the wood. This is of utmost importance for as soon as the rubber rests on the polish it will stick. Keep the rubber moving from one place to another. When you have gone over the wood once, allow it half an hour or more to dry. If the pores are not filled the operation will have to be repeated, using the pumice stone and the polish as before. It may often require several coats of polish to fill a wood as open-grained as walnut, while many more will be needed for oak or chestnut. Each coat should be rubbed down with very fine sandpaper after it is dry. The more coats that are added, the longer time will be necessary for each one to dry. The first application may dry sufficiently to rub within 30 minutes, but the second should be allowed to remain at least an hour.

After the grain of the wood has been well-filled with shellac and pumice stone, the next operation is to obtain a good body of polish on the wood. This process involves more care than the first. The polish should be heavy in body, almost as thick as that used in the first process. The method of applying is similar to that which has been described, but great care must be taken lest the undercoat be picked up on the rubber. New rubbers will be necessary because the rubbing surface of the old one will probably be badly frayed or worn. Take the cone shaped wadding from the rubber and moisten it with polish. Replace the outside cloth and begin as before with a good full circular sweep, taking care not to go over the path of the rubber for a second time. As the rubber loses its moisture it will be necessary to press gradually harder. In case the rubber gets dry it will be necessary to stop and recharge it as often as needed.

The polish which has been applied in this manner will now be full of ridges and a circle of lines which the rubber has left in its path. These must be removed. First allow the body of the polish to harden thoroughly. It will be better if the work could be left for at least a day before the next operation is commenced.

Be sure that the rubber is in good condition with a smooth surface and a firm shape. This time use a thinner shellac, for the purpose is not to build up a polish but to smooth that which has already been applied. If prepared shellac is used, thin this with about an equal part of denatured alcohol and stir well. Remove the cone from the rubber and apply only a little polish to it and wrap it up. A little oil should be applied to the sole of it, and the rubbing begins lightly with a circular motion in the opposite direction to that which was used before. This will help to smooth the ridges left by the former process. Look at the sole o shiny. If it is shiny, you are another place in the wrappir and rub as before. Do not a this part of the process and the surface by pressing harde ing will take a long time, and interval. Never continue to w the surface of your work is even longer. It will then b process. The same rubber w again be used if it is smooth all the oil from the polish an free from all rubber marks a this procedure, but the cornpure alcohol. Merely moister spread this over the rubber up oil in this process. In this s dry a rubber than one which allow the wood to dry freque stake, and you may either ma

SHARPEN

Handicraft club members nicked, or improperly sharper pride in his tools and derives when they are in the prope members should be able to boys may visit an experienc communities to get first-hand in keeping a set of tools in a grindstone, an oil or carbo flat file, a saw jointer and a s process. Look at the sole of the rubber often to see whether it is shiny. If it is shiny, you are using too much oil. Change the cone to another place in the wrapping and decrease the amount of oil used and rub as before. Do not allow the rubber to become very dry in this part of the process and do not attempt to smooth a soft part of the surface by pressing harder on the rubber. This part of the polishing will take a long time, and each of it must be followed by a drying interval. Never continue to work on a "tacky" or sticky surface. When the surface of your work is smooth, set it aside to dry for a day or even longer. It will then be ready for the final or "spiriting out" process. The same rubber which was used for the last process may again be used if it is smooth and soft. The purpose now is to remove all the oil from the polish and to make a beautiful varnished surface free from all rubber marks and flaws. No polish is generally used in this procedure, but the corner of the rubber is just moistened with pure alcohol. Merely moisten the palm of the hand with alcohol and spread this over the rubber upon the moistened palm. Do not use any oil in this process. In this step of finishing it is better to have too dry a rubber than one which is too moist. Take time in polishing and allow the wood to dry frequently. The beauty of the polish is now at stake, and you may either make or mar it.

SHARPENING SHOP TOOLS

Handicraft club members cannot do their best work with dull, nicked, or improperly sharpened tools. A good workman takes great pride in his tools and derives pleasure and satisfaction in using them when they are in the proper condition. Advanced handicraft club members should be able to keep their tools this way. Perhaps the boys may visit an experienced carpenter or cabinet maker in their communities to get first-hand knowledge of the various methods used in keeping a set of tools in condition. The special tools needed are a grindstone, an oil or carborundum stone, a three-cornered file, a flat file, a saw jointer and a saw set.







Fig. 8

ly. (Note gullies and flat top are still uneven.)

A: AMININ

Views of crosscut and rip-

saw teeth jointed down even-

Fig. 10

Ripsaw teeth jointed and shaped ready for setting.

Five steps are usually nece ening a saw:

1. Jointing. The saw is p right. A flat file is placed in a s ride the teeth and remove all

2. Shaping Teeth. All the and shape. Place a corner of t the teeth and file straight acro finished side of a tooth comes

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Fig. 11

Five steps are usually necessary in doing a complete job of sharpening a saw:

1. Jointing. The saw is placed in a vise with the handle to the right. A flat file is placed in a small clamp or saw jointer. The file will ride the teeth and remove all high points, making them all even.

2. Shaping Teeth. All the teeth of a saw should be of uniform size and shape. Place a corner of the triangular file in the gullet between the teeth and file straight across the blade at a right angle until the finished side of a tooth comes up to a point. Go on to the next gullet

and cut it down in a similar manner. Proceed in this fashion until the entire blade is shaped. Be sure to hold the file square and level and work at right angles to the blade so that the teeth will be cut out square and pointed. When all teeth are shaped and of equal height they are ready to be set.

3. Setting. This consists of bending the points alternately, one

to the right, the next to the left, thus causing the saw to cut a channel which is slightly wider than the thickness of the blade. Best results in setting will be obtained if the saw set is used. This tool is adjustable, and is set so that about one-third to one-half of the tooth is bent. This will be plenty for most saws. It is much easier to set the saw from one side at a time, setting every other tooth



Fig. 12. A lever saw set. (Screws adjusted to correspond with number of teeth per inch.)

in the same direction. When one side is completed the saw may be reversed, and the alternate teeth set in the opposite direction to the others.

4. Filing. Filing should point and shape the teeth at the proper angle so that they will cut the wood easily. Three-cornered files are used for this purpose.



Fig. 14. This shows ripsaw teeth ready to finish. After jointing, shaping and setting ripsaws the pitch in rip teeth should be as shown in illustration No. 14.

With the saw teeth properly jointed and set you are now ready for finishing or pointing up and beveling. Fig. 13. This shows crosscut teeth set ready to file. The teeth are even, properly shaped and set. Inspect the illustration carefully and note that the teeth are set about two-thirds the distance from point to the gullet. In general crosscut saws are tools made up of a series of "sharp knives" so arranged as to sever the fibers of the wood across the grain as shown in illustration No. 15.



A. Crosscut Saws. Teeth are saw in a clamp or vise (handle to the right) so that the teeth of the saw are just a trifle above the vise. Hold the file so that the handle is at about a 45-degree angle to the blade of the saw. The thumb of the right hand should be on top of the file handle, and the tip of the file held between the thumb and fore-finger of the left hand. Hold the file level and push it evenly through the gullets at about a 45-degree angle, bringing the tooth to the right and the one to the left of the file to a point at the same time, but beveled in the opposite direction.

