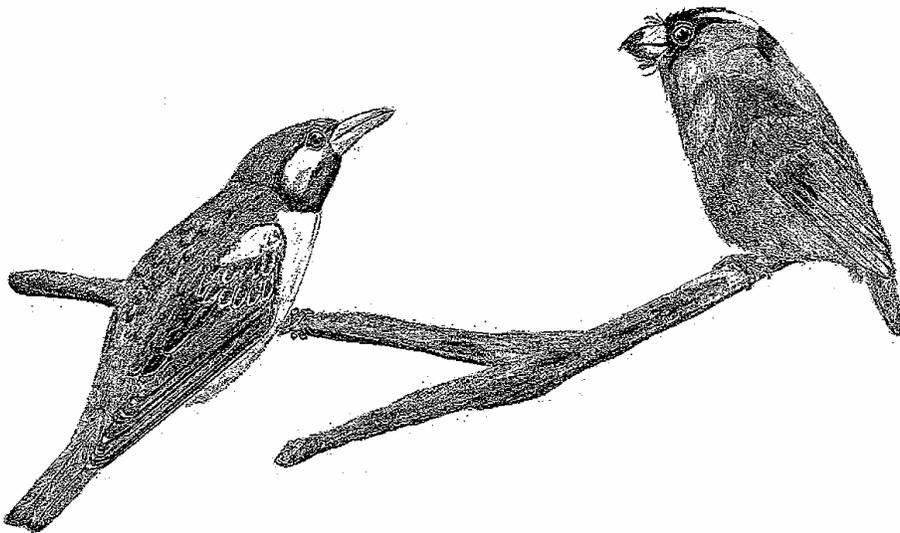
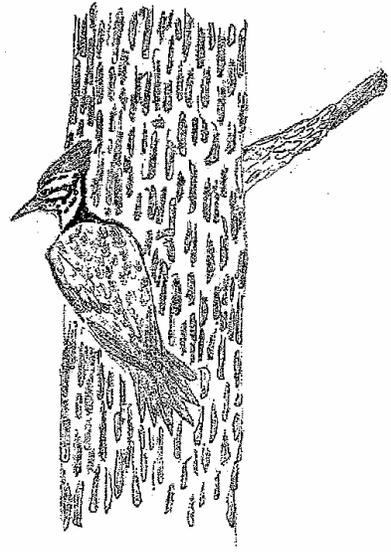
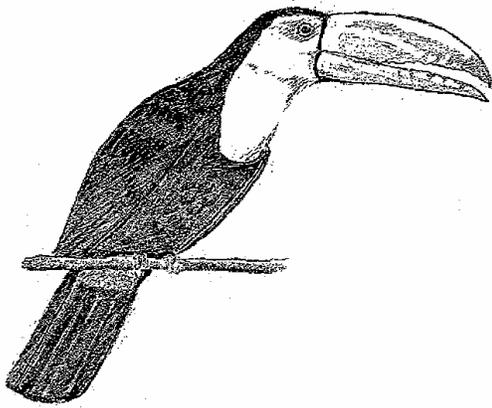


# Toucans, Woodpeckers & Their Relatives

Materials for Teaching and Learning about  
Toucans, Woodpeckers, Barbets and Honeyguides.  
Grades K-4



J deGrauw 2005

## ***Instructors Guide***

*(Note to instructors: it is encouraged that you and your students utilize this website and any other factual information accessible to you to learn more about Piciformes. The information in this packet is general, more in depth information is offered on the Piciformes TAG website. There are many exercises in this packet. Feel free to use all or only a portion of them. Most of these are line drawings and can be colored; they are also indented so they could be put together as a booklet).*

**Toucans, Woodpeckers, Barbets and Honeyguides are in an Order of birds called *Piciformes*; which literally means 'woodpecker-like'. However, as you will discover, 'Piciformes' is a group of some of the most recognized, unique and important animals in the natural world.**

### **Where Can I Find Them? What Do They Eat? Tell Me More.**

**Toucans, toucanets and aracarís (pronounced- AIR a SAIR i) are found only in Central and South America from southern Mexico to northern Argentina and Paraguay. The larger toucans mainly live in the forested and semi-forested lowlands. The toucanets and aracarís live in higher altitudes in true rain forest and cloud forest habitats. They eat fruits, insects, lizards and bird eggs. Toucans nest in old woodpecker holes or crevices of trees. They lay two to six eggs that hatch in about 12-18 days. The young are fed fruits and animal matter (insects, lizards) and leave the nest around 20-30 days and stay with their parents for a month or so before leaving the area.**

**Woodpeckers are found throughout the world except in Australia, Ireland the pacific and the polar caps. Wherever there is forest, open woodland and even desert habitat you might find a certain specie of woodpecker; some of the Flickers are even found in areas where trees are rare.**

**They eat insects including ants, beetles, flying insects, also spiders, berries, vegetation and sap. Woodpeckers drill holes into trees to lay two to 10 eggs that hatch in about 11-17 days. They leave the nest hole in about 20 days. The parents continue to feed them insects and spiders until they leave the area.**

**Barbets** (pronounced bar BET) can be found in tropical Africa, Central and South America and in Southeast Asia. Barbets live in several habitats from rain forest habitat to a drier scrub landscape. They eat fruits and insects. Using old woodpecker holes for nesting they lay 2-6 eggs that hatch in around 11-14 days. They chicks leave the nest in around 18 days. The parents feed the chicks animal matter and fruits until they leave the area.

**Honeyguides** are mainly found in Africa with a few species in Southeast Asia and one specie in the Himalayas. They prefer a forested to open woodland/scrub habitat. Most honeyguides eat beeswax. Others will consume some berries and insects. They are known as *parasitic egglayers*, which means they lay their eggs in the nests of other kinds of birds. The other birds actually raise the honeyguide chick until it leaves the area or is discovered to be an 'impersonator'.

