4-H Woodworking Project

Activity Guide

Revised 2009

Agriculture and Agri-Food Canada
Agriculture et Agroalimentaire Canada

Learn to do by doing

4-H Pledge

I pledge:

My HEAD to clearer thinking,

My HEART to greater loyalty,

My HANDS to larger service,

My HEALTH to better living,

For my club, my community and my country

4-H Grace

(Tune of Auld Lang Syne)

We thank thee Lord, for blessings great

On this, our own fair land.

Teach us to serve thee joyfully,

With head, heart, health and hands.

Unless otherwise noted, the content of this project has been adapted from the Alberta 4-H Woodworking Leader's Reference Manual, 2004.

CONTENTS

INTRODUCTION

How To Use the 4-H Woodworking Project Activity Guide

The 4-H Woodworking Project Activity Guide is divided into eight main themes. Each sub-topic (linked to the Reference Guide section it best illustrates) is identified in topic line of the activity. Each activity is designed to stand alone. The activities do not need to be implemented in any specific order, but it is recommended that activities emphasizing safety be done at the start of the club, and throughout to reinforce proper safety procedures. Some activities contain suggestions that allow for variations of that activity. Choose a variation that is relevant to your topic and age group. You will find an alphabetical index of the activities at the end of the guide.

Safety

This section emphasizes basic safety practices in a variety of situations, gives members a chance to become familiar with different types of personal protective equipment, and to anticipate potential hazards in new environments.

Forestry & Sustainability

This section helps members learn about the importance of the forestry industry in Canada, and encourages members to reduce waste.

Wood

This section encourages members to learn about the structure and different types of wood, what kinds of wood should be used for different projects, and how to properly select project materials.

Tools

This section explores a range of tools, from simple hand tools, to power tools, to advanced power tools. Proper care and use of each is emphasized, as well as selecting the right tool and materials for each job.

Measurement

This section teaches members the importance of proper measuring techniques.

Patterns & Drafting

This section helps members learn the tips and tricks for using patterns, and basic drafting principles.

Fastening, Sanding & Finishing

Proper procedures and materials for fastening, sanding and finishing are explored in this section, including glue, sanding and joinery.

Project-Related Activities

This section includes exercises designed to help members learn, practice and reflect on the principles behind judging and entrepreneurship, as well as building confidence, personal growth, and goal setting.

The 4-H Woodworking Project Activity Guide was designed with three age groups in mind:

- Junior: 8 to 10 years of age
- Intermediate: 11 to 14 years of age
- Senior: 15 to 19 years of age

Each activity has been designed for one of these age groups, but occasionally activities are appropriate for more than one of the age categories. At the top of each activity the recommended age group is identified.

This section includes 'project based activities', including judging (though you will find elements of judging in activities throughout this guide). These activities are meant for the members to have an opportunity to judge to help members learn, evaluate, make decisions, communicate and develop confidence.

Each activity has the following format:

Title	*Instructions*
Topic	*Suggestions*
Learning Outcomes	*Discussion / Comments*
Time	*Processing Prompts*
Materials / Resources	

Each activity in the 4-H Woodworking Project has learning outcomes identified at the beginning of the activity, and processing prompts at the end. To gain a better understanding of why these were added to every activity, we have included the following section about experimental learning.

Experiential Learning

Experiential learning is a model that, simply put, consists of action and reflection. Research shows that learning is often best achieved when it is fun, active, interesting and easy to understand. Participating in fun activities creates a sense of togetherness within a group and help members relate to one another, as well as

allowing the group to relax, to feel safe and at ease. Through guided reflection and discussion, activities with meaning often help individuals understand concepts and skills more than if the same meaning was presented in a lecture format.

A leader can help 4-H members and groups learn, by leading activities with meaning. These activities can then be processed to help the group find the meaning. These lessons can then be applied to other area of the members' lives – helping them to transfer the meaning from the activity to the real world and everyday life.

The following 4-H Woodworking Project Activity Guide includes learning outcomes at the beginning of each activity. Members will discuss and explore the meaning behind the activities and transfer these insights, through the help of the 4-H leader, into their everyday lives whether it be in sports teams, school groups, community groups or at home with family. The 4-H leader can facilitate this by using the processing prompts listed at the end of each activity.

What is Processing?

Processing is when individuals reflect, describe, analyze and communicate what they have or will be experiencing in an activity. Each activity has processing prompts. There will be a list of questions to ask regarding concept to focus on in a group discussion. Some or all of the questions can be used to process the activity. Feel free to add your own processing prompts if you feel there is a specific topic that you would like to discuss.

When implementing the 4-H Woodworking Project Activity Guide, processing is most easily done with the group when sitting or standing in a circle, and when the group is attentive and focused on the discussion. When questions are designed properly and used thoughtfully, discussion questions can be an effective learning tool that promotes creativity, as well as generates meaningful interaction and understanding for the member. Processing can be fast or slow depending on the group and the activity.

Things to Make and Do

This final section includes a variety of patterns and instructions for things to make as part of the Woodworking Project. For more sources of project ideas, consult the Patterns and Drafting section in the Reference Guide.

SAFETY

Hazard Hunt — Junior, Intermediate, Advanced

Topic Basic Workshop Safety

Learning Outcomes

To reinforce the importance of safety in the workshop, and to encourage members to evaluate their work environment for safety concerns before beginning work on a project.

Time 25 minutes

Materials / Resources

- Workshop space
- Workshop materials, including a variety of tools and woodworking materials
- Copies of the Hazard Hunt checklist
- Clipboards
- Paper
- Pencils

Alternate Materials / Resources

- Pictures, pre-drawn, photographed, or printed from the Internet, depicting safe and unsafe workshop practices
- Hazard Hunt checklist

Instructions

Before the club meeting, stage some ‘unsafe’ situations around the workshop, being cautious not to set up anything too hazardous.

Have members go through the workshop while going through the “Hazard Hunt” checklist that is included on the next page.

Discussion / Comments

Have members debrief after the hunt to compare their findings, and then challenge them to come up with the own improvement suggestions for enhanced safety measures.

Suggestions

If workshop space is not available, do some research on the Internet and print off copies of photos depicting safe/unsafe workshop practices. Or, set up safe and unsafe workshop situations, and take and print off your own photos prior to the meeting. Have members use the "Hazard Hunt" checklist on the next page to analyze the photos.

Processing Prompts

- What was the most difficult unsafe workshop practice to spot?
- What improvements can you suggest to make sure unsafe situations don't occur?
- Can you name something you should do regularly in your workshop to make sure it is safe?

Hazard Hunt Checklist

- ☐ General tidiness of work area: is everything in its place or is there a jumble of things to trip over?
- ☐ Is wood stored so that it will not fall on someone?
- ☐ Are tools in good condition?
- ☐ Is safety equipment available and appropriate to tasks? (Eye protection, hearing protection, dust protection, etc.)
- ☐ Is fire equipment available and ready to be used?
- ☐ Is ventilation appropriate?
- ☐ Are there trashcans for wood scraps and other waste?
- ☐ Is lighting adequate?
- ☐ Is work surface smooth and free of snags?
- ☐ Are chemicals stored safely?

Our Shop Safety Rules — Junior, Intermediate, Advanced

Topic Basic Workshop Safety

Learning Outcomes

To encourage members to learn basic shop safety rules, and gain experience working as a group to develop effective safety rules for a specific environment.

Time 25 minutes

Materials / Resources

- Lined paper
- Pencils, markers
- Poster paper
- Tape / poster tack
- Copies of the "Our Club's Safety Guidelines" handout on the next page (optional)

Instructions

As a group, come up with a list of safety rules and concerns that members and leaders will abide by. Have members record these guidelines on the handout on the following page, or record them in their record book.

Have members take one rule each (or divide the rules out according to the number of members in your group) and make a poster about it, which can then be posted in the workshop.

Encourage them to do the same around their workshop at home.

Discussion / Comments

There are many universal workshop safety rules – but should also be customized for your environment.

Processing Prompts

- How will your safety rules at home be different from those in your workshop? Will any be the same?

Our Club's Safety Guidelines

1. _____

2. _____

3. _____

4. _____

5. _____

Safety Video Challenge — Intermediate, Senior

Topic Basic Workshop Safety

Learning Outcomes
To help members develop effective communications and public speaking skills, and reinforce the importance of basic safety procedures.

Time 1 – 1 ½ hours

Materials / Resources
- Access to the Internet – the Expert Village website offers a free carpentry series from a wood shop teacher and professional instructor: www.expertvillage.com/video-series/8101_workshop-safety-tips.htm
- Video camera or other recording device
- Paper, pens / pencils
- A selection of tools and scrap wood to act as props
- Bridgewater, Alan and Gill. 100 Keys to Woodshop Safety. Popular Woodworking Books. 1996

Instructions
Challenge members to make their own safety video. In pairs or groups, instruct members to write, practice and record their own safety video. Their video can focus on general safety, or one aspect of woodworking safety (for example, power tool safety).

If members wish, they can then enter into this video challenge:
http://thewoodwhisperer.com/lumberjockswoodwhisperer-safety-video-challenge/

Discussion / Comments
Knowing basic workshop and woodworking safety principles is important. Clearly communicating these concepts is important to ensure that everyone in the workshop is following the same basic rules and procedures.

Suggestions
This activity could be partially completed during the club meeting, and assigned for members to complete on their own prior to the next meeting.

Processing Prompts
Do you think good communication is important in workshop safety? Why or why not?

Loony Logos — Junior, Intermediate

Topic Safety Logos

Learning Outcomes

To help members develop the artistic skills necessary for woodworking.

To develop communications skills.

Time 15 minutes

Materials / Resources

- Examples of real safety logos for reference
- Paper
- Markers
- Pencils

Instructions

Have members make up their own silly logos for various “hazards” that they encounter in their day-to-day lives (perhaps a “No Sandals and Socks” emblem, or “No homework on the weekends” logo).

Discussion / Comments

Safety symbols are important for woodworkers to determine possible hazards at a glance. A good safety symbol should simple, and recognizable at a glance.

Processing Prompts

- Name some important ‘real’ safety symbols.
- Are there safety symbols you are not sure of?
- What makes a good safety symbol?

Safety Gear Runway — Junior, Intermediate, Senior

Topic Personal Protective Equipment

Learning Outcomes

To help members become aware of the range of safety equipment available and the key features of each piece of equipment; to help members become accustomed to wearing personal protective equipment.

Time Field Trip – 1 – 1 ½ hour

Fashion Show – 1 ½ hour

Materials / Resources

- A local hardware store willing to participate
- A 'runway' suitable for a fashion show
- Pens, pencils, paper
- Some extra personal protective equipment to make sure there is enough for all members to participate.

Instructions

Plan a field trip to a hardware store or to a store that specializes in safety equipment clothing. Have an employee of the store explain to members all of the different pieces of safety equipment that are currently on the market.

If there is time, have the employee demonstrate some of the newly incorporated safety mechanisms that the equipment itself has built into it, such as saw keys and feather boards, kill switches, riving knives, etc. Make sure that members have brought a few extra dollars along as this would be a prime time for them to invest in a few of their own pieces of safety equipment.

Once members have purchased their safety equipment, organize a safety gear fashion show, with members writing summaries on their newly acquired purchases that an emcee will read as the members strut their new "duds" down the runway.

Discussion / Comments

Some people are reluctant to wear / use safety equipment. However, despite the inconvenience it might cause, it is far more inconvenient to suffer an injury because this equipment was not used.

Processing Prompts

- How did you feel while wearing the safety equipment on the runway?
- Why do you think some people don't wear / use safety equipment?
- Why is it important to wear / use safety equipment?

Safety "Faux Pas" — Junior, Intermediate, Senior

Topic Safety and Tools

Learning Outcomes

To help members identify safety hazards, and formulate ways to eliminate them.

Time 30 minutes

Materials / Resources

- Props (optional)
- An open space large enough for members to act out their scenarios.

Instructions

Divide members up into groups, and give each group a scenario of a common safety "faux pas".

Have members act out their scenes to the other members, who need to first identify all of the safety concerns that are being acted out, as well as provide suggestions for how to eliminate the hazard.

Discussion / Comments

There are a variety of potential hazards in any workshop / woodworking environment. Woodworkers must evaluate each new environment and plan ahead to avoid hazards before starting a new project.

Processing Prompts

- How would potential hazards be different in a workshop, compared to on a construction site or outdoors?
- How can you avoid hazards in different environments?

Safety First! Homemade First-Aid Kits Junior, Intermediate, Senior

Topic First Aid

Learning Outcomes
To learn how to make a customized first aid kit

Time 20 minutes

Materials / Resources

- A container to store all of these items in; a tackle box or a plastic lunch container make a great first-aid kit.
- Antiseptic ointment
- Antibacterial hand wash
- Gauze pads
- Scissors
- Adhesive tape
- Instant Cold pack
- Latex gloves
- Band-Aids
- Tensor Bandages
- Ibuprofen
- Cotton balls
- Tweezers
- Other items would be useful in an emergency situation

The Survival Center: http://www.survival-center.com/firstaid/kit.htm

Canadian Red Cross: Red Cross: http://www.redcross.ca/article.asp?id=620&tid=021

American Red Cross: http://www.redcross.org/services/hss/lifeline/fakit.html

Instructions
Set out the materials on a table, and have members choose items to complete their first aid kits.

Instruct members to take them home, put them into their own cars or their parents' vehicles, or keep them in their lockers at school.

There is a list included above of suggested items for member's first aid kits. Encourage the members to do their own research and think of their own items that would make the kit more useful to them, such as an EpiPen if they have a severe allergy, their asthma inhaler, or perhaps a candle and some chocolate if it is going to be a kit for their car.

Have a discussion with members about sorts of items they would like to see included in their kits to ensure that the first aid kit that they create is designed specifically to their needs.

Discussion / Comments

In every first aid kit, there are some essential items that should be included – but first aid kits should also be customized specifically for the family / individual who might be using it.

Suggestions

Instead of making individual kits, you may want to have members work together to create one for the whole club to use in the workshop. However, be sure to protect members' privacy in regards to personal health information.

Processing Prompts

- What things should be included in every first aid kit? Why?
- Name some places you should keep a first aid kit.
- What are some important things to remember when making a first aid kit?
- What are some important things to remember when choosing a place to keep your first aid kit

FORESTRY AND SUSTAINABILITY

Simply Sustainable — Junior, Intermediate, Senior

Topic Environmental Sustainability

Learning Outcomes

To encourage members to incorporate ideas of environmental sustainability in their daily lives.

Time 20 minutes (or take-home activity, if suggestions are followed).

Materials / Resources

- Flipchart and markers / whiteboard and markers

Instructions

Recording ideas on the flipchart / whiteboard, have members brainstorm ideas to incorporate environmental sustainability into club meetings. For example, instead of using plastic plates at your next event, suggest that everyone bring their own. Or have members decorate a recycling bin so that juice and pop cans have somewhere to go. Encourage members to bring snacks in reusable plastic containers rather than plastic wrap.

Then, discuss the ideas and come up with an environmental sustainability plan that your club members will follow. Write this plan on the flipchart / whiteboard and make sure it is posted at each meeting.

Discussion / Comments

Though environmental sustainability is a big issue, there are small things people can do in their daily lives to make a difference.

Suggestions

To enhance this activity, have members research an environmental issue of interest to them, and present their findings in a speech or a demonstration. This may be the basis for a public speaking competition.

Processing Prompts

- What things should you consider when coming up with an environmental sustainability plan?

- What reasons do people give for not being environmentally sustainable? Do you think these are good reasons? Why or why not?

Trees Are Everywhere! Junior, Intermediate

Topic Trees Please!

Learning Outcomes

To help members realize the importance of wood products in daily life – and therefore the importance of protecting this valuable resource.

Time 1 ½ hours

Materials / Resources

- Internet access or a variety of catalogues that feature wood products
- Copies of a pre-prepared scavenger hunt, one for every two members
- Clipboards and pencils
- Magazines, flyers, newspapers
- Poster paper, glue, scissors, markers

Instructions

Prior to the meeting, devise a scavenger hunt that requires members to find wood products around their club meeting area.

At the start of the meeting, have members research and make a list of the various number of products in which trees are an ingredient.

Have members complete the scavenger hunt to show members how "close to home" many of these products are found.

Next, using the scavenger hunt list, and the information members have researched, use magazines, flyers, newspapers and ads, and have members cut all of the tree-related products that they can find. Create a poster collage to hang up during club meetings or in the workshop to remind members of the major roles that trees play in everyday life.

Discussion / Comments

Be sure to recycle the scrap paper produced by this activity.

Processing Prompts

- Has this activity changed how you see trees? How?

Forestry in Canada — Intermediate, Senior

Topic Canada's Forestry Industry

Learning Outcomes
To give members the opportunity to learn about the many different sources of information and perspectives on sustainable forestry.

Time
30 minutes (or more, depending on how many documentaries you wish to watch).

Materials / Resources
- A computer with Internet access

Instructions
At the end of the previous meeting, ask members to research documentaries that have been done regarding sustainable forestry. For example, a Canadian filmmaker and documentarian, Edward Homer, has a three-part series on the forestry and logging industry in Canada:

http://www.ecofilms.bc.ca/product_info.php?cPath=21&products_id=40.

At the next meeting, have members discuss their findings. If there is time, and Internet access available, watch a few samples of these documentaries.

Discussion / Comments
Many viewpoints exist on the subject of sustainable forestry. Members should be able to listen to different arguments, and be able to discuss these viewpoints to come to their own conclusions.

Suggestions
Variation

Have members watch carpenter, Ron Hazelton, as he turns a tree from his front yard into useable lumber. Perhaps it could turn into your club's next project?

"Home Grown Lumber" video, courtesy of Ron Hazelton's website:
www.ronhazelton.com/howto/home_grown_lumber.htm

Processing Prompts
- How is a documentary different from another kind of film?
- Were there different opinions expressed in the documentary you researched? What were they?

For Ron Hazelton's video:

- What was the most interesting part of the video? What aspect of the process were you most intrigued by? Surprised by? Unimpressed by?
- What sorts of tools and machines do you think that paper and saw mills have in order to speed up this process, or do you think that wood is still processed this way?
- Would you feel confident building something with homemade lumber?

In Action — Junior, Intermediate, Senior

Topic Canada's Forestry

Learning Outcomes

To become more aware of an industry that contributes much to Canada's employment and total gross domestic product.

Time 1 hour (approximately)

Materials / Resources

- A sawmill and / or forestry professional willing to participate

Instructions

Arrange a field trip to a nearby sawmill.

If a field trip is not an option to due distance or time, research to see if there are any forestry professionals in your area, who could come and talk to the members about the forestry industry. Potential topics could include the importance of the forestry industry in Canada, and how many people are affected by changes that occur within the export industry, and the availability and sustainability of trees and forests, etc.

Discussion / Comments

The importance of sustainability is highlighted when you consider the individuals and families affected by changes in the industry.

Processing Prompts

- How has the sawmill we visited / forestry professional that spoke to our club been affected by the changes in the industry?

Know Your Region — Intermediate, Senior

Topic Forest Management Certification

Learning Outcomes

To learn about desired regional, and official forest management certification standards

Time 20 minutes

Materials / Resources

- A copy of the Forest Stewardship Council's official standards – visit http://www.fsccanada.org/forestmanagementstd.htm for the most up-to-date standards for your region.
- Whiteboard / flipchart and markers

Instructions

As a club, make up your own "regional-specific" standards for obtaining Sustainable Forest Certification. Then double-check with FSC's official standards to see if members are on the right track.

Discussion / Comments

The Forest Stewardship Council's standards have been developed so they can be evaluated by an independent certifier. Therefore, when developing standards, they must be specific and measureable.

Processing Prompts

- How did the standards developed by your club measure up to the Forest Stewardship Council? How were they different?
- Why are standards important?

Forest Leftovers — Intermediate, Senior

Topic Forest Management Certification

Learning Outcomes

To learn the importance of waste reduction in sustainable forestry

Time 30 minutes.

Materials / Resources

- Reference books / access to the Internet

Instructions

Have members research what sorts of products are created by tree "leftovers" after they have been cut down and sent to a mill for processing.

Discussion / Comments

Forestry by-products need to strike a balance between our (as a society) increasing demands for forest products, and the preservation of forest health and diversity. This balance is critical to the survival of forests, and to the prosperity of forest-dependent communities.

Processing Prompts

- Why is it important to reduce waste in the forest industry?

Cross Country Sustainability — Senior

Topic Forest Management Certification

Learning Outcomes

To help members learn about the differences and similarities in sustainability plans across the country.

Time Approximately 30 minutes

Materials / Resources

- Computer with Internet access

Websites:

British Columbia British Columbia's Ministry of Forestry and Range: http://www.gov.bc.ca/for/

Vancouver Island: http://www.vancouverisland.com/information/details.asp?id=36

Saskatchewan

Saskatchewan Forest Centre: http://www.saskforestcentre.ca/

Manitoba

Manitoba Forestry Branch: http://www.gov.mb.ca/conservation/forestry/about.html

Ontario

Ontario Forest Industries Association: http://www.ofia.com/about_ofia/who_we_are.html

Forest Stewardship Council Canada: http://www.fsccanada.org/

Instructions

Using the websites above, or others members can find, have members research what their provinces are doing in terms of sustainability, and in comparison to other provinces.

Discussion / Comments

Different provinces have different approaches to sustainability.

Processing Prompts

- Why do different provinces have different standards and approaches to sustainability?

A Future in Forest Management — Junior, Intermediate, Senior

Topic Forest Management Certification

Learning Outcomes

To help members learn about a career in sustainable forest management.

Time 1 hour, depending on availability of the school or instructor.

Materials / Resources

- A post-secondary school with a sustainable forest management program willing to participate.

Instructions

Take a tour of a post-secondary school that has a sustainable forest management program. Or, have an instructor come and speak about courses that are offered regarding forest management.

Discussion / Comments

Developing new researchers and managers is critical to sustainable forest management. A new generation of educators, managers and researchers will need to work with industry, First Nations, government and the public to achieve sustainable forest management.

Suggestions

Variation

Have members interview a Sustainable Forest Manager.

Some sample questions: what is the toughest part of being a forest manager, the most rewarding? What got them interested in forest management? What does a day in the life of a forest manager look like? What are some goals that they aspire to, and what are some challenges that they face in pursuit of that goal?

Have members brainstorm ideas for interview questions, as a club. Then, they will go into their interviews well-prepared. This may encourage interest among members in forest management as a career path.

Processing Prompts

- How many different careers can you think of that deal with sustainable forest management?
- What do you think the challenges would be working in sustainable forest management? What about the rewards?

WOOD

"Wood" You Take a Look at That? Junior, Intermediate, Senior

Topic Wood Basics

Learning Outcomes

To become familiar with the range of different grain types, and the varnish and finishing techniques works best with each.

Time 30 minutes

Materials / Resources

- Assortment of wood scraps of different grain types and finishes

Instructions

Gather up an assortment of wood scraps and samples that vary in grain types and the number of annual growth rings. The samples should be a mix of both finished and unfinished pieces as they give members an idea of how certain grains take to different varnishes and finishing techniques.

Have members go through the samples, counting the rings and examining the grains.

Discussion / Comments

Each type of wood grain responds differently to various finishes. This is an important thing to remember when planning a project.

Suggestions

To make this activity more in depth, ensure that you have a range of wood scraps that are unfinished – then, test a range of finishes on the wood scraps.

Processing Prompts

- Which wood grains work best with each finish? Which ones don't work? Why do you think this is?

On the Road — Junior, Intermediate, Senior

Topic Wood Basics

Learning Outcomes

To provide members with a visual of what the wood that they have been discussing actually looks like.

Time 1 hour (approximately)

Materials / Resources

- A lumberyard or woodworking shop, and a professional staff member willing to participate

Instructions

Organize (or have the members organize) a tour to a lumberyard or a woodworker's shop, and ask a staff member to provide a tour.

This way, members will have an industry expert to talk them about various samples and projects.

The trip may also be useful because members will now have a contact where they may be buying their project materials.

Encourage members to be thinking about their own projects and subsequent wood choices prior to going to the lumber yard or workshop. Then, they can analyze the different wood types during the tour, and consider other options available to them for their projects.

Discussion / Comments

When planning projects, it is important to develop a good relationship with the staff at your local lumberyard. They can help you choose the best material for your project.

Processing Prompts

- Why is it important to see the wood before purchasing it?
- What do you think about purchasing lumber online?

Wood Types — Junior, Intermediate

Topic Knots and Warps

Learning Outcomes

To teach members about the various defects that can occur in wood, and why they occur.

Time 45 minutes

Materials / Resources

- A wide selection of wood samples, including those with knots, warps, splits and gnarls.
- Older members willing to address the group to talk about past projects, and the challenges they faced using a variety of wood. Samples of projects from previous years.

Instructions

Bring in a variety of wood samples and have members examine the examples that you have assembled. Make sure that there are knotted, warped, split and gnarled pieces, as well as soft and hard wood samples.

Lay the examples out on tables or desktops so that members are able to handle the wood and get a good look. If possible, place projects that were attempted or done with defective wood alongside the samples.

Have “veteran” members bring woodworking samples from prior years and have them explain to their fellow members why they chose the type of wood that they did. Have the members talk about whether or not it was a difficult wood to work with and whether they would choose that same type of wood again for a similar project.

Discussion / Comments

It is important for members to consider the choice of wood when planning a project, as this will have an effect on the final product.

Processing Prompts

- What are key things you need to consider when choosing wood for a project?

Microscopic View — Intermediate, Senior

Topic Hardwood versus Softwood

Learning Outcomes

To give members the opportunity to see the difference between a hardwood and a softwood.

Time Approximately 30 minutes, depending on resources available

Materials / Resources

- Devices to examine wood – binoculars, microscopes, magnifying glasses.
- Paper and pencils
- Lab space – ideally, a high school biology lab

Instructions

Ask members to bring a magnifying glass, or a set of binoculars, or ideally, a microscope. If this is not possible, arrange a trip to your high school's biology lab, where members will be able to look at slides of hardwood and softwood through a microscope.

Have the members record their observations, and discuss.

Discussion / Comments

For members to be able to understand why certain woods are more suitable than others for projects, they should first know the basics about trees, including how trees grow, their cellular makeup and how grain is created in wood.

Processing Prompts

- After looking closely at both hardwood and softwood, what can you tell about how each should be treated in your woodworking projects? Consider factors like stains and finishes, construction, etc.

Plywood, The "Other" Lumber — Junior, Intermediate

Topic Plywood

Learning Outcomes
To educate members about plywood is, what is good for, how it is made and how it is graded.

Time 15 minutes

Materials / Resources
None

Instructions
As a group, make a list of projects in which plywood could be used, and another list with projects that require a naturally-occurring wood.

Discussion / Comments
Due to plywood's construction, it is much stronger in each direction than a similarly-sized board cut from a single tree. This makes it better for projects that require a stronger wood.

Suggestions
If available, bring in some samples of past projects that were made with plywood, and some made from natural wood.

Processing Prompts
- How is plywood graded? If you were looking for plywood to build a cabin, what grade of plywood would you buy?
- What are some plywood properties that make it desirable or undesirable to use?

TOOLS

Penny for Your Thoughts — Junior, Intermediate, Senior

Topic Tools of the Trade

Learning Outcomes

To help members learn the sizes of various nails

Time 30 minutes

Materials / Resources

- A selection of common and finishing nails

Instructions

Assemble a "showcase" of common and finishing nails. Be sure to have a collection that ranges in sizes so that the members have a number of options to choose from.

Divide the club into teams, or have members work together as partners. Have the two teams (or partner sets) quiz one another regarding the sizes of various nails.

Encourage them to use the proper "d" measurement, and have them try their hand at identifying the wire gauge numbers.

Discussion / Comments

Choosing the correct tool for the job is an important part of a woodworker's craft. Knowing the different kinds of nails and their uses is important when planning a project.

Suggestions

Depending on how well members learn about nail sizing, challenge them to name a particular project that a nail of a particular size would be good for.

