Home arts course.

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Boston University

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Boston University
BOSTON UNIVERSITY

SCHOOL OF EDUCATION

HOME ARTS COURSE

Submitted by
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In partial fulfillment of requirements for
the degree of Master of Education

1953
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Professor of Education

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Instructor in Education
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HOME ARTS COURSE

The problem of supplying adequate knowledge that will be of direct benefit to the individual pupil of junior high school age seems to many teachers to be of paramount importance. It must be recognized that not all youngsters are adapted for academic subjects. It must also be recognized that many of these nonacademic youngsters, finding school of no particular practical use, tend to become discouraged and look expectantly, not to the schools for aid, but to outside sources. The tremendous number of annual drop outs is adequate testimony to this condition.

It is, therefore, with this problem in mind that this thesis has been developed: to point out at least in part a defect in the educational systems of our time and to indicate the ideas that we must incorporate in the curricula of our schools, if we are to prepare our nonacademic youngsters adequately for competent adult living.

It has been my experience that each pupil of junior high school age has a different inclination, and a desire to do things independently. Perceiving a problem, he conceives a variety of possible solutions, and by experimentation finally solves the problem, at least to his satisfaction. Many of these problems are in the purely
intellectual sphere: mathematical equations, hygienic perplexities, the mysteries of adolescence, etc.

There are many of our pupils who are unable to cope with the didactic problems, who, albeit, have differing talents in other fields, particularly the field of manual dexterity.

It is tragic indeed, that owing to our traditional conception of education, that these people have been sadly neglected.

We see all about us today the results of past failures to meet adequately the needs of people talented only in the realm of manual arts--poor laborers, robbed of opportunities to use their God-given endowments, struggling for a living failing utterly to accomplish what their natural abilities would enable them to do if properly developed.

We, who are present day educators, must take definite and practical steps to insure that no pupil may be subjected to an antiquated system of meribund pedagogy that has for its aim only the inculcation of purely speculative knowledge.

It has often been asserted that the average teacher is unable to adjust sufficiently to the natural demands of the heterogeneous types which he may encounter. This idea should be examined in an objective light and should be rejected for the obvious fallacy that it is. It is conceded that not every teacher can give the solution to every practical problem. He can, in fact, he must, if he is to
fulfil his obligations to the manually talented, point the way to a solution of a given problem or indicate the initial steps that will enable the pupil to proceed.

In addition to satisfying basic interests there is another important element to be considered—economic satisfaction. All of us are beset by the upheavals of a maladjusted economic system. Pecuniary gains and losses are by no means of little importance. We must therefore afford an opportunity for the adult of tomorrow to lessen the demands made on his pocketbook by the carpenter, the plumber, the painter, etc. The specialist has taken full sway, we grant, at the present time. The ancient values which predominated in the times of the founding fathers of our country have vanished like the Indian. Democritus, Michelangelo, Thomas Jefferson, and the myriad of talented folk, able to turn their hands to any and all problems, practical as well as intellectual, are conspicuous by their dearth. To counterbalance this loss, to supply an individual with the minimum knowledge to meet and solve his everyday problems must be our educational ideal.

"The person who said, 'I can repair everything in my home with the telephone,' probably was intelligent, but he was not a practical individual. It is reasonable to assume that if a home owner called in outside help to repair every little failure or breakage, he would need to be a richer man than the average. Besides cost, there is also the factor of inconvenience in having to await the arrival of the particular mechanic required."  

At present in our schools we are increasingly adopting certain procedures, which if pursued thoroughly, may aid in the counterbalancing of our past intellectual tendency. Trade schools, industrial schools, and practical arts courses have been established through the cooperation of superintendents, school authorities and interested townspeople. In our large communities the problem of the manually dexterous pupil in an academic school has been to a great degree obviated by the presence of splendid trade schools, in which boys and girls alike can develop their talents to meet the demands of adult living.

It is with the smaller town, however, that we should be concerned. Here quite often we find being taught under one roof a science course, a shop course for boys, and a domestic arts course for girls. The success of this system is contingent upon the degree of cooperation that exists among the various teachers, the school officials and the townspeople. Adequate space is a prerequisite if all are to work advantageously.

In the community in which the writer teaches, the domestic arts courses for the girls and the shop courses for the boys have been set up in a building completely separated from the academic classrooms. These courses were set up rather recently, with some degree of defiance, by the school officials as an innovation. These courses were regarded as a rather tenuous project; a project whose
desirability must be proved after a prolonged period of experimentation.