The file should cut only on the push stroke. Continue the file in every other gullet, skipping the

Fig. 15

other gullet, skipping the one between until the end of the then reversed in the vise and file omitted the first time. The file n all teeth and each tooth brought

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133

A. Crosscut Saws. Teeth are given beveled edges. Place the

saw in a clamp or vise (handle to the right) so that the teeth of the saw are just a trifle above the vise. Hold the file so that the handle is at about a 45-degree angle to the blade of the saw. The thumb of the right hand should be on top of the file handle, and the tip of the file held between the thumb and fore-finger of the left hand. Hold the file level and push it evenly through the gullets at about a 45-degree angle, bringing the tooth to the right and the one to the left of the file to a point at the same time, but beveled in the opposite direction.

The file should cut only on the push stroke. Continue the file in every other gullet, skipping the



Fig. 15. Illustrating the cutting action of properly filed and set saw teeth.

one between until the end of the saw has been reached. The saw is then reversed in the vise and file the alternate gullets which were omitted the first time. The file must be held at the same angle for all teeth and each tooth brought to a sharp point.



Fig. 16. Section showing crosscut saw teeth filed properly with file in correct position for sharpening from left of tooth.

5. Side-dressing. This consists of putting a final touch to the job after the saw has been set and filed. The saw is laid on a flat surface, and a worn file or whetstone is run along each side a few times. This removes the wire edge or unevenness at the point due to the filing. B. **Ripsaws.** Teeth are not beveled, but the file is held at right angle to the saw blade and pushed straight across, making the front edge of the tooth square. Otherwise, the procedure is the same as for crosscut saw Every other tooth is filed from one side, then the saw is reversed, and the remaining teeth are pointed up.



Fig. 17. Same as Fig. 16 but sharpening from the right of tooth.

NOTE: Figures illustrating saw sharpening are used through courtesy of E. C. Atkins and Company, Indianapolis, Indiana.

Wood Chisels

If the chisel is nicked, the nicks are first ground out by holding the cutting edge at a right angle against the grinding stone, the edges ground back squarely to the bottom of the nicks. The chisel is now ready for sharpening. Grind the chisel on the beveled edge only. The length of the bevel will depend upon the type of cutting to be done. For fine work a long bevel with a thin edge is preferred. For general work a bevel of ¹/₄" long is most suitable, which means holding the chisel at about 25- to 30-degree angle to the stone. Continue the grinding until a uniform bevel is obtained and a wire edge has been formed. The corners of the chisel are kept square. After grinding, COOPERATI

hone the chisel to a fine edge of the chisel down, and with a edge. Avoid making any beve sharp by honing occasionally.

Pl

These are sharpened in the with two exceptions – the beve very slightly rounded. The pla angle of 25 to 30 degrees, cutti longer than twice the thickness tant that the bevel be kept s blades should also be honed to

A

These are sharpened by filin a very slim taper file is best, have been damaged, file away tip of the file around the thread do so only on the inside. hone the chisel to a fine edge on an oil-stone; then turn the flat side of the chisel down, and with a few forward strokes remove any wire edge. Avoid making any bevel on the flat side. Chisel may be kept sharp by honing occasionally.

Plane Blades

These are sharpened in the same manner as described for chisels with two exceptions – the bevel should be shorter and the corners are very slightly rounded. The plane blade is held to the grindstone at an angle of 25 to 30 degrees, cutting a bevel about 3/16'' long or slightly longer than twice the thickness of the plane blade. It is very important that the bevel be kept straight and of uniform width. Plane blades should also be honed to remove the wire edge.

Auger Bits

These are sharpened by filing. An especially made auger bit file or a very slim taper file is best. If the tip or edge of the screw points have been damaged, file away the loose part carefully by passing the tip of the file around the threads. If necessary to file the cuttings first, do so only on the inside.

FORMULAS

HARDWOOD CRACK PASTE

(a)
1 part of cornstarch
1 part of wheat flour
1 part of linseed oil
1 part of Japan drier

(b)
1 part of beeswax
1 part of powdered resin
12 parts of either orange or white shellac

STAINS (OIL) NATURAL

2	quarts	of	pure	turpent	tine	
2	quarts	of	raw	linseed	oil	

ntine 1 quart of liquid drier

To this add colors in oil according to proportions outlined below.

Cherry- 1 ¹ / ₂ pints of burnt sienna	Dark Oak	-1 pint raw sienna
Mahogany–1 pint Vandyke brown ½ pint of Rose lake	Walnut-	¹ / ₂ pint burnt umber and a touch of burnt sienna 1 ¹ / ₂ pints of Vandyke brown
Light Oak—1 pint raw sienna ¼ pint raw umber		or 1 pint of burnt sienna and ¼ pint of drop black

STAINING END GRAIN

For staining end grain the stain should be cut down with 3 or 4 parts of naphtha to 1 part of stain. Turpentine or linseed oil may also be applied to the end grain to prevent absorption of too much stain. Try diluted stain on a scrap piece of wood and compare color with flat surface.

FINE SAWDUST AND GLUE

This mixture when made into a thick paste can be packed into the holes of wood. Care should be taken not to smear the glue to the other parts of the surfaces.

STICK SHELLAC

Stick shellac can be purchased in many different colors. It may be applied with a small spatula. To heat the knife, use an alcohol or gas flame. An electric soldering iron is very convenient. When hole is filled and made smooth with hot knife, the rough spots can be scraped with a razor blade and polished. Because of the many unusual stains, they have become exceed purchased in powder form (ana will be necessary to sponge the 24 hours to dry. After drying, with sandpaper to remove all th Better results will be obtained if be necessary in order to get an deeply and it might be suggest vaseline in order to prevent di allow the stain to dry at least 2 essary it may be applied after va has dried it will be necessary to the shellac is thoroughly dried it cannot be used on oil surfaces.

WAX

1 part of beeswax

Apply hot to wood and allow old clothes brush. Several coats

FIL

Use type of fillers to correspon

¹/₂ filler ¹/₂ naphtha or non-leaded gasoline

PASTE

1 part of brown Japan drier

This solution is mixed thoroug make a paste. Any color may be a

WAT

WATER STAIN

Because of the many unusual colors that can be obtained by water stains, they have become exceedingly popular. Water stain should be purchased in powder form (analine). If water stain is to be used it will be necessary to sponge the article with warm water and allow 24 hours to dry. After drying, the article should be rubbed lightly with sandpaper to remove all the fuzz which will be very noticeable. Better results will be obtained if the stain is applied hot and heat will be necessary in order to get an even job. This stain penetrates very deeply and it might be suggested that the hands be greased with vaseline in order to prevent discoloration. It will be necessary to allow the stain to dry at least 24 hours and if a second coat is necessary it may be applied after varied sandings. After the second coat has dried it will be necessary to apply a coat of wash shellac. After the shellac is thoroughly dried it may be sanded lightly. Water stain cannot be used on oil surfaces.

WAX STAINS

1 part of beeswax

8 to 10 parts of turpentine and coloring to suit

Apply hot to wood and allow it to harden. Polish surface with old clothes brush. Several coats will be necessary.

FILLERS

Use type of fillers to correspond with the wood.

¹/₂ filler ¹/₂ naphtha or non-leaded gasoline Number 8-pound cut is recommended for fillers which means 8 pounds filler in 1 gallon naphtha, or 1 dry oz. filler in 1 fluid oz. naphtha or gasoline

PASTE FILLER

1 part of brown Japan drier

2 parts of boiled linseed oil

This solution is mixed thoroughly and enough silex is added to make a paste. Any color may be added to this mixture.