**What sets Toucans, Woodpeckers, Barbets and Honeyguides apart from other birds?**

**Feet and Bills are just a couple...**

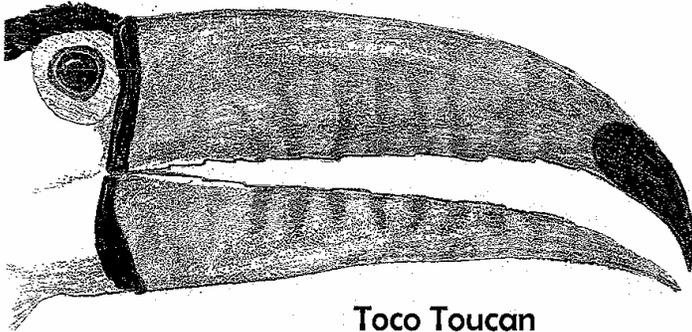
Toucans, woodpeckers, barbets and honeyguides share similar physical characteristics and abilities. The most obvious is the arrangement of toes on their feet which is called *zygodactylous*. Rather than having three toes forward and one behind like a lot of birds, they have two toes forward and two behind. Because of this they are able to hold on to and even move up (and down) vertical tree trunks and limbs with great ease as well as perch like a normal bird.

***Exercise: Feet and Bills (many faces but the same toes)***

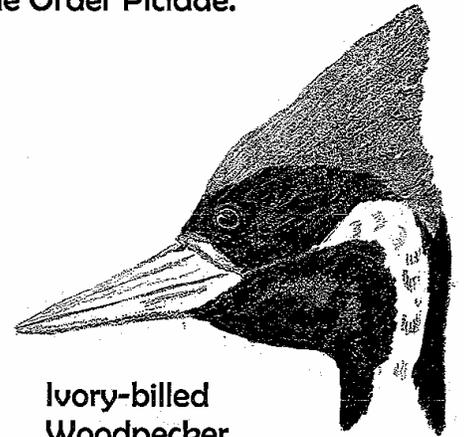
***Included in your packet is a page that compares the many bill sizes of toucans, barbets, woodpeckers and honeyguides. Another page shows the toe pattern comparison using a woodpecker and a crow foot. This same page also discusses the woodpecker bill.***

# Different Birds and Bills

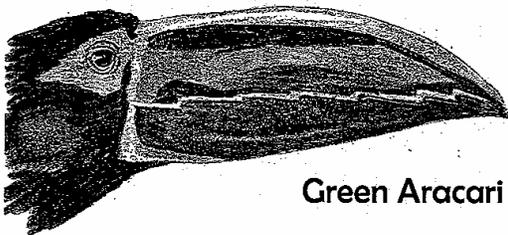
There are many shapes and sizes of birds in the Order Picidae.



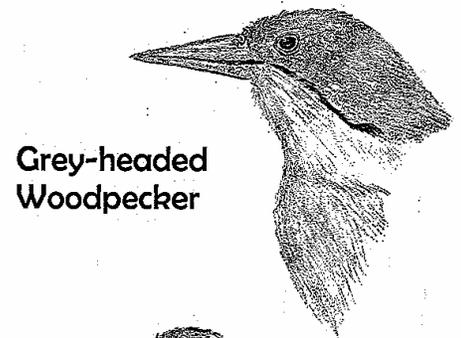
Toco Toucan



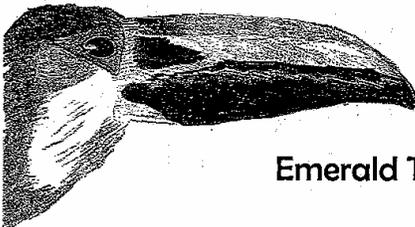
Ivory-billed Woodpecker



Green Aracari



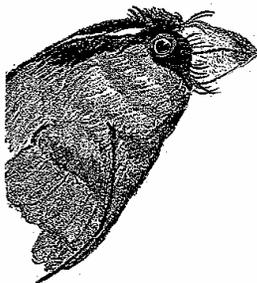
Grey-headed Woodpecker



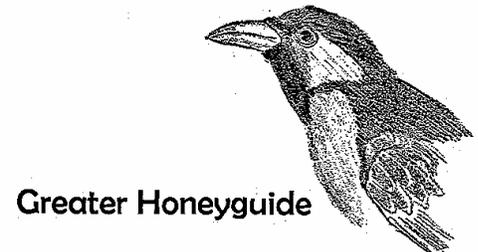
Emerald Toucanet



Antillean Piculet

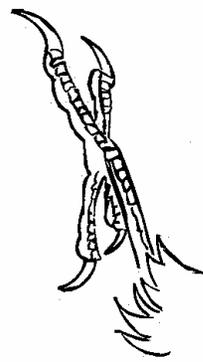


Toucan Barbet

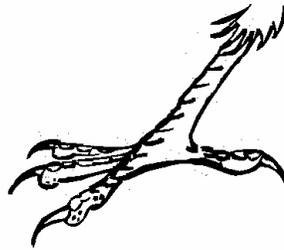


Greater Honeyguide

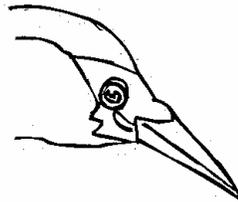
**Woodpecker feet and bills are different from other birds. Their feet let them move up and down trees. Their bill lets them peck at wood without getting hurt.**



**Woodpecker Foot**



**Crow Foot**



**Woodpecker Bill**



**Warbler Bill**

**The head of the woodpecker is designed to handle constant tapping and pecking. Its has muscles that act like cushions. It has extra space in its skull to cushion their brains.**

