MSU Extension Publication Archive

Archive copy of publication, do not use for current recommendations. Up-to-date information about many topics can be obtained from your local Extension office.

Handicraft Club Work 2nd Year 11b Michigan State University Cooperative Extension Service 4-H Club Bulletin P.G. Lundin, Assistant State Club Leader Revised August 1954 102 pages

The PDF file was provided courtesy of the Michigan State University Library

Scroll down to view the publication.





REQUIREMENTS FOR 4-H HANDICRAFT CLUB WORK

- 4-H handicraft club members must be between the ages of 10 and 20 years, inclusive. Second year members must be 11 years old by January 1.
- 2. 4-H handicraft club members enrolling for second year work must make any three of the articles listed for the second year work.
- 3. Each 4-H handicraft club members must make an exhibit of his work at a club, community, district or county achievement day.
- Note: The club members need not necessarily make articles listed in this bulletin. With the permission of the local leader, the club member may make articles from plans obtained elsewhere, but the articles selected must compare in difficultness of construction to those articles listed in second year work.

Power machinery should not be used in making second year exercises.

In the bill of materials the exact measurements are given as shown by drawings. Allow ¹/₄ inch extra in width and length for cutting, planing and sanding before assembling.

> Issued August 1930 First Revision, November 1937 Second Revision, October 1939 Third Revision, June 1942 Second Printing of Third Revision, June 1944 Fourth Revision, August 1950 Fifth Revision, August 1954

4-H Handicraft Club Work

By P. G. LUNDIN¹

4-H Handicraft Club Work for the Second Year has several purposes. One is that 4-H Club members may choose articles which are practical and valuable for farm or home use. Another, and more important, is that the members in making these articles shall gain knowledge and certain skills about wood working. This will include not only construction, but also the selection and care of tools and lumber, reading plans, and preparing and applying simple finishes.

The work periods and business meetings of the club should be interesting and valuable. Members should learn to work together and meet together. These meetings should be well planned and carried out with the help of the local club leader.

TOOLS AND EQUIPMENT

While it is desirable to have a complete set of tools it is not absolutely necessary. Essential and desirable tools are listed below:

Essential Tools

Back Saw Cut-off Saw Chisels, ¹4", ¹2", and 1" Hammer (not too heavy) Screw Driver Brace and Bits, ¹4", ¹2" ³8" and ³4" Smoothing Plane Coping Saw Tri-square Marking Gauge Two-foot Rule Knife Oilstone Desirable Tools Ripsaw T-bevel Drawknife Spoke Shave Vise for Work Bench Compass Saw Framing Square Aeroplane or 4-ply Rasp Expansive Bit Gimlet Bits Twist Drills Bench Brush

¹Assistant State 4-H Club Leader. The author wishes to acknowledge the assistance of John W. Creighton, Associate Professor, Forest Products Department, in the preparation of this bulletin.

SELECTION AND CARE OF TOOLS

Tools should be carefully selected. It is a well known rule that "with the best tools you can do the best work". In order to do good work, it is necessary to keep the tools in good condition. Tools should be kept in a clean, dry place. A cabinet over the work bench, or drawers in the bench, should be within easy reach. Each tool should have its proper place. A picture of each tool may be placed on the rack behind it, so that you can see where it belongs at a glance.

Oil should be used on tools to keep them from rusting, but sparingly. If tools become rusty, the rust should be removed by rubbing with fine sandpaper, steel wool or powdered pumice stone. They should then be wiped with an oily cloth.

All tools bearing an edge should be kept well-sharpened. Much time and energy is wasted in using dull tools.

Care should be taken that the edges of plane bits and chisels are not needlessly dulled by contact with metal or dirty surfaces. In using old lumber, care should always be taken to remove all nails, grit, and dirt. Never use the plane after sandpapering; the fine particles will dull the plane bit.

MATERIALS

Lumber, wood fasteners (nails, screws, glues, dowels) hardware, (handles, coasters, hinges), and the finishing supplies are all classified as "materials". One of the most important of these is lumber. No attempt is made in this bulletin to recommend any special grade, kind or variety of wood for the article to be constructed.

The choice of lumber will be left to the local leader and the individual members of the club, depending on local conditions.

Beginners in woodworking will find that the softer woods—like white pine, aspen or popple, basswood, yellow poplar and cedar—are much easier to work than the harder woods.

Cabinet woods like cherry, walnut, oak, maple and birch may be used after the members have acquired skill and good results with the softer woods. Plywoods can be used to good advantage in many of the articles listed for second year. (See Page 47.) A few characteristics and properties of the more common woods are mentioned here, so that you may select the right kind for the article to be made. Each member should figure his lumber needs and pool his order with the local leader. The leader can then purchase all the lumber in the standard sizes for the entire club. It may be of interest to 4-H members to know how to make up a lumber order and to figure a number of board feet in various sized boards.

Three dimensions are given to all lumber stock. The thickness of the board is expressed by the first figure, width by the second, and length by the third. Type of material and number of pieces are also indicated in making the order; for example—

Yellow pine-2 pieces 2 x 6 x 48

Basswood -8 pieces 2 x 4-12

In the first example $2 \ge 6 \le 48$, measurements are all in inches, while in the second example the dash (—) before the 12 shows that the piece is 12 feet long. All measurements in the bulletin are given as illustrated above.

FIGURING BOARD FEET

A board foot is 1 inch x 12 inches x 12 inches, or its equivalent. The rule for finding the number of board feet in a piece of lumber is as follows: Multiply the thickness in inches by the width in inches by the length in inches, and divide by 144. If the last measurement is in feet divide by 12, instead of 144.

0	nionos	$2 \times 6 \times 48$	1152 or 8 board feet
4	pieces	144	144
8	nieces	$\frac{2 \times 4 - 12}{} =$	= 768 or 64 board feet
0	pieces	12	12

WOOD DESCRIPTION, CHARACTERISTICS AND PROPERTIES

A few characteristics and properties² of the more common lumbers are mentioned here so that you may select the right kind for the article that you wish to make.

Northern white cedar

The sapwood is a grayish-white; heartwood straw brown; wood has characteristic cedar odor; straight grain; texture fine and uniform, very soft; weak; easy to work with tools, and very resistant to decay.

²4-H Club Bulletin 26, Wood Identification for 4-H Club, by A. J. Panshin, Professor and Head, Forest Products Department, M.S.C.

Eastern spruce

The heartwood is not distinct; wood white to pale yellow and yellowish brown; straight grain; fine texture; moderately soft; easy to work; glues well; easy to nail, does not split readily in nailing, but is low in ability to hold nails and screws; not durable.

Northern white pine

Sapwood is white to pale yellow; the heartwood is yellowish-white to light brown. It has straight grain; slight resinous odor; soft and moderately strong; works easily with tools; glues well; takes and holds paint well; nails easily, does not split readily in nailing, average ability to hold nails and screws, low to average in ability to resist decay.

Redwood

Sapwood white, heartwood ranges from a light cherry red to dark reddish-brown with no characteristic odor. Straight grain; even, but coarse texture; soft to moderately hard; very strong for its weight; works moderately well with tools; glues well; takes and holds paint exceptionally well; nails easily but holds nails and screws poorly; resistant to decay.

Ponderosa pine

Sapwood nearly whitish to pale yellow; heartwood ranging from yellow to orange or reddish-brown; conspicuous resinous odor; straight grained; moderately coarse texture; weak to moderately strong; easy to work; glues well; average in paint-holding ability; nails easily and does not split readily; average in ability to hold nails and screws; not durable.

American elm

Sapwood grayish-white to light brown; heartwood light brown to brown; frequently with reddish tinge; straight or frequently crossed grain; moderately heavy, hard and strong with excellent bending quality; tough and difficult to split; works moderately well with tools; hard to nail, but has good nail-holding ability.

Basswood

Sapwood whitish to creamy white or pale brown; generally merging gradually into somewhat darker heartwood; wood with characteristic odor when freshly cut or when moistened; straight grained; even texture; soft; weak; works well with hand tools; nails easily without splitting, but holds nails and screws poorly; glues well; takes and holds paints well; very low in durability under conditions favorable to decay.

Beech

Sapwood whitish; heartwood whitish with reddish tinge, straight or frequently cross grained; hard; strong; bends readily after steaming; somewhat difficult to work with hand tools; excellent for turning, nails hard, has tendency to split along the broad rays, but is high in nail holding ability; average in resistance to decay.

Birch

Sapwood whitish, pale yellow to light reddish-brown; heartwood light to dark brown or reddish-brown; straight grained, close texture, moderately heavy to very heavy; moderately hard to hard and moderately strong to very strong; works well with tools, turns well, takes smooth finish; nails hard, has a tendency to split, but holds nails and screws well; not too durable under conditions favorable to decay.

Black cherry

Sapwood whitish to light reddish brown; heartwood light to dark reddish-brown, straight-grained; texture fine and uniform, moderately hard; strong; works moderately hard with hand tools, but machines well; glues well; takes and holds finishes well.

Black walnut

Sapwood whitish to yellowish-brown; heartwood rich chocolate or purplish-brown; wood has mild but characteristic odor; stem-wood usually straight grain, but a variety of figures are obtained from walnut stumps, burls, and crotches, hard; strong; works well with tools; and finishes very smoothly; holds stain well and takes fine polish; glues readily; very durable under conditions favorable to decay.

Butternut

A close relative of walnut, but lighter in color and no characteristic odor, moderately soft, and rather weak in bending; works well with tools; takes stain well and can be finished to resemble walnut; glues readily, not resistant to decay.

Cottonwood and aspen (popple)

Sapwood whitish or grayish, usually merging gradually into creamywhite, grayish-white or grayish-brown or pinkish heartwood; has unpleasant odor when freshly cut or moistened, straight or sometimes cross-grained; light, soft to moderately soft; moderately weak; easy to work with tools; nails easily without splitting, but holds nails and screws poorly; easy to glue; takes paint well; very low in durability, in conditions favorable to decay.

