Eagle Scout Project Plan
Candidate: Kyle Nesslein
Revision date: 8/28/05

Bluebird Educational Kiosk and Bluebird Nesting Habitat for Fenton Park, MO.

Overview

The Bluebird is Missouri's official state bird. The purpose of this project is to create native bluebird nesting sites at Fenton Park, and educate the community on this particular species.

The project consists of:

- Designing and building an information kiosk to educate the Fenton community on bluebirds, their habitat, and the locations within Fenton Park for viewing nesting bluebirds
- Installing the kiosk along the main walking trail surrounding the park
- Building bluebird houses for each bluebird territory that can be supported within Fenton Park
- Installing the bluebird houses to establish new nesting sites

The project benefits Fenton Park by helping the park management team provide new nature experiences to the citizens of Fenton. The citizens of Fenton benefit from educational and viewing opportunities within their own community.

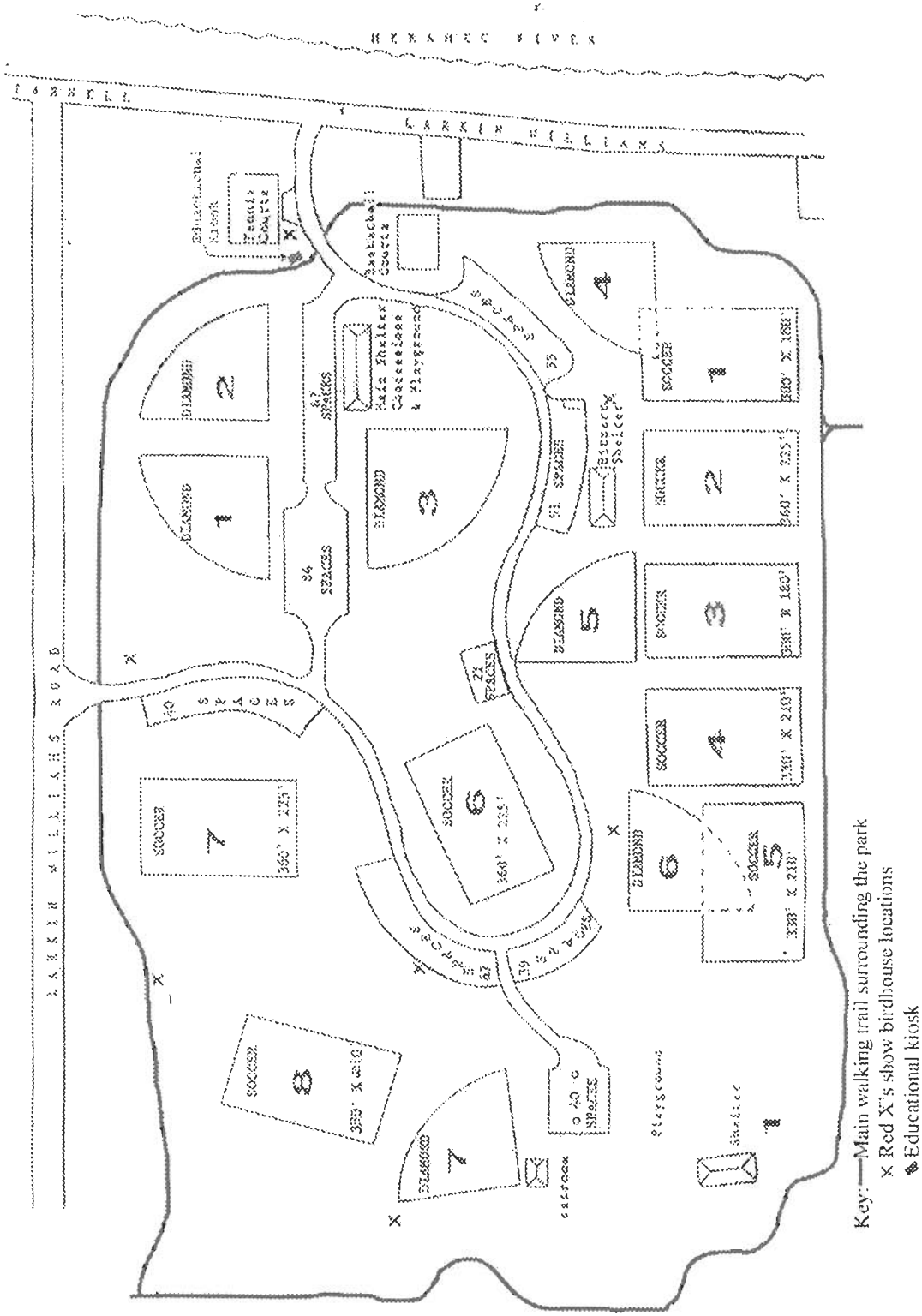
The educational kiosk conveys general information on the bluebird species, a discussion on nesting habitat food sources, maps of their range in North America, a map of the exact location of the bluebird houses in Fenton Park, tips for viewing and pictures to identify male and female bluebirds.

