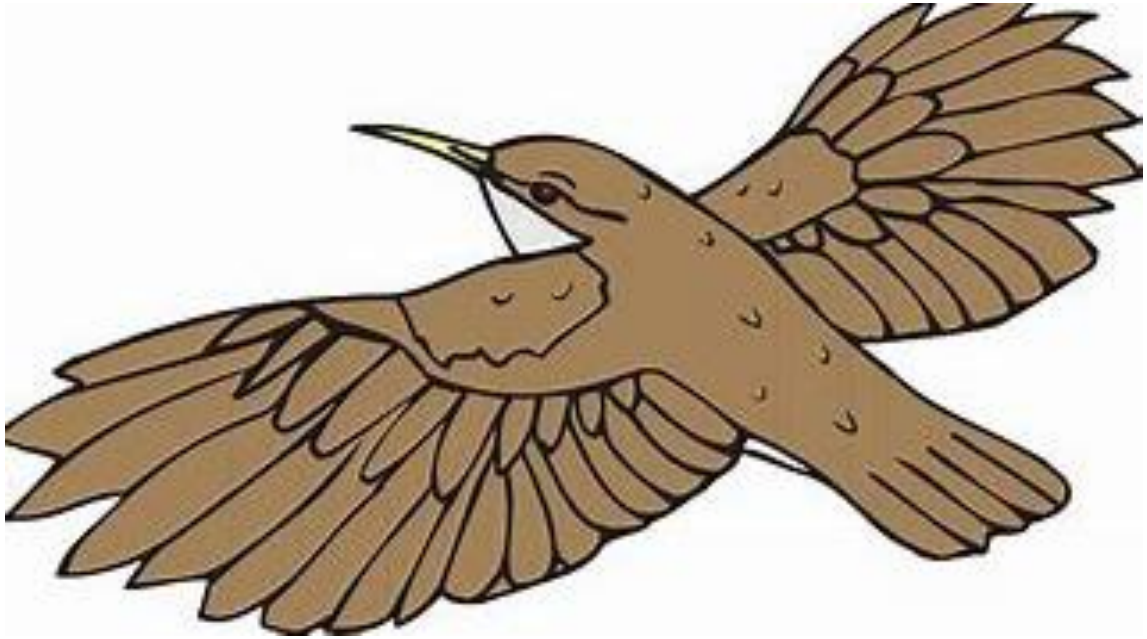


Breakfast for a Bird

Adaptations for feeding, nesting and flight!

Bird beaks, flight patterns and nests are adapted to specific needs and functions.

Birds are warm blooded animals that have wings, feathers, beaks and flight.

Feathers serve several purposes: flight, insulation, defense, display, camouflage, and waterproofing. Feathers are composed of several parts: quill (calamus hollow part that connects to the skin or bone), shaft (rachis or part that holds the vane), vane or plumed part composed of barbs which in turn are composed of barbules, and the downy afterfeather used for warmth. Each barb is like a tiny feather made up of barbules with a smooth side and a hooked—barbicels—side. The barbicels are tiny hooks that hook up with nearby barbules to create a smooth vane.

Feather terms

The calamus is the quill, the hollow lower part of a feather, without barbs, that attaches to the skin or bone.

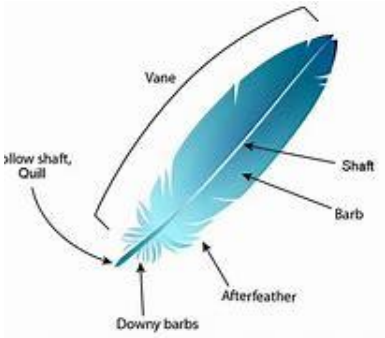
The rachis is the central part of the feather from which the barbs extend.

Barbs are parallel fibers coming off the rachis at a 45-degree angle. All the together form the vane of the feather. Barbs branch into barbules, which in turn branch into barbicels. These hook together to form the surface.

A plumulaceous microstructure has flexible barbs and relatively long barbules that trap air close to the bird's warm body.

Pennaceous feathers are stiff and flat, with microscopic hooks on the barbules interlocking to form a wind and waterproof barrier that allows birds to fly and stay dry.

Contour feathers on the wing, are called coverts. They shape it into an efficient airfoil by smoothing over the region where the flight feathers attach to the bone.



Kinds of feathers:

Wing feathers or remiges are specialized for flight and are characterized by uniform windproof surfaces, or vanes, on either side of the central shaft that are created by an interlocking microstructure.

