

Course outline page 1

**CLASS DESCRIPTION**

Build wood project.

Learn how to work safely with an assortment of woodworking tools. Learn about four woodworking projects that Cub Scouts can do (with adult preparation). (Handouts: Bug house, spinning top<demonstrated class project>, Pine Wood Derby vehicle stand, garden tool tote, wooden demonstration pocket knife.)

**PURPOSE**

After participating in this class you will have learned how to teach a Cub Scout how to safely work with an assortment of woodworking tools and materials:

Hammer	Screwdriver
Nails	Screws
Assorted clamps	Stapler
Hand powered miter saw	Glue
Hand powered drill	Wood

**PROJECT**

How to build a Garden tool tote

**COURSE OUTLINE**

I. Introduce instructor

A. Qualifications

1. Self employed woodworker twenty-two years.
2. Summer school woodworking teacher twelve years.
3. BSA Woodworking Merit Badge councilor
4. Scouter, Cub Scouts & Boy Scouts

II. Safety

A. General safety rules

1. If you feel out of sorts or don't feel like participating—  
**DO NOT**  
--- Find something else to do.
2. Establish a desire to participate in project.
3. When transporting tools
  - a. Carry tools in front of yourself.
  - b. Carry tools in your visual range.
  - c. Carry tools with dangerous surfaces down or towards yourself.
4. Always ask/learn how to use an unfamiliar tool.
5. **ALWAYS** clamp materials before nailing, sawing, screwing

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III. Introduce tools

- A. Hand powered miter saw -- Demonstrate.
  - 1. Always clamp miter saw to large stable surface
  - 2. How to set up stop for replicated cuts.
  - 3. Always clamp materials to miter saw.
    - a. Use clamp – first choice.
    - b. Use hand – second choice.
  - 4. Optimal foot and body placement
  - 5. How to start the cut.
  - 6. Where to find and approx. cost of miter saw.
  
- B. Hammer -- demonstrate following:
  - 1. Weight of hammer -- 7 oz.
  - 2. How to hold.
  - 3. Safety area.
  - 4. How to keep nail from bending.
  - 5. How to always avoid hitting your fingers.
    - a. Always clamp materials before nailing.
    - b. Always start nail by gently tapping nail head until well started.
  
- C. Nails – Demonstrate:
  - 1. Reason to use wax.
  - 2. How to start.
  - 3. How to prep nail to keep wood from splitting.
  - 4. How to start in preparation for a glued joint.
  
- D. Clamps – Demonstrate:
  - 1. Use of various clamps.
  - 2. Review importance of clamping materials.
  
- E. Glue – Demonstrate:
  - 1. Proper quantity.
  - 2. Need to spread.
  - 3. How to clean up.

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- F. Hand operated Drill – Demonstrate:
  - 1. How to install bit.
  - 2. Need to clamp drilled material.
  - 3. Need to **think** about keeping drill perpendicular.
  - 4. Remind to rotate handle clockwise.
  - 5. How to remove bit.
  
- F. Screws – Demonstrate:
  - 1. How to determine proper length.
  - 2. How and why to wax before using.
  
- G. Phillips screw driver – demonstrate:
  - 1. Selection of proper size
  - 2. How to hold
  - 3. Proper positioning --screw driver must be perpendicular to screw head
  - 4. Techniques for young users.
  
- H. Stapler – Demonstrate
  - 1. How to position smaller hands.  
(Please note that some scouts will not be able to use stapler. Adults can help with this step or small tacks can be used).

Notes:

- 1. Precut, predrill and prebore project materials where required (See project sheets).
  
- 2. Use softwood such as pine for ease of working. Working with easy to manipulate materials will help to instill a joy of working with wood. Teach to avoid nailing or screwing into knots. Avoid sawing redwood (another soft wood) without a quality dust mask, as its sawdust is a sensitizing agent that can (in many people) produce severe allergies to redwood and to a variety of nonrelated allergens.
  
- 3. When working with youth always have builder sign and date the project with the following:
  - Made By: John Scout
  - Date: January 25, 2003Sign and date on the bottom or some other inconspicuous but visible location.

**POW WOW 2003**  
**WOODWORKING**

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4. Always review what was learned.
5. Have Scouts clean up work area upon completion.
6. Materials resources:
  - When buying wood, Home Depot is, or at least has in the past been, the least expensive source of four-foot lengths of 1X12 knotty pine. (Price 12-26-02 was \$1.38 per board foot in 4' lengths, \$1.54/BF in 10 foot lengths)
  - When looking for 'Free' wood, remember that you are looking for softwood with the least amount of knots.
  - Check with builders at construction sites (Remember to wear your uniform -- it really makes a difference)
  - Check Home Depot lumber department -- ask when, during the week, when do they clean up the molding area (many sizes and shapes of clear soft wood). They sell at very low price or can be talked into a donation. The remainder of the lumber dept. is cleaned up on a regular basis as well. Check the milling area operators to see if they have scrap or cutoffs.
  - OSH has a donation program with monthly quotas. Check with the store managers early in the month for donations.
  - Lumber yards like Economy lumber in Campbell have an in house mill and will donate cutoffs freely.
  - Most cabinet shops use hardwoods that are mostly not suitable for scouts working with hand tools.