The birdhouses are specifically designed to house bluebirds, and will be mounted in the center of each of their habitat areas. They will be 12 ½ in. tall and 8 in. x 7 ¼ in. in the largest dimension. They will be mounted 4-5 ft. above the ground on suitable trees. The wood will be 1in. thick pine boards to promote durability and they will be stained and sealed to ensure longer life.

Project Team Members / Resources

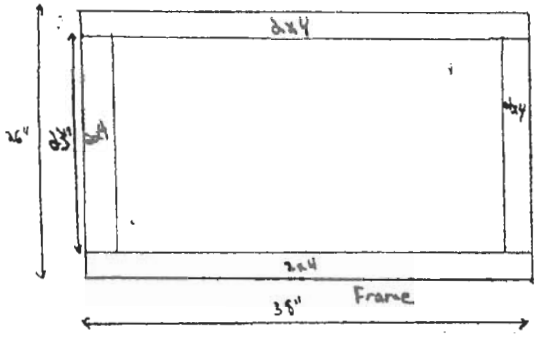
Team Member	Role	Responsibilities
Kyle Nesslein	Eagle Candidate / Project manager	• Develop concept • Secure sponsor • Develop project plan including design • Identify types of expertise required • Secure individual expert contributions work plans and cost estimates • Obtain approvals from sponsor, troop committee, and New Horizons Eagle Board • Execute project plan to successful completion.
Julie Miles	Project Sponsor	• Recreation Manager of Fenton
Cornell Lab of Ornithology	Expert source of data on Bluebird species	• Supply data for use on educational plaque
Dino Biondo	Construction expert	• Woodworking design • Power tool safety education
Dale's Signs	Plaque fabricator	• Expert in sign materials and construction, • Establish technical requirements for sign design

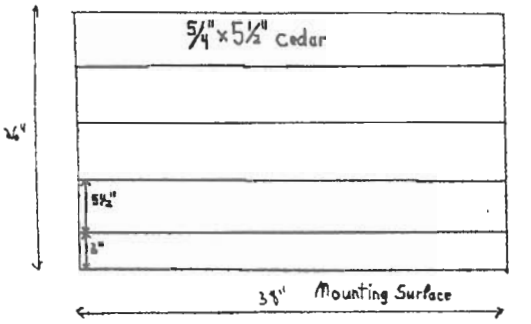
Bird House and Kiosk Locations

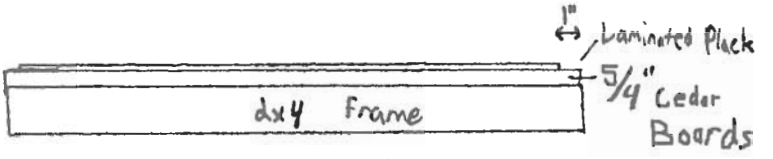


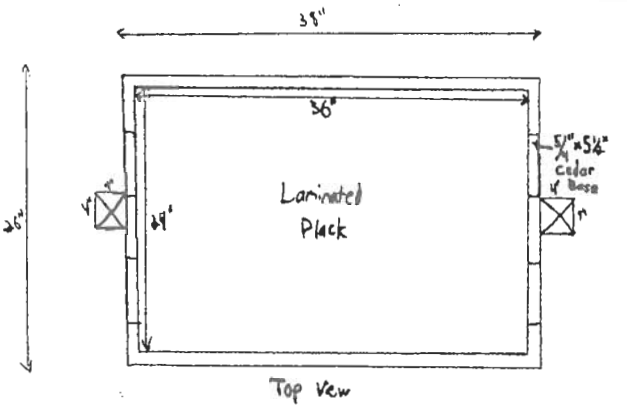
Educational Kiosk Frame Details

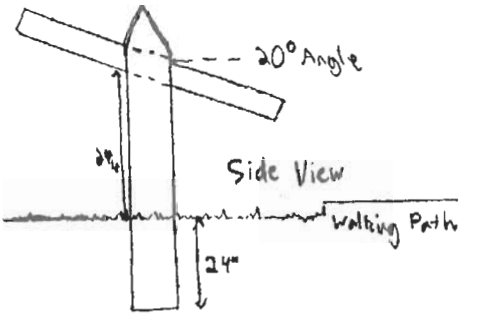
The kiosk frame will be constructed according to the following pictures:

