4H WLL 22

Bluebirds and Other Cavity-Nesting Birds

Leader's Guide

UF UNIVERSITY of FLORIDA
IFAS Extension

Using This Manual

This guide has been created to help youth become the best bird-watcher they can be! Bird watching involves a lot more than just sitting outside looking at the skies! In this project, youth won't be looking for just any bird. This guide will introduce a very special type of bird - the small cavity-nesting bird. During the project, youth may find a number of small cavity-nesting birds in your area. So, even though this book often refers to the bluebird, youth can use any of these cavity-nesters to complete the project. Just make sure they properly research any specific details about the bird they have chosen to study.

Table of Contents

Lesson Topics covered in Youth Manual

Birds of a Feather... - Bird Basics - This lesson is designed to help youth become familiar with basic bird anatomy as well as characteristics that are used to classify various cavity-nesting birds.

Come Fly with Me - Observations - This lesson allows youth to combine the knowledge from previous lessons and observe local bird activity.

Happy Habitats - Habitats - This lesson uses research techniques to discover common habitats in which cavity-nesting birds are typically found.

Home, Tweet Home - Building a Bird house - This lesson leads youth through the process of building a bird house suitable for small cavity-nesting birds.

E.G.G. Security Systems - Predator Prevention - This lesson presents common predators of cavity-nesting birds and concludes with the construction of a guard for the bird house.

Bountiful Banquet - Food Preparation - This lesson leads youth through the process of creating a food supply for the cavity-nesting birds living in your area.

On the Look Out - Monitoring - This lesson is designed to lead youth through the process of monitoring and reporting your bird house once a bird moves in.

Ready, Set, Fledge! - Baby Birds - This lesson presents facts about baby birds (from hatchling to fledging), culminating in preparing and maintaining the nest for the second brood once the first brood fledges.

Egg-cellent Job! - Avian Careers - This lesson highlights some of the career opportunities available in the avian world.

Curriculum Components ~ what the icons throughout the activities mean

This icon indicates which lesson the youth are working on.

This icon (***Yoki Tales***) gives a scenario with related questions to help youth apply the life skills practiced in each lesson.

This icon (***Fly Into Action***), located throughout each lesson, indicates the beginning of each required activity.

This icon (***Eggsplore***) highlights additional activities youth may wish to do to enhance their study of cavity-nesting birds.

This icon (***Let's Wiggle It Out***) comes before the reflect questions for each lesson.

This icon (***Feathered Facts***) is above information that youth may complete either as an activity or simply give some interesting avian facts.

Experiential Learning

4-H Youth Development relies heavily upon the five steps of the experiential learning model to teach life skills. The sequential steps of the model help youth identify what they have learned from a 4-H experience or activity and to apply that learning to other experiences or situations. This model requires that the "teacher/leader" be very clear about the skill or concept targeted and that the experience and the processing questions are designed to support that learner goal. The experiential learning process engages the learners in all phases of the activity, resulting in the ability to generalize this learning to new situations.

Experience. Begin with concrete experience. This can be an individual activity or a group experience, but it involves "doing something."

Share. Next, get the participant(s) to discuss the experience. Encourage open group discussion about reactions and observations.

Sharing Questions

- What did you do?
- What happened?
- What was most difficult?
- How did you feel?
- How did it feel to…?
- What was easiest?

Process. Discuss how recurring themes, problems, and issues are brought out by the exercise. Speak to specific problems and issues that the group discovers from the exercise or recalls from personal experiences.

Processing Questions

(Use data generated from sharing questions)

- Did problems/issues seem to occur over and over?
- What were they?
- What similar experiences have you had?

Generalize. Find general trends or common truths in the experience. Draw out and identify the principles that are important and that apply to "real life," not just the activity. Focus on the key messages.

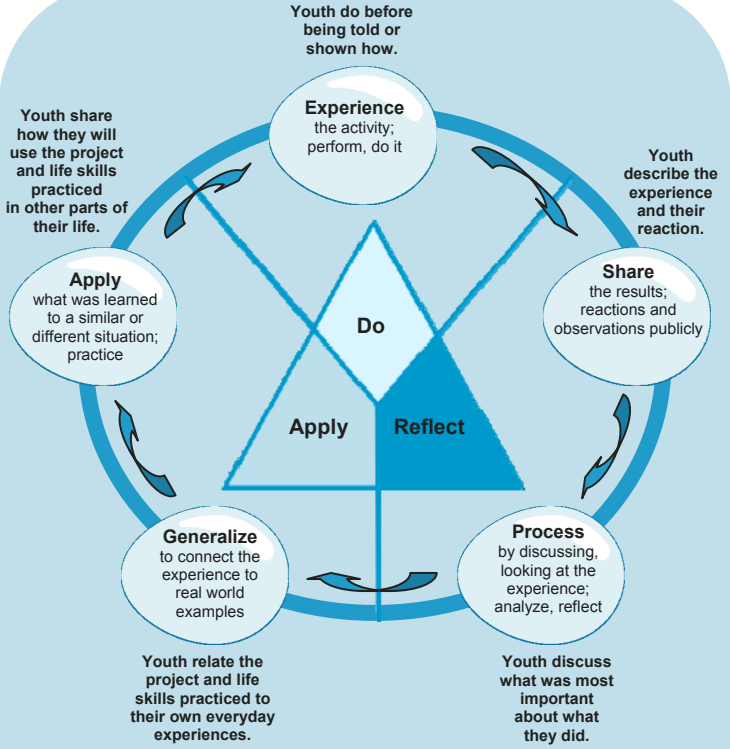
Generalizing Questions

- What did you learn about yourself through this activity?
- What did you learn about the life skill (i.e., making decisions)?
- How did you go about making your decision?
- How do the major themes or ideas relate to real life and not just the activity?

Apply. Concentrate on how the new learning can be applied to everyday situations. Discuss how issues raised by the activity can be useful in the future. Describe how more effective behaviors can grow out of what is learned.

Applying Questions

- How can you apply what you learned (making decisions) to a new situation?
- How can issues raised by this activity be used in the future?
- How will you act differently in the future as a result of this activity?



Experiences lead to learning if the participant understands what happened, sees patterns of observations, generalizes from those observations and understands how to use the generalization again in a new situation. When this model is used, youth both experience and process the activity.

Benefits for youth participating in the experiential learning process, no matter what their individual learning style, include:

- learning from each other by sharing knowledge and skills
- working together, sharing information and evaluating themselves and others
- taking responsibility for their own learning
- relating experiences to their own lives

Adapted from Kolb, D. (1984)

Targeting Life Skills

A skill is a learned ability. Life skills are those competencies that assist people in functioning well in the environments in which they live. Youth development professionals and volunteers are concerned with helping youth become competent in the life skills that will prepare them for transition to adulthood. 4-H focuses on developing skills that are healthy and productive for both youth and their communities.

Positive youth development programs identify the skills within the four targeted competency areas that are appropriate to the age of the youth in the program and offer experiences to teach these skills. Because skills are best learned through practice, many experiences that teach or reinforce skills must be provided. Mastery of any skill requires opportunities to try, make mistakes, and try again. The following graphic represents a system for targeting skills that lead to mastery of targeted competencies.

4-H Focus of Youth Competencies

HEAD: Knowledge, Reasoning and Creativity Competencies

Thinking: using one's mind to form ideas and make decisions; to imagine, to examine carefully in the mind, to consider.

Managing: using resources to accomplish a purpose.

HEART: Personal/Social Competencies

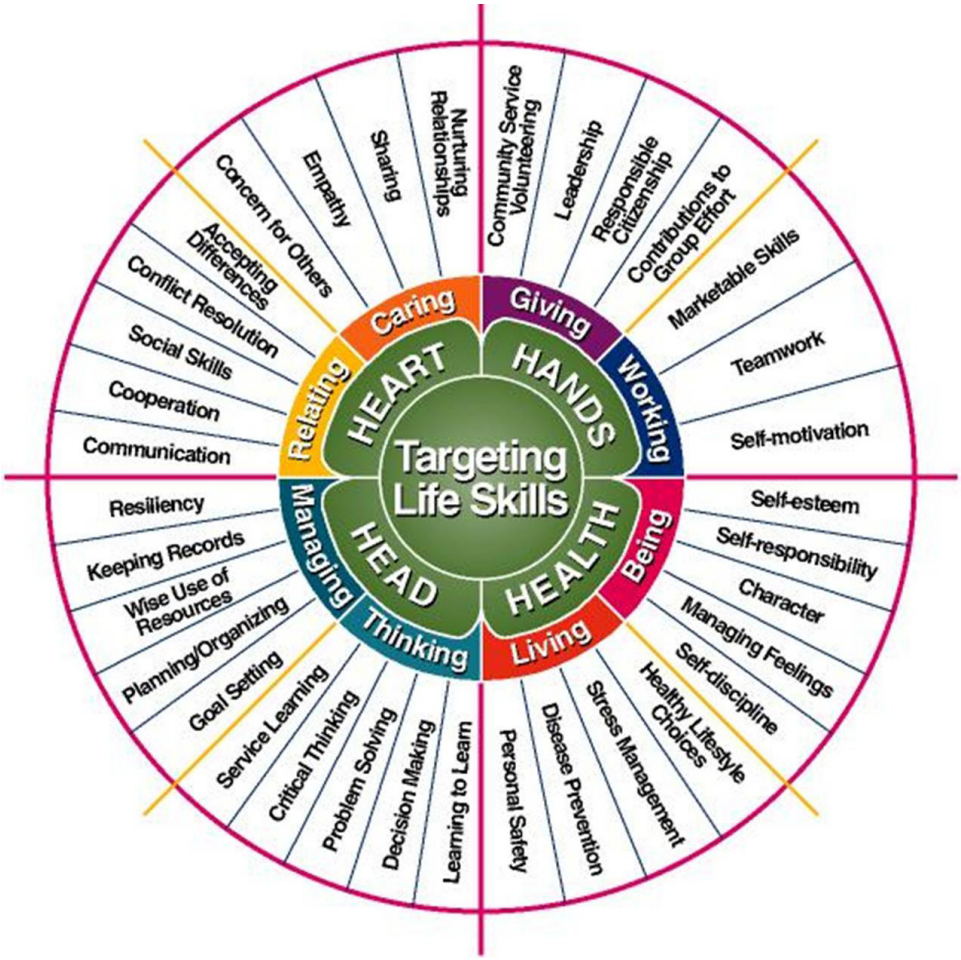
Relating: establishing a mutual or reciprocal connection between two people that is wholesome and meaningful to both.

Caring: showing understanding, kindness, concern and affection for others.

HAND: Vocational/Citizenship Competencies

Giving: providing, supplying, or causing to happen (social responsibility).

Working: accomplishing something or earning pay to support oneself through physical or mental effort.



Adapted from Hendricks, P. (1998)

HEALTH: Health/Physical Competencies

Living: acting or behaving; the manner or style of daily life.

Being: living one's life; pursuing one's basic nature; involved in personal development.

The Title Bar indicates which **Life Skills** are being covered within the lesson's activities.

Bluebird Background Basics and Activities

Lesson 1 *Birds of a Feather…*
Background

Taxonomy of North American Bluebirds

North American bluebirds are members of the family Turdidae which also includes the American Robin, Solitaires, and a variety of thrushes. These three bluebirds make up the songbird Genus *Sialia*.

The three types of bluebirds found in North America are the Eastern Bluebird, Western Bluebird and Mountain Bluebird. The Western Bluebird (*Sialia mexicana*) is most commonly found in oak woodlands across the western half of the United States along with southwestern parts of Canada and down into Mexico. Mountain Bluebirds (*Sialia currucoides*) can be found in western areas from Alaska to Mexico with an elevation of 3,000 feet or higher. The Eastern Bluebird (*Sialia sialis*) can be found throughout the eastern part of the continent down into Mexico.

Anatomy of North American Bluebirds

Attributes such as color patterns and size are often used to distinguish between different types of birds. Scientists use the markings on a bird's body to help them identify and classify birds.

Colors: The ***Western Bluebird*** has Cobalt Blue on its back, wings, and throat; a ruddy orange-red breast; and a white belly. The ***Mountain Bluebird*** is silvery blue in appearance with no distinct coloring on the breast. The ***Eastern Bluebird*** has a Cobalt Blue back, a ruddy orange-red throat and breast, and a white belly. Telling these bluebirds apart is very easy. Just remember: the Mountain Bluebird is all blue, the Western Bluebird has a blue collar and an orange vest, and the orange on the Eastern Bluebird comes all the way up to its bill.

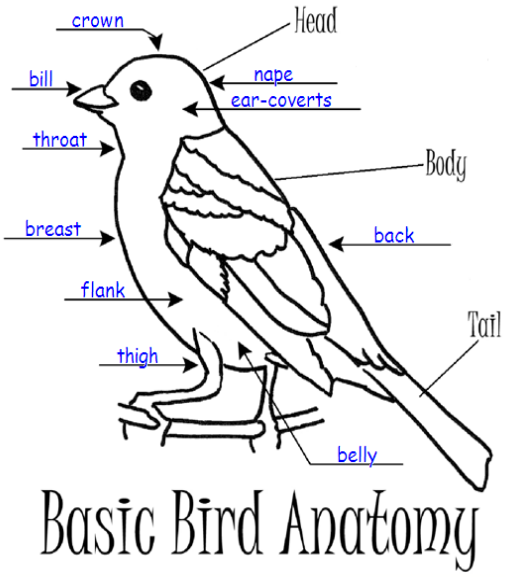


Male bluebirds can usually be detected by their bright coloring, whereas the females are duller shades to help them camouflage and blend in with their environments for protection.

Size: Most bluebirds are about 6—7 inches long with slender bodies and bills. Mountain bluebirds are the slimmest of the three.

Basic Bird Anatomy

Back: the area on each side of the backbone
Belly: contains the stomach, intestines, and other vital organs
Bill: the beak or mouth
Breast: the chest of the bird
Crown: the top part of the head
Ear-coverts: the small feathers that cover the area of the ear (sometimes distinctively colored)
Flank: each side of the body of a bird between the last rib and the hip
Nape: the back part of the neck
Thigh: the top of the leg, between the knee and the hip
Throat: the front part of the neck; area from the end of the bill to the start of the chest



Group Activity for Lesson 1:
***Skill-a-thon* - Introduction:**

A skill-a-thon is a series of learning stations designed to help participants enhance their understanding of a given topic. These four skill-a-thon stations represent information that provides a necessary foundation when studying birds.