Tail feathers or rectrices feature an interlocking microstructure like wing feathers. These feathers support precision steering in flight.

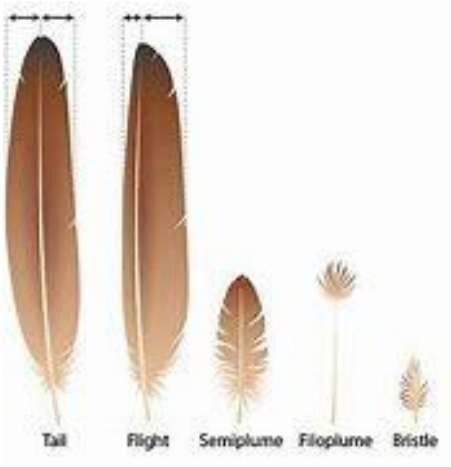
Contour feathers are what you see covering the bird's body and streamlining its shape. They are ranged in an overlapping pattern like shingles with the waterproof tips exposed to the elements and the fluffy bases are tucked close to the body. They may provide camouflage or display functions.

Semiplumes are hidden beneath other feathers on the body, with a developed central rachis but no hooks on the barbules, creating a fluffy insulating structure.

Down feathers have an even looser branching structure with little or no central rachis; they are relatively short and positioned closest to the body where they trap body heat.

Filoplumes are short simple feathers with few barbs, and function like mammal whiskers to sense the position of the contour feathers

Bristles are the simplest feathers, with a stiff rachis that usually lacks barb branches, commonly found on the head, protecting the bird's eyes and face.



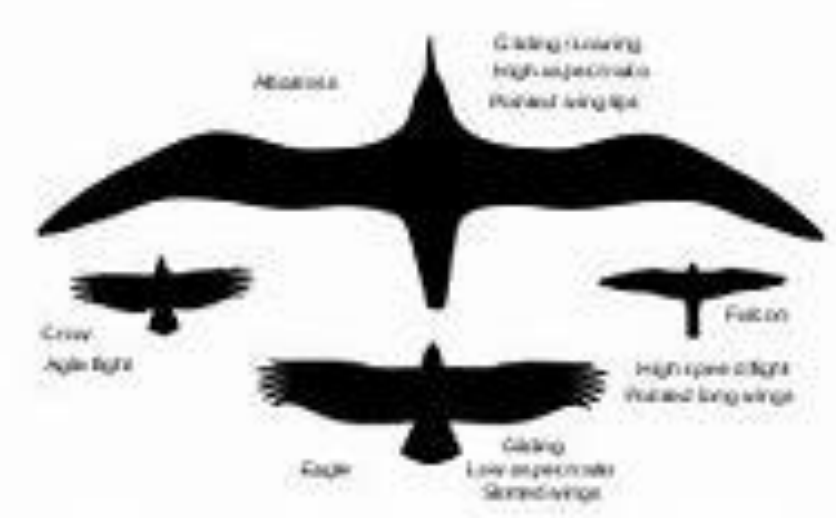
Wing forms

Passive soaring wings have long spread-out primary feathers, creating areas that allow the bird to catch vertical columns of hot air—thermals--and rise higher in the air.

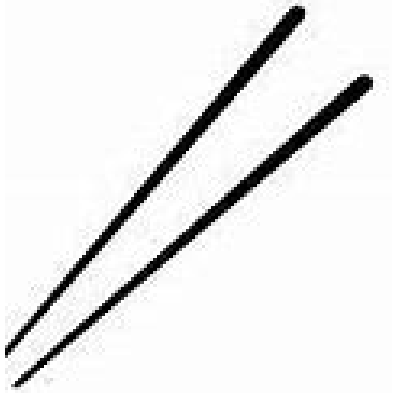
Long and narrow active soaring wings allow birds to soar, without flapping their wings, for a long time. These birds are more dependent on wind currents than passive soaring birds.

Long and thin high-speed wings are not as long as active soaring wings. Birds with this wing type are incredibly fast and can maintain their speed for a while.

Hovering wings are small and quick with nerves and muscles are specially adapted for incredibly fast movement.



Bird beaks are adapted for different foods and conditions: long and hollow for nectar, long and pointed to find food in mud, cone shaped to crack seeds and shells, pouch to scoop fish, strainer to filter tiny plants and animals, gaping to trap insects, sharp pointed to pick insects from bark, long thick to pick fruit, strong sharp and pointed to chisel bark, and long to hunt for fish in water.