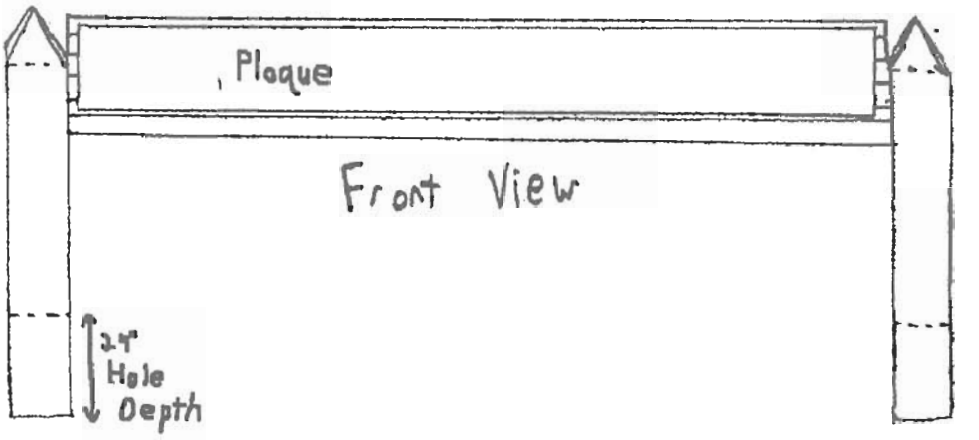




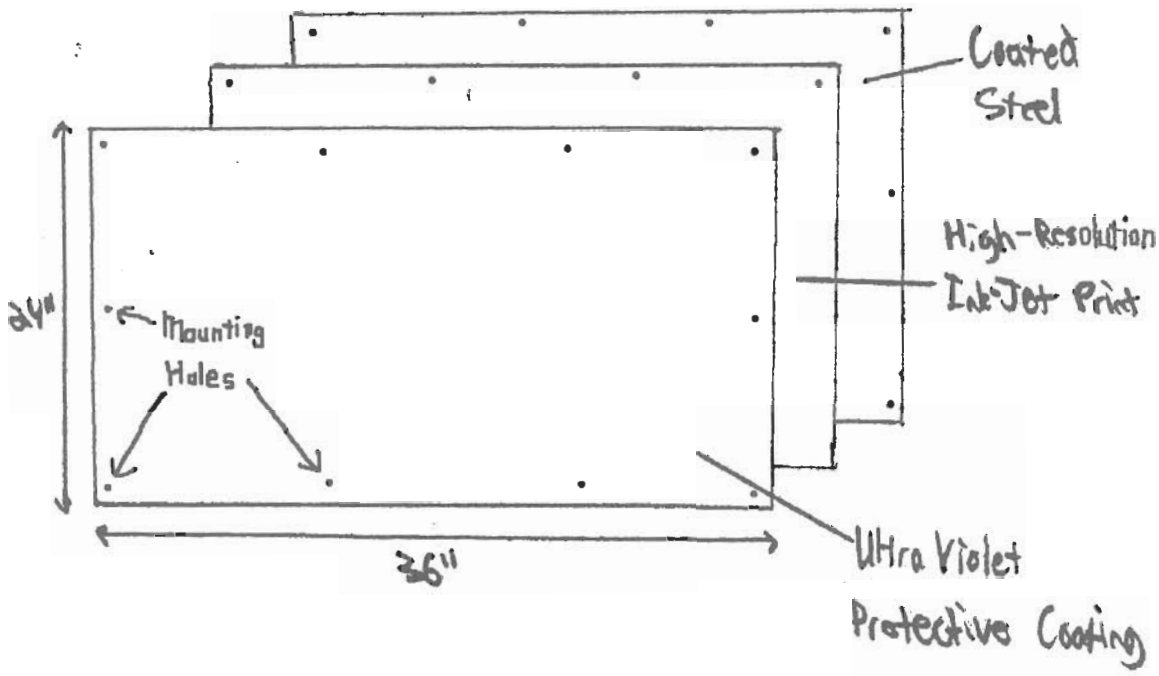








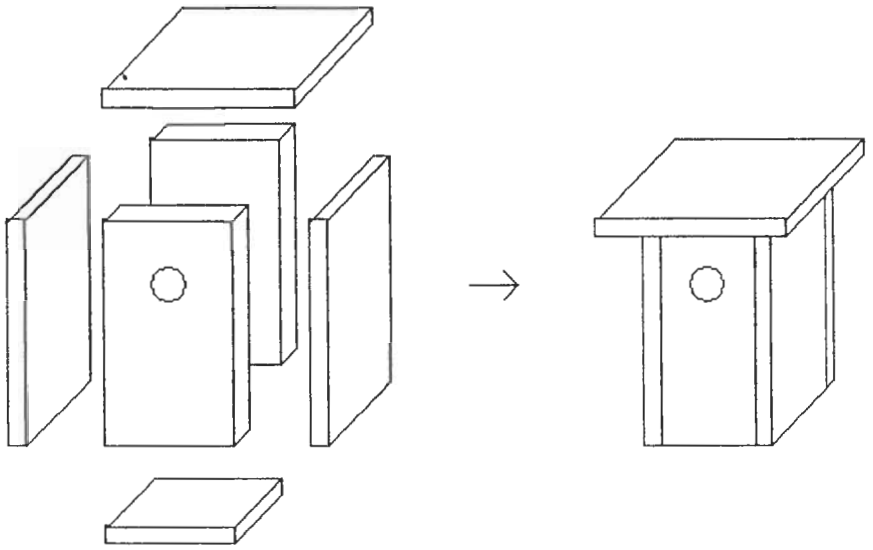
Plaque Lamination Detail



Bluebird House Details

I have selected well-designed plans specifically developed for bluebirds. The following illustrations show the design and construction methods.

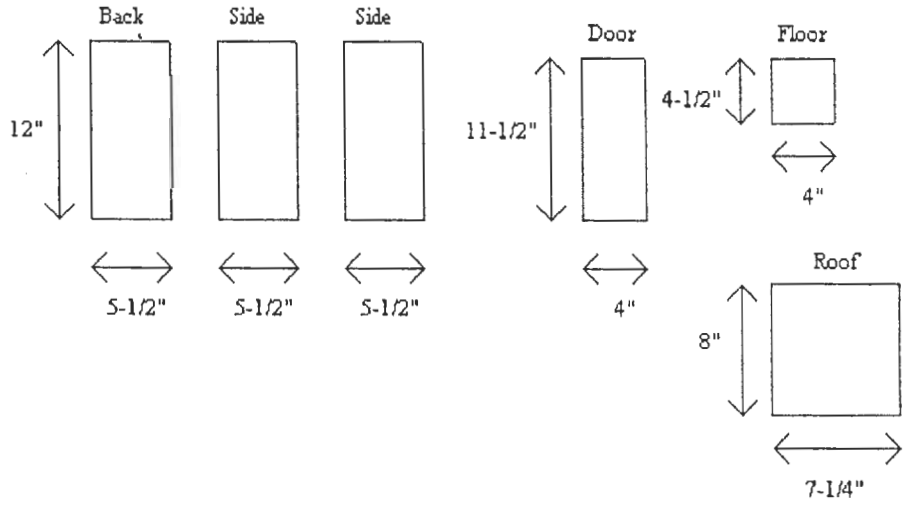
By Marshall Brain



The back is nailed to the two sides. The roof is nailed on top of the back and the two sides. The sides are nailed to the floor. The door is nailed to the two sides so it pivots from the top, and is held in place at the bottom by a latch nail.

Wood Dimensions and Cutting