The high school courses call for grades seven and eight to take part in some form of domestic arts and shop work. As a result we developed the "Home Arts" course with boys and girls working together in both the domestic arts and the shop classes.

In order to obtain objective criteria on which to base the content of these courses it was thought expedient to mail out a questionnaire to the parents of a selected group and thus determine what these people considered practical. In addition to the questionnaire, interviews were conducted in order to obtain a wider variety of responses than was possible through the questionnaire alone.

From an examination of periodicals, pamphlets, books on practical arts, and suggestions from interested persons, a list of fifty-four pertinent questions was drawn up, the cumulative effect of which, it was hoped, would indicate the underlying opinions for or against the basic aims of the course.

The form used was as follows:

Home Arts Projects

The writer feels it would be very valuable if everyone knew some of the few simple things that they could do around the home. This would make life more enjoyable, more comfortable, and less expensive. If one could do most
of the things listed below, he would be able to save time, money and a great deal of inconvenience.

Will you please check "Yes" if you feel this operation would be of help to a seventh grade pupil. Check "No" if you feel it is not necessary around the home:

Yes  No

1. How to use a wood chisel.
2. How to use drills.
3. How to use glue for general repairs.
4. How to put a new handle in a hammer.
5. How to use a hammer.
6. How to put a new handle in an ax.
7. How to put a new handle in a hoe or spade.
8. How to use a mallet.
9. How to use a plane.
10. How to read and use a ruler.
11. How to use a saw.
12. How to bevel and sharpen a chisel.
13. How to sharpen knives.
14. How to sharpen a plane.
15. How to file and set a cross cut saw.
16. How to file and set a rip saw.
17. How to use a square.
18. How to use wood bits.
19. How to make a simple drawing.
20. How to read a simple drawing.
21. How to clean and lubricate a small electric motor.
<table>
<thead>
<tr>
<th>Yes</th>
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<td>22. How to fix a faulty light switch.</td>
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<td>23. How to install a floor or wall plug.</td>
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<td>24. How to locate and replace a blown fuse.</td>
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<td>25. How to read the electric meter.</td>
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<td>26. How to repair the extension cord used on a flat iron or a toaster.</td>
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<td>27. How to wire an electric lamp.</td>
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<td>28. How to wire an extension cord.</td>
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<td>29. How to adjust and sharpen a pair of shears.</td>
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<tr>
<td>30. How to bevel and sharpen a hoe.</td>
<td></td>
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<td>31. How to shape the blade of a screwdriver.</td>
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<td>32. How to sharpen an ax.</td>
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<td>33. How to use pliers.</td>
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<td>34. How to use a screwdriver.</td>
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<td>35. How to use wrenches.</td>
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<td>36. How to fix doors that stick.</td>
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<td>37. How to install a new lock.</td>
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<td>38. How to install a pair of hinges.</td>
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<td>39. How to paint woodwork in the house.</td>
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<td>40. How to put a new cane seat in a chair.</td>
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<td>41. How to put on a door latch.</td>
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<td>42. How to repair a loose board on steps.</td>
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<td>43. How to solder cooking utensils.</td>
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<td>44. How to tighten loose joints in furniture.</td>
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<td>45. How to varnish woodwork in the house.</td>
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<td>46. How to wax woodwork in the house.</td>
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<tr>
<td>Yes</td>
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<td>47.</td>
<td>How to clean a drain trap.</td>
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<td>48.</td>
<td>How to fix a leaking garden hose.</td>
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<td>49.</td>
<td>How to shut off water in the house draining all pipes.</td>
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<td>50.</td>
<td>How to thaw a frozen water pipe.</td>
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<td>51.</td>
<td>How to cut glass.</td>
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<td>52.</td>
<td>How to glaze a window or a door.</td>
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<td>53.</td>
<td>How to repair a window lock.</td>
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<td>54.</td>
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This set of questions was discussed with and analyzed by fifty-three persons as to their likes and dislikes. The results tell what they felt would be of some value to a pupil in the seventh grade in this community.

The fifty-three forms returned were tallied and each item was placed in order with the highest per cent of "Yes" answers heading the list and on down to the item with the lowest rating.