LIQUID FILLERS FOR CLOSE GRAINED WORK

Varnish Filler-inside use-½ pound of fine silica 2 quarts of good varnish

Shellac Filler—inside use— Equal parts of white shellac and denatured alcohol outside use—Varnish and silica to form thin paste—dilute with turpentine to flow easily—one or two coats—rub and add coat or two of spar varnish

SHELLAC WASH COATS

1 part shellac 3 parts denatured alcohol for water stain surfaced and before filling

(b)

(a)

1 part denatured alcohol 2-3 parts shellac

to act as primer for varnish

WAXES

1 part of beeswax

1 part of turpentine

The beeswax is cut into small pieces and allowed to stand overnight in the turpentine.

PASTE WAX

¹/₄ pound of beeswax 1 pound of paraffin ¹/₄ pint of raw linseed oil 1¹/₄ pints of turpentine

Melt the paraffin and beeswax over a slow fire or in a double boiler. Remove from the stove; add linseed oil and turpentine (both are inflammable) and stir vigorously. The congealed wax should be kept in a covered jar. Two thin coats are recommended with each coat rubbed in well. It is recommended that shellac in varnishing should be done over the paint before the wax is applied. One pound of this wax will cover approximately 250 square feet.

PAINT PRIMER

8 to 10 pounds of white lead ^{1/2} gallon of raw linseed oil ¹/₂ gallon of turpentine

SECOND COAT

8 pounds of white lead 1/2 to 3/4 gallon of linseed oil 1 pint of turpentine

THIR

White lead and turpentine as may be obtained by adding 4 p varnish. Add color.

PAINT REI

1 ounce of ammonia

1 ounce of soda lye

PAINT REI

1 cup vinegar¼ can lye1 pint lump starch

Add water to make thin paste stand for five minutes. Remove

VARNISH

(No. 1) 1 quart of benzol 1 quart of denatured alcohol 1 small cake of white paraffin or beeswax

PAINT AND VA

Use equal parts of kerosene solution and wring it almost dr cleaned with the moist cloth. V soft, clean cloth.

ASPHA

1 gallon asphalt

2 ounces of aluminum

FURNITU

(No. 1) 5 parts of spirits of alum 1 part of benite

BLEA

Dark spots may be removed b in one pint of hot water). Apply is poisonous.

THIRD COAT

White lead and turpentine and a drier for flat work - The gloss may be obtained by adding 4 pounds of zinc white in a gallon of varnish. Add color.

PAINT REMOVER NO. 1

1 ounce of ammonia 5 ounces of water glass 1 ounce of soda lye

PAINT REMOVER NO. 2

1 cup vinegar 1/4 can lye

mixed together

1 pint lump starch

Add water to make thin paste. Put it on with an old brush and let stand for five minutes. Remove with cloth or scraping knife.

VARNISH REMOVERS

(No. 1) 1 quart of benzol

(No. 2) 1 part banana oil 2 parts of wood alcohol

1 quart of denatured alcohol 1 small cake of white paraffin or

beeswax

PAINT AND VARNISH CLEANER

Use equal parts of kerosene and vinegar. Dip clean cloth into solution and wring it almost dry. Gently wash the surface to be cleaned with the moist cloth. Wipe the clean surface with a dry, soft, clean cloth.

ASPHALT PAINT

1	gallon	asp	halt	
2	ounces	of	aluminum	

Kerosene enough to make a paste with the aluminum

FURNITURE POLISH

	(No.	1)					(No. 2)	
5 p	parts of spirits	of	alum	1	part	of	boiled linseed	oil
1 p	part of benite			1	part	of	vinegar	
				1	part	of	turpentine	

BLEACHING

Dark spots may be removed by a solution of oxalic acid (2 ounces in one pint of hot water). Apply warm to dark spots. This material is poisonous.

PUTTY

Putty may be purchased already prepared or the ingredients may be obtained and putty made at home. When commercial putty is bought, the best quality should be obtained. The cheaper brands may be adulterated with marble dust to add weight, and kerosene, which is much cheaper than linseed oil. In the homemade putty, make a stiff dough by mixing the best bolted whiting with pure raw linseed oil. (This formula is for pure putty.) The putty that will be slightly harder when dry may be made by taking equal parts of white lead and whiting and mixing with linseed oil. A very hard putty will consist of equal parts of white lead and whiting and mixing with one part turpentine and two parts of linseed oil.

When not being used, putty should be kept in a tight container which will prevent the oil from oxidizing and the putty from becoming hard. It should be laid on tin, glass or porcelain, and not on any substance that will absorb oil, such as wood, paper or concrete. When the putty becomes too stiff to work conveniently, add a few drops of linseed oil, gradually working the putty in the hands until it is the right consistency. If too much oil is added and the putty becomes too soft, work more of the hard putty in with it, or add a little whiting. The linseed oil will oxidize, and the putty will become stiff and hard if exposed to the air for any length of time or laid upon any substance that will absorb the oil. In either event it may be softened by crushing it upon a board with a hammer and applying linseed oil and working it first with the putty knife and finally with the hands. Putty may be colored by working in dry colors, such as lampblack, burnt umber, burnt sienna, or ochre. If the dry colors make the putty too stiff a little linseed oil may be added. Most woods turn darker with age, and putty should be made a little darker than the stain it is matched with. Puttying should never be done until the wood is first primed as the wood absorbs the oil from the putty, and it may later fall out. A primer may be made of equal parts of paint and raw linseed oil. Putty will not take a stain and it is necessary to stain or stain and fill the wood before the putty is colored and used. The putty should be pressed tightly into the holes and filled completely. If this is not done the putty will be very apt to shrink and leave a flaw in the finish. A convenient procedure is to press the putty firmly into the bottom of the hole, and without moving the thumb away, cut the putty with a putty knife which is held in the other hand. The hole will be completely filled, and there will be no shrinkage and no flaw in the finish.

Liquid ar

There are many forms of on the market to be used in fi Most of these are in a putty for upon exposure to the air. Wh wood, having all the propertie liquids or plastic woods will ta without splitting, can be plan in the lathe or worked with a material may be purchased in t the more common furniture w rather difficult for the average the solvent that is used in the results are obtained with either either case the stain should be rubbed with a dry rag, not allo surface. Additional applications wood will absorb the stain the liquid wood and mixed thorou openings of the wood. The av find it more advantageous to bu he is using rather than try to ma Before applying the plastic woo sanded clean and dry. The ad the method of inserting the ma

Fig. 18. When pl wood is put into a without pressin firmly to all sides.

TOOL

Fig. 20. Use a b tool to force the pl wood thoroug against all sides.

Illustrat

Liquid and Plastic Woods

There are many forms of liquid wood that may be purchased on the market to be used in filling the blemishes or holes in wood. Most of these are in a putty form that harden into a likeness of wood upon exposure to the air. When the material hardens it looks like wood, having all the properties of wood except the grain. These liquids or plastic woods will take and hold nails and screws firmly without splitting, can be planed, sawed, sanded and even turned in the lathe or worked with any of the wood-working tools. This material may be purchased in the natural wood and also in colors of the more common furniture woods. Staining these woods will be rather difficult for the average handicraft club member because of the solvent that is used in the preparation. Sometimes satisfactory results are obtained with either an oil or spirits (alcohol) stain, but in either case the stain should be applied with a brush and quickly rubbed with a dry rag, not allowing the material to remain on the surface. Additional applications doubtless will be necessary. If the wood will absorb the stain the color can be added to the plastic or liquid wood and mixed thoroughly before it is inserted into the openings of the wood. The average handicraft club member will find it more advantageous to buy the liquid wood in the color that he is using rather than try to match completely the patch by staining. Before applying the plastic wood the surface should be scraped and sanded clean and dry. The accompanying drawing shows briefly the method of inserting the material into the holes.



