

FINISHING UP – UNIT 4

H911006.* **WOODWORKING ARTICLE** – Item made using skills learned in the Finishing It Up Project. Examples include: dovetailing, making a pen using lathe, overlays, using a router, etc. Item is required to be appropriately finished.

H911008.* **RECYCLED WOODWORKING DISPLAY** - Article made from recycled, reclaimed or composite wood. Article must be appropriately finished **and/or** sealed and utilize one or more woodworking techniques from page 2 of the Unit 4 manual. Exhibit must include the woodworking plan and a minimum one-page report of how the design and engineering process was used to develop the woodworking plan.

Engineering Design Process

- 1) State the problem (Why did you need this item?)
- 2) Generate possible solutions (How have others solved the problem? What other alternatives or designs were considered?)
- 3) Select a solution (How does your solution compare on the basis of cost, availability, and functionality?)
- 4) Reason for article finish (What type of finish, how did you finish or why you choose this finish?)
- 5) Build the item (What was your woodworking plan, and what processes did you use to build your item?)
- 6) Evaluate (How does your item solve the original need?)
- 7) Present results (How would you do this better next time?)

DEPARTMENT WELDING

This category helps 4-H'ers learn the basics of welding. In addition, 4-H'ers get the opportunity to present their knowledge on the topic and display what they have made. Involvement in SET Welding gives participants a first-hand experience in a skill that can be used for a lifetime. For help getting started with this project contact your county 4-H office.

PREMIUMS: Purple-\$4.50; Blue-\$4.00; Red-\$3.50; White-\$2.50

4-H WELDING PROJECT TIPS AND SUGGESTIONS

CLASS 1

- All welds should be made with the same electrode/wire/rod size and number.
- Welds should be made only on one side of metal so penetration can be judged.
- Welds should be cleaned with chipping hammer and wire brush. Apply a coat of light oil (penetrating oil) to the metal to prevent rusting. Wipe off excess oil.
 - ◆ It is suggested that all welds be on the same size and thickness of metal. These pieces, referred to as coupons, should be 1.5 to 2 inches wide and 3.5 to 4 inches long. A good way to get this size is to buy new cold rolled strap iron and cut to length.
 - ◆ The extra width is needed to provide enough metal to absorb the heat from the welding process and prevent the coupons from becoming too hot before the bead is completed. Narrower coupons will become very hot, making an average welder setting too cold at the bead start, just about right in the middle, and too hot at the end. The correct way to weld narrow strips is to make short beads and allow time to cool, however this project requires a full length bead.
- Stick welding
 - ◆ Suggested coupon thickness - 1/4" if using 1/8" rod
 - ◆ Suggested rod - AC and DC straight or reverse polarity - first E-7014, second E-6013
- MIG welding
 - ◆ Suggested coupon thickness - 1/4" if using .035 wire and 1/8" if using .023 wire
- Oxy-Acetylene
 - ◆ Suggested coupon thickness - 1/8"
 - ◆ Suggested rod - 1/8" mild steel rod

CLASS 2

- It is suggested that all welds be on same size and thickness of metal. These pieces are referred to as coupons. The welds can be on one coupon that is about 4" x 4" or on individual coupons that are about 2" x 4" and 1/4" thick. Suggested rods for this class of position welds for AC and DC straight or reverse polarity is, first E-6013, second E-7014 and E-6010 for DC reverse polarity only.
- Welds should be cleaned with a chipping hammer and wire brush. Apply a coat of light oil (penetrating oil) to the metal to prevent rusting. Wipe off excess oil.

CLASS 3 & 4

- All welds should be cleaned and protected from rust with paint or light oil. Plans are to be complete enough that if they were given to a welding shop, the item could be made without further instructions. Bill of materials should include a cost for all items used including steel, electrodes, paint, wheels, etc.

DIVISION 920 - WELDING

H920001.* **WELDING JOINTS** - A display of one butt, one lap and one fillet weld.

H920002.* **POSITION WELDS** - A display showing three beads welded in the vertical down, horizontal and overhead positions.

H920003.* **WELDING ARTICLE** - Any shop article where welding is used in the construction. 60% of item must be completed by 4-Her and notes regarding laser welding or machine welding must be included. All plans, plan alterations, and a bill for materials must be attached to the article. Protect plans with a cover. If project is designed to be outside, it is required to have appropriate outdoor finish because project may be displayed outside.

H920004.* **WELDING FURNITURE** - Any furniture with 75% welding is used in the construction. 60% of item must be completed by a 4-Her and notes regarding laser welding or machine welding must be included. All plans, plan alterations, dimensions and a bill for materials must be attached to the article. Protect plans with a cover. If project is designed to be outside, it is required to have appropriate outdoor finish because project may be displayed outside.

H920005. **PLASMA CUTTER/WELDER DESIGN** - Plasma cutters/welders allowed for detailed design(s) to butt cut into metal. 4-Hers will create a notebook describing the design process to create the "artwork" to butt cut into the metal. This exhibit is not eligible for State Fair. In the notebook include:
A) A photo (front and back) of the finished project. Also include detailed photographs of the project to allow judges to examine cuts.
B) Instructions on how the design was created, this allows for replication of the project.
C) Lessons learned or improvements to the project.

H920006.* **COMPOSITE WELD PROJECT** - 60% of the project must be welded and 40% made from other materials such as wood, rubber, etc. All plans, plan alternations, and a bill for materials must be attached to the article. Protect plans with a cover. If project is designed to be outside it is required to have appropriate outdoor finish because project may be displayed outside. (SF280)