Bird Beak Functions—bird beaks are adapted for gathering and eating different kinds of foods. What things can you find around the house that are like different kinds of beaks? Try out the things you find with beans, rice, seeds, pieces of cotton or paper and discover which "beak" works with which food,

- Long and hollow for nectar
- Long and pointed to find food in mud
- Cone shaped to crack seeds and shells
- Pouch to scoop fish
- Strainer to filter tiny plants and animals
- Gaping to trap insects
- Sharp pointed to pick insects from bark
- Long thick to pick fruit
- Strong sharp and pointed to chisel bark
- Long to hunt for fish in water

You can be finger birds!

- **Some birds flap wings (flap arms to sides)**
- **And some dive down-- (dive)**

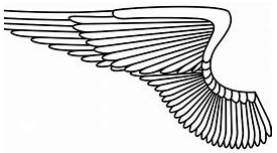
- **Some back and forth, (move back and forth)**
- **Some turn around! (turn around)**

Bird Architects

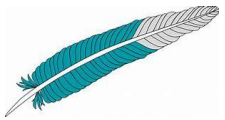
- Bald eagles make long lasting nests adding to them each year.
- Hummingbirds make small nests which stretch as the babies grow.
- Orioles make long elaborate nests dangling from trees.
- Birds that nest on beaches make a shallow depression to use as a nest.
- Birds that nest on rocky cliffside ledges on a coast lay pointy eggs that won't roll off the edge.
- Water birds like ducks build nests floating on the water, or in grassy areas in or near the water.
- Burrowing owls build nests underground.
- Other owls are cavity nesters building nests in holes in trees and snags (dead trees).

Birdie Pokey (Hokey Pokey)

- *You put your right wing (arm) in.*
  You put your left wing(arm) out.
  You put your right wing(arm) in,
  And you shake it all about.
  You do the birdie pokey
  And you turn your self around.
  That's what it's all about.



- *You put your beak (head) in.*
  You put your beak (head) out.
  You put your tail feathers (bottom) in,
  And you shake it all about.
  You do the birdie pokey
  And you turn your self around.
  That's what it's all about



Birdie Boogie

You can read the story or view it as a slideshow.

Some birds flap wings.

And some dive down.

Some back and forth.

Some turn around!

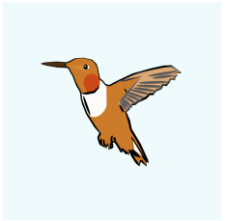
You can read stories or watch slideshows.

The Bouncy Little Hummingbird

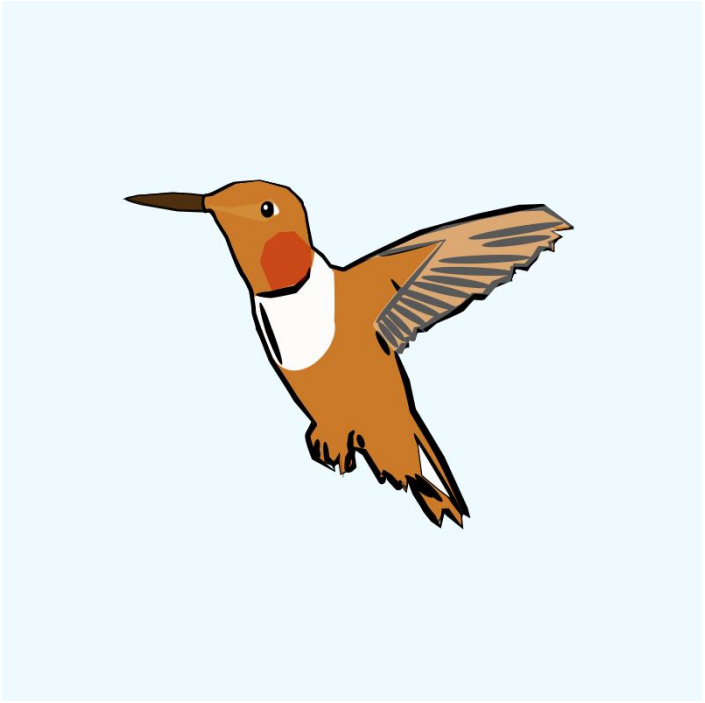
and

Grandpa Stan’s Owl

You can cut out hummingbirds to act out the story!