Fig. 18. When plastic wood is put into a hole without pressing it firmly to all sides.



Fig. 19. It draws away from the edges as in contracts, and loses its holding surface.



Fig. 20. Use a blunt tool to force the plastic wood thoroughly against all sides. Fig. 21. Remove the tool, fill above the surface with plastic wood, and level it off when hard.

Illustrations, courtesy of A. S. Boyle Co., Cincinnati, Ohio.

WOODS AND THEIR TREATMENT

It is possible to give only a few general rules for the finishing of the more common woods. Because of the many inquiries about finishing, a brief discussion is given to those most frequently used. The handicraft club member must make the application to fit the condition.

Basswood is very light and soft. It is close-grained and will take stain well. Because of the lack of color or graining, the wood is ordinarily painted or enameled.

Beech is hard, heavy, and close-grained. The hardwood varies from reddish brown to almost white. Frequently beech is used as an imitation for walnut and mahogany. Its figure is a trifle prominent for this purpose. Because of hardness it will be difficult to stain, and the best results will be obtained if it is finished in the natural wood.

Birch is increasing in popularity as a furniture wood. Red birch is more valuable than either the yellow or white and has a beautiful reddish brown color. In some respects it is similar to cherry, although not quite so dark. The best imitations of mahogany may be made from this wood. On birch, water stains will raise the grain more than usual. Shellac should be used as a filler and rubbed slightly, and then the surface may be varnished. To finish the birch in the natural color use no oil, filler or varnish. White shellac will probably be the most suitable finish.

Cedar lacks the strength and the firmness of some of the other woods. The native cedar is lighter in weight and softer in composition than some of the furniture woods. Red cedar (Tennessee) is a beautiful wood and is used extensively for making chests and lining drawers and closets. It has a pleasant odor and a beautiful light red color. It is close-grained and soft in texture, but it will take a high polish. Use no stain, filler or varnish directly on the wood. Knots, which are common to it, should be well-smoothed, and any cracks filled with a thick shellac or sawdust and glue mixture. After sanding, apply successive coats of white shellac. Oil, if applied to the wood, will have a tendency to turn it a reddish brown. Varnish will also darken the wood because of its amber cclor. If varnish is to be used it must be applied over the two coats of white shellac which serves both as a surfacer and as a filler. **Cherry.** This is a hard, clo color. The grain has a natural v ing. A stain may be used to gi will hide the beauty of the gi preferred. A filler may be adde (orange) will fasten the color ar be used. French polishing will be used if the surface is not Fi

Cypress. Because of its res. stain and is the one reason for surface. A water stain applied sults. Resinous portions of the coat of shellac before it is pawill not be satisfactory.

Gum. Of the three varieties first is the best to use. It is a so from knots. Stains are used to will not be necessary if shellac is by using a colored liquid filler of and varnish.

Maple. This is one of the h It is strong, close-grained, free h and takes any kind of a stain we is the most common. To finish h face very carefully and apply a filler is needed. When thorough sandpaper or pumice or steel wo be applied, using pumice stone steel wool for rubbing. The last white copal varnish. When dry, water. Never use varnish direct natural. On bird's-eye maple or used. French polishing will also

Mahogany is considered to cabinet woods. Mahogany below resembles some species of cedar more common, consisting of alte One of the easiest ways of color

COOPERATIVE EXTENSION SERVICE

Cherry. This is a hard, close-grained wood of a rich red-brown color. The grain has a natural wave and should be preserved in finishing. A stain may be used to give it the desired color. A deep color will hide the beauty of the grain, so the lighter shades are to be preferred. A filler may be added to obtain a smooth surface. Shellac (orange) will fasten the color and form a base for a varnish if it is to be used. French polishing will give cherry a fine finish. Waxes may be used if the surface is not French polished.

Cypress. Because of its resinous quality this wood is difficult to stain and is the one reason for paint and varnishes peeling from its surface. A water stain applied hot to cypress will give the best results. Resinous portions of the wood should be given at least one coat of shellac before it is painted. Drenching the wood with oil will not be satisfactory.

Gum. Of the three varieties of gum, red, black, and tupelo, the first is the best to use. It is a soft, fine, and close-grained wood, free from knots. Stains are used to bring out the figured portion. Fillers will not be necessary if shellac is used. Dark colors may be obtained by using a colored liquid filler composed of cornstarch, burnt umber, and varnish.

Maple. This is one of the best woods for club members to use. It is strong, close-grained, free from knots and flaws, of even texture and takes any kind of a stain well. The sugar or rock maple probably is the most common. To finish maple in the natural, prepare the surface very carefully and apply a thin coat of white shellac. No other filler is needed. When thoroughly dry rub down the surface with fine sandpaper or pumice or steel wool. Several other coats of shellac may be applied, using pumice stone and water instead of sandpaper or steel wool for rubbing. The last coat may be either white shellac or white copal varnish. When dry, rub to a gloss with pumice stone and water. Never use varnish directly upon maple which is to be finished natural. On bird's-eye maple or curly maple this same finish may be used. French polishing will also give a fine gloss to the wood.

Mahogany is considered to be the most valuable of commercial cabinet woods. Mahogany belongs to the cedar family of trees and resembles some species of cedars closely. The "stripy" figure is the more common, consisting of alternate stripes of dark and light wood. One of the easiest ways of coloring mahogany is to apply a coat of

raw linseed oil. The oil may be colored if a darker shade is desired. Mahogany, however, should not be heavily stained as a slight difference in the color or texture of the wood will affect materially the final results of staining. For this reason formulas will not act alike in all cases. Never apply stain to the wood until you have tested it carefully on similar pieces of wood. If oil is used as a natural finish, the pores will absorb enough to act as a filler. Shellac should be added after the oil and rubbed. Shellac will act as the final filler and also as a "grab" coat for the varnish if this is desired. If stains are applied, fillers should be used as mahogany is a very open-grained wood. A varnished or a polished surface will add to the beauty of the finish.

Oak. Of all the species of oak the most common are red, white, and burr. They all vary in size, color and compactness of grain, but all are common as cabinet woods. Because of the prominent medullary ray a desirable figure is obtained when the oak is quarter-sawed. Stains can be used on all oaks according to the individual taste. They may be diluted to give very little color, or darkened to almost any shade. A dilute mixture of a dark filler rubbed over the surface and given a coat of orange shellac will produce a golden oak finish, while a heavy shade of walnut stain or a dark filler and then a coat of shellac will make a dark oak stain. Because of its pores oak must be well filled in order to have a smooth surface.

Pine. Many of the species of pine are useful in outside work, but only a few are readily adapted to the needs of furniture making. All pines are more or less resinous, and such surfaces and knotty areas should always be shellacked to prevent "bleeding" through. A pine may be stained any color, but will be more satisfactory if painted or enameled.

Poplar. This wood is generally used in construction where paint or enamel is to be the final finish. Because of its greenish streaks in the wood, it does not blend itself toward a uniform stain.

Redwood is a coarse-grained wood of very strong color. Oil stains of the darker shades are used to obtain different effects between red and brown. Allow some time for the stain to sink in, but wipe it dry with a cloth before it is entirely dry. A base filler should also be used in getting a smooth surface.