Hard and sugar maple

Sapwood with a reddish tinge; heartwood light brown, usually straight grained, occasionally curly, wavy, and birch-eye grained, fine and close textured, hard; strong; works well with tools, turns well and finishes very smooth; hard to nail, has tendency to split, but holds nails and screws well; intermediate for gluing; takes stain very well; not durable under conditions favorable to decay.

Red oak

Sapwood grayish-white to pale reddish, heartwood light reddish or pinkish-brown; usually straight grained, open texture, hard to very hard; strong; hard under tools, but machines well and finishes smooth; difficult to nail, tends to split in nailing, but holds nails and screws well; glues well; takes paint and other finishes well, but requires a filler; not durable under conditions favorable to decay.

White oak

Sapwood grayish-white to light brown; heartwood light to dark brown, usually straight grained, hard to very hard; strong; hard under tools, but machines well and finishes smooth; difficult to nail, tends to split in nailing, but holds nails and screws well; glues well; takes paint and other finishes well; very durable under conditions favorable to decay.

Yellow Poplar

Sapwood whitish to grayish-white; heartwood variable in color ranging from light-yellow to shades of green to dark olive-brown; straight grain, uniform in texture, soft to moderately soft; moderately weak; easy to work, with tools; nails easily, but low in nail holding ability; glues satisfactorily; takes and holds stain, paint and enamel well; not durable under conditions favorable to decay.

OTHER MATERIALS

Besides the lumber the other materials are wood fasteners including nails, brads, screws, corrugated fasteners, hardware, such as hinges, handles, and so on, glue, brushes, and finishing supplies.

Each member should figure his lumber needs and pool his order with the local leader. The leader can then purchase all the lumber in standard sizes in the amount and kind needed for the entire club. In material measurements, ¹/₄" is usually allowed for cutting, planing, and sanding.

HOW TO READ DRAWINGS

For the beginner, drawings and plans are hard to read and understand. Most of the drawings in this bulletin are drawn to show front, side and top views. Not all measurements are given in any one drawing, so it will be necessary to study all three to obtain all of the dimensions.

The third angle projection shown below, reprinted from the *Industrial Arts Magazine*, illustrates the three views of a drawing.



HOW TO LAY OUT AND PLANE A CHAMFER

Sometimes it is desirable to remove the sharp edges of stock, both for service and appearance. This process is called "chamfering". A pencil may be used in laying out the chamfer. The line need not be deep and can be removed later with the plane.

To mark or lay out a quarter inch chamfer, mark a point on the work *face*, one-quarter inch from the edge. Hold the pencil in such a way that the middle fingernail is in contact with the edge of the wood, and the point of the pencil is on the mark one-quarter inch from the edge. Then keeping the hand and pencil in this position, slide them away from you, marking a line as this is done. Next, mark a point on the *edge* one-quarter inch from the face. Hold the hand and pencil as before, except that the nail is next to the face and the pencil point is on the edge. Draw a line on the edge. If the chamfer is to be placed on all the edges, mark all the way around the face or edge without loosening the hold on the pencil.

On planing a chamfer, hold the plane at an angle, so as to produce a shearing cut. Chamfer the end grain first and work as in planing the end of a board—that is, from each edge to the center. A chamfer should be square across, and not rounded.

SANDPAPERING

When the handicraft club member is sure that it will not be necessary to do any more cutting with edge tools—and not until then—he can use sandpaper to finish the piece of work. The grit left in the pores of the wood by the sandpaper will take the edges off tools almost effectively as a grindstone will. When sandpaper is used, it should be treated as a tool, which it really is. It should be handled just as carefully. Sandpaper is numbered according to the size of the grains of the sands used on the surface. The numbers range from 000000 (6/0) to 3.

The grades used for rougher work usually start with 00 and then range from 0, $\frac{1}{2}$, 1, $\frac{1}{2}$ to 2, $\frac{2}{2}$ to 3. The finer grades $\frac{3}{0}$ to $\frac{6}{0}$ are used in the final smoothing and in the buffing down of finishes. A commercial package of sandpaper contains one ream (500 sheets), each sheet 9 inches by 11 inches.

How to Use Sandpaper

For the first sanding of a piece of lumber, coarse sandpaper is used. But it is seldom necessary to use numbers $2\frac{1}{2}$ and 3 because

they leave deep scratches that require considerable work with a finer paper to remove. If sandpaper is held under the hand it will follow the exact shape of the surface. If one attempts to sandpaper on or near an edge the paper will "drag" the corners and spoil the neat sharp lines, making them rounding.

The sanding block may be used to good advantage. A convenient size for a sanding block is 3 inches by 5 inches, a form which can be made to fit the convenience of the club member. A large sheet of sandpaper is cut into four equal pieces and drawn over the edges of the block. The face of the block over which the paper is drawn should be perfectly straight, flat, and smooth, so that every part of the paper will come in contact with the surface of the wood. Sandpaper thus held will not follow the small depressions on the surface but will cut only on the high spots, gradually bringing them level. The paper cannot drag the edges because it is held up by the block. In fact, the block gives more perfect control of the cutting of the sandpaper and makes it an efficient tool. Don't tack the paper to the block for it is necessary to renew it often.

In general, sanding should be done parallel to the grain of the wood. This means pushing the sandpaper straight forward and pulling it straight back. Careless cross-grain strokes with the paper will cause scratches which show plainly when the wood is finished.

WOOD FASTENERS

Proper assembly of the articles is an important part of the handicraft member's work. Nails, screws, glue, and dowels all have their proper uses. Consider your problem and select the wood fastener most suitable to your needs.

Nails

Nails are sold in quantity by the keg containing 100 pounds of nails—20d, 30d, 40d, 50d and 60d are "base". The "d" is the old English abbreviation for "penny", a term by which nail size is still indicated—as in "tenpenny" nail (10d).

Wire nails are also bought and sold by weight. The size of wire is according to the standard wire gage, and length in inches is taken into consideration in specifying the size and in fixing the price per pound. Common wire nails are thick and have large, flat heads. They are used in rough work where strength is desired. Finishing nails are used for fine work such as inside woodwork and cabinet work. Casing nails are somewhat thicker and stronger than finishing nails; they have smaller heads.

Length in		Length in	
Inches	Size	Inches	
3/4	9d	$2^{3/4}$	
7/8	10d	3	
1	12d	31/4	
11/4	16d	$3^{1/2}$	
11/2	20d	4	
$1^{3/4}$	30d	$4\frac{1}{2}$	
2	40d	5	
21/4	50d	$5\frac{1}{2}$	
21/2	60d	6	
	Length in Inches 3/4 7/8 1 11/4 11/2 13/4 2 21/4 21/2	Length inInchesSize $\frac{3}{4}$ 9d $\frac{7}{8}$ 10d112d $\frac{1}{4}$ 16d $\frac{1}{2}$ 20d $\frac{1}{3}$ 30d240d $\frac{2}{4}$ 50d $\frac{2}{2}$ 60d	

Brads

Brads vary in size from 3's'' to 1'z''. They are made from wire varying in gage from No. 20 to No. 11. For fine work brads up to 1" in size are commonly used.

Screws

Next to nails, screws are the most common fasteners used in woodwork. The setting of screws requires more time and labor, but results in a much stronger joint. *Flat-headed* and *round-headed* types of wood screws are the most common in use. Use a flat-headed screw where a flat surface is desired. On exposed surfaces a round-headed screw presents a neater appearance.

To fasten two pieces of wood together with screws, (1) drill the first hole large enough to allow the shank of the screw to slide in easily; (2) drill the second hole slightly smaller than the diameter of center portion of the screw. The second hole is sometimes omitted in very softwood. For flat-head screws use a countersink to ream out the first hole deep enough to permit the head of the screw to drop down flush with the top of the wood. Soap or oil on the threads of the screw will make the screw easier to drive, especially in hardwood.

Corrugated Fasteners

The wiggle nail or corrugated fastener is a little device that can be used for tightening loose joints or cracks. It is commonly used in fastening window frames, screen doors and in joining boards together. It is a nail which has much strength for holding two surfaces together side by side.

The wiggle nail is made with plain edges for hardwood and saw edges for soft woods. It can be obtained in different sizes.

Glue

Glue is one of the secrets for producing good work. Glue is so strong that when properly used it is frequently stronger than the wood itself. Ordinarily liquid glue is convenient because it is always ready, but it is not as strong as hot glue.

Animal glue is used hot. Fish and vegetable glues are usually liquid glues and are used cold. Glue may be applied with either a brush or a paddle.

Before using hot glue, be sure to have everything in readiness. Have the work and clamp handily arranged for quick use. Put the pieces together that are to be glued, see that they fit and will quickly go together when glue is applied. Warm the joints so the glue will penetrate into the wood.

Casein glue may be purchased in powdered form and diluted with 2¹/₈ parts of water.

Dowels

Wood dowels make a very satisfactory fastener for the common joints. Many years ago round wooden pegs (dowels) were used for this purpose instead of nails. A dowel joint, when glued, is stronger than one nailed. Dowels are usually made of hard and strong woods such as maple or birch. They can be purchased in diameters ranging from 3/16 to 1 inch in 3 foot lengths, or assorted sizes.

SECOND YEAR DRAWINGS

Adjustable Book rack Bench Bird House Flicker Feeding Shelf Nest Shelf Nesting Shelter Woodpecker Wren Blotter Holder Book Racks Book Ends Broom Holder Ceramics

Clothes Basket Cart Clothes Line Reel Clothes Line Support Clothes Stick Clothes Pin Basket Corner Whatnot Cribbage Board Dress Hanger Dust Pan Flower Box Fly Trap Foot Stool Foot Scraper Forest Tree Seedling Planting Tray Garden Trellis Hall Tree Kitchen Back Kitchen Utensil Holder Lace Cutters Lap Board Mash Hopper Miter Box Milk Stool Necktie Racks **One-bushel** Crate Pen Holder

Pipe Rack Portable Sewing Cabinet Recipe File Box Rope Maker Sack Holder Sawhorse Scissors Holder Serving Travs Shoe Rack Shoe Shining Box Shopping Memorandum Silverware Trav Sign Board Sleeve Board Smoking Stand Soap Dispenser Spice Shelf Tie Rack Trough (swine) Two-horse Evener Vise Wall Book Shelf Wall Shelf Waste Paper Basket Weather Vanes

BIRD HOUSES

A well-built bird house should be durable, rain-proof, cool and readily accessible for cleaning. Original ideas and designs may be used to add beauty to the house.

