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.

- 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.
- Stick Welding
  - Suggested coupon thickness: ¼" if using 1/8" rod
  - Suggest 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 1 Welding Joints *[SF281]*: A display of one butt, one lap, and one fillet weld.

Class 2 Position Welds *[SF281]*: A display showing 3 beads welded in the vertical down, horizontal, and overhead positions.

Class 3 Welding Art *[SF283]*: Any art created using tack welds to hold the metal pieces together (examples include horseshoe projects). Type of welder, welder settings, all plans, plan alternations, and a bill for material 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.

Class 4 Welding Article *[SF281]*: Any shop article where welding is used in the construction. 60% of the item must be completed by 4-H Member and notes regarding laser welding or machine welding must be included. Type of welder, welder settings, all plans, plan alternations, and a bill for material 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.

Class 5 Welding Furniture *[SF282]*: Any furniture with 75% welding used in the construction. 60% of the item must be completed by 4-H Member and notes regarding laser welding or machine welding must be included. Type of welder, welder settings, all plans, plan alterations, and a bill for material 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.

Class 6 Plasma Cutter/Welder Design *[SF279]*: Plasma cutters/welders allowed for detailed design(s) to butt cut into metal. 4-H members will create a notebook describing the design process to create the "artwork" to butt cut into metal. In the notebook include:

1. A photo (front and back) of the finished project.
2. Instructions on how the design was created (include software used), this allows for replication of the project.
3. Lessons learned or improvements to the project
4. Steps to finish the project

Class 7 Composite Weld Project *[SF280]*: 60% of the project must be welded and 40% made from other materials such as wood, rubber, etc. Type of welder, welder settings, all plans, plan alterations, and a bill for material must be attached to the article. Protect plans with a cover. If project is designed to be outside, it is required to have an appropriate outdoor finish because project may be displayed outside.

WOODWORKING

WOODWORKING GUIDELINES

- Develop skills such as measuring, squaring, and cutting a board, driving nails, and using clamps and screws; Build a picture frame, a letter holder, a box, or an airplane; Measure, cut, sand, drill, and use advanced hand and power tools; Apply paint and use bolts and staples; Build a sawhorse, birdhouse, toolbox, or a stool; Practice measuring angles, cutting dado and rabbet joints; Use a circular saw, a table saw, and a radial arm saw; Sand and stain wood.
- In this category, 4-H Members have the opportunity to create exhibits for varying levels of woodworking. In addition, participants can also create informational exhibits about their woodworking projects. Through involvement in this category 4-H Members will be better educated about the topic and better their woodworking skills.
- The name and county of each exhibitor should appear separately on the back of each board, poster or article and on the front cover of the notebooks so owner of the exhibit may be identified if the entry tag is separated from the exhibit.
- **Requirements:** All articles exhibited must include a plan (with drawings, sketch, or blueprints) stating dimensions and other critical instructions a builder would need to know how to build the project and 4-H Member's name and county. Plans may include narrative instructions in addition to the dimension drawings and include any alterations to the original plan. Part of the score depends on how well the project matches the plans. If the plans are modified, the changes from the original need to be noted on the plans. All plans used for making the article must be securely attached and protected by a clear plastic cover.
- All projects must have appropriate finish.
- If the project (i.e. picnic tables, wishing wells, swings, chairs, bridges, doghouses, etc.) is designed to be used outside, it will be displayed outside.
- All outside projects MUST have entry tag and supporting information placed in a protective bag to prevent damage from weather events such as rain and be attached to projects with string, zip ties, etc.
- Scoresheets, forms, contest study materials, and additional resources can be found at http://go.unl.edu/ne4hwoodworking
- Educational resources can be found at: https://4hcurriculum.unl.edu/index.php/main/program_project/144

DEPT. H / DIV. 911 WOODWORKING

[Scoresheets SF91, SF95, SF97, SF284]

WOODWORKING 1 - MEASURING UP

(NOT Eligible for State Fair)

Class 901 Creative Woodworking Item *[SF91]*: Exhibitor must be enrolled in the woodworking project and exhibit must be individual's own creative design and work. Any 4-H member between the ages 8-18 is eligible. **Plans are required.** Exhibitors may either interview judge on Saturday morning of the fair OR submit a written report at time of entry.

Class 902 Display Board *[SF91]*: 24" high x 32" wide x 1/4" thick, rigid type material. Ten sample blocks of different kinds of wood, 2½" x 6" surface size and from 3/8" to 5/8" thick, to be mounted firmly on the board. Each sample must be identified with the following information: kind of wood, where grown, and main use or uses. Other articles related to woodworking can be displayed but will require a sample of at least 10 units. These might include types of wood fasteners, types or grades of sandpaper, types of wood

finish, etc. Each sample should be clearly identified with the following information: 1) the kind, type or grade, 2) where and why it is used, and 3) the importance of these units in woodworking.

Class 903 Articles Made With Hand Tools *[SF91]:* Select from Unit 1 or use comparable plans from other sources.

WOODWORKING 2 - MAKING THE CUT

(NOT Eligible for State Fair)

Class 904 Articles as shown in Unit 2 or Comparable Items *[SF91]:* Using power hand tools, electric jig saw, power drill and/or oscillating sander.

WOODWORKING 3 - NAILING IT TOGETHER

(Eligible for State Fair)

Class 1 Woodworking Article *[SF91]:* Item should be made using either joints, hinges, dowels, or a dado joining made using skills learned in the Nailing It Together manual. Item is required to be appropriately finished. Examples include: bookcase, coffee table or end table.

Class 3 Recycled Woodworking Display *[SF95]:* 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.

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) Build the item (What was your woodworking plan, and what processes did you use to build your item?)
5) Reason for article finish (What type of finish, how did you finish or why you chose this finish?)
6) Evaluate (How does your item solve the original need?)
7) Present results (How would you do this better next time?)

Class 4 Composite Wood Project *[SF284]:* 60% of the project must be wood and 40% made from other materials such as metal, rubber, resin, etc. All plans and plan alterations 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.

Class 5 Outdoor Wood Project Made with Treated Wood *[SF97]:* Treated wood projects DO NOT have to have a finished coating. All plans and plan alterations 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. Examples include: picnic tables, planters, outdoor furniture, etc.

Class 6 Wood Projects Created on a Turning Lathe *[SF91]:* Article is the object created from spinning wood on a turning lathe. Article must be appropriately finished and/or sealed. Exhibit must include plans detailing design and process of completion, any changes made to the design, details of finishing techniques, and other relevant information about the article. Must include a description of tools used.

WOODWORKING 4 - FINISHING UP

(Eligible for State Fair)

Class 7 Woodworking Article *[SF91]:* 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.

Class 8 Recycled Woodworking Display *[SF91]:* 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.

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?)