Walnut is considered by wood. Therefore, the color of brought out rather than hidden methods of finishing walnut a almost entirely, and the other uniform color. Shellac, waxes, either case. To some people th to others it is objectionable. effect on any dark wood and m any of the ordinary accidents w be renewed like wax from tim surface. This particular meththe subject of "Oil Polishing". to apply stain, filler, shellac and Frequently there is a differen used to make the shade uniform of one ounce of dry filler to on pores and to make a smooth s the finish. After rubbing, varni

DEMO

One of the best methods of members or other groups is the member learns by doing is usue through books or lectures. All of and the team demonstration bre by club members.

A demonstration is usually a a team, limiting their work to so strations should frequently be afford the members opportunit and confidence. For local club by individuals. This will give the team to represent the club.

In a successful demonstration all the time, the discussion bein order to present their topics put their subject, have proper equivide the demonstration into

COOPERATIVE EXTENSION SERVICE

Walnut is considered by many to be America's most beautiful wood. Therefore, the color of the wood and the graining should be brought out rather than hidden by the finish. The two most common methods of finishing walnut are the natural finish where oil is used almost entirely, and the other where stains are applied to make a uniform color. Shellac, waxes, or even varnishes may be used after either case. To some people the natural finish will be preferred, while to others it is objectionable. Oil has a beautifying and darkening effect on any dark wood and more so upon walnut. It is proof against any of the ordinary accidents which may spoil other finishes. Oil may be renewed like wax from time to time by merely rubbing over the surface. This particular method is explained more in detail under the subject of "Oil Polishing". The other method commonly used is to apply stain, filler, shellac and then varnish or wax, or perhaps both. Frequently there is a difference in color of boards, and a stain is used to make the shade uniform. A dark paste filler in the proportion of one ounce of dry filler to one ounce of gasoline is added to fill the pores and to make a smooth surface. A coat of shellac will add to the finish. After rubbing, varnish, wax, or both may be used.

DEMONSTRATIONS

One of the best methods of presenting various subjects to club members or other groups is through a demonstration. 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, as 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.

A demonstration encourages the development of the team members in originality, initiative, poise, personality, accuracy in knowledge of subject and ability to think, speak and act before an audience.

A demonstration, if well chosen and well given, tends to arouse interest in some phase of the subject.

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 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 things may be suggestive in developing a team.

(A) THE TEAM -

Members must be enrolled in project in which they are demonstrating.

1. Members of about the same height and ability usually work well together.

2. Cheerfulness and enthusiasm will invite the confidence of the audience.

3. Speak clearly, easily, not too fast, and just loudly enough to be heard well.

4. The use of good English is important to the success of the demonstration.

5. Stand erect and talk to the audience.

6. Wearing apparel should be simple, clean, and practical. Shoes should be appropriate for the occasion.

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7. The amount of work t will be divided as nearly equ Each member of the team, h stration and be able to take

8. The team, not the lead check it at the beginning an

9. The demonstration ta

working space in full view of the team should leave that s

10. Members should make

(B) THE DEMONSTRATION -

Divide the demonstration

1. Introduction – One me mate and himself, telling whe to demonstrate.



Demonstratio

7. The amount of work to be done and explanations to be made will be divided as nearly equally as possible between the members. Each member of the team, however, should know the entire demonstration and be able to take it up if necessary.

8. The team, not the leader should make a list of equipment and check it at the beginning and at the close of each demonstration.

9. The demonstration table should be well arranged, and the working space in full view of the audience. After each demonstration the team should leave that space in order for the next team.

10. Members should make their moves count. Do not "putter".

(B) THE DEMONSTRATION -

Divide the demonstration into three parts:

1. Introduction – One member of the team introduces his teammate and himself, telling where they are from and what they intend to demonstrate.



Demonstration of Steps in Finishing.

2. *Demonstration* – Outline what is to be done step by step; what is to be explained with each step; how to do it, and in some cases, why.

3. Conclusion - A brief summary covering the important steps of the demonstration will leave the audience better satisfied. Questions should be invited and answers cheerfully given.

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.

(C) PREPARATION OF DEMONSTRATION -

1. The subject selected should be practical.

2. Demonstrations may deal with any phase of the present or past projects taken by the club members.

3. The phase to be developed should be covered thoroughly, giving enough explanation to prove the points.

4. Members should study their subject well, looking up material from reliable sources before starting to write the demonstration.

5. Illustrative material should be large enough to be seen clearly 30 feet away. Posters, charts, samples, or other means of illustrating the subject adds interest.

6. Make or obtain the necessary illustrative material.

7. Write the demonstration, giving due attention to what is being said and done at the same time. (See Method of Procedure.)

8. Team members should be accurate in their subject matter, cool in emergencies, willing to take suggestions, profit by criticisms, willing to work, and give much time to practice.

9. Know the demonstration but do not "memorize" it.

(D) CONCLUSION -

A summary of the demonstration, emphasizing the important steps, leaves a more complete picture of the entire process before the audience.

Ask for questions, accept them cordially, answer them courteously. It is well to re-state the question or answer it in such a way that everyone will know what question was asked.

If the team is not able to answer the question, refer the person to a bulletin or other reference where the answer may be found. If the team promises to look up the and notify the person as soon

Leader's Pa

A leader may be of real a him to participate in a demon in planning a demonstration by stration, obtain the illustrative equipment, prepare the space demonstration has been given.

Suggestions for improveme expected from the leader.

A real leader never prompts

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Subject

List

Demonstrator A

Introduction. Greeting by A or B.

Introduction of members by eit demonstrator.

Statement of subject and purpose. (Given by either.)

Demonstration. Development of subject by discussi Steps in logical order.

Work to correspond. Charts or other materials to she add interest.

Working space should be kept order clean and in full view of audience. (By either.)

Conclusion—By A or B. Summary.

Questions.

Concluding Statement. (By either.)

team promises to look up the answer, it should keep that promise and notify the person as soon as the answer is found.

Leader's Part in Demonstration

A leader may be of real assistance to a club member in urging him to participate in a demonstration. The leader may assist a team in planning a demonstration but should let the team write the demonstration, obtain the illustrative material, make a list of the necessary equipment, prepare the space and clear away everything after the demonstration has been given.

Suggestions for improvement, corrections, and comments may be expected from the leader.

A real leader never prompts nor signals to a team.

Method of Procedure

Subject of Demonstration

List of Equipment

Demonstrator A	Demonstrator B	
Introduction. Greeting by A or B.		
Introduction of members by either demonstrator.	Acknowledgment of introduction.	
Statement of subject and purpose. (Given by either.)	Preparation of necessary materials. (By either member.)	
Demonstration. Development of subject by discussion. Steps in logical order.	Work being done to correspond to steps in discussion.	
	Discussion resumed developing new phase of subject.	
Work to correspond. Charts or other materials to show, add interest.	Person talking may also work.	
Working space should be kept orderly, clean and in full view of audience. (By either.)	Discussion and work alternated until demon- stration is completed.	
Conclusion—By A or B. Summary.		
Questions.	Questions usually answered by person who	
Concluding Statement. (By either.)	discussed the phase to which question per- tains.	