**Animals not made for pecking at wood could get a headache or a more serious injury to their head.**

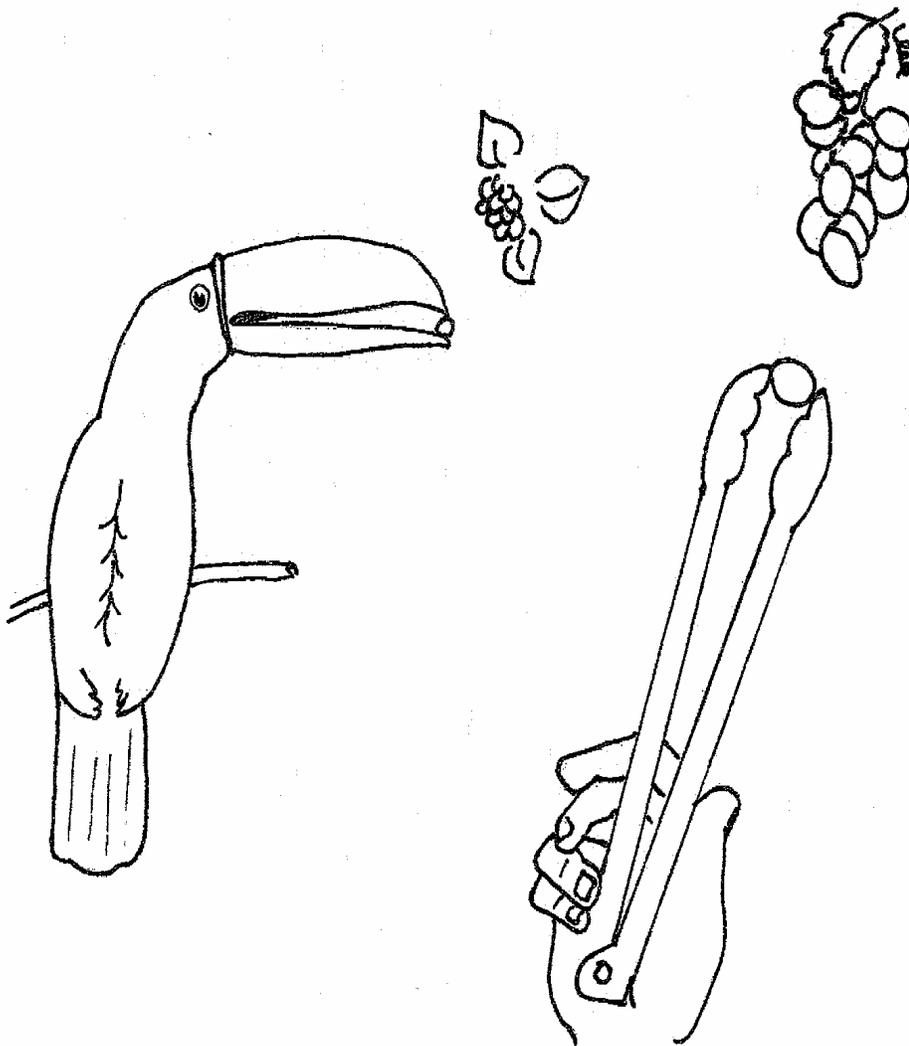
**This is very important since three of the four families (toucans, woodpeckers and barbets) actually *roost* and *nest* in holes, called *cavities* that they *excavate* themselves by pecking tunnels into trees, cacti and even mud banks. Without their specialized toes, they would not be able to hold on to trees in their unique way.**

**The *bills* or *beaks* of are also very interesting. Obviously, toucans and their smaller cousins, the aracarís and the toucanets are known for their ‘oversized’ bills. Although some of them are strikingly beautiful others can be dull and black. However, they are not just for looks. The elongated *mandibles* of toucans, toucanets and aracarís allow them to pluck fruits from plants and probe into crevices of trees to search for water or even insects, lizards and eggs. Elongated bills also play a part in courtship. A male and female will *bill-slap* with each other prior to nesting as a sort of a bonding ritual.**

**Exercise: Toucan Bill Use**

***Included in your packet is a coloring page that shows how a toucan can pluck fruit from a plant. You can emphasize this with a set of tongs and items such as marbles, small balls or even fruit like grapes; having the children try their skills at picking these items up.***

**A toucan uses the tip of its bill to pluck fruit from plants. With a set of tongs see how well you can grasp and hold items.**



**The bill of the woodpecker is designed to chip away at and even excavate holes into dead and even live trees. It is hard and chisel-shaped to be able to pierce through bark and wood. The structure of the head of the woodpecker is designed to withstand the constant pecking and drilling that they do. Specialized muscles act as shock absorbers. The brain is compact and surrounded by tissue and fluid which takes the brunt of the pounding. The bill is even positioned to deliver specific blows to also minimize shock.**

**Barbets also use their bills in the same manner as both toucans and woodpeckers. They often nest in roost in old woodpecker holes but can drill their own in softer woods and plants. They also use them to pluck fruit and catch living prey. However, barbets have bristles or feather-like plumes that cover their nostrils.**