The results are as follows:

<table>
<thead>
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<th>Per cent of Yes Answers</th>
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<tr>
<td>98</td>
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Per cent of Yes Answers

92  How to repair a loose board on steps.
90  How to use a saw.
90  How to put on a door latch.
88  How to use wood bits.
88  How to use pliers.
88  How to use a screwdriver.
88  How to install a new lock.
88  How to install a pair of hinges.
88  How to tighten loose joints in furniture.
88  How to varnish woodwork in the house.
86  How to use a hammer.
86  How to clean and lubricate a small electric meter.
86  How to fix a faulty light switch.
86  How to wire an electric lamp.
86  How to fix doors that stick.
86  How to thaw a frozen water pipe.
86  How to repair a window lock.
86  How to read and use a ruler.
84  How to put a new handle in a hammer.
84  How to use a mallet.
84  How to sharpen a plane.
84  How to read the electric meter.
84  How to repair the extension cord used on a flat iron or toaster.
84  How to shut off water in the house draining pipes.
Per cent of Yes Answers

82  How to locate and replace a blown fuse.
82  How to paint woodwork in the house.
82  How to cut glass.
80  How to sharpen knives.
80  How to read a simple drawing
80  How to shape the blade of a screwdriver.
80  How to sharpen an ax.
78  How to bevel and sharpen a chisel.
78  How to make a simple drawing.
78  How to wire an extension cord.
78  How to fix a leaking garden hose.
76  How to put a new handle in a hoe or rake.
74  How to put a new handle in an ax.
74  How to install a floor or wall plug.
72  How to solder cooking utensils.
70  How to glaze a window or a door.
68  How to file and set a crosscut saw.
68  How to file and set a ripsaw.
68  How to wax woodwork in the house.
60  How to clean a drain trap.
58  How to bevel and sharpen a hoe.
52  How to adjust and sharpen a pair of shears.
50  How to put a new cane seat in a chair.

From these results the writer has taken all questions that received over 75% positive answers and put them in a
group of lesson plans that one may use as a guide in teaching a "Home Arts" course for the seventh or eighth grade.

The question that received the highest per cent of positive answers was number 54 (How to make useful projects). Even though this had a high rating it could be carried out only by the mastering of some of the other operations; therefore, it is purposely put near the end of the lesson plans.

There are certain basic and fundamental operations that one must learn, but after these are learned by the pupil, he must have a project of interest to bring out his best work. What could be better than a small article designed by the pupil for his or her own use? It takes a little guidance from the teacher, to be sure, but that is his reason for being in school (I hope). We must help the children so that they will be able to help themselves first, and when they can take care of themselves, they will be able to put more time toward helping other people less fortunate than they.
Making Useful Projects

To make useful projects one must learn to use the basic tools and the simple operations come first. There are a great many plans for about all kinds of objects one may wish to make, however I find if I have the student draw his own plans he understands his project better and will do much better work because of this.

We do use a great many plans that are sold or we find in magazines, however we make changes in these plans to fit the need of the student making the project.

Often one sees a picture of a piece of furniture and from this the student should draw the plans to make the object fit his needs.

The projects should have several different kinds of operations and require several types of tools so that the student will learn the proper use and the different operations one can perform with the various tools and materials.
How To Varnish Woodwork In The House

Varnish is applied to a wood surface as a preservative and also to improve its appearance. It forms a hard film on the surface which protects the wood. Varnish is used under a variety of conditions and for different purposes. Varnish is manufactured to suit the conditions and the purpose for which it is intended. Care should be used in buying varnish so that one gets the kind he needs for the job he is doing at the time. When wood is stained or filled, this is done before the varnish is applied.

One should have all materials ready before he starts to work, which will be the varnish, brush, duster, and tack rag.

Thin the varnish by adding one part turpentine to seven parts varnish. Stir and let stand. Keep the varnish warm for best results seventy degrees to ninety degrees.

Remove all dust with a duster and run over surface with a tack rag. Work in a well-ventilated dust-free room.

Flow the varnish over covering the surface well, beginning at the center and working toward the ends. Even up the surface with light feathering strokes working with the grain. Do not let the varnish pile up and do not brush after the varnish becomes sticky enough to cause the brush to drag.

Let the work set for forty-eight hours or longer if there is poor ventilation or damp weather.

For a good rubbed finish three coats of varnish are needed.
How To Put A New Handle In A Hammer

A great many hammers have a handle made of wood. If these are used as is very frequently done the handle will break and it is then necessary to replace the broken part with a new handle to restore the hammer to use again.