SUGGESTED OUTLINE FOR A PAINTING DEMONSTRATION

Demonstrator A	Demonstrator B
Introduction. Brief talk on club work as carried on in our community. Title of demonstration. Importance of this topic.	Acknowledges introduction. Gets materials ready. Shows material mentioned by team-mate.
Shows how to plane, sand, wipe, fill cracks, putty, plastic wood. Apply shellac coat to knotty or resinous sections.	Discussion of how to prepare surface for painting. (a) wood (b) others If time permits might take up the removal of old paint.
How to estimate the quantity of paint needed. Spreading rates. Estimating requirements.	Shows charts on subject. May apply paint to various surfaces. Color charts.
Discuss paint materials, base, pigments, and vehicle. Importance of good material.	Show ingredients of paint. Reading of printed material on paint can show composition. May mix simple paints.
Have samples of several kinds of paint. Show labels on paint cans to emphasize contents. Help teammate to prepare home-made paint.	Mixed and home-made paints—advantages, disadvantages. Testing quality of paints. Equipment necessary for home mixing. Tell how to prepare at least one home-made paint. Value of thinners, driers.
Summarize demonstration. Provide opportunity for audience to ask questions.	Assist teammate in summary and answers to questions. Collect materials.

Reference: U.S.D.A. Bulletin 1452.

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SUGGESTED OUTLINE FOR

De	mor	etr	ator	A
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Introduction. Appropriateness of demonstration. Importance of finish. 4-H Handicraft standards. Differences in woods with reference to f Expensive hard woods. Cheaper woods.

Shows samples with defects. Work t them ready. Fill cracks, holes. Wipe surfaces with (turpentine) moist cloth.

Use of stains and fillers. Classes of stains and how made. Application. Comments on fillers. Application and wping of fillers. Value of shellac. As a wash. As a filler—grab coat. Use on sappy knots or resinous section Applies wash coat and shellac. Shows panels of varnished and enam

Applies wax to old panels. Charts showing ingredients of home-n waxes.

Summarizes demonstration. Answers questions.

SUGGESTED OUTLINE FOR WOOD FINISHING DEMONSTRATION

Demonstrator A	Demonstrator B
Introduction. Appropriateness of demonstration. Importance of finish. 4-H Handicraft standards. Differences in woods with reference to finish. Expensive hard woods. Cheaper woods.	Acknowledge introducticn. Show several previously prepared panels, or small handicraft articles. Wood samples.
Shows samples with defects. Work to get them ready. Fill cracks, holes. Wipe surfaces with (turpentine) moistened cloth.	Discuss importance of preparing the wood for finishing. Smoothing. Grease spots. Excess glue. Dents. Holes or cracks. Final smoothing.
Use of stains and fillers. Classes of stains and how made. Application. Comments on fillers. Application and wiping of fillers. Value of shellac. As a wash. As a filler—grab coat. Use on sappy knots or resinous sections. Applies wash coat and shellac.	Shows sample stains. Mix one to show method. Prepares filler for partner. Prepares a shellac wash coat. 1 part shellac and 3-4 of wood alcohol. Shows samples and illustrative material.
Shows panels of varnished and enameled surfaces in process of completion. Applies wax to old panels. Charts showing ingredients of home-made waxes.	Discusses varnish and enamels. Conditions necessary. Value and importance of wax. Home-made waxes. Selection and care of brushes. Brushes may be cleaned if time permits.
Summarizes demonstration. Answers questions.	Helps teammate with questions. Collects materials.

COOPERATIVE E

MICHIGAN STATE COLLEGE

SUGGESTED OUTLINE FOR DEMONSTRATION ON CONSTRUCTION OF ARTICLES

Demonstrator A	Demonstrator B
Introduction. Brief talk on club work. Title and purpose of demonstration. Explains about article to be made and tools to be used in work.	Acknowledges introduction. Hangs up charts. Arranges equipment. Shows completed article. Starts working on various pieces.
Pieces may be cut, smoothed and fitted. If they are already out, enough work should be done on them to demonstrate methods.	Explains the working drawings of the article. Purposes of drawings. Three dimensions of pieces. Dotted lines. Work in cutting, squaring and assembly of article.
Explains the assembly of article. Use of nails, screws and hardware. Tell briefly the steps necessary before article is ready for finishing.	Shows pieces made. Refers to charts to check measurements. Sands lightly the surfaces. May use crack filler, plastic wood.
Shows completed article. Arranges tools and equipment.	Summarizes demonstration. Gives opportunity for audience to ask questions.

Both demonstrators clean up the work bench and arrange equipment.

SUGGESTED OUTLINE FOR A

Speaker A

Introduces himself and teammate in some novel way.
Duisf toll an alub mark on comind on in th
nation state and the community.
Demonstration is part of club work.
Nature and purpose of demonstration.
Assists by showing parts of saw, pointing out differences as found and mentioned by speaker B.
Shows good and bad features of saws a mentioned by his partner.

Jointing. Proper set for good work, and different types of lumber.

Demonstrates how to hold file and shows chart.

Tells how to file ripsaw.

Clears bench and prepares to help his partner answer any questions that may be asked.

Suggestions for

- 1. Demonstrators should face t
- 2. Make the talks by each dem
- 3. Make the demonstration sm
- 4. The demonstrators should be giving the explanation.
- 5. Have something to say rath
- 6. A demonstration should be an of subject matter so that the the manner of presentation a
- 7. Never stand in front of you ested in seeing as well as h
- 8. If unable to answer the que rious publications on carpent or other text books on the s

SUGGESTED OUTLINE FOR A SAW FILING DEMONSTRATION

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. Shows 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 part- ner answer any questions that may be asked.	Summarizes points. Asks if there are any questions. Closes.

Suggestions for Demonstrators

- 1. Demonstrators should face the audience at all times.
- 2. Make the talks by each demonstrator as natural as possible.
- 3. Make the demonstration smooth and rapid; avoid delays.
- 4. The demonstrators should be busy at all times either working or giving the explanation.
- 5. Have something to say rather than have to say something.
- 6. A demonstration should be an interesting and natural presentation of subject matter so that those hearing it will be entertained by the manner of presentation and instructed by the information.
- 7. Never stand in front of your work. The audience will be interested in seeing as well as hearing.
- 8. If unable to answer the question, refer the questioner to the various publications on carpentry work—the handicraft club bulletin or other text books on the subject.

- 9. Courteously avoid answering questions that do not pertain to the work.
- 10. Team members do not have to be 15 years of age to represent their county at the district contests, but those making the trips to Michigan State Fair and the National Club Congress should be near this age.

Measuring Results of the Demonstration

Club members should look for the standards in a score card and measure their results according to these standards. In the same way a team demonstration may be judged.

In competitive demonstration contests it is almost essential to have an outline of some form or a score card to use in order to evaluate the main parts of the demonstration.

The following score card is given as a guide in judging demonstrations:

A. Subject Matter.

Importance with relation to problems of farm or home. 1.

- 2. Accuracy of statements.
- 3. Approved methods.
- Completeness. Giving steps necessary to understand the process. 4.
- 5. Clearness and definiteness of statements on subject outlined.
- 6. Replies to questions.

Presentation. B.

40%

30%

1. 2. 3. 4. 5. 6.	Preparation, arrangement and use of material. Organization of the work. Appearance and conduct of demonstrators. Skill shown by team. Ease of speech and system in procedure. Workmanship.	
Results	•	15%
1. 2. 3.	Effect upon audience. All processes made clear. Summarization.	
Practic	ability.	15%
1. 2. 3.	To demonstrators' own community. To show an actual or needed club practice. Value to other handicraft members.	