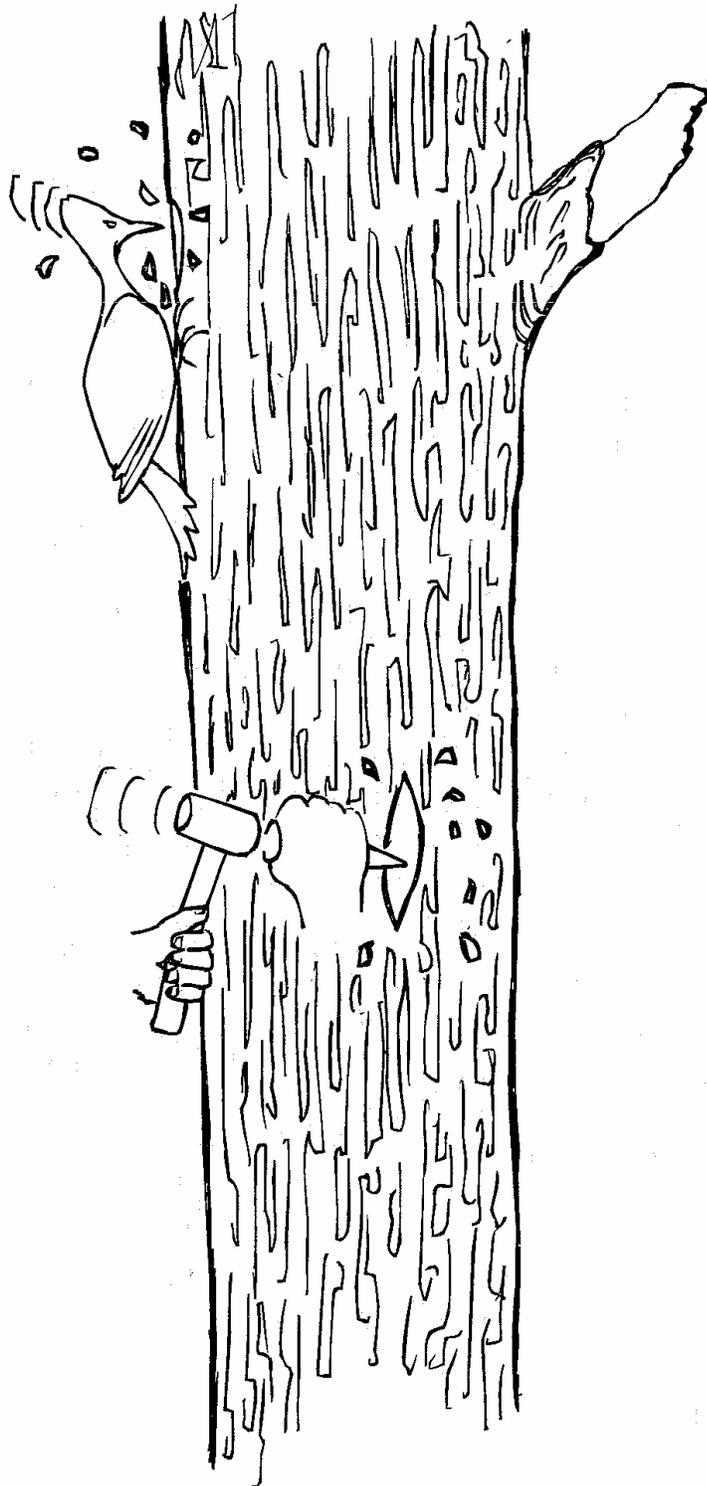
***Exercise: Woodpecker Bill***

***In your packet is a coloring page with text comparing a woodpecker bill to a chisel. The text can be read aloud in class and the drawing colored in by students.***

**Woodpeckers have bills shaped like a tool called a 'chisel'. This tool is used to chip away at wood much like a woodpecker uses its bill.**

**They peck at trees to look for food. They chip away large pieces of dead trees to make a tunnel where they lay eggs and also to sleep in.**

**Sometimes woodpeckers drum loudly on trees to let other woodpeckers know where they are.**



**Honeyguides share the zygodactylous toe pattern but they do not drill nest holes. They actually lay their eggs in the nests of other birds and let them incubate and raise their babies. They have bills much like a typical bird and do not use it like their relatives.**

### **Why are they important to the Natural World?**

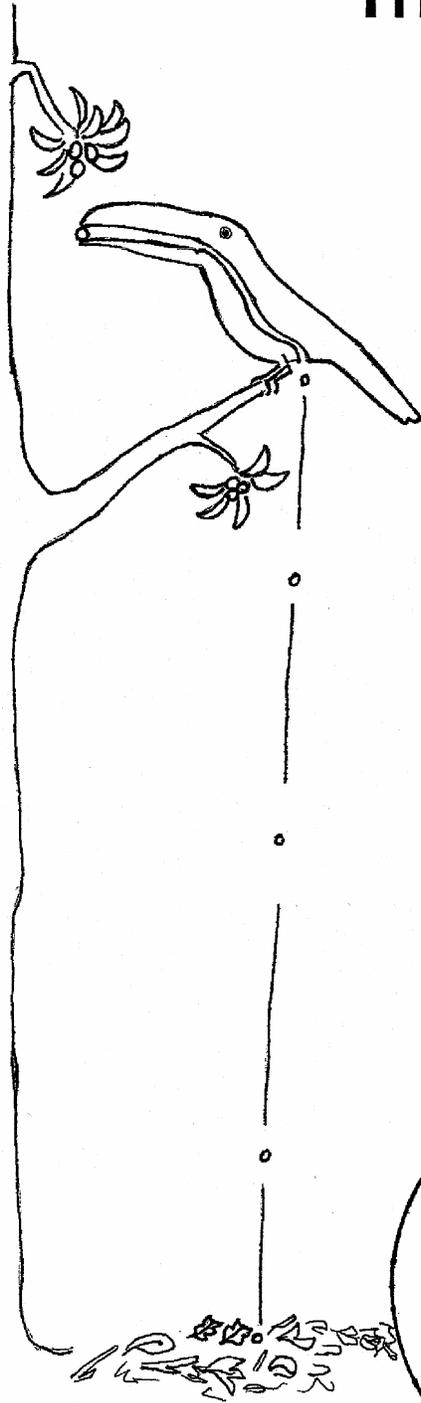
**Much like many birds and mammals, the toucans and barbets are *seed dispersers*. They eat many fruits and berries in the forest. Some of which are only partially digested, or in some cases the seeds are indigestible. Once the bird has defecated, the partially or undigested fruit/seed hits the forest floor which is made up of rich, topsoil and decaying plant materials. If the conditions are right, the seeds will sprout and grow into a mature plant or tree which can offer more fruit for the forest animals.**

**Animals that are dubbed ‘seed dispersers’ are very important in reforestation projects; without them an ecosystem is incomplete and can become out of balance; at which time invasive plants may take over and actually destroy the whole ecosystem.**

### **Exercise: Seed Dispersal**

***Included in your packet is a page entitled ‘The Seed Journey’. The page shows the importance of ‘seed dispersers’ and allows the child to trace the path of a seed from the plant, ‘through a toucan’ and back to the ground.***

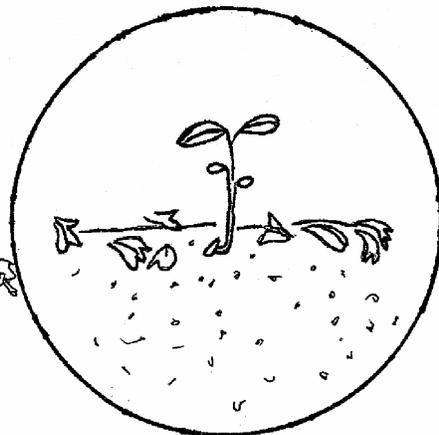
# The Seed Journey



An aracari stops to feed on the fruit of a tree in the forest.

