Birds (Main Level)



If you have extra time, visit these related exhibitions:

World of Mammals (Main Level)
Mammals of Asia (Main Level)
Bird Habitats (Main Level)
DNA Discovery Center (Upper Level)

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Visualize (before you explore)
As you read the paragraph below, visualize the environment described:

The Environment: Imagine you are in a large forest of tall pine trees. These trees are over 200 years old and tower above you. There is a thick layer of green shrubs, pine needles, and dead wood covering the ground. The air smells fresh and feels moist. Light rainfall occurs frequently. In the nearby stream salmon, trout, frogs, and mud minnows swim. Beavers and raccoons live near the banks of the stream. Overall, the climate is moderate. The summers are warm and sunny with temperatures ranging from 48°F – 65°F. The winters are mild and damp with temperatures ranging from 37°F – 51°F.

Observe and Explain (in the exhibition)
Travel to the ***Gidwitz Hall of Birds*** exhibition located on the **Main Level**, and find two birds – one bird that is well-adapted for the environment described above and one that is not. Record your observation in the charts provided.

Bird 1: **Find** a bird that is **well-adapted** for the environment described above. **Sketch** and **describe** this bird's features in the chart below.

Bird Name:_____

Feature		Sketch	Describe	How does this feature help the bird survive?
Feathers	•Color and pattern •Shape and size •Sheen and stiffness			
Beak	•Shape and size •Length and thickness •Sharpness			
Feet	•Talon shape/size •Thickness of toes •Curved, flat, or webbed toes			
Other				

Guiding Question: Over time, traits that help organisms survive in a specific environment become more common across a species' population. What might the bird's physical features reveal about the food in its environment?

Trip Tip: Before you begin, find a bench or a spot on the floor. Give students an overview of this activity and discuss the environment described in the **Visualize** section.

Trip Tip: Different types of feathers are adapted for different functions. Downy feathers offer warmth, stiff feathers are aerodynamic, shiny oil-coated feathers repel water, and colorful feathers can attract a mate.

Guiding Questions: What food sources are available in this environment? How could the structure of this bird's beak help it eat one or more of these foods?

Trip Tip: Think about how feet have adapted for specific functions. Webbed feet are good for swimming, flat long toes for running, curved toes for perching in trees, and talons for grasping prey.

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Bird 2: Find a bird that is **unfit** for the environment described on the first page. **Sketch** and **describe** the bird's features in the chart below.

Bird Name:_____

	Feature	Sketch	Describe	How does this feature make the bird unfit for the environment?
Feathers	•Color and pattern •Shape and size •Sheen and stiffness			
Beak	•Shape and size •Length and thickness •Sharpness			
Feet	•Talon shape/size •Thickness of toes •Curved, flat, or webbed toes			
Other				

Guiding Question: Would this bird's feathers be able to protect it from the temperature, weather, and predators in the environment?

Guiding Question: Would this bird have trouble accessing available food sources in the environment with this beak?

Guiding Question: What kind of environment might this bird be better adapted for?

Share and Compare (after you explore)

Environmental Change: Now the winters have become much colder. In the middle of winter, snow covers the ground and the stream is frozen over. Over time, how might the population of **Bird 1** and **Bird 2** change due to the environmental change?

What would happen to the population of **Bird 1**?

What would happen to the population of **Bird 2**?

Guiding Questions: Would the frozen stream restrict a major food source? How might the birds respond if they did not have access to the food in the stream? How would this response affect the population of the species in this area over time?

Trip Tip: Find a quiet spot in the Museum to discuss the **Share and Compare** ideas, or ask students to draw or write a description when they return to school.

Trip Tip: Emphasize the idea that individuals with traits that allow them to survive in their environment, reproduce and pass on these traits to their offspring. Over time, the prevalence of these beneficial traits increase in a population.

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What would happen to the population of **Bird 1**?

What would happen to the population of **Bird 2**?