Setting Up the Stations:

Each station has a stand-up sign that clearly indicates the topic covered by the skill-a-thon (***Station Starter***). Create a sign for each station from poster board or construction paper using the ***Situation*** and ***Youth Task*** prompts on the next page. After reading the sign, the youth should be able to complete the activity.

Notes to The Facilitator

Each station should have someone (the facilitator) to aid youth in the learning process. The facilitator:

1. is someone who is familiar with the topic from the background provided in the Leader's Guide
2. develops questions to ask youth if they get stuck
3. assists youth by using the following method:
   - Step back and allow youth to figure it out for themselves.
   - Respond to questions by asking questions so youth derive their own answers.
   - Accept or reject solutions.

Station Starters

Station 1: Basic Bird Anatomy (cards and poster for this task on pages 14 and 15)

Materials: Sign, cards, and poster.
Situation: Your friend saw an unfamiliar bird in his back yard. He tries to describe the bird to you, but he doesn't know the proper names for the bird's anatomy to correctly describe it for you.
Youth Task: Match the parts of the bird's anatomy to the appropriate name.

Station 2: Bluebird Colors (cards on page 14)

Materials: Sign, cards, and crayons/markers (orange, dark blue, and light blue or teal).
Situation: You are visiting a national park and see a beautiful bluebird. Your mother asks you what it looked like and which type of bluebird it was.
Youth Task: Color in the three bluebird outlines, using the proper color markings for each type of bird.

Station 3: Bird Identification (cards and poster for this task on pages 14, 16, and 17)

Materials: Sign, cards, and posters.
Situation: You and your club members are organizing a bird-watching field trip. You will be working in teams of four to identify and record as many birds as possible.
Youth Task:
STEP 1: Determine the type of bird in each picture. Indicate what characteristic you used to distinguish between the birds.

STEP 2: Determine the gender of the two birds in each picture. Indicate what characteristic you used to distinguish between the birds.

***Note -** Please note that two pairs of birds have been included in this activity because of the distinct color differences between the male and female - Northern Cardinals and Painted Buntings. However, these birds are NOT cavity-nesting birds; they actually nest in shrubs.*

Lesson 2 *Come Fly With Me…* Background

Preferred Habitats of North American Bluebirds

Bluebirds prefer open spaces with short or sparse vegetation. Meadows, pastures, prairie coulees, golf courses, and open parks are a few examples of prime bluebird sites.

A few trees on the fringes of the area provides branches for them to perch on. They use these low perches to scout for insects and the limited vegetation will enable them to see more insects as they search for food. Bluebirds might be found close to a forest's edge since they like to hide in the trees right after their young have fledged. However, it is unlikely that they would be found in a thick forest or swampy area.

Group Activity for Lesson 2

***Habitat Hunt* - Introduction**

Cavity-nesting birds excavate nesting holes, use cavities resulting from decay, or use holes created by other species in dead or deteriorating trees in which to create their nests. These dead or deteriorating trees, sometimes referred to as snags, are often considered undesirable by forest and recreation managers and are therefore often eliminated. As a result, some areas contain few nesting sites for cavity-nesting birds.

Setting Up the Activity

Plan a field trip to a local wooded area. Use this trip to look for potential and currently used nesting sites. Remind youth that birds can be very territorial, especially during nesting season. As they look for nests, they need to be careful not to disturb any nests they may find. For photographic fun, allow youth to use cameras to take pictures of the nesting sites. Take care to always look out for the well-being of the birds, protect habitat, and make no negative impact.

Notes to The Facilitator

Use the checklist below to prepare for the field trip:

- Permission slips with Emergency Contact information from each youth's guardian
- Well-stocked first aid kit
- Notes on any allergies the youth may have, as well as necessary medications to treat (inhalers, bee-sting kits)
- Proper attire - hats, sunscreen, rain gear
- Snacks and drinks - small bags of trail mix, granola bars, or cereal are easily transported
- Call ahead to confirm hours, fees, or availability

Lesson 3 *Happy Habitats*
Background

Habitat Issues of North American Bluebirds

Natural habitats are found in frequently burned pinelands, forest openings, and open woodlands. In human-modified environments, they are often found in pastures, agricultural fields, golf courses, and urban parks and backyards. Unfortunately, bluebirds and other cavity-nesting birds cannot find suitable nesting cavities during the breeding season. Introduced European Starlings and House Sparrows have made it difficult for bluebirds to occupy available nest cavities. Nest cavities are in short supply, particularly in human modified habitats. Landowners often remove many dead trees that could contain nesting cavities. In addition, the use of pesticides and removal of habitat structure (e.g., variety of native plants) limits foraging areas, which contain insects and some fruits that they feed on.

Mankind, however, has tried to help reverse the effects of the destruction of the natural habitats. People have increased the number of suitable and safe habitats for them to use by building bird houses in their yards, near open spaces, and along trails. Natural observation stations have been established to enhance bird education opportunities.

Group Activity for Lesson 3

***Awesome Aviaries* - Introduction**

Clubs can visit aviaries, an enclosed facility where birds are kept in captivity, but are allowed to fly freely. These aviaries are used to observe birds in a free flight environment. There are a number of aviaries throughout the United States.

Setting Up the Activity

Depending on your location, determine the amount of time it will take for round trip travel and the amount of time you would like to spend with youth inside the aviary.

Many of the larger zoos throughout Florida have a walk-through aviary. Below is a list of Florida zoos with aviary facilities:

- *Aviary Zoo of Naples* - Naples, FL
- *Brevard Zoo* - Melbourne, FL
- *Busch Gardens* - Tampa, FL
- *Gatorland* - Orlando, FL
- *Jacksonville Zoo and Gardens* - Jacksonville, FL
- *Lowry Park Zoo* - Tampa, FL
- *Miami Metrozoo* - Miami, FL
- *Palm Beach Zoo at Dreher Park* - West Palm, FL
- *Santa Fe College Teaching Zoo* - Gainesville, FL
- *Sea World* - Orlando, FL

Notes to The Facilitator

Use the checklist below to prepare for any Field Trip:

- Permission slips with Emergency Contact information from each youth's guardian
- Well-stocked first aid kit
- Notes on any allergies the youth may have, as well as necessary medications to treat (inhalers, bee-sting kits)
- Proper attire - hats, sunscreen, rain gear
- Snacks and drinks - small bags of trail mix, granola bars, or cereal are easily transported

These facilities charge various fees for entry and have various days and opportunities for visits. Please contact each respective facility for planning your trip. See the Resources Page for contact information.

Natural Observation Stations Introduction

In addition to aviaries, clubs can visit many places throughout Florida where bird life is abundant. One fabulous resource for these locations is the Great Florida Birding Trail (GFBT). The GFBT is a collection of 445 sites throughout Florida that have been selected due to their excellent bird watching and bird education opportunities.

Setting Up the Activity

Depending on your location, determine the amount of time it will take for round trip travel and the amount of time you would like to spend with youth on the trail.

Use GFBT's Web site (http://floridabirdingtrail.com) to determine which site you would like to visit and the opportunities that are available for your club.

Notes to The Facilitator

Use the checklist below to prepare for any field trip:

- Permission slips with Emergency Contact information from each youth's guardian
- Well-stocked first aid kit
- Notes on any allergies the youth may have, as well as necessary medications to treat (inhalers, bee-sting kits)
- Proper attire - hats, sunscreen, rain gear
- Snacks and drinks - small bags of trail mix, granola bars, or cereal are easily transported

Call ahead to confirm hours, fees, or availability.

Lesson 4 *Home, Tweet Home*
Background

Housing Habits of North American Bluebirds

In warm states, bluebirds may seek nearby habitats or remain in the area where they hatched. In cold states, they will migrate south to spend the winter and travel back north again for the breeding season. Bluebirds will only seek shelter in a cavity or nest box when it gets extremely cold (below 30°F). The only other time bluebirds will use a nest cavity is during breeding season. Bluebirds start breeding activities as soon as the middle of January in the deep south, and with most first eggs for the rest of the United States, starting to be laid by the middle of March.

There are two kinds of cavity nesters: excavators and adopters. An excavator (e.g. woodpeckers) creates its own cavity (hole) with its beak and then lines its nest with the resulting woodchips. Adopters cannot dig out their own natural nesting areas with their beaks, so they may choose to use old, abandoned nesting cavities. This cavity might be in a tree that has died, fallen down, or broken in half due to fire. Bluebirds are adopters. They cannot carve out their own natural nesting areas with the beaks they have. Instead, they use an old abandoned nesting cavity, or a tree that has died, broken down, or been damaged by fire. Bluebirds will also use man-made cavities for nesting.

Group Activity for Lesson 4

***Building Bird Houses as a Group* - Introduction**

A bird house is a man-made structure (cavity) in which cavity-nesting birds can find shelter to lay their eggs and raise their young.

Setting Up the Activity

This plan provides instructions for creating the pieces for building 6 bird houses from a 4' x 4' piece of plywood.

Notes to The Facilitator

The detailed plans are on pages 26-27.

- The piece of plywood needed for this activity is 4' x 8'. This can be difficult to cut, even with a circular saw. It is recommended that you measure and trace out the pieces of the bird house prior to cutting them apart.
- Materials for this project are included with the building plans.

Lesson 5 *E.G.G. Security Systems*
Background

Predators, Parasites, and Competitors of North American Bluebirds

All animals need to be aware of their natural surroundings. A predator is a living organism that eats another part of an animal. A parasite lives on or in a host animal, sometimes killing it. Competitors are organisms that share similar environments and use the same resources.

The eggs and baby birds put off an odor which can attract predators. That is why it is best for nesting boxes to be placed on stand-alone poles which are protected against predators, and away from fences or trees, which a predator could climb or jump to easily.

There are several bluebird predators.

- ***Snakes*** - Snakes eat both eggs and baby birds. Snakes are most often attracted once baby birds have hatched since the smell of the nest becomes stronger as it gets used. Snakes can climb a pole, so in areas where snakes are common, a guard should be used to prevent the snake from getting into the box. The stove pipe and cone guards are effective for snake control.

- ***Raccoons, Cats, Bears*** - These predators are known to eat adult birds, nestlings, and fledglings. If these predators are common to an area, a baffle should be used. This prevention method deters them with the size of the baffle and the baffle's wobbling nature, which makes it frustrating to climb.

- ***Chipmunks, Squirrels*** - Chipmunks and squirrels will enter nests and destroy or eat eggs or young. They may also enter in hopes of taking over the nesting area for themselves.

- ***Ants*** - Ants can also climb a pole, trying to reach the baby birds. To deter the ants, some people put heavy grease on the pole, about a foot from the ground. Other solutions include tying an oil-soaked rag to the pole.

Parasites - Parasites, including Blow Flies or Flesh Flies, can infest a nest box and then attach themselves to the baby birds. When monitoring a nest box one needs to check at times under the nest to see if the Blow Fly maggots will take over the nest, or if the maggots have attached themselves to the underneath of the babies' wings. If there is an infestation, a new nest can replace the old nest, and you would also want to remove any maggots attached to the babies. Always put an old or infested nest in a plastic bag and throw it away. Never throw a nest on the ground since this can help a predator find the nesting box.

There are several bluebird competitors.

- ***House Sparrow*** - Even other birds can be predators for the bluebird. House Sparrows are known to peck a bluebird to death in the nest box. It has been documented that the House Sparrow has been caught killing close to ninety different types of birds! Both the House Sparrow and European Starling came from Europe and they are not protected birds in the United States. Both the European Starling and House Sparrow are now found in every state, and are considered pests.

  If you find a bird, other than a bluebird, trying to build a nest in your box make sure you are not dealing with a House Sparrow. If House Sparrows are common to your area, they may very well try to claim use of your nest box. You may have so many House Sparrows you may never get bluebirds, since House Sparrows may try to take over every available nesting box or cavity. They are a little brown bird of about 5 inches and the males have a black throat. They have a single loud clear chirp for a sound. If House Sparrows claim your box, you can take out the nest they build. You can even throw out the eggs they lay. If they keep building a nest over and over again, you can then make them part of the project. Let them have the box and lay their eggs. **However, the one thing you do not ever want to do is to allow House Sparrows to successfully breed, because of the damage they can cause.**

  To keep the eggs from successfully hatching, put pinholes in each egg after they are all laid. Slowly hard boiling, or freezing the eggs, also ensures the eggs will not hatch. This is a passive way of dealing with House Sparrows. By letting them sit on a nest of eggs, which will now not hatch, the House Sparrows are kept busy for about three weeks attending to their nest, and not bothering other birds. Doing this is keeping them from hurting other birds, and it also keeps them from adding to their numbers which could do more damage to other birds in the future. Once they abandon the nest, or if three weeks have passed, clean out the nest box. Have youth also keep records of House Sparrow nest attempts and their egg counts.

- ***European Starling*** - The European Starling is also known to take over nest boxes. They will fight for the nest box, even pulling the bluebird from his house. The European Starling is known for reaching into a nest box and tossing out the babies.

  European Starlings should not be able to get into the box to breed, because the 1 ½ inch hole keeps them from getting inside. However, if a squirrel or woodpecker has enlarged the hole, European Starlings could then become a problem.

- ***Mosquitoes*** - The latest threat against birds is the mosquito, which may carry the deadly West Nile Virus. Many birds have already died from being bitten by a mosquito which carried West Nile Virus. This is one predator where a monitor will not be able to help.

- ***Mankind*** - Man can also be considered a competitor. Mankind has used much of the bluebirds' natural habitat to build on. Chemicals are sprayed on golf courses, or agriculture fields, which poisons the bugs the birds will then feed on. Worst of all, there are those who will purposely destroy the nesting boxes just to vandalize them.

Additional information on predators can be found in the Youth Project Book on page 33.

There are several types of predator guards. Three major types include:

- A *predator baffle* is the most complex, but the most effective type of guard. It is made of 8-inch snap together stove piping. Hardware ¼-inch cloth and plumbing straps are used for the top. Stove pipe of less than 8 inches has been proven ineffective.

- The *conical guard* which works well for boxes that are attached to free-standing poles. The collar is a circular piece of galvanized sheet metal that is placed around the pole underneath the nest box.

- The *Noel guard* consists of a rectangular tube of hardware cloth stapled to the front of the nest box. The edge of the tube has sharp points that will jab creatures that try to reach into the entrance hole while still allowing the occupants to easily come and go. This type of guard is most effective after the eggs have been laid.