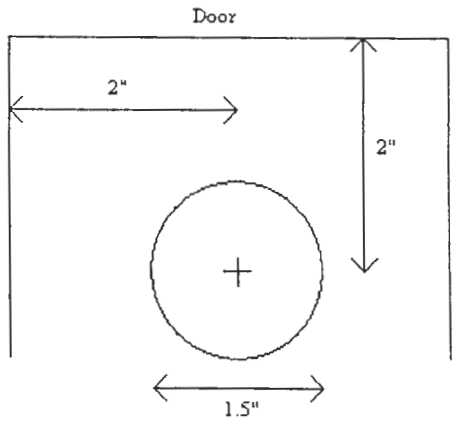
Each house will consist of a roof, a floor, a front door, a back and two sides. The two sides and the back are 12-inch long pieces of 1 x 6. The roof is an 8-inch long piece of 1 x 8. The door is an 11.5 inch piece of 1 x 6 ripped down to 4 inches wide. The floor is a 4.5-inch piece of 1 x 6 also ripped down to 4 inches wide. The exact dimensions of the six pieces are shown below:



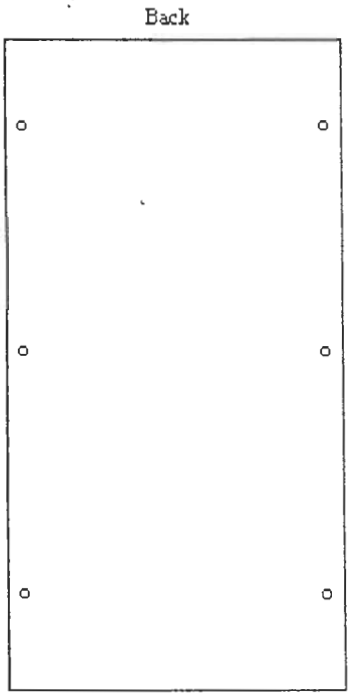
Note: A 1 x 6, despite the fact that it is called a 1 x 6, has a thickness of 3/4" and a width of 5-1/2". A 1 x 8 has a width of 7-1/4". Knowing this makes the dimensions shown above seem more sensible.