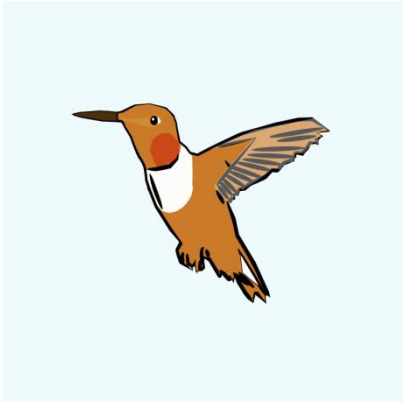


The Bouncy Little Hummingbird

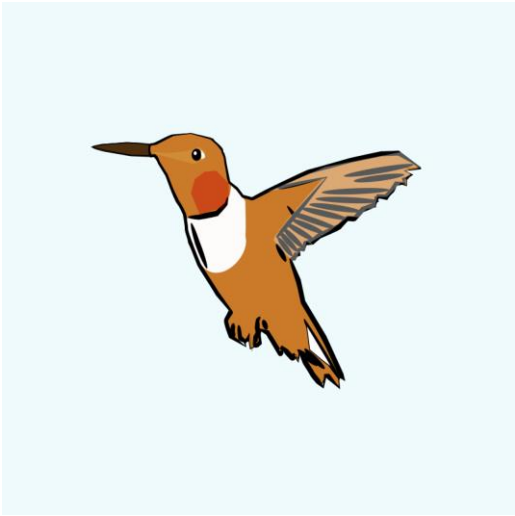


Once there was a hummingbird—he was a brown rufous hummingbird named Rufa. All the other hummingbirds were brightly colored, and they made fun of Rufa because he was brown. Rufa was sad.

But Rufa had a secret talent—you see Rufa was a bouncy little hummingbird—in fact, Rufa was the bounciest little hummingbird in the garden and everyone knows that hummingbirds need to bounce to make their nests.



And so, when it came to the important job of nest building Rufa was the best-est hummingbird of all!

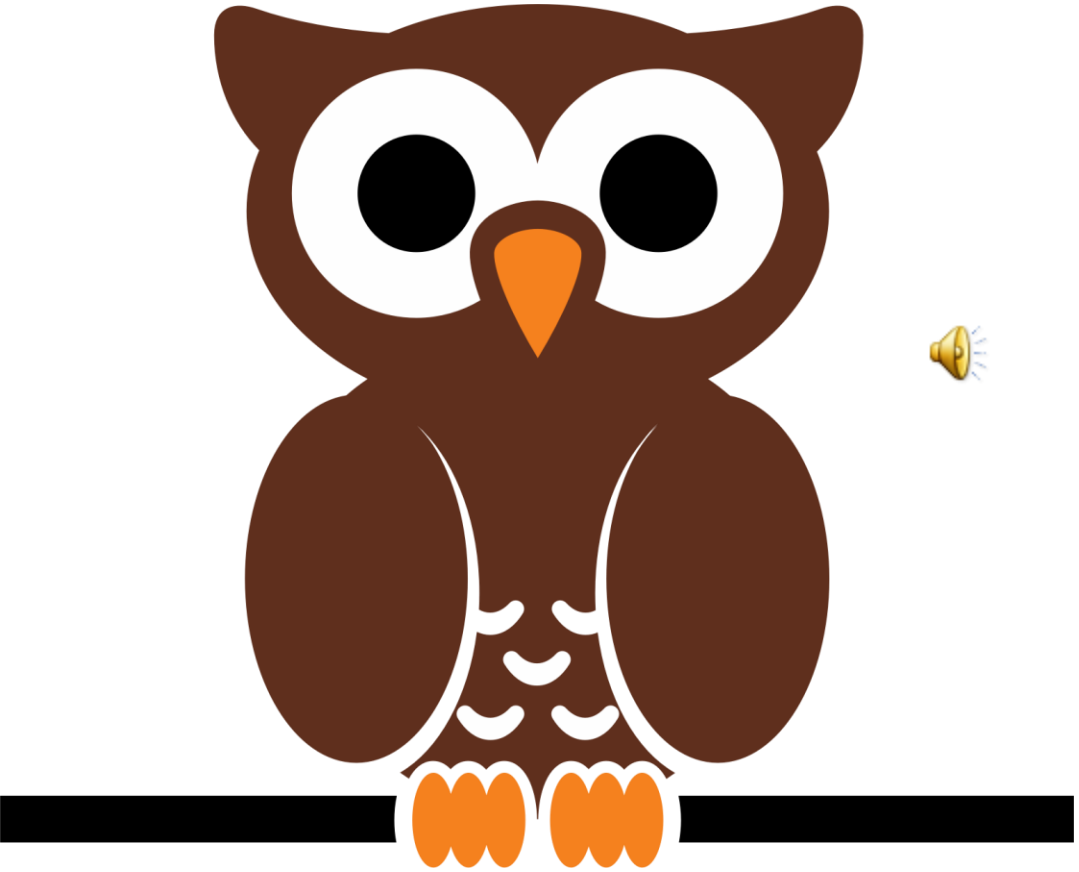


You can be the owl family!