Group Activity for Lesson 5

***Demonstrations* - Introduction**

A demonstration is a method used to communicate an idea from a 4-H project. Any time youth learn how to do something in a 4-H project and then show another person how to do it, they are performing a demonstration. By completing a demonstration, youth have completed an important 4-H activity to add to their achievement records.

The demonstrations can either be individual or team. However, team demonstrations actually take more time due to the extra time for planning and practicing. In a team demonstration, members should participate equally in both the speaking and the demonstration part of the presentation.

Setting Up the Activity

Allow youth to decide on whether they want to participate in team or individual demonstrations. Allow youth time to prepare their demonstrations on one of the following topics:

- Constructing a common predator guard
  - Noel Guard
  - Predator Baffle or
  - Conical Guard
- Designing and constructing a "Better Predator Guard"

Lesson 6 *Bountiful Banquets*

Background

Eating Habits of North American Bluebirds

For the most part, bluebirds feed on ground-dwelling insects throughout the warmer months. They prefer grasshoppers, crickets, caterpillars, and other various insects. Often their eating habits are favorable to farmers because they reduce the number of crop harming insects. During colder seasons, bluebirds often turn to berries, fruits, and seeds for sustenance. Bluebirds will try to find food near their nest, which is why they prefer open landscapes with plenty of visibility. An area with a large variety of native plants offer a diverse amount of insects and fruits/seeds for the birds.

Group Activity for Lesson 6

PART1* - *Native Plant Scavenger Hunt

Begin this activity by allowing youth to visit the site http://www.sialis.org/plants.htm to find out common plants that have seeds and fruits that bluebirds may eat. You can then use the plant identification Web site http://plants.ifas.ufl.edu/ to search for pictures and additional information about the plants common to your area. Once all the information is collected, have youth look around their yards to find native plants that would provide food sources for bluebirds during winter months.

***PART 2* - *Creating a Feathered Feast* - Introduction**

There are times during the colder parts of the year when our fine feathered friends could use extra food due to reduced food supplies or increased food consumption during mating and nesting season. The recipe is the same one listed in the youth manual. Other variations of this recipe are available at http://www.sialis.org/suet.htm.

NOTE: This recipe (with suet or peanut butter) should only be used when it is cool or cold outside as these concoctions will spoil quickly in hot weather. It is also a more attractive meal to other cavity-nesting birds, such as woodpeckers, chickadees, and nuthatches.

Setting Up the Activity

MIX 1 cup peanut butter
4 cups yellow cornmeal
1 cup unbleached or whole-wheat flour

ADD 1 cup fine sunflower seed chips
1 cup peanut hearts (or finely ground nuts)
1/2 - 1 cup Zante currants (or raisins cut in halves)

DRIZZLE and STIR IN
1 cup rendered, melted suet, let cool

Note: The resulting mix should be crumbly and have pea-sized lumps after mixing in the suet. If too sticky after cooling, mix in a bit more flour. If too dry, drizzle in more melted suet. Refrigerate any mix you are not using. This will prevent it from turning rancid (spoiled).

Note to The Facilitator

Suet is beef or mutton fat. It melts at 21°C (70°F) and it is mostly saturated fat. Its main use is to make tallow, which can be stored for extended periods of time without refrigeration. Tallow is used for making soap, cooking, and preparing bird food. It was once also used to make candles.

You can use a ready-made, pure, bird's suet cake or you can make your own: Grind or cube butcher store suet. Melt over low heat or in a microwave. If you are using the oven, be careful because suet is a fat and extreme heat can cause a fire. Use a strainer to remove the cracklings or stringy bits. Cool. Melt the mixture a second time.

***PART 3* - *Serving Your Feathered Feast* - Introduction**

Creating the food is only one step in providing sustenance for our fine feathered friends. Serving the food in a safe manner is also necessary.

Setting Up the Activity

MATERIALS

- Several sturdy logs (at least 3 to 4 inches in diameter and about 18 inches long) - have one for each small group of youth
- Power drill with 1¼" drill bit

Notes to The Facilitator

Drill several holes in each log. The holes should be approximately 1 inch deep.

Warm the *Feathered Feast* recipe in the microwave to soften the mixture (10-20 seconds). Push the mixture into the holes in the log feeder. Think about the best way to position the feeders. Be careful how the feeders are oriented near buildings. Place the log at a 90° angle to the building. This will encourage most birds to fly away from windows if startled while feeding, rather than into them.

The log feeders can also be hung from posts or trees. Simply screw a large eye bolt into one end of the log and secure using strong rope or chain.

Lesson 7 *On The Look Out*

Background

Breeding Habits of North American Bluebirds

Bluebirds usually pick one mate for life. If the mating has been successful the pair may even stay together for the next year, and years to come. Bluebirds have also been known to breed with more than one to ensure successful breeding. A male bluebird usually begins the search for an appropriate cavity. Once a cavity is chosen, the male bluebird becomes very territorial. Once he has selected a suitable cavity, the male starts his quest for a mate. Perched near the nest hole, the male will sing to attract females in the area. Sometimes, he will carry nest materials in and out of the hole. Once a female shows interest, the male will respond by stretching out and showing off his bright colors. If the female responds by singing softly and flying towards the nest hole, she has accepted his offer for mating.

Once the female has accepted a mate and a nesting cavity, she begins to build the nest. Occasionally the male will help collect materials for the nest, but normally he just tags along while singing his bluebird song. The female will build a cup-style nest, usually made of pine needles and grasses, occasionally lining it with feathers and animal hair. Both male and female bluebirds take an equal role in protecting the nest box from intruders.

Monitoring North American Bluebirds

There are many advantages to monitoring a nest box. A monitor can observe problems with local predators and try to correct those situations. These may include keeping wasps and Blow Flies out of the box, or devising better ways to keep raccoons and snakes from getting into a nest box. Monitors can also look out for House Sparrows or European Starlings attacking a box.

Monitors also help tend to the needs of the nest box. If a nest is too wet or soiled, it can be replaced. If the weather is too hot, a second roof or heat shield can be applied. Monitors are also aware if a parent is missing, and may offer food to help in feeding. If both parents disappear, baby birds could be taken to a rehab specialist.

Records kept each week of what is found in a box can assist researchers in learning more about the bluebird from that particular box in that particular habitat area. Records turned into Cornell University's NestWatch are compiled with thousands of other individual monitors who turn in their bluebird information. That information then aids in the further understanding of the future survival of both the bluebirds and other cavity-nesting birds overall.

Bluebirds are very social birds and usually do not mind being looked in on by people. Sometimes the female will stay sitting on her nest when one goes to monitor. Instead of moving her, check back a bit later when she has moved. It will not hurt if you have to pick up the baby birds and place them in a dry nest or parasite free nest, but do not ever pick the baby birds up just to look at them.

Group Activity for Lesson 7

***Best Nest Contest* - Introduction**

A nest is a place of safety, built to hold an animal's eggs and provide a place to raise their young. Bird nests are typically made of organic materials such as twigs, grass, or leaves. They may be free-standing, or they may be created in a hole found in a tree, rock, or building.

Setting Up the Activity

Separate youth into small groups. Provide each small group with a plastic grocery bag. Instruct each group to go foraging for items to create their own bird nest. These materials should be the same ones a bird would consider using such as grasses, twigs, leaves, feathers, or string. Remember, birds use a large variety of materials to construct their nests.

Notes to The Facilitator

Once youth have collected their materials, have the groups spread out. The goal is to construct their own bird's nest out of the materials they found. The nest should be able to be gently moved without falling apart and be made without using any bonding material (such as glue, tape, or plastic wrap). Youth will see how hard it is to actually construct the nest without using bonding materials; yet birds construct these masterpieces every year using instinctual weaving habits. Make the task more challenging by having youth assemble the nest using tweezers.

Optional Activities for Lesson 7

Offspring Development

These two activity sheets *(pages 20-21)* can be used to acquaint youth with the size and types of eggs common to cavity-nesting birds, as well as the development of the egg once laid. These full color files are also available at the project Web site: http://florida4h.org/projects/bluebirds/resources.

ACTIVITY 1: Make at least one copy of the card set. Ask youth to arrange the cards in order of development from birth to adult.

ACTIVITY 2: Make at least one copy of the card set. Ask youth to match the bird with the egg they think it laid.

Lesson 8 *Ready, Set, Fledge!*

Background

Birth and Fledging of North American Bluebirds:

Female bluebirds begin laying eggs soon after the nest is constructed. A first-year female bluebird usually lays three to four eggs, following years will be four to five, and even six to seven have been recorded. She will lay one egg a day, usually in the early morning, and will continue laying one egg a day until they are all laid. That's when she will start to incubate them; all at the same time. The incubation time for bluebirds is 12-14 days, with shorter times usually in warmer states. The female is the only parent capable of incubating the eggs. She creates a brood patch by plucking out feathers from her belly region. The blood vessels close to the skin work like a hot water bottle to transfer heat from the mom's body to the eggs. The eggs' temperature will stay at about 95°F. Eggs will fail to hatch if it gets hotter than 107°F. This usually happens because of the outside temperature and/or the size of the box, not by the female sitting on them.

After the hatchlings are born, the mother will carry away the empty shells to help protect her young from predators. About ten days after the young have left the nest, the mother may return to the nest box to lay another set of eggs. If this is the case, the male bird will take over the responsibility of raising the youngsters as they continue to perfect their flying and hunting techniques. If a second set of young hatch, the whole family may contribute to feeding them. Bluebirds can have two broods a year, and in the more southern areas, a third or even a rare fourth breeding can happen.

Baby bluebirds are born in what's called an altricial state, meaning that their eyes are still closed and they are completely unable to secure food for themselves. Both male and female bluebirds take a role in raising the hatchlings. Early on, the hatchlings can only eat soft insects like caterpillars, but as they grow the parents will bring a variety of insects. Hatchlings are born with almost no feathers and the mother must keep them warm with her body as they continue to develop. Feathers begin to grow in about a week's time and most nestlings are completely feathered by two weeks.

The next step in development is for the young to strengthen the muscles in their wings by flapping. They are usually ready to leave the nest, or fledge, after approximately 18—22 days. Often, fledglings/ fledged birds remain with their parents to learn survival skills such as finding food for themselves.

The parents can start their next clutch within just a number of days (and most likely do within a couple of weeks at most). The juvenile birds will sometimes stay in the area, and may even help with the next clutch of baby birds by helping the parents to feed them. By the next breeding season, the babies from the first clutch will be ready to become parents.

Group Activity for Lesson 8***

***Creating a Bluebird Trail* - Introduction:**

A Bluebird Trail consists of 5 or more bluebird houses in the same locale. These resources create areas for breeding, and allow cavity nesting birds to expand their often limited breeding range into new areas.

***Please be aware that setting up a Bluebird Trail comes with responsibilities. This activity provides youth with great educational opportunities. However, please consider the necessary commitments prior to establishing a Bluebird Trail for your club.**

Setting Up the Activity

Once youth have created their bird houses, have them mount them in a common area using the guidelines below.

Notes to The Facilitator

Responsibilities come with the establishing of a Bluebird Trail. As a Bluebird Trail "landlord," boxes need to be not only constructed and mounted, but properly maintained. Bird houses must be monitored every three days during the nesting season. Bluebirds nest in late March in much of the United States; however, southern states have reported nestings as early as the middle of January.

You may get nesting bluebirds the first year, or it may take a few seasons for them to find your nesting boxes. Once they find your bird houses, they generally return to the same area each year. Bluebirds usually have two broods each season, but three or even four broods are possible. Once hatchlings are about 12 days old, nest box checks should cease. This is to avoid the hatchlings leaving the nest before they are ready to fledge.

When finding a location for your trail, choose an area that allows the birds to live in a natural habitat. Bluebirds prefer pastures, parks, cemeteries, and golf courses. To avoid competitive species, such as the House Sparrow or House Wren, avoid heavily wooded areas, farmsteads, and feedlots where grain is used/stored.

Bird houses should be mounted 5—6 feet above the ground, facing away from the prevailing winds. Houses for Eastern Bluebirds need to be placed between 100 and 150 yards apart. Houses for the Western or Mountain Bluebirds need to be at least 300 yards apart.

Many birders set out houses in pairs. These pairs should be placed between 10 and 15 feet apart. This allows competitive species, such as the Tree Swallow or House Sparrow to take up residence near a bluebird box without threatening the bluebird's nesting site.

Lesson 9 *Egg-cellent Job!*

Background

Avian Employment

There are a number of professional opportunities for people who enjoy working with birds.

- **Avian Ecologist -** a professional who examines the interrelationship between birds and their environments.
- **Avian Veterinarian -** a veterinarian which studied to treat the specific medical needs of birds.
- **Aviculturist -** a general term for one who cares for and raises birds.
- **Breeder -** a person who raises a specific breed of bird, in keeping with the accepted standards for the breed.
- **Ornithologist -** a professional scientist who studies the lives and behaviors of birds.

Group Activity for Lesson 9

***Charades* - Introduction**

There are a number of professions related to the care and propagation of various bird species. In the individual member book, youth have the opportunity to shadow or research one of the jobs associated with aviculture.

Setting Up the Activity

Allow youth to act out the job that they have chosen to study in front of the other youth. Have the observers try to guess which of the avian jobs is being portrayed.

Group Activity for Lesson 9

***Guest Speaker* - Introduction**

There are a number of professions related to the care and propagation of various bird species. Ask a local avian professional to visit a club meeting and discuss their profession. If possible, request that the professional bring one of the birds they work with to enhance the educational experience.

*Other Cavity-Nesting Birds****

Depending on your location, it is possible that you will have a number of feathered friends stopping by your bluebird box to check it out. This section provides some basic information about some of those potential visitors. In addition to these brief paragraphs, information cards have been included on some of the common small cavity-nesting birds (pages 25-29).

This project book focuses on smaller cavity nesting birds. There are large cavity-nesting birds such as the Boreal Owl, American Kestrel, Wood Duck, and various woodpeckers. A bluebird is considered a "small" bird because its size is being compared to these larger cavity-nesting birds.