Wood is by all means the best building material for bird houses. In the choice of wood an easily workable kind—as cypress, pine, or yellow poplar—is preferable. Saw mill waste, (rough slabs with the bark on) furnishes cheap and satisfactory material for rustic houses.

Paint may be used, unless a rustic finish is desired. Modest tones, as brown, gray, or dull green are generally to be preferred. Martin houses and others that are placed in exposed places should be painted white to reflect heat.

Entrance holes for bird houses in most cases are placed near the top of the box. Perches at the entrance are more of an assistance to enemies than a requirement for the occupants.

	And a second s				
Species	Floor of cavity	Depth of cavity	Entrance above floor	Diameter of entrance	Height above ground
	Inches	Inches	Inches	Inches	Feet
Bluebirds Robin Chickadees Titmice. Nuthatches.	5 x 5 6 x 8 4 x 4 4 x 4 4 x 4	8 8-10 8-10 8-10	6 (1) 6- 8 6- 8 6- 8	$1\frac{1}{2}$ (1) $1\frac{1}{8}$ $1\frac{1}{4}$ $1\frac{1}{4}$	5-10 6-15 6-15 6-15 12-20
House wren Bewick Carolina wren Violet-green swallow Tree swallow	4 x 4 4 x 4 4 x 4 5 x 5 5 x 5	6- 8 6- 8 6- 8 6	$ \begin{array}{r} 1- \ 6\\ 1- \ 6\\ 1- \ 6\\ 1- \ 5\\ 1- \ 5 \end{array} $	7/8 1 1 1/8 1 1/2 1 1/2	6-10 6-10 6-10 10-15 10-15
Barn swallow. Purple martin. Song sparrow. House finch. Starling.	6 x 6 6 x 6 6 x 6 6 x 6 6 x 6	6 6 6 16-18	(1) (1) (1) (1) (2) (2) (2) (3) (4) (1) (2) (4) (1) (2) (4) (1) (1) (2) (4) (1) (1) (2) (4) (1) (1) (2) (4) (1) (1) (2) (1) (1) (2) (1) (1) (2) (1) (1) (1) (2) (1) (1) (2) (1) (1) (2) (1) (1) (2) (1) (2)	(1) $2\frac{1}{2}$ (2) 2 2	8-12 15-20 1- 3 8-12 10-25
Phoebe Crested flycatcher Flicker Golden-fronted woodpecker Red-headed woodpecker	6 x 6 6 x 6 7 x 7 6 x 6 6 x 6	6 8-10 16-18 12-15 12-15	(1) 6-8 14-16 9-12 9-12	(1) 2 2 ¹ / ₂ 2 2	8-12 8-10 6-20 12-20 12-20
Downy woodpecker Hairy woodpecker Screech owl Saw-whet owl Barn owl	4 x 4 6 x 6 8 x 8 6 x 6 10 x 18	8-10 12-15 12-15 10-12 15-18	6- 8 9-12 9-12 8-10 4	1 ¹ / ₄ 1 ¹ / ₂ 3 2 ¹ / ₂ 6	6-20 12-20 10-30 12-20 12-18
Sparrow hawk Wood duck	8 x 8 10 x 18	12-15 10-15	9-12 3	3 6	10-30 4-20

Dimensions of nesting boxes for various species of regular box-inhabiting birds and the height at which they should be placed above the ground.

(1) One or more sides open.

(2) All sides open.

WREN HOUSE

Top-1 piece, ½ x 7 x 8 Top-1 piece, ½ x 6½ x 8 Sides-1 piece, ½ x 5½ x 6 1 piece, ½ x 5½ x 6 Front and back-2 pieces, ½ x 5½ x 5½ Perch-1 piece, % diameter x 2 (dowel) 6-No. 6¾ R.H. screws

WOODPECKER HOUSE

Back-1 piece, $\frac{1}{2} \ge 7 \ge 20$ Front-1 piece, $\frac{1}{2} \ge 7 \ge 14$ Sides-2 pieces, $\frac{1}{2} \ge 6 \ge 16$ Top-1 piece, $\frac{1}{2} \ge 6 \ge 6$ Bottom-1 piece, $\frac{1}{2} \ge 6 \ge 6$ Perch-1 piece, $\frac{3}{2} \ge 6 \ge 6$ Owel) 6-No. 6³/₄ R.H. screws

OUTDOOR NEST SHELF

Back-1 piece, ½ x 8 x 15 Side-1 piece, ½ x 6 x 10 Top-1 piece, ½ x 8 x 10 Bottom-1 piece, ½ x 6 x 8 Braces-1 piece, ½ x 2 x 7½ 1 piece, ½ x ½ x 7½

FLICKER BIRD HOUSE

Top-2 pieces, ½ x 9 x 10½ Back and front-2 pieces, ½ x 11 x 15½ Sides-2 pieces, ½ x 6 x 10½ Bottom-1 piece, ½ x 6 x 6 1 inch brads and 4-one inch screws

TROUGH FOR SWINE

Ends-2 pieces, 2 x 8 x 24 Sides-1 piece, 2 x 8 x 36 1 piece, 2 x 6 x 36 Braces-2 pieces, 2 x 2 x 11

SLEEVE BOARD

Center-1 piece, $2 \times 4 \times 5^{1/4}$ Top-1 piece, $3^{1/4} \times 5^{3/4} \times 2^{1/6}$ Bottom-1 piece, $3^{1/4} \times 5^{3/4} \times 2^{1/6}$ One $3^{1/4} \times 5$ carriage bolt Two flathead screws, 1 inch

BROOM HOLDER

Back-1 piece, $\frac{3}{4} \times 2\frac{1}{2} \times 7$ Front-1 piece, $\frac{1}{2} \times 2\frac{1}{2} \times 4$ 6 No. 6³/₄ round head screws 2 metal plates for hinges $\frac{1}{2} \times 2\frac{1}{2}$









FLICKER BIRD HOUSE

TWO HORSE EVENER

1 piece-2 x $4\frac{1}{2}$ x 48 2 bolts or rivets $\frac{1}{4}$ diameter x 4

BOOKENDS

Back-2 pieces $\frac{3}{4} \times 5 \times 6$ Braces-2 pieces $\frac{3}{4} \times 2\frac{1}{2} \times 5$ 4 pieces $\frac{3}{4} \times 2 \times 4$ 4 pieces $\frac{3}{4} \times 1\frac{1}{2} \times 3$

MITER BOX

Bottom-1 piece, 2 x 4 x 20 Sides-1 piece, 7% x 5½ x 20 1 piece, 7% x 5 x 20

SPICE BOX SHELF

Ends-2 pieces, $\frac{7}{8} \times 6 \times 12$ Sides-2 pieces, $\frac{1}{2} \times 3 \times 15$ Bottom-1 piece, $\frac{1}{2} \times 6 \times 14$ Top-1 piece, $\frac{1}{2} \times 2 \times 15$

WALL BOOK SHELF

Ends-2 pieces 5% x 6 x 9¼ Top and Bottom-2 pieces 5% x 6 x 18¾ Back-1 piece ply wood ¼ x 14 x 20



22

MICHIGAN 4-H CLUB BULLETIN 11B











FLOWER BOX

Ends-2 pieces $\frac{3}{4} \times 8 \times 10$ Back and bottom-2 pieces $\frac{3}{4} \times 8 \times 42$ Front-1 piece $\frac{3}{4} \times 8\frac{1}{2} \times 42$

KITCHEN RACK

Ends-2 pieces % x 2 x 8 Front-1 piece % x 1¾ x 17% Bottom-1 piece % x 2 x 16½

SHOE RACK

Ends-2 pieces ¾ x 6 x 10 Rest-3 pieces ¾ x 1 x 26 Braces-2 pieces ¾ x ¾ x 1 4 round headed screws No. 8-1½



Second Year 4-H Handicraft Club Work





MICHIGAN 4-H CLUB BULLETIN 11B

CLOTHES STICK

1 piece 1 x 3 x 34

SHOESHINE BOX

Sides-2 pieces $\frac{1}{2} \ge 9\frac{1}{2} \ge 13$ Back and front-2 pieces $\frac{1}{2} \ge 12 \ge 13$ Bottom-1 piece $\frac{1}{2} \ge 8\frac{3}{4} \ge 11\frac{1}{4}$ Top-1 piece $\frac{1}{2} \ge 3\frac{1}{2} \ge 12$ Braces-1 piece $\frac{3}{8} \ge 1 \ge 8$ 2 pieces $\frac{3}{8} \ge 1 \ge 11\frac{1}{4}$ 2 pieces $\frac{3}{8} \ge 1 \ge 11\frac{1}{4}$ 2 pieces $\frac{3}{8} \ge 1 \ge 12$ Corrugated rubber- $3\frac{5}{8} \ge 12$ $1-\frac{5}{8}$ knob 2-small hinges 8-screws

CLOTHESLINE REEL

1 piece-3/4 x 6 x 14

2 pieces-3/4 diameter x 23/4

2 bolts-1/4 x 41/4 with washers and 4 nuts

ONE BUSHEL CRATE

Sides and Bottom-16 pieces $9/16 \ge 1\frac{1}{2} \ge 16\frac{5}{8}$ Ends-10 pieces $9/16 \ge 1\frac{1}{2} \ge 12$ Corners-Two pieces $2 \ge 2 \ge 12$ (Cut diagonally into 4 pieces)

DUSTPAN

Sides-2 pieces ½ x 3 x 9½ Top brace-1 piece ½ x 2 x 12 Bottom brace-1 piece ½ x ¾ x 13 Handle-1 piece ½ x 30 (dowel or broom handle) 1 hinge and screws to fit

SCISSORS HOLDER

Back-1 piece 3×9 Sides-2 pieces $\frac{1}{4} \times 1 \times \frac{5}{2}$ Front-1 piece $\frac{1}{4} \times 3 \times \frac{5}{2}$

RECIPE FILE

Use thin plywood or cigar box boards. Two sizes are given as cards come 3×5 or 4×6 . See drawing for details.










