

- CLASS 2** **Woodworking Display** – Display exemplifying one of the principles learned in the *Nailing it Together* project (examples include: measuring angles, wood lamination, and joint types).
- CLASS 3** **Recycled Woodworking Article** - 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 3 manual. Exhibit must include the woodworking plan and a minimum one-page report of how the engineering design process was used to develop the woodworking plan.

WOODWORKING – UNIT 4

- CLASS 4** **Woodworking Article** – Items made using skills learned in the *Finishing Up* manual (examples include: dovetailing, making a pen using lathe, overlays using a router, or other skill appropriate item). Item is required to be appropriately finished. Items **MUST** be entered with construction plans (see above).
- CLASS 5** **Woodworking Display** – Display exemplifying one of the principles learned in the *Finishing Up* project (examples include: career opportunities, types of finishes, or dovetailing).
- CLASS 6** **Recycled Woodworking Article** - 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.
- CLASS 10** **Careers Interview** – Interview someone who is working in the field of woodworking and research that career. Interviews can either be written or in a multimedia format (CD/DVD). Written interviews should be in a notebook. Written reports should be three to five pages, double-spaced, 12-point font, and 1" margins. Multimedia reports should be between three and five minutes in length.

WELDING

WELDING RULES

1. **GENERAL RULES** – See GENERAL RULES – SCIENCE, ENGINEERING & TECHNOLOGY
2. **EXHIBIT REQUIREMENTS** – All welds exhibited in Class 1 or 2 must be mounted on a 12" high x 15" long display board of thickness not to exceed 3/8". Attach each weld on a wire loop hinge or equivalent, so the judge can look at the bottom side of the weld when necessary. Each weld should be labeled with the following information: 1. Type of welding process (stick, MIG, TIG, oxy-acetylene, etc.), 2. Kind of weld, 3. Weld setter, 4. Electrode/wire/rod size, and 5. Electrode/wire/rod ID numbers. Attach a wire to display board so it can be hung like a picture frame.
3. **TIPS & 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 the medal 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 thickness of metal. These pieces, referred to as coupons, should be 1.5" to 2" wide and 3.5" to 4" long. A good way to get this size is to buy new cold rolled strap iron and cut to length. The extra wide width is needed to provide enough metal to absorb 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 ¼" 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 ¼" 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 ¼" 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 instruction. Bill of materials should include a cost for all items used including steel, electrodes, paint, wheels, etc.
4. **TOP EXHIBIT** – A top exhibit will be selected from those exhibits receiving purple ribbons in the welding division.
5. **MANUALS** – Printed materials are available from the Johnson County Extension Office for all currently enrolled 4-H members in Johnson County.

DEPARTMENT H	DIVISION 920				WELDING
PREMIUM	Purple \$2.50	Blue \$2.00	Red \$1.50	White \$1.00	
CLASS 1	Welding Joints – A display of one butt, one lap, and one filet weld.				
CLASS 2	Position Welds – A display showing three beads welded in the vertical down, horizontal, and overhead positions.				
CLASS 3	Welding Article – Any shop article where welding is used in the construction. All plans and bill of materials must be attached to the article. Protect plans with a plastic cover.				
CLASS 4	Welding Furniture - Any furniture with 75% 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 alternations, dimensions and a bill for materials must be attached to the article. Protect plans with a cover. If the project is designed to be outside it is required to have appropriate outdoor finish.				
CLASS 5	Plasma Cutter/Welder Design – Plasma cutters/welders allow for detailed design(s) to be cut into metal. 4-Her will create a notebook describing the design process to create the "artwork" cut into the metal. In the notebook include: <ol style="list-style-type: none"> 1. A photo (front and back) of the finished project. Also include detailed photographs of the project to all judges to examine cuts. 2. Instructions on how the design was created, this allows for replication of the project. 3. Lessons learned or improvements to the project. 				
CLASS 10	Other Item – Other item displaying the knowledge gained in this project.				