We've already discussed two types of birds who may want to use your box (see Lesson 5). European Starlings might want the box, but they should not be able to get in because of the 1½ inch entrance hole. The House Sparrow may want the box because it wants as many nesting sites as it can find just to have them available. Some other small cavity-nesting birds include:

Tree Swallows - Tree Swallows, found in many northern states, are more numerous than bluebirds. It is likely that they will try to take over a bluebird box. So, to accommodate the Tree Swallow, people in northern states usually set up two bluebird boxes within 15 feet of each other. The Tree Swallow takes one and the bluebird takes the other, leaving both bird families happy. This is called ***pairing*** the boxes. If you do not pair boxes in these areas, the Tree Swallow usually takes over the box, leaving your bluebirds homeless. Even if a Tree Swallow takes over your box, don't worry. A Tree Swallow only breeds one time a year; the rest of the year the bluebirds will have an opportunity to use the box.

House Wrens & Carolina Wrens - These wrens can also make use of a bluebird box. They use grass, twigs, feathers and even snake skins to build their nests. Placing your box too close to trees may inadvertently attract these birds. Wrens can be pushy and may take over a box, building their nest right on top of another bird's nest. If they do nest in your box, do not touch what they have done until their baby birds fledge or they abandon that nest. These are protected birds, and therefore, cannot be interfered with.

Titmice & Chickadee - These are small cavity-nesting birds commonly found throughout the southeast. They are attracted to boxes placed very close to wooded areas. Chickadees build their nests from moss or fur. Titmice will include leaves, strips of bark, a piece of snake skin, or even a piece of cellophane.

Nuthatches & Prothonotary Warblers - These birds are also found closer to wooded areas. House Finches are usually found in the northern areas. They look much like the House Sparrow, but the coloring is more reddish purple. Again, when finding birds other than a bluebird you may want to look at a bird identification book for help with proper identification.

Great Crested Flycatchers - These birds usually will not go into the bluebird box, because, like the European Starling, the size of the hole is too small. If the hole has been enlarged, by a squirrel or woodpecker, you may then find flycatchers using your box. The Great Crested Flycatcher may be more common around the time of the second brood, since that is the time it arrives from Central America in route back to the north after winter migration.

Woodpeckers - After they enlarge the hole, a woodpecker may try to nest in your box. Woodpeckers can cause large amounts of damage to the hole and even the bottom of the box as they attempt to make the box more suitable for their needs. If you find woodpeckers working on your boxes, it may indicate they also need suitable homes just for them. If a woodpecker breeds in your box, you may find it interesting to see how very little nesting material is uses for a nest.

***** With the exception of the House Sparrow and the European Starling, any birds who take over a bluebird box cannot in anyway be disturbed until their birds fledge or the nest is abandoned.**

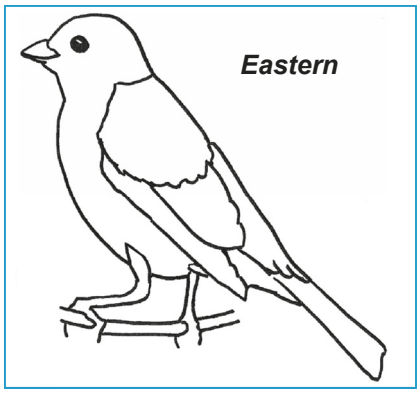
Lesson 1: *Birds of a Feather…*
Group Activity: Skill-a-thon

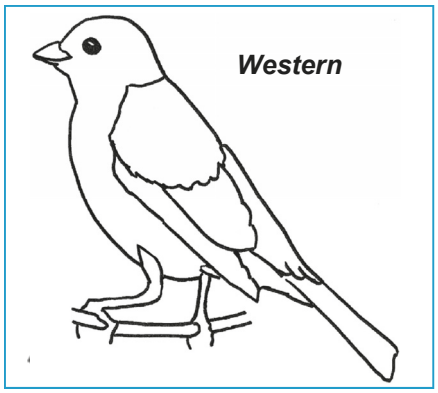
Cards for Each Station

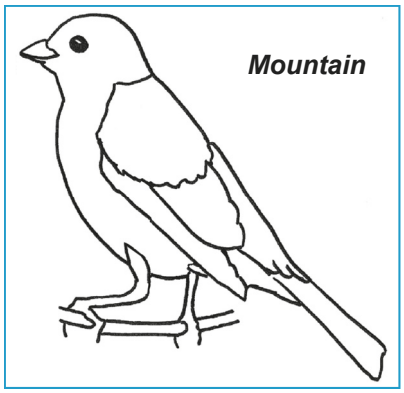
Make a copy of the cards below. Cut out and place at the indicated station. Laminate for durability.

Bill Station 1	**Ear-coverts** Station 1	**Tufted Titmouse** Station 3
Back Station 1	**Flank** Station 1	**Hairy Woodpecker** Station 3
Belly Station 1	**Nape** Station 1	**Wood Duck** Station 3
Breast Station 1	**Thigh** Station 1	**House Sparrow** Station 3
Crown Station 1	**Throat** Station 1	**Eastern Bluebird** Station 3

Make a copy of the cards below for each youth member. Cut out and place at Station 2.

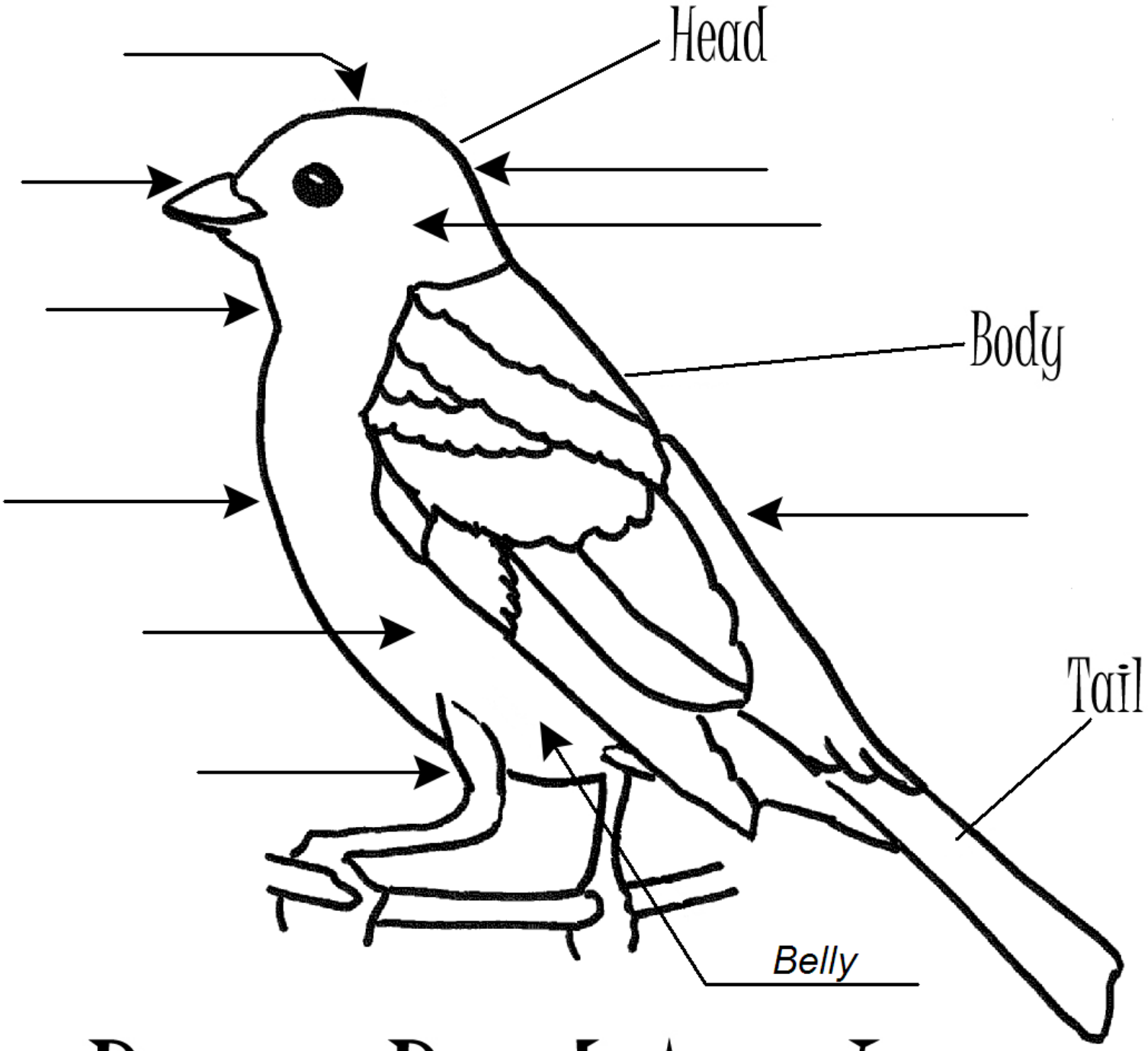






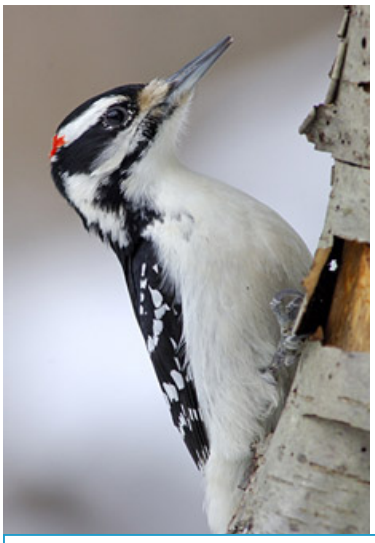
This page is available in FULL COLOR on the project Web site:
http://florida4h.org/projects/bluebirds/resources.

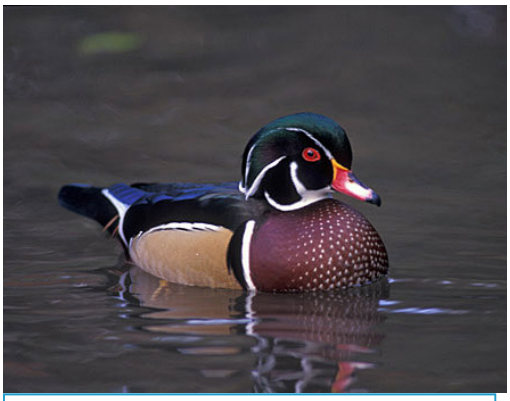
Use the next three sheets to create your posters...



Basic Bird Anatomy

Station 1





Station 3 - STEP 1

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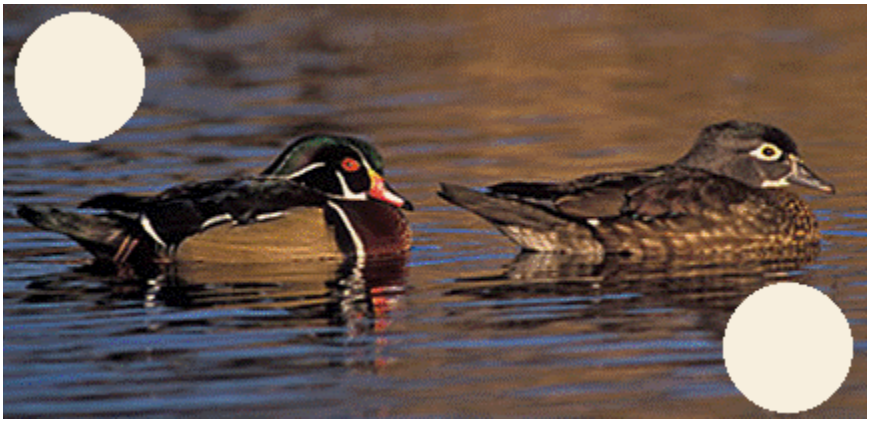

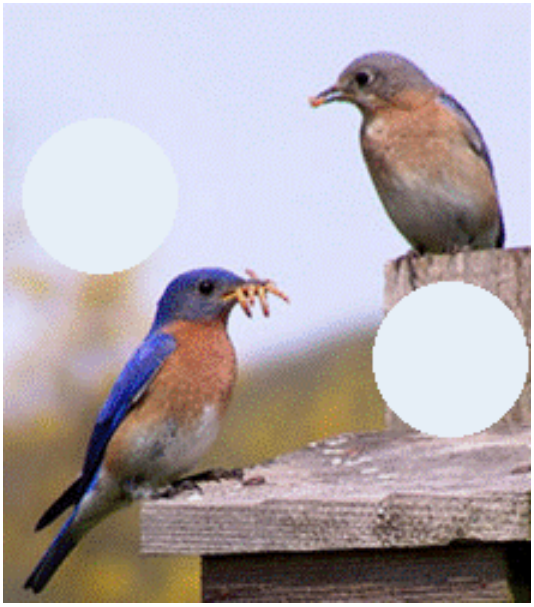

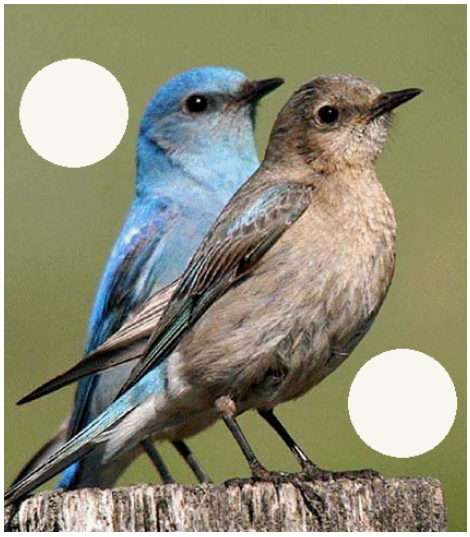

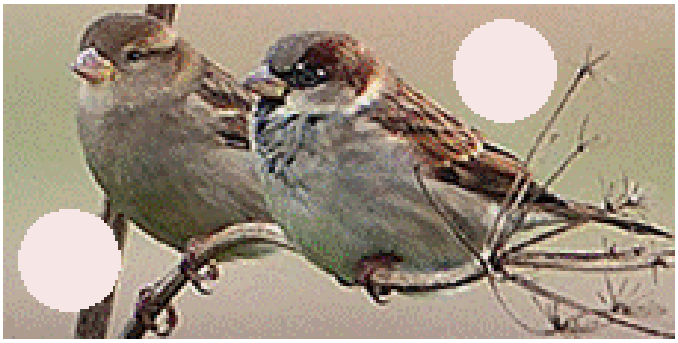

Station 3 - STEP 2

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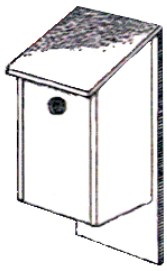
Lesson 4 *Home, Tweet Home*

Group Activity: Building Bird Houses as a Group



The instructions below create ***six*** bird houses.