Using a table saw for accuracy and safety in cutting small pieces, cut the pine boards provided to the dimensions shown for each piece, for 7 birdhouses.

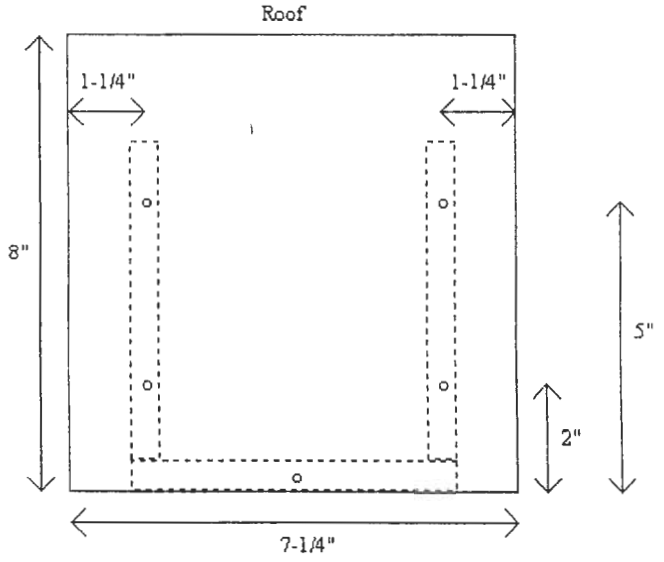
Now, using the drill press with a 1.5" drill bit, drill the entry hole in the door. Position it as shown below:



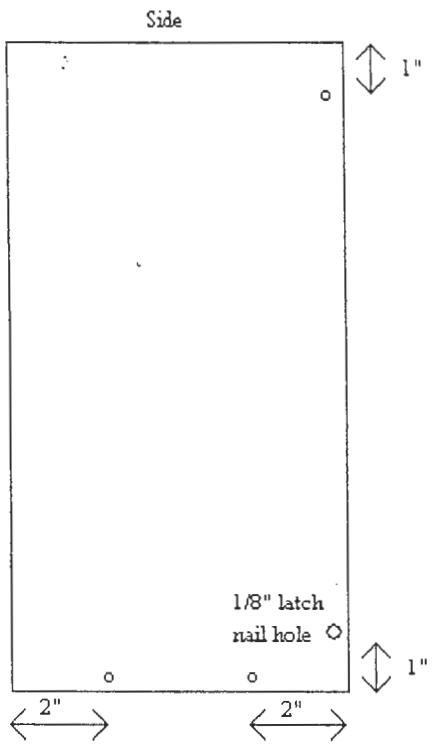
You now need to mark holes for the nails to make it easier to accurately nail the house together. Mark six holes in the back piece. The marks should be 3/8" in from the edge, and 2 inches from the top and bottom:



Mark 5 holes in the roof piece. In the picture below, the dotted lines represent where the side and back pieces will lie when the roof is in place. Mark the hole in the back center 3/8" away from the edge and centered.



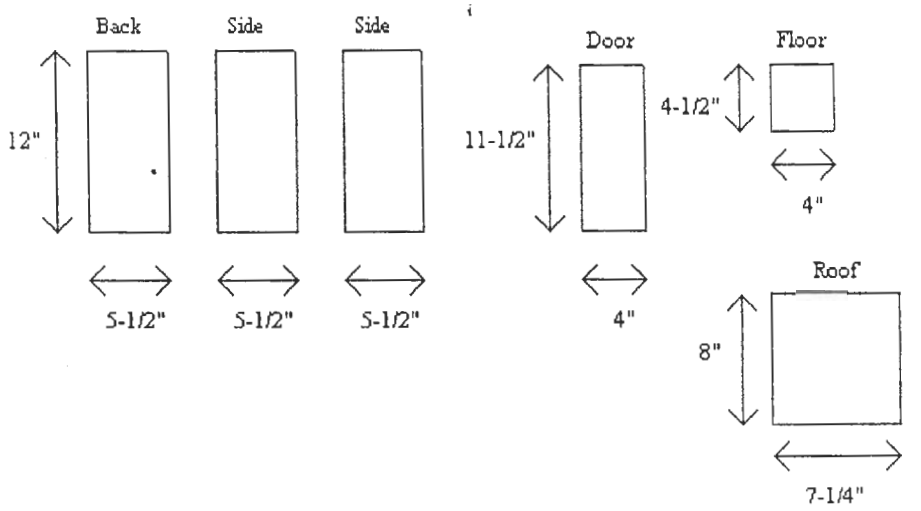
Mark 3 holes in each side piece. Two of the holes will hold the floor in place, while the third will hold the hinge nail for the door.