Processing Prompts

- What would happen if you used a finishing nail in a project that required a common nail, and vice-versa?

Source: Alberta 4-H Woodworking Leaders' Reference Manual

Nailed it! Junior, Intermediate, Senior

Practice With a Hammer and Nails

Topic Hammers

Learning Outcomes
To give members a chance to practice with a hammer and nails.

Time 15 minutes

Materials / Resources

- Safety goggles
- Hammers (one for every two members)
- A variety of nails
- Blocks of scrap wood

Instructions
Have members pair up, and while wearing safety goggles, practice hammering a variety of nails into the scrap wood.

Processing Prompts

- Name something that is important to remember when using a hammer and nails.

Pilots in Training — Junior, Intermediate, Senior

Topic Screws

Learning Outcomes
To give members experience in drilling pilot holes

Time 20 minutes

Materials / Resources
- Safety goggles
- Power drill
- Scrap wood

Instructions
It is time for members to try their hand at drilling pilot holes, the preliminary hole that the screw is driven into before it ever comes into contact with the wood. Consult the Reference Guide while running this activity, and use proper safety equipment.

Remind members that the pilot hole must be smaller than the screw that will be used. This will prevent the wood from splitting. It will also make driving the screw an easier job.

Discussion / Comments
Drilling pilot holes before drilling in screws makes the process easier, and reduces the risk of wood splitting.

Processing Prompts
- What are the benefits of drilling pilot holes?
- What purpose do they serve?

Take Your Pick! Junior, Intermediate, Senior

Topic Screws and Screwdrivers

Learning Outcomes

To give members experience using different screwdrivers, and to learn the importance of drilling pilot holes to prevent wood from splitting.

Time 30 minutes

Materials / Resources

- Three different types of screwdrivers – multiples, if possible
- Scrap wood – enough for all members
- Screws of various sizes, pre-drilled into the scrap wood
- Proper personal protective equipment

Instructions

Before the meeting, pre-drill pieces of scrap wood with screws that fit the three main different screwdrivers (slot, Roberston, and Phillips).

After discussing the differences between the three, let members experiment unscrewing and screwing the screws in the scrap wood.

For a longer activity, allow members to try drilling a few holes with a power drill, under proper supervision. Be sure to let them practice drilling the pilot holes and having them drill past the point of the screw being flush with the wood so that they can see how easy it is to split the wood when using a screwdriver.

Discussion / Comments

Each screw / screwdriver type is best suited for specific work. The

Robertson or square socket is favoured for woodworking in Canada, as the right-sized screwdriver tip fits snugly in its square head. The Phillips head / screwdrivers are most commonly found used in metalwork. The flat head is a simple screw / screwdriver, and is sometimes used, but screwdrivers can easily slip and damage the wood.

Processing Prompts

- Which screwdriver was the easiest to use? The most difficult? Why?
- Why is drilling a pilot hole important?

Hand Tool Extravaganza — Junior, Intermediate, Senior

Topic Saws, Rasps & Chisels

Learning Outcomes
To help members learn the proper use and safety measures for a variety of tools.

Time 30 minutes

Materials / Resources
- Assortment of handsaws, rasps, screwdrivers and chisels
- Scrap wood
- Personal protective equipment

Instructions
Leaders should gather (from their own collection or by borrowing) an assortment of handsaws and their appropriate protective coverings, rasps, screwdriver (all three varieties if possible) and chisels. Bring in plenty of pieces of scrap wood for experimenting on, and then let the members have a hand tool extravaganza (after, of course, proper technique, safety reminders and care and storage tips have been imparted).

Discussion / Comments
All tools should be used properly, and under proper supervision if the woodworker is inexperienced or unsure.

Suggestions
Ask advanced woodworking members to act as mentors for the junior or inexperienced members. Ideally, there should be an experienced mentor for every one or two slightly more inexperienced members.

Processing Prompts
- Which tool were you the most unsure of? Why?
- What benefits are there to working with a buddy when woodworking?

Tool Jeopardy — Junior, Intermediate, Senior

Topic Saws, Rasps & Chisels

Learning Outcomes
To help members learn the specific uses of each tool.

Time 35 minutes (depending on the size of the group)

Materials / Resources
- Pre-prepared Jeopardy questions, as described below.

Instructions
Coordinate a quick game of *Jeopardy* by taking the "features" of each tool and asking members to name the tool, according to the characteristic that has been read out.

E.g.: *Feature*: "I am used for cutting exact angle cuts." *Correct Tool*: "Backsaw."

Discussion / Comments
Using the right tool for each job improves the chance of the job's success, and also means less chance of injury.

Processing Prompts
- Why is it important to select the right tool for each job? What might happen if you selected the wrong tool?

Field Trip — Junior, Intermediate, Senior

Topic Saws, Rasps & Chisels

Learning Outcomes

To learn the purpose of a variety of hand tools.

To improve public speaking skills (if enhanced option is chosen).

Time 1 hour

Materials / Resources

- A local hardware store willing to participate.

Instructions

Organize a field trip to a local hardware store for a description of the hand tools that the store has in stock. Have an experienced employee give an explanation of each one.

Enhanced option: If the members are keen, have them do preliminary research (as individuals or in teams) on the various tools and then have them make a presentation on the uses and features of their researched tool to the rest of the club.

Discussion / Comments

Members have been introduced to a range of hand tools. Each one has been designed with a specific purpose in mind.

Processing Prompts

- How many of the tools shown during the field trip / presented by club members can you name? What does each do?

Hand Tool Discussion — Intermediate, Senior

Topic Advanced Hand Tools

Learning Outcomes

To encourage members to critically and thoughtfully consider the use of each type of tool when planning and carrying out new projects.

Time 20 minutes

Materials / Resources

- None required

Instructions

Encourage members to discuss the pros and cons of using hand tools (saw, rasp, hand drill, brace and bit, etc.) versus power tools (jigsaw, power drill, power sander, etc.). This way, both beginner and advanced woodworkers can partake in the discussion, though members who worked with both hand and power tools will likely have more to say.

No absolute conclusions need to be reached, but it might be interesting to learn what members' opinions are regarding the various tools.

Discussion / Comments

Every tool, whether hand tool or power tool, has pros and cons to consider when planning your project.

Processing Prompts

- When planning your next project, what is the most important thing you will use to decide whether to use a hand tool or a power tool?

Drill Practice — Intermediate, Senior

Topic Advanced Hand Tools

Learning Outcomes
To give members a chance to practice using a power drill.

Time 35 minutes

Materials / Resources
- Proper personal protective equipment
- Clamps
- Scrap wood
- Various sizes of drill bits
- Plug-in or rechargeable drill (or both!)

Instructions
1. Have members clamp their piece of wood securely. Ensure all safety steps are observed.
2. Demonstrate putting a drill bit in the drill. After members observe, let them try this themselves. Check to ensure the bit is secure.
3. Have members practice drilling various sizes of holes.
4. Have members practice using both plug-in and rechargeable drills, if both are available.
5. Encourage them to concentrate on drilling holes that are straight up and down.

Discussion / Comments
Power drills are useful for increasing the speed at which holes are drilled, but this also increases the speed at which injury is caused. There are two types of power drills: plug-in or rechargeable. Plug-in drills are more powerful and more lightweight, but require a power source; rechargeable power drills come equipped with a battery, are heavier and do not have as much power as a plug-in drill.

Suggestions
Give the members the following tip. When you need to control the depth of a hole you are drilling, stick a bit of tape on the drill bit at that depth. When you reach that depth, stop drilling. You will be at the correct depth!

A drill can also be used to put in screws. Let members practice this on some waste wood.

Processing Prompts

- What do you prefer, a plug-in drill or rechargeable drill? Why?

Make a Featherboard — Intermediate, Senior

Topic Advanced Power Tools

Learning Outcomes

To learn how to make a featherboard, a tool designed to keep stock pressed against a table saw or router's fence.

Time 15 minutes

Materials / Resources

- ¾" plywood
- Pencils
- Table saw
- Push stick
- Eye protection

Instructions

Visit http://www.woodzone.com/tips/featherboard.htm for instructions and background for this activity.

Discussion

A featherboard is useful for keeping smaller pieces of stock pressed firmly against the table saw or router's fence, and preventing kickback.

Processing Prompts

- What is kickback, and why should you try and reduce it?
- Why should you use a push stick when working close to a cutter?

Power Drill Roundtable — Intermediate, Senior

Topic Advanced Power Tools

Learning Outcomes

To help members learn the characteristics, safety concerns, advantages / disadvantages of a power drill, and to know when to use one.

Time 20 minutes

Materials / Resources

- Flipchart / whiteboard and markers to record answers

Instructions

Have members discuss following questions and topics:

Characteristics of a power drill

Safety Observations

Advantages of Using a Power Drill

Disadvantages of Using a Power Drill

How can I make sure that I drill straight with a power drill?

How can I tell which one of my projects require the use of a power drill?

Processing Prompts

- After this discussion, do you think you will feel comfortable using a power drill? Why or why not?

Jigsaws – Discussion — Intermediate, Senior

Topic Advanced Power Tools

Learning Outcomes

To encourage members to consider the advantages and disadvantages of advanced power tools such as jigsaws and power sanders.

Time 30 minutes

Materials / Resources

- Flipchart / whiteboard and markers to record discussion

Instructions

Hold a discussion using the processing prompts below after members have a chance to try jigsaws and power sanders. Record the main points raised on the flipchart / whiteboard.

Processing Prompts

- Discuss the models of jigsaws tried.
- What jigsaw did you prefer using? Why?
- What hand tool does the jigsaw remind you of?
- Name the characteristics of the power sanders that other members sampled.
- Discuss the advantages of using power sanders.
- Discuss the disadvantages of using power sanders.
- Did you prefer the power sander, belt or vibrating, to hand sanding? Why or why not?

Practice Using a Router – Name Plate Senior

Topic Routers

Learning Outcomes
To learn how to properly use a router

Time 1 hour

Materials / Resources

- Eye and/or face protection
- A router and a straight bit, 2mm or 3mm
- Pieces of wood, 2cm by 20cm by 50cm
- Pencil
- Clamp
- Stencils (optional)

Instructions

1. Check that the bit is secure and set to a 2mm or 3mm depth.
2. Have members print a name or word on the wood in letters so it suits the dimensions of the wood. They can make a sign that says “shop,” “office,” “keys,” “Grand Poobah” or whatever they like. Stencils can be used to outline the letters. Remember that the router will remove quite a bit of wood. Leave sufficient space between each letter.
3. Clamp the wood to a bench or place it in a vise with the top edge just above the vise edge.
4. Operating a heavy router is tiring. If a member becomes tired, have them stop.
5. Hold the router over the board so that the bit is right over the first letter. The router should be tilted so that edge touches the board.
6. Start the router. Slowly lower the router into the letter space to be dug out. Cut out the outline of the letter first, then go back and clean out the insides. Some people like to just outline the letters and not clean out the insides.

7. Paint or stain the letters and the wood around them. One technique used by campgrounds is to paint the letters one colour and paint the flat wood another colour with a roller.

Suggestions

Though this is an intermediate / senior activity, junior members may be able to assist with some parts, and should observe.

Processing Prompts

- Routing can be a difficult activity – why is it important to stop if you get tired?

Turn a Tealight — Intermediate, Senior

Adapted from http://www.aroundthewoods.com/tealights.shtml. Used with permission. For images, consult the website.

Topics: Lathes

Learning Outcomes:
To give members experience using a lathe.

Time: 30 minutes

Materials / Resources:

- Block of wood
- Glue gun and glue
- Scrap wood
- Lathe
- ¼" bowl gouge or a ¼" Oland tool
- Pencil
- Turner's polish
- Parting tool

Instructions:
Choose a block of wood from the scrap pile which will turn a piece about three inches around and 1 1/2" to 2" high. Use a piece of maple to flatten the bottom between centers in preparation for a glue block.

Heat up the glue gun and hot glue a glue block to the wood.

Turn the block round and face it off. This will be the top of the tea light. Turn at about 1200 – a 1/4" Oland tool can be used.

Measure the insert. It will likely be 1 1/2" diameter by 3/8" deep. Turn the mortise for the insert a little wider in case someone ends up with an odd sized tea light.

To measure the diameter on the block, use a set of dividers opened to the required diameter. With the lathe running, let the left point of the divider mark the wood while the right point never touches. Visually check the diameter by moving the left point until the right point would be on the inscribed line if it were to touch.

Cut the mortise using a 1/4" bowl gouge or a 1/4" Oland tool. Refine the edges using a scraper or a skew on its side. Mark the height of the finished piece with a pencil.

Turn the sides using whatever decoration you like. Cutting in at the bottom line with a parting tool will make it easier to picture the finished product. The eyes are stopped by the sharp edge and prevent the illusion of farther curves. A little inturn or cove at the bottom will give a sense of lift to the item.

Sand and finish using a turner's polish – a commercial brand can be used, or make finish from one part each of shellac from the hardware store, boiled linseed oil, and denatured alcohol. Brush it on with the lathe turned off, give a quick wipe, turn on the lathe and polish it in until dry. It only takes a minute. Make sure not to wrap the polishing rag around the fingers.

Part the glue block from the piece by parting straight in at the glue line with a parting tool. Stop when the tenon is about 3/4" to 1" thick. Turn off the lathe and pry the piece for the block using the parting tool as a pry bar. The heat from the friction of the parting cut is sufficient to soften the glue enough to remove the piece. If it is too hard to pry, part in a little farther and try again.

Hold the piece using a four jaw chuck in the mortise or by mounting it on a jam chuck. For a jam chuck, mount a piece of scrap wood on a face plate and turn it until if just fits the mortise in the piece. Jam the piece on to it.

Gently finish cut the bottom of the piece, sand and finish.

Remove from the chuck or pop it off the jam chuck, sign and admire.

Suggestions:
To view images illustrating this activity, visit
http://www.aroundthewoods.com/tealights.shtml

Processing Prompts:

- What safety considerations do you have to remember when using a lathe?

Posters — Junior, Intermediate, Senior

Topic Advanced Power Tools

Learning Outcomes

To help members become more familiar with common power tools, and to encourage them to create a reference they can use for future projects.

Time 30 minutes

Materials / Resources

- Woodworking and carpentry magazines
- Construction paper / cardstock / other poster-type paper
- Glue
- Scissors
- Markers
- Background information on power tools -can be from the Reference Guide, or via the Internet (check the website accuracy if members use this resource).

Instructions

Have members go online or flip through woodworking and carpentry magazines to find photos of a variety of power tools.

Have them use the reference information to make informational posters – including pictures of the power tools, and instructions for proper safety and use.

Encourage members to hang the posters on the walls of the workshop. This way, their learning is reinforced by their research, and they will always have an easily accessible point of reference.

Discussion / Comments

There are a wide range of power tools that members may need to use for their current projects, and then later in life. It is important that they learn where to go to get information on how to properly use power tools.

Processing Prompts

- What reference source did you find the most useful when making your poster?

Olympics — Intermediate, Senior

Topic Advanced Power Tools

Learning Outcomes

To gain practice using power tools, and to assess the value of the learning experience

Time 45 minutes (approximately)

Materials / Resources

- Appropriate personal protective equipment
- A selection of power tools
- Scrap wood
- Screws, drill bits, or other required hardware

Instructions

Set up a number of "challenges" for members, as individuals or teams, to compete in. Challenges could include; straightest hole drilled; safest shop behaviour; best hole drilled without splinters; roundest corner; closest-cut corner; most unique bit design; smoothest finish, etc. Ensure you provide proper personal protective equipment for each challenge.

It's up to the members and leader(s) how competitive the challenges become. You may consider awarding points or simple prizes, or designating a judging panel, using unanimous member agreement – or just be done in good fun.

Regardless, make sure that every member gets a chance to try out each machine and that adequate supervision is available at each station.

Discussion / Comments

Competition is a powerful tool to encourage people to strive for their best – but there are also benefits to doing things just for a sense of accomplishment.

Processing Prompts

- Does competition change the way you approach woodworking (or any other) projects?

Smooth Rider — Junior, Intermediate, Senior

Topic Planes

Learning Outcomes

To have members practice using different planes, and learn the purpose for each.

Time 20 minutes

Materials / Resources

- A variety of different planes
- Scrap wood suitable for sanding
- Sandpaper
- Masks

Instructions

For the meeting, ensure that there are a number of different planes on hand so that members can get a good idea of what each plane does, and whether they prefer the results of a plane or hand sanding.

Encourage experienced members to help less-experienced members.

Discussion / Comments

A plane works to smooth out rough wood surfaces, and reduces or eliminates the need to sand a project.

Processing Prompts

- What was the difference between using a plane, and a hand sander? Which do you prefer to use?

Tool Labelling and Maintenance — Junior, Intermediate, Senior

Topic: Taking Care of Your Tools

Learning Outcomes:
To learn proper care of tools

Time: 30 minutes (approximately)

Materials / Resources:

- A label maker
- Other label making materials: tape, markers, tags
- Tools to label
- Canvas
- Leather
- Tennis balls

Instructions:
Using a variety of materials, have members experiment with different materials to label their tools. Have members label all of their tools with their name, an individualized stencil or decal to ensure that there is no mix-up at the end of the day.

As a leader, make sure that you are modeling good tool maintenance. Be mindful that your members are watching your lead.

Explain proper storage and maintenance, instructing members about how to rinse out a paintbrush and wrap up cords and put away power tools (always make a point of employing any safety features that your tools come equipped with. Bring in (or have members bring in) dry canvas, pieces of leather or tennis balls so that they are able to make their own tool sheaths. Encourage members to label or decorate these protection pieces as well.

Discussion / Comments:
This activity can be completed over several meetings, but the lesson should be reinforced throughout the club.

Processing Prompts:

- Why is proper tool care important?

MEASUREMENT

Prove It — Intermediate, Senior

Topic Measuring Up

Learning Outcomes

To give members a chance to practice measuring using both the metric and imperial system – and to convert from one to the other.

Time 25 minutes

Materials / Resources

For more information on this particular activity, go to:
www.france-property-and-information.com/metric-system-and-history.htm

- Tape measures
- Paper & pencils
- Metric conversion reference

Instructions

To determine the measurement system that works best for each individual member, have members measure a room in yards and inches and calculate the amount of required carpet in square yards. Help members to take these measurements and convert them into the metric system.

Then, have members reverse the process. Measure the room in metres and centimetres and calculate the amount of carpet in square metres, and then convert these measurements into yards, inches and total square yards required.

Discussion / Comments

Ideally, this activity will help members to decide what system of measurement they feel most comfortable using.

Processing Prompts

- Which system of measurement did you find easiest to use, and why?

Variations on a Variation — Junior, Intermediate, Senior

Topic Measuring Up

Learning Outcomes

To help members learn the differences between the different systems of measurement.

Time 20 minutes

Materials / Resources

- Access to the Internet:

http://www.metric-conversion-tables.com/imperialunitsmeasurement.htm

Instructions

Have members research the differences between the metric, imperial and American way of measuring up.

Have them share their findings with each other.

Discussion / Comments

Along with the lumber industry, the United States did not adopt the metric system. Rather, they opted for a system that resembles the Imperial system, with some variations between the traditional British system and the present American one.

Processing Prompts

- What are the differences between the American measuring system, the British imperial system, and the metric system?

Measuring the Distance — Junior, Intermediate, Senior

Topic Introduction to Measurement

Time 20 minutes

Materials / Resources

- Several small rectangular pieces of wood
- A table or similar piece of furniture
- Tape measures
- Small rulers
- Pencils
- Paper

Instructions

Instruct the members to do the following:

- Choose a piece of wood. Measure it accurately, using both the measuring tape and the ruler.
- Make a quick drawing of the piece of wood and note its measurements on a piece of paper.
- Have your group leader check your results.
- Choose a table, bookcase, or other structure with rectangular or square shape. Measure one surface, draw it and note its measurements on the drawing. Use both your measuring tape and a ruler.
- Have your group leader check your measurements. What tool did you prefer for measuring this time, the rectangle or the square shape?

Discussion / Comments

Measuring tools, such as tape measures and rulers, are designed to measure different types of things.

Processing Prompts

- What tool did you prefer for measuring the piece of wood, the tape or the ruler?

- What tool did you prefer for measuring the table or bookcase?

Try Practicing — Junior, Intermediate

Topic Introduction to Measurement

Learning Outcomes
To improve measuring skills and techniques

Time 15 minutes

Materials / Resources

- For each member / pair:
- A piece of wood 30 cm long and 20 cm wide (approx.)
- Tape measure
- Straight edge
- Sharp pencil
- Try-square

Instructions
Demonstrate the following for members, and then give them the following instructions so they can try it themselves.

Hook the end of the tape measure on one end of the wood and extend it to the other end of the board. Lock the tape measure.

Hold the tape straight with one hand. Mark the wood at 15 cm and at 20 cm, exactly.

Use the straight edge to draw a line as straight as you can at the 15 cm mark.

Place the calibrated side of the try square at the 20 cm mark, with the other side of the try square snug against the edge of the board. Draw a line across the board at the 20 cm mark (parallel to the first line drawn at the 15 cm mark).

Discussion / Comments
Try-squares are specifically designed to measure if two surfaces are at a 90 degree angle.

Processing Prompts

- What line looks straighter? (Which line looks like it is at 90 degrees to the edge of the board?) It should be the one drawn with the try square.

Take Home Practice — Junior, Intermediate, Senior

Topic Introduction to Measurement

Learning Outcomes
To help members how to properly measure a variety of household items.

Time Take home activity

Materials / Resources

- Ruler
- Try Square
- Measuring tape
- Paper
- Pencils
- Scrap wood

Instructions
Give the members the following take home assignment:

Practice measuring and drawing various objects around home, using both your tape measure and a ruler.

Bring your drawings to the next club meeting to see if other members can understand and follow them easily.

Practice drawing lines across scrap wood using a try square. Remember to keep the try square snug up against the edge of the board.

Discussion / Comments
Practice makes perfect – like any other skill, proper measuring takes practice, and practicing on a variety of objects will help for future projects.

Processing Prompts

- Did you learn any measuring tricks while completing this assignment at home? What challenges did you face, and how did you solve them?

Tool Buffet — Intermediate, Senior

Topic Advanced Measurement

Learning Outcomes
To allow members a chance to practice and experiment with a variety of measurement tools

Time 30 – 45 minutes

Materials / Resources
- T-bevels, scratch awls, combination squares, pencil compasses (all labeled)
- Scrap wood
- Pencils

Instructions
Gather several of the tools, such as the T-bevel, scratch awl, combination square, and pencil compass, for members to practice with (set a good example by having all of your tools labeled!). Have wood and pencils available for members to use when trying out of these new measuring devices.

Have members practice using the various tools. Design a skills challenge with certain parameters set out for each measuring tool (e.g. for the T-bevel, state a particular angle that must be duplicated, or set out a particular distance that members must set using the scratch awl and combination square).

This activity can be more or less competitive. Points can be awarded for each successful challenge, small prizes can be given at the end, or it could just be done for fun.

Discussion / Comments
Experimentation is essential when learning new skills. The best way to learn is by doing.

Processing Prompts
- What challenge / method of measuring did you find the easiest or most challenging? Why?
- After practicing measuring techniques, do you think it is possible to measure things ‘by eye’?
- Why is proper measuring important in woodworking?

Time for Action — Intermediate, Senior

Topic Advanced Measurement

Learning Outcomes
To learn the importance of precise measurement

Time 30 – 40 minutes

Materials / Resources
Businesses and individuals willing to participate

Instructions
If it is feasible, visit a renovation or construction site where measuring is being done so that the members can see the importance of precise measurement. If possible, arrange for the members to talk with woodworkers present about their experiences with measurement, whether proper or improper.

Also, plan a field trip to a hardware store that supplies woodworking tools so that members can see the tools and have an educated employee walk them through the various uses of each one.

Discussion / Comments
Precise measurement is essential, not only for home-based projects, but on construction sites and in lumber yards

Processing Prompts
- Did anything you learned today about measurement surprise you?
- Why is precise measurement important in woodworking?

PATTERNS AND DRAFTING

Assessing a Pattern's Level of Difficulty Junior, Intermediate, Senior

Topic Patterns

Learning Outcomes
To learn how to read a pattern and assess its difficulty

Time 15 minutes

Materials / Resources

- A variety of patterns
- If possible, items made from these patterns
- Reference list of pattern sources

Instructions
The best way to learn how to read and recognize details about a pattern that will indicate the pattern's level of difficulty is to have members examine a variety of different patterns (and subsequent projects) so that they can get a feel for it.

Gather a variety of patterns and, if possible, display the patterns alongside the items that were made from those patterns.

Prior to the meeting, collect a reference list of pattern sources for members to access on their own time (especially if the sources are online). Distribute this at the end of the meeting.

Discussion / Comments
With practice, examining patterns will reveal their level of difficulty.

Suggestions
You may wish to pair junior members with older members for this activity

Processing Prompts

- How can you tell how difficult a pattern is to complete?

See and Make! Junior, Intermediate, Senior

Topic Pattern Drawing and Transferring

Learning Outcomes

To learn how to use carbon paper and outlines to create a simple pattern for a project.

Time 30 minutes

Materials / Resources

- Small piece of wood (30 cm by 30 cm)
- Pattern or drawing that will fit on the wood
- Carbon paper
- Dulled pencil
- Masking tape

Instructions

For simple projects, members can outline a picture of the product that they like. Provide them with a number of different options to choose from, and then let members prove to themselves what they are capable of!

1. Tape one side of the pattern to the wood, so that it will lift like a flap. Line the pattern up so it is in the right position.
2. Put the carbon paper under the pattern, with the carbon side against the wood.
3. Using the dulled pencil trace along the lines of the pattern, pressing firmly. (A sharp pencil would cut the pattern.)
4. Lift the carbon paper up to make sure the pattern is marking properly.
5. Lay the paper and pattern back down, tape in a few more places, and continue tracing.
6. When finished, cut this out, paint, carve or wood burn it!

Discussion / Comments

Transferring a photo or a pattern onto a piece of wood is an effective and efficient way to build simple woodworking projects.

Processing Prompts

- Name some simple projects for which this technique would be useful.

Transferring — Junior, Intermediate, Senior

Topic Pattern Drawing and Transferring

Learning Outcomes

To show members how to draw out patterns for simple woodworking projects.

Time 25 minutes

Materials / Resources

- Paper
- Pencils
- Tracing Paper
- Photocopied patterns
- Iron
- Wood scraps

Instructions

Have members start out with copying patterns by hand, and then have them transfer their patterns by tracing and by using a photocopy and iron.

Also, have enough resources on hand for members to begin to research or select patterns for their future projects.

Discussion / Comments

Transferring a photo or a pattern onto a piece of wood is an effective and efficient way to build simple woodworking projects.

Processing Prompts

- What challenges did you face when completing this activity?
- Are there any drawbacks you can think of to transferring a pattern in this way?
- Would you use this technique again?

Practice Time! Intermediate, Senior

Topic Isometric and Orthographic Drawings

Learning Outcomes

To help members learn doing isometric and orthographic drawings of simple projects and accurately finding points on a drawing to match points on a project.

Time 35 minutes (approximately)

Materials / Resources

- Small box or rectangular object
- Ruler or tape measure
- Unlined paper
- Pencil & eraser

Instructions

Give the members the following directions:

1) Draw an isometric drawing of a box.

2) Measure the box. Draw the box in isometric style. Do a neat job, using your ruler for the lines. Print on all the measurements of all sides on. Put the box away.

3) Use your isometric drawing as a guide. Now draw an orthographic drawing. Make the scale 1 to 2 (one cm on paper = two cm on the actual box). This ratio is written as 1:2.

4) Show the three views: top, side and front. Label neatly with all the measurements. The drawing should be exactly one-half the size of the box. Print 1:2 at the bottom right corner.

5) To test the accuracy of your drawing, swap orthographic drawings with another member and build a paper or cardboard box from each others drawings! Measure and cut accurately to the drawing. How do your boxes turn out?