MATERIALS LIST

1 piece of ½-inch exterior plywood — 4' x 4'

120—155 galvanized nails (1¾ inch) to secure the boards together.
(20—25 per bird house)

12 latch nails or double-headed nails
(2 per bird house)

Heavy gauge wire

Pole (if mounting boxes on poles)

TOOLS NEEDED

Power drill with...

1½-inch hole saw for the drill

1/16-inch and 1/8-inch drill bit

Circular or power hand saw

Hammer

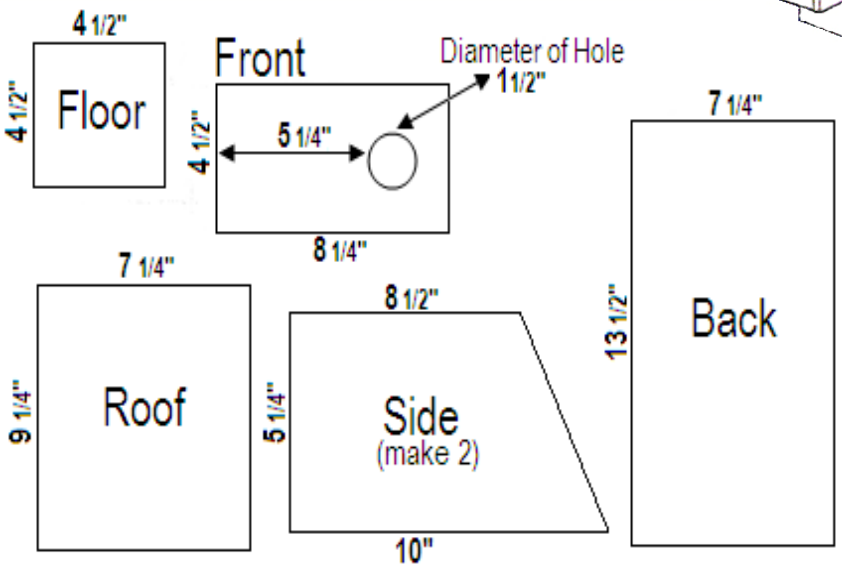
Straight-edged ruler or yardstick

Pencil or marking pen

Hot glue gun with...

Hot glue sticks

Safety goggles



Instructions:

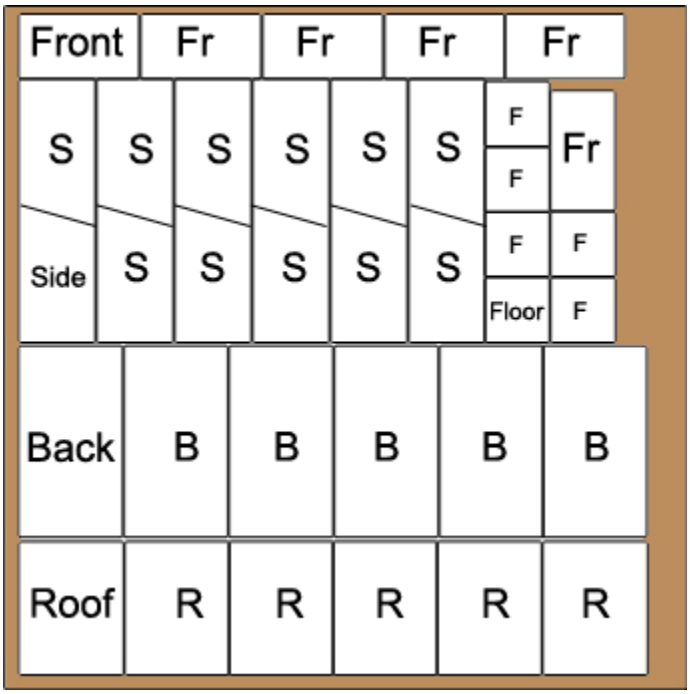
Step 1: Purchase or obtain the supplies needed to construct the bird houses (see above).

Step 2: *Selecting and cutting the pieces for the bird house:* When you go to the lumber yard or hardware store, you will need to buy a 4 foot x 4 foot piece of ½" exterior plywood.

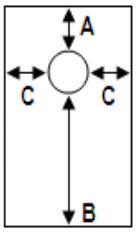
Use the diagram at right to sketch the layout for the bird house pieces on the plywood. The measurements for each piece are above.

To create the diagonal for the side pieces, measure 8½ inches on one side of the board and place a mark. Then, measure 10 inches on the opposite side of the board and mark. Use a straight-edge to connect these two points with a line. Then, just cut along that diagonal line.

Be sure to be careful while operating power tools. Dress for safety (wear goggles and closed-toe shoes; do not wear loose hanging clothing). If youth are assisting with the cutting, be sure each one is properly dressed to participate.

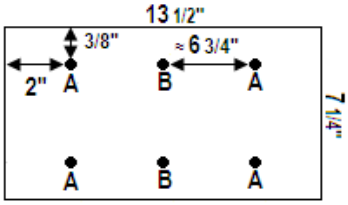


Step 3: Use a 1½-inch hole saw, drill the entry hole for the front.

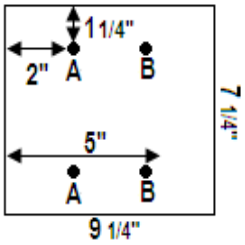


A. Top edge of the hole is 1½ inches from the top of the board.
B. Bottom edge is 5¼ inches from the bottom of the board.
C. Side edges are 1½ inches from the edge of the board.
Or, mark a point that is 6 inches from the bottom of the board and 2¼ inches from the long edge of the board. Center your drill over this spot to create your hole.

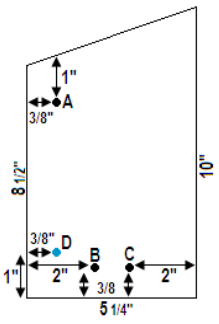
Step 4: Take the **BACK** (13½ x 7¼) and mark the places you need to drill holes, using this diagram. There are 6 small holes on the back. Three on each 13½-inch side. The holes marked **A** are all 2 inches from the 7¼-inch side and 3/8 inches from the 13½-inch side. Holes marked **B** are also 3/8 inches from the 13½-inch side, but they are placed in the middle, approximately 6¾ inches from either corner hole. Once you have marked all 6 locations and have checked your positioning with the diagram, use the 1/16-inch drill bit to make the holes.



Step 5: Take the **ROOF** (9¼ x 7¼) and mark the places you need to drill holes, using this diagram. There are 5 small holes on the roof. The holes marked **A** are 2 inches from the 7¼-inch side and 1¼ inches from the 9¼-inch side. The holes marked **B** are 5 inches from the 7¼-inch side and 1¼ inches from the 9¼-inch side. Hole **C** is 3/8 inches from the 7¼-inch side and centered along that same side. Once you have marked all 5 locations and have checked with the diagram, use the 1/16-inch drill bit to create the holes.



Step 6: Take both **SIDE** pieces (10 x 5¼) and mark the places you need to drill holes, using this diagram. There are 3 small holes on each side piece. The first hole **A** is 1 inch from the diagonal side and 3/8 inches from the 8½-inch side. Hole **B** is 2 inches from the 8½-inch side and 3/8 inches from the 5¼-inch side. Hole **C** is 2 inches from the 10-inch side and 3/8 inches from the 5¼-inch side. Once you have marked all 3 locations, check your positioning with the diagram, then use the 1/16" drill bit to create the holes. Repeat these steps for both side pieces.



Hole **D is 1inch from the 5¼-inch side and 3/8 inches from the 8½-inch side. Mark it on both side pieces, but DO NOT DRILL yet.

Step 7: Follow the diagrams and instructions, using the nails to secure the pieces of your bird house. Hint: You may find it helpful to hot glue the bird house pieces together before you hammer in the nails.

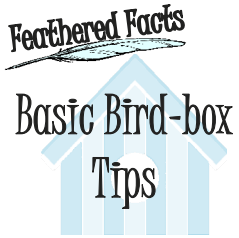
a. Attach the sides to the back and nail them in making sure all the outside edges and corners are even and flush.

b. Attach the floor according to the diagram at right. There should be a 3/8 inch gap between the edge of the floor and the back of the bird house. This gap provides ventilation and drainage. The floor should be flush with the sides of the house.

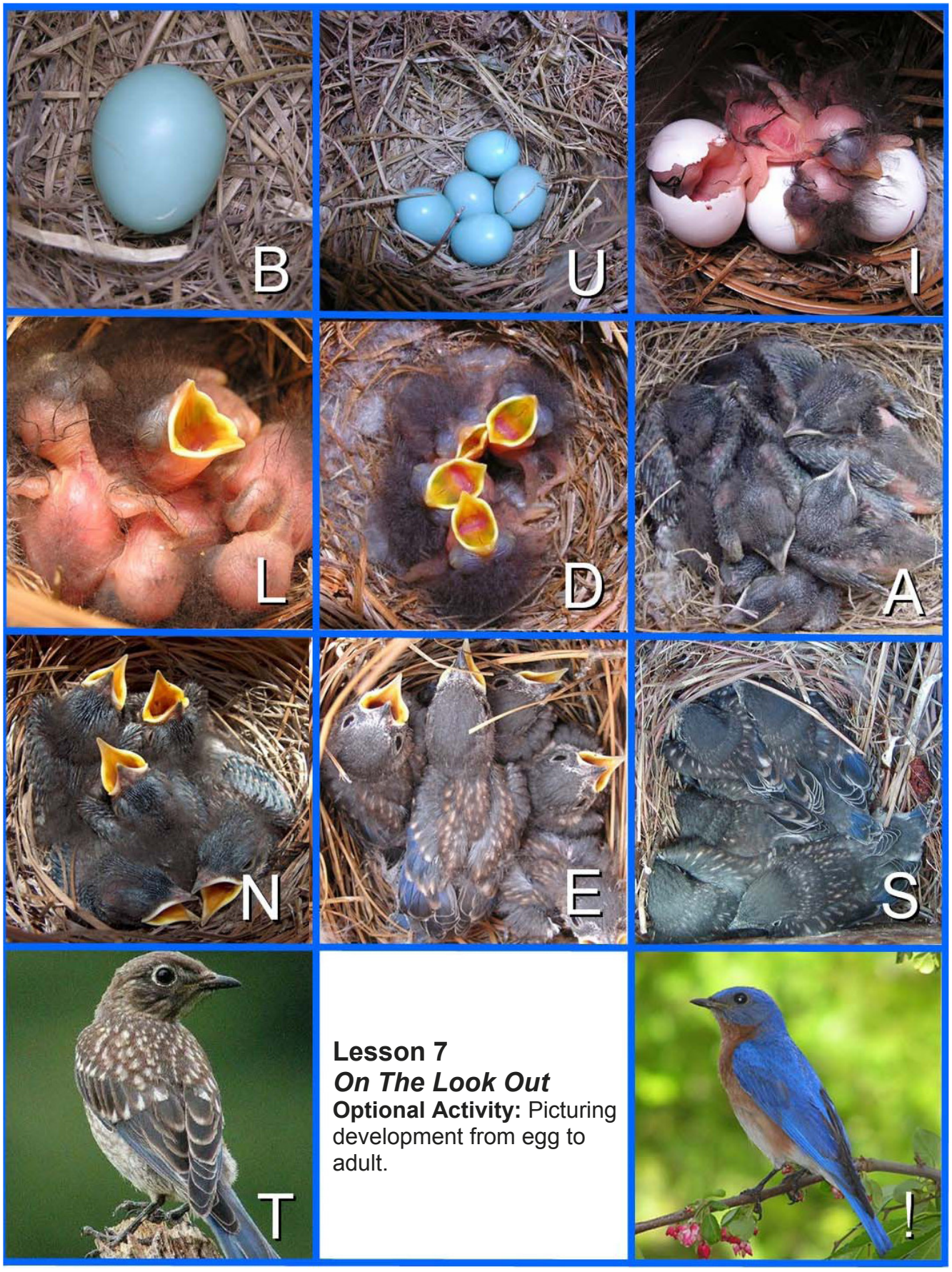
c. The door is attached with regular nails on the two top sides and latch nails on the two bottom sides. This will allow you to open the box so that you can clean it. Make sure the door is even with the bottom and front of the house (there should be a gap of about 1/2 inch at the top.) Nail in the top two nails - be sure to leave a little slack so that the nails can act as hinges for your door.

d. Now that the nails are in place, use the hole **D** marks from step 6 to drill a hole (with the 1/8-inch drill bit) through the sides and into the front piece. Use your fingers to insert the latch nails on the bottom. They should slide in easily and help keep the door secure.

e. Now you are ready to attach the roof! Using the holes you drilled, hammer in 5 nails to secure the roof down.



- Make small holes in the floor to allow water to drain out or cut a small piece off each corner of the bottom of the box to allow for drainage.
- Drill several small ¼-inch holes in each side, or leave a ¼-inch space at the top of each side, to provide birds with ventilations which could be especially useful in areas with hot weather.
- Never add a perch on a bird nest box.
- You can use the sharp point (like the end of a screwdriver) to make many X marks up the inside front wall below the entrance hole so that young birds can get a grip when they try to exit the box.



Lesson 7
On The Look Out
Optional Activity: Picturing development from egg to adult.

