

Student Laboratory Packet

Bird Adaptations

A Laboratory Activity for the Living Environment

Background

Birds have many adaptations for flight. Hollow bones make birds light. Their feather-covered bodies are streamlined, which reduces air resistance. Strong flight muscles move the wings, and the wings provide aerodynamic lift.

Birds are also adapted to their food source and to their environment. Their beaks and tongues are shaped in ways that help in getting food. Their feet are modified to function in a particular environment.

The various sizes and shapes of beaks and tongues are adaptations for capturing, holding, and eating particular kinds of food. Tongues vary in length and shape. Some beaks are hooked or toothed for grasping and tearing; some are pointed for spearing food; some are long and thin, for probing flowers.

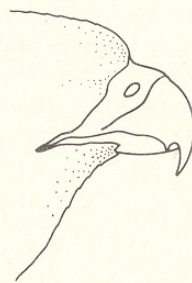
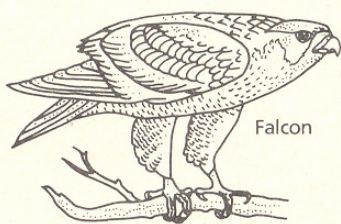
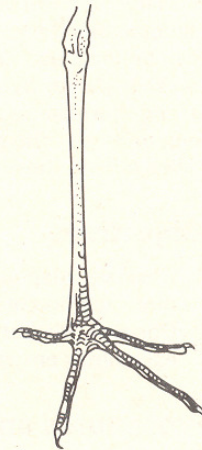
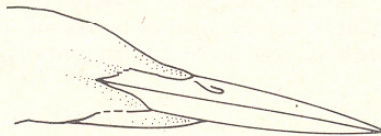
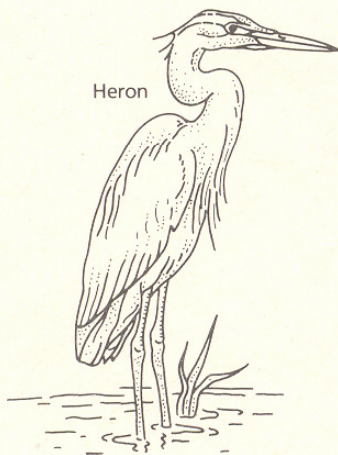
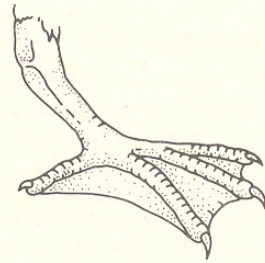
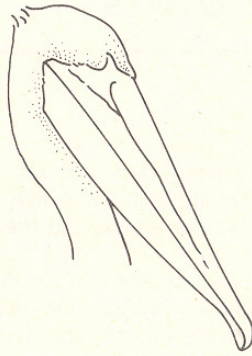
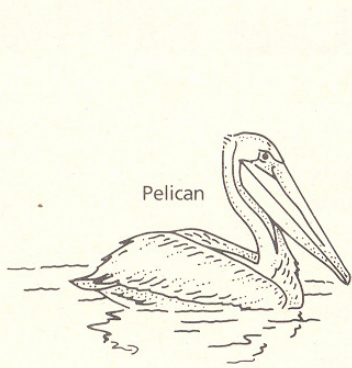
The legs and feet of birds are adapted for running, swimming, climbing, perching, seizing prey, and other activities. Toes on the feet may be long and slender, or short and stout. Many birds have a long toe that points backward. At the end of each toe is a nail, made of strong, hornlike material. Nails may be blunt or sharp. They may be long or short. The nails of birds of prey, such as hawks and owls, are called *talons*. These nails are very long, hooked, thick, and sharp.