Discussion / Comments

Before members start to build their project, it is useful to first draw their project. Doing so may unearth potential problems such as certain cuts, angles, tools required, wood needed that would have set members back time and money in the actual

building process. By doing preliminary drawings, members will go into their project well versed in what to expect and equipped for any obstacles that may arise.

Processing Prompts

- What is the difference between an isometric and orthographic drawing? Give an example of when you would use each one in a project. Why are these drawings useful?

Grid Work: Junior, Intermediate, Senior
Using a Grid to Enlarge a Pattern

Topic Isometric and Orthographic Drawings

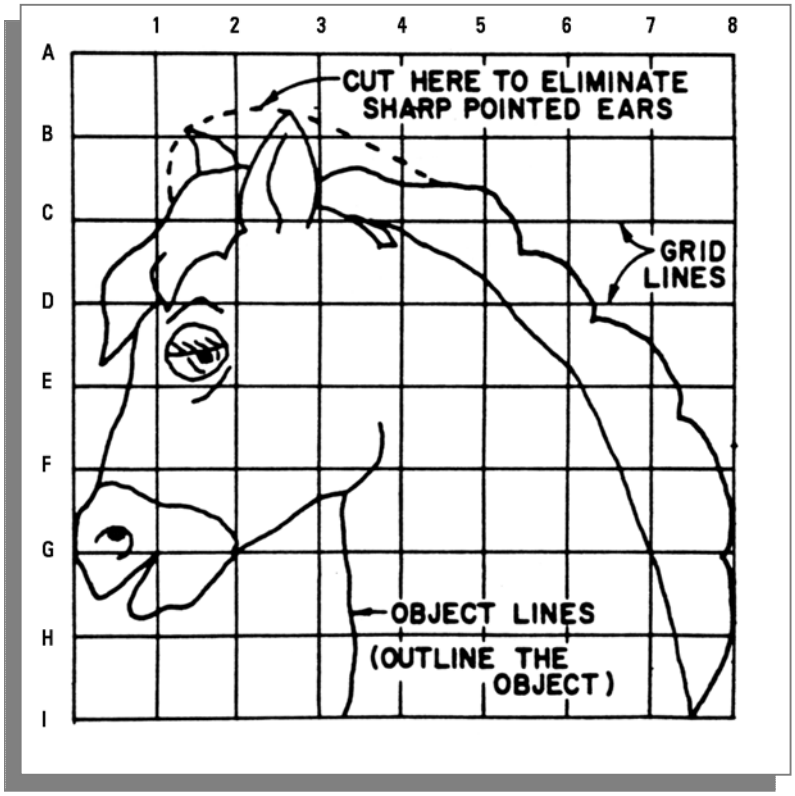
Learning Outcomes
To learn how to increase the size of a project based on a smaller pattern

Time 15 minutes

Materials / Resources

- Original pattern
- Paper large enough to accommodate the new pattern (such as drafting paper)
- Ruler
- Pencil
- Erasers

Instructions
Provide members with the following instructions:



Draw a grid on the original pattern or on a copy of it. Number each line and letter as shown.

Decide the size you want the project to be. Draw a grid with larger squares to fill the space that you want the project to be. Use the same number of lines that you used on the original pattern.

See where the grid lines cross the objects lines in the first drawing? Place dots on the same points and lines on the larger

pattern. When you have all the dots on the new pattern, connect the dots, using curved and straight lines like the original. The new pattern will be a larger version of the original drawing.

You can display this enlarged copy at Achievement Day!

Discussion / Comments

This grid method can be used to enlarge patterns to customize the size of the final product.

Processing Prompts

- Do you think it is possible to enlarge a pattern without drawing the grid?

Copycat: Junior, Intermediate, Senior

Using a photocopier to enlarge the pattern

Topic Isometric and Orthographic Drawings

Learning Outcomes

To learn an alternate, quick method to enlarge patterns for woodworking

Time 10 minutes

Materials / Resources

- A photocopier with enlarging capabilities

Instructions

If it is possible to have access to a photocopier, take a pattern and copy it using the enlarging feature. While this doesn't test drawing abilities, it may prove to be a time saver. It's all a matter of personal preference, as some woodworkers prefer to enlarge their own patterns, while others enjoy the photocopying method. Have members sample both techniques and see what one is preferred.

Discussion / Comments

Enlarging patterns by hand is more time consuming, but more flexible, whereas enlarging using a photocopier saves time, but has some restrictions.

Processing Prompts

- When is it best to use the hand-drawn technique to enlarge patterns? What about the photocopying technique?
- Which method do you prefer?

Try Your Hand at Freehand — Junior, Intermediate, Senior

Topic Isometric and Orthographic Drawings

Learning Outcomes

To learn the importance of scale when using isometric and orthographic drawings

Time 45 minutes

Materials / Resources

- Drawings, patterns and sample paper or cardboard models that were made-to-scale from a pattern.
- Carbon paper, pencils, paper, rulers, erasers, cardboard, wood scraps and small boxes on-hand for the meeting.
- If it is possible, secure access to a photocopier (and if not, have a photocopied pattern to show members) and an iron.

Sources of Plans and Patterns:

Websites

www.thewoodcrafter.net

www.leevalleytools.com

www.woodworkershop.com

www.intheworkshop.com

Books

Check out the library to show members the vast amount of information that exists in a hard copy form, as well as in an electronic format.

Imagination and Research

Imagination may be the source of some of the best projects. You may need to a special item with a specific size dimension to fit a particular spot. This will call for research through stores, catalogues, and online to see if the right thing is out there for sale, or for inspiration for your own design.

Instructions

Have members make orthographic and isometric drawings of small boxes. However, first have them make the boxes without making them to scale, then have the members switch their drawings among one another and see how the paper representations turned out.

After the swap and the realization of how important drawing to scale is, have members make orthographic and isometric drawings of small boxes, this time doing it properly and using an appropriate scale. Have the members swap drawings again and see how much better (and more accurate) the paper-constructed boxes turn out.

Have members experiment with the scale that they are using if they wish, thereby enlarging the pattern on their own. If they would rather, have them use a grid pattern to enlarge the pattern. Using the grid will see members transferring the pattern onto wood using carbon paper and a pencil. Lastly, if your club is equipped for it and members are interested have members transfer a pattern onto wood using a photocopied picture and a hot iron.

Discussion / Comments

When proper scale is not used, projects will usually not turn out correctly.

Processing Prompts

- How did your boxes turn out in the first round? What about the second? What does this tell you about the importance of scale?

Custom Designs - By Me! Intermediate, Senior

Topic Isometric and Orthographic Drawings

Learning Outcomes
To learn how to create original designs and patterns

Time 45 minutes

Materials / Resources

- Proper measuring tools
- Paper
- Pencils & erasers
- Cardboard
- Wood
- Any required hand / power tools

Instructions
Give the following instructions to your members:

Decide what you want this project to do for you. What are the requirements of the project?

Let's say you want to build a shelf for your school locker. There will be size limitations. It will have to be of certain strength. Do you want it to be adjustable so you can move it up and down? Will you have to assemble it after you have put the pieces in the locker or can you pre-assemble it at home? Do you plan to store heavy or light objects on this shelf?

Take measurements of the space to be occupied by the project. Measure your locker door. Measure the inside of the locker.

Make both isometric and orthographic drawings of the project. This step helps you think through the building and use of the item.

Make a paper or cardboard model of the project. Test it in the space that you intend to use the actual article. Many design problems are detected at this stage! It is a lot cheaper to discover a mistake with a paper model than it is with an expensive wood object!

Make any necessary design changes. Repeat your test.

Transfer your pattern to wood. Proceed with building the real article.

Install, use and appreciate your custom designed project.

Take a picture for your record book!

Discussion / Comments

For custom design projects, as well as all woodworking projects, it is essential that you properly plan ahead by taking good measurements, constructing models if necessary, and making appropriate adjustments.

Suggestions

Describe this activity to members during a previous meeting, so they come prepared to create their design idea

Processing Prompts

- After you made your model, did you have to make any adjustments to your original design?

Fastening, Finishing and Sanding

How Do You "Glue" That? Junior, Intermediate, Senior

Topic Glue

Learning Outcomes
To learn how to properly use glue to affix wood pieces.

Time 10 minutes to glue, 1 hour to dry

Materials / Resources

- Carpenter's glue
- Scrap wood
- Clamps

Instructions
Wood must be clean, dry and smooth or it will not glue successfully.

1. Apply a wiggly line of glue to both pieces. Smear the glue around until all the surfaces are covered. If too much glue is used, it will squeeze out, make a mess and go to waste.
2. Put the two glued pieces together and squeeze them. A small amount of glue should squeeze out on the edges. Line them as desired. Clamp them, using wood scraps to prevent dents in the project. Clean up any excess glue.
3. Lightly tighten the clamps at first. Check for positioning.
4. Tighten the clamps further.
5. Leave the clamps on for at least an hour.
6. When the clamps are taken off, leave the project overnight before any more work is done on it.
7. Clean up.

Discussion / Comments
Patience and proper procedure, including making sure all surfaces to be glued are clean, are keys to making sure the glue will hold.

Suggestions

For variation, have members try and glue wood with unclean surfaces. Then experiment to see how well each sample holds.

Processing Prompts

- Why do you think it is important for wood surfaces to be clean when applying glue?
- What role do clamps play in gluing?

Glue Practice — Junior, Intermediate, Senior

Topic Glue

Learning Outcomes
To learn the importance of proper gluing procedure

Time 20 minutes

Materials / Resources
Types of glues, scraps of clean wood, painted wood and dirty wood, a variety of materials to use as clamps.

Instructions
Give the members the following instructions.

1. Glue two dirty or greasy pieces of wood together. Clamp and let dry.
2. Glue two clean pieces of wood together. Clamp and let dry.
3. Glue two pieces of painted wood together. Clamp and let dry.
4. Compare the strength of the examples at the next meeting. How will these joints stand up over time?
5. Practice gluing pieces of wood together and determining how much glue is enough. Practice cleaning off excess glue with a warm, damp, clean cloth. Maybe later you can practice staining this piece and see how the glue affects the staining process.
6. Compare the types of glues that you have. What differences do you notice in how the glue flows, sticks, smoothes out and bonds?

Ask the members to observe the following:

Look around home, school and public places to see places where glue has been used.

Sometimes you will see fine examples of gluing. For other items it will look like a glue fight happened. Learning how to glue effectively and neatly is an important skill to develop.

Sometimes you will see very old examples of gluing that still work. Other times you will see where the glue has failed. Often woodwork has to be taken apart, scraped well, re-glued and clamped. For example, kitchen chairs that get a lot of use often need regular re-gluing.

Discussion / Comments

Proper glue use may save time and can last for a long time.

Processing Prompts

- Compare the types of glues that you have. What differences do you notice in how the glue flows, sticks, smoothes out and bonds?
- For further prompts, refer to the 'observe' portion of the instructions above.

Glue it Again! Intermediate, Senior

Topic Epoxy Glue

Learning Outcomes
To gain experience using glue and evaluating previous work.

Time 35 minutes (approximately)

Materials / Resources
- Tables to accommodate the glue stations
- Scrap wood
- White, yellow and epoxy glue
- Samples of old and new woodwork with glued components
- Proper ventilation

Instructions
Practice makes perfect, and learning how to glue is no exception. Set up workstations, where members can try their hand at a number of different aspects related to gluing. Listed below are some examples of the activities that can be done at the various stations:

- viewing examples of use of glue in new and old woodwork
- viewing example of good gluing and bad gluing
- practicing getting the correct amount of glue
- practicing cleaning wet and dry glue off wood
- experimenting with white and yellow glue. For senior and intermediate members, they can also trying mixing and using epoxy glue.

Discussion / Comments
Proper use of adhesives takes practice.

Processing Prompts
- What were some of the problems you experienced with this activity? How did you solve them?
- What could you tell about how well the gluing work had been done in some of the older projects? Was it done well? Or were there problems?

Clamping Your Style — Junior, Intermediate, Senior

Topic Clamping

Learning Outcomes

To help members learn the differences between a variety of clamps and their intended uses, and to prevent leaving clamping marks.

Time 25 minutes

Materials / Resources

- A variety of clamps
- Sample wood pieces
- Variety of materials (that members bring from home)

Instructions

Compare the usability, grip and overall effectiveness of various clamps on a selection of items. Have members bring in a wide variety of goods that are not wood. Leaders can supply the sample wood pieces. See which clamp members prefer for each type of material.

Prior to clamping, inform members how to go about not leaving clamp marks on their items. Follow this exercise be sure to show members how to remove clamping marks.

Discussion / Comments

Clamps can be used on a variety of objects, but it must be done properly to avoid leaving marks.

Processing Prompts

- What is the best way to avoid leaving clamp marks on a project?
- What was the most difficult material to clamp together?

Join the Fun — Junior, Intermediate

Topic Joinery

Learning Outcomes
To help members assess the strengths and weaknesses of different joint options

Time 35 minutes

Materials / Resources
- A variety of woodworking, home renovation, and carpentry books and magazines that can be used for their images
- Poster paper
- Markers
- Glue
- Scissors

Instructions
Have members go through a number of woodworking, home renovating and carpentry books and magazines. Source photos of these different joint options.

Have them discuss what ones they like the most in regards to esthetics, usability, strength, and level of skill required to construct the joint.

Make the “best” photo examples of various joints into posters. Represent each joint with its pros and cons. Ideally, when members need to decide on what joint to use, they will be able to refer to the posters on the walls of the workshop for inspiration.

Discussion / Comments
Each technique has its own set of pros and cons. Determining which one to use will be likely be dictated by the project that you’re making.

Processing Prompts
- Name a characteristic of a good joint.
- How do you decide which joint to use for each new situation?

Make a Sanding Block — Junior, Intermediate, Senior

Topic Sanding

Learning Outcomes
To learn how to make a sanding block

Time 15 minutes

Materials / Resources

- Wood blocks 2 cm x 11 cm x 12 cm
- Carpet / rubber
  Glue
- Sandpaper
- Materials for decoration – markers, etc.

Instructions
Have members make their own hand sanding block. Inform members the week prior so that they will have time to find material such as carpet or rubber for gluing onto the bottom, unless you are supplying this material.

To make a sanding block, measure the bottom of the wood block. Measure and cut the carpet / rubber to match. Glue the material to the bottom of the block, and let it set.

After the glue has dried, encourage members to make their sanding blocks distinctive. Members could use a polka dot pattern carpet piece, or decorate the tops of their sanding blocks – something that will make them smile each time that they reach for it.

Discussion / Comments
A hand sanding block is used to make the best use of sandpaper. A sanding block helps put even pressure on the wood being sanded. This prevents making grooves in your project with the sandpaper.

Suggestions
Have members experiment by sanding with, then without, a sanding block – then compare the difference.

Processing Prompts

- What is the difference in quality and results between using a sanding block, and using only sandpaper?

Grit Sampler — Junior, Intermediate, Senior

Topic Sandpaper

Learning Outcomes
Members will learn the importance of following a specific course of sandpaper in their projects.

Time 30 minutes

Materials / Resources
- Sandpaper in a variety of different grits
- Patterns that state a specific course of sandpaper
- Scrap wood

Instructions
Have members select a pattern that specifically states a grit of sandpaper. Have them sample a variety of different grits in order to see the difference between each one. See why the pattern that they chose would have specified a particular grade.

Encourage members to sand “out of order” so that they can see firsthand what the product will look like if the use the less coarse grade of sandpaper (which is how many number of grits?) before using the more coarse variety. Again, quiz members on what sort of a number indicates coarser sandpaper.

Discussion / Comments
Some patterns require a particular grit of sandpaper for a specific reason. Not following the instructions can produce negative results.

Processing Prompts
- What was the result when you sanded the wood out of order of the recommended grit?

Power Sander Discussion — Intermediate, Senior

Topic Advanced Power Tools

Learning Outcomes

To encourage members to consider the advantages and disadvantages of power sanders.

Time 30 minutes

Materials / Resources

- Flipchart / whiteboard and markers to record discussion

Instructions

Hold a discussion using the processing prompts below after demonstrating proper care and use of power sanders, and members have a chance to try them. Record the main points raised on the flipchart / whiteboard.

Processing Prompts

- Name the characteristics of the power sanders that members sampled.
- Discuss the advantages of using power sanders.
- Discuss the disadvantages of using power sanders.
- Did members prefer the power sander, belt or vibrating, to hand sanding? Why or why not?

Practice Using Various Types of Sanders — Intermediate, Senior

Topic Power Sanders

Learning Outcomes

To give members a chance to practice using various sanders and grits of sandpaper, and to have them compare the results of each.

Time 25 minutes

Materials / Resources

- Scraps of wood (different roughness and hardness)
- A variety of sanders
- Eye protection
- Dust protection

Instructions

Have members clamp the wood to be sanded, practice using various sanders and grits of sandpaper on the wood, and compare the quality of the work done.

Discussion / Comments

Power sanders and hand sanding require different skills to use and produce different results. Members will need to choose which method is right for them.

Suggestions

After you have just sanded a surface, dampen it lightly. This will amplify any imperfections and you can sand again, producing a smoother finish!

To sand into a corner, put a bit of sandpaper on the tip of a putty knife.

Processing Prompts

- Which type of sander did you prefer? Which model? How heavy was the sander? Is a power sander right for you right now or do you prefer hand sanding?

Filter Fashion Show — Junior, Intermediate, Senior

Topic Sanding

Learning Outcomes
Filters and masks come in several different forms. Members must learn which to use in each instance.

Time 15 minutes

Materials / Resources
- A variety of nuisance and reusable respirator masks

Instructions
Have nuisance filters and reusable respirator masks on hand (purchased previously from a local hardware store, or organize a respirator mask "fashion show" at a local hardware store) for members to try on so that they can feel and see the difference between the two.

Discussion / Comments
A filter mask is an essential part of many woodworking projects. It is important to know the difference between these masks to choose the right one.

Suggestions
Strongly encourage members to purchase their own mask, especially if woodworking is something that they are thinking of pursuing as a hobby or a career.

Processing Prompts
- What is the difference between a nuisance filter and a reusable respirator mask?
- What is the benefit of purchasing your own mask?
- Why is it important to make sure your mask is clean?

Micron Examination — Junior, Intermediate, Senior

Topic Sanding

Learning Outcomes

To learn the importance of wearing a mask when sanding

Time 15 minutes

Materials / Resources

- Magnifying glasses or microscopes
- Variety of household items

Instructions

Have members bring in a magnifying glass or a set of binoculars (or better yet, see if anyone happens to have a microscope that can be borrowed). Supply a variety of items to be analyzed under the magnified eye so that members are able to see just how miniscule 10 microns is.

This will hopefully dispel the “if I can’t see them then they must not be there” mentality. Otherwise, this may lead to members not wearing masks, which could lead to permanent lung damage.

As leader, make sure you wear you wear your mask at the appropriate time as well.

Processing Prompts

- What reasons do people give for not wearing a mask when sanding?

Feature Finishes — Junior, Intermediate, Senior

Topic Finishing

Learning Outcomes
To help members learn about a variety of finishes and surface treatments.

Time 30 minutes for presentations, or more depending on size of group (research take home activity).

Materials / Resources
None required

Instructions
Have members do research on the following penetrating finishes: linseed, tung, teak, Danish, Swedish and polyurethane oils.

Have them present their findings (encourage them to flip through catalogues or take photos of products to bring in to show fellow members) to the group so that members can be more aware of the appearance and benefits of each one.

If there are enough members, split the group and have some do the same research with surface treatments: paint, varnish, shellac and lacquer.

Discussion / Comments
Finishes and surface treatments come in many varieties, and each has different characteristics, benefits and drawbacks.

Processing Prompts
- Based on your research, what are some things you must consider when choosing a finish or surface treatment?

Finishing Stations — Junior, Intermediate, Senior

Topic Finishing

Learning Outcomes
To allow members to learn and experiment with a variety of finishes

Time Up to 1 hour

Materials / Resources

- An 'expert' willing to participate
- Materials for finishing stations – variety of finishing treatments and materials
- Well-ventilated space

Instructions
Schedule a tour or have an expert come in to explain to members the various finishing techniques and treatments.

Afterwards, set up stations so that members can work through a variety of different applications.

Discussion / Comments
"Learn to do by doing" is key for figuring out what works and what doesn't, as well as what you like and what you don't like.

Processing Prompts

- What finishing technique did you like the best?
- Were there any techniques that didn't work out? Why do you think this was?

PROJECT-RELATED ACTIVITIES

Why Judging is Important — Junior, Intermediate, Senior

Source: Adapted from 4-H Ontario's Judging Guide

Objective

To show members that judging is a skill that is applicable to woodworking, as well as being relevant to a number of consumer-related decisions.

Processing Prompts

- Does judging seem like a skill that is related to everyday life?
- Have members noticed an improvement in their analytical skills since having joined 4-H? Have they noticed an increase in their ability to reason and their power of discernment due to the judging practice that the 4-H program provides?
- What do members find to be the hardest aspect of judging? The easiest? The most confusing?

Background

Buying something involves making a decision. Cost, need or space in one's home or closet are all examples of variables that one considers before deciding to buy something. It is important, once having made a purchase, to know the reasons that led to the purchase, or in some cases, the reasons that led to not making the purchase.

Knowing what to look for in a particular product also makes a person a savvy consumer, which is always a good thing to be – who doesn't want to get the best deal on the highest quality product?

Being a knowledgeable consumer means more than consuming a lot, it means knowing the prices, the benefits, the quality, the brands of comparable products. It is this type of research that will be the difference between knowing what is a good deal on a particular product, and being swept up by a deal that sounds too good to be true (mostly because it usually is!).

In addition to knowing how to accurately and sensibly judge products, judging instills that following traits in those who know that skill well:

- confidence
- a sense of accomplishment
- decision-making skills
- enhanced memory
- the ability to assess the positives and negatives of a situation
- organized thought patterns and the ability to think while speaking
- effective and articulate communication skills
- leadership skills (choosing something that you want to based on your own knowledge, not because you're taking someone else's lead)

Judging is an adaptable skill that will carry over to all areas of life (what to buy at the grocery store, selecting a livestock at an auction sale, deciding what to eat for breakfast, picking a post-secondary school, and so on).

Benefits of Giving Oral Reasons:

- You become organized.
- Your memory becomes sharper
- Your ordering of thoughts and therefore your articulate improves
- You learn to speak more clearly
- You become more of a logical as opposed to emotional decision-maker
- You learn to defend your decision.
- You learn to sell yourself and your ideas
- You improve your presentation skills
- You build confidence in yourself and your skills
- You improve your public speaking skills

In 4-H, another major perk of learning how to properly judge a product are the contacts and connections made with the professionals who act as the official judges for 4-H judging competitions. Whether it is a beef, woodworking, craft or dairy class, the person who listens

to the giving of reasons likely has keen knowledge of that industry, and will therefore be a good person to know.

Key Messages

Judging is an important skill to hone – not only does it make members more discerning consumers, but it also increases confidence, enhances memory, improves communication, heightens observation skills – the list is seemingly endless!

While the giving of oral reasons seems to draw groans from many members, being able to "defend" decisions is half of the judging process, not to mention the potential industry networking that may occur between the members and the official judges.

Activities

Consumer decision-making is somewhat different than livestock judging, simply because you will typically be given a list of criteria—the consumer's age, their specific needs, why they are in the market for that particular product, their price range, any constraints that they might have, and so on—that you read, consider and then make informed decisions in respect to the parameters that you were given. You are also, usually, expected to do your own background research so that you know a bit more about the products being presented in the class (which yes, means that you would have a heads-up on the products that would be included in the class, which is also quite a bit different from livestock judging).

With this in mind, the following three items are simply suggestions for products that could be used in a consumer decision-making class.

1. Wood Comparison: Hardwood versus softwood versus plywood

For example, if you had tables made out of these three materials, and then the criteria stated that the table would be used on the patio at a family's cabin, you would likely lean toward the plywood, simply because you would know that the table would be sat out and exposed to the elements. However, if the criteria also stated that they wanted it to be a piece of furniture that, after the summer months, could be transferred inside, you would probably need to change your decision as plywood, depending on its grade, may not be altogether presentable for the indoors.

Feel free to play around with your lists of criteria, and allow members to come up with their own scenarios to allow them to get the hang of things.

Once the members are beginning to feel more comfortable with this form of judging and placing, have an "official" judge come in, place the items and then be the receiver of the oral reasons to see how the member's reasons and placings stack up against theirs.

2. Sanding: Hand sanding vs. stationary sanding vs. block plane

Same type of scenario as above, outline parameters (e.g. the person who is making the purchase is not planning to put a finish on the item and wants to have a piece that will be "finished" nicely enough just with sanding to be able to stand on its own until the varnish or oil is applied to it) and let the members go to it!

3. Router

Given all of the different edges that can be done with a router, this judging class could take a variety of different scenarios. Perhaps ask members to supply some of their own project work for judging. If, as the leader, you feel like this might make the judging feel too personal feel free to outsource the items (maybe bring in a few of your own projects!)

Business Minded - Entrepreneurial Aspects Junior, Intermediate, Senior

Adapted from Mind Your Business project, Alberta 4-H.

Learning Outcomes To introduce members to the idea of entrepreneurship.

Applicability

It is important to show members that although the project year is over, their learning and growing do not have to end.

Background

Now that the year's project work has finished, is anyone looking for their next big challenge?

What about starting up a small business?

When members take stock of what they have gained from their 4-H experience and have learned from project and club work, are there any products or skills that could be marketed? Is there a niche in the industry that has been identified, perhaps on a club field trip, or through talking to store employees or from researching the additional online resources?

Here are a few prompts to get members thinking about whether or not starting up their own business is a good idea. Have members know that at the beginning, their "business" might be a booth at a Farmers' Market every weekend, or putting up flyers around their community stating that there is an "experienced woodworker for hire."

Processing Prompts

- Do any of the members know someone who is an entrepreneur, or someone who has their own small business?
- What are some of the pros of being one's own boss? What are some negative aspects of this?
- What are some good things to think about and analyze before making the decision to open a business?

Activity 1

Have members fill out the lists on the following pages.

What five "things" did I learn from being in 4-H?

example: *How to make a blouse*

example: *How to groom a calf*

example: *How to work with others*

1. _____

2. _____

3. _____

4. _____

5. _____

I learned the following skills from taking the Woodworking project (feel free to add as many lines as necessary!):

1. _____

2. _____

3. _____

4. _____

5. _____

I feel confident in the following projects, techniques, tools and/or skills (feel free to add as many lines as necessary!):

1. _____

2. _____

3. _____

4. _____

5. _____

When members have completed filling this out, talk with them about the number of different opportunities that exist in opening a small business. Be sure to remind them that the word "business" doesn't mean that they have to own a fax machine and have an office – it just means that they're being inventive with the newly acquired skills!

Here is a list of successful product and service based businesses that could be run by young people.

Product-based Businesses

- selling woodworking projects
- selling specialty intarsia crafts
- hiring-out skills to those wanting their woodworking project ideas to come to fruition
- jewelry creation (wooden rings, bracelets, earrings, etc. are really popular right now!)

Service-based Businesses

- acting as a carpenter's assistant
- instructing others in woodworking
- woodworking "repairs"

Businesses can provide a product, a service or both.

Activity 2

If members are having difficulty identifying their skills, or naming what sort of projects of tasks they could undertake, try introducing the concept of Mind Mapping!

Any business idea can lead in many different directions. Drawing a map of ideas is a good way to see where it can lead. Idea maps can be made individually or with other 4-H members.

Mind Mapping

Here's How:

1. Start by writing the project interest in the centre of a blank sheet of paper.
2. Each time a new idea is suggested, draw a line from the centre in a new direction. If that thought breaks down into further possibilities, draw more lines connecting those ideas.
3. For each new idea, go back to the centre and start a new spoke on the wheel and map outwards as that idea develops.
4. Continue until there are no more possibilities associated with that idea.