FOREST TREE SEEDLING PLANTING BOX

Side-2 pieces $\frac{1}{2} \times 5\frac{1}{2} \times 15$ Back-1 piece $\frac{1}{2} \times 5\frac{1}{2} \times 10$ Front-1 piece $\frac{1}{2} \times 7\frac{3}{4} \times 10$ Bottom-1 piece $\frac{1}{2} \times 9\frac{1}{2} \times 10$ Posts-2 pieces $\frac{1}{2} \times 1\frac{3}{4} \times 10$ Handle-1 piece broom handle 10 inch

SOAP CHIPS CONTAINER

Sides-2 pieces ¹/₄ x 6³/₈ x 8¹/₈ Back-1 piece ¹/₄ x 4¹/₈ x 10 Front-1 piece ¹/₄ x 4¹/₈ x 10 Handle-1 piece ¹/₄ x 4¹/₈ x 10 Bottom-1 piece ¹/₄ x 4¹/₈ x 7¹/₈ Top-1 piece ¹/₄ x 4⁵/₈ x 5¹/₄ 2 pieces ¹/₄ x 3⁵/₈ x 4⁵/₈ 1 knob

NECKTIE RACK (I)

Back-1 piece $\frac{3}{4} \times 2 \times 4\frac{1}{2}$ Arm-1 piece $\frac{3}{4} \times 6 \times 6$ Wheel-1 piece $\frac{3}{4} \times 6 \times 6$

NECKTIE RACK (II)

1 piece–¼ x 7 x 15 2 small screws

HALL TREE

Sides-4 pieces 3% x 1½ x 74 Centers-3 pieces 7% x 3 x 3 Braces-2 pieces 7% x 1½ x 20 4 hooks 10 small screws

CLOTHESLINE SUPPORT

2 pieces-2 x 2 x 5 or longer 2 pieces tin-4 x 10 1 spool-2 x 1 diameter 1 bolt and nut 2 x $\frac{1}{4}$ diameter











SMOKING STAND

Feet-1 piece ³/₄ x 6 x 6¹/₂ 1 piece-³/₄ x 5 x 5 1 piece-³/₄ x 3¹/₂ x 4 Top-1 piece ¹/₂ x 5¹/₂ x 5¹/₂ Upright-1 piece ³/₈ x 6 x 24¹/₂ Ash receptable

PENHOLDER

Bottom-1 piece $\frac{34}{2} \times 3 \times \frac{412}{2}$ Top-1 piece $\frac{112}{2} \times \frac{214}{2} \times \frac{214}{2}$ Rubber bushing- $\frac{12}{2}$ or $\frac{5}{8}$

FLY TRAP

Ends-2 pieces $\frac{1}{2}$ x 6 x 8% Inside ends-2 pieces $\frac{1}{2}$ x 3% x 4% Outer Rails-3 pieces-% x 1 x 12 Inner Rails-2 pieces-% x 1 x 11

PLYWOODS

Many articles listed from here on will suggest the use of plywood. Where exercises are to be light and yet durable, this material will be very satisfactory. Plywood can be purchased in most any variety of wood and in varying thickness. Fir, birch, maple and gum veneers are very common—although walnut, mahogany, cherry and others are being used to good advantage in the making of plywoods.

For most purposes $\frac{1}{4}$ ", $\frac{1}{2}$ ", or $\frac{3}{8}$ " plywoods can be interchanged in the bill of material. Waterproof plywoods should be used for outside articles.





WEATHERVANES

Material according to size of vane. Plywoods 1/2, 1/4 or 3/8

SINGLE CLAMP VISE

Front-1 piece-1 x 3¹/₈ x 9 Back-1 piece-1 x 4¹/₈ x 9 Bottom-1 piece 1 x 4¹/₄ x 9 1 No. 3 Clamp 2 No. 2¹/₂ wood screws

BOOK RACKS

Plywood for large side pieces and woods to match for braces. Here also different designs may be used and sizes vary according to individuals.

WALL SHELF

Sides-2 pieces $\frac{1}{4}$ or $\frac{1}{2} \times 7 \times 24$ Shelves and Top-4 pieces $\frac{1}{4} \times 7 \times 10$ 1 piece- $\frac{1}{4} \times 10 \times 26$ (Back if desired)

SHOPPING MEMORANDUM

Back-1 piece $36 \times 3 \times 6$ Braces-1 piece $36 \times 36 \times 2$ Adding machine paper-No. 24 Metal plate- $56 \times 2\frac{1}{2}$ Wire- $\frac{1}{6} \times 5$ inches







SECOND YEAR 4-H HANDICRAFT CLUB WORK



Second Year 4-H Handicraft Club Work

MILK STOOL

Seat-1 piece $1\frac{14}{4} \times 11\frac{12}{2} \times 14\frac{34}{4}$ Braces-2 pieces $\frac{34}{4} \times 5 \times 5$ Apron-1 piece $1 \times 8 \times 10$ Brace-1 piece $\frac{34}{4} \times 1\frac{34}{4} \times 2\frac{34}{4}$ Rest-1 piece $\frac{34}{4} \times 3 \times 6$ Leg-1 piece $\frac{214}{4} \times 2\frac{14}{4} \times 10$ Iron band- $\frac{16}{8} \times \frac{34}{4} \times 27$

CRIBBAGE BOARD

1 piece ³/₄ x 2¹/₂ x 10 4 pegs ¹/₈ x 1¹/₂ 1 piece 18 gauge brass ¹/₂ x 1¹/₂

PIPE RACK

Back-1 piece $\frac{1}{4}$ or $\frac{1}{2} \times 8 \times 10$ Bottom-1 piece $\frac{1}{4}$ or $\frac{1}{2} \times 2\frac{1}{2} \times 8$ Brace-1 piece $\frac{1}{4}$ or $\frac{1}{2} \times 3 \times 4$ Brace-1 piece $\frac{1}{4}$ or $\frac{1}{2} \times 2 \times 2\frac{1}{2}$

CUTTERS FOR LEATHER LACES

(A) 1 piece-¾ x ½ x 2¼. Knife or razor blades
(B) 2 pieces-¾ x ⅔ x 2⅓ Three razor blades

CORNER WHATNOT FOR FLOWERS

This article can be made in one piece. Large ends-2 pieces $\frac{1}{2} \ge 8 \ge 18$ Middle ends-2 pieces $\frac{1}{2} \ge 8 \ge 12\frac{1}{2}$ Small ends-2 pieces $\frac{1}{2} \ge 8 \ge 7\frac{1}{2}$ Large top-1 piece $\frac{1}{2} \ge 18 \ge 18$ Middle top-1 piece $\frac{1}{2} \ge 12\frac{1}{2} \ge 12\frac{1}{2}$ Small top-1 piece $\frac{1}{2} \ge 7\frac{1}{2} \ge 7\frac{1}{2}$

LAP BOARD

Top-1 piece ½ or ¾ x 16 x 26 Legs-2 pieces ½ or ¾ x 1½ x 27

or

Top-1 piece ³/₄ x 24 x 42 Legs-2 pieces 1 x 1 x 24 Braces-2 pieces 1 x 1 x 1%

FOOT SCRAPER

1 piece plywood ³/₄ or 1 x 4¹/₂ x 10 2 pieces ¹/₂ x 1 x 7 1 piece metal ¹/₈ x 1 x 4¹/₂



いた

Line Maria

Michigan 4-H Club Bulletin 11B

CRIBBAGE BOARD



TEMPLATE FOR DRILLING



ON A PIECE OF 18-GAUGE BLACK IRON LAY OUT THE HOLES VERY ACCURATELY AND DRILL WITH $\frac{1}{8}$ DRILL. BEND TABS OVER TO FORM GUIDES.

FOUR PEGS REQUIRED

 \square



THE PEGS MAY BE MADE OF DOWELS, WITH THE ENDS ROUNDED SLIGHTLY, OR MADE BY ROUNDING THE HEADS OF FINISHING NAILS CUT TO SIZE.

PEG HOLDER COVER



LAY OUT THE COVER ON 18-GAUGE BRASS AND DRILL THE HOLES. CUT ON THE LAYOUT LINES WITH SNIPS.

DECORATION



PAINT, INLAY, OR STAIN A STRIPE







SERVING TRAYS

Design and sizes may vary according to needs. Holes may be made according to size of glasses. See drawing.

BIRD FEEDING SHELF

Sides-2 pieces $\frac{34}{2} \times 5 \times 12\frac{12}{2}$ Bottom-1 piece $\frac{12}{2} \times 12\frac{12}{2} \times 18$ Top-1 piece $\frac{12}{2} \times 8 \times 20$ Partition-1 piece $\frac{12}{2} \times 5 \times 16\frac{12}{2}$ Rail-1 piece $\frac{34}{2} \times 1 \times 16\frac{12}{2}$ Back-1 piece $\frac{12}{2} \times 6 \times 18$ Post-1 piece 4×4 or small post

ROBIN NESTING SHELTERS

Top-1 piece ½ x 7½ x 9 1 piece ½ x 7 x 9 Back-1 piece ½ x 7½ x 8 Bottom-1 piece ½ x 7½ x 8 Frame-1 piece ½ x 8 x 1 Top-1 piece ½ x 8 x 11 Back-1 piece ½ x 8 x 13 Bottom-1 piece ½ x 6 x 8 Frame-1 piece ½ x 6 x 8

SILVERWARE TRAY

Sections-5 pieces ½ x 2¼ x 10 Sides-2 pieces ¼ x 2½ x 13½ Bottom-1 piece ¼ x 10½ x 13½ No. 16 brads 1¼ inch

BOOK RACK

Ends-2 pieces $\frac{3}{4} \times \frac{4}{2} \times 5$ Bottom-1 piece $\frac{3}{4} \times \frac{4}{3} \times 12$ No. 8 round head screws $\frac{1}{4}$ inch

NECKTIE HOLDERS

5 pieces doweling-¼ x 35% Back-1 piece ½ x 3¼ x 6 1 piece-¾ x 1½ x 8½ Upright-1 piece-½ x 3 x 5¼ or Brace-1 piece ½ x 3¼ x 4 Back-1 piece ½ x 4¼ x 12