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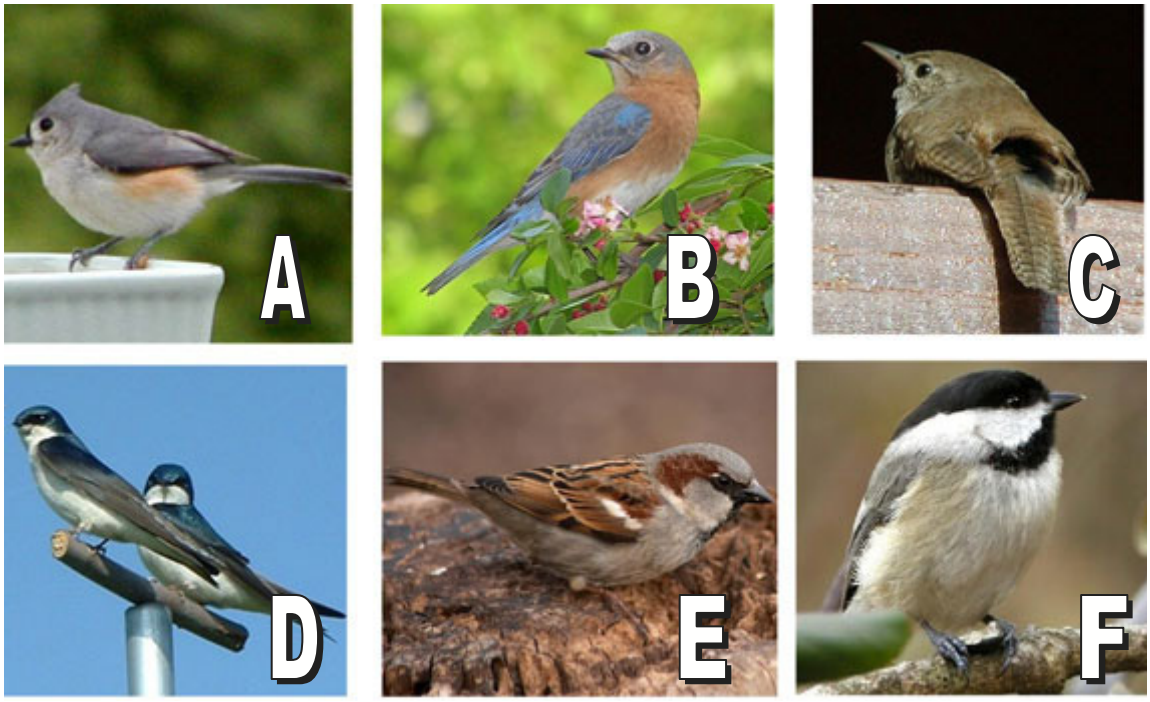
Lesson 7 *On The Look Out*

Optional Activity: Matching adult pictures with corresponding egg size and color.



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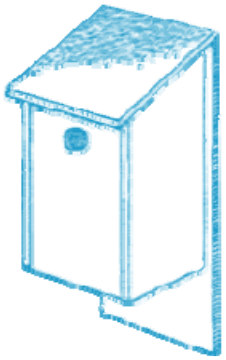
http://florida4h.org/projects/bluebirds/resources.

Using Monitoring Sheets



- Each time youth inspect a box, they should record their observations. Make sure they note even the smallest of changes. Details will be helpful when they want to review the progress of their birds. If there are no signs of birds using the box, have them record that information as well.
- As previously stated, birds are generally very social animals and do not mind being observed by people. However, remind youth to be careful to respect their space and to not interfere with any of their young.
- Remind youth to not be discouraged if their box is not used the first year. It may take the birds a few seasons to find the box. During that time, they should think about changes they might make to improve their chances in the next season.

Remember: Monitoring Sheets are for youth in the back of their book (pages 58—64), but additional pages can also be downloaded from the project Web site: http://florida4h.org/projects/bluebirds/. Pages for copying have also been included on the following pages for your convenience.

Example of Monitoring Sheet

<table>
<tr><td rowspan="6">Box #:
2

Species:
Eastern bluebird

Date:
12 August 07

Brood #:
2nd</td><td>Nest (describe)</td><td>Adults</td><td>Eggs</td><td>Young</td></tr>
<tr><td rowspan="3">Small cup made out of pine needles, grass, and one red string.</td><td>How Many? 2</td><td>How Many? 3</td><td>How Many? 1</td></tr>
<tr><td>Banded: Yes (No)</td><td>In Box: (In) Out</td><td>In Box: (In) Out</td></tr>
<tr><td>In Box: IN 1 Out 1</td><td rowspan="2">Appearance:
Eggs are a light blue color.</td><td rowspan="2">Appearance:
No real feathers, small.</td></tr>
<tr><td colspan="2">Appearance:
Typical color on both.</td></tr>
<tr><td colspan="4">Comments:
The eggshell from the first nestling is gone. I wonder what happened to it.</td></tr>
<tr><td colspan="4">Other Important Dates: Be sure to record when these events occur!
First Egg Laid:

Hatch Date:

Fledge Date:</td></tr>
</table>

Box #:	Nest (describe)	Adults	Eggs	Young
		How Many?	How Many?	How Many?
Species:		Banded: Yes No	In Box: In Out	In Box: In Out
		In Box: In Out	Appearance:	Appearance:
		Appearance:		
Date:				
Brood #:	Comments:			
	Other Important Dates: Be sure to record when these events occur! First Egg Laid: Hatch Date: Fledge Date:			

Box #:	Nest (describe)	Adults	Eggs	Young
		How Many?	How Many?	How Many?
Species:		Banded: Yes No	In Box: In Out	In Box: In Out
		In Box: In Out	Appearance:	Appearance:
		Appearance:		
Date:				
Brood #:	Comments:			
	Other Important Dates: Be sure to record when these events occur! First Egg Laid: Hatch Date: Fledge Date:			

Box #:	Nest (describe)	Adults	Eggs	Young
		How Many?	How Many?	How Many?
Species:		Banded: Yes No	In Box: In Out	In Box: In Out
		In Box: In Out	Appearance:	Appearance:
		Appearance:		
Date:				
Brood #:	Comments:			
	Other Important Dates: Be sure to record when these events occur! First Egg Laid: Hatch Date: Fledge Date:			

Box #:	Nest (describe)	Adults	Eggs	Young
		How Many?	How Many?	How Many?
Species:		Banded: Yes No	In Box: In Out	In Box: In Out
		In Box: In Out	Appearance:	Appearance:
		Appearance:		
Date:				
Brood #:	Comments:			
	Other Important Dates: Be sure to record when these events occur! First Egg Laid: Hatch Date: Fledge Date:			

Common Cavity-Nesting Birds

European Starling
Sturnus vulgaris

Order: *PASSERIFORMES*
Family: *STURNIDAE*

- **Nest in Florida:** yes
- **Length:** 20—23 cm
- **Mass:** 60—96 g
- **Diet:** Extremely diverse diet that varies geographically, with the age of individuals, and with season. Eats invertebrates when available, fruits and berries, grains and certain seeds during other times of the year.
- **Habitats:** In North America, European Starlings seem to avoid only large expanses of undisturbed non-grassland native habitats, like forested areas, desert, etc.
- **Nest:** The male builds the cavity nest and the female chooses him based on his song and cavity-building skills.
- **Behavior:** European Starlings walk or run, often vigorously and quickly with a distinctive waddling gait.
- **Fledge:** Nestlings fledge at 21—23 days.
- **Did You Know:** The European Starling can mimic sounds such as car horns, cats, and even simple words like “Hello.”

Prothonotary Warbler
Protonotaria citrea

Order: *PASSERIFORMES*
Family*: PARULIDAE*

- **Nest in Florida:** yes
- **Length:** 14 cm
- **Mass:** 14—16 g
- **Diet:** Primarily eats insects throughout the year . During the non-breeding season may be more opportunistic, feeding on some seeds, fruit, and even nectar in addition to insects and spiders.
- **Habitats:** Often found near wooded areas with water near cavity nest sites. Nest are usually placed over or near large bodies of standing or slow-moving water. Other habitat correlates include low elevation, flat terrain and shaded forest habitats .
- **Behavior:** Mostly hops along and sometimes climbs upward along trunks of trees.
- **Nest:** Occurs soon after the matting pair forms. Only female builds nest, although male often places foundation of moss in cavity during territory establishment.
- **Fledge:** Nestlings fledge at 10—11 days.
- **Did You Know:** Warblers are brightly plumed in the spring, but after the autumn molt they become uniformly drab.

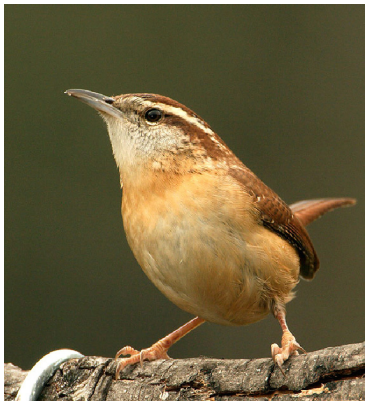
This page is available in FULL COLOR on the project Web site: http://florida4h.org/projects/bluebirds/resources.

Common Cavity-Nesting Birds

Brown-headed Nuthatch
Sitta pusilla

Order: *PASSERIFORMES*
Family: *SITTIDAE*

- **Nest in Florida:** yes
- **Length:** 10.0—11.0 cm
- **Mass:** 10.0 g
- **Diet:** Eats mainly insects during warmer months, and pine seeds during colder months.
- **Habitats:** Prefers pine woodlands.
- **Behavior:** May climb upward or downward on trunks. Very occasionally seen on ground.
- **Nest:** Usually excavates nest cavity, but sometimes uses existing cavity of nuthatches or woodpeckers, as well as artificial nest box. May begin multiple cavities before choosing one for nesting.
- **Fledge:** Nestlings fledge at 18—19 days.
- **Did You Know:** The Brown-headed Nuthatch is the smallest hole-nester in Florida.



Carolina Wren
Thryothorus ludovicianus

Order *PASSERIFORMES*
Family *TROGLODYTIDAE*

- **Nest in Florida:** yes
- **Length:** 12.0—14.0 cm
- **Mass:** 18.0—22.0 g
- **Diet:** Eats mainly insects and spiders.
- **Habitats:** Prefers woodlands with thick under bush.
- **Behavior:** Runs, hops, and flits about on or near ground.
- **Nest:** The males build various nests on their territory and the females make the final choice of nest site.
- **Fledge:** Nestlings fledge at 12—14 days.
- **Did You Know:** The Carolina Wren is one of the few types of wren that seems to have a monogamous relationship rather than a polygamous one.

This page is available in FULL COLOR on the project Web site: http://florida4h.org/projects/bluebirds/resources.

Common Cavity-Nesting Birds

Purple Martin
Progne subis

Order: *PASSERIFORMES*
Family: *HIRUNDINIDAE*

- **Nest in Florida:** yes
- **Length:** 19—20 cm
- **Mass:** 45—60 g
- **Diet:** Eats flying insects at all times of year.
- **Habitats:** Preferred habitat open fields, yards, and golf courses.
- **Behavior:** When on ground, walks exclusively.
- **Nest:** Both sexes visit multiple nest cavities before confining activity to one.
- **Fledge:** Nestlings fledge at 28—29 days.
- **Did You Know:** There has been a long and close association between people and the Purple Martin, a relationship that distinguishes this bird from nearly all others on the North American continent. Extremely popular and well known to much of the public, this species in eastern North America now breeds almost entirely in backyard bird houses.

Tufted Titmouse
Baeolophus bicolor

Order: *PASSERIFORMES*
Family: *PARIDAE*

- **Nest in Florida:** yes
- **Length:** 14—16 cm
- **Mass:** 18—26 g
- **Diet:** Eats assorted insect species and seeds.
- **Habitats:** Preferred habitat old growth woodlands.
- **Behavior:** Jump along branches and hop while on the ground. Often hang upside down from branches and thin twigs.
- **Nests:** Titmice do not like living in nest boxes. They prefer to reside in natural cavities that may either be holes abandoned by woodpeckers, or naturally occurring crevices in tree trunks.
- **Fledge:** Nestlings fledge at 17—18 days.
- **Did You Know:** In contrast to most species of titmice and chickadee, young tufted titmice often remain with their parents during the winter and then disperse later in their second year. Some yearling titmice even stay on their natal territory and help their parents to raise younger siblings.

This page is available in FULL COLOR on the project Web site: http://florida4h.org/projects/bluebirds/resources.

Common Cavity-Nesting Birds

Carolina Chickadee
Poecile carolinesis

Order: *PASSERIFORMES*
Family: *PARIDAE*

- **Nest in Florida:** yes
- **Length:** 10—12 cm
- **Mass:** 8—14 g
- **Diet:** In the winter the diet is about half plant, half animal. The rest of the year most of the diet is insects and spiders. Carolina Chickadees gather insects from foliage and tree bark, often while hanging upside down.
- **Habitats:** May be found in deciduous and mixed deciduous-coniferous woodlands, swamps, riparian areas, open woods and parks, and also in suburban and urban areas.
- **Behavior:** Usually in trees, not commonly on the ground. Hops along; rarely climbs.
- **Nest:** Both members of a pair excavate a cavity or choose a cavity or nest box. The female builds the nest base with moss and sometimes strips of bark. Then she adds a thick lining of hair and/or plant fibers.
- **Fledge:** Nestlings fledge at about 16-19 days.
- **Did You Know:** Carolina Chickadees can sing their own name: *chick a dee-dee-dee.*

Hairy Woodpecker
Picoides villosus

Order *PICIFORMES*
Family *PICIDAE*

- **Nest in Florida:** yes
- **Length:** 18— 26 cm
- **Mass:** 40— 95 g
- **Diet:** Eats mostly insects, with a preference for ones found in wood or bark. Will also eat bees, wasps, caterpillars, and rarely cockroaches.
- **Habitats:** Are found in forests across the continent. They also inhabit woodlots, suburbs, parks, and open woodlands.
- **Behavior:** Climb up tree trunks and along main branches. They will feed at the bases of trees and along fallen logs.
- **Nest:** Nests are often excavated in dead stub of a living tree, especially trees with heartrot, or in a dead tree. The cavity is often in a branch or stub that is not completely vertical, so that the entrance hole is on the underside.
- **Fledge:** Most nestlings fledge at about 28—30 days of age.
- **Did You Know:** Hairy Woodpeckers will sometimes drink tree sap leaking from wells made by sapsuckers. They have also been seen pecking into sugar cane to drink the sugary juice.

This page is available in FULL COLOR on the project Web site: http://florida4h.org/projects/bluebirds/resources.

Common Cavity-Nesting Birds

Great Crested Flycatcher
Myiarchus crinitus

Order: *PASSERIFORMES*
Family: *TYRANNIDAE*

- **Nest in Florida:** yes
- **Length:** 17—21 cm
- **Mass:** 27—40 g
- **Diet:** Insects, other invertebrates, some small fruits.
- **Habitats:** Breeds in open deciduous woodlands, old orchards, riparian corridors, wooded swamps, parks, cemeteries, and urban areas with large shade trees. Winters in humid forests and second growth.
- **Behavior:** Spends little time on ground. Even if unsuccessful in catching prey on ground, usually flies back to perch rather than hopping or walking along ground.
- **Nest:** Both sexes inspect prospective nest sites, but female does most if not all nest-building. Trips to the nest are more frequent in the early morning and late evening. Finer items, like feathers, are added to the nest during egg laying, incubation, and brooding of the young.
- **Fledge:** Nestlings fledge at 13—15 days.
- **Did You Know:** The Great Crested Flycatcher is the only cavity-nesting flycatcher of eastern North America.