Then have members record any viable business ideas that may have been discussed in the Mind Map:

_____

_____

_____

_____

Following the writing out of ideas, have members answer the following questions:

1. Will this idea work in my community?

_____

_____

2. Who would use this product/service?

_____

_____

3. Will my schedule fit into other things I do?

_____

_____

4. How much will it cost to get started?

_____

5. Could I make at least minimum wage? Yes / No

6. Will I learn valuable skills? Yes / No

Listed below are some points for members to consider and keep in mind when they are crafting up their small business plans and ideas:

The Concept(s) Should:

- Be unique and exciting. Make people say "I have to have that product or that service!"
- Fill a real need.
- Be practical to make or do.
- Be safe.
- Improve customer's life and have added value (as in, why would someone purchase a coffee table from you, when they could get one from a store?)
- Be good value for the cost.
- Accent a home. People seem to be spending more time at home and therefore want their space to be comfortable and inviting.
- Be environmentally friendly. Saving the environment is a big challenge. How about environmentally friendly products, resource conservation, reduced pollution?

For more information on entrepreneurship, go to:

Government of British Columbia website:
www.sb.gov.bc.ca/smallbus/workshop/workshop.html

Canadian Youth Business Foundation: www.cybf.ca/

Careers: The Next Generation: www.nextgen.org/

Information Toss Up — Junior, Intermediate, Senior

Topic: Project terms, safety, joinery, etc.

Learning Outcomes:
To learn about a specific topic in woodworking

Time: Any amount (5 minutes or more)

Material/Resources:

- Large Ball (beach ball)
- Paper
- Tape
- Tape the questions onto the ball until the whole ball is covered. Or obtain an inexpensive markers or pens

Instructions:
Prior to the activity, create several questions. Themes for questions can be around a variety of topics (examples to follow). Write the questions on different colors of paper and cut into different shapes and size beach ball and write on it with permanent marker to reuse from year to year.

Instruct the group that they are to stand in formation. Choose to have them stand in a circle or in two lines facing each other.

Toss the ball from person to person. When someone catches the ball they are to answer the question that their left thumb lands on the ball. Have the catcher read out the question to the group prior to answering it.

Be sure not to embarrass anyone through creating a supportive environment of hints or answers from the whole crowd or allowing a “pass” option.

Once the question has been answered, toss the ball onto another person. Be sure that everyone gets a turn.

Topic Ideas:

Junior

Put the name of a tool on the ball and have the members either name a part of the tool or have them say how the tool is used.

Woodworking terms like: kerf, knot, flush, cross cut, rip, grain, set, pitch, seasoning, finish, etc. and have them explain the word.

Intermediate

Have members name a safety rule. Write words on the ball like clothing, vapors, dust, fire, tool, shop, etc, and have the members name a rule.

Add woodworking terms like: varnish, rake, bow, twist, warp, splating, oils, brad, coniferous, deciduous, isometric, orthographic, etc. and have them explain the word.

Senior

Add joinery, terms like butt, lap, spline, dado, rabbet, dowelled, dovetail, miter, etc. and have them explain how the joint is made.

Add woodworking terms like: tear out, in feed, out feed, kickback, jig, veneer, fence, epoxy, etc. and have them explain the word.

Discussion / Comments

Members will all learn woodworking terms differently – some people are better than others at memorizing terminology.

Processing Prompts

- How many terms did you remember? Did you ever take a 'pass'? What techniques do you use to remember terms?

A Safety Exercise — Junior, Intermediate

Adapted from the 4-H Ontario Woodworking Manual

Topic Safety

Learning Outcomes
To get members to reflect on what it would be like to suffer a serious injury.

Time 5 minutes

Materials / Resources
None required

Instructions
As a woodworking group, try tying up your runner laces without using your thumbs, or try to do up your shirt buttons without using your thumbs. How much fun would it be to do this all the time? It's never too late to think safety!

Discussion / Comments
Proper safety measures are essential to prevent injury; even though they may seem inconvenient, it is more inconvenient to suffer a serious injury.

Processing Prompts

- Name a safety measure used in woodworking to prevent injury. Why is this measure used?

Disappearing Dents — Intermediate, Senior

Topic Removing Dents

Learning Outcome Learn how to remove small dents from wood

Materials/Resources

- Safety goggles
- Hammer
- Scrap piece of lumber (piece of 25mm X 100mm)
- Cloth
- Clothes iron

Instructions

1. Put on safety glasses
2. Using the hammer, strike your scrap piece of lumber making a dent
3. Dampen the cloth and place it over the dent.
4. Apply heat to the cloth using the clothes iron.
5. After heating the cloth to the point that it has dried out, check to if the dent has disappeared.
6. If the dent is still present, re-dampen the cloth and apply more heat.

Discussion/Comments

Dents can be removed – but patience and proper procedure is required.

Processing Prompts

- Why were the dents removed or not removed?
- Were you able to remove the dent?
- How many times did you dampen the cloth before the dent was removed?

Tool Box Jumble — Junior

Topic Tools

Learning Outcomes

To learn the names of common woodworking tools

Time 15 minutes

Material/Resources

- Pencils
- A copy of the Tool Box Jumble (on the next page) for each member.

Instructions

Unscramble the letters to discover a common woodworking tool.

Discussion/Comments

There are many different ways to remember information.

Processing Prompts

- What is each tool in the jumble used for?
- Can you name another type of tool in that category? i.e. Hand Saw- Back saw

Tool Box Jumble

bintionamoC quaSre	oolT xBo
rngiMasue peTa	lurRe
pmlaC	tyefSa sesslaG
erdrivwcreS	liaN teS
danHwsa	kcolB enalP
ecaBr lilrD	Snppradae
lrilD	reHmma
liPcne	ueGl

Nail set	Coping saw	Hammer	Sandpaper	Pencil	Glue
Combination Square	Handsaw	Ruler	Tool box	Clamp	Drill
Measuring tape	Safety Glasses	Brace Drill	Screwdriver	Block Plane	

Woodworkers Tic-Tac-Toe

Junior, Intermediate, Senior

Topic Woodworking Terms

Learning Outcome

To learn different woodworking terms

Time 15 minutes or more

Materials/Resources

- Nine cards marked with an X on one side and an O on the other side
- Questions (on the following page, or write your own)
- Nine (9) chairs

Instructions

This game is played similar to the TV version of Hollywood Squares or old fashioned Tic-Tac-Toe. Place nine chairs in a square. Have nine people sit in the chairs, giving each one of them a card, one side marked with an O and one side marked with an X.

Select two additional people as contestants A and B to compete against each other. Assign O to one person and X to the other. After determining who will go first, one contestant (A) chooses a person in one of the squares.

Master of Ceremonies asks a question (on reverse) of the person in the selected square. The person can either:

A. Give the correct answer or

B. Bluff with a made-up answer if he (she) doesn't know the correct one.

Contestant A has to either agree or disagree with the response. If the correct response is given, contestant A gets the square. The person in the square holds up an X or O. If he (she) misses, contestant B gets the square.

The only exception to this is –if there are already two marks in a row a contestant can not win by default. The other person has to get the answer correct to have a winning row.

The object is to get three marks in a row just like tic-tac-toe.

Discussion / Comments

It is important to be able to recognize main woodworking terms, and make quick and accurate decisions using the correct terminology– not only during woodworking tic-tac-toe, but while working on woodworking projects.

Suggestions

If you do not have 11 members in your group just play it on paper with the member who gets the right answer gets to mark in their O or X when they answer the question right.

Processing Prompts

- How did you feel when it was your turn to answer the question?
- How did you react if you didn't know the answer?
- Can you think of a scenario when working on a woodworking project when you might have to make a quick decision? What is the best way to make this kind of decision?
- What techniques do you use to remember information like the terms used in this game?

Woodworkers Tic-Tac-Toe Questions – Junior

1. What tool is used to cut a board into two parts? Saw
2. What item is worn to prevent injury to the eyes? Safety glasses
3. What type of handsaw is designed to cut curves in wood? Coping saw
4. What are the three dimension of a piece of wood? Thickness, width, length
5. Name the two parts of a hammer? Head, handle, face, neck, claw
6. What should every shop have to treat cuts and scrapes? First aid kit
7. What would you use to make wood smooth? Rasp or sandpaper
8. What tool is used to counter sink a nail? Nail set
9. The cut in the wood made by the saw is called the _____. Kerf
10. The appearance, size and direction of the fibers of the wood are called the _____. Grain
11. When replacing a blade in a coping saw the teeth of the blade should be pointing _____? Why? Toward the handle because less chance of the blade to break.
12. What tool is used to check if your saw cut is straight? Square
13. When two adjoining surfaces are perfectly even with each other this is called being _____. Flush
14. When measuring always _____ before cutting your piece of wood to make sure it fits. Re-measure
15. The time it takes wood to dry is called _____. Seasoning
16. The direction of the teeth on a saw blade left or right is called the _____. Set
17. When you make a cut with a saw across the grain this is called a _____. Crosscut
18. To prevent dents in your wood place a _____ between your good board and the clamp. A thin scrap piece of wood
19. When sanding a piece of wood always sand with the grain of the wood to prevent _____. Scratches
20. Name two types of screwdrivers? Philips, Robertson, slotted

Woodworkers Tic-Tac-Toe Questions – Intermediate

1. Never use paints or varnish near an _____ because they are very flammable. Open flame
2. A _____ is the portion of a branch or limb that is embedded in the wood. Knot
3. Name three pieces of clothing you should wear when working around equipment.

1. Long pants, shoes, tight fitting shirt

4. The bending, splitting, cupping or twisting of a board is called _____. Warping
5. Name two types of hardwood. Oak, Cherry, Birch, Walnut, Maple
6. What is another name for the T-bevel? Bevel square
7. What is a chuck? The part of a drill that holds the drill bit in the machine.
8. Name a type of sandpaper. Garnet, flint, aluminum oxide, silicone carbide
9. The lengthwise twisting of the wood due to uneven seasoning or grain is called _____. Twist
10. When you cut with the wood grain it is called _____. Ripping
11. Why should long hair be tied back? To prevent it from getting caught in equipment
12. The number of teeth per inch on a saw blade is called the _____. Pitch
13. The angle at which the teeth on a saw blade are ground or sharpened is called the _____. Rake
14. When using finishes like paints and varnishes which give off toxic gases make sure that your work area has lots of _____. Fresh air or air movement
15. Name two types of power sanders. Palm, pad, or belt
16. What type of paint brush is best for applying stains and varnishes? Natural bristle brushes
17. Name two types of softwoods. Pine, fir, willow, redwood, cedar
18. Name three parts of a screw. Slot, head, shank, threads, core, point
19. Name one of the two basic kinds of drawings for building. Isometric or orthographic
20. A little bit of _____ on screw threads may help to turn in a difficult screw. Soap or wax

Woodworkers Tic-Tac-Toe Questions - Seniors

1. A device used to hold your work or act as a guide is called a _____. Jig
2. A change in the texture, strength, color of wood caused by colonies of fungus growing within the dead wood is called _____. Splating
3. When a work piece is thrown back by the cutter (saw, router, etc.) this is called _____. Kickback
4. What is the most common type of joint used when making picture frames? Miter
5. When working with power equipment like table saws and routers what should be worn to prevent hearing loss? Ear plugs or ear muffs
6. _____ is the tendency to splinter the trailing edge of the material when cutting across the grain. Tear out
7. Name three types of joints that can be made by a table or radial arm saw. Miter, dado, rabbet, spline
8. The side of a power tool where the board enters is called the _____. In feed
9. If you are using and oil finish and spill it what can be used to clean it up. Sawdust
10. What is veneer? A thin layer of wood which is made to be laid on another piece of wood
11. What is a dado joint? A cut in the middle parts of a board where another piece of board is made to fit
12. Name three of the most popular woods used by woodworkers. Pine, oak, ash, birch, cherry, mahogany, maple, walnut
13. Which is a stronger joint a dovetail joint or a box joint and why? Dovetail because it has wedge-shaped fingers and notches which hold the two pieces of wood tighter
14. When you make a cut at the end of a board so that the other board fits into it is called a _____. Rabbet joint
15. What is the weakest type of joint and why? Butt joint because the end of a piece of wood is joined to the side of another and glue does not hold on an end grain.
16. What is an epoxy? A glue which requires mixing two different components together to form a chemical reaction which results in a hard glue.

Self Evaluation — Junior, Intermediate, Senior

Topic Self Esteem, Achievement and Reflection

Learning Outcomes

To help members tap into their own internal motivation – the type of motivation that comes from self satisfaction of a job well done and increased self esteem through gaining new abilities rather than external rewards such as trophies, ribbons and money.

Time 30 minutes (or more, depending on the size and interest of the group)

Materials / Resources

- 4-H Project Review Sheet (following page) – one per participant
- Pens or pencils

Instructions

People can learn a lot about themselves through self-evaluation. Self evaluation just means taking an honest look at both strengths and areas needing improvement. e.g. Are there things the participants like about themselves or things they would do differently if they had the chance to change?

Have members complete the top section ("Member's Point of View") of the 4-H Project Review sheet (following page). The evaluation can be done on a specific item or a number of items/tasks for the entire year.

Collect the members' sheets and complete the "Another's Point of View" section or give the sheets to project leaders, head leader, another member in the group to complete.

Return the sheets to the members and encourage discussion.

Discussion / Comments

This activity allows members and leaders to have a look at what has been accomplished so far in project work and for the members to identify what they think about their work effort.

Suggestions

Adopt this system for your Achievement evaluation and have the achievement 'judges' become project reviewers. Display the sheets at achievement day.

Processing Prompts

- What have you learned by taking this club?
- How do you feel about the work you have accomplished?
- Are there any improvements you would like to make? What do you need to do to accomplish this?

Source: Manitoba Quality Equation 4-H Club Pack. 2003

4-H Project Review

4-H Member: _____

Club: _____

Project: _____

4-H Year: _____

Member's Point of View

1. The most successful part of this project was . . .

_____

2. One skill that I learned from this project was . . .

_____

3. One area that I would improve upon or do differently (if I had the chance to redo this project!) would be . . .

_____

_____

4. The most difficult part of my project was . . .

_____

_____

_____

Signature

Another's Point of View

1. I am most impressed by . . .

2. In reviewing your project work, I believe that you have learned . . .

3. One suggestion for improvement that I have is . . .

4. I congratulate you on achieving the following goals . . .

_____

Signature

If using for achievement purposes:

☐ 4-H Project is complete

☐ 4-H Project is incomplete

Source: Manitoba Quality Equation 4-H Club Pack. 2003

Tokens of Knowledge — Junior, Intermediate, Senior

Topic Teambuilding, Values, Celebration

Learning Outcomes

To give members a chance to reflect on the past year, and to consider the true value of their 4-H experience.

Time 15 – 20 minutes

Materials / Resources

- Paper, pens or pencils
- A copy of the poem on the following page.

Instructions

Ask members to take a moment to think back over the year – what were the highlights of the 4-H year?

Read the poem (on following page) to the group.

Ask participants whether they thought like the father or the son in the poem when reflecting on their year.

Allow one minute for the audience to reflect.

Break audience into groups of three and brainstorm ten skills and values that they learned / improved through participating in 4-H this year. Allow 3 – 5 minutes.

Have each group share their items with the whole group. Use the sharing as an opportunity for celebrating the past 4-H year.

Discussion / Comments

It is very easy to automatically think of the material rewards (like the son) but often it is the skills and values learned that will still be rewarding in 10 to 20-years time.

Processing Prompts

- What values and skills have you developed during your whole 4-H career? What else do you hope to get out of the 4-H experience?

Source: Manitoba Quality Equation 4-H Club Pack. 2003

TOKENS OF KNOWLEDGE

There once was a boy who won ribbons, mostly red
Came home from the fair with a big trophy, t'was said
With a voice glad and proud he said to his Dad,
"Tis the very best year that I've had."

Said his very wise Dad, "Son, I'd like to hear,
Why you think that this was such a very fine year."
"Why, Dad, you well know all the prizes I've won;
How I've come out on top in most things I've done."

"Just look at the ribbons that hang on my wall,
And think of the money I've made since last fall
From premium cheques and a big auction price
You can't help but think cash and ribbons are nice."

"But the man said, "My son you're not thinking right,
Red ribbons, 'tis true are better than white:
But ribbons will fade and trophies grow old,
Money's soon spent and fame soon grows cold."

"The important things, Son, are not ribbons or pins,
And sometimes it's really the loser who wins;
Now here are the things most important, it's true
Your 4-H experience has accomplished for you."

"You've seen how a business meeting is run,
This knowledge will help you in years to come.
You've conquered the fear of addressing a crowd,
You've learned how to stand up and talk nice and loud."

"Patience you've learned in your projects, too.
As well as your skills that will always help you.
You've learned the fine feeling it gives you to lend
A glad helping hand to a stranger or friend."

"You've learned to cooperate with majority rule,
To give in with grace and not be a fool,
Who must always have his very own way,
Be it in club work, in school or at play."

"You've learned how to lose without making a 'beef'
You know the judge judges to his best belief.
You've learned how to win without boasting too loud,
A kid can lose friends if he's overly proud."

"These are the things most important to you.
You'll remember and use them all your life through.
They'll help you become a mighty fine man,
They'll do more for you than a prize ever can."

Author and Source Unknown

The Quality Touch Test — Junior, Intermediate, Senior

Topic Projects, Quality, Ethics

Learning Outcome

Quality Projects – To develop a quality project, a member must draw on a variety of strengths such as: prioritization; time management; goal setting; new or progressive skill development; perseverance and desire.

Materials / Resources

- Finishing Touch Test (on reverse) – one per participant, pens or pencils.

Time 15 minutes

Instructions

Sometimes when there is a task to complete, it can be hard to "buckle down" and get everything done. Things get left until the last minute and then there's a scramble to get it done in time.

This can occur to anyone and ranges from things like not studying until the night before a big test, waiting until the last minute to put the finishing touches on a 4-H sewing project, or even realizing at the last minute that a 4-H calf needs a bigger halter for the show which is the next day.

Sometimes leaving things until the last minute doesn't result in a major crisis but often there is a lot of stress, a lower quality result and feelings of dissatisfaction.

Plan ahead for achievement by using the Finishing Touch Test (on following page).

This planning will ensure that all project work is completed and done with care and quality in mind. If any of the Finishing Touch Test questions are answered with a no – the members can complete all tasks to ensure the answer is a yes before Achievement Day.

Discuss with members the importance in completing a task and the pride they will have when they know they have done a good job and have made the extra effort to make a quality product.

Source: Manitoba Quality Equation 4-H Club Pack. 2003

The Finishing Touch Test

Fill in the questions below. Some may not apply specifically to your project where you have not made an item. In this case, consider your display or presentation and run through the test to ensure you are ready for Achievement.

1. Is your item ready to use? **YES or NO**

For example:

If you have made a gun cabinet – is the lock installed?

If you sewed a skirt – is the button sewn on the waistband?

If you are putting together a display for your Creative Option – is it ready for achievement?

If you are showing your heifer at achievement – have you been practicing, is your animal use to noise?

2. Is your item finished with quality in mind? **YES or NO**

For example:

If you have made a Christmas wreath in crafts – are there any glue gun "strings" hanging?

If you sewed an item – are the seams loose with threads hanging?

3. Are all the exercises completed in your project manual? **YES or NO**

4. If you were going to comment on your work during the year what would you say?

Excellent (I am a hard worker and do more than expected. I plan ahead, my work is high quality)

Pretty Darn Good (I work hard and complete what is necessary; my work is quality)

Passable (My stuff is O.K. but I know I could do better if I would only make more of an effort)

Not that Great (I am really not happy with what I've done, I would do things differently given another chance).

5. If there was anything that you would change with regards to your project work what would it be and why?

6. Discuss with your group the importance of completing a task and the pride in a job well done.

Source: Manitoba Quality Equation 4-H Club Pack. 2003

WORD SEARCH

HAMMER AND NAILS!

W	A	S	B	T	G	L	I	C	N	E	P
B	E	Z	P	R	E	D	Z	N	X	E	T
G	W	A	O	O	I	G	W	G	S	W	H
C	M	E	A	S	U	R	E	L	G	N	A
P	R	Q	T	B	S	X	D	T	L	O	M
A	L	E	W	R	V	Z	G	B	U	D	M
I	I	G	R	O	O	V	E	Y	E	J	E
N	F	W	D	P	Z	N	T	D	J	H	R
T	I	F	O	M	H	I	Q	A	H	U	B
V	Q	W	W	B	J	A	F	E	P	W	E
T	E	H	E	M	S	T	C	L	Q	E	I
R	G	S	L	Y	N	S	D	W	O	O	D

WORD LIST

HAMMER POWER DOWEL MEASURE SAW EDGE

NAILS STAIN GLUE PAINT TAPE GROOVE PENCIL WOOD

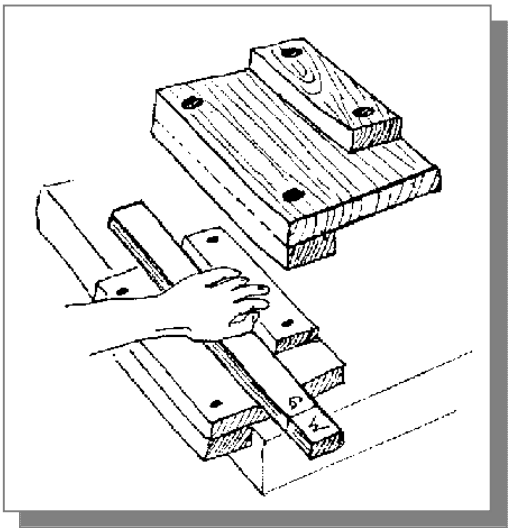
SOLUTION: HAMMER AND NAILS!

W	A	S	B	T	G	L	I	C	N	E	P
B	E	Z	P	R	E	D	Z	N	X	E	T
G	W	A	O	O	I	G	W	G	S	W	H
C	M	E	A	S	U	R	E	L	G	N	A
P	R	Q	T	B	S	X	D	T	L	O	M
A	L	E	W	R	V	Z	G	B	U	D	M
I	I	G	R	O	O	V	E	Y	E	J	E
N	F	W	D	P	Z	N	T	D	J	H	R
T	I	F	O	M	H	I	Q	A	H	U	B
V	Q	W	W	B	J	A	F	E	P	W	E
T	E	H	E	M	S	T	C	L	Q	E	I
R	G	S	L	Y	N	S	D	W	O	O	D

THINGS TO MAKE AND DO

Bench Hook

A bench hook steadies wood while you saw it. You hold the wood you are sawing firmly against the back of the bench hook. The front of the bench hook is hooked over the front edge of the work bench, so that nothing slides. Viewed from the end, a bench hook looks like a capital S .



Attach the lips so that the side edges are flush with the centre piece. If they aren't, any wood you hold with your bench hook won't be straight.

Materials:

- 1 1x8", at least 12" (30 cm) long
- 1 1x2", at least 24" (60 cm) long

Tools:

- 6d finishing nails
- wood screws
- wood glue
- sandpaper, 100 grit
- tape measure, try square, pencil, C-clamp, handsaw, hammer, screwdriver, protective eye wear

Cut List:

- 1 1x8" base
- 2 1x2x8" strips (lips)

Instructions:

1. Use the try square to see if your 1x8 is square. If it is not, mark a square line, then cut it. (Secure the board with the C-clamp because you don't have a bench hook yet!)

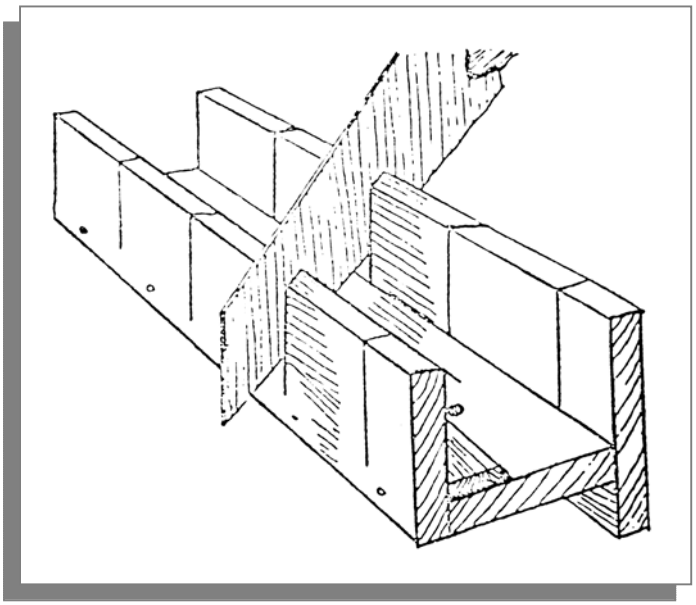
2. Use your tape measure to measure a point 8” from the new end of the board.
3. Use the try square and pencil to draw a line through that point, across the board. This is your other cut line.
4. Secure the board with the C-clamp. Cut on the cut line. This piece of wood is the base for your bench hook.
5. Square one end of the 1x2 using your marking tools, c-clamp and handsaw.
6. Cut two 8” pieces from the 1X2. These are called lips.
7. Glue and clamp the pieces together as shown in the diagram. Countersink the screws so they will not scratch any project.
8. Wipe off any extra glue that squeezed out.
9. Sand your bench hook with your sandpaper so it will not scratch your projects.
10. Take a picture of it! Initial and date your work. Note in your record book. Congratulations!

Square Cut Box

This box looks and works like a mitre box but is designed for square cuts only. It helps when cutting dowels or small bits of wood for projects. It would be nice to have one of your own, or to make one for a friend.

Materials:

- 1 1x4, at least 40” (1 m) long
- 8 No. 10 x 1 2” flathead wood screws
- 4d finishing nails
- wood glue
- sandpaper, 100 grit
- duct tape



Tools:

- marking tools
- c-clamp
- handsaw
- hammer
- protective eye wear
- twist drill and 5/32” bit
- screwdriver

Cut List:

- 3 1x4x12”

Instructions

1. Check the end of the 1x4 to see if it is square. If not, use your marking tools to square it.
2. Clamp the board to the work surface. Use your marking tools to measure a square line across the board at 12” from the square end. This is your first cut line.
3. Use your handsaw to cut on this line. This piece will become the bottom of your mitre box.
4. Repeat steps two and three, to make the sides of your mitre box. Lay the unglued pieces against each other, as they will appear in the finished mitre box.

5. Have a helper hold the square cut box bottom on its long edge. Run a line of glue along the top edge.
6. Set one of the side pieces flat on the glued surface so that they look like a capital L from the end. The edges should meet evenly. Have the helper keep on holding them together.
7. Put on your protective eye wear.
8. Choose a spot about one inch from the end of the square cut box. Hammer a nail down through the side, into the edge of the bottom. Make sure the nail is straight up and down or it will break out of the wood.
9. Hammer a nail at the other end of the square cut box. These nails hold things together so you can later screw the pieces together more securely.
10. Turn the project over, so that the bottom pieces other edge faces up. Run glue along that upper edge.
11. Set the remaining side piece on the edge of the bottom piece (on that glued surface). Nail it as you did the other side. It should look like a C from the end.
12. Clamp the nailed square cut box to the work surface, so that the open side faces you. Mark the places for four screws on the side piece facing up. Space them evenly between the two nails.
13. Dimple the Xs by tapping a large nail with a hammer. Do not drive the nail in. This dimple helps the drill work more easily, without slipping.
14. Insert the drill bit into the hand drill.
15. Wrap a bit of duct tape around the bit at 1/2 from the sharp end. This marks how deeply you will drill.
16. Hold your hand drill straight up and down, so the holes will not come out of the boards. Drill a hole at each X. Stop drilling when you reach the duct tape.
17. Repeat steps 12 to 16 for the opposite side of your square cut box.
18. Drive the screws into the pilot holes you drilled. Keep pressing down on the screwdriver as you turn it.
19. Keep working until the head is just even with the wood surface.

20. Set the square cut box on the work surface, on its bottom. The open side should be facing up.

21. Use your marking tools to mark six inches from either end on a top edge.

22. With a try square and pencil, draw a square line across both top edges. Turn your try square so you can mark a line on the face nearest you. Use the line you just drew to guide you.