The broken handle should be removed and this is done by pulling out the wedge, if metal this is not too difficult. It is then possible to drive the broken handle back out with a punch, old bolt, or some blunt object that will fit inside of the eye of the hammer.

If the handle is still tight or if it is a wedge that cannot be pulled out, one may drill several holes in the end of the handle and it will now drive out.

The new handle is cut down to fit in the eye with a wood file. It should be a snug fit. One should have a saw cut in the end of the handle for a wedge as the eye of the hammer is smaller at the front than at the back. Put in the wedge and the handle will swell out tight against the sides of the eye holding the head on and in place. As the end of the handle is now larger than the opening in the eye of the hammer the head will stay on the handle.
Sharpen And Care Of The Ax

The ax is a very useful tool and is needed around the home. However it must be used with care and in the right manner if one is to be safe and have the best work produced by his efforts with the ax.

Axes come in several shapes and sizes but we will deal with the hatchet and the woodman's ax.

The hatchet is small and has a head of about one and one-half pounds. It is used for chopping small wood, for removing a large amount of wood before planing and for roughing out some types of work. It has a short handle and is used with one hand by swinging with the forearm and wrist.

The woodman's ax has a two and one-half to three and one-half pound head and has a long handle about twenty-four inches to twenty-six inches in length. This ax is used for cutting down trees or for any large amount of chopping in the weeds or around the home. It is used with two hands and one must be careful while using the ax.

Several things one must keep in mind while using the ax or hatchet are:

1. Keep your ax sharp.
2. Keep the handle tight.
3. Do not use it as a hammer (unless it has a special made head for this use).
4. Be sure you have a clear area in which to swing the ax.
To do good work keep the ax sharp and this can be done in several ways. Using a mill file, shape the ax by cutting away some of the steel on each side until there is an angle from the cutting edge on back of about seventy-five degrees. If the ax is too thin it will break, if it is too thick it will not cut at its best. This angle can be put on the ax by a grindstone or an emery wheel. Of the three ways I like the grindstone the best. Care must be taken with the emery wheel or one will burn the ax and draw out all the temper, making the blade useless.

After the angle is ground, take a hand stone, oil, water, or carborundum and rub the stone along the cutting edge in a smooth circular motion until a very fine edge is produced. The ax is now ready for use.

Be sure the handle is tight as the ax could come off of a loose handle and do a great deal of harm.

If the ax is used as a hammer it will swell out the soft metal head and split open the eye making the ax useless.

Be sure you have room in which to swing the ax as a branch or some other object in its path may cause it to miss what you are aiming at and do damage to yourself, someone else, or some object near by.
How To Sharpen A Knife

More people use a knife than any other tool I know of, but very few know how to keep a keen edge on the blade so that one can do his best work at all times.

A good knife blade has the proper bevel when it leaves the factory.

When sharpening a knife we should keep this bevel as near as possible as was on the knife when new.

If a blade is in bad shape one must grind the bevel back to its original shape. This is done by a grindstone, or an emery stone. If the emery stone is used one must be very careful not to ever heat the blade. It should be kept cool by dipping in water very frequently.

After the blade is back to the shape wanted it is now ready for whetting. This is done by using a fine carborundum stone or an oil stone.

Place the blade on the stone at about a twenty degree angle and pull the cutting edge into the stone. This will take several strokes on each side of the blade.

To get a real keen edge use a leather strap or a butchers' steel and one will have a very sharp knife.
How To Install A Pair Of Hinges

Hinges come in a great many sizes and types.

Some of the types are: butt hinge, (loose pin and stationary pin), surface hinge, chest hinge, semi-concealed hinge, and box hinge.

If one can put on a butt hinge, he will be able to handle most jobs around the home or shop that the amateur will take upon himself.

To start with one must pick the kind of hinge for the job and it should be a simple matter to set the butt hinge if one can use a few simple tools.

Set the hinge on the door or box and mark around the outside edge. Check with a square to be sure door will hang square. Mark the width of the insert. Mark the depth of the insert slightly deeper than the thickness of the hinge. Using a chisel cut away the waste starting from each end and work toward the middle. When most of the wood has been removed pare the rest down to the line carefully. Drill holes for the screws slightly off center so that the head will draw the plate toward the shoulder for a tight fit.

By repeating this operation on the cover, door jam or whatever the hinge is going to be fastened to we have a nice job, and one that should work free and easy.