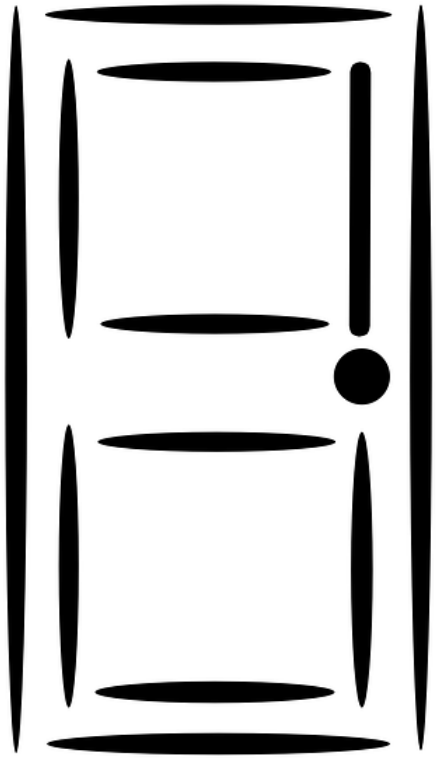
Once upon a time there was a family of owls—Mommy Owl, Daddy Owl and tiny little Baby Owl. They lived in the trees at Grandpa Stan’s house.

Mommy Owl liked to fly onto Grandpa's roof.

Daddy Owl liked to have a conversation with Bubbie Wendy—*who cooks for you you, who cooks for you you*!



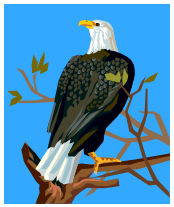
Baby Owl was learning to fly and liked to sit in the doorway.



Birds move in different ways to find food, depending on the kind of food they eat.

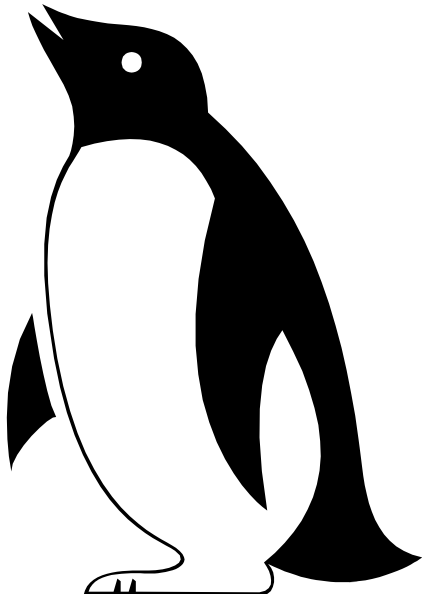
You can learn to “fly” like different birds:

- Swim like a penguin
- Arms out in a V like a vulture
- Arms straight out like an eagle
- Rollercoaster up and down like a woodpecker
- Back and forth like a hummingbird
- Stand on you toes like a flamingo
- Dive with elbows up like an osprey
- Do the rooster dance
- Turn around like a pigeon



Penguin—stand=arms straight at sides, swim=fly underwater, arms right angles

- Stand arms straight down at sides, swim arms at right angles and bend over to swim
- Eat fish



Turkey vulture--tip in V, diurnal=day, eat carrion, rise on thermals

- V side to side
- Eat dead animals

Bald eagle-- side to side, fly 75-90mph, eat live prey, see a rabbit at 2 miles, dive 125-200 mph

- Wing to sides arms straight out to sides and look around
- Eat vertebrates

Woodpecker-- flap hands up and down, eat bugs in tree bark, and rollercoaster to bark