23. This next cut is very important. Clamp the square cut box, open side up, to the work bench. Use a handsaw to carefully cut through both sides of the square cut box at the line drawn on the side. Cut until the teeth just meet the bottom. Do not cut into the bottom. This cut must be straight.

24. Sand. Take a picture! Initial and date your project. Note in your record book. Congratulations!

Stilts

These stilts have several settings so they can be adjusted for different sizes of users! Before you drill any holes, lay the pieces of wood together so you will understand the assembly. Measure twice, cut or drill once!

Materials:

- 1 scrap 2 x 4, at least 16” long
- 2 scrap 2 x 2s, at least 60” long
- 1 scrap 1 x 2, at least 16” long
- 4 hex bolts, 3/8” x 7”
- 4 3/8” washers
- 4 3/8” wing nuts
- wood glue
- sandpaper, 100 grit

Tools:

- square and pencil
- handsaw
- hammer
- protective eye wear
- brace with 3/8” bit

Cut List:

- 2 2x4x6” (steps)
- 2 2x2x60” (legs)
- 2 1x2x6 3/4” (braces to keep feet slipping off steps)

Instructions:

1. Measure and mark a square line at 60” on the 2x2 using your marking tools.
2. Clamp this piece to the work bench. Cut on the line. This will be one leg of your stilts.
3. Cut a matching stilt leg, the same length.
4. Clamp a stilt leg to the work bench with a piece of scrap wood under it. Using your tape

5. measure, mark an X at every four inches, starting from one end, until you have marked four Xs.
6. Mark the Xs in the centre of the leg.
7. Use the brace and bit to bore a hole at each X. The scrap wood under the leg protects the work surface when the bit cuts through the leg.
8. Repeat the marking and drilling steps for the other leg.
9. Clamp the 2x4 to the work bench with a C-clamp, with at least 8 inches hanging over the edge.
10. Measure, mark and square the 2x4 at six inches from the end. Clamp and cut it at the six inch line. This will be one step.
11. Repeat steps seven and eight to make a matching step.
12. Measure, mark and square a 1x2 piece so it is 6-3/4" long. Clamp and cut it. This piece will keep your foot from sliding off the step.
13. Repeat step 10 to make another brace. You will glue a brace to the outside edge of each step.
14. Put a step on the work bench on its edge. Put glue on the edge that is facing up.
15. Lay the flat face of a brace on top of the glued step edge, so that 3/4" of the brace hangs over one end. Put on your protective eye gear.
16. Hammer a finishing nail through the brace and into the step, at either end. Place the nails near the ends so that there will be room to bore holes for the bolts that hold everything together.
17. Repeat steps 13 and 14 for the other step and brace.
18. Mark where the bolts will go through this way. Place the step/brace piece on the workbench with the brace on the bottom. One edge of the step will face up. Measuring from the end of the step that is even with the brace, mark two marks on the steps edge, at 1" and at 5".
19. Square across the step's edge at each mark. Pencil an X at the centre of each line.
20. Clamp one step/brace piece to the work surface, with a piece of scrap wood underneath. Use a brace and 3/8" bit, drill a hole all the way through both X

marks. Hold the brace and bit straight up and down so the hole does not come out the side.

21. Repeat step 18 for the other step/brace.
22. Sand all the pieces well, especially the legs where you will be holding on.
23. Assemble your stilts, making sure that the step/brace piece is right side up! Decide what set of holes to use. Push the bolts through the step/brace until they come out the other side of the leg. Put a washer and wing nut on each bolt and tighten.
24. Ask people to stand back while you practice or they might get bonked by a stilt! Take a picture!

Name or Message Sign # 1

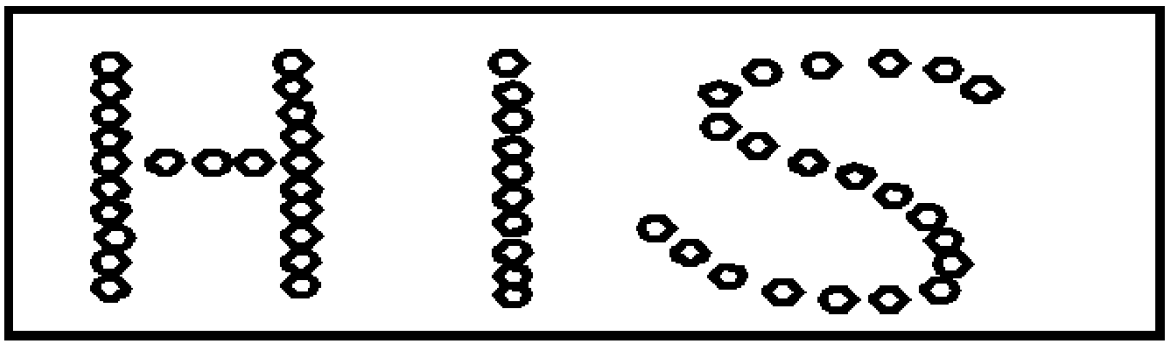
Make this sign to hang on your door or sit on a shelf or mantel!

Materials:

- Paper
- Scrap of 1 x 4, approximately 12” long
- paint or stain (optional)
- drill and bit

Instructions:

1. Sketch the word or name for the sign on a piece of paper the same size as the finished sign will be. Practice two or three times until you are satisfied with how it looks.
2. Square off the ends of the 1x4 at a length that your word will fit on, plus one inch at each end. Sand it carefully.
3. Sketch your word/name onto the wood with a pencil.
4. Put a piece of duct tape at 1/4” on the bit of the drill. This will show you at what depth to stop drilling.
5. Drill holes on the pencil lines of the letters for the name/word.
6. Dust the sign. It might be necessary to vacuum the holes to get all the dust out!
7. You can leave your sign plain, or you can paint the surface with a roller, so that the holes show up against a painted surface.
8. Take a picture for your record book. Congratulations!



Name or Message Sign # 2

Materials:

- scrap of pine

Tools:

- pencil
- ruler
- coping saw
- rasp
- sandpaper
- finish

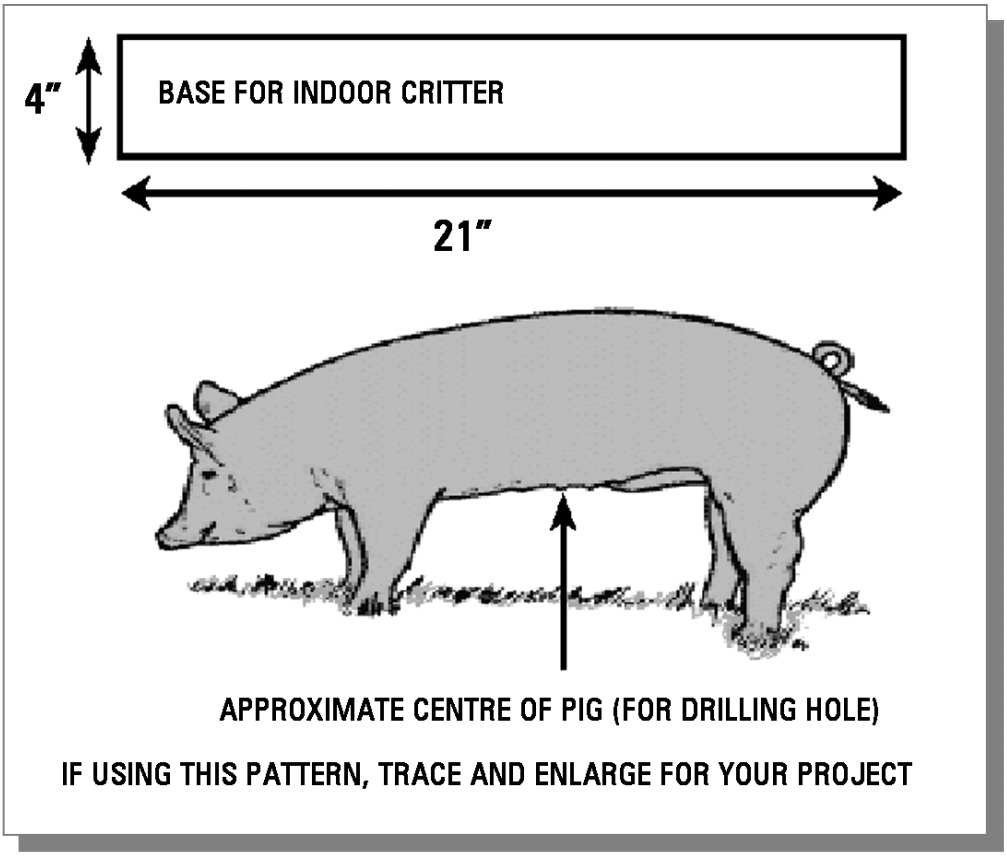
Instructions:

1. Write your name or message in rounded letters so that letters touch.
2. Cut out the name or message, being careful not to separate them.
3. Smooth with a rasp, if necessary.
4. Sand, then finish.

Suggestions for messages: Office, CEO, Joy, Peace, Hi!, Exit.

Folk Art Critter

Make this item to liven up a lawn or flower bed, or to adorn a shelf or mantel inside! Select your favourite critter or image as the subject. (E.g. a running horse or dog, a happy pig, a lightning bolt, a simple scene)



Materials:

- 1 1 x 8 pine, 21" long (Body)
- 4 x 4, 21" long base (for indoor item)
- 2 to 3 feet of 1/4" dowel (for indoor item) or metal stair-runner rod (for outdoor item) for stand
- 14" square scrap of scrap sheet metal or thin wood for small detail pieces (e.g. legs, ears, tails etc.)

Tools:

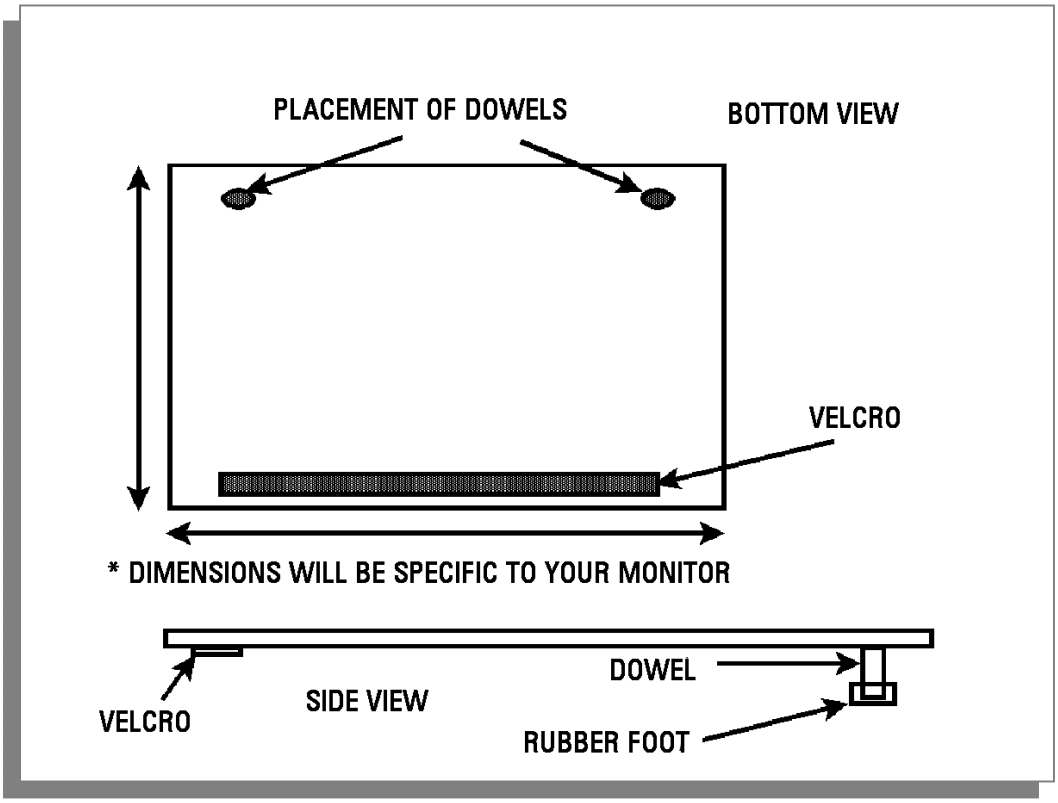
- Coping saw
- tin snips
- rasp
- sandpaper
- exterior grade paint (for outdoor projects) or
- acrylic paint (for indoor projects)
- artist's paintbrushes

Instructions:

1. Trace or sketch your pattern for the main body part onto the 1 x 8.
2. Cut out using a coping saw. Use the rasp and sandpaper to smooth.
3. Trace or sketch the small detail parts (such as ears, tails, wings etc.) on the thin wood or metal. Cut using either coping saw or tin snips.
4. Assemble the critter without glue, as a trial. With adult help, determine where the centre of the critter is. Mark that spot on the bottom edge of the body with an X.
5. Paint all the pieces carefully. Let dry. Glue the detail pieces onto the main body with epoxy glue. Let dry.
6. For an indoor project, carefully drill a hole 2" deep at the X in the critter's body. Cut the dowel the length you want. Put a dab of glue on the end of the dowel and gently, but firmly push it into the hole.
7. For the indoor critter, drill a 1/2" hole in the centre of the base. Dab epoxy onto the bottom of the dowel and insert into the hole in the base.
8. For an outdoor critter, put a dab of epoxy on the end of the stair runner rod and push into the hole at the X.
9. Take a picture for your record book. Congratulations!

Computer Shelf

This is a small shelf that sits on top of your monitor so you can use that otherwise tilted space for something! Do you know anyone who might like one for a gift?



Materials:

- wood the dimensions of the top of your monitor (3/8" to 2" plywood will do fine)
- dowel (1/2" to 5/8") the length will be determined by the angle of the top of your monitor
- two rubber or plastic feet to go on the end of the dowel
- glue

Tools:

- saw
- measuring tools
- sandpaper
- drill
- adhesive-backed Velcro
- paint or stain

Instructions:

1. Measure the width and depth of the top surface of your monitor to decide how big to make the shelf.
2. Cut the wood to these dimensions.
3. Set the wood on top of the monitor, so that the surface is flat. There will be a gap at the back of the board, between it and the top of the monitor. This is where you will put dowels as feet to hold up the shelf. Measure this gap.
4. With the wood still in place, mark the best place to install the dowels.
5. Cut the dowels to the length of the gap, plus the depth to which you will sink the dowels into the shelf. (Make the depth of the holes about 2 to 2/3 of the thickness of the wood.)
6. Drill two holes in the spots you marked.
7. Insert the dowels, with the rubber feet on, as a test. Place it on top of the monitor.
8. If you are satisfied with the dowel location and their length, glue in the dowels.
9. Sand lightly.
10. Finish with your preferred materials.
11. Clean and dry the top of the monitor where you will attach one side of the Velcro.
12. Attach a generous strip of Velcro to the top of the monitor. Attach the matching piece of Velcro to the appropriate spot on the computer shelf.
13. Take a picture for your record book! Congratulations!

Wooden Birds

This project will give you good practice in using a coping saw and sanding. You can paint the birds to make them look realistic or you can just stain or varnish the wood. You can hang these around the house or yard or even on the Christmas tree. Wooden birds sell well at craft fairs and make enjoyable gifts. You can also sketch other birds that you like and make them. You could also make them in a bigger size and use them as lawn ornaments!

Materials:

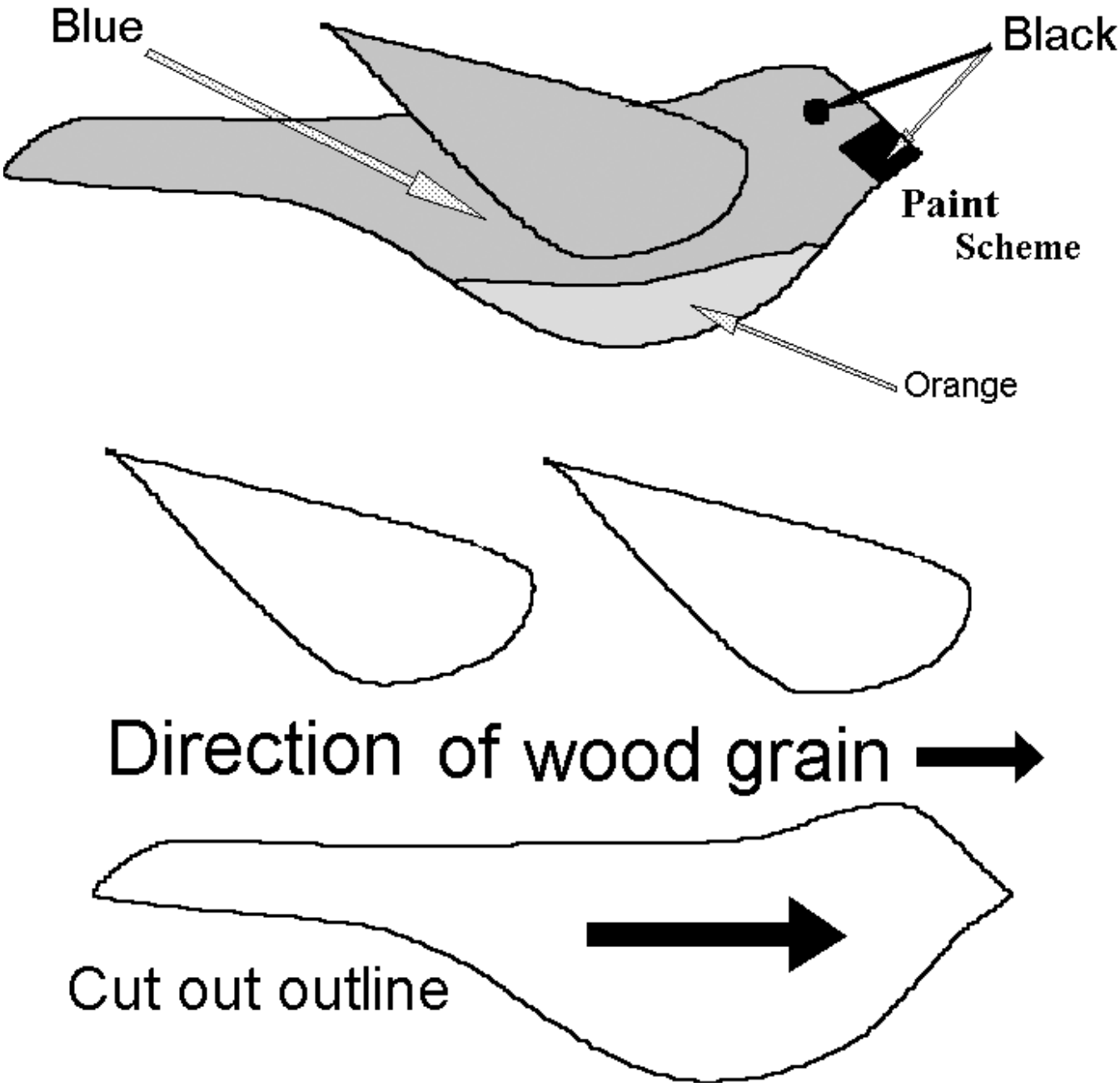
- Scrap pieces of pine or other soft wood (3/4" for the body and 1/2" or thinner for the wings)
- Sandpaper
- Finishing materials of your choice (paint, stain, varnish etc.)
- Cleaning supplies
- Small hook

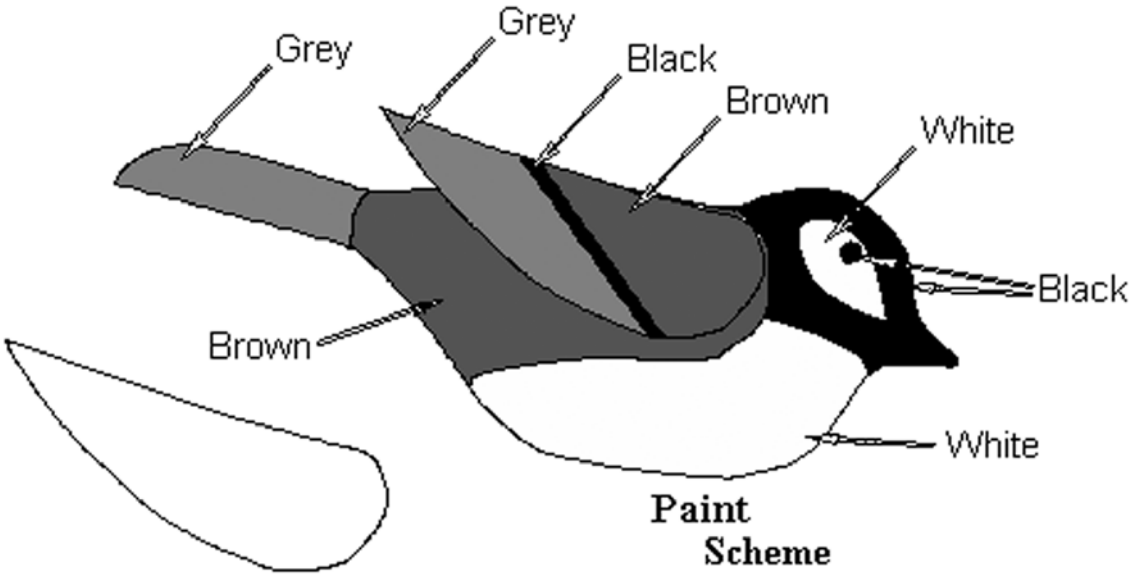
Tools:

- Pencil
- Tracing paper
- Coping saw
- Paint brush
- Hand drill and small bit

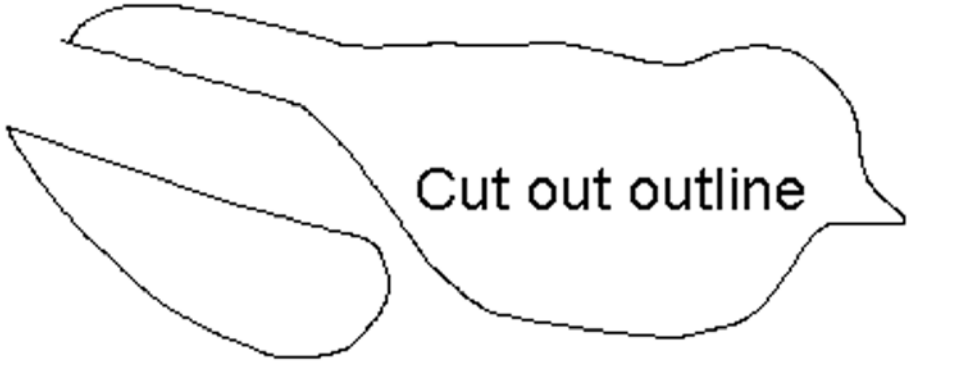
Instructions:

1. Place your pattern pieces on the wood, with the arrow running in the same way as the wood grain.
2. Trace your pattern onto the wood.
3. Cut out the wood pieces.
4. Sand carefully.
5. Glue the wings to the bird. Remove any excess glue so it will not interfere with your painting. Let dry.
6. Paint or finish, as you prefer.
7. Carefully insert the small hook into the top of the bird, so it will hang straight.


Blue
Black
Paint
Scheme
Orange
Direction of wood grain
Cut out outline



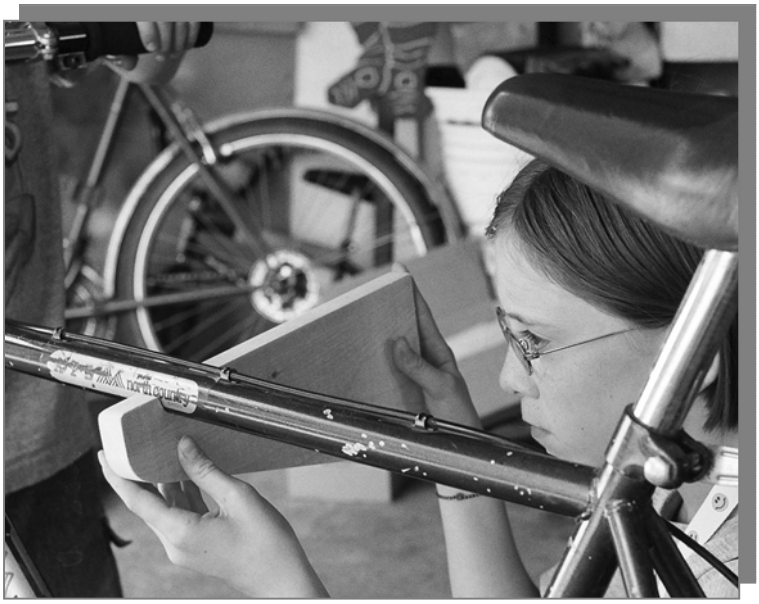
Paint Scheme



Direction of wood grain ⟹

Bike Rack

This rack holds a bike with a horizontal crossbar. The rack looks like a small bookshelf, with two long supports that stick out and hold the bike's frame between the seat and handle bars. There is room for keys and a water bottle on the shelf and you can add pegs to hold your helmet.



Make a cardboard model of this bike rack first, so it is the correct depth for your bike and accessories.

Making a model also helps prevent mistakes and waste.

Materials / Cut list:

- 1 25mm x 15mm x 50.8cm (1" x 6" x 20") The back
- 2 25mm x 15mm x 30.5cm (1" x 6" x 12") The arms the bike rests on
- 1 25mm x 20.3cm x 50.8cm (1" x 8" x 20") The shelf on top
- 3 (3/8") 10mm dowels, each (3") 7.6cm long (pegs)

Note that the back and shelf on top may have to be longer if you want to secure this to the studs in the wall.

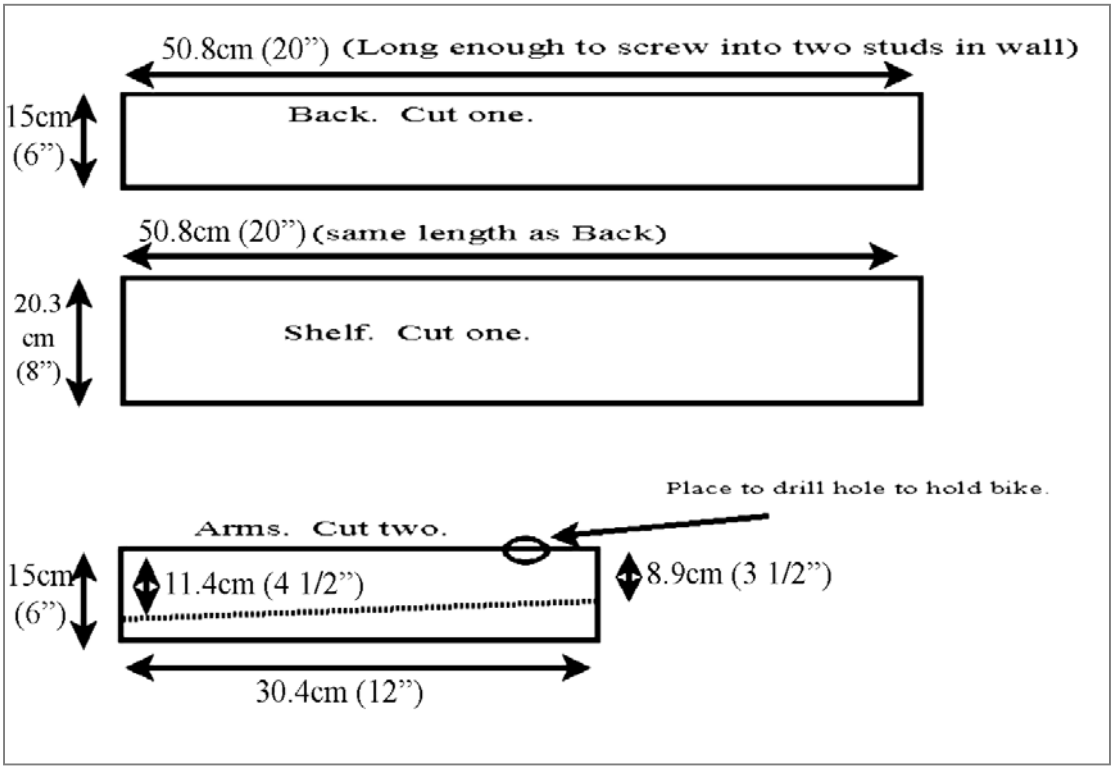
Tools:

- Marking tools
- C-clamp
- Handsaw
- Hammer
- Hand drill with 5/32" bit
- Screwdriver
- Coping saw
- Brace with 3/8" and 1" bits
- Rasp

Instructions:

1. Make a cardboard model first.
2. Mark, clamp and cut the pieces listed.
3. Lay one of the supports on the work surface. On one end, mark a point 11.4cm (4 1/2”) from the side. On the other end of the support, mark a point 7.6cm (3”) from the side, on the same face of the support. Draw a line from one point to the other. The line will slope.
4. Clamp and cut on this line.
5. Repeat steps two and three for the other support.
6. To make a curved end on the support, trace the jar lid on the small end of the support, so that the line connects the supports two edges.
7. Clamp and cut with the coping saw. Use your rasp to smooth down the edge.
8. Repeat steps five and six on the other support.
9. Lay both supports on the work surface, with the top edges against each other. Put a piece of scrap wood under them. Clamp each piece so that they cannot possibly move! You might need an adult to help at this point. On the joint between the two pieces, mark a point at 2” from the narrow end of the support. This is the point at which the bike frame will hang. (At the narrow end of the support.)
10. Drill a one-inch hole with the brace and bit at the 5cm (2”) mark. You will be cutting one hole, which will make a semi circle in each support. Neat, eh? Test that this hole is big enough to hold the frame of your bike.
11. Assemble the pieces to see how they will all go together. With a helper, hold it against your bike to make sure the supports are the correct size. Is everything fitting together and making sense? With a pencil, mark where the supports touch the back and sides. Determine where to drive the screws. With an adult helper, decide where to drill for the lag bolts.
12. Protect the work surface with scrap wood. Bore the marked holes using either the hand drill or brace and bit.
13. Sand all the parts with the sandpaper. Wipe off the dust.

