

# **WOOD SCIENCE PROJECT GUIDELINES**

## **GOALS:**

- A. To develop an appreciation for woodworking,
- B. To understand the uses of different kinds of wood.
- C. To Learn to measure, cut, sand and finish a wood project
- C. To learn safe, proper use of woodworking tools and related items.
- D. To learn how to prepare wood for finishing and to select the proper finish for the intended use of the project created
- E. Appreciate wood as a valuable and renewable energy source
- F. Explore wood carving, wood harvesting, tooling, refinishing and antiquing.

## **Learning Activities & Suggestions:**

Develop a step by step procedures for each item to be made. This procedure should include, but is not limited to, the following:

1. Determine what is to be accomplished.
2. Draw to scale or use a print to determine the amount of stock required, construction steps, and changes etc.
3. Rough cut the stock.
4. Machine to drawing or print.
5. Finish.

**A series of woodworking bulletins and resources books are available at the 4-H office. Advanced and Intermediate members are encouraged to develop their own project designs.**

## **GUIDELINES:**

### **Woodworking**

- Introductory (suggested ages 9-12) The member is to exhibit three different items that he/she made of elementary nature. The items may include bookracks, cutting board's etc. Power tools may be used at the discretion of the leader. Prints of plans should be included with the exhibit.
- Intermediate (suggested ages 12-15) Two different items are to be exhibited which show increased skill in workmanship. Items in this class should have some type of jointer such as spline and miter or mortise and tenon. Items may include furniture, boats, sports equipment, tools and shop equipment, or toys and games. Power tools are necessary to exhibit in this class. Prints of plans should be included with the exhibit.
- Advanced (suggested ages 15-17). Only one item is required for this class. All the elements required for the above classes should be present in this class. Exhibit may include any of the items listed in Intermediate class but of a more intricate nature. Prints of plans should be included with exhibit.
- High School – project completed in high school classroom.

## **Wood Carving**

- Beginning Carving – This class is for first year carvers. Whittling, chip carving, country carving or incised carving of elementary subjects or designs with little detail is appropriate.
- Intermediate Carving - Members should progress into this class as skill is developed. All the above methods with increased detail and difficulty are required.
- Advanced Carving – Reserved for most skillful carver who has the ability to carve with great detail. A three-dimensional subject carved in the round is suggested.

## **Furniture Refinishing & Antiquing**

- Beginning Refinishing – The pattern for the three classes in this section is the same as for Woodworking. The first year should emphasize learning the types of products used, chemicals used in the products and basic procedures for stripping off old finish. The exhibit should be of an uncomplicated nature which demonstrates basic techniques. The finish on the exhibit should be appropriate for the level.
- Intermediate Refinishing – The intermediate class should continue the learning process with the emphasis on techniques of both removing old finish and placing the new finish. The exhibit should reflect the new techniques learned.
- Advanced Refinishing – The advanced class consists of primarily learning the methods of working with large items which can not be completed in a short time span. Finishing should be appropriate for the piece and of very fine quality.
- Upholstery or Canning – Member should learn the techniques of reupholster or canning and exhibit one completed piece.

## **Exploring Wood Science**

- Class - Notebook with pictures, poster with photos or 3-D exhibit explaining techniques observed in harvesting and processing trees.
- Class – Explore six different species of wood. All six pieces should be machined in the same manner. Observe the similarities and the differences of the machining characteristics of each species. Determine, based on the observed characteristics, the appropriate use of each based on the above characteristics. The exhibit should be a display of each of the pieces with captions explaining the above.
- Class – A piece of woodwork may be machined expertly, but without an equally expert finishing, the end product use is of little value. Therefore, knowing which finish will withstand what conditions is important. In this class, finish six pieces of wood with three different finishes (Tung Oil, Danish Oil, Shellac etc.). After proper curing time, subject each set of three different finishes to environmental conditions until the finish fails. Examples: Solvents, temperature variations, moisture conditions, etc. For the exhibit, display the samples with captions explaining the important information. The member will need to explain the procedures, the conditions, and then draw conclusions about each finish.
- Class – This class explores joints and the glue that holds them together. Only one part need be completed. Understanding which joint to use for the end product is very

important; therefore an understanding of the advantages and disadvantages of joints is necessary. For the exhibit, machine three different joints using the same wood. Display with captions all pertinent information and be able to explain advantages and disadvantages of each as well as possible end product uses. The second choice is to machine three joints all the same and glue up with three different types of wood working glue. Let pieces cure to maximum strength. The exhibit will consist of the three samples. At the judging the member will attempt to demonstrate how to make the joints fail and then explain why they did or did not fail.

### **Safety & Tooling**

- Safety Exhibit – A display of pictures showing safety procedures used in the wood shop for at least four machines or tools.
- Tooling Exhibit – Most tooling made in a wood shop is designed to make operation of stationary tools more safe and efficient. The exhibit requires two items made in a wood shop which makes wood machining safer.