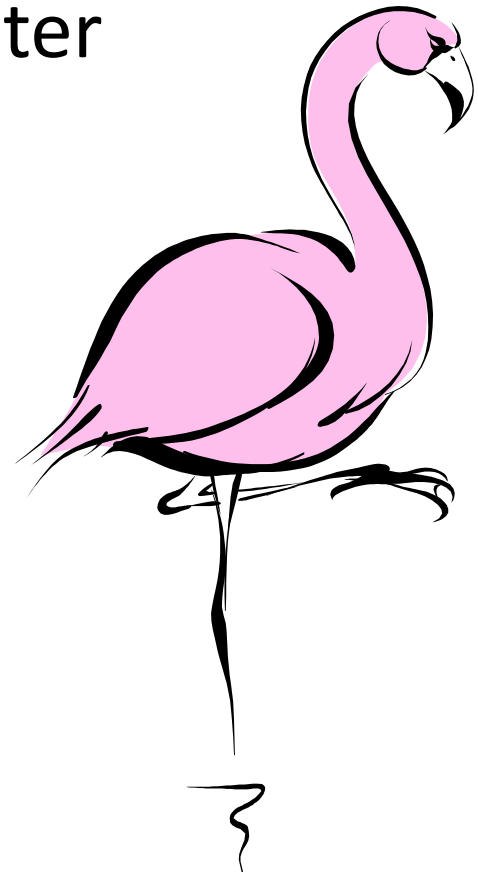
- Roller coaster wavy S movements up and down
- Eat insects

Hummingbird-- fast hands and back and forth, 70-80x per second, nectar

- Figure 8 back and forth hands at shoulders flapping fast
- Drink nectar

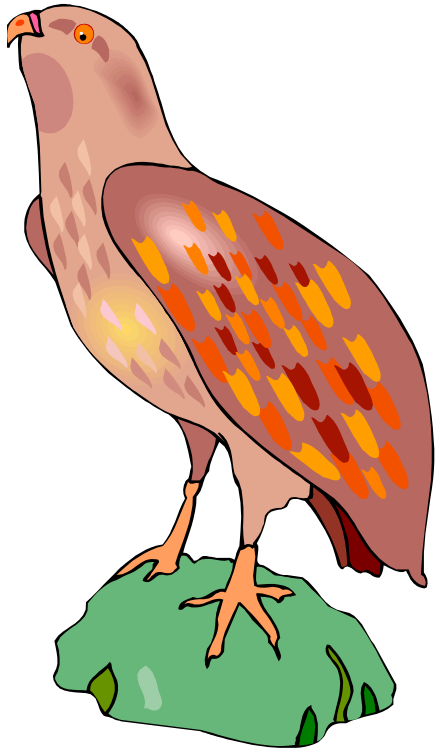
Flamingo--stand on one toe each side

- Stand on toes
- Eat plants and animals in the water



Osprey--M arms and dive, eat fish

- Dive, arms at shoulders in an M
- Eat fish



Rooster--One wing up>step step step and shake tail

- One wing up (left arm bent at elbow to waist), step step step (right), other wing up (right arm bent at elbow to waist), step step step (left), shake your tail (bottom)
- Eat grain, berries insects

Pigeon-- coo, bob neck and turn in circles; head bobbing improves slow vision

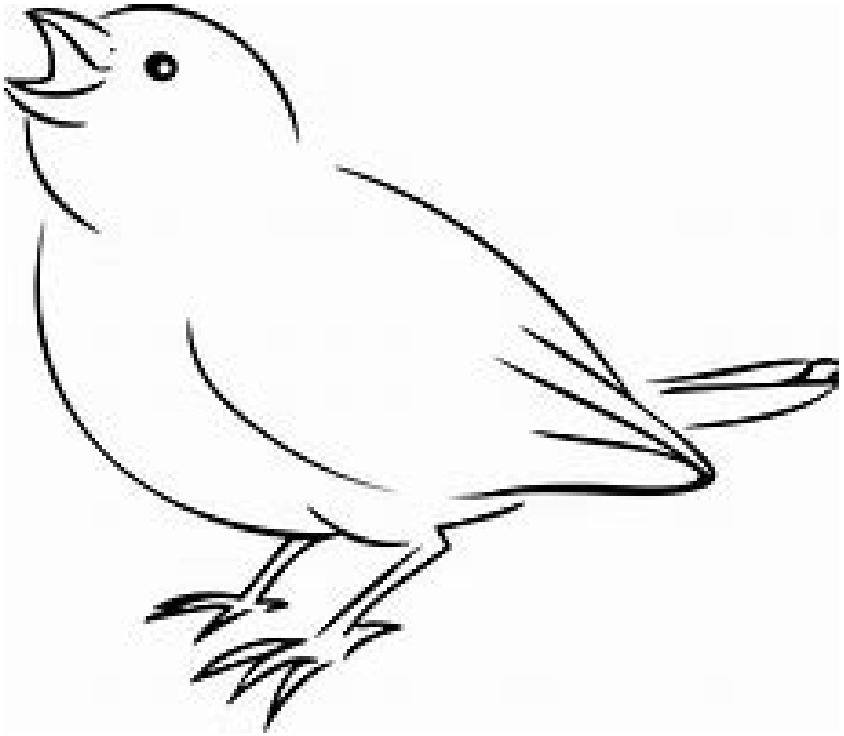
- Circle both ways, circle clockwise cooing and bobbing head, circle counterclockwise cooing and bobbing head
- Eat grains, insects, trash