It swallows the fruit whole. Its body digests the soft parts but the seed in the middle is hard and it gets 'pooped' out.

The seed falls to the forest floor where there is rich soil.



Once the seed is on the ground it can sprout. The tiny seed can grow into a tree and grow more fruit.

**If there were no toucans to spread seeds on the forest floor what would happen to it?**

**Exercise: Feeding a Barbet**

***In zoos, barbets are fed a variety of fruits, vegetables and even insects. Zookeepers chop up apples, pears, papaya, bananas, sweet potatoes and grapes. They also add mealworms, waxworms and sometimes even meat to the barbet food. Have the class draw a top view of an empty bowl (a simple large circle) and have them either draw the items in the bowl or have them draw and cut them out of construction paper, then glue them in the bowl.***

**Woodpeckers excavate nest holes and roost holes periodically to *brood* their young or just to sleep in. The old holes become perfect homes for some forest birds and mammals to have their young in. The bird and mammal species that rely on woodpecker holes would be in a great deal of trouble and would disappear from the forest; perhaps forever.**

**Exercise: Woodpeckers**

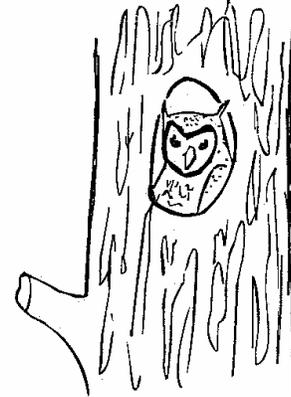
***Included in your packet is coloring page entitled 'Many animals of the forest use woodpecker holes'. The instructor can read over this page with the class and encourage them to color the drawings and answer the question at the bottom of the page.***

## Many animals of the forest use woodpecker holes.

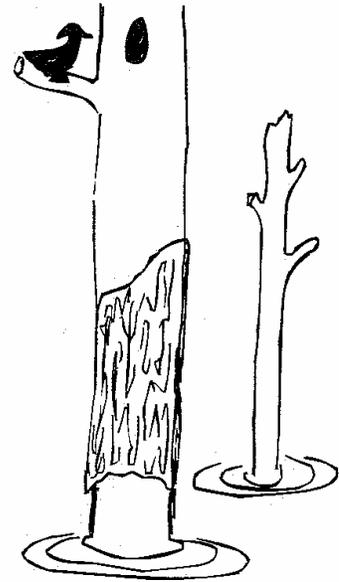
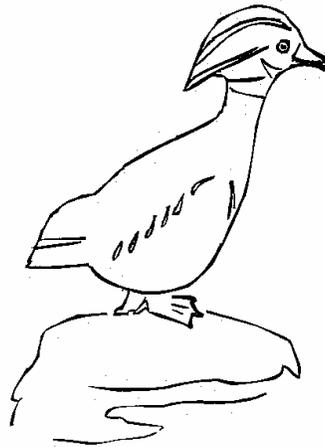
Woodpeckers drill new holes for nesting every year. The old holes are often discovered by other forest animals. These holes make perfect places for animals to hide, sleep and have their young. Here are just a few:



Parrots and macaws use old woodpecker holes in Central and South America.



Owls of all sizes can be found using woodpecker holes in most parts of the world.



In the United States fox squirrels, grey squirrels and flying squirrels use old woodpecker holes. Even some ducks, like the American Wood Duck use woodpecker holes to lay their eggs in.

If there were no woodpeckers to drill the holes what would happen to the forest animals that rely on them?

**The honeyguide eats beeswax, almost exclusively; they will from time to time eat insects. Honeyguides will tear into bee hives or find one already opened by another animal to get to the wax. Although they have thick skin they have no other protection from bees and can die from many stings at one time. The fact that they find an opened hive or watch another animal open the hive and wait their turn to eat is the source of many fables regarding the honeyguides ability to lead animals or man to a hive.**

**The ratel or honeybadger is an expert at tearing into hives to consume the sweet honey produced by the bees. One fable says that the honeyguide actually leads the honeybadger to a hive so it can eat the honey and the bird can eat the wax. Although this may be a possibility, it has not been documented. Some tribal cultures in Africa say they are lead to hives by the honeyguide; this is also a possibility. A more likely scenario is that the tribesmen simply follow and observe the bird until it does visit a hive.**

***Exercise: Honeyguides***

***Included in the packet is a Zulu fable entitled: The Honeyguides Revenge (below). A story of a greedy tribesman that doesn't leave anything for a honeyguide after the bird leads him to a hive. Later, wanting more honey, the tribesman hears the same bird calling and begins to follow it only to get lured up a tree where a leopard rested.***

***After reading this fable, children should be given the opportunity to draw or color a picture of their favorite part of the story.***

## Honeyguide's Revenge (A Traditional Zulu Story)

The children sat before the fire slowly licking their fingers for the last of the sticky sweetness. "Ah, Sibonelo!" Gogo smiled. "You are a good one for finding a ripe hive! We shall have honey at least until the new moon!"

Sibonelo grinned back at his granny. "It was easy, Gogo! I just followed the Honeyguide."

Gogo looked at him thoughtfully. "I hoped you remembered to leave the little bird his portion!"

"Oh, yes, Gogo! I would never think of cheating Ngede out of his share!" Sibonelo knew that the Honeyguide would search for a human helper whenever he found a hive that was ready for harvest. While Honeyguide did not care for the honey, he loved to eat the bee grubs and wax from the nest. But poor Honeyguide was ill-equipped to get the food for himself. He therefore relied upon a two-footed friend to pull down the nest. "I remember what happened to Gingile, the greedy one, when he took all the honey for himself!"

"What happened to Gingile, Gogo?" asked some of the younger children who had not heard or had forgotten the story. Now that their tummies were full, it was time to satisfy the soul.

"Alright, my children," laughed Gogo. "I think a story about little Ngede is appropriate after feasting upon the honey he helped bring to our table!" She took a deep breath and began, "Kwasuka sukela...."

There once was a greedy young man named Gingile. He rarely shared with anyone, preferring to keep the meat from any of his kills to himself, hoarding every mealie pip (kernel of corn) that grew in his small garden.

