Educational Projects

Mechanical Guidelines

Woodworking

GENERAL

- Learn how to select wood, materials, tools and patterns for projects.
- Learn safe and correct use of hand & power tools.
- Learn names and use of tools
- Learn types and uses of different wood
- Members may get project ideas from woodworking catalogues and similar sources.
- It is very important for members to do the proper amount of sanding and evaluate each step before moving on.
- Advance skills in at least one area, each year
- Journals with photos, or drawing are appropriate for non-portable project
- Refinished furniture needs a journal with before and after photo

Suggested Project Goals

BEGINNER (9-11)
1. Assemble and finish one pre-cut article for an exhibit
2. Construct an article using hand tools only
3. Learn to select wood (soft woods, such as pine, basswood, or western cedar are most appropriate for this age group)
4. Learn to lay out a project with the grain; and measure, mark and cut
5. Sand & prepare wood surfaces for finishing
6. Learn how to use glue and finishes

INTERMEDIATE (12-14)
1. Learn how warping and swelling affect the use of wood
2. Learn how to use the grid system to make irregular shaped objects.
3. Learn to make and use joints, wood fasteners, and draw working sketches.
4. Learn more advanced skills in wood selection and finishes.
5. Learn to use power tools
6. Cut, construct and finish a project using basic power tools
7. Project ideas include: bookrack, footstool, step stool, chair, and picnic table, make extra items and sell at a craft show, etc.

ADVANCED (15-19)
1. Learn how woods are named and classified.
2. Learn about the economics of forest products.
3. Learn advanced skill in using tools, power tools and specialty tools
4. Develop original design(s)
5. Construct a building such as a tool shed
6. Learn how to make and install kitchen/bath cabinets.
7. Project ideas include: kitchen cabinets, table, desk, hutch, gun cabinet, hexagon picnic table, etc.

**Welding**

**GENERAL:**
- Learn basic fundamentals of how a welder operates; positive/negative/ground flow
- Know basic safety procedures and hazards to avoid
- Learn common types of metals, types of rod required and common temperature settings
- Advance skills in at least one area each year
- Seams should be appropriately ground
- Photo, journal, drawing or displays are appropriate for non-portable project.

**GOALS:**

**BEGINNER:** Accomplish a solid bond that will not break under normal use.

**INTERMEDIATE:** Learn and use a special weld(s) and know its practical application
- Example: stitch weld for strength on a long or curved joint.

**ADVANCED:**
- Use a special type of weld or equipment (ex: mig welder)
- And/or bond different types of metals (ex: Cast)

**Resources:**

Small Engines [www.4-hmall.org](http://www.4-hmall.org)
Finishing Up [www.4-hmall.org](http://www.4-hmall.org)
Electricity Excitement [www.4-hmall.org](http://www.4-hmall.org)