You can take a discovery walk!

- Where is the water in your house? Where is the food? What kinds of shelter do you have? Is there space enough for each person?
- Can you find water, food and shelter for birds around your house?
- Birds can be carnivores (meat eater), herbivores (plant eater), insectivores (insect eater) or detrivores (dead animal eater). What foods do you have inside or outside your house that a carnivore or herbivore might like to eat?
- Now think of birds and beaks. What things are in your house that birds eat? What kind of beak would the birds need to eat it?
- What things are outside that a bird might like to eat? What kinds of beaks would they need to eat those foods?

You can be a bird engineer and design a bird!

You can decorate your bird and glue feathers on it.







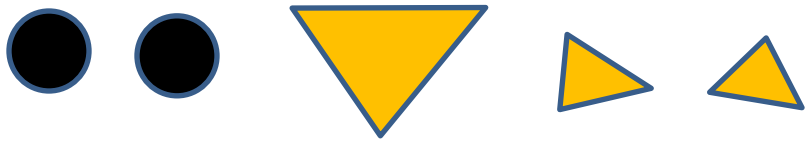

You can cut out feathers for your bird.

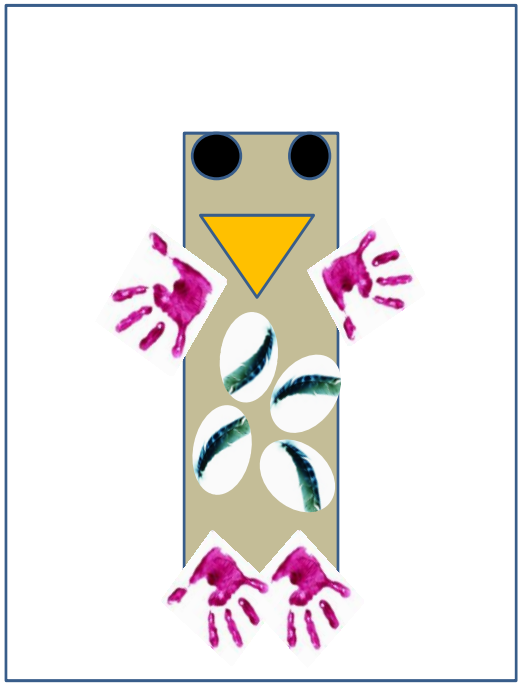


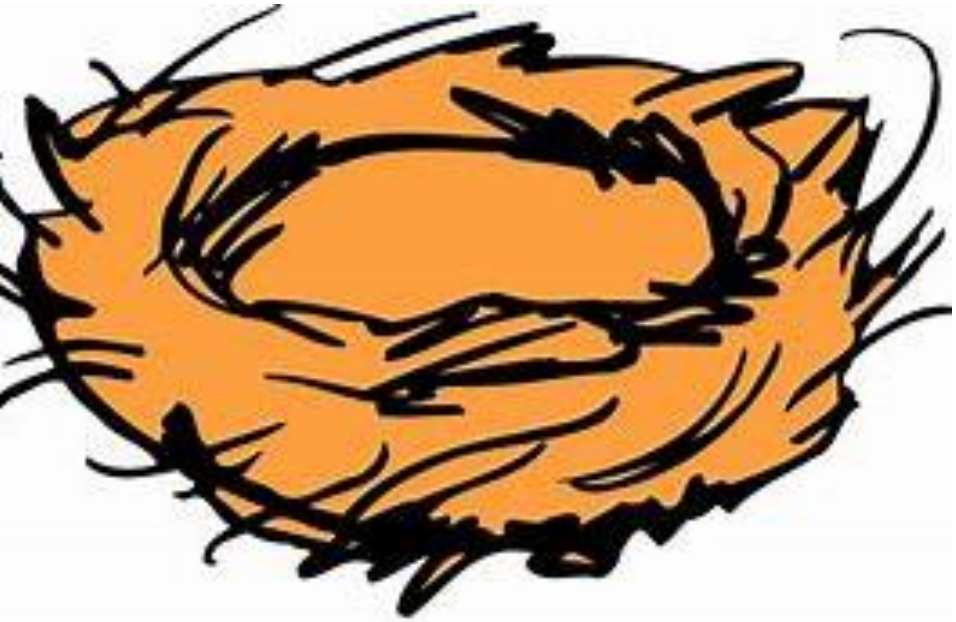



Or you can make a paper bag bird with your feathers!

- Take a paper bag and draw a beak and eyes.
- Trace your hands for wings and feet.
- Glue the feathers on.
