

## Small Engines

Exhibits will be entered on Wednesday from 4:00 p.m. – 7:00 p.m. at Exhibition Hall.

### Department H - Division 890

(Pay Category 3)

900 Numbers Do Not Go To State Fair

#### Crank It Up, Unit 1

**H901. Small Engine Display/Item.** Show an application of one of the concepts learned in the Crank It Up project manual. Examples include: identify the parts of a small engine, safety rules for starting a small engine, small engine repair tool identification. Warm It Up, Unit 2

**H902. Small Engine Display/Item.** Show an application of one of the concepts learned in the Warm It Up project. Examples include: comparison of engine oil types, transmissions, or safety related to engines. Exhibit could be a poster display, or an actual item. Tune It Up, Unit 3

**H903. Engine Display/Item.** Display/Item should exemplify one of the lessons learned in the Tune It Up Project. Examples include: diagnostic tools, fuel systems, ignition systems. If a complete engine is exhibited it will not be started. However, display needs to report process of building/rebuilding engine and how/where engine will be utilized (i.e. lawn mower, weed eater, snow blower, etc.)

## Woodworking

Exhibits will be entered on Wednesday from 4:00 p.m. – 7:00 p.m. at Exhibition Hall.

(900 Numbers Do Not Go To State Fair)

### Department H - Division 911

#### Unit I Woodworking

(Pay Category 3)

The ability to build objects as designed by another person is an important life skill. Professional woodworkers often are hired to build objects to exacting specifications as laid out in a written plan.

Requirements: All articles exhibited must include a plan (with drawings or sketch or blueprint) stating dimensions and other critical instructions a builder would need to know how to build the project. Plans may include narrative instructions in addition to the dimension drawings. Part of the score depends on how well the project matches the plans. If the plans are modified the changes need to be noted on the plans. All plans used for making the article must be attached and protected by a clear plastic cover.

#### Woodworking, Measuring Up, Unit 1

##### CLASS NUMBER:

**H900. Woodworking Article.** Item made using skills learned in the Measuring Up manual. Examples include: box, napkin/letter holder, picture frame, or other skill level appropriate item. Items should be entered with construction plans.

**H901. Woodworking Display.** Display exemplifying one of the principles learned in the Measuring Up manual.

**H902. Other Items - Unit 1.** Other article as shown in Woodworking Unit 1 manual or comparable.

**Department H - Division 911**

**Woodworking, Making the Cut, Unit 2**

(Pay Category 2)

**H903. Woodworking Article.** Item made using skills learned in the Making the Cut manual. Examples include: birdhouse or foot stool. Items should be entered with construction plans.

**H904. Woodworking Display.** Display exemplifying one of the principles learned in the Making the Cut manual.

**H905. Other Items - Unit 2.** Other article as shown in Woodworking Unit 2 manual or comparable.

**Department H - Division 911**

**Woodworking, Nailing It Together - Unit 3**

(Pay Category 1)

**CLASS NUMBER:**

**H1. Woodworking Article.** Item made using skills learned in the Nailing It Together manual. Examples include: bookcase, coffee table, or end table.

**H2. Woodworking Display.** Display exemplifying one of the principles learned in the Nailing It Together manual. Examples include: measuring angles, wood lamination and joint types.

**H3. Recycled Woodworking Display.** Article made from recycled, reclaimed or composite wood. Article must be sanded and 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) Evaluate (How does your item solve the original need?)

6) Present results (How would you do this better next time?)

H906. Other Items - Unit 3. Other article as shown in Woodworking Unit 3 manual or comparable.

**Woodworking, Finishing up - Unit 4**

(Pay Category 1)

**H4. Woodworking Article.** Item made using skills learned in the Finishing It Up manual. Examples include: dovetailing, making a pen using lathe, overlays, using a router, etc.

**H5. Woodworking Display.** Display exemplifying one of the principles learned in the Finishing It Up manual. Examples include: career opportunities, types of finishes, or dovetailing.

**H6. Recycled Woodworking Display.** Article made from recycled, reclaimed or composite wood. Article must be sanded and 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) Build the item (What was your woodworking plan, and what processes did you use to build your item?)

5) Evaluate (How does your item solve the original need?)

6) Present results (How would you do this better next time?)

**H907. Other Items - Unit 4.** Other articles as shown in Woodworking Unit 4 manual or comparable.

## **CAREERS**

**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 3 to 5 pages, double spaced, 12 point font, and 1" margins. Multimedia reports should be between 3 to 5 minutes in length.

## **Welding**

Exhibits will be entered on Wednesday from 4:00 p.m. – 7:00 p.m. at Exhibition Hall.

**Department H, Division 920**

**Arcs and Sparks**

(Pay Category 3)

(All metal welding process accepted.)

All welds exhibited in Class 1 and 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 information stated 1) type of welding process (stick, MIG, TIG, Oxy-Acetylene, etc.) 2) kind of weld, 3) welder setting, 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.

**CLASS NUMBER:**

**H1. Welding Joints.** A display of one butt, one lap and one fillet weld. Suggestions for Welding Joints: 1. All welds should be made with the same electrode/wire/rod size and number. 2. Welds should be made only on one side of metal so penetration can be judged. 3. 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. 4. 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.

**H2. Position Welds.** A display showing three (3) beads welded in the vertical down, horizontal, and overhead positions. Suggestions for Position Welds: 1. 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"x4" or on individual coupons that are about 2"x4" inch 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. 2. 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.

**H3. Welding Article.** Any shop article or piece of furniture where welding is used in the construction. All plans and bill of materials must be attached to the article. Protect plans with a cover. Suggestions for Welding Article: 1. 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.

**H4. Careers Interview.** Interview someone who is working in the field of welding 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 3 to 5 pages, double spaced, 12 point font, and 1" margins. Multimedia reports should be between 3 to 5 minutes in length.