Bar-1 piece 3/s x 13/4 x 12







SECOND YEAR 4-H HANDICRAFT CLUB WORK







ADJUSTABLE BOOK RACK

Ends-2 pieces ³/₄ x 5¹/₂ x 5¹/₂ Bottom-1 piece ³/₄ x 6 x 20 Legs-2 pieces ¹/₂ x ¹/₂ x 20 2 pieces ¹/₂ x ¹/₂ x 6 2 No. 9 screws

FOOTSTOOL

Top-1 piece ¾ x 9 x 14 Sides-2 pieces ¾ x 5 x 9 Long Brace-1 piece ¾ x 3 x 10 Short Brace-Four pieces ¾ x ¾ x 3¼

WASTE PAPER BASKET

Sides-4 pieces ¼ x 12 x 14 Bottom-1 piece ¼ x 8 x 8 Small lace or cord

ROPE MAKER

Back-1 piece ³/₄ x 8 x 16 Bottom-1 piece ³/₄ x 6 x 16 Brace-1 piece ³/₄ x 4 x 4 Wire-1 piece No. 9 x 24 Rod-1 piece ¹/₄ inch x 10



SECOND YEAR 4-H HANDICRAFT CLUB WORK





SECOND YEAR 4-H HANDICRAFT CLUB WORK



Second Year 4-H Handicraft Club Work

SACK HOLDER

This model is for peanut bags. Change to grain or potato bag size. Base-2 pieces 2 x 4 x 24 4 pieces 2 x 6 x 24 Uprights-2 pieces 2 x 4 x 16 1 piece 2 x 6 x 36 Slide-3 pieces-2 x 6 x 18 1 piece 2 x 6 x 24 2 pieces 2 x 6 x 9 Hardware— $\frac{1}{2}$ inch x 4 inch bolt $2-5/16 \ge 5$ inch carriage bolt 16 No. 10 x 21/2 inch wood screws 6 10 D nails 42 8 D nails 1 screw eve 1 12 inch chain 1 cotter pin 2-2 inch diameter casters

CLOTHESPIN BASKET

Ends-2 pieces $\frac{1}{2} \times 4\frac{3}{4} \times 7$ Slats-12 pieces $\frac{1}{4} \times 1 \times 9$ 2 screw eyes $\frac{1}{2}$ $\frac{3}{4}$ brads

DRESS HANGERS

Base-1 piece $\frac{3}{4} \times 8 \times 16$ Brace-1 piece $\frac{3}{4} \times 4 \times 8$ Upright-1 piece $\frac{3}{4} \times 1\frac{1}{4} \times 4\frac{1}{2}$ Top-1 piece $\frac{3}{4} \times 3 \times 16$

CLOTHES BASKET CART

Frame-4 pieces % x 1½ x 48 Ties-7 pieces ½ or ¾ doweling 24 inches long Wheels-4 pieces % x 6 x 6 Floor Brace-2 pieces ¾ x 1½ x 16 Floor-1 piece ¼ x 16 x 17 Washers and cotter pins

SAWHORSE

Top-2 pieces $-2 \times 3\frac{1}{2} \times 32$ Legs-4 pieces $2 \times 3\frac{1}{2} \times 19$ Apron sides-2 pieces $\frac{3}{4} \times 6 \times 30\frac{1}{2}$ Apron ends-2 pieces $\frac{3}{4} \times 6 \times 8\frac{3}{4}$










KITCHEN UTENSIL HOLDER

Back-1 piece ½ x 2 x 5 Brace-1 piece ¾ x 3 x 4 Wheel-1 piece 1 x 4 x 4 Top-1 piece ½ x 1½ x 6 2 inch round head stove bolt 7 screw hooks

BLOTTER HOLDER

Bottom-1 piece 1 x $2\frac{1}{4}$ x $4\frac{1}{2}$ Top-1 piece $\frac{1}{4}$ x $2\frac{1}{2}$ x $2\frac{1}{4}$ 1 dresser knob 1 stove bolt $\frac{1}{2}$ inch

GARDEN TRELLIS

Size and shape will vary so much that no bill of material is given.

PORTABLE SEWING CABINET

Cross Supports-6 pieces ½ x 1 x 15 Uprights-4 pieces 1 x 1 x 36 Shelf-1 piece ½ x 8 x 13 2 hingles-hooks and nails-cloth for sides and pockets.

BENCH

Seat-1 piece 1 x 8 x 18 Legs-2 pieces 1 x 6¹/₂ x 6¹/₄ Braces-2 pieces 1 x 2 x 14

SIGN BOARD

Brace-1 piece ³/₄ x 3 x 12 1 piece ³/₈ strap iron Name plate-1 piece plywood ¹/₂ x 7 x 15¹/₂ molding or groved top brace 2 screw eyes 2 screw hooks Top-1 piece ³/₄ x 4 x 5 1 piece plywood ¹/₂ x 5 x 19¹/₂

Shingles to cover







77



OTHER CRAFTS

4-H Club members may do other types of craft work besides the wood work outlined in this bulletin. There is a lot of interest, especially at 4-H Camps, in leather, metal, plastic, ceramics and other types of hobby craft.

Members enrolling for the first year hobby craft must make four articles. They may be in the same or in different materials.

CERAMICS

Different kinds of plaster can be used, but the one that has given the best results is Hydrocal. It is an extremely hard, low absorption, casting plaster with a very fine texture, making it less porous than some of the others. Surface hardness and tensile strength are from two to four times greater than the standard plaster casting, depending on the amount of water used in mixing process. The setting time is 15 to 30 minutes under ordinary conditions.

If Hydrocal cannot be bought, art plaster, dental plaster, molding or even gauging plaster can be substituted. Keene cement has been used successfully although it requires 24 hours for complete setting.

SUGGESTIONS FOR MAKING MOLDS, SHELLS AND PLASTER CASTINGS

Molds

1. Obtain a small plaque as a pattern or model.

2. Put one-eighth to one-quarter of an inch of modeling clay on back of the pattern.

3. Place the model with clay onto a clean piece of glass. Apply a thin coat of rubber to the model with a small, soft, clean brush.

4. Extend rubber coating onto the glass about one inch from the edge of the model.

5. After 10 minutes inspect the rubber coat and remove any air bubbles.

6. Apply six or seven more coats at 45- to 60-minute intervals.

7. When brush is not in use it should be placed in a soapsuds solution.

Plaster Shells

1. Build box-like form one inch higher than the rubber mold. Have space between form and the model at least one inch.

2. Form can be constructed of wood, tin or stiff cardboard.

3. Joints should be tight to prevent plaster from running out of form.

4. It is necessary to have work table level to form even shells.

5. Grease rubber mold with oil (not lubricating).

6. Mix a thick gauging plaster and pour over greased model.

7. Plaster may be reinforced with strands of hemp rope or heavy twine.

8. When thoroughly dry remove the box-like form.

- 9. Remove the shell, rubber mold and model from the glass.
- 10. Separate the shell from the rubber and the model.

11. Peel off the rubber mold from the model.

12. Wash rubber mold inside and outside.

13. Trim the edges of the rubber mold with small shears.

14. Allow shell and mold to dry for several days.

Casting

1. Equipment needed. Several tin cans (No. 3, "coffee" or a No. 10), measuring cup, two water pails, several small mixing spoons, putty knife, scoop or large spoon, and wiping cloth.

2. Put clean water into a tin can. The amount will depend upon cubical contents of rubber mold.

3. Sprinkle Hydrocal into the water slowly until all the water is absorbed.

4. When well soaked (one or two minutes), mix with a spoon to a smooth consistency.

5. Place shell (open surface up) on a level table.

6. Fit the washed rubber mold into the shell.

7. Pour plaster mixture into the rubber mold.

8. Jar or tap the shell to eliminate air bubbles or pockets.

9. A hanger may be inserted in the back of the cast in the form of a small twisted copper wire.

10. Leave first cast in shell for at least an hour. Succeeding casts can be taken out as soon as they are hard.

11. Removal of cast from the rubber mold is made when there is evidence of heat in the plaster.

Finishing Articles

1. Cast should dry thoroughly for several days.

2. Seal surface with either shellac, paint sealer or a flat lacquer.

3. Colors in oil with a small amount of turpentine will be very satisfactory.

4. Pop bottle caps are convenient containers for mixing colors.

5. For finer work the small art brushes may be more convenient.

6. When no details in coloring are necessary the paint can be put on with small wads of cotton.

PLASTICS

Plastic materials are now available in many forms. Attractive articles can be made out of plexiglass, lucite and other forms of plastic materials.

Saws, drills and machine tools are used in making many articles. Wooden jigs should be constructed and used to shape the heated plastics.

Suggestions for handling plastics:

1. Plastic sheets are protected with a tough paper. This should be left on as long as possible.

2. Cut the large sheets into desirable dimensions stock.

3. Scribling may be done on the surface with a sharp instrument.

4. Polishing. Scrape edges with a sharp knife to remove saw marks. Use scouring powder, simonize cleaner, or rubbing compound to bring out the luster.

5. Threading can be done without chipping, if care is taken not to remove too much material at once. Keep the plastic cool.

6. Forming. Thermoplastic becomes soft and pliable when heated to 220 to 275 degrees Fahrenheit. At this stage, it can be bent to any shape. When the material cools, it retains the shape to which it is bent. This plastic will, however, return to its original flat shape when reheated to the above temperature.

7. Heating is done in ovens which may be regulated within 220 to 275 degrees Fahrenheit. Forms may be hung vertically or placed

on trays with asbestos cloth bottoms. A kerosene stove oven will be satisfactory for small work. In an emergency, an electric hot plate may be used, but the plastic should not come in contact with the heating element.

8. Cementing. With care and practice, it is possible to obtain a cemented joint, which will closely approximate the plastic itself. Most cementing is done by the soak method, which consists of placing one of the two pieces to be cemented into the cement for about three to five minutes or until a cushion is formed. Upon removal, the soaked surface is pressed against the opposite dry surface. The excess cement forms a smaller second cushion that makes a firm contact. A good cement is the 1A, a 50% mixture of Monomeric and Methyl Methacryolte. The viscus cement is better for amateurs and is made by adding a small amount of plastic to cement 1A. The viscus cement is used similarly to glue. Place a small amount on each surface—press together firmly and let dry.