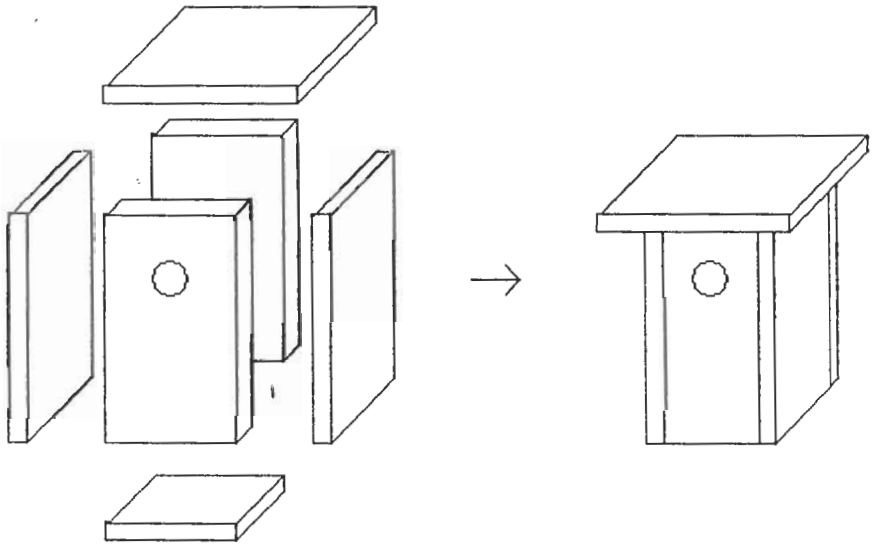
Finally, with your 1/8" (or better yet 3/32" if you have it) bit you need to drill a "latch hole" in the side pieces of the house. This birdhouse uses two "latch nails" to hold the door shut. You want to drill a hole through the side and into the door for this latch nail to go into. You want the hole to be big enough for the nail to be finger tight, but preferably not so big that the nail falls out when the house is tipped. It would be better, however, for the latch nail to be too loose than too tight.

Assembling the Bluebird Houses

You should have the following pieces for each birdhouse with the holes marked for the air-driven brad nailers:



The house is going to go together like this:

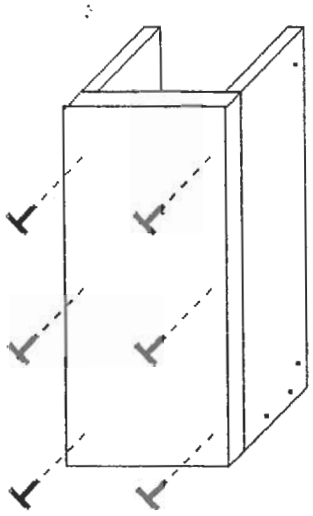


To build your birdhouse, take the following steps.

Note: The houses will be assembled with 166 brad nails using air-driven brad nailers.

Step 1: Attach the sides to the back

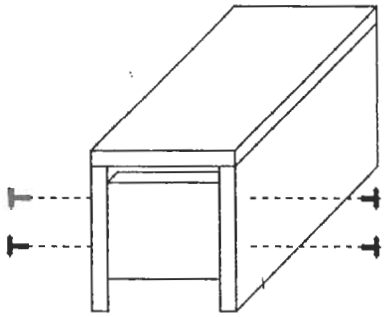
Nail the back to the two sides as shown below:



Note that the sides should be placed so the nail marks are facing in the directions shown.

Step 2: Attach the floor

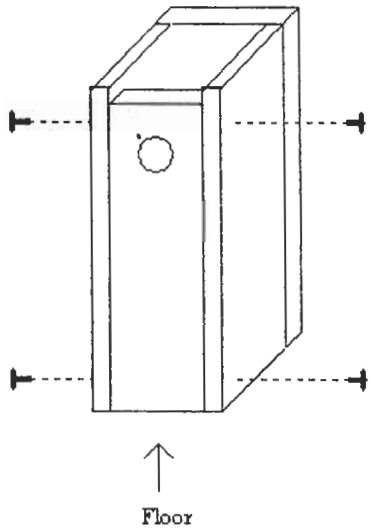
Attach the floor as shown below:



There should be a 3/8" gap between the edge of the floor and the back of the birdhouse. This gap will provide ventilation. The floor should be flush with the bottom of the house.