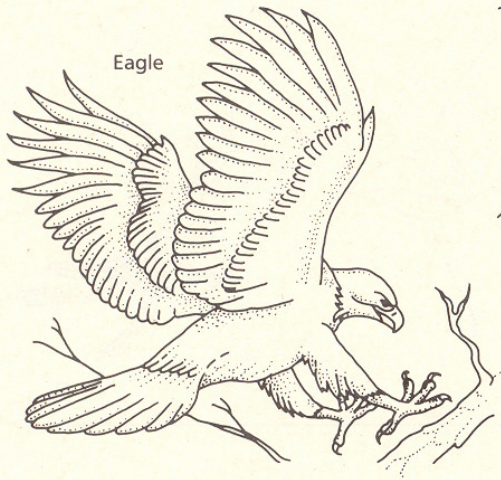
Objectives

1. Observe adaptations of beaks of birds, and relate these to each bird's method of feeding.
2. Observe adaptations of legs and feet of birds, and relate these to each bird's environment.

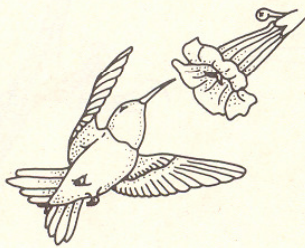
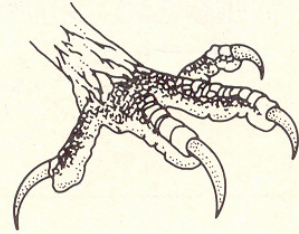
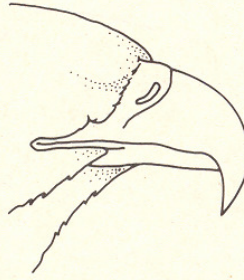
Procedures and Observations

1. Examine the size and shape of the beak of each bird shown in Figure 1. Decide if each beak is long or short. A beak is *long* if it is the same size or longer than the bird's head. It is *short* if it is shorter than the bird's head.
 - a. Record these observations in Table 1 on page 346.
2. You can determine the function of a bird's beak by examining its structure. The structure and function of various beaks are described in Table 2. Match these descriptions to the birds shown in Figure 1.
 - b. In Table 1, record the structure and function of each bird's beak.

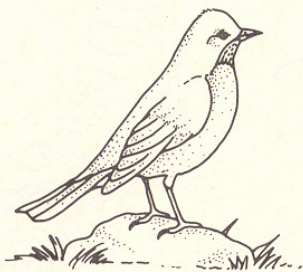
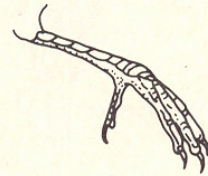
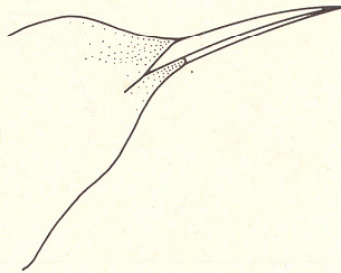




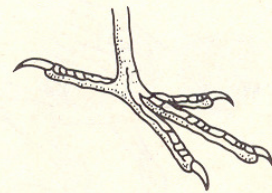
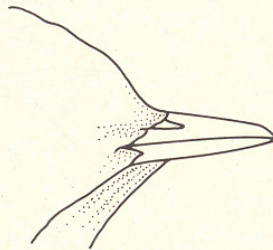
Eagle