Be sure the pins of the hinges are in line with each other so that the lid or door will work freely.
How To Use And Care For A Screwdriver

The screwdriver is a tool used to drive screws. It is made up of several different parts which are: head, handle, ferrule, blade and the tip. They come in sizes from two inches to eighteen inches in length. A long screwdriver is the more powerful because the long handle gives more leverage.

One should grind a screwdriver blade so that it is square and flat and also to fit the slot in the screw to be driven.

If the screwdriver is too thin or it if has rounded edges it may slip out of the screw slot and damage its edges.
How To Use Woodbits

Woodbits are made for boring holes in wood and are sized by sixteenths of an inch measuring the diameter, and range from one-fourth inch up to one inch. The parts of the bit are the tang, the shank, the twist, the cutting edge, the spur, and the feed screw.

The feed screw pulls the bit into the wood, the spur cuts the outside line and the cutting edge cuts out the hole. The shaving is then taken up the twist and out of the work. The shank is smaller than the twist and joins the twist and the tang together. The tang goes in the chuck of the bit brace and has the size of the bit marked on it. The number on the tang tells in sixteenths of an inch what size hole the woodbit will make.

The woodbit may be sharpened with a bit file. The spur should be sharpened on the inside so as to keep the diameter the same and the cutting edge filed on top to maintain the clearance on the underside. For a keen edge one may use a slipstone.
How To Read And Use A Rule

The United States standard measure for the work we will do in shop is the inch, the foot, and the yard.

The yard is made up of three feet which in turn is broken down into inches with twelve inches to the foot or thirty-six inches in a yard. The inches are broken down into fractions or parts of an inch the largest being one-half. The one-half inch is again cut in half making four parts or one-fourth of an inch. Again the cutting is done making eight equal parts or one-eighth inch graduations and for our use, we break the one-eighth inch down and have one-sixteenth inch graduations.

The inch is broken into many more parts, but for our use the sixteenth of an inch is small enough and as close as one is able to work with hand tools.

There are several types of rulers and some of these are the zigzag rule, the folding rule, the desk rule, pull-push rule, bench rule, and the yardstick.

One should have several types of rulers on hand to show to the class.

"To measure accurately hold the rule on its edge so the measuring marks are in contact with the work. Mark with a sharp knife or pencil."¹

By placing the rule at an angle one may divide a piece of stock in equal or proportional parts.

One may also use a rule and the pencil as a gauge to mark lines parallel to the edge of the stock.

¹Stanly Tool Guide, Chart #2, New Britain, Conn.
How To Use A Square

The try square is used for testing the squareness of lumber, and in checking the squareness of work being assembled.

There are two parts to the try square, the blade and the stock. The blade is thin and is made of steel with an inch scale stamped on it and the stock is thick and made out of wood or iron. The two are firmly fastened together at right angles. The sizes run from four inches to twelve inches.

When using the square hold the stock tight against the stock when testing the ends, edges or scribing lines on the work.

One may test a board with square by using the blade on the flat surface, testing crosswise, lengthwise, and from corner to corner. If one can see light under the blade then the work is not smooth and flat.

To scribe a line hold the stock against the work and run a knife blade or a sharp pencil along the edge of the blade.
How To Sharpen A Plane Iron

To have a plane working its best one must keep the plane iron sharp. This means the person using the plane should know how to grind and whet a plane iron (and this also applies to chisels).

When grinding plan to have the angle of the blade about twenty-five degrees to thirty degrees or make the bevel a little longer than twice the thickness of the plane iron.

Move the plane iron so as to grind all parts of the bevel even and keep the edge straight and almost at right angles to the sides of the plane iron.

The plane iron should be kept cool by dipping in water frequently during the grinding operation.

The plane iron should be ground when the cutting edge is nicked, when the bevel has been worn down by whetting, and when the bevel has been rounded by careless whetting.

Care must be taken to avoid a bevel too long and thin as it is weak and will nick easily.

To whet the plane iron use an oil stone to produce a real sharp cutting edge. Place the plane iron at thirty degrees to thirty-five degrees on the stone and move it back and forth. Keep the hands parallel to the stone so that you will keep the angle the same at all times. Use enough oil to keep the stone moist and free of steel particles.

Take a few strokes with the flat side of the plane iron held flat on the stone to remove the wire edge.
How To Use A Plane

To use a plane so as to have the best results from your work the plane must be sharp and it must be the right size. It is easier to plane a large edge straight with a long plane than with a short one. The long plane bridges the low parts and cuts off the high spots until they are removed.