9. Coloring. Dyes may be used to change the colorless plastic to various shades. Plastics can however, be bought in all colors.

うちちょうろう

WOOD FINISHING

Wood finishing is a trade by itself, but in 4-H club work the member who does the woodwork must also complete the finishing. There are at least two good reasons for a finish; viz., to protect the surface and to beautify it.

All wood should be well-dried or seasoned, as the drying process is called, before it is used in any kind of construction. Wood not properly dried is likely to check, crack and warp. Moisture in the wood will also affect the finish. Remember that the kind of finishing will depend upon individual tastes, nature and type of wood, type of articles chosen, and where they will be used.

Some leaders suggest that the boy should be allowed to decide this matter and that we not dictate to him the methods we like. Let him make mistakes and profit from them accordingly. Other leaders contend that the experience of others should be of some value to beginners and that definite outlines be followed.

The main points to keep in mind when finishing wood are:

1. Make a smooth surface.

2. Remove grease spots or discolorations.

Second Year 4-H Handicraft Club Work

- 3. Remove excess glue, if glue was used for jointing.
- 4. Remove dents in the wood.
- 5. Fill holes and checks.
- 6. Sandpaper.
- 7. Apply finishes.

The smooth surface is obtained by use of the smoothing tools. The plane, scraper and sandpaper should be used on each piece before the article is assembled, being sure that all saw cuts or other marks are removed by these tools.

In furniture finishing the order is usually sanding, staining, filling (if necessary) sealing and waxing. Buffing will be necessary after sealers are completely dry. Shellac, varnish and lacquers are too complicated for handicraft members to use in the second year.

Stains or wood dyes usually dissolved in naphtha, turpentine, alcohol or water. They are named for the type of solvent—oil, spirits of water. For beginners oil stains are recommended. These come in many colors and should be diluted with turpentine according to the shade desired. It is well to practice staining on scrap lumber before it is applied to the constructed article. End grains should be finished with stain anywhere from one-third to one-eighth in strength. If colors are too light, one or two coats can be applied. Stain should be applied quickly covering all parts. Before the stain has time to dry the surface must be wiped with a cloth or a wad of waste or cheesecloth. Allow at least 24 hours for the stain to dry. Avoid colored varnish or varnish stains in handicraft finishing.

Penetrating sealers may be used before, with or after stains. If the wood needs a filler it should be applied after the stain.

Grease spots or discoloration may be removed by rubbing with a cloth dipped in benzine or naphtha.

If glue has been used, the excess glue should be removed. If glue has been spilled on the wood, it must be removed not only from the surface but from the grain of the wood. This may be done by applications of a cloth wrung out of boiling water. If the glue is not removed from the grain of the wood, it acts as a filler and prevents the finish from entering the wood.

To remove dents, wring out a piece of wet muslin and lay two thicknesses of it over the dented surface. Then apply to the cloth a hot pressing iron. By repeating this process, the dent is removed. The part that has been moistened should be sandpapered.

In filling holes and cracks several different methods are used.

A. In case of large holes a piece of wood that matches the rest of the wood should be inserted.

B. Smaller holes or checks can be filled by mixing some fine sawdust of the wood used with ordinary glue. This mixture when made into a thick paste can be applied to the hole. Care should be taken not to smear the glue to other parts of the surface. Stick shellac, plastic wood, and commercial crack fillers are also satisfactory. Putty can be used under paints.

C. For filling cracks in hardwoods, mix together one part of cornstarch and one part of wheat flour. To this mixture add one part of linseed oil with one part of japan drier. This mixture when placed into the cracks will take any stain.

When the surface is level and all the cracks and holes are filled, the work is ready for the final smoothing. This may be done by using a very fine sandpaper (No. 4 or No. 5-0).

Stains, paints, enamels, varnishes, fillers, and other finishing compounds are used to transform, beautify, or preserve wood surfaces.

Paints and enamels are usually applied to cheaper woods or outside surfaces.

Stains, fillers, varnishes, and waxes are used to finish the finer furniture woods and interior surfaces.

When furniture woods are used it is essential that fillers be applied. Maple, gum, and beech are the exceptions.

The first step in the process of wood finishing has been mentioned and is in reality a part of the workmanship of the owner.

The second step is that of staining and coloring. Almost anything painted, smeared, or daubed over the surface of the wood will change the appearance, and someone can always be found who will call it "beautiful." The object of the best finishes is however, to bring out the natural beauty of the wood rather than to add mere color and striking effects. Paint is a very good substance to use on cheaper woods that have little or no natural beauty or graining.

84

STAINS

Stains are wood dyes usually dissolved in oil, naphtha, turpentine, alcohol, or water. For beginners, oil stains are better than any others. These may be diluted with turpentine to obtain the desired shade. Practice on some scrap lumber (similar to that used in your article) is recommended before the stain is applied to the constructed article.

Stain should be applied quickly covering all parts. Before the stain has time to dry the surface must be wiped with a cloth or a wad of waste. If the color is too light, apply one or two or even more coats until it is dark enough. If too dark, a damp cloth rubbed over the surface will absorb some of the stain and take up some of the color. It is easier to dilute the stain to the desired strength. End grain should be finished with stain of one-third to one-eighth strength. Stain should be allowed to dry at least 12 hours and preferably 24. Avoid colored varnishes or varnish stain in handicraft finishing.

LINSEED OIL

Linseed oil is one of the oldest finishing materials. Mixed with turpentine it penetrates deep into the wood and acts as a preservative, filler, and sealer.

If many coats are applied and rubbed, a natural finish will be produced. The first few coats can be applied with a mixture of 50% oil and 50% turpentine. The oil is gradually increased so that it makes up about 80% of the solution for the final coats.

APPLICATION OF WOOD FILLERS

Woods are divided into two classes, **open grain** and **close grain**. The surface of open grain wood—such as oak, chestnut, ash, butternut, mahogany, walnut and so on—contains many small open holes. To fill these pores, giving a smooth, hard, uniform foundation for the finish, paste wood filler is applied. The materials needed in making this application will be the wood filler and benzine, naphtha or turpentine. The wood filler is diluted with equal parts of one of the others and applied to the surface of the wood. If the filler is a natural one, stain may be added to give the filler the color of the wood itself, or to bring out contrasting shades. The filler should be about the consistency of thin cream. One dry ounce of filler and one liquid ounce of naphtha is a good proportion. The surface to receive the filler must have been previously sanded. If a wood dye has been used, be sure that it is perfectly dry before attempting to apply the filler. All dust and foreign particles should be removed from the surface of the wood. The filler may be applied by beginning in the middle of the section, brushing both with and across the grain. This works the needle-like particles well into the pores of the wood. Do not cover more than can be conveniently cleaned off before it hardens.

Wiping Off the Filler

Allow the filler to dry just until the gloss begins to leave the surface (about 15 to 20 minutes) and then wipe off any excess, wiping across the grain with a piece of burlap, waste, or excelsior. Wipe across the grain only so as not to wipe the filler out of the pores. Clean corners with a pointed soft-wood stick covered with a cloth. See that no filler remains on the surface because it is almost impossible to remove when it has hardened. Allow it to dry 24 hours before applying shellac or varnish.

WAX

Wax may be applied to wood or over any finish: (1) to polish and beautify, (2) to protect and preserve wood or other materials, (3) to protect and preserve the life of varnish, enamel, or other finish previously applied, and (4) to make the surface easy to keep clean.

The following procedure is recommended: (1) Clean the surface; (2) apply the wax with a cloth, spreading out in a thin, even coat. A thin coat polishes better and is more satisfactory than a heavy coat. Allow the wax to dry until the stickiness disappears, usually at about the end of 15 minutes. Polish with a soft cloth or a weighted brush. In polishing it is speed rather than weight that brings up the luster.

Waxed surfaces are easy to renew, as any portion can be retouched whenever necessary, without going over the entire surface.

SEALERS

Sealers have become very popular in finishing wood-work, floors and even handicraft articles. Sealers are easy to apply with a cloth or a brush, and if buffed between coats will leave a nice glossy finish. Sealers that penetrate deeply into the wood will also act as a wood preservative. They can be used with, before or after fillers are applied to the porous wood. Two or three coats will be necessary for a high polish. Wax will help to protect the finish.

PAINTS

Articles to be used outside should either be oiled or painted. Use linseed oil diluted with one-half to two-thirds turpentine on articles that are not to be painted. Two or three coats will be enough. There is no harm in oiling surfaces that are later to be painted.

Paints may be purchased in many colors and shades. Best results will be obtained if the directions printed on the label are followed.

If the surface contains knots and pitch areas, shellac should be used to touch up these places. This will prevent the pitch from bleeding through. Shellac will also act as a grab coat for the paint. The first coat of paint should be given 24 hours to dry. For some of the smaller articles it is recommended that the paint be sanded to smooth the surface for the second coat. Sometimes a third coat is applied.

CARE OF BRUSHES

Good brushes are necessary in order to get a satisfactory finish. A new brush should be cleaned with warm water and soap and allowed to dry thoroughly before using. Brushes should be cleaned immediately after using. If the finishing material dries in the brush, the bristles may be injured. The brush will also become hard and it will be very difficult to clean.

The solvent used in cleaning a brush will be the same as that used in thinning out the finishing material, viz., turpentine for paint, enamel or varnish; alcohol for shellac; lacquer thinner for lacquer. Soak the brush in this solution for a minute or two. Work the brush up and down in the container to release the material from the bristles of the brush. Fill the brush with cleaning solution and quickly turn the bristles up, allowing the solvent to soak through the crown, or the part of the brush next to the handle. Repeating this operation two or three times will help to remove finishing material from the part of the brush that is the hardest to clean.

A full brush may be worked towards the operator on several layers of newspaper to help remove sediment from the bristles.