One day while Gingile was out hunting he heard the honey call of Ngede. Gingile's mouth began to water at the thought of the sweet treat. He stopped and listened carefully, searching until he found the little fellow among the branches above his head. "Chitik-chitik-chitik," the little bird rattled, like the sound of a matchbox shaken lengthwise. When Ngede saw that he had an

interested partner he quickly began moving through the branches toward the nest. "Chitik, chitik, chitik," he continued, stopping several times to be sure that Gingile followed.

After thirty minutes or so they reached a huge wild fig tree. Ngede hopped about madly among the branches. He then settled on one branch and cocked his head, looking at Gingile as if to say, "Here it is! Come now! What is taking you so long?" Gingile couldn't see anything from his place on the forest floor, but he knew Honeyguide's reputation for finding big, ripe nests flowing with sweet honey. Gingile deposited his hunting tools at the foot of the tree. He then gathered some dry twigs and made a small fire. As soon as the flames were well established, Gingile put a long dry stick into the heart of the fire. This wood was especially known to make lots of smoke while it burned. As soon as he was sure it was properly burning, he began climbing, the cool end of the branch clamped in his mouth.

Soon he could hear the loud buzzing of the busy bees. "Ah," he thought to himself, "I can almost smell the sweetness in the air. How I love the taste of honey!" When he reached the place of the hive he quickly thrust the burning, smoking end of the branch into the hollow. The bees came rushing out, angry and mean. When most of them were out, Gingile pushed his hands into the nest. He took out handfuls of the heavy comb, dripping with rich honey and full of fat, white grubs. He ignored the few stings he received, placing the comb carefully in the pouch he wore around his neck and chest. When the nest was empty, Gingile slowly made his way back down the tree.

Ngede watched all of this activity with a great deal of anticipation. He fidgeted nervously, waiting for the moment when Gingile would walk once again on the forest floor and leave, as was the custom, a fat piece of honeycomb as a thank-offering to the Honeyguide. Ngede loved the juicy larval bees and the waxy comb. He flittered from branch to branch, closer and closer to the ground. Finally Gingile reached the forest floor. Ngede flew to a rocky perch near the man and patiently waited for his share. But, Gingile put out the fire, picked up his tools and started walking home, obviously ignoring the little bird. Ngede chirped indignantly. He flew before Gingile and landed on a rock in front of the hunter. There he faced the man and crossly called in a high-pitched voice, "VIC-torr! VIC-torr!" Gingile stopped, stared at the little bird and

laughed aloud. "You want some of the spoils, do you, my friend? Ha! Who did all the work and received all of the stings? Why should I share any of this lovely honey with you, you little nothing? Be off and find yourself another supper!" And with a wave of his arm in dismissal, Gingile set off for his homestead.

Ngede was furious! How dare this man break the long-time custom and refuse to show his gratitude! But little Ngede was not powerless. He would get his satisfaction! Ngede waited and watched the man for several moons before he sought his revenge.

One day several weeks later Gingile again heard the honey call of the Ngede. Remembering how sweet and wonderful the last harvest had been, Gingile eagerly followed the little bird once again. After making his way around the edge of the forest, Ngede suddenly stopped his characteristic "Chitik-chitik-chitik," and came to rest in a great umbrella thorn. "Ahh," thought Gingile. "The hive must be in this tree." He quickly made his small fire and began his ascent, the smouldering branch in his teeth. Ngede sat and watched.

Gingile climbed, wondering why he didn't hear the usual buzzing. "Perhaps the nest is deep in the tree," he thought to himself. He was concentrating so much on his climbing, and was daydreaming about the sweet taste of honey, when he found himself face-to-face with a leopard. Poor leopard was taking her usual mid-day nap in her favourite tree, exhausted after a long night of hunting, when she was suddenly awakened by a scream. Leopard was first startled and then angry at having her sleep so rudely interrupted. She narrowed her eyes, opened her mouth to reveal her very large and very sharp teeth and took a quick swipe at the man, raking her claws across his forehead. Gingile rushed down the tree, half-falling. He landed with a heavy thud on the ground, breaking several of his bones. Lucky for him that Leopard was still so tired, or she might have decided to pursue the man. Never-the-less Gingile departed as fast as his broken bones would allow him. And he wore the scars of Leopard on his forehead the rest of his life.

Ngede had his revenge, and Gingile never followed a Honeyguide again. But the children of Gingile, and the children of the children of Gingile, heard the story of Ngede and had respect for the little bird. Whenever they harvest

honey, they are sure to leave the biggest part of the comb with the juiciest grubs for Ngede!

[www.canteach.co](http://www.canteach.co)

## **Do Toucans, Woodpeckers, Barbets and Honeyguides have enemies?**

**Forest birds of prey (eagles, hawks and owls) will capture, kill and eat these birds if given the opportunity. Many *arboreal* snakes will also take birds and bird eggs for food. Mammals have also been known to take these birds and especially their eggs.**

**However their greatest enemy is *deforestation*! The clearing of large tracts of forest for lumber and development does many things; it takes away food, shelter and nesting sites from all forest dwellers including toucans, woodpeckers and barbets.**

## **How can I help these birds and their homes?**

**A few things that can be done are:**

- **Educate yourself about toucans, woodpeckers, barbets and the ecosystems they share with other animals.**
- **Find a Conservation organization with a good record of helping to save the habitats of these birds and donate your time or money to them.**
- **Host a fundraiser in which donations go towards specie or forest conservation.**

**The good news is that some forests can be managed to keep them and the animals that call them home healthy while still taking what is needed in a responsible manner. Besides having large tracts of land set aside as national parks or public land concerned folks can approach land owners and developers to adopt a process called 'Responsible Land Management'. This process involves biologists and land owners/developers monitoring the forest in question for signs of stress by:**

- **Biologists and land owners/developers coming together to reach a goal that both sides can be happy with. *This may involve:***

*having the land owner/developers agree to set aside some of their land to remain in tact, only felling certain trees, leaving mature trees in while developing an area, having only limited managed hunting on the land, etc...*