To obtain a smooth surface one must plane with the grain and adjust the plane iron to take a very thin, even shaving. When starting on a board put pressure on the knob and as the plane gets on the board go ahead and use the handle also. When going off of the board, put pressure on the handle as it comes off of the board. This keeps the front of the plane from going down and rounding off the end of the board.

To plane end grain go in half way from each edge.

To obtain a smooth surface plane with the grain (that is in the uphill direction of the fibers). If the grain is torn or rough after the first stroke, reverse the work.
How To Use A Chisel

The chisel is controlled with the left hand, pressing firmly on the chisel and the wood. The power is applied with the right hand. The chisel is held slightly turned so that the edge slides across the work or the chisel is moved to the right or left as it is advanced to give a sliding action to the cutting edge. This is easier than a straight thrust and leaves a smoother surface on the work. Both hands should be in back of the cutting edge at all times.

The chisel is held with the bevel down for a roughing cut and with the bevel up for a paring cut.

To avoid splintering the corners cut half way from each edge toward the center. Remove the center stock last.

The mallet may be used to strike the chisel, but one must be careful to cut across the grain to keep from splitting the work.

The chisel should be sharp and this is best done by grinding the blade on a twenty-five degree to thirty degree angle and then whetting it on about a thirty degree to a thirty-five degree angle.
How To Use A Hand Saw

There are two kinds of hand saws that will be taken up at this time. They are the ripsaw and the crosscut saw.

The ripsaw is made to cut with the grain in the wood and the teeth are shaped like chisels. They cut like a gang of chisels in a row.

To start the saw cut draw the saw backward, holding the blade square to the stock and steady it at the line with your thumb. If the saw leaves the line twist the handle slightly and draw it back to the line. About sixty degrees is the correct angle between the saw and the work for rip-sawing.

The crosscut saw is made to cut across the grain of the wood. The teeth are made like two rows of knife points and crumble out the wood between the cuts. About forty-five degrees is the correct angle between the saw and the wood for crosscut sawing.

The size of the saw is determined by the length of the blade in inches and the number of points per inch tell how coarse or fine a cut the saw will make.

Saw teeth are set, that is, every other tooth is bent to the right and those in between are bent to the left. This makes the kerf wider than the saw blade and prevents binding (the wood pinching the saw blade).

Keep the saw teeth sharp and properly set.
How To Use The Nail Hammer

The nail hammer is made up of several parts which are: the head, the handle, the adze eye, claw, cheek, face, poll, and the neck. The hammer is used to drive with and to pull nails with.

To drive with one should grasp the hammer firmly near the end of the handle and start his swing. Rest the face of the hammer on the nail, draw the hammer back and give a light tap to start the nail and to determine the aim. Strike the nail squarely to avoid marring the wood and bending the nail. Keep the face of the hammer clean to avoid slipping off the nail. If a nail bends draw it out and start a new one in its place.

To draw a nail slip the claw of the hammer under the nail head, pull until the handle is nearly vertical and the nail partly drawn. Slip a piece of wood under the head of the hammer to increase the leverage and to relieve the unnecessary strain on the handle. Another pull will bring the nail out.
How To Use The Hand Drill

The hand drill is used for the rapid drilling of small holes in both wood and metal. The holes should be started, to help locate and center the drill, in wood with an awl and in metal with a center punch.

The hand drill is made up of several parts which are: the handle, the frame, the idler pinion, the crank and handle, the detachable side handle, the speed gear, the pinion, and the chuck.

The chuck holds the twist drills and they come in a large range of sizes.

To place the drill in the chuck open it only slightly more than the diameter of the drill. This helps to center it. Insert the drill. Tighten the chuck by turning clockwise on the crank with the right hand while holding the chuck shell tight with the left thumb and forefinger.

To use hold the drill steady in the direction desired and exert an even pressure. Turn the crank at a constant speed and not too fast.

To remove the drill, hold the chuck shell tight with the left thumb and forefinger and turn the crank in a counter clockwise direction with the right hand. When loose take twist drill out of chuck.
Wiring An Electric Lamp

To wire a lamp one must have all the materials ready: the wire, the plug, and the socket.