14. Glue and screw the wide ends of the supports to the back of the bike rack. The top edges of the supports should be even with the top edge of the top edge of the back.
15. Glue and screw the shelf to the back and the supports. Avoid getting glue on the parts of the support that will be exposed.
16. Put a drop or two of wood glue into each peg hole. Tap or push a peg into each hole.
17. Sand the project carefully. Wipe off the dust and finish the bike rack with varnish.
18. When your bike rack is 100% dry, mount it at an appropriate height, on a wall using the lag bolts. If you are making this as a gift for someone, have that person help decide at which height you should install the rack.
19. Take a picture. Write this accomplishment in your record book! Congratulations!



Casserole Holder

Materials:

- 2 pieces- 25mm (1”) x 75mm (3”) x 50mm (2”) longer than the width of the baking dish hardwood wood stock for the end pieces
- 2 pieces- 25mm (1”) x 25mm (1”) x 110mm (4”) shorter than the sidepieces, hardwood wood stock for the handle pieces
- 6 pieces of 13mm (1/2”) dowel x 75mm (3”) longer than the length of the baking dish
- 4 pieces of 13mm (1/2”) dowel x 75mm (3”) long to put handles on with

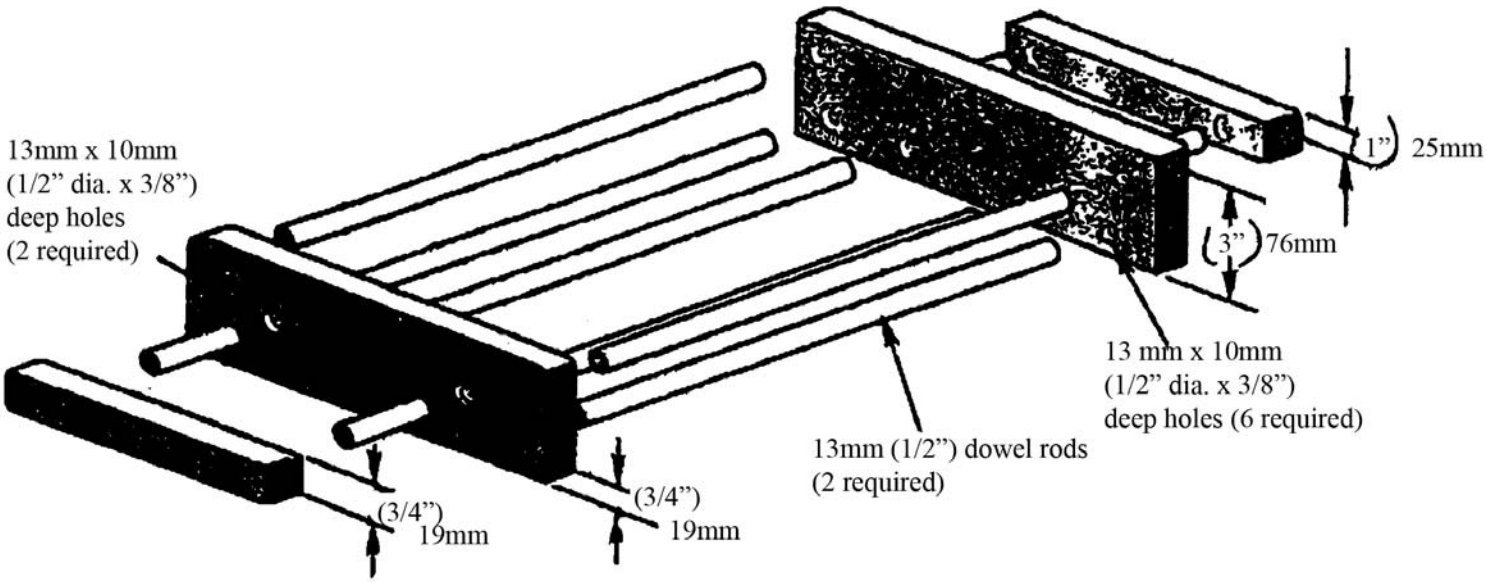
Tools:

- Tape measure
- Table saw
- Drill press
- Hand saw
- Bar or pipe clamps
- Rasp
- Sandpaper - 80 grit and 220 grit

Instructions:

1. Measure length and width of casserole dish.
2. Add 75mm (3”) to the length of the dowels and 50mm (2”) to the length of the hardwood stock for the end pieces.
3. Cut dowels to length with handsaw.
4. Cut end pieces to length.
5. Cut wood stock for handles 110mm (4”) shorter than the length of the end pieces.
6. Drill dowel holes in end pieces 10mm (3/8”) deep, (see diagram for approximate location). (Note: If you think the casserole holder is too wide you may want to put 2 extra dowels in the center.)
7. Rasp and sand all pieces until smooth.
8. Glue in dowels to end pieces, use pipe or bar clamps to hold until dry.
9. Glue and clamp handles into place. Let dry.
10. Apply finish.

Casserole Holder Illustration



Cooling Racks

Materials:

- 2-pieces of 20mm (3/4”) x 20mm (3/4”) hardwood wood stock
- 8 or16 -10mm (3/8”) dowel 229mm (9”) long
- Non-toxic finish (optional)

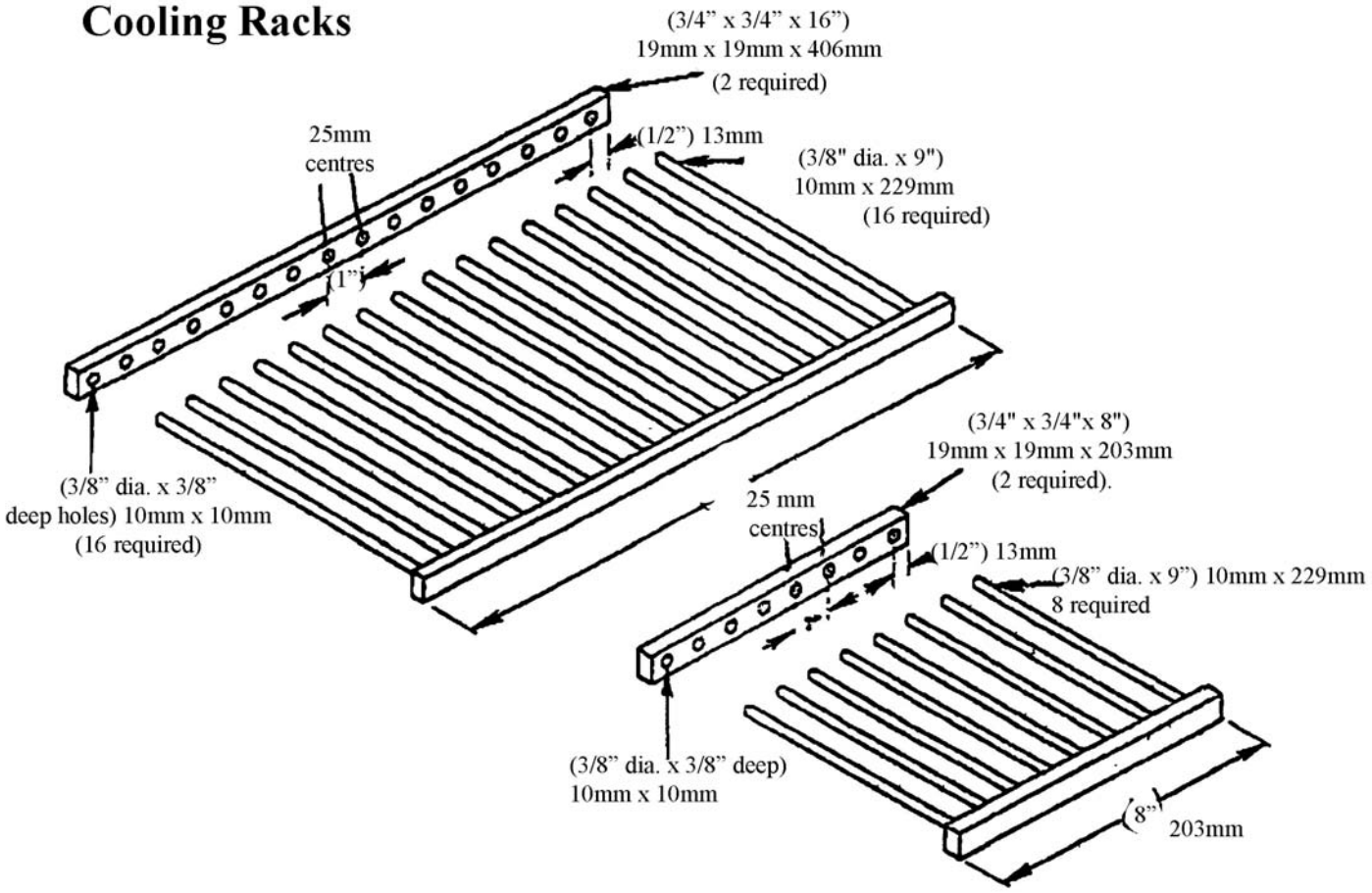
Tools:

- Pencil
- Square
- Table saw
- Sandpaper 80 grit and 220 grit
- Drill press, 11mm (3/8”) drill bit
- Tape measure
- Bar clamps or pipe clamps

Instructions:

1. Cut wood for sides from hardwood wood stock to size. For **big rack**- 19mm (3/4”) x 19mm (3/4”) x 406mm (16”) and for **small rack**- 19mm (3/4”) x 19mm (3/4”) x 203 mm (8”).
2. Cut dowel 229mm (9”) long, 8 for small rack and 16 for big rack.
3. Mark holes at 25mm (1”) centers starting 13mm (1/2”) from either ends.
4. Drill holes 11mm (3/8”) deep, using the drill press.
5. Sand all pieces until smooth.
6. Glue dowel into sides and use square to square before clamping with bar or pipe clamps. Let dry.
7. Apply finish or leave natural.

Cooling Racks



Letter Holder / Napkin Holder

Materials:

- 1 piece of 25mm (1”) x 50mm (2”) x 152mm (6”) spruce or pine wood stock
- 2 pieces of 25mm (1”) x 152mm (6”) x 152mm (6”) spruce or pine wood stock
- 8- 25mm (1”) wire brads
- Glue
- Paint or varnish

Tools:

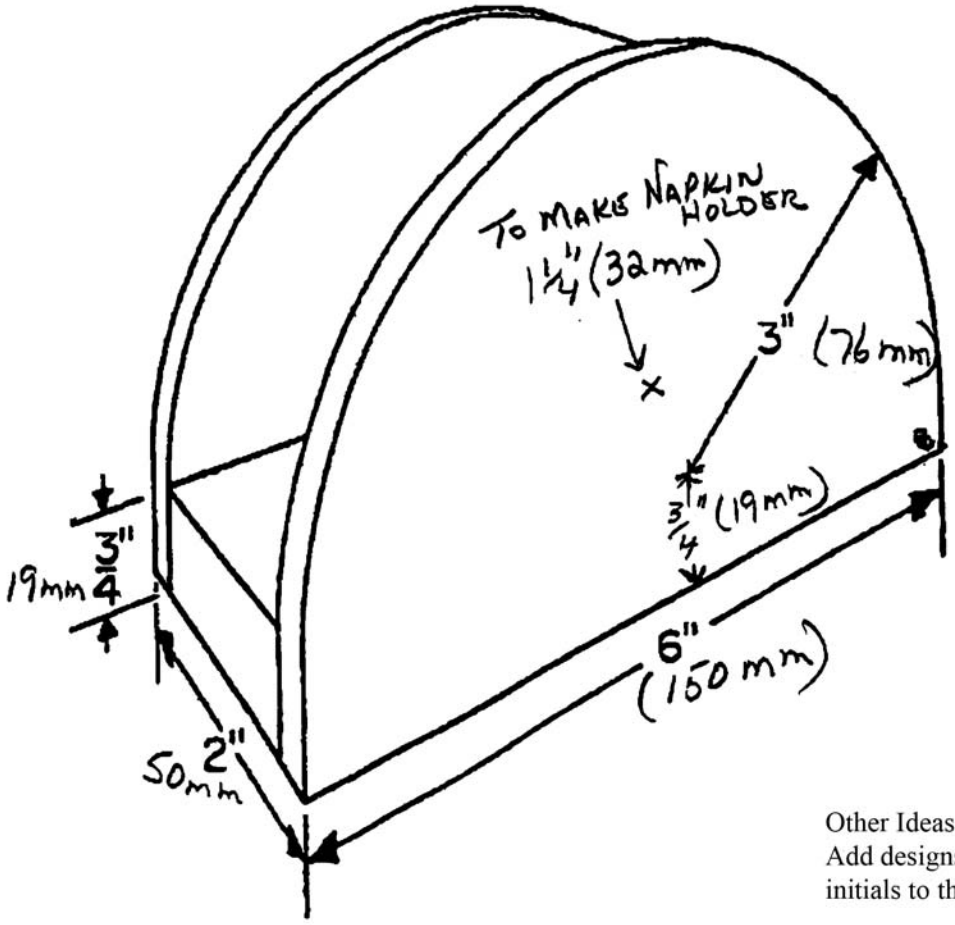
- Pencil
- Tracing paper
- Compass
- Square
- Coping saw
- Handsaw
- Hammer
- Nail set
- Sandpaper 80 grit and 220 grit

Instructions:

1. Cut the centre piece to width and length.
2. Make a pattern for the sidepieces by following the diagram. Make a bottom line 152mm (6”) long. Put compass point at position of x and draw a curve from one end of the bottom line to the other. These are you sidepieces. Cut out with scissors and trace 2 on 25mm (1”) x 152mm (6”) piece of wood stock.
3. Cut out with coping saw.
4. Sand all pieces until smooth.
5. Paint on a design or add decals, wood burn on a design or just varnish.

Note: To make letter holder place compass 19mm (3/4”) from bottom and then draw the curve, to make a napkin holder place compass 33mm (1 ½”) from the bottom and then draw the curve.

Letter or Napkin Holder



Other Ideas:
Add designs or decals or your initials to the side pieces.

Picnic Table Napkin Holder

Materials:

- 19mm (3/4”) x 50mm (2”) x 223mm (8”)
- 19mm (3/4”) x 225mm (8”) x 260mm (12”)
- 1 piece of 11mm (3/4”) x 305mm (11”) long dowel
- Varnish or Danish oil
- Felt

Tools:

- Pencil
- Coping saw
- Rip saw
- Hand drill, 19mm (3/4”) drill bit
- Rasp
- Sandpaper 80 grit and 220 grit

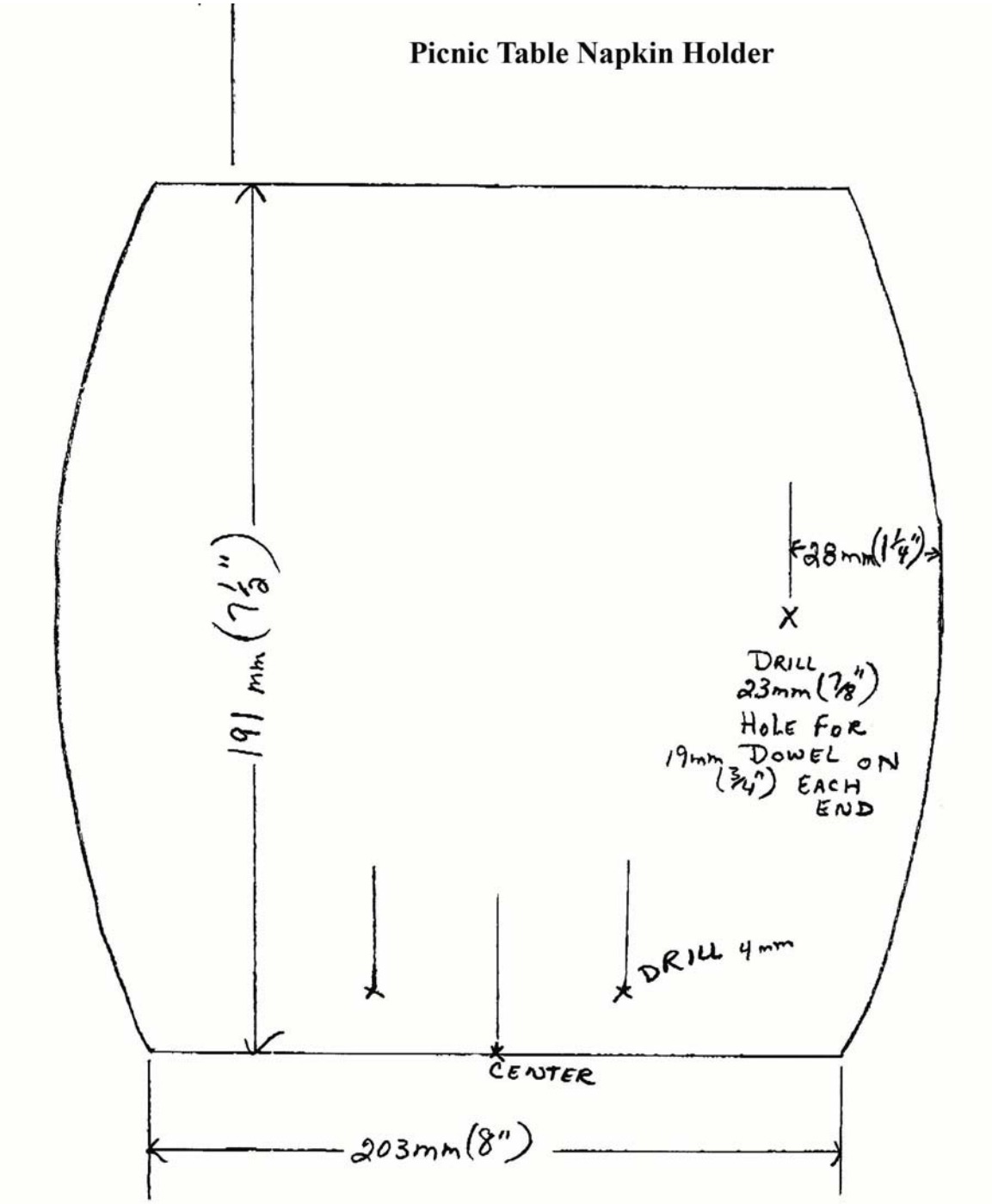
Instructions:

1. Trace your pattern of base onto board.
2. Cut out with coping saw.
3. Cut out second piece of wood 50mm (2”) wide and 223mm (8”) long using rip saw.
4. Clamp base and second piece of wood together and drill 19mm (3/4”) hole all the way through the top piece and 13mm (1/2”) into the base piece.
5. Cut 19mm (3/4”) dowels to 129mm (5 ½”).
6. Take the rasp and slightly round the top edges of the base piece and all the edges of the second piece of wood.
7. Cut 4-10mm (3/8”) dowels to 114mm (4 ½”) with crosscut saw.
8. Drill the 4 holes in base for 10mm (3/8”) dowel.
9. Sand both pieces of wood and dowels until smooth.
10. Glue in all dowels.

11. Apply finish and let dry.

12. Cut and glue a piece of felt to the bottom of the base.

Note: Picnic napkin holder may be made with or without the 4-side dowel. If not using the 4 side dowels, then omit steps 7 and 8.


Picnic Table Napkin Holder
191 mm (7½")
28mm (1¼")
DRILL 23mm (⅞") HOLE FOR 19mm (¾") DOWEL ON EACH END
DRILL 4mm
CENTER
203mm (8")

Paddle Boat

Materials:

- 25mm (1”) x 153mm (6”) x 305mm (12”) wood stock for main deck
- 25mm (1”) x 103mm (4”) x 126mm (5”) wood stock for upper cabin
- 6mm (1/4”) x 64mm (2 1/2”) x 172mm (6 3/4”) wood stock for paddles
- 2-19mm (3/4”) wood screws
- Elastic band
- Yellow glue (carpenter’s glue)
- Acrylic paint or varnish

Tools:

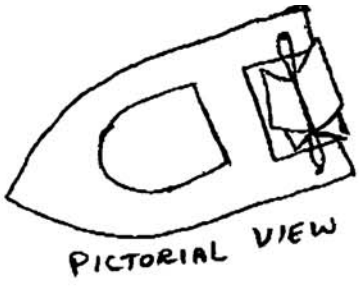
- Pencil
- Coping saw
- Hand saw
- Rasp
- Chisel
- Sandpaper 80-grit and 220-grit
- Paint brush

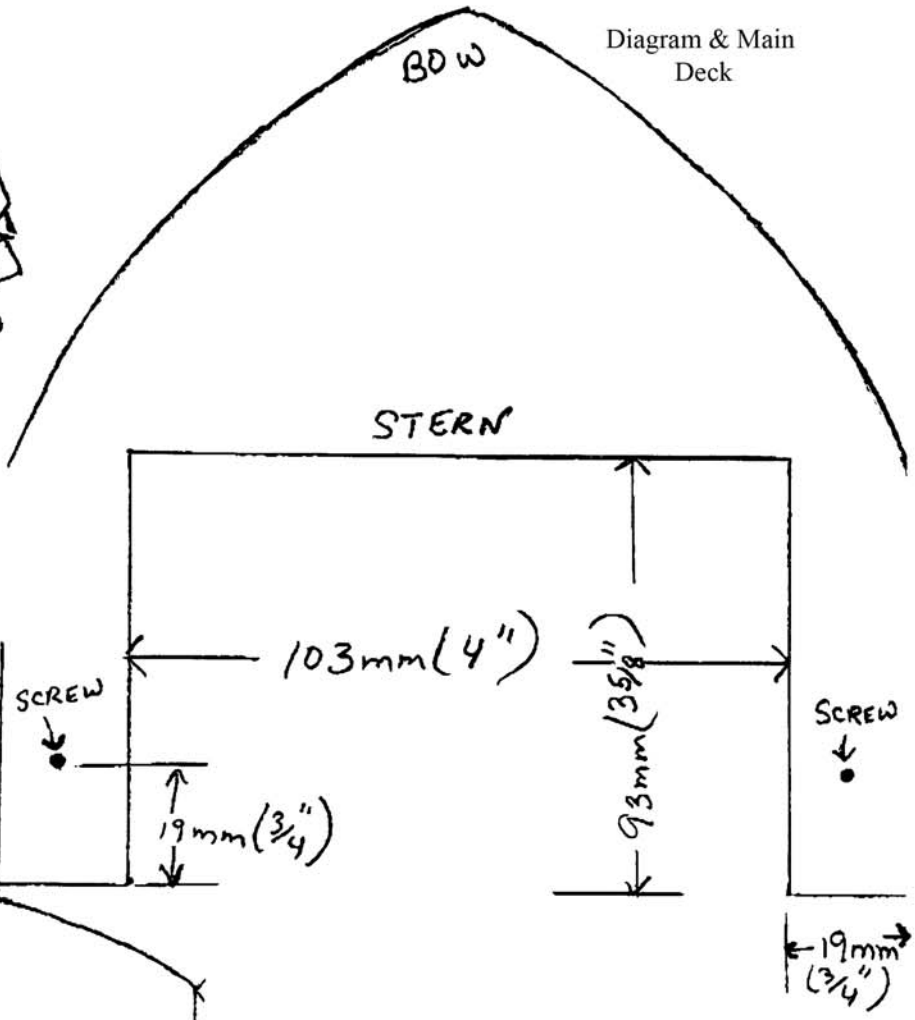
Instructions:

1. Trace main deck and upper cabin onto wood stock pieces.
2. With rasp slightly taper underside of main deck bow.
3. Sand main deck and cabin pieces until smooth first with rasp and then sandpaper.
4. Glue cabin to main deck.
5. Cut the two paddle blades to size (diagram 3).
6. Cut out notch (notch should only be as thick as wood used) with coping saw and use chisel to chip out waste wood.
7. Slip one notch into the other to form the paddle.
8. Finish boat with a couple of coats of paint or varnish.
9. Screw in the crews to the stern of the main deck.

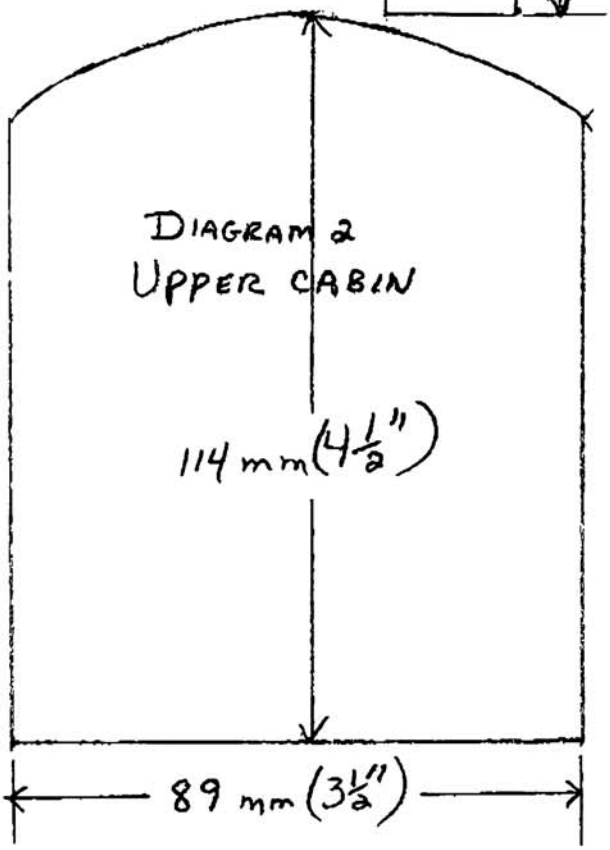
10. Place elastic band between the paddle blades.
11. Wind up the paddle blades a few times, let it go in the water and enjoy.