House Sparrow
Passer domesticus

Order *PASSERIFORMES*
Family *TROGLODYTIDAE*

- **Nest in Florida:** yes
- **Length:** 15—17 cm
- **Mass:** 27—29 g
- **Diet:** Eats mostly grains, wild and domestic; weed seeds; insects and other arthropods during breeding season.
- **Habitats:** Preferred breeding habitat associated with are human modified environments, such as farms, residential and urban areas. They are absent from extensive woodlands, forests, grasslands, deserts.
- **Behavior:** The usual mode of terrestrial locomotion is hopping. Walking rarely observed and then in old individuals.
- **Nest:** Males may begin nest-site sitting displays in the fall at winter roosting site, which may be used for nesting the following spring. Females prefer hole-type nests over tree nests.
- **Fledge:** Nestlings fledge at about 14 days.
- **Did You Know:** The House Sparrow population in the U.S. began with 100 sparrows, purchased for a sum of $200 dollars in England, 1851.

This page is available in FULL COLOR on the project Web site: http://florida4h.org/projects/bluebirds/resources.

Resources for Individual & Group Projects

The following resources have been compiled for your convenience when assisting youth with their Bluebirds and Other Cavity-Nesting Birds project. A number of the resources listed are specific to Florida. However, you can ask your youth to compile their own list of local aviaries and zoos within your area.

FIELD GUIDES

A field guide is a book created to help the user identify certain parts of nature such as wildlife (plants or animals) or other objects that naturally occur (minerals). It is generally designed to be brought into the 'field' or local area where such objects exist to help distinguish between similar objects. Typically, these books include descriptions of the various objects, paintings or photographs, and an index.

A Guide to Field Identification: Birds of North America
By: Robbins, Bruun, and Zim,
ISBN: 1-58238-091-0 (hc)
ISBN: 1-58238-090-2 (pbk)

National Geographic Field Guide to the Birds of North America
ISBN 0-7922-5314-0

The Sibley Field Guide to Birds of Eastern North America
Written and illustrated by: David Allen Sibley
ISBN 0-679-45120-X

WEB SITES

Cornell Lab of Ornithology
http://www.birds.cornell.edu, www.allaboutbirds.org
The Cornell Lab of Ornithology Web site contains many tools for learning about birds as well as current research being done throughout North America.

Sialis
http://www.sialis.org/index.html
This Web site was developed as a resource for people interested in helping bluebirds (like the Eastern Bluebird - *Sialia sialis*) and other native cavity-nesters survive and thrive.

Department of Wildlife Ecology and Conservation
http://www.wec.ufl.edu/extension
This Web site contains a variety of tools and information regarding the conservation of wildlife. In particular, the “Landscaping for Wildlife” section is most useful.

What Bird
http://www.whatbird.com
This Web site contains a broad set of tools that can aid in identifying over 880 birds in North America. Here are some of the interactive activities this Web site offers:
- Interactive game: ***Avian Sleuth***
- Online search engine to identify birds
- Learn to identify birds by song
- Glossary of bird terms

PRINT RESOURCES

Berger, Cynthia, Keith Kridler, and Jack Griggs. 2001. ***The Bluebird Monitor’s Guide to Bluebirds and Other Small Cavity-Nesters.*** New York: HarperCollins Publishers, Inc.

**This is an excellent book to add to your library because of its complete coverage of Bluebird Monitoring.*

Scriven, D. H. 1999. ***Bluebird Trails: A Guide to Success 3rd Edition.*** Minneapolis: Bluebird Recovery Program.

Stokes, Donald W., and Lillian Q. Stokes. 1991. ***Bluebird Book The Complete Guide To Attracting Bluebirds.*** Boston: Little, Brown, and Company.

Stokes, Donald W., and Lillian Q. Stokes. 1999. ***Bluebird Basics Getting Started With Bluebirds.*** [Video]

Toops, Connie, 1994. ***Bluebirds Forever.*** Stillwater, MN: Voyageur Press.

Zeleny, Lawrence. 1978. ***The Bluebird: How You Can Help Its Fight for Survival.*** Bloomington: Indiana University Press.

Zickefoose, Julie. 1993. **Enjoying Bluebirds More.** [Pamphlet] Bird Watcher’s Digest, Marietta, OH.

ONLINE PRINT RESOURCES

Cavity-Nesting Birds of North American Forests
http://www.na.fs.fed.us/spfo/pubs/wildlife/nesting_birds/
Forest Service; U.S. Department of Agriculture
Agriculture Handbook No. 511
November 1977

Helping Cavity-nesters in Florida
http://edis.ifas.ufl.edu/UW058
By: Joe Schaefer, Urban Wildlife Extension Specialist, Wildlife and Range Sciences Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL 32611-0304.

COMMUNITY & RESEARCH ORGANIZATIONS

Cornell Lab of Ornithology:
159 Sapsucker Woods Rd.
Ithaca, NY 14850

Phone: Toll free: 1-800-843-BIRD (1-800-843-2473)
Email: cornellbirds@cornell.edu
Web Address: http://.birds.cornell.edu/

Ornithological Society of North America:
Ornithological Society of North America (OSNA) is the combined effort of a number of ornithological societies. Its main purpose is to combine the individual efforts of these societies and produce a print and online version of their ornithological newsletter, *The Flock*.

5400 Bosque Blvd.
Suite 680
Waco, TX 76710

Phone: 1-254-399-9636
E-mail: business@osnabirds.org
Web Address: http://www.osnabirds.org/

North American Bluebird Society
The North American Bluebird Society is a non-profit education, conservation and research organization that promotes the recovery of bluebirds and other native cavity-nesting bird species in North America.

PO Box 43
Miamiville, OH 45147

Phone: 1-812-988-1876
E-mail: info@nabluebirdsociety.org
Web Address: http://www.nabluebirdsociety.org/

Aviary and Caged Bird Society of South Florida
The Aviary and Caged Bird Society of South Florida offers its membership information and education concerning the care and breeding of avian species. It promotes the science of Aviculture, while trying to ensure the preservation of cage birds in the United States.

Flamingo Gardens
3750 Flamingo Road
Davie, FL 33330

Web Address: http://www.feathers.org

FLORIDA ZOOS AND AVIARY FACILITIES

Aviary Zoo of Naples - Naples, FL
http://www.aviaryofnaples.com/

Brevard Zoo - Melbourne, FL
http://www.brevardzoo.org/

Busch Gardens - Tampa, FL
http://www.buschgardens.com/BGT/default.aspx

Gatorland - Orlando, FL
http://www.gatorland.com

Jacksonville Zoo and Gardens - Jacksonville, FL
http://www.jaxzoo.org/

Lowry Park Zoo - Tampa, FL
http://www.lowryparkzoo.com/

Miami Metrozoo - Miami, FL
http://www.miamimetrozoo.com/

Palm Beach Zoo at Dreher Park - West Palm Beach, FL
http://www.palmbeachzoo.org/

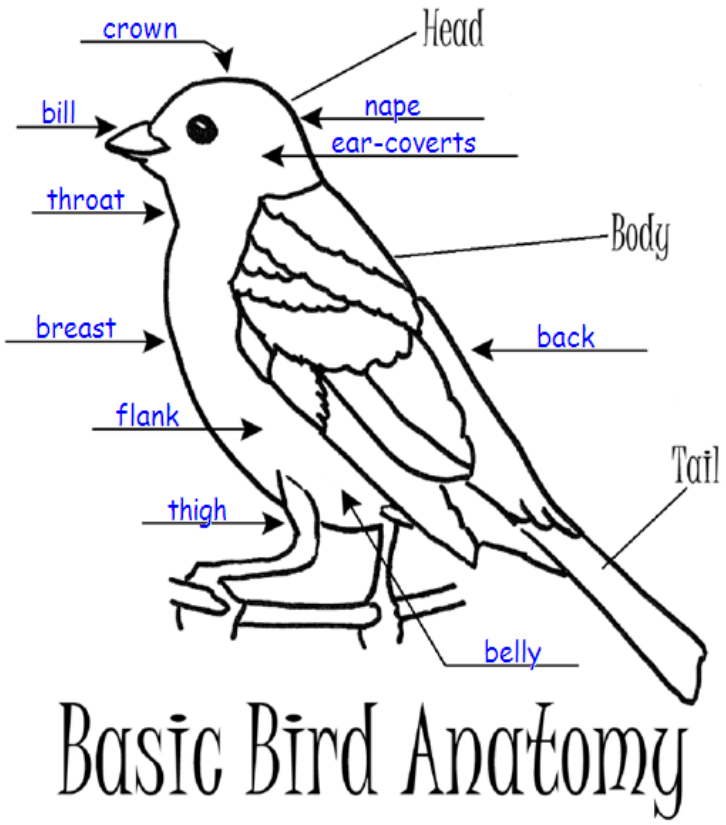
Santa Fe College Teaching Zoo - Gainesville, FL
http://inst.santafe.cc.fl.us/~zoo/

Sea World - Orlando, FL
http://www.4adventure.com/SWF/default.aspx

INDIVIDUAL PROJECT BOOK ACTIVITY ANSWERS

Lesson 1: Youth Project Book, pg. 7
Basic Bird Anatomy

A. **Back:** the area on each side of the backbone
B. **Belly:** contains the stomach, intestines, and other vital organs
C. **Bill:** the beak or mouth
D. **Breast:** the chest of the bird
E. **Crown:** the top part of the head
F. **Ear-coverts:** the small feathers that cover the area of the ear (sometimes distinctively colored)
G. **Flank:** each side of the body of a bird between the last rib and the hip, found above the thigh
H. **Nape:** the back part of the neck
I. **Thigh:** the top of the leg, between the knee and the hip
J. **Throat:** the front part of the neck; area from the end of the bill to the start of the chest



Lesson 1: Youth Project Book, pg. 8
Bluebird Color Differences

	Eastern	Western	Mountain
Back	Dark Blue	Dark Blue	Teal Blue
Belly	White	White	White
Breast	Orange	Orange	Light Blue
Head	Dark Blue	Dark Blue	Teal Blue
Wings	Blue	Blue	Blue
Throat	Orange	Blue	Teal Blue

Western

Mountain

Eastern

The images on this page are available in FULL COLOR on the project Web site: http://florida4h.org/projects/bluebirds/resources.

Lesson 3: Youth Project Book, pg. 18
Research Using Web sites

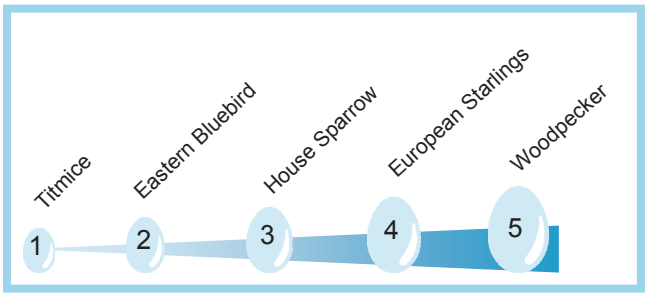
.gov — Web site maintained by a **government** entity, includes information about local/state offices and services, politics and citizenship, government statistics, etc.

.edu — Indicates that information is connected to an **educational** institution, such as a college or university, often times you can find research that the institution has performed, and fact sheets for the public on a wide range of topics.

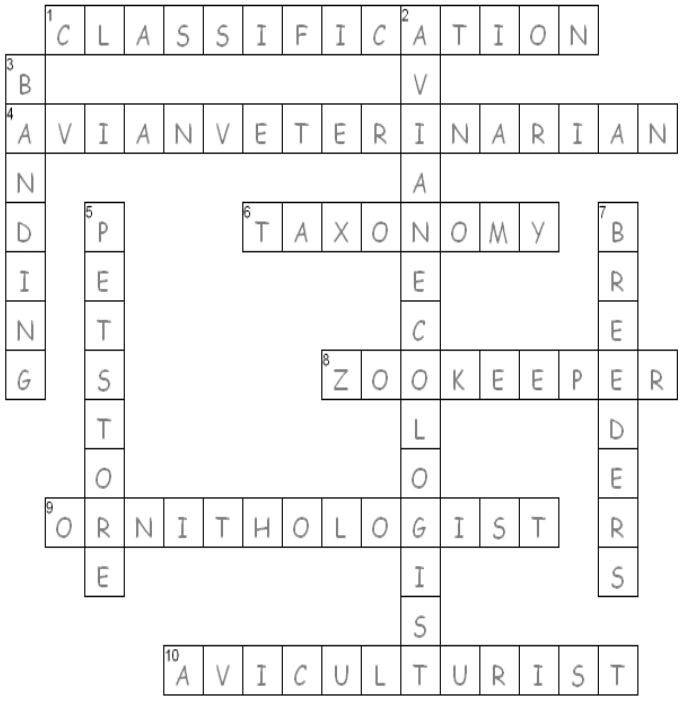
.org — This type of Web site is maintained by a specific **organization**, information is mostly credible, but may be presented in a way that supports the agencies missions or beliefs.

.com — **Commercial** Web site which contains a combination of facts and opinions and may not come from credible, scientific sources, often times these sites may be promoting products or services they sell.

Lesson 7: Youth Project Book, pg. 40
Differences in Egg Sizes



Lesson 9: Egg-cellent Job!
Word Puzzle: Youth Project Book, pg. 51

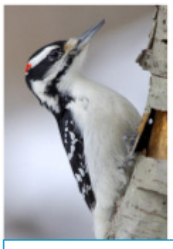


GROUP PROJECT BOOK ACTIVITY ANSWERS

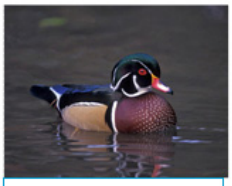
Lesson 1, Skill Station 1: Leader's Guide, pg.
(see diagram page 4 of the Leader's Guide)

Lesson 1, Skill Station 2: Leader's Guide, pg.
(see images on page 4 of the Leader's Guide)

Lesson 1, Skill Station 3, Step 1: Leader's Guide, pg.