Cut the insulation from the two wires so that there will be a good connection. Pass the two ends up through the plug. Loosen the screws in the plug and bring one of the wires around the plug post in a clockwise direction and hook the uninsulated end of the wire around the screw in a clockwise direction (so as to tighten as one turns the screw). Repeat with the other wire.

Now take the other end of the wire and remove the insulation from both of the copper strands.

Take the socket apart and this is done by pressing in on the brass where the brass cap and outer shell go together. As you press pull and it will come apart. Put the ends of the wire through the hole in the cap. Loosen the screws on the socket, wrap the uninsulated end of one wire around one of the terminal screws of the socket in a clockwise direction and tighten the screw. Connect the second wire in the same manner. Recheck the work to be sure all is tight. Slip the fiber case over the socket and slide the brass case in place. Push the brass case into the cap until they snap together. Test to be sure it works.
The Mallet And Its Use

Mallets are wooden hammers. As wood is more elastic than iron or steel a mallet should always be used when driving on wood. The blows of a steel hammer would soon splinter a chisel handle, and mar a joint to be driven together beyond repair. A mallet with a head three inches in diameter and five inches long is a good size for wood-workers.

The mallet is used like the hammer. It has a handle and a head which is three inches in diameter so that if one does not hit on center it will still do a nice bit of driving. One should hold the mallet by the handle near the end and take slow, light blows, while watching the work, until he is sure he has his aim. Then he should start hitting harder and harder as the need requires.
How To Make A Simple Drawing

One should make a rough sketch of the object he wishes to make. If this is what he wants then he should start in to work out some of the details.

I feel one should have an end view, a side view, and a plan view of the object he is thinking about building.

The plan view represents the object as it appears when looking directly down on it. It should give the length and width of the object and any inlay or other work that is to be on the top.

The end view will show the end and give the complete information about the shape and construction of the end or ends.

The side or front view should give all the information needed to construct it, as to length, thickness, and height.

All joints should be set out in a detail drawing where it can be seen very clearly and all parts numbered or marked so as to know where and how they are to go together.

The drawing should be large enough so one may see everything very clearly. Do not crowd.
How To Read A Simple Drawing

To read a drawing one must know what he is looking for. After he has found the object, or the drawing of an object, he must study the drawing to understand what is in the make-up of this project.

What is the length, width, and height; all that is needed is to look at the drawing as all this information is in front of your eyes.

The different type joints and where they are used should be in the drawing and one should be able, by using the plan view, the side view, and the end view, to make a mental picture of the object and its many different parts.

By following the directions he should make himself some very useful articles.
The bookshelf is simple and easy to construct making a very good project for the beginner. The dimensions are left out as each person must make this project to fit his books and the space which it will occupy. The shelves may be held in place with screws or glue, or both.

Later the student may put on a top and a back.
CLOTHES BARS

MADE OF STOCK 3/4" X 1" FREE OF KNOTS AND STRAIGHT GRAIN. HOLES AT ENDS ARE 3/8" D. AND CENTERED 1" FROM END OF MATERIAL.

13 DOWELS 30" X 3/8" ARE USED TO ASSEMBLE THE CLOTHES BARS BY BEING PLACED IN THE HOLES OF THE SIDE PIECES.

THE TWO PIECES 13" LONG HOLD THE RACK IN PLACE WHEN OPEN FOR USE.

THE RACK WILL FOLD INTO A SMALL UNIT FOR EASY STORAGE.
The clothes bars are to fold into a small unit. The holes must be measured very carefully.

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The parts are put together with dowels and glue or with wood screws. The barrel may be changed to any shape desired, such as tub or trough. The shape of the handle is optional. The base is 5" wide.
Combination Chest and Footstool

By gluing narrow pieces of ¾" material together a strong top can be made that will not warp. The bottom is ¼" plywood dado into the sides and glued in place. The top is put on with 2 flat hinges.
END TABLE

The end of the legs are rounded in the lathe. Holes are bored into the bottom and the legs are glued into place. The sides are held with wood dowels and glue. One must take his time and fit the parts together very carefully before putting on the glue. It must be held with clamps until the glue has set hard.
COMMON WOOD JOINTS

CROSS LAP

END LAP

HALF LAP

MIDDLE LAP

RABBET

DADO

MITER
COMMON WOOD JOINTS

TONGUE + GROOVE

BUTT

DADO + RABBIT

DADO TONGUE + RABBET

THRU MORTISE TENON

BLIND MORTISE TENON
BIBLIOGRAPHY

Books


Periodicals