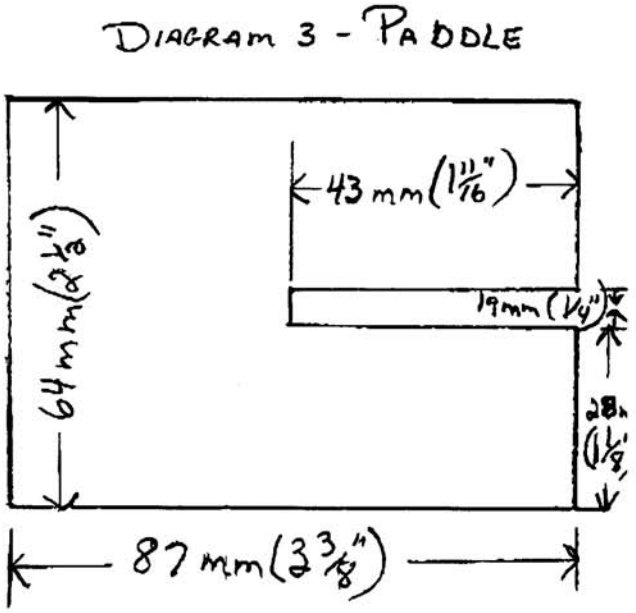
Paddle Boat





The length from bow to stern is 305mm (12")





Push Stick for Table Saw

Materials:

- 10mm (3/8”) x 19mm (3/4”) x 300mm (11 ¾”) spruce, pine or plywood wood stock

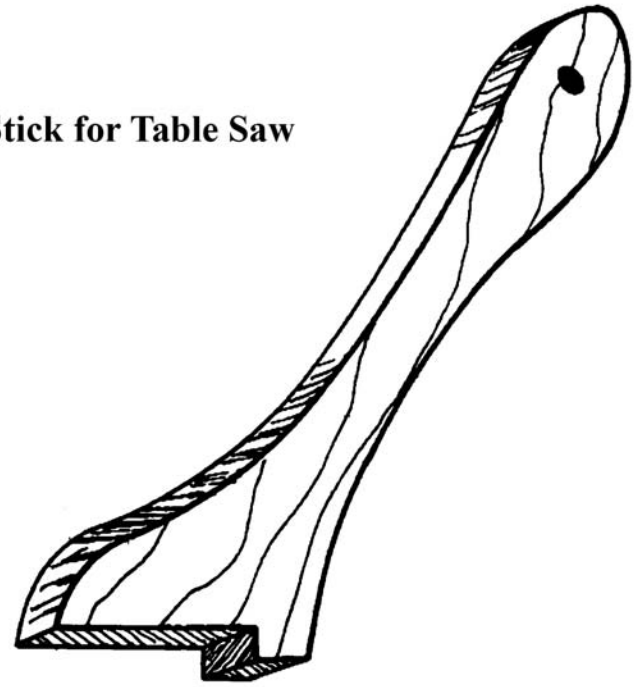
Tools:

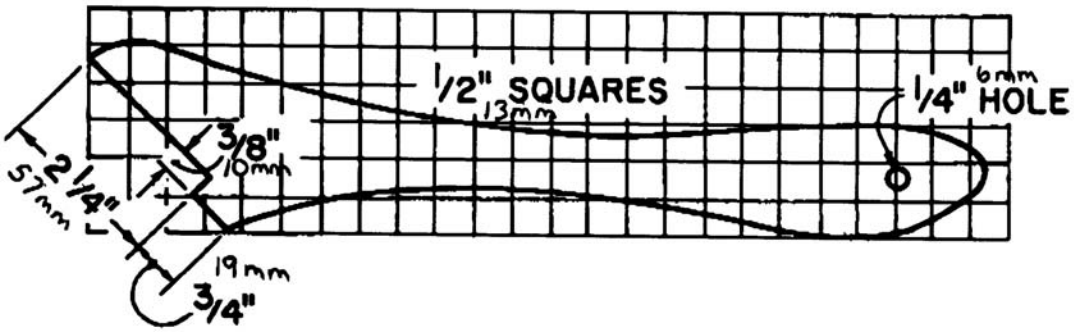
- Pencil
- Paper
- Ruler
- Scroll saw (jig saw or coping saw)
- Drill, 6mm (1/4”) drill bit
- Sandpaper 80 grit and 220 grit

Instructions:

1. Enlarge pattern
2. Cut out pattern and trace it onto wood stock.
3. Cut out push stick with saw.
4. Sand until smooth.
5. No finish necessary.

Push Stick for Table Saw





Robin's Nest

Materials:

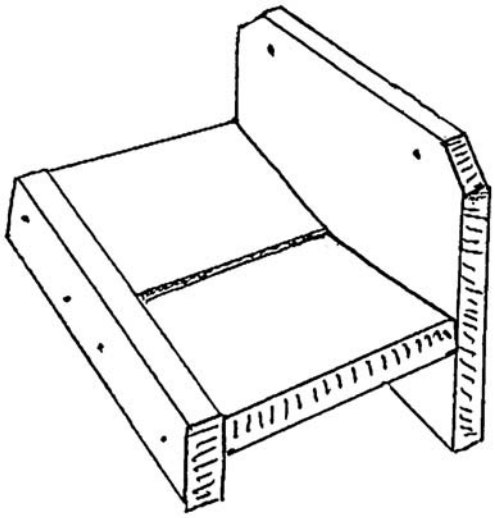
- 25mm (1") x 152mm (6") x 457mm (18")
- 25mm (1") x 50mm (2") X255mm (10")
- 8 -20mm (2") finishing nails
- Paint

Tools:

- Crosscut saw
- Ripsaw
- Hammer
- Pencil
- Tape measure
- Nail set
- Sandpaper 80 grit and 220 grit
- Paintbrush

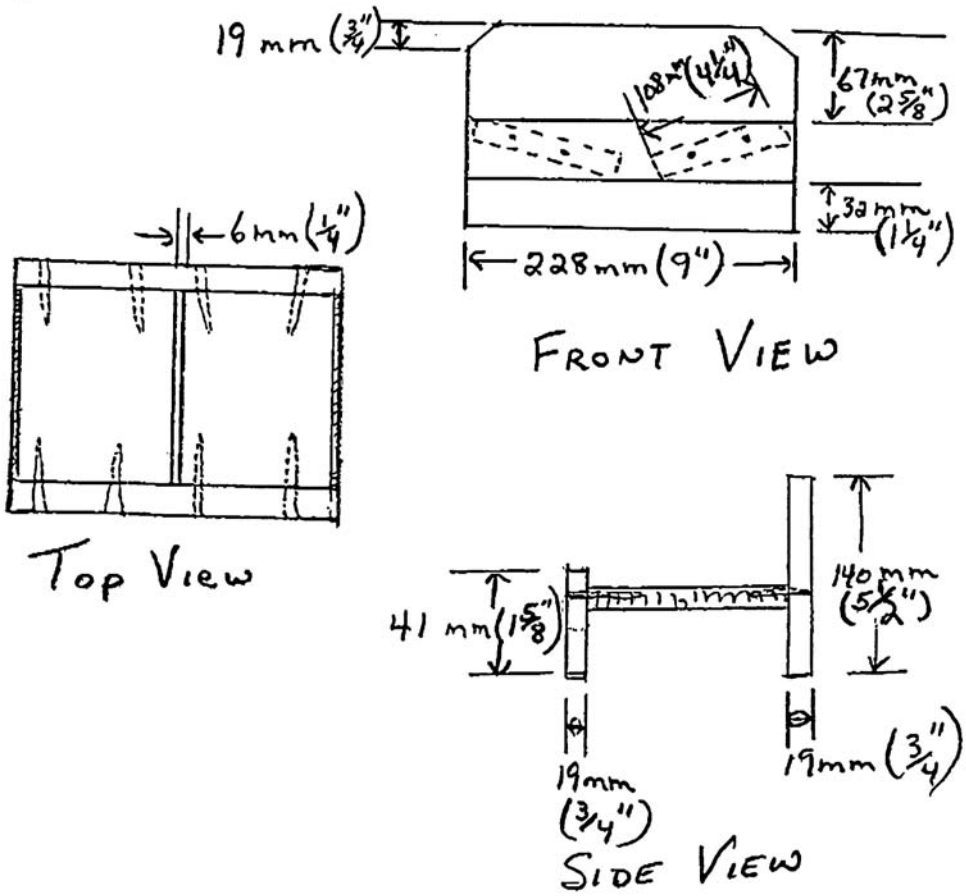
Instructions:

1. Measure and cut material to length from wood stock.
2. Sand all pieces with sandpaper.
3. Glue and nail pieces flush or countersink nails with nail set.
4. Apply finish.



Robin's Nest

Pictorial view
Not to scale



Star Candle Holders

Materials:

- 25mm (1”) x 223mm (8”) x 762mm (30”) spruce or pine
- 2-7/8” metal candle ferrules
- Carpenters glue
- Wood primer and red and green acrylic paint
- Felt

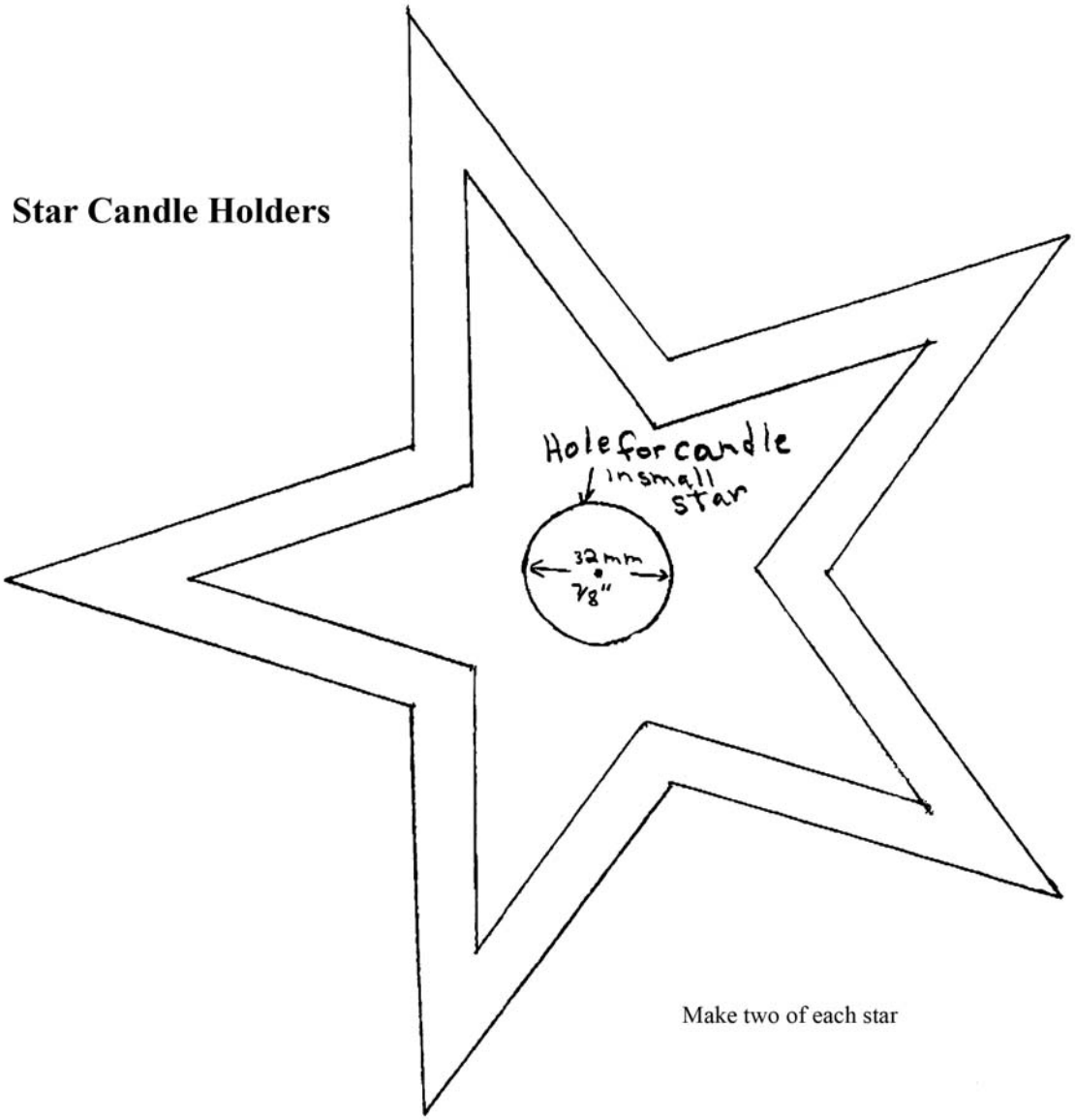
Tools:

- Pencil
- Tracing paper
- Coping saw
- Hand drill, 32mm (7/8”) drill bit
- C-clamps

Instructions:

1. Trace stars onto wood, you need 2 big stars and 2 small stars
2. Cut out the 4 stars.
3. Drill a 32mm (7/8”) hole in center of each of the small stars.
4. Sand the stars until smooth.
5. Paint the tops of the small stars red and the big stars green (Note: you do not have to paint the center of the big stars, make a tracing of the little star on the center of the big star and paint just a little inside of the trace mark). Let dry.
6. Glue the small star to the big star with the carpenter’s glue and clamp together with the C-clamps. Let glue dry.
7. Cut and glue a piece of felt to the bottom of each candleholder.
8. Put in metal candle ferrules.

Star Candle Holders



Make two of each star

Suet Feeder

Materials:

- 19mm (3/4”) x 102mm (4”) x 179mm (7”) cedar, spruce or pine wood stock
- 10mm (3/8”) x 1218mm (48”)
- Eye hook
- Carpenter’s glue

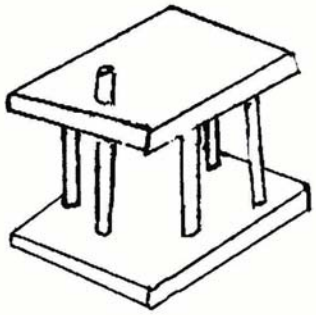
Tools:

- Pencil
- Square
- Crosscut saw
- Hand drill, 10mm (3/8”) drill bit
- Bar clamp (or pipe clamp)
- Sandpaper 80 grit and 220 grit

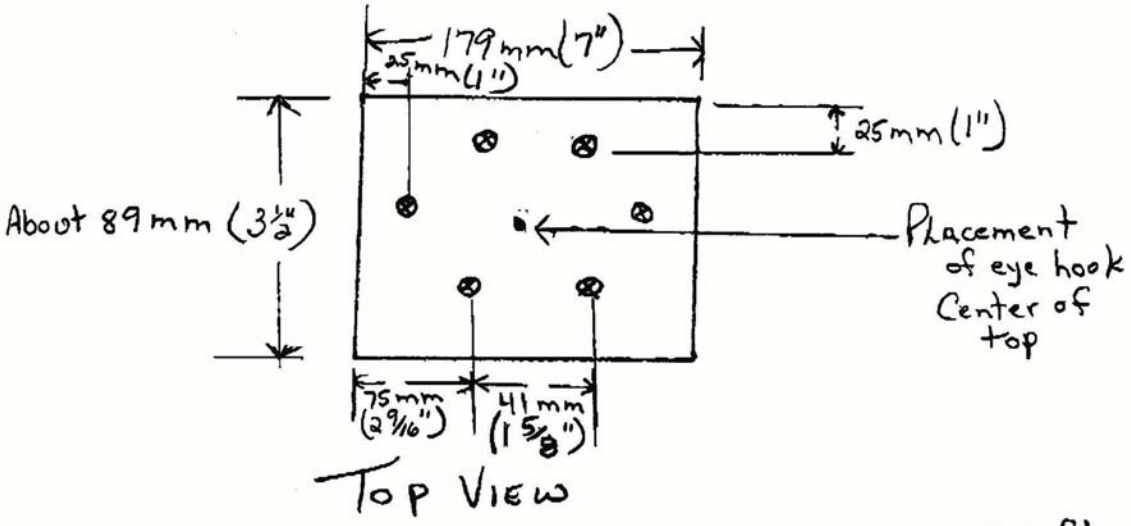
Instructions:

1. Measure 2 pieces 179mm (7”) long from the wood stock. Use the square to draw a straight line across the board.
2. Sand all the sides of the 2 pieces until smooth.
3. Use diagram I to mark where the holes are to be drilled for the dowels.
4. Drill the holes 10mm (3/8”) deep on the baseboard.
5. When drilling the holes for the dowel on the top piece, drill the 4 side holes and the one on the back 10mm (3/8”) deep. Drill the front hole of the feeder all the way through (Note: This is so that, the dowel can be removed to put in a new suet cake.).
6. Cut 5 dowels 191mm (7 1/2”) long and the sixth one 241mm (9 ½”) long.
7. Glue in the 5 dowels with carpenters glue and clamp together until the glue is dry.
8. Apply finish or leave natural.

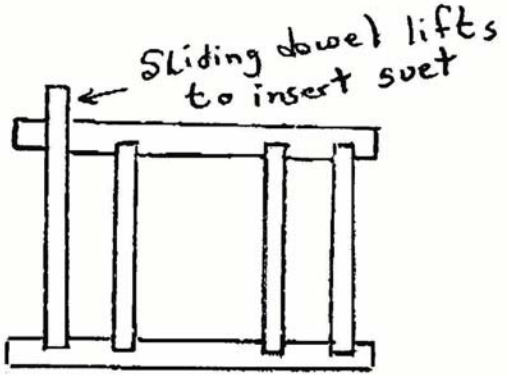
Suet Feeder



Pictorial view
Not to scale



TOP VIEW



SIDE VIEW

4-H Bookends

Materials:

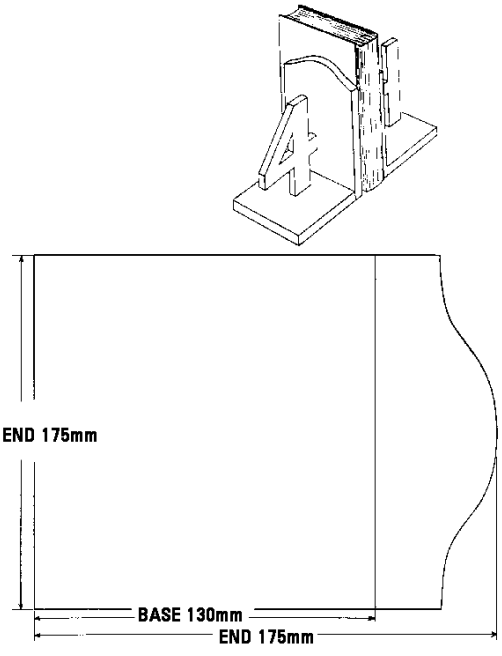
- 1 18 mm x 135 mm x 900 mm (wood or plywood)
- 14 38 mm finishing nails
- sandpaper
- paint or varnish

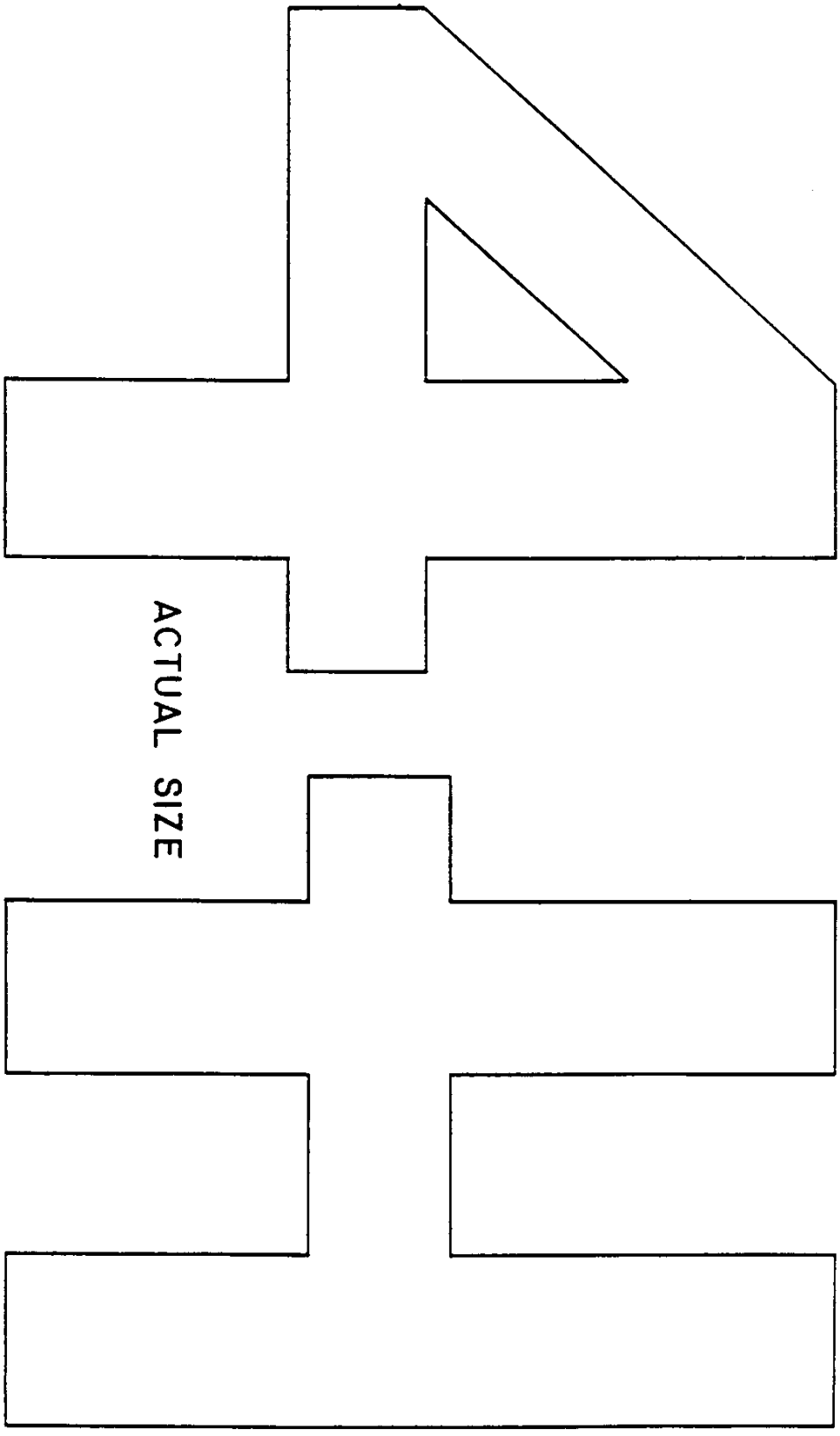
Tools:

- crosscut handsaw
- coping saw
- hammer
- eye protection

Instructions:

1. Cut two bases 135 mm by 130 mm with the crosscut saw.
2. Cut two ends 135 mm by 175 mm with the crosscut saw.
3. Trace the rounded tops of the ends and cut with the coping saw.
4. Trace the 4” and the H. Cut these out with the coping saw.
5. Sand all the pieces smooth.
6. Glue and nail the ends to the bases.
7. Glue and nail the 4” to the left side bookend. Glue the H to the right side bookend. (Otherwise you will have a H-4” bookend.)
8. Varnish or paint your project.
9. Have someone take your picture with your bookends. Congratulations!




ACTUAL SIZE

Firewood Rack

Materials:

- 2 38 mm x 190 mm x 610 mm (base)
- 2 38 mm x 190 mm x 610 mm (base)
- 11 19 mm x 64 mm x 450 mm (slats)
- 26 38 mm #8 screws
- glue
- sandpaper
- outdoor stain

Tools:

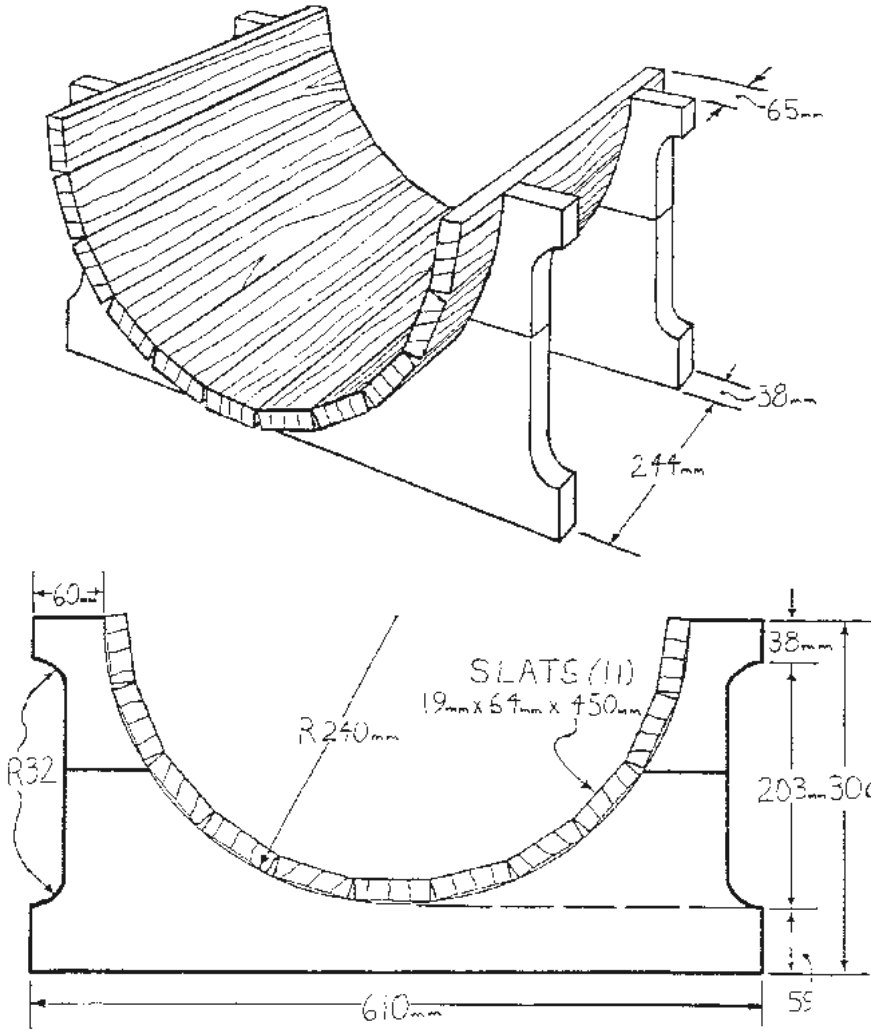
- jigsaw
- crosscut handsaw
- drill
- clamps
- screwdriver
- string and pencil
- clamps

Instructions:

1. Glue one 38 mm x 140 mm piece to a 38 mm x 190 mm piece to make one piece of wood that is 38 mm x 330 mm x 610.
2. Repeat step one.
3. Cut the glued pieces of wood down to 38 mm x 300 mm x 610 mm.
4. Using the string and pencil, nail the string to the middle of the top side (at 305 mm). Tie the pencil at 240 mm in the string. Draw a half circle with the pencil on the wood.
5. Repeat for the other base piece.
6. Cut out the half circles with the jigsaw.
7. Draw a cut at each end of the frame pieces that measure 200 mm by 32 mm, with rounded corners. You can use a jar lid for tracing the rounded corners. Cut these out with the jigsaw. (This step is for appearances only, but it does look better than a straight end.)

8. Sand all the wood to remove sharp or splintering edges.
9. Clamp the base pieces so they are 244 mm apart from each other (measuring from the inside edges). If you do not have clamps, you could carefully nail or screw them to 2 x 4's from below at the correct distance. Then remove the 2 x 4's after all the slats are attached.
10. Drill two pilot holes at each end of two slats at 78 mm. These will be the top slats.
11. Drill pilot holes 78 mm from the end of all the other slats, in the centre of the slat.
12. Glue and screw the slats in place, starting at the bottom and alternating sides as you work your way upward. The slats should stick out 65 mm past the end of the base pieces at both ends. (See diagram.)
13. Sand and wipe.
14. Stain your firewood rack with a tough outdoor stain. Or you can leave it plain, if that's your pleasure.
15. Take a picture for your record book. Congratulations. I bet it looks nice.

Source: Saskatchewan 4-H Unit Two : The 4-H Woodworker.