Hairy Woodpecker


House Sparrow


Wood Duck


European Starling

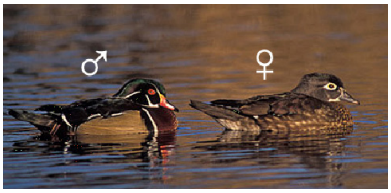

Eastern Bluebird

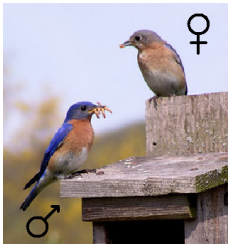

Tufted Titmouse

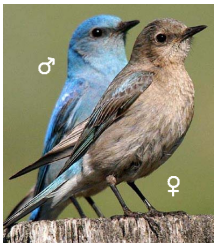
This page is available in FULL COLOR on the project Web site:
http://florida4h.org/projects/bluebirds/resources.

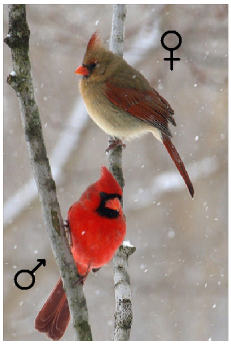
Lesson 1, Skill Station 3, Step 2: Leader's Guide, pg.
Skill Station 3 Step 2, Male versus Female

Male - ♂ Female - ♀



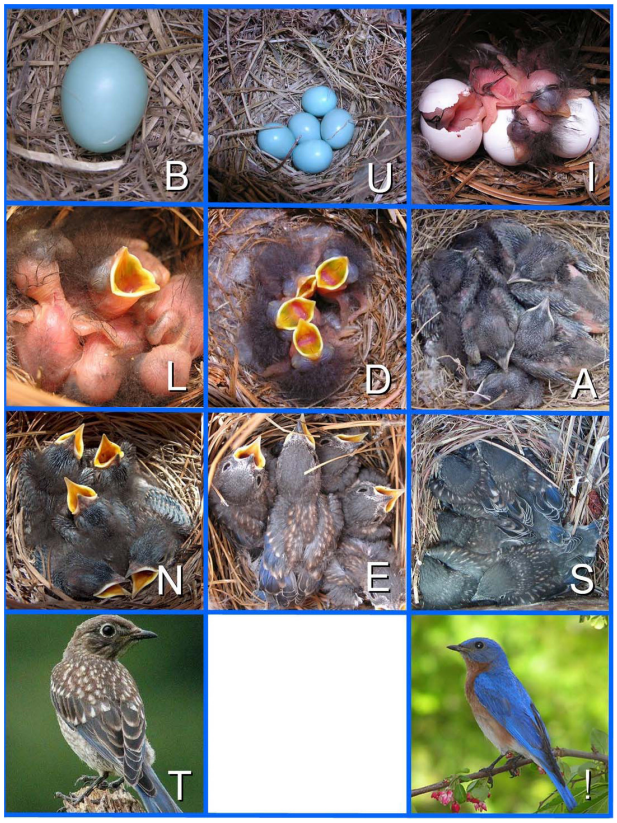






Lesson 7: Leader's Guide, pg.
From Egg to Adult

When properly arranged, the cards spell out "Build A Nest"



Lesson 7: Leader's Guide, pg.
From Birds and their Eggs

A 2 D 4

B 1 E 3

C 5 F 6

Avian Glossary

Aves (n) - the Latin word for "bird," and also the name of the class of animals that have wings and feathers, are warm-blooded, and lay eggs.

Avian (adj) - of, relating to, or derived from birds.

Avian Ecologist (n) - a professional who examines the interrelationship between birds and their environments.

Avian Veterinarian (n) - a professional which studied specifically to treat the medical needs of birds.

Aviculturist (n) - a general term for one who cares for and raises birds.

Adopter (n) - one of two distinct types of cavity-nesting birds; adopters use old, abandoned nesting cavities, such as a tree that has died, fallen down, or broken in half for their nest; unlike excavators, they do not carve out their own cavities.

Back (n) - the area of a bird's body on each side of the backbone.

Banding (v) - the act of attaching small individually numbered, metal or plastic rings to a bird's leg or wing in order to aid in the study of birds in the wild.

Belly (n) - the body part that contains the stomach, intestines, and other organs.

Bill (n) - the beak or mouth.

Bluebird Trail (n) - consists of five or more bluebird houses in the same locale.

Breast (n) - the chest of the bird.

Breeder (n) - people who raise a specific breed of bird, in keeping with the accepted standards for the breed.

Brood (n) - the young of an animal cared for at one time; **(v) -** to sit on (eggs).

Brood patch (n) - a bare patch of skin on the belly region of a bird, where downy feathers either fall out or are plucked out, by the female just before she begins incubating; becomes engorged with blood vessels during breeding season, and works like a hot water bottle to transfer heat from the parent's body to the eggs.

Camouflage (n) - attributes, such as coloring, that helps hide an animal; **(v)** the act of hiding from predators.

Carrion (n) - the dead and rotting body of an animal.

Conical Guard (n) - this guard uses a circular piece of galvanized sheet metal, placed around the pole beneath the box.

Crown (n) - the top part of a bird's head.

Ear-coverts (n) - the small feathers that cover the area of the ear, sometimes distinctively coloured, which aids in identifying the bird species.

Environment (n) - the air, water, minerals, organisms, and all other external factors surrounding and affecting a given organism at any time.

Excavator (n) - one of two distinct types of cavity-nesting birds; creates its own cavity (hole) with its beak and then lines its nest with the resulting woodchips.

Extinction (n) - the coming to an end, or dying out, of a species.

Flank (n) - each side of the body of an animal, between the last rib and the hip.

Fledge (v) - to acquire the feathers necessary for flight; when a baby bird first leaves the nest.

Fledglings (n) - a young bird that has recently acquired its flight feathers.

Habitat (n) - the natural environment of an organism; place that is natural for the life of an organism.

Incubation (n) - the act of maintaining favorable temperature and other conditions that promote development.

Migrate (v) - to change location periodically, especially by moving seasonally from one region to another.

Monitor (v) - a term used to describe careful and repeated observation. Scientists monitor animals in their natural habitats to collect research about their lifestyles and behaviors.

Nape (n) - the back part of the neck.

Noel Predator Guard (n) - the Noel guard is a rectangular tube of hardware cloth stapled to the front of the nest box.

Ornithologist (n) - a professional scientist who studies the lives and behaviors of birds.

Plumage (n) - the entire feathery covering of a bird.

Predator (n) - an organism that lives by capturing and eating other organisms.

Predator Baffle (n) - a predator baffle is the most complex but most effective type of guard. It is made of stove or PVC pipe that encircles the pole where the box is located.

Resources (n) - the air, water, minerals, organisms, and all other external factors needed for an organisms survival.

Scientific Classification (n) - organizing or arranging things by class or category.

Secondary Cavity-Nesting Bird (n) - a bird that use the cavities hollowed out by other birds to build their nests and raise their young; also known as *adopters*.

Species (n) - regarded as the basic category of biological classification, composed of individuals that resemble one another and are able to breed amongst themselves, but not able to breed with members of another species.

Suet (n) - beef or mutton fat used in cooking, or processed to yield tallow.

Tallow (n) - hard-processed animal fat used for making soap, cooking, and preparing bird food. It was once used to make candles.

Taxonomy (n) - the scientific method for naming organisms.

Thigh (n) - the top of the leg between the knee and the hip.

Throat (n) - the front part of the neck; the part of the airway and digestive tract between the mouth and both the esophagus and the windpipe.

Transcontinental Bluebird Trail (n) - a bluebird trail that extends through the United States created by thousands of people who monitor bluebird houses.

Vertebrates (n) - members of the subphylum Vertebrata, a primary division of the phylum Chordata that includes the fishes, amphibians, reptiles, birds, and mammals, all of which are characterized by a segmented spinal column and a distinct well-differentiated head.

Photograph and Illustration Credits

Florida 4-H would like to express great appreciation to each of the following photographers who have allowed the use of their images within this document to promote increased knowledge of cavity-nesting birds among today's youth.

Melinda Applegate: San Diego Aviary's observation tower (p.6)

Steve Baranoff (www.birdsbybaranoff.com): Eastern Bluebird (pp. 4 and 32); Eastern Bluebird (pp. 16 and 33); European Starling (pp. 16, 25, and 33); Carolina Wren (p. 26)

Michael Brown: Purple Martin (p. 27)

Chuck Carmack: Eastern Bluebird (p. 36)

R. Corado, Western Foundation of Vertebrate Zoology: Prothonotary Warbler nest (p. 10); Eggs and nests of Brown-headed Nuthatch, Carolina Chickadee, Carolina Wren, European Starling, Great Crested Flycatcher, House Sparrow, Prothonotary Warbler, Purple Martin, Tree Swallow, and Tufted Titmouse (pp. 25-29)

Barbara Dunn: Eastern Bluebird pair (pp. 17 and 34)

Pat Hemlepp: Eastern Bluebird (cover)

Dave Johnson: Western Bluebird (pp. 4 and 32)

Jessica Kochert: Birdhouse dimension diagrams (pp. 18 and 19)

Lincolnshire Wildlife Trust: House Sparrow pair (pp. 17 and 34)

Lori Larson: Northern Cardinal pair*** (pp. 17 and 34)

Clifford W. Lamere: Hairy Woodpecker on log feeder (p. 10)

Jim McCulloch: Great Crested Flycatcher (p. 29)

North American Bluebird Society: Baffle guard, conical guard, and Noel guard (p. 8)

Trish Overton: Carolina Chickadee (cover and p. 28); Tufted Titmouse (pp. cover, 16, 27, and 33)

Brian Pearson: House Sparrow (p. 16, 29, and 33)

George K. Peck: Hairy Woodpecker eggs and cavity (p. 28)

Paynes Prairie: Prairie flowers (p. 5); Observation tower (p. 6)

Loretta Rodriguez: Bluebird sketch (pp. 4, 14, 15 and 32)

Scott Schaub: Red-bellied Woodpecker (cover)

Brian E. Small: Brown-headed Nuthatch (p. 26)

B.L Sullivan: Prothonotary Warbler (p. 25)

Gerrit Vyn: Hairy Woodpecker (pp. 16, 28 and 33); Wood Duck (pp. 16 and 33); Wood Duck pair (pp. 17 and 34)

Worldpress.com: Painted Bunting pair*** (pp. 17 and 34)

Yasutomo: Bluebird origami instructions (p. 38)

Mike Yip: Mountain Bluebird (pp. 4 and 32); Mountain Bluebird pair (pp. 17 and 34)

Bet Zimmerman and Wendell Long (www.sialis.org): Bluebird development (pp. 20 and 34); Cavity-nesting birds with corresponding eggs and nests (p. 21)

****Note** - though Northern Cardinals and Painted Buntings are NOT cavity-nesting birds, they have been included in this activity because of their distinct differences between the male and female*

References

Hendricks, P. A. (1996). *Developing youth curriculum using the targeting life skills model.* A publication of Iowa State University Extension (4H-137A). Ames, Iowa: Iowa State University.

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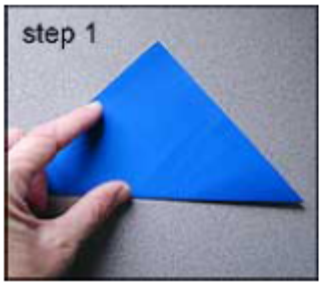
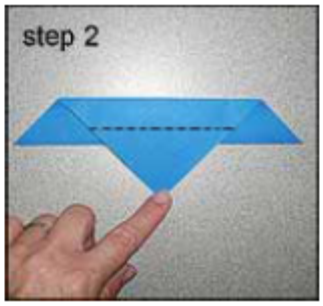
Just For Fun...

Origami Bluebird

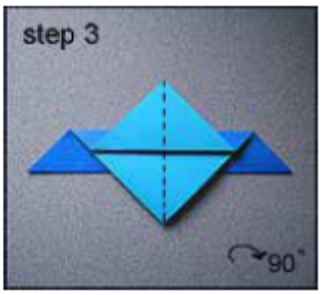
You will need a sheet of 5 7/8" or larger double sided origami paper.



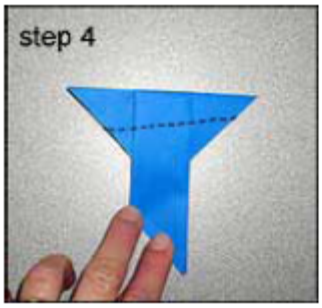
Fold in half diagonally then fold top section about two thirds of the way down.



Valley fold top layer only up to form two equal triangles.



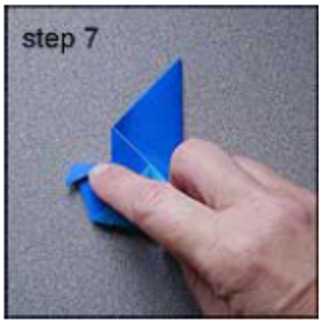
Valley fold unit in half along dashed line. Turn unit 90 degrees going to the right.



Valley fold top layer up along dashed line.

Mountain fold bottom layer back to align with top layer.

The wings should line up with each other.



Fold down a little corner at the head area then unfold. Make the top of the head a valley fold and push down to create the beak.

Fold the wing down at top of the body edge as shown in illustration. Turn the unit over and repeat on the other side.

Your bluebird is now complete!

The 4-H Motto

To make the best better.

The 4-H Pledge

I pledge

my head to clearer thinking,

my heart to greater loyalty,

my hands to larger service, and

my health to better living,

for my club, my community,

my country and my world.

Visit the 4-H Web site for more information: http://www.florida4h.org

Special thanks to Christina Packard, a 10-year alumni of Florida's Sarasota County 4-H. She created Christy's Bluebird Project, used in Sarasota and Manatee Counties, after learning about bluebirds. Christy learned that bluebird monitors across the United States wanted to get youth involved. Thanks to Christina for spearheading this project development and funding effort to engage 4-Hers across the country in bluebird education and monitoring.

The ***Bluebirds and Other Cavity Nesting Birds*** curriculum package was developed by Loretta Rodriguez, 4-H Project Assistant, Joy Jordan, 4-H Curriculum Specialist, and Mark E. Hostetler, Associate Professor and Wildlife Ecology and Conservation with the assistance of Christina Packard, 4-H Alumni and Jessica Kochert, Graphic Design, University of Florida, Institute of Food and Agricultural Sciences, Department of Family, Youth and Community Sciences. Thanks to Amy Duncan, 4-H Agent, Citrus County, for reviewing this project.

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