Other Dem

- 1. How to sharpen a plane.
- 2. The use of the miter box,
- 3. The correct way to use a h bit and other tools.
- 4. The making of a dove-tail
- 5. The construction of any an
- 6. The way to use a bench h
- 7. Demonstrate use of a T-b
- 8. Bending wood for skis, or
- 9. Stain, shellac, or varnish of
- 10. How to file a cut-off and a
- 11. Cleaning paint brushes.
- 12. Preparing home-made pair
- 13. Refinishing furniture.
- 14. Weaving and recaning.
- 15. Tying knots and splicing r

WOOD IDENTI

The purpose of this contest of Michigan's commercial woo properties and uses. Knowledg craft members when they com The type of finish to apply will of the wood.

Detailed information about 4-H Club Bulletin 26, "Wood] craft clubs may obtain from th 14 wood samples for this study

The wood identification co achievement day. It is option members, but all are urged to scoring boys in the county cont district elimination contests. A lected to go to the Michigan Sta The two highest individuals in to the National Club Congress

1	F 4
л	J 4
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C.

D.

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 ripsaw.
- 11. Cleaning paint brushes.
- 12. Preparing home-made paints.
- 13. Refinishing furniture.
- 14. Weaving and recaning.
- 15. Tying knots and splicing rope.

WOOD IDENTIFICATION CONTEST

The purpose of this contest is to stimulate an interest in the study of Michigan's commercial woods and to learn their characteristics, properties and uses. Knowledge of woods will be of value to handicraft members when they come to select lumber for their articles. The type of finish to apply will largely be determined by the nature of the wood.

Detailed information about wood identification can be found in 4-H Club Bulletin 26, "Wood Identification for 4-H Clubs". Handicraft clubs may obtain from their county extension agent a box of 14 wood samples for this study.

The wood identification contest is held sometime during the achievement day. It is optional with handicraft and forestry club members, but all are urged to participate. The two or three highest scoring boys in the county contest will be eligible to compete in the district elimination contests. At these events eight boys will be selected to go to the Michigan State Fair to compete in the state contest. The two highest individuals in the state contest are eligible to go to the National Club Congress in Chicago, Ill.



Courtesy, The Detroit Edison Company 4-H Achievement Day Exhibit.

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 now conducted as allcounty 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 years' 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 exhibit 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.

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 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 character-

COOPERATIVE

istics of Michigan's common we kind could be given by some me ple exercise, sharpening tools, re

> Talk: What I Think of Hand Talk: What I Think of Hand Club Songs. Instrumental Music. Reading the best story of th Judge of Exhibits. Social Hour – Games, lunch,

HANDICRAFT

The club meetings should h

- 1. The business or formal part learned and used.
- 2. Subject matter: Discussions, of interest to the members.
- 3. Social or recreational: Songs tertainment.

Besides the regular work per business meetings during the sea vanced work, more time and atte

The discussions will naturally and its individual members, as w A discussion leader may be apported meeting in order to have someth of interest to the members ma A few suggestions are offered:

- 1. What are the aims of 4-H h
- 2. What relation does the proj home life?
- 3. Why is "good housekeeping
- 4. Suggest standards for good
- 5. What factors did you use in
- 6. Should a farmer have a wor

istics 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.
Reading the best story of the Handicraft Club Members.
Judge of Exhibits.

Social Hour – Games, lunch, etc.

HANDICRAFT CLUB MEETINGS

The club meetings should have three definite purposes:

- 1. The business or formal part in which parliamentary practices are learned and used.
- 2. Subject matter: Discussions, demonstrations, talks on the subject of interest to the members.
- 3. Social or recreational: Songs, games and other forms of social entertainment.

Besides the regular work periods, the club should hold at least six business meetings during the season. Because of the nature of the advanced work, more time and attention should be given to discussions.

The discussions will naturally depend upon the interest of the club and its individual members, as well as the nature of the work at hand. A discussion leader may be appointed or selected in advance for each meeting in order to have something definite prepared. Most anything of interest to the members may be used as topics for discussions. A few suggestions are offered:

- 1. What are the aims of 4-H handicraft work?
- 2. What relation does the project have to club members' farm and home life?
- 3. Why is "good housekeeping" necessary to the shop?
- 4. Suggest standards for good workmanship.
- 5. What factors did you use in selecting your projects?
- 6. Should a farmer have a workshop? Why?

- 7. Farmer Jones has \$10 to spend for tools. What tools would you recommend that he purchase?
- 8. What are the requirements of good lumber?
- 9. Why is lumber graded? What are the grades?
- 10. What is the penny system?
- 11. Name some precautions in the care of tools.
- 12. What equipment is necessary for sharpening tools?
- 13. Describe each of the five methods used in sharpening a hand saw.
- 14. Figure out the number of board feet and total cost of:

No. Piece	Kind of Wood	No. Bd. Ft.	Price per M.	Total Cost
1	H. Maple		\$3 6	
1	B. Walnut		220	
4	Basswood		40	
4	White Pine		55	

- 15. What ingredients are found in paint and what is the use of each?
- 16. Should ready-mixed or home-made paint be used?
- 17. What kind of paint would you recommend for: House, chicken coop, hayrack, wagon box, kitchen cabinet, garage, hog trough, bathroom walls, unfinished furniture?
- 18. Suggest methods for cleaning paint brushes.
- 19. What factors must be considered in choosing a finish?
- 20. What are some of the common kinds of finishes?
- 21. How should the wood be prepared for finishing?
- 22. What are the kinds of stain? How may they be applied?
- 23. What are fillers?
- 24. What procedure should be followed in applying shellac and varnish?
- 25. What is meant by an oil finish?
- 26. What are the objects of using wax?
- 27. How should old finishes be removed?
- 28. What steps would you recommend in refinishing an old enameled black walnut chest?
- 29. What is meant by the term "bleeding" in finishing?

COOPERATIVE

- 30. Name three common kinds
- 31. What are some advantages work at the school house?
- 32. The advantages of power
- 33. The value of home-made
- 34. How can the school board
- 35. Should prizes be given for
- 36. Give requirements of a good
- 37. Should the wood identificat

REPORT

The report is a definite re blank will be furnished each t be summarized. This report f exercises at the 4-H club achie

Each club member should supplies, nails, screws, and other each article.

If you have a camera take s onstration team, exhibits, or an add to the value of your report the worthwhile things that you

RECORD OF I

- 1. Date club was organized
- 2. Date first selected exercise was
- 3. Date last selected exercise was
- 4. Was work done at home or at s
- 5. How many meetings did your
- 6. How many did you attend?

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- 30. Name three common kinds of glue.
- 31. What are some advantages and disadvantages of doing handicraft work at the school house?
- 32. The advantages of power machinery for advanced work.
- 33. The value of home-made articles vs. factory-made articles.
- 34. How can the school board help your club?
- 35. Should prizes be given for handicraft work?
- 36. Give requirements of a good bird house.
- 37. Should the wood identification contest be continued and enlarged?

REPORT AND STORY

The report is a definite requirement for completion. A report blank will be furnished each member in order that the work may be summarized. This report form is exhibited with the handicraft exercises at the 4-H club achievement day.

Each club member should know the cost of the lumber, finishing supplies, nails, screws, and other hardware used in the making of each article.

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.

RECORD OF HANDICRAFT WORK

1.	Date club was organized
2.	Date first selected exercise was started
3.	Date last selected exercise was completed
4.	Was work done at home or at school?
5.	How many meetings did your club have?
6.	How many did you attend?