65mm
38mm
244mm
60mm
38mm
SLATS (11)
19mm x 64mm x 450mm
R240mm
R32
203mm
610mm

Cookbook Holder

Materials:

- 1 2 x 15 x 8” (back)
- 1 3/4” x 7” x 15” (base)
- 1 3/4” x 3” x 4 2” (support)
- 1 1/8” x 12” x 15” (splash cover of plexiglass)

Tools:

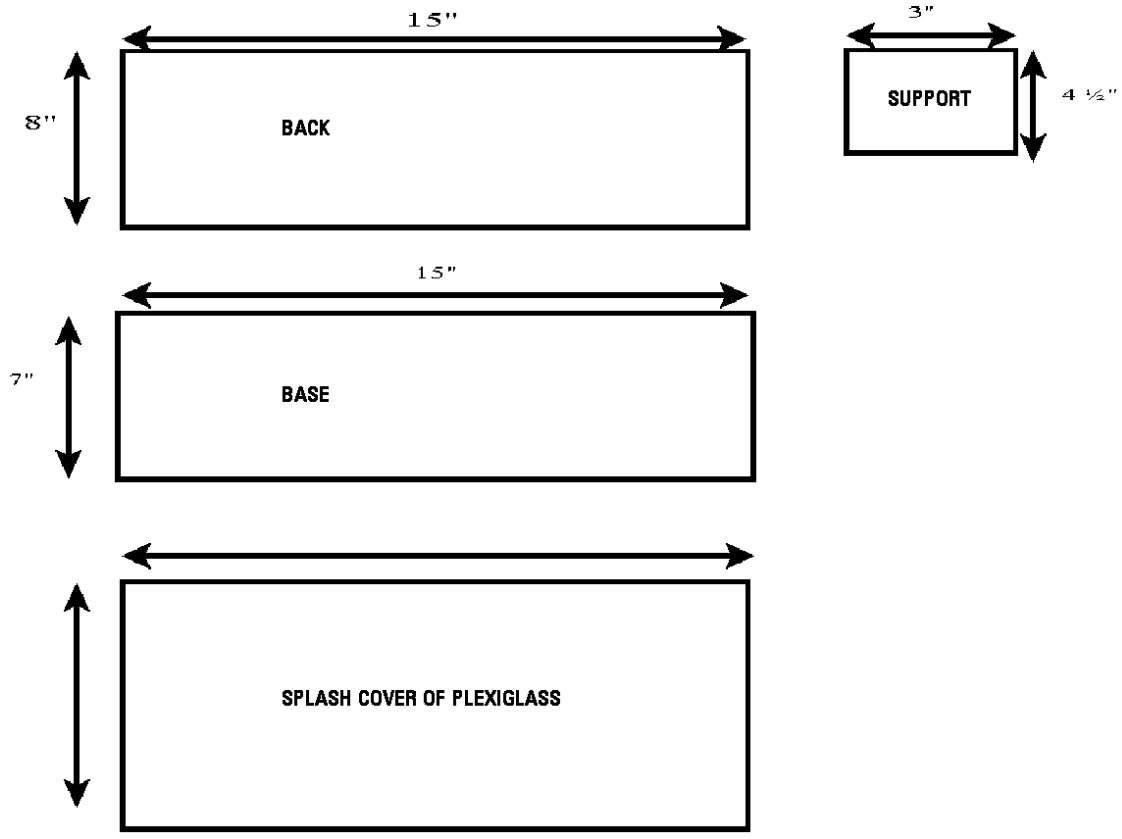
- circular saw
- jigsaw
- jar lid
- sander

Instructions:

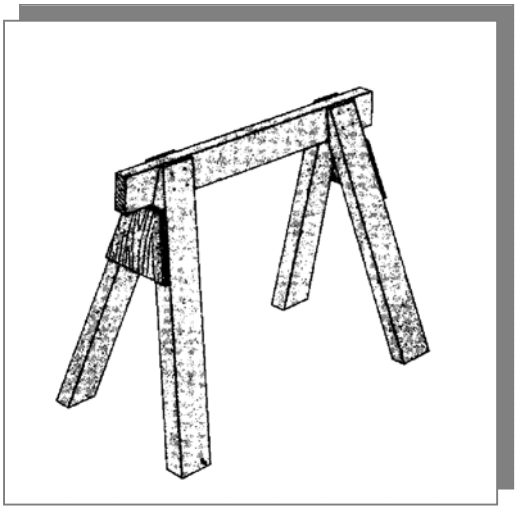
1. Measure and cut all the wood and the plexiglass. Sand lightly. Wipe.
2. Cut the bottom edge of the base to an angle of 15 degrees. This allows the book to slant back, so it will not fall forward.
3. Mark out where the slots should be in the base, to hold the back and the piece of plexiglass. These slots will also be cut at a 15-degree angle, so that the plexiglass will also slant backwards and hold the book pages open. You will cut four slots for the plexiglass, to accommodate various thicknesses of books.
4. All the slots will be 1/4” deep.
5. The slot for the base should be the width of the back so it will fit snugly. The slot for the
6. plexiglass should be 1/8” wide. Space the slots for the plexiglass evenly between the front and the slot.
7. Check before you cut that you will be cutting the slots angling towards the back, not the front!
8. Cut the support piece. This piece is also angled at 15 degrees.
9. Screw the support piece to the base, making sure the back support is lined up with the slot for the base.
10. Apply glue to the sloped edge of the back support, as well as in the 2” slot.

11. Put the back piece in place. Clamp together overnight.
12. Use a finishing oil on the cookbook holder.
13. Cut out the piece of plexiglass. Round off the top edges. Sand down the edges to smooth them
14. Take a picture for your record book. Congratulations.

Note: You could cut out a decorative shape, such as a heart, out of the top centre of the holder. Rasp and sand it well.



Sawhorse

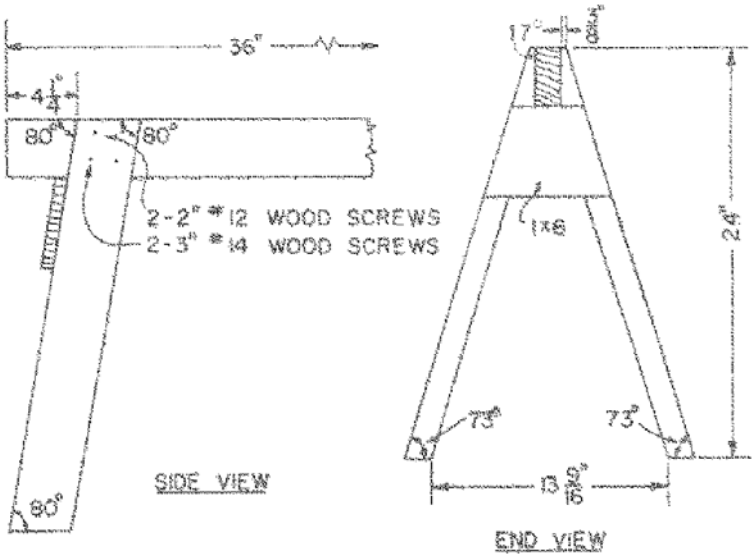


Materials: (for sawhorse with 24” legs)

- 1 2” x 4” x 12’ (sound wood, free from splits, knots or other weakening defects) for the legs and the beam
- 1 piece 1” x 6” x 24” – for the support under each end of the beam
- 8 No. 14, 3” flathead wood screws
- 20 No. 12, 2” flathead wood screws
- 20 4d finishing nails
- Colourless penetrating wood finish, such as boiled linseed oil or varnish with paint thinner or commercial wood seal

Tools:

- hammer
- crosscut saw
- screwdriver
- countersink
- combination square
- sandpaper
- tape rule
- T bevel
- plane



Instructions:

1. Lay out and cut all pieces. Refer to the diagram for the angles of cuts on the legs.
2. Assemble sawhorse as shown with nails.
3. Drill pilot holes and install screws.
4. After all the legs are marked and cut out, cut 1 1/4” off the tapered end to give a narrow, flat end section. The flat end section will be flush with the top of the beam
5. Sand lightly.

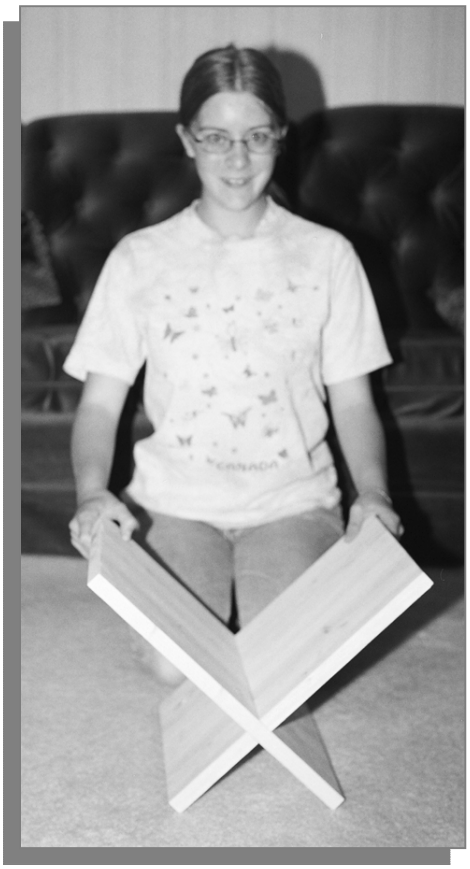
6. Finish with your chosen finish.

Note: To make a sawhorse even sturdier, add supports on the inside of the legs too.

Source: National 4-H wood Science Committee. Building Bigger Things. Chevy Chase, MD. : National 4-H Council of the United States of America, 1987.

Magazine Rack

This design goes together quickly. A slot in each piece fits into the other to form a sturdy, yet simple rack.



Comes apart easily for moving. A great gift idea for someone's dorm room or first apartment!

Materials:

- 1 scrap of 1 x 12", at least 32" long (or glue and clamp together some 1 x 6)
- sandpaper, 100-grit and 150-grit
- varnish
- mineral spirits or turpentine
- 1" paintbrush
- rags and newspaper

Tools:

- measuring and marking tools
- C-clamp
- handsaw
- coping saw
- rasp

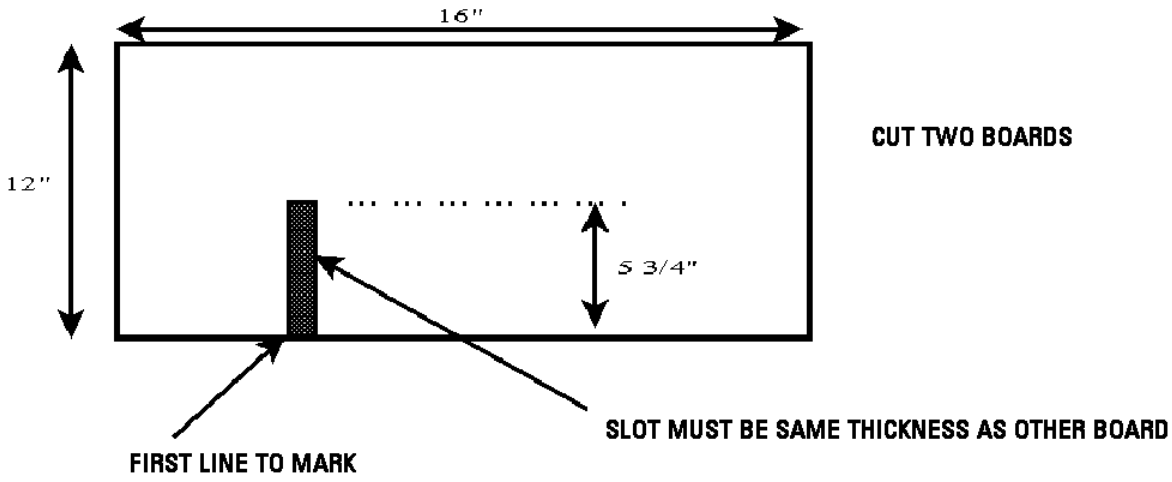
Cut List:

- 2 1 x 12 x 16" sides

Instructions:

1. Square the end of the wood.
2. Cut two 16" long pieces from the 1 x 12.
3. Lay one piece on the work surface. You are going to mark where to cut the slot. This slot has to be the actual thickness of the other board. Measuring from one cut end, mark a point at 5 inches. Mark a second point, which will be at 5 inches plus the thickness of the second board.
4. Measuring from the edge of the piece, lightly draw a line through each of the marks you just made. You will have two lines parallel to each other.

5. From that same edge, measure and mark a point 5 3/4” down, between the two faint lines.
6. Connect the two lines across this point, using your try square to make sure the line is square.
7. Clamp the wood to the work surface. Cut the two faint lines with the handsaw, up to the latest line that crosses the two lines. Tip your saw up at the end of the cut, so that the cut will have a square end.
8. Cut along the short line with the coping saw. You may have to drill a small hole so you can turn your coping saw to point the right way. Sand the rough inside edge with the rasp and then the sandpaper.
9. Repeat steps two to seven with the other piece of wood.
10. Slide the two slots together. The longer ends of the wood should be on top, so the rack will hold more magazines.
11. Separate the sides. Sand all surfaces. Wipe away the dust.
12. Give each side at least two coats of varnish, sanding lightly between coats.
13. When the sides are completely dry, put them together. Have someone take your picture with your new magazine rack. Congratulations!



Toolbox

Materials

- 1 1” x 8” x 18” (bottom)
- 2 1” x 4” x 18 (Sides)
- 1 1” x 4” x 10 (Ends)
- 1 1” x 6” x 18” (handle)
- 4 #8, 1 2 “ flathead wood screws
- 25 #8, 2” flathead wood screws
- fine grit sandpaper

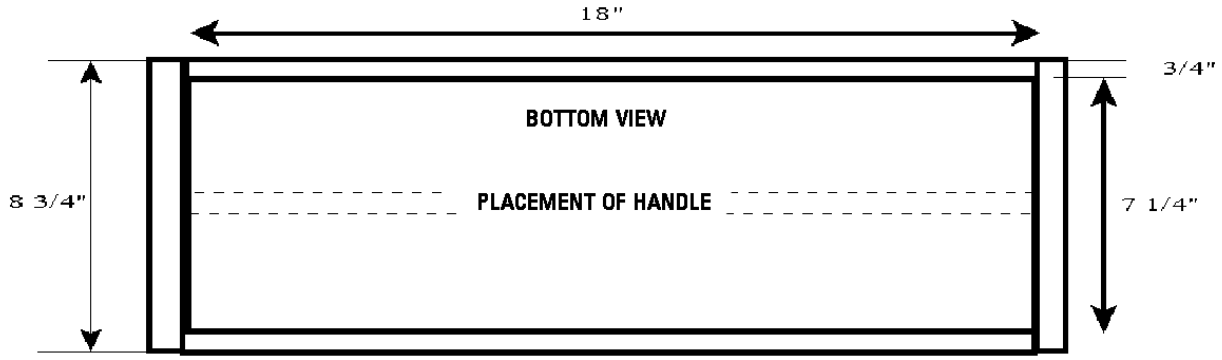
Tools:

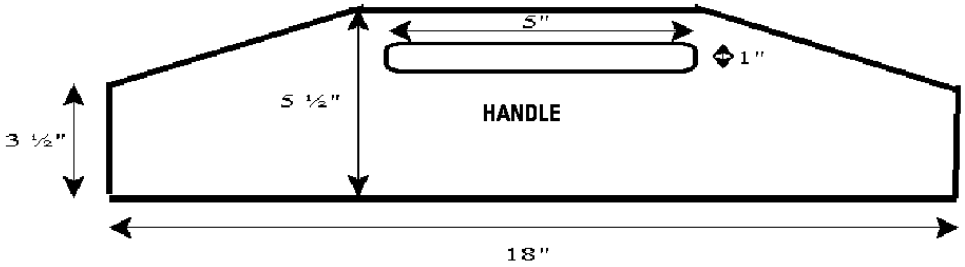
- saws
- screwdriver
- round wood rasp or file
- drill with 1” bit
- pilot hole bits to fit screws and countersink

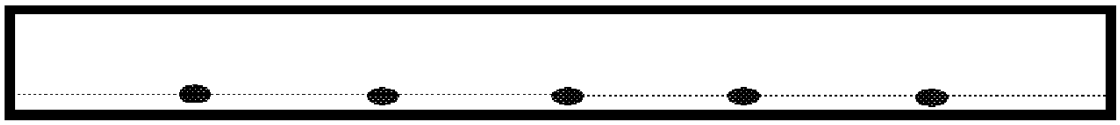
Instructions:

1. Cut pieces to size (see diagram).
2. Mark and cut the angled cuts on the handle, leaving 1/16” or so for sanding.
3. Mark the handle hole. Bore a 1” hole at each end of the mark and saw out the rest. Use the rasp or file to even and round out the edges. Sand and smooth all sides and edges.
4. On the 8 x 18 bottom piece, draw a centre line lengthwise. Mark and drill countersink holes every three inches on this line. Sand smooth all sides and edges. Screw the bottom to the handle with 2” screws.
5. *Tip: When use slotted screws, line up all the slots the same way. It looks more professional.*
6. In the side pieces, drill the countersink holes 3/8” from the bottom edge. Space the holes as shown on the diagram. Sand smooth all sides and edges. Use 2” screws to fasten both sides to the bottom piece.
7. Add the ends in the same way. Use 1/2” screws at the bottom corners so you do not hit the screws holding the side pieces.

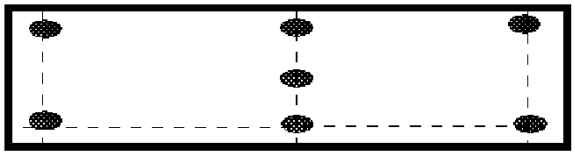
8. For extra strength, drill and countersink the holes in each end piece to hold the handle. Use a 2” screw in each hole.
9. Paint or stain your tool box to personalize it.
10. Take a picture for your record book. Congratulations! Enjoy using your new tool box.







SIDE VIEW SHOWING PLACEMENT OF SCREWS



END VIEW SHOWING PLACEMENT OF SCREWS

SCREW PLACEMENT THROUGH BOTTOM INTO HANDLE

Intarsia

Looking for something a bit different?

Intarsia, anyone?

Intarsia is almost like a wood mosaic that is fitted into a support. It is intricate, fine work; however, the outcome is amazing!

Go to http://intarsia.hostcentric.com/home/e-book/Intarsia101.htm for a comprehensive overview and training, and this site also offers a ton of free patterns.

Didn't find anything that you liked on the previous site? Check out this site for more intarsia ideas: http://www.freeintarsiapatterns.com/

Tray

Make this as a practical item or decorate it to add colour to your home! This tray features rabbeted corners and a dadoed bottom for strength and appearance. Select a washable finish. The dimensions are for a standard tray. Adjust them for your needs. Optional hand holes can be cut to size.

The next time you make this tray, you could try another type of joint. A simpler version of this tray can be made with butt joints, gluing and using fine screws to secure.

Cut List:

- 1 1/4" x 20" by 13" of plywood (tray bottom)
- 2 2" x 2" x 20" sides (Wood of your choice)
- 2 2" x 3" x 12" ends (Wood of your choice)

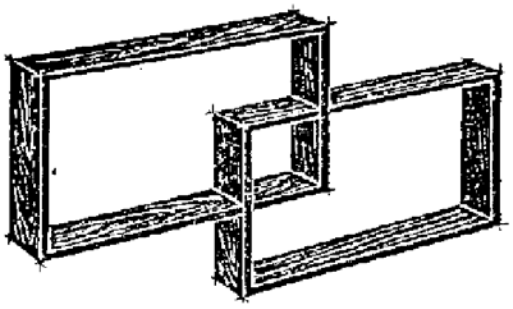
Instructions:

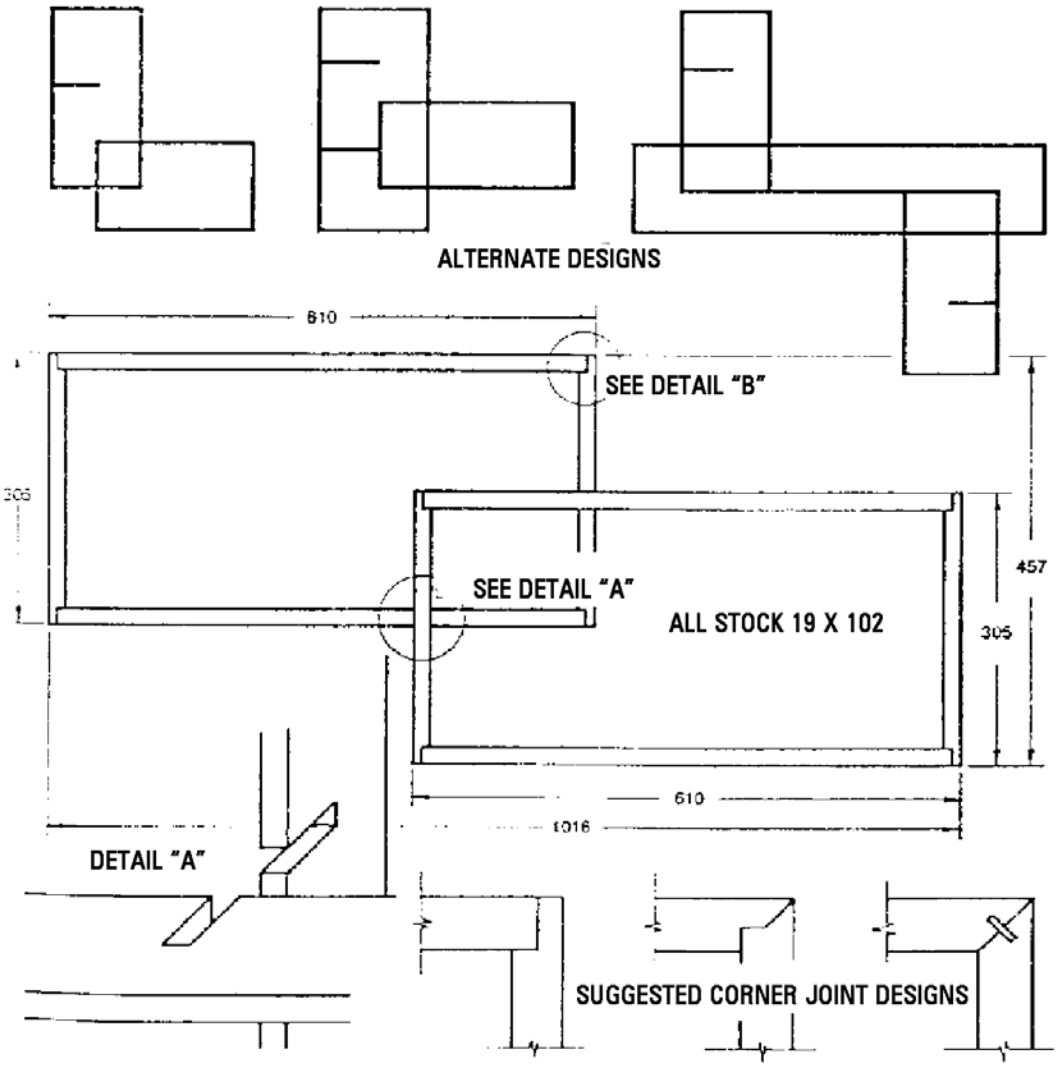
As with all projects, it is suggested that you sketch or make a cardboard model of this project first, before making it in wood.

1. Measure, mark and cut the pieces of wood.
2. Test assemble the pieces to check for fit.
3. Insert a 1/4" dado blade in the table saw. Set it to cut a groove 1/4" deep. Test a scrap of the wood you are using for the tray bottom in this groove. When this fits smoothly, dado the ends and sides of the tray bottom.
4. Test assemble the tray.
5. If you want to have hand holes in the ends of the tray, sketch and cut them now. Sand them smoothly.
6. Sand all the parts of the tray.
7. Glue, assemble and clamp.
8. Finish as desired.
9. Take a picture for your record book!

Shadow Box

Use this to display pictures or collections of small items. Use the type of corner joint you prefer. Or make several shadow boxes, each with a different style of joint.





Chess Set

Make one for a special gift or one for yourself! This is a challenging project. The designs for the chess pieces can easily be modified or replaced with styles you prefer. The traditional sizes for the pieces descend in this order: king, queen, bishop, knight, rook, pawn.

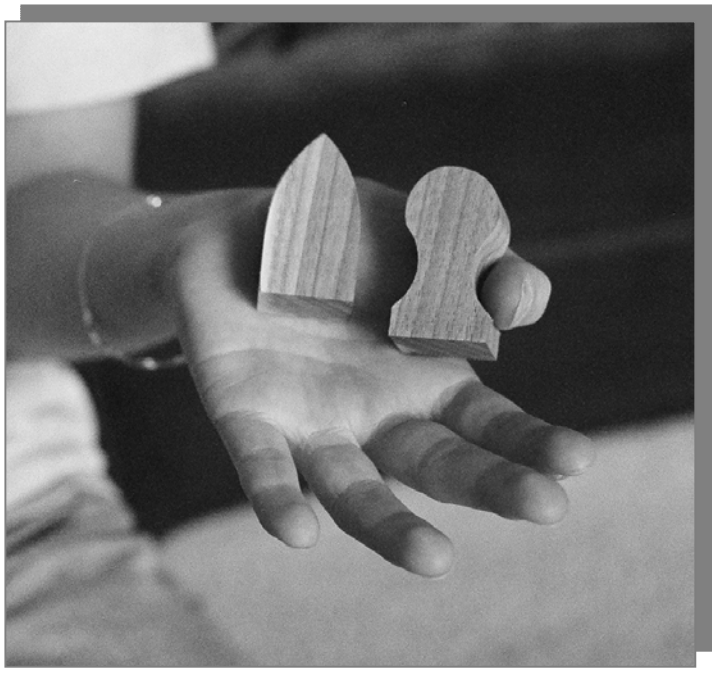
If you have only one colour of wood, stain half of it to provide the colour contrast needed for the two armies of pieces.

Materials for the Chess Figures:

- green felt
- Hardwood
- Dark 950mm x 25mm x 25mm
- Light 950mm x 25mm x 25mm

Tools:

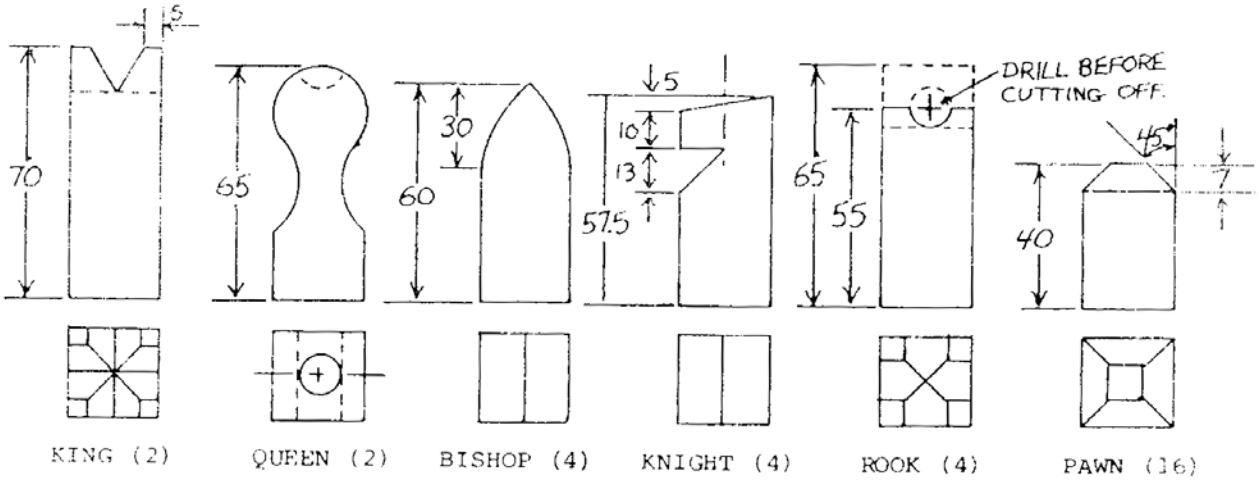
- pencil
- sanding disc
- ruler
- pencil
- try square
- marking guage
- tenon saw
- file
- chisel