- **Biologists making sure individual species of plants and animals have adequate, healthy populations. And offer solutions to quell potential problems, hopefully before they happen.**
- **Educating land owners and developers on techniques that have minimal impact on forests, and then implementing these techniques.**
- **Educating the people in the area under question about the forest and why it is important to manage it properly.**
- **Having a continuous relationship between biologists and land owners/developers to assure success in the future.**

### **What does the future hold?**

**Believe it or not over the last 20 years biologists, land owners and hunters alike have come together to manage and even restore some habitats. This proves it can be done. No doubt, there is still a lot of work to be done to curb deforestation and saving endangered species. The Piciformes TAG is dedicated to conserving toucans, woodpeckers, barbets and honeyguides the world over. With your help and the help of other groups we can indeed make sure these birds are around for many years to come.**

## **Student Project Grade 4:**

### **Specie Profiles**

Students, individually or as groups, will choose a specie of toucan, barbet, woodpecker or honeyguide to research and report on in either a paper or poster format. This exercise will not only increase the student and class knowledge of Piciformes and the natural world; it also develops research and presentation skills.

After reviewing the materials provided in this packet with your class they should have a chance to research a particular specie through your library, or on the internet; and be challenged to do further research at a city or university library. After choosing a specie students must provide the following information and materials for their presentation:

#### **Specie**

*Both common an Latin names*

#### **Picture of the bird**

*Encourage artwork if applicable*

#### **Range and Habitat (blank map provided in packet)**

*Have students fill in areas of map where the bird resides*

#### **Status in the Wild**

*Is it endangered, threatened and why, or is it doing well*

#### **Courtship, Nesting and Egglaying**

*Do pairs stay together year round, how long does it take to build a nest, how many eggs are laid, who incubates the eggs, how many days before they hatch, how long do chicks stay with the parents*

#### **Diet**

*Give details of their diet in the wild*

#### **Interesting Facts**

*Give some interesting facts about the specie*



## **Student Project Grades K-3**

### **Specie Profile**

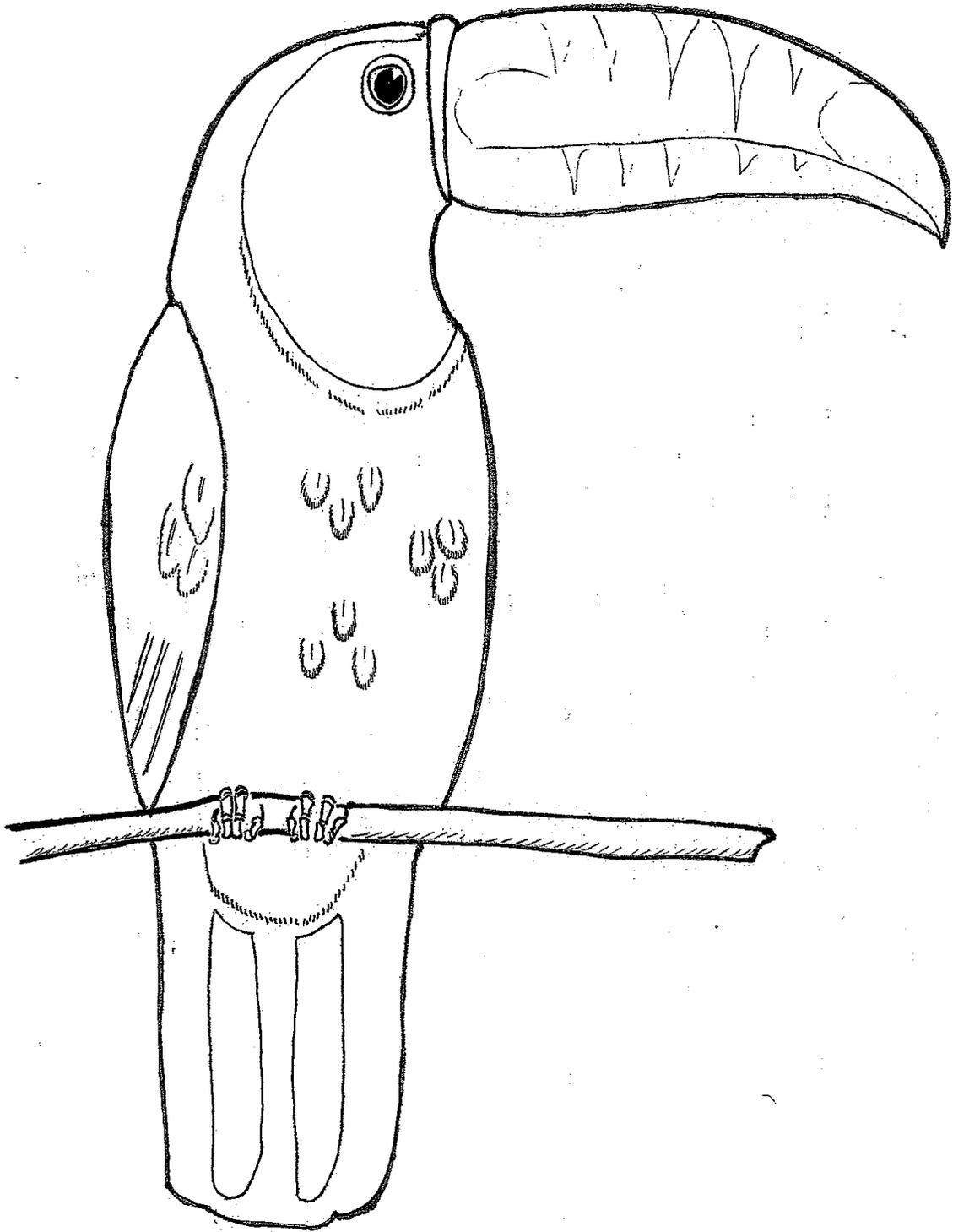
As a learning focus for this age group this exercise has materials dealing with toucans and woodpeckers. Teachers can use their discretion about the depth in which they want to speak about barbets and honeyguides. However, it is suggested that they are at least mentioned as relatives of the two focus families of birds. Children will not only learn about toucans and woodpeckers with this exercise but can also reinforce hand/eye coordination, grammar and presentation skills.