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Project descriptions with materials and tools needed list.

**CATCH AND RELEASE BUG HOUSE**

Tools and Materials list.

Tools:

table saw  
drill press  
1 ½ inch hole saw with mandrel  
scissors and paper cutter.  
radial arm or miter saw  
Staple gun

Project Materials

1X12X 4' -- knotty pine  
1 ½ " finish nails  
1 ¼" Pan head cabinet screws  
A quantity of fiberglass screen  
1 or more rolls of electrical tape (choice of colors)  
3/8 inch staples

Directions for producing blank:

-Make blanks by ripping 1 X 12 into 3 inch widths then cross cut to 11 ¾ inch lengths.

-Bore 1 ½ inch hole (with hole saw mounted in drill press) on centerline 2 1/16 inches from one end of blank.

-Next:

Cut 5 3/8 inch widths of fiberglass screen. Cut these to 9 ¼ inch lengths. Cut electrical tape to length for each edge and apply to screen material ½ width of tape. (Note: it is easier to apply screen to sticky side up tape, press to adhere tape then fold tape over and press again).

Preparation Done.

**Build Bug House**

-In miter saw, saw off four corners of blank at a 45-degree angle. Set up the cuts so that 7/8 of an inch is removed from each corner.

-Next, cross cut each end at the 3 inch mark (two end pieces and one base will be produced by these two cuts).

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- Next blunt the points of 4 - 1 ½ inch finish nails.
- Next in the large flat surface of the 3 X 5 ½ inch block, drive a blunted finish nail in each of the four corners ½ inch from the long sides and 3/8 of an inch from the ends. The nail should be driven straight in and should just protrude through the other side.
- Select the two dog-eared 3 X 3 blocks and apply glue to the end opposite the dog-ears.
- Place dog-eared ends on work surface with large sides parallel to one another – 5 ½ inches apart.
- Place 3 X 5 ½ block with nail points toward and into upright ends -- do final side to side and end to end alignments, clamp in place to the work bench and complete driving finish nails.
- Turn project on side and place taped screen on base and staple in place. Use three staples to secure to side of base. Use 2 staples to secure screen to each upright. Next one staple on each of the forty-five degree angles nearest the top.
- Now turn the project onto its base and staple the screen to the top. Continue on around the side to the base in the same manor as before.
- In miter box cross-cut 2 inch wide bug-house door material into 2 inch squares
- Next, drill small hole into one corner of large flat surface of the bug house door. Drill the hole exactly 1/4 inch from each side.
- Insert screw and tighten until screw point just protrudes.
- Place door on bughouse wall with hole so that door covers hole without extending beyond project bottom.
- Tighten screw until door is just snug.
- Go catch a Bug – enjoy.

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**PINE WOOD DERBY VEHICLE DISPLAY STAND**

**Tools and Materials**

**Tools**

Table saw  
Router and bits  
Miter saw

**Project Materials**

Sandpaper  
Glue  
1 X 4(or wider) hard or soft wood (Hard wood preferred)

**Directions**

- Using table saw, rip material to 3 3/8 inches wide. Cross cut prepared material to 7 inches long.
- Edge treatment of the top large flat surface can be completed using a multitude of methods.
  - \*Shape edge using a router and your choice of edge bits.
  - \*Chamfer edge with a table saw set either at a 45-degree angle or an angle similar to the angle of the standoffs (30 degrees).
- Next, on a table saw with a right tilting blade, rip material 2 inches wide with the blade set at 30 degrees. Rotate 2" material and run past blade to duplicate 30-degree angle on opposite side. Resulting material should have a base of 2 inches and a top of 1 1/16 inches.
- On a table saw or miter saw cross cut both ends at a 30-degree angle (this is presuming that you are starting with clean 90 degree ends). The resulting standoffs should have a top of 1/16 inch and a base of 1/2 inch. Now cross cut long material at 90 degrees so that cutoff has a base of 1/2 inch and a top of 1/16 inch. You have now completed standoffs for two vehicles.

**Pine Wood Derby vehicle stand assembly directions.**

- Using a pine wood derby car, locate car with standoffs (standoffs in Derby Car axle grooves) on top of the finished base. Lightly mark base where standoff edges contact. Remove all, spread glue on standoff bottoms and replace with corners at marks.
- Let DRY.
- Use as is or use clear finish as desired. ---- Enjoy.