Step 3: Attach the door

The door swings out from the bottom, pivoting at the top, and uses latch nails to hold it in place. The nails at the top of the door act as the hinge. Instead of using the air-driven brad nailer, pre-drill the holes and use 2in. nails. Attach the door as shown below:

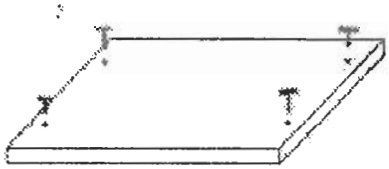


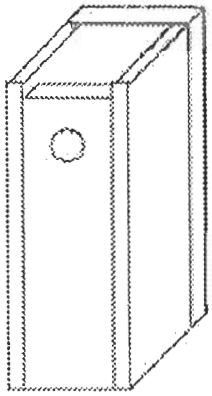
The door should be even with the bottom of the house, flush with the front of the house, and there should be a gap at the top of about 1/2". Insert one of the latch nails at the bottom with your fingers. DO NOT hammer the latch nail in. You want it to be loose so that you can remove it to clean the house. It should slide in smoothly and help hold the door in place. Now nail in the top two nails. Nail them almost tight, but leave a tiny amount of slack so that the hinge will have some freedom.

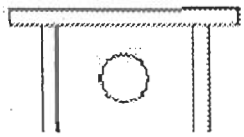
Remove the latch nail. The door should swing out smoothly on the hinge nails.

Step 4: Attach the roof

Attach the roof as shown below:







Roof Alignment

Floor

Step 5: Attach the eye-bolts

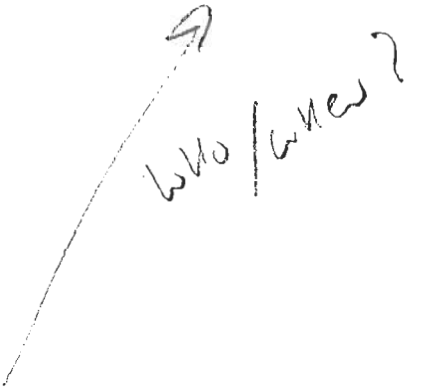
Mark a hole in the center of the side of the board, 2in. from the roof on each side, and drill the holes. Hand screw in the eye-bolts until the base is flush with the wood.

Supply List

Quantity	Item / Dimensions	Source	Cost
Bird Houses			
3x	1in. x 6in. x 10ft.	Lowe's	$21.51
1x	1in. x 8in. x 10ft.	Lowe's	$9.25
1x	15 Zinc Coated eye-bolts	Lowe's	$6.24
1x	1lb box of 2in nails	Lowe's	$6.50
1x	Box of 1000 Bostich 2" 16G Brads	Lowe's	$8.57
1x	Galvanized 20gauge wire	Lowe's	$6.24
Kiosk			
2x	4in. x 4in. x 8ft. cedar	Lowe's	$39.94
2x	2in. x 4in. x 8ft. cedar	Lowe's	$13.94
3x	5/4in. x 6in. x 8ft. cedar	Lowe's	$24.90
1x	1lb Box of screws	Lowe's	$6.50
1x	1gal Can of stain/ sealer	Lowe's	$15.97
4x	50lbs bags Concrete	Lowe's	$26.72
1x	Packet of 8 sheets of finish-grade Sandpaper	Lowe's	$8.50
1x	1lb box of Stainless Steel Mounting Screws	Lowe's	$17.50
4x	2" paintbrush	Lowe's	$14.00
Plaque			
1x	Kiosk Plaque	Dale's Signs	~$90
Total Material Cost			**~$316.28**
Tax: Tax ID Letter			**$0.00**
Estimated Donations – Lowe's 20%			**~$45.24**
Estimated Donations – Dale's Signs 10%			**~$9.00**
Total Cost:			**~$262.04**

Tool List

Item	Quantity
5gal Buckets	5
Air Compressors	2
Brad Nailer	2
Broom	2
Circular Saw	1
Compound Miter Saw	1
Cordless Power Drill	2
Drill Press	1
Earplugs	20 pairs
Finishing Grade Sandpaper	1 packet of 8 sheets
Grounded Extension Cords	5
Hammers	2
Level	1
Paintbrushes	4
Pencils	4
Pliers	4
Post Digger	2
Putty knife	1
Rake	1
Safety Glasses	8
Sanding Blocks	4
Saw Horses	2
Shovel	2
Table Saw	1
Tape measure	2
T-Square	2
Wire Cutters	4
Work Gloves	8 pairs



Safety Equipment on Hand / Safety Issues Evaluated

Address / Location of Closest Hospital
Cell Phone
Earplugs
First Aid Kit
Grounded Extension Cords & Outlets
Orange Safety Cones for Walkway
Safety Glasses
Team members with current Red Cross First Aid training certification
Water Supply
Well-Lighted Work Area

Project Workplace and Timeline

There are currently no bluebird houses at Fenton Park. We will build 7 bluebird houses and mount them on trees throughout the park to create Bluebird habitat. We will also build an educational kiosk pertaining to bluebirds and install it along the trail near the tennis courts.