When clean, wipe the brush dry. Allow it to dry and then it may again be washed with warm soapy water. After it is thoroughly dried, the brush can be wrapped in waxed paper. A brush cleaned this way can be kept indefinitely. If the brush is to be used repeatedly, it is not necessary to clean it each time. Suspend it in a pail or a jar by running a small wire through the handle, so the bristles are kept at least ¹/₂" from the bottom of the pail or jar. A tightly covered pail can also be used if holes are punched in the cover to allow the handles to stick through. Put enough cleaning solution in the jar or the pail to cover all the bristles. This solution will depend on the type of brushes used, as mentioned above.

4-H HANDICRAFT CLUB MEETINGS

The handicraft clubs should hold work meetings at least every other week. Special work periods may be held as often as the local leader and club members desire. The club should also have at least six regular business meetings during the club season. Each one should have a definite purpose. Subjects that will be discussed, naturally will depend upon the interest of the local club.

Suggestions for Handicraft Club Programs

- I. The following may be used in answering roll call:
 - a. Name of kinds of soft woods that may be used in handicraft work.
 - b. Name of kinds of hardwoods that may be used in handicraft work.
 - c. Name of standard makes of the different tools, such as, Stanley planes, Disston saws, etc.
 - d. Statement of handicraft articles already completed.
 - e. Statement of handicraft articles to be made this year.
 - f. States of the United States which lead in the production of lumber.
 - g. Name of kinds of trees which grow in your community.
 - h. Cost per thousand feet of different kinds of lumber.
 - i. Name of tools shown by secretary.
 - j. Give number of nail or screw shown by secretary.
 - k. Important use for different woods.
 - 1. Name different kinds of finishings which can be applied to articles.

- m. Names of paint manufacturing companies.
- n. Something useful that we could make for which we have no plans.
- II. The following may be used as topics for talks or papers by club members or club leaders.
 - a. How I am keeping my report up to date.
 - b. Best methods of keeping tools in good condition.
 - c. How I am using my handicraft articles at home or on the farm.
 - d. The use of paint, stains, sealers or wax in handicraft.
 - e. How to arrange an exhibit of the articles made by our club.
 - f. The advantages and disadvantages of doing handicraft work alone at home.
 - g. The advantages and disadvantages of doing handicraft work at the school house.
 - h. How to identify the different kinds of trees.
 - i. How to identify the different kinds of woods.
 - j. How our school board can help our club.
 - k. How father and I are planning a farm work shop.
 - 1. How to obtain the tools necessary for our club work.
 - m. Debate: "The value of home-made articles vs. factory-made articles."
 - n. Why keep a report on handicraft work.
 - o. What handicraft clubs are doing in Michigan.
 - p. What kind of awards should be given for handicraft work.
 - q. Talks by local men engaged in similar work.

REPORT

A report is a definite requirement for completion. The report should be turned into the extension office by your local leader sometime before the achievement day. No story is required, but be sure to answer all of the questions. Each club member should know the cost of the lumber, finishing supplies, nails, screws and other hardware used in making of each article. (See financial statement).

COST OF MATERIALS

The cost of materials include not only the amount for lumber used, but also sandpaper, nails, screws, hardware and finishing supplies. If the purchase price of the new lumber is not known, the cost should be estimated at 30° per board foot. Reclaimed or used lumber should be figured at 10° per board foot.

Number	Name	Cost of Material Used	Estimated Value
First Exercise	Necktie Rack	\$.40	\$1.50
Second Exercise	Scissors Holder	.30	.75
Third Exercise	Hall Tree	1.25	4.00
Other Exercises			
	Finishing Supplies	.50	
Totals		\$2.45	\$6.25

FINANCIAL STATEMENT

(Note-Use additional sheet if necessary)

Total Estimated Value of Exercises	. \$6.25
Total Cost of Material Used on Exercises	. 2.45
Total Profit on Exercises	. 3.80

If you have a camera take some pictures showing your club demonstration team, exhibits, or any other things of interest. These will add to the value of your report and will be a means of showing others the worthwhile things that you and your club have accomplished.

ESTIMATED VALUES FOR HANDICRAFT ARTICLES

The following is an estimated value of completed handicraft articles. Use these values in your report. Your club leader should help you estimate the value of other articles which you have made, if they are not in the bulletin.

Second Year Exercises

Adjustable Book Rack, \$2.00 Bench, \$2.00 Bird Feeding Shelf, \$2.00 Blotter Holder, \$2.00 Bluebird House, \$1.50 Book Ends, \$1.50 Book Rack, \$3.00 Book Shelves, \$10.00 Broom Holder, 75c Ceramics, 5c-50c Chickadee House, \$1.50 Clothes Basket Cart, \$2.00-\$3.00 Clothes Line Reel, \$1.00 Clothes Line Support, \$2.00 Clothes Line Basket, \$1.50 Clothes Stick, 75c Corner Shelves, \$2.00 Corner Whatnot, \$3.00 Cribbage Board, \$1.00 Dress Hanger, \$2.00 Dust Pan, \$3.00 Flower Box, \$4.50 Fly Trap, \$3.00 Foot Scraper, \$2.50 Foot Stool, \$2.00 Forest Tree Seedling Planting Tray, \$3.00 Garden Trellis, \$3.00 Hall Tree, \$6.00 Kitchen Rack, \$1.50 Kitchen Utensil Holder, \$4.50 Lace Cutters, \$1.00 Lap Board, \$2.00 Magazine Basket, \$3.00 Miter Box, \$2.00 Necktie Holder, \$1.50 Necktie Rack, \$1.50 One-Bushel Crate, \$2.00 Pen Holder, \$2.00 Pipe Rack, \$3.00 Portable Sewing Cabinet, \$4.00 Recipe File, \$1.50 Robin Nesting Shelter, \$2.00

Rope Maker, \$1.50 Sack Holder, \$7.50 Sawhorse, \$3.00 Scissors Holder, 75c Serving Trays, \$2.00 Shelf, \$2.00 Shoe Rack, \$3.00 Shoe Shining Box, \$3.00 Shopping Memorandum, 75c Signboard, \$4.00 Silverware Tray, \$3.00 Sleeve Board, \$3.00 Smoking Stand, \$3.00 Soap Dispenser, \$1.50 Tie Rack, 75c Trough (Swine), \$4.50 Two-horse Evener, \$4.50 Vise, \$1.50 Wall Book Shelf, \$3.00 Wall Shelf, \$3.00 Waste Paper Basket, \$4.50 Weather Vanes, \$3.00

ACHIEVEMENT EXHIBITS

The achievement day will have a very significant meaning to all handicraft club members who have completed their project requirements. Most of the achievement days are conducted as all-county events. Exhibits from every member and all of the clubs in the county will be on display. This will give every member a chance to make comparisons, and inspect the advanced year's work.

The 4-H exhibit is a public demonstration of what has been accomplished throughout the year, and is a means of interesting other boys in the work.

Handicraft exhibits are set up on long tables. Paper placed on the tables will give a neater appearance and help to show up the articles to better advantage. Each club will have a definite space and will place its exhibits according to the different years of work. Each boy's articles should be grouped together, and each article labeled with the name of the club member, year of work and name of the leader of the club.

The work of the members will be judged on the things listed on the following score card—

My 4-H Exhibit HANDICRAFT

	Excellent	Satisfactory	Should Improve
A. QUALITY AND GENERAL APPEARANCE			
B. CHOICE AND SELECTION OF MATERIALS			
Wood adapted for article			
Type of fasteners			
Hardware			The second se
C. CONSTRUCTION			
General Workmanship			
Edges			-
Square			
Bevels	and a second production of the second second		
Joints			
Planing			
Sanding			
D. FINISHING			
Appropriate			
Article prepared for finish			
Application			
Sanded, buffed or rubbed			

Other factors considered are:

Interest and attitude as a club member.

Completeness, neatness and correctness of the report.

Achievements may be held locally, either before or after the county day. A short but instructive program should be given. The president of the club should preside at the meeting. A typical business meeting



A handicraft exhibit of second year articles.



Exhibit at county achievement day.

may be conducted. Roll call could be responded to by some statement pertaining to handicraft work, such as things that have been learned from the project. Articles made and cost. Properties and characteristics of Michigan's common woods. A short demonstration of some kind could be given by some members of the club, making some simple exercise, sharpening tools, reading working drawings, etc.

Talk: What I think of Handicraft Club Work—Club Member. Talk: What I think of Handicraft Club Work—A Father. Club Songs.

Instrumental Music or 4-H Talent Acts.

Reading the best story of the Handicraft Club Members.

Talk and awarding of prizes-Judge of Exhibits.

Social Hour-Games, lunch, etc.

DEMONSTRATIONS

A demonstration is one of the best methods of presenting various subjects to club members or other groups. What a club member learns by doing is usually more lasting than what he learns through books or lectures. All club work is demonstrational in method, and the team demonstration brings out the means and methods used by club members.

A demonstration is usually given by two club members working as a team, limiting their work to some phase of the club project. Demonstrations should frequently be a part of the club meeting, because they afford the members opportunity for self-expression and gaining skill and confidence. For local club meetings the demonstrations may be by individuals. This will give each member a chance to try out for the team to represent the club.

In a successful demonstration the members of the team are busy all the time, the discussion being correlated with the work done. In order to present their topics properly the team members must study their subject, have proper equipment and illustrative matter, and divide the demonstration into logical parts.

After the topic has been selected, the team should make a careful study of the different things to be discussed in the demonstration. Before demonstrating in public the team should be properly instructed and trained. Each team member should be sufficiently familiar with

94

the subject to speak convincingly during the demonstration, and to answer questions asked by the audience. This requires a good general knowledge of the subject.

To demonstrate means to show. Every successful demonstration requires some equipment to illustrate the different parts or phases of the work. Remember, illustrative material and equipment play a large part in helping to show or demonstrate the subject under discussion.

What one sees is remembered longer than what one hears. The materials and equipment to be used should be carefully selected before the demonstration and checked over so that everything may be ready. The following suggestions may be helpful in developing a team.

Select topic to demonstrate.

1. Show how to make an article.

2. Tell the use of some tool—

Plane.

Saw.

Square.