Financial Statement (Example)

No.	Name	Cost of material used	Estimated value
First Exercise	End Table	\$3.55	\$6.00
Second Exercise	Wall Shelf	1.48	3.00
Third Exercise	Tool Box	1.63	3.00
Other Exercises			-
Totals		\$6.66	\$12.00

(Note-Use additional sheet if necessary)

7.	Total Estimated Value of Exercises	\$12.00
8.	Total Cost of Material Used on Exercises	6.66
9.	Total Profit on Exercises	5.34

COST OF MATERIALS

The cost of materials includes not only the amount for lumber but sandpaper, nails, screws, hardware and finishing supplies. If the purchase price of the new lumber is not known, the cost should be figured at 30 cents per foot. Reclaimed or used lumber should be figured at 10 cents per foot. For details on figuring the lumber bill, see page 9.

ESTIMATED VALUES FOR HANDICRAFT ARTICLES

It is impossible to set a definite value upon all of the articles made in the advanced years. These values will vary according to the kind and grade of lumber used; type of hardware selected, and quality of finishes applied. In order that all boys may have a more or less uniform report, the estimated values quoted below may be used. The real value to you will in most cases be much higher, because there is a certain amount of pride and satisfaction in having made the articles yourself. Your club leader should help you estimate the value of other articles which you have made, if they are not in the bulletin.

COOPERATIVE E

Third

Auto creeper	\$3
Bird feeder	3
Bluebird house	1
Bulletin rack	
Bow and arrow\$3.0)0-15
Chickadee house]
Clothes hamper	2
Clothes rack	50
Cupboard	
Curtain, poles and bracket	3
Dairy barn desk	
Dressing bench	6
Folding-screen	3
Foot stool	3
Knife and fork tray	1

Fourth

Barn medicine desk	\$4
Bookcase	5
Book end lamp	3
Book rack	5
Bow and arrow\$3.00	-15
Candle holder	2
Combination table and cupboard	10
Game table	5
Hot lunch cupboard	6
Kitchen helps	4
Kitchen wagon	5
Lawn chairs	7

Fifth, Sixth, and

Red in ashingt	005
bed in cabinet	φΔυ
Bow and arrow	\$3.00-15
Breakfast nook	30
Cabinet bed	25
Cedar chest	20
Chair	10
Chair lamp	7
Dog house	10
Dressing table	30
End table	5
Fences	ouble co
Helm lamp	5
Hog house	25

*Note: This is put in because it it will depend upon height, length,

Third Year Exercises

Auto creeper	\$3.50	Lunch box shelf	\$1.50
Bird feeder	3.00	Magazine rack	3.00
Bluebird house	1.00	Nail box	.75
Bulletin rack	3.00	Pant hanger	1.50
Bow and arrow\$3.00	-15.00	Pedestal	3.50
Chickadee house	1.00	Radiator cover	5.00
Clothes hamper	2.00	Refreshment stand	4.00
Clothes rack	5.00	Rustic gate	3.50
Cupboard	4.50	Stilts	1.50
Curtain, poles and bracket	3.00	Taboret	3.00
Dairy barn desk	3.00	Tool box	3.00
Dressing bench	6.00	Wagon jack	3.50
Folding screen	3.50	Wall lamp	2.50
Foot stool	3.00	Wall shelf	3.00
Knife and fork tray	1.00	Waste paper basket	2.00

Fourth Year Exercises

Barn medicine desk	\$4.00	Mallet	\$1.00
Bookcase	5.00	Martin house	5.00
Book end lamp	3.50	Modern end table	5.00
Book rack	5.00	Porch swing	10.00
Bow and arrow \$3.00	-15.00	Sewing cabinet	4.00
Candle holder	2.00	Step ladder	7.50
Combination table and cupboard	10.00	Tool chest	8.00
Game table	5.00	Umbrella stand	3.50
Hot lunch cupboard	6.00	Vanity bench	7.50
Kitchen helps	4.00	Wheeled lawn table	7.50
Kitchen wagon	5.00	Window seat	5.00
Lawn chairs	7.50		

Fifth, Sixth, and Seventh Year Exercises

00 Kitchen table \$7	7.50
00 Library table 15	5.00
00 Modern desk 15	5.00
00 Piano bench 5	5.00
00 Radio end table 10	00.0
00 Round top table 15	5.00
50 Self feeder 10).00
00 Sewing cabinet 10	00.0
00 Spinet desk 25	5.00
00 Studio couch 30).00
t* Telephone stand).00
00 Work bench 15	5.00
00 Writing desk 20).00
	00 Kitchen table \$7 00 Library table 15 00 Modern desk 15 00 Piano bench 55 00 Radio end table 16 00 Round top table 15 00 Self feeder 16 00 Sewing cabinet 16 00 Spinet desk 25 00 Studio couch 36 01 Studio couch 36 02 Studio couch 15 03 Work bench 15 04 Writing desk 26

 $^\circ Note:$ This is put in because it is hard to estimate the cost of fences because it will depend upon height, length, and other things.

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," Griffeth, published by Manual Arts Press, Peoria, Ill.
- "Farm Shop Work," Brayce and Mayne, published by American Book Company, New York, N. Y.
- "Elements of Woodwork and Construction," King, published by American Book Company, New York, N. Y.
- "Agricultural Woodworking," Roehl, published by Bruce Publishing Company, Milwaukee, Wis.
- "Problems in Farm Woodwork," by Blackburn, published by Manual Arts Press, Peoria, Ill.
- "Home Labor Saving Devices," Scott, published by J. P. Lippincott Company, Philadelphia, Pa.
- "Problems in Carpentry," Roehl, published by Webb Publishing Company, St. Paul, Minn.
- "Farm Woodwork," Roehl, published by The Bruce Publishing Company, Milwaukee, Wis.
- "Constructive Carpentry," published by The American Book Company, New York, N. Y.
- "Wood Finishing," Jeffrey, published by The Manual Arts Press, Peoria, Ill.
- "Toy Patterns," Dank, published by The Manual Arts Press, Peoria, Ill.
- "Shop Problems," Series 1-12, Siepert, published by The Manual Arts Press, Peoria, Ill.
- "Boy Activity Projects," 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.

- "Construction and Repa Press, Cambridge, M
- "Agricultural Engineerin Chicago, Ill.
- "Farm Mechanics," (Coo ing Co., Danville, Ill

Magazines:

Home Craftsman, Walke Popular Mechanics, 200 Popular Science, 353 4th Deltagram, 600 E. Vien Fellow Crafters, 739 Boy Home Craft, General Pu

Commercial Literature:

- California Red Wood La Calif.—Agricultural So
- Forest Products Laborat Wood Products.
- National Lumber Mfg. Lumber on the Farm
- Southern Pine Association South Pine and Its U
- Sargent and Company, I
- Squares, Planes, etc.
- Detroit White Lead Wor American Steel and Wire
- E. C. Atkins and Company
- Henry Disston and Sons Saws.
- A. E. Boyle Company, C Plastic Wood.
- National Lead Company Handbook on Painting

- "Agricultural Woodworking," Roehl, Bruce Publishing Company, Milwaukee, Wis.
- "Construction and Repair Work for the Farm," Struch, Riverside Press, Cambridge, Mass.
- "Agricultural Engineering," (Smith), Lippincott, Wabash Avenue, Chicago, Ill.
- "Farm Mechanics," (Cook, Scranton & McColly), Interstate Printing Co., Danville, 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.
- Forest Products Laboratory, Madison, Wis.-Technical No. 240-Wood Products.
- 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 and 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.

- Dutch Kraft Corporation, Grand Rapids, Mich.-Manual on Wood Finishing.
- 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–Manual and Catalogue on Art 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.

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Dowels

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