After reviewing the packet with the class provide them with a few photos or concise artwork of toucan or woodpecker species. Then choose one of the following exercises:

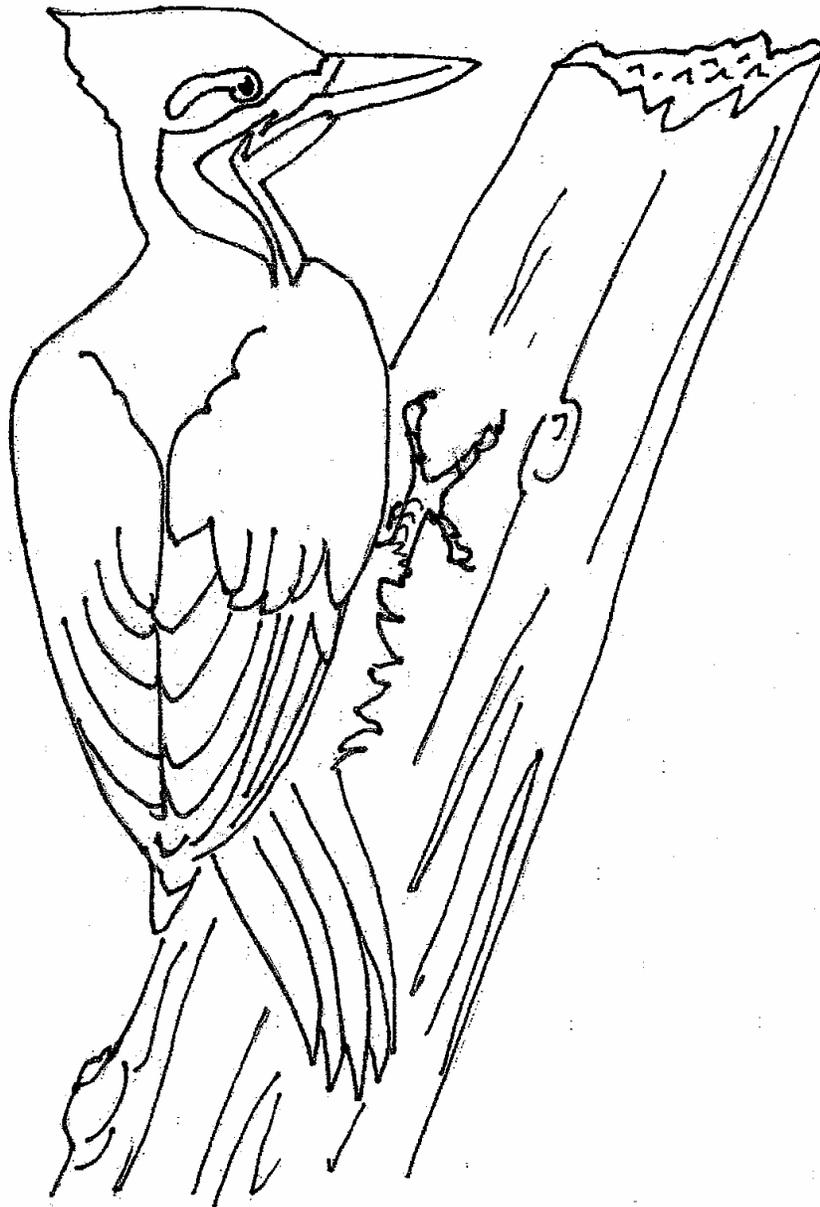
Using the blank toucan or woodpecker drawings, have each child color theirs with crayons, markers or colored pencils. They can also finish the sentence offered (i.e. **Toucans** eat fruit.) with what they have learned. A class presentation could be done by each child by reading their sentence and even telling more about what they have learned.

The artwork could also be displayed on a wall in the class room. Teachers or aids could include text about these birds to accompany the children's work.

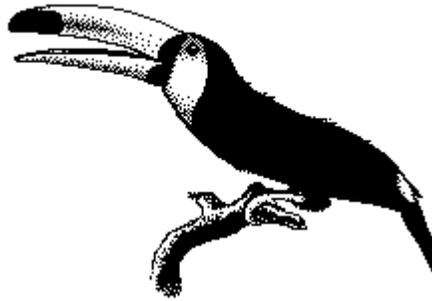
We encourage you could get as creative as your imagination warrants.



**Toucans** \_\_\_\_\_ ●



**Woodpeckers** \_\_\_\_\_ ●



## **Definitions**

**Arboreal-** dwelling in trees, of the trees, pertaining to a tree or trees.

**Beak- *same as bill-*** hardened projection from the jaw of animals, primarily birds, that is part of the mouth which is used for grabbing and manipulating food before it is consumed, biting in attack or defense, etc...

**Bill Slap-** a routine of bonding in some birds in which the male and female will purposely rattle their bills together for a few seconds at a time.

**Brood-** as a verb- to set on/incubate eggs.  
as a noun- babies, that have hatched at the same time, of birds.

**Deforestation-** the process of totally clearing or cutting away a portion of an ecosystem.

**Excavate-** to dig.

**Mandibles-** the top and bottom section of the bill of a bird. *Sometimes the lower portion is referred to as the mandible (as in the human jaw) and the upper portion of the bill is referred to as the maxilla.*

**Nest Cavity-** hole in tree or plant, cliff or ground in which birds would lay eggs, incubate and hatch their young. *Note: other animals also may use natural or dig their own cavities for the purpose of having their young.*

**Parasitic Egglayer-** an animal (primarily birds) that lay their eggs in another species nest for them to incubate and raise the chick.

**Piciformes- pronounced both: Pi' si for mees' and Pi' ki for mees'- the taxonomic classification of the Order of birds that include, Toucans, toucanets, aracaris, barbets, woodpeckers, wrynecks and piculets.**

**Seed Disperser- an animal that consumes seeds or foods containing seeds that are digested and unknowingly defecated out onto the forest floor where they may take root and grow, aiding in reforestation.**

**Zygodactylous- having two toes forward and two toes backwards on each foot.**