If additional material is needed to fill out demonstration, discuss any one tool, how to sharpen and adjust.

How to file a saw.

How to set a saw.

How to finish an article.

Caning a chair.

Common wood joints and their uses.

How to square a piece of stock and reduce to proper dimensions.

Select members for team.

In doing this, the leader selects two older members whom he thinks are best suited to make the demonstration or he places the selection on the basis of an elimination contest. Members must be enrolled in project which they are demonstrating.

Preparation of team members and speeches.

Make a careful study of the topic selected for the demonstration. Arrange the subject matter in logical order and collect all the illustrated material possible to use with the speech. The members should train themselves to explain things as they are being done. Talk naturally so that the audience can understand. To make the best appearance it is well for the team to be dressed uniformly.

Parts of the demonstration:

1. Introduction.

The best speaker should make the first speech introducing himself and his teammate. Give a brief talk on club work, tell about the work and the purpose of the demonstration.

2. Demonstration proper.

The various phases of demonstration are presented by the club members. While one speaks to the audience, the other assists by either preparing some part of the article to be made or performing an operation or any other action directly connected with the demonstration. The members should alternate in talking and working.

Speaker A	Speaker B	
Introduces himself and teammate in some novel way. Brief talk on club work as carried on in the nation, state and the community. Demonstration is part of club work. Nature and purpose of demonstration.	Gets material ready. Arranges tools, adjusts saw. Shows chart, etc.	
Assists by showing parts of saw, pointing out differences as found and mentioned by speaker B. Show good and bad features of saws as mentioned by his partner.	Speaks on use of saw. Parts, differences between cut-off, rip, back, keyhole and coping saws. What to look for in buying saws. How to handle a saw.	
Discusses the following: Jointing. Proper set for good work, and different types of lumber.	Shows how to joint. Shows hand set and anvil set. Use charts if possible.	
Demonstrates how to hold file and shows chart.	Tells how to file cut-off saw.	
Tells how to file ripsaw.	Demonstrates how to hold file. Shows chart.	
Clears bench and prepares to help his partner answer any questions that may be asked.	Summarizes points. Asks if there are any questions. Closes.	

Suggested Outline for a Saw Filing Demonstration

SECOND YEAR 4-H HANDICRAFT CLUB WORK

3. Conclusion.

Sum up points covered, give audience an opportunity to ask questions. If you are unable to answer any question asked, refer to the handicraft bulletin or any other book on wood working. Courteously avoid answering questions that do not pertain to the work.

OTHER DEMONSTRATIONAL TOPICS

- 1. How to sharpen a plane.
- 2. The use of the miter box, miter saw or power machinery.
- 3. The correct way to use a hammer, a plane, a square, a brace and bit, and other tools.
- 4. The making of a dove-tail joint.
- 5. The construction of any article.
- 6. The way to use a bench hook.
- 7. Demonstrate use of a T-bevel.
- 8. Bending wood for skis, or curves of any kind.
- 9. Stain, shellac, or varnish demonstration.
- 10. How to file a cut-off and a rip saw.
- 11. Cleaning paint brushes.
- 12. Preparing home-made paints.
- 13. Refinishing furniture.
- 14. Weaving and recaning.



A demonstration on wood finishing.

REFERENCE MATERIAL

This list of books is given as reference material for handicraft clubs. One or more of these texts should be found in the library of every rural school, or they may be purchased by the handicraft club.

Books:

- "Essentials of Woodworking," Griffith, published by The Manual Arts Press, Peoria, Ill.
- "Farm Shop Work," Brace and Mayne, published by the American Book Company, New York, N. Y.
- "Elements of Woodwork and Construction," King, published by The American Book Company, New York, N. Y.
- "Agricultural Woodworking," L. M. Roehl, published by The Bruce Publishing Company, Milwaukee, Wis.
- "Problems in Farm Woodwork," by Blackburn, published by The Manual Arts Press, Peoria, Ill.
- "Home Labor Savings Devices," Rhea Clarke Scott, J. P. Lippincott Company, Philadelphia, Pa.
- "Problems in Carpentry," L. M. Roehl, published by Webb Publishing Company, St. Paul, Minn.
- "Farm Woodwork," L. M. Roehl, published by the Bruce Publishing Company, Milwaukee, Wis.
- "Constructive Carpentry," published by The American Book Company, New York, N. Y.
- "Wood Finishing," Harry R. Jeffrey, published by The Manual Arts Press, Peoria, Ill.
- "Toy Patterns," Michael C. Dank, published by The Manual Arts Press, Peoria, Ill.
- "Shop Problem," Series 1-12, Albert F. Siepert, published by The Manual Arts Press, Peoria, Ill.
- "Boy Activity Projects," Samuel A. Blackburn, The Manual Arts Press, Peoria, Ill.
- "Farm Engineering," Robb & Behrends, John Wiley & Sons, New York, N. Y.
- "Principles of Farm Mechanics," Sharp & Sharp, John Wiley & Sons, New York, N. Y.
- "Agricultural Woodworking," L. M. Roehl, The Bruce Publishing Company, Milwaukee, Wis.
- "Construction and Repair Work for the Farm," F. T. Struch, Riverside Press, Cambridge, Mass.

"Agricultural Engineering," (Smith), Lippincott, Wabash Avenue, Chicago, Ill.

Magazines:

Home Craftsman, Walker-Turner Company, Plainfield, N. J. Popular Mechanics, 200 E. Ontario Street, Chicago, Ill. Popular Science, 353 4th Avenue, New York, N. Y. Deltagram, 600 E. Vienna Avenue, Milwaukee, Wis. Fellow Crafters, 739 Boylston Street, Boston, Mass. Home Craft, General Publishing Company, Chicago, Ill.

Commercial Literature:

California Red Wood Lab., 405 Montgomery Street, San Francisco, Calif.-Agricultural Series of Red Wood Bulletins.

National Lumber Mfg. Association, Washington, D. C.–Use of Lumber on the Farm and Lumber and Its Utilization.

Southern Pine Association, New Orleans, La.-100 Handy Helps-South Pine and Its Uses.

Sargent & Company, New Haven, Conn.-Literature on Saws, Squares, Planes, etc.

Detroit White Lead Works, Detroit, Mich.

American Steel and Wire Company, Chicago, Ill.-Nail Chart.

E. C. Atkins and Company, Indianapolis, Ind.-Literature on Saws.

Henry Disston and Sons, Inc., Philadelphia, Pa.-Literature on Saws.

A. E. Boyle Company, Cincinnati, Ohio-200 Things to Do with Plastic Wood.

National Lead Company, 900 West 18th Street, Chicago, Ill.-Handbook on Painting.

Grand Rapids Wood Finishing Co., Grand Rapids, Mich.-Better Wood Finishing.

Berry Brothers, Inc., Detroit, Mich.-Natural Woods and How to Finish Them.

Grand Rapids Fibre Cord Co., Grand Rapids, Mich.-Manual and Catalogue on Art of Fibre Weaving.

Brodhead Garrett Co., Cleveland, Ohio-Catalog on Manual Training Supplies.

Superintendent of Documents, Washington, D. C.-U. S. D. A. Bulletins:

Farmers Bulletin No. 1452-Painting on the Farm.

Miscellaneous Circular No. 66-Identification of Furniture Woods.

Grand Rapids Varnish Corporation, Grand Rapids, Mich.-Manual on Wood Finishing.

INDEX

P	AGE
Achievement exhibits	91
Adjustable book rack	65
Aims of handicraft work	2
Bench	75
Bird houses	15
Wren	18
Woodpecker	19
Flicker	21
Feeding shelf	60
Nesting shelter	20
Nest shelf	61
Blotter holder	77
Book racks	, 62
Book ends	24
Brads	13
Broom holder	23
Bushel crate	34
Care of brushes	87
Care of tools	4
Ceramics	79
Clamp vise	48
Clothes basket cart	72
Clothes line reel	33
Clothes pin basket	71
Clothes line support	41
Clothes stick	30
Club meetings	88
Corner what-not	55
Cost of materials	89
Cribbage board	53
Demonstrations	94
Demonstration outline	96
Dowels	14
Drawings14	, 15
Dress hanger	71
Dust pan	35

	PAGE
Estimating lumber bill	5
Evener	24
Fasteners	12
Flower box	28
Fly trap	45
Footscraper	58
Footstool	66
Forest tree seedling planting tray	38
Garden trellis	78
Glue	14
Hall tree	42
Kitchen rack	29
Kitchen utensil holder	77
Lap board	56
Leather lace cutter	54
Linseed oil	85
Materials	4
Milk stool	52
Miter box	25
Nails	12
Necktie holders	63
Necktie rack	40, 41
Other crafts	79
Paint	87
Penholder	44
Pipe racks	54
Plastics	81
Plywood	43
Portable sewing cabinet	78
Reading drawings	10
Recipe file box	36
Reference material), 100
Report	89
Requirements	2
Rope maker	68

INDEX

	PAGE
Sack holder	70
Sandpapering	11
Sawhorse	73
Seissors holder	35
Screws	13
Sealers	86
Serving trays	59
Shoe rack	30
Shoe shine box	32
Shopping memorandum	50
Sign board	76
Silverware tray	62
Sleeve board	23
Smoking stand	42
Soap chips container	39

	PAGE
Spice box shelf	26
Stains	85
Tools	3
Trough for swine	. 22
Value 2nd year articles	90
Wall book shelf	27
Wall shelf	50
Wastepaper basket	67
Wax	86
Weather vanes	47
Wood characteristics and	
properties	5-9
Wood fillers	85
Wood finishing	82

102

4-H CLUB MOTTO "To Make the Best Better"



4-H CLUB COLORS Green and White

4-H CLUB PLEDGE

I pledge

My head to clearer thinking,

My heart to greater loyalty,

My hands to larger service and

My health to better living

For

My Club My Community and My Country.

Cooperative extension work in agriculture and home economics. Michigan State College and the U.S. Department of Agriculture, cooperating. D. B. Varner, Director, Cooperative Extension Service, Michigan State College, East Lansing. Printed and distributed under Acts of Congress, May 8 and June 30, 1914.

5RV 8-54:20M