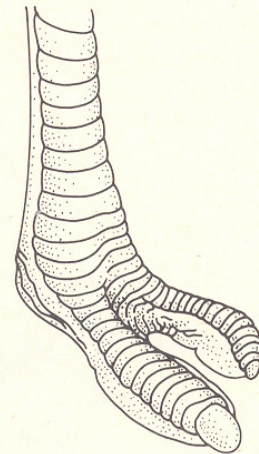
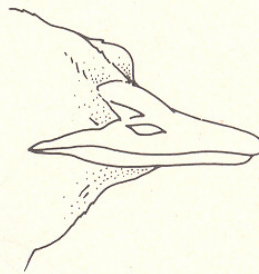
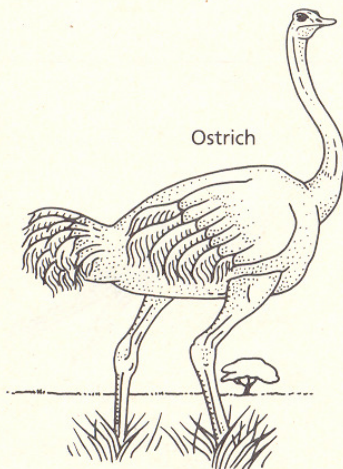
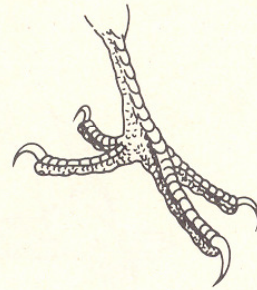
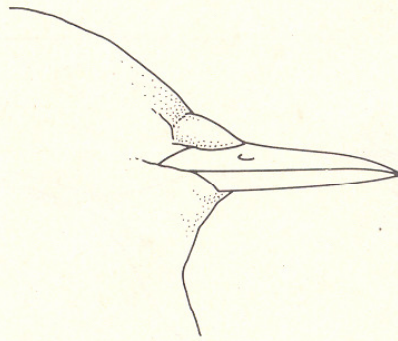
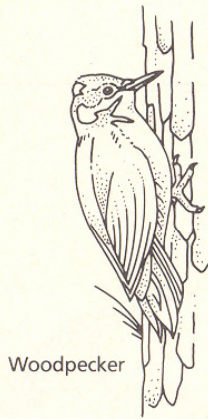
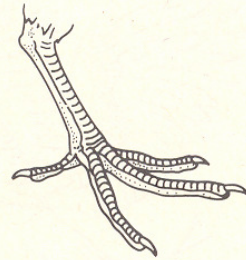
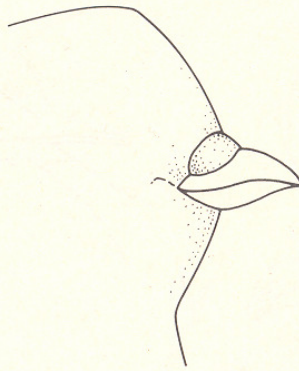
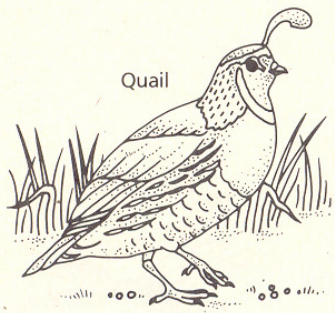


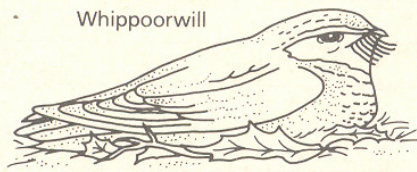
Hummingbird



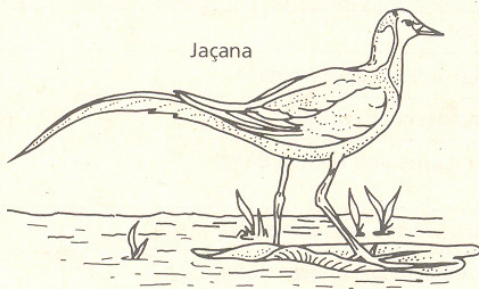
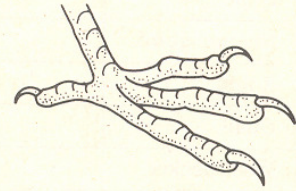
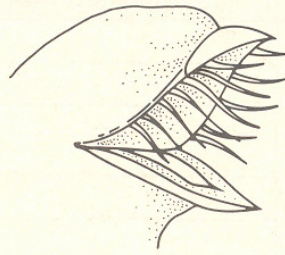
Robin



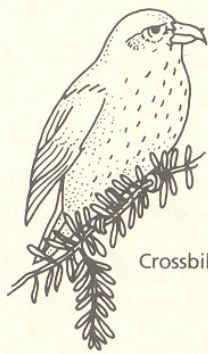
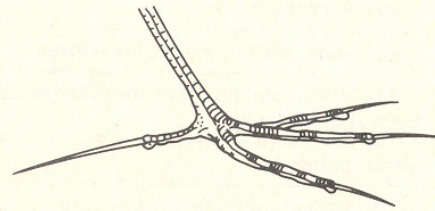
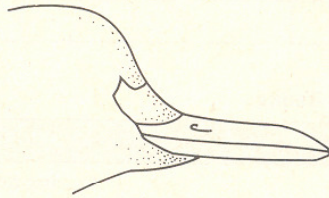




Whippoorwill



Jacana



Crossbill

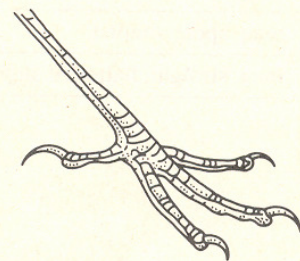
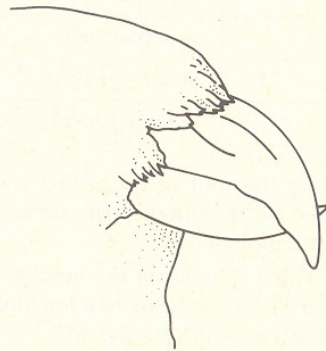


Table 1. Adaptations in Beaks of Birds

Bird	Length of beak	Structure of beak	Function of beak
Pelican			
Heron			
Falcon			
Eagle			
Hummingbird			
Robin			
Quail			
Woodpecker			
Ostrich			
Whippoorwill			
Jacana			
Crossbill			

Table 2. Sizes and Shapes of Beaks

Beak Structure	Function
short, hooked, thick	tearing flesh
short, very thick	cracking and crushing seeds
short, wide, with fringelike structures	trapping insects in the air
short, thick, hooked, with toothlike structure on each side of hook	capturing prey and tearing flesh
short, pointed	capturing worms and insects
short, with curved and crossed tips	prying open scales of pine cones
long, thin, pointed	probing into flowers to get nectar
long, straight, pointed	drilling into trees
long, thick, broad	capturing small animals, eating fruits, and picking up stones to mix with foods
long, with pouch	scooping fish
long, spear-shaped	spearing fish
long, straight, flattened slightly at tip	catching small fish and mollusks

3. Examine the foot of each bird shown in Figure 1. Notice that the number and position of the toes, as well as the type of nail, varies with the type of bird.

c. In Table 3, indicate the number and position of the toes for each bird. Front toe refers to a toe that points forward. Back toe refers to a toe that points backward.

- d. In Table 3, describe the type of nail of each bird.
4. Use the descriptions given in Table 4 to determine the function of each bird's foot.
- e. In Table 3, record the function of each bird's foot.

Table 3. Adaptations in Feet of Birds

Bird	Toes		Nails	Function of foot
	front	back		
Pelican				
Heron				
Falcon				
Eagle				
Hummingbird				
Robin				
Quail				
Woodpecker				
Ostrich				
Whippoorwill				
Jacana				
Crossbill				

Table 4. Sizes and Shapes of Bird Feet

Foot Structure	Function
strong, thick toes; short, blunt nails	scratching
relatively long back toe, three front toes; short, sharp, curved nails	perching
webbing between toes; short nails	swimming
only two toes; short nails	running (on land)
very long legs and toes; short nails	wading
extremely long toes that are very widely spread; very long nails	running (over water plants)
two front toes, two back toes; nails are curved and pointed	climbing
stout toes; large, thick, very sharp, curved talons	grasping

Analysis and Interpretations

1. In the birds you studied, what was the most common function of the feet?

2. What was the most common number and arrangement of toes on the birds that you studied?

3. How are the beaks of the heron and pelican adapted for feeding on fish?

4. How are the feet of a woodpecker adapted for the way the bird feeds?

5. Some hummingbirds have longer beaks than others. How does this show that they are adapted for feeding on different flowers?

6. Imagine a bird with a certain habitat and feeding habits. What would this bird look like? What kind of beak and feet would it have? Describe the habitat and type of food that the bird would eat. Describe the physical characteristics of the bird