- You can add triangle ears on top to make it an owl!







Be a nature architect! What can you use to design a bird nest or bird house?

- Will you use grass, leaves and twigs?
- Will you use a box, jug, or can?

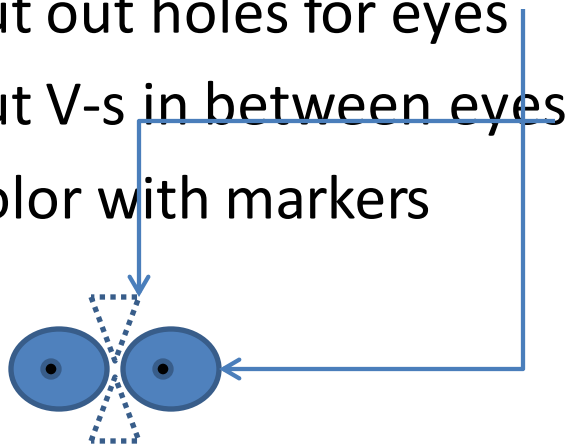


You can make bird houses, bird feeders and bird waterers from recycled materials!

Can you think of other birdie activities?

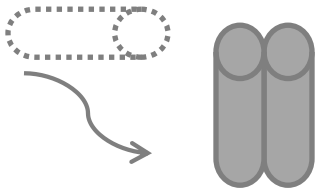
Owl eyes

- Cut out a pair of egg carton holders
- Cut out holes for eyes
- Cut V-s in between eyes
- Color with markers



Other activities

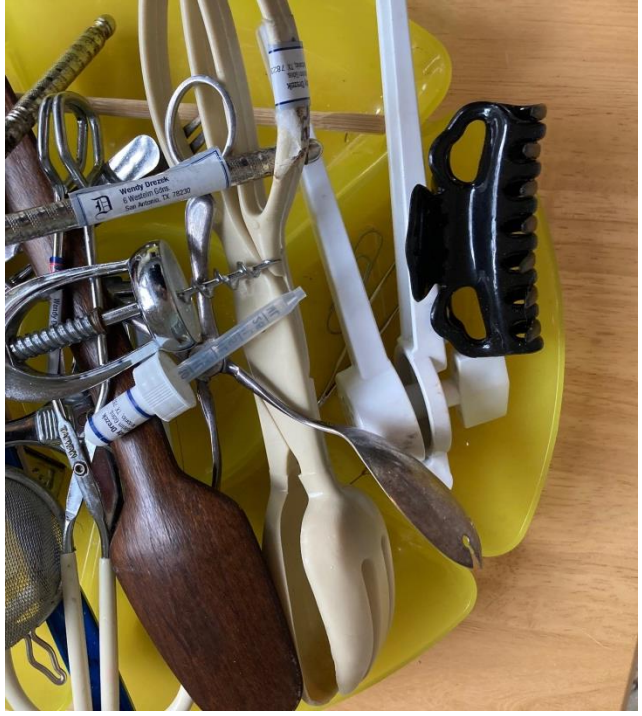
- Paint with feathers
- Make binoculars—cut paper towel roll in half, leaving ½" connected—bend at the connection and tape ends together.



Be a nature chef!

Make a meal for a bird! What kind of bird are you? What kind of beak do you have? What foods do you have for your bird? What utensils will you use to eat those foods?

Here are some examples of things you can find around the house for thinking about birds!




H-E-B
Almondmilk
H-E-B
Almondmilk
SIN ENDULZAR
35


grahams
Zesta
Zesta
Fiesta

You can make a mini-book!

- Fold the paper in half
- Then in half again.