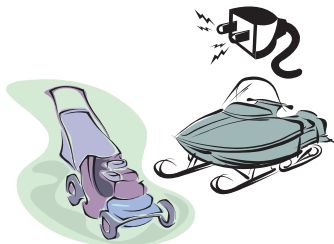


Woodworking, Electrical Science, & Small Engines



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ELECTRIC – (HCE)

ELECTRICAL SCIENCE

BEGINNERS (1-2 years in project/9-11 years old)

SUGGESTED KNOWLEDGE / SKILLS TO BE LEARNED

1. Know definition and fundamentals of electricity.
2. Learn the importance of and how to use electric tools.
3. All members should fully understand the safety factors in working with electricity.

SUGGESTED PROJECTS FOR BEGINNERS

- Repair of one of the following: trouble light, desk lamp, drop light, flashlight, or repair and maintenance of a simple electrical device.
- Notebook describing the initial condition of the item, what was done, and what was learned is recommended.
- Design a working circuit.

INTERMEDIATES (3-4 years in project/12-14 years old)

SUGGESTED KNOWLEDGE / SKILLS TO BE LEARNED

1. Review fundamentals of electricity and safety habits.
2. Members may want to explore electronics at this stage.
3. Learn the different types of circuits (i.e. parallel, etc.).

SUGGESTED PROJECTS FOR INTERMEDIATES

- Advanced wiring, fundamentals of home wiring, learning to read wiring schematics, etc.
- Repair and maintenance of home appliances.

ADVANCED (5+ years in project/15+ years old)

SUGGESTED KNOWLEDGE / SKILLS TO BE LEARNED

1. Advanced wiring techniques.
2. May learn some fundamentals of electronics.

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SUGGESTED PROJECTS FOR ADVANCED

- Electrical motor wiring or motor rebuilding.
- Schematic diagram of wiring system installed.
- Air compressor construction or stationary home construction.

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ENGINES, TRACTORS, & FIELD EQUIPMENT – (GCC)

SMALL ENGINES

BEGINNERS (1-2 years in project/9-11 years old)

SUGGESTED KNOWLEDGE / SKILLS TO BE LEARNED

1. Learn about engine sizes.
2. Learn differences between 4-stroke and 2-cycle engines.
3. Learn external engine parts.
4. Understand the general maintenance of an engine.
5. Understand uses of small engines and the safety issues with small engines.

SUGGESTED PROJECTS FOR BEGINNERS

- Create a display of proper safety labels and procedures for small engines.
- Create instructions on how to prepare an engine for winter storage.
- Make a display board of external parts which could be exhibited at the Jackson County Fair.
- Demonstrate how to start and stoop an engine.

INTERMEDIATES (3-4 years in project/12-14 years old)

SUGGESTED KNOWLEDGE / SKILLS TO BE LEARNED

1. Study the internal parts of engines.
2. Understand the process of tearing down and rebuilding an engine.
3. Discover the tools of the trade to work on small engines.
4. The use of diagnostic tools and how to trouble-shoot common problems with small engines.
5. Learn about occupational possibilities.

SUGGESTED PROJECTS FOR INTERMEDIATES

- Make a display board of internal parts which could be exhibited at the Jackson County Fair.
- Show how to adjust a carburetor.
- Show how to conduct a compression check.
- Tune-up an engine.

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ADVANCED
(5+ years in project/15+ years old)

SUGGESTED KNOWLEDGE / SKILLS TO BE LEARNED

1. Study and understand function of the various internal parts of an engine.
2. Understand the use of more advance diagnostic tools.
3. Understand the electrical systems of different small engines.
4. Understand the emission systems on small engines and future trends.
5. Learn about the effect horsepower has on gas consumption and machinery wear.
6. Investigate alternative fuel sources.

SUGGESTED PROJECTS FOR ADVANCED

- Tear down and rebuild a small engine.
- Perform a tune-up, maintenance, and minor repairs on a farm tractor (40 HP or less).
- Visit a repair shop and job shadow a mechanic.
- Become a teen leader or start a club.

WOOD SCIENCE – (HCH)

WOODWORKING AND FURNITURE REFINISHING

GENERAL SUGGESTIONS FOR LEADERS

- Develop good work habits, care of tools, and cleanliness of shop area. It is important for members to understand and learn safety in the use of all tools. Leaders should strive to create the safest environment possible for project work.
- The type of wood used should be chosen to meet the function of the project. Soft wood such as bass wood, western cedar, or pine are suggested for the youth division.
- The type of finish is very important and should compliment the item made and its use.
 - Shop equipment or outdoor projects need not have a finish like that for furniture. They may be painted, stained, sealed, or have another utility finish applied.
 - Varnish and shellac are very difficult to apply correctly to result in the proper finish (smooth and free of streaks or lap marks).
 - Exterior projects may be painted, stained, or sealed.
 - Danish oil, Q.R.B. (Quick Restored Finish), or polyurethane rubbing varnish gives an especially good finish on fine furniture.
- We strongly suggest the member spend time experimenting with materials to be used in this project. For example, the member should work with different types of wood and finishes to help yield the desirable results in a project. Leaders should give only guidance to the member in this process.
- Refinished furniture needs to be entered with a notebook of photographs of before and after shots. This should also include a description of techniques used to refinish.

BEGINNERS
(1-2 years in project/9-11 years old)

SUGGESTED KNOWLEDGE / SKILLS TO BE LEARNED

1. Learn how to buy and use lumber and plywood.
2. Learn how to measure, mark, cut, sand, and smooth wood.
3. Learn how to use glue and finishes.
4. Learn about wood grains.
5. Learn how warping and swelling affect the use of wood.
6. Learn how to use the grid system to make irregular shaped objects.
7. Learn how to safely use beginner woodworking tools (i.e. crosscut and coping saws, c-clamps, and electric wood burning tools).
8. Leaders demonstrate how to use some electric tools. Some older beginners may learn how to use tools with adult supervision.

SUGGESTED PROJECTS FOR BEGINNERS

- Tie rack, letter holder, picture frame, games, saw horse, note holder, broom holder, tool box, birdhouse, book rack, book ends, toy, etc.
- Tour a lumber yard.

INTERMEDIATES
(3-4 years in project/12-14 years old)

SUGGESTED KNOWLEDGE / SKILLS TO BE LEARNED

1. Continue to use skills learned in previous years.
2. Learn about the physical structure, properties, and characteristics of wood and how it affects its use.
3. Learn how woods are named and classified.
4. Learn about the economics of the forest products industry.
5. Learn how to safely use additional tools (i.e. combination square, pencil compass, hand drill, but brace & auger, and rip & compass saws).
6. Learn how to safely use electric tools (i.e. electric drill, jig & saber saws, and oscillating sander).

SUGGESTED PROJECTS FOR INTERMEDIATES

- Door knocker, cutting board, games, birdhouse, book ends, tool box, book rack, foot stool, step stool/chair, etc.

ADVANCED
(5+ years in project/15+ years old)

SUGGESTED KNOWLEDGE / SKILLS TO BE LEARNED

1. Continue to use skills learned in previous years.
2. Learn how to safely use more woodworking tools and machinery.
3. Demonstrate a technique and/or develop instructional materials.
4. Explore career opportunities in woodworking.
5. Construct a building (i.e. tool shed).
6. Learn how to make trims and windows and how to install doors.
7. Learn how to make and install kitchen cabinets.
8. Make extra items and sell them at craft shows, etc.
9. Become a teen leader. Serve on county committees.

SUGGESTED PROJECTS FOR ADVANCED

- Kitchen cabinet, gun case, table, desk, window and trim, door and frame, hutch, cabinet.