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**SPINNING TOP PROJECT**

Tools and materials list

Tools

Drill press

Hole saw and mandrel

Materials

1 X 12 X 4' knotty pine

Directions

- Using table saw rip 1 X 12 into 4 - 2 11/16 inch lengths.
- On Drill press, using a 2 ½ inch hole saw blade and mandrel, set the rear fence to just clear the spinning hole saw blade.
- Note: Higher drill press speed tends to produce smoother cuts.
- Turn on drill press, cut out disk, turn off drill press, remove disk, restart press and repeat (Use caution during this process).
- Preparation – completed.

Spinning top Project tools and materials

Bench vice or hold down clamp  
Coping saw or other fine bladed saw  
100 grit sandpaper  
2 ½ inch prepared disks  
4 foot lengths of 1/4 inch hard wood dowel  
Bottle of glue

Directions for making spinning top.

- In bench vice or with clamp hold ¼ inch dowel so that 4 to 5 inches extends out beyond the edge of the work bench.
- Cut off dowel with coping saw.
- Using sandpaper, roundover one end of the cutoff until it resembles the end of your small finger.
- Now, sand off all burrs and roundover all edges of the 2 ½ inch disk. Remember to sand disk edge evenly.
- Push prepared dowel through hole in center of disk until approx. 1 inch of rounded over end sticks through.
- If dowel loose, glue into place. -----Test (read play with immediately).



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**GARDEN TOTE PROJECT**

Tools and materials list

Tools

Hand drill  
8-oz. Hammer  
Miter saw with stop  
Adjustable C-clamps

Materials

1 X 4" Rough redwood  
5/16 X 1 ½" Redwood lath  
1" Galvanized nails  
1 5/8" Phillips screws (yellow)  
¼ inch sisal rope  
¾" or 1" masking tape

Directions for making Garden Tote

- Set up miter saw with stop set at 5 ½ inches. Cut two pieces from 1 X 4" rough redwood stock
- Measure to 2 ¾" on long, wide side and mark using square and pencil. Measure over from edge at that point ¾ inch and mark again using square and pencil. Later in project, at intersection of lines, drill ¼ inch whole with drill and bit.
- through out project, reference the 5 ½ X ¾ " side with mark near it, as the top
- Set up miter box with stop at 13 ½ inches from blade.
- Using redwood lath material cut 7 pieces.
- Prepare 28 --1" galvanized nails by blunting sharp tips with hammer. (Be sure to back nail on vice or some other heavy metal object.)
- one at a time, lay out your 13 ½ inch pieces of lath. On the wide side and 3/8" from the end and 3/8 " from each side, tap in one, 1" nail. The nails should just pierce the other side. Complete all four corners and all 7 pieces of lath.
- Next, place one of the 3 ½ inch by 5 ½ inch blocks on its 3 ½ X ¾ inch face.
- place one end of the prepared lath perpendicular to and on top of the 3 ½ inch exposed face being sure that the edges of the lath are flush with the block. This should be near the bottom face of block. Drive in one nail.
- place second block as you did the first and repeat above step.
- by eye or using a square, align blocks at 90 degrees and drive in the remaining nails.

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**GARDEN TOTE PROJECT**

- on same face approximately 1/8 inch from 5½ inch face, referenced as the top, attach a second lath using above methods.
- Repeat with next two laths on other 3½ inch side.
- Place project on the 5 ½ X 3/4 face (top) that has the lath held back 1/8 inch.
- Place lath on 5 ½ face (bottom) even with the ends and sides of the blocks and drive nails after checking for square.
- Repeat at other end of same face.
- Repeat, with last piece of lath, centered between previous 2 lath.
- NOW IS A GOOD TIME TO DRILL BOTH HOLES NEAR OPEN SIDE.
- Prepare to cut ¼ inch rope by first measuring 28 inches from end.
- Tightly wrap masking tape around tightly twisted rope.
- Cut in middle of tape. LEAVE TAPE IN PLACE.
- Tie simple overhand knot but modify by passing through bend two times.
- Tighten knot.
- Twist taped rope through both holes in project end blocks then repeat knot.
- Cut 45 degree angle on both ends of 1X1 so that the short side is 5 ½ inches.
- Drill 1/8 inch hole ¾ inch in from 45 degree taper on 5 ½ inch flat surface.
- Wax four gold 1 5/8 phillips screws and insert on 7 ½" side.
- Place project on flat surface with the side with bottom side up.
- Place prepared blocks (the 5 ½ surface) on lath above end block.
- Check for center, clamp in place and tighten screws.
- Sand any rough or pointed edges or use as is.
- Enjoy