ACTIVITY:

This center provides activities that illustrate how the various adaptations of bills, eyes, wings, and feet assist birds in finding and eating food. Familiar birds common to the Tucson area are represented in the lessons.

LOCATION:

CESC staff will inform you of the location of the activity.

EQUIPMENT AVAILABLE:

Bird bills:
- 8 pictures of bill types
- 8 tools that simulate bird bills
- 7 foods appropriate for each bird bill
- 2 bird skulls

Bird feet:
- 8 pictures
- 4 bird foot models

Bird eyes:
- 4 pictures

Bird wings:
- 4 pictures

Books:
- selection of five books for end-of-lesson reading

EQUIPMENT BROUGHT FROM SCHOOL:

Peanuts, walnuts, or pecans in shells.

ASSIGNMENT FOR GROUP LEADERS A FEW WEEKS PRIOR TO TRIP:

The leader reads all the material about the lesson, selects the activities to be used, and works out a plan for the time allotment. The leader may wish to do additional research about bird adaptations.

DIRECTIONS FOR GROUP LEADERS ON TRIP DAY:

Take the kit to the activity area and look over the materials.
THE LESSON:

1) Introduction
Ask the group:
Think of birds that you know. Picture them in your mind. What do they all have in common? (Possible answers: bills, wings, feathers, two feet.)

Now think of ways they are different. Name some differences. (Possible answers: color, size and shape of the bird, size and shape of the bill, wings, and feet, where they live.)

Hold up pictures of the:
   a) hummingbird
   b) hawk
   c) duck

These are all birds—they have feathers, wings, two feet, and a bill, but they look quite different from one another. Take special notice of the bills, eyes, wings, and feet. In what ways are these important to a bird? (Possible answers: they help them find food and escape predators.)

Now we are going to look at the bills, eyes, wings, and feet of a number of different kinds of birds and learn how they are the tools birds use to help them survive.

2) Bird Bills (8 birds are represented)
In this activity students examine pictures of the birds, tools that simulate different bird bills, and food types. Then they group the picture, tool, and food for each species.

Before the first group arrives prepare the following:
- float bits of styrofoam in a bowl of water
- place plastic insects under rocks
- sprinkle rice onto the piece of wood
- scatter the tools (bird bills) and food items on a table

The children gather around the table and look at the items. Explain that they are going to match a picture of the bird with a tool that resembles the bird bill. Then they will determine which food item would best be suited for that bird bill.

Hold up a picture of a bird. Ask the students which tool resembles the bill of that bird. The child that answers may pick up the tool. Now ask which food item on the table would be eaten by a bird with that kind of tool for a bill. The child who answers may pick up that food. Experiment with the tool and the food. Examples: the needle-nosed plier-like bill of the woodpecker can pick insects out of the styrofoam log; the eyedropper and protruding brush simulate the hummingbird’s bill and tongue which can dip deep into a flower. The chart below will help you match the species to the tool and the food.
<table>
<thead>
<tr>
<th>SPECIES</th>
<th>TOOL</th>
<th>FOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gila woodpecker</td>
<td>needle-nosed pliers</td>
<td>beads in styrofoam (insects in wood)</td>
</tr>
<tr>
<td>cactus wren</td>
<td>tweezers</td>
<td>rice in log (insects in wood)</td>
</tr>
<tr>
<td>curve-billed thrasher</td>
<td>smaller hair clips</td>
<td>insects under rocks</td>
</tr>
<tr>
<td>cardinal</td>
<td>pliers</td>
<td>peanuts to be cracked</td>
</tr>
<tr>
<td>hummingbird</td>
<td>eyedropper with brush</td>
<td>flowers</td>
</tr>
<tr>
<td>roadrunner</td>
<td>large hair clips</td>
<td>lizards, snakes, scorpions, centipedes</td>
</tr>
<tr>
<td>hawk</td>
<td>vice grip</td>
<td>mouse</td>
</tr>
<tr>
<td>duck</td>
<td>tea strainer</td>
<td>styrofoam bits in water</td>
</tr>
</tbody>
</table>

As students match the bird to the tool to the food allow them to discuss their choices and their observations.