Project Planning: Design and evaluate alternatives for educational plaque (Man-Hours: 2)

1. Discuss sign material selection to meet a 3-5yr lifespan
2. Identify fabrication work and materials to make sign according to expert recommendations (Dale's Signs)
3. Obtained estimated cost information and assumptions
4. Obtained computer file specification requirements
5. Obtained turn-around time for given assumptions

Plaque Design and Printing Production (Man Hours: 10)

1. Meet with printers to determine sign material specification and computer file requirements
2. Develop educational content
3. Design plaque layout in EPS file format
4. Print test
5. Review test output with project sponsor
6. Working with printer, finalize print file
7. Execute printing
8. Laminate image to steel backing
9. Laminate ultra-violet coating to plaque
10. Sign off on final finished plaque

Pre-workday Setup (Man-Hours: 6)

1. Get wood and concrete supplies from local hardware store.
2. Setup work area with the required saws and drills in a safe and effective layout.
3. Setup food and drink for workdays
4. Make copies of project plan as a training tool for work teams
5. Working with Mr. Biando, cut and assemble one complete birdhouse as part of the training tools for the scouts. Test saw setup for accuracy and safety

Day 1: Cut Birdhouse and Kiosk Pieces (Man-Hours: 24)

Team 1, Birdhouses: 4 scouts – 1 cutter, 1 stacker, 2 sanders
Team 2, Kiosk: 4 scouts – 1 cutter, 1 stacker, 2 sanders

Team 1: Work Steps

1. Distribute and discuss pages 6-13 with assembly team – answer all questions
2. Select piece to cut
3. Setup saw to cut sides
4. Cut 21 sides
5. Stacker removes cut pieces and stacks them in sanding area
6. Sanders smooth all edges, prepare for finishing and mark for assembly
7. Repeat steps 1-5 for floors, doors, and roofs.

Team 2: Work Steps

1. Distribute and discuss page 4 with assembly team – answer all questions
2. Select piece to cut
3. Setup compound miter saw to cut posts
4. Cut posts
5. Stacker removes cut pieces and stacks them in sanding area
6. Sanders smooth all edges, prepare for finishing and mark for assembly
7. Repeat steps 1-5 for the frame pieces, and the display board

Day 2: Assemble Bluebird Houses and kiosk (Man-Hours: 24)

Team 1, Birdhouses: 4 scouts – birdhouse assemblers
Team 2, Kiosk: 4 scouts – kiosk assemblers

Setup separate work areas for each team with the required tools and materials in a safe and effective layout near the stacked boards from day 1.

Team 1: Work Steps

1. Distribute and discuss pages 6-13 with assembly team – answer all questions
2. Sort and check each piece for the birdhouse
3. Assemble birdhouses in sequence according to pages 7-12
4. Check final assembly
5. Final cleaning and prep of birdhouses for staining
6. Stain birdhouses

Team2 : Work Steps

1. Distribute and discuss page 4 with assembly team – answer all questions
2. Sort and check each piece for the kiosk
3. Assemble kiosk frame in sequence according to page 4
4. Check final assembly
5. Final cleaning and prep of frame and posts for staining
6. Stain frame and posts
7. Mount plaque on the frame
8. Assemble posts to frame

Day 3: Install Bluebird Houses and kiosk on site (Man-Hours: 16)

Mount the bluebird house 4-5ft. above the ground on the trees using mounting wire. Install the kiosk with 24in. of the posts underground, supported by cement.

Team1: 4 scouts – Birdhouse installers
Team2: 4 scouts – Kiosk installers

Team1: Work Steps

1. Distribute maps of the park with birdhouse locations
2. Discuss effective mounting height and method of securing it to the tree
3. Assign each scout to 1-2 locations
4. Instruct each scout to take a picture of the birdhouses they mounted

Team2: Work Steps

1. Check installation site for safety, put orange safety cones on walkway
2. Layout work tools, equipment and assembled kiosk
3. Measure and mark hole location
4. Dig 2 post holes as marked
5. Check hole depth
6. Insert assembled kiosk into post holes
7. Assemble cross braces to stabilize kiosk while concrete sets
8. Fill holes with concrete and water, mix to appropriate consistency
9. Haul posthole dirt for disposal in 5gal buckets
10. Cleanup and rake worksite
11. Remove orange safety cones from the walkway

Installation Closeout (Man-Hours: 8)

1. Assemble crews at kiosk for food, drink, and team photo
2. Thank all participants for their support

Project Close-out (Man-Hours: 8)

1. Remove cross bracing from kiosk, final check of area
2. Check birdhouse installations
3. Conduct installation walkthrough with project sponsor, Julie Miles
4. Discuss overall satisfaction of project sponsor
5. Record and make changes or requests from project sponsor
6. Write up final project documentation, including photos
7. Schedule New Horizons Eagle Board of Review

Estimated Total Man-Hours: 98