### 3) Bird Eyes

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>EYE PLACEMENT</th>
<th>FOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>owl</td>
<td>forward facing</td>
<td>rodents</td>
</tr>
<tr>
<td>roadrunner</td>
<td>forward and downward facing</td>
<td>snakes, lizards, insects</td>
</tr>
<tr>
<td>cardinal</td>
<td>on the sides of the head</td>
<td>seeds and berries</td>
</tr>
<tr>
<td>hummingbird</td>
<td>on the sides of the head</td>
<td>flower nectar</td>
</tr>
</tbody>
</table>

Hold up a picture. Examine the eye placement. How would forward facing eyes help a bird that hunts for moving prey? How would side placed eyes help a bird that eats plant material?

Possible answers:
- Forward facing eyes in birds and other animals helps them locate prey that is running away. This also gives animals 3-dimensional vision or depth perception which helps them in judging distance as they pounce upon moving prey.
- Eyes placed on the side of the head allow a bird to watch for predators as they eat. They have some 3-dimensional vision directly ahead, but as they feed on plant material those side-facing eyes can be on the lookout for possible danger.

**Review bills and eyes by examining two bird skulls**

One at a time hold up the bird skulls. With each skull ask the group:
- Look at the bill. What does the shape and size tell you about the kind of food this bird would eat?
- Look at the eyes. Which direction do they face? How would eye placement help the bird look for food?

The **cormorant** dives into the ocean and catches fish.
The **owl** catches and rips apart small animals such as rodents.
4) Bird Feet

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>DESCRIPTION</th>
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</tr>
</thead>
<tbody>
<tr>
<td>hawk</td>
<td>strong talons–good for catching and holding active prey</td>
<td>mice, squirrels, snakes</td>
</tr>
<tr>
<td>duck</td>
<td>webbed–good for paddling, especially for ducks that upend and paddle in place while they eat from the pond bottom</td>
<td>waterplants, seeds, insects, tadpoles, fish, worms</td>
</tr>
<tr>
<td>coot</td>
<td>lobes along length of toes–good for swimming and diving; they flare out on the backstroke, propelling the bird forward, then fold back on the forward stroke</td>
<td>plant material, algae, insects, tadpoles, fish, worms, snails, crayfish, eggs</td>
</tr>
<tr>
<td>woodpecker</td>
<td>two toes forward and two toes backward–give solid grip on vertical tree trunks (short, stiff tail feathers prop against the tree which brace the bird as it pecks)</td>
<td>insects</td>
</tr>
</tbody>
</table>

5) Bird Wings

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>DESCRIPTION</th>
<th>FOOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>swallow</td>
<td>long, pointed–good for speed and maneuvering</td>
<td>flying insects</td>
</tr>
<tr>
<td>red-tailed hawk</td>
<td>broad wings–good for soaring on lifts of rising air</td>
<td>rodents, rabbits, reptiles, insects, birds</td>
</tr>
<tr>
<td>quail</td>
<td>stubby wings–good for quick takeoffs and dodging trees</td>
<td>seeds, leaves, berries</td>
</tr>
<tr>
<td>hummingbird</td>
<td>wings can beat very fast and at different angles–good for hovering in one spot as they feed on nectar</td>
<td>flower nectar, insects, spiders</td>
</tr>
</tbody>
</table>

6) Summary
Use The Bird Alphabet Book to show pictures of a variety of birds. Ask the students to figure out what the bird eats by looking at bills, eyes, wings, and feet.

7) Reading a Story
If time remains before the end of the activity time allotment, choose a book in the kit to read to the group.

CLEANUP:
AFTER EACH GROUP: Collect all materials and return them to the appropriate boxes. Use the list in the kit to check that everything has been returned. Upon completion of all sessions arrange all materials in the activity kit.

Return the box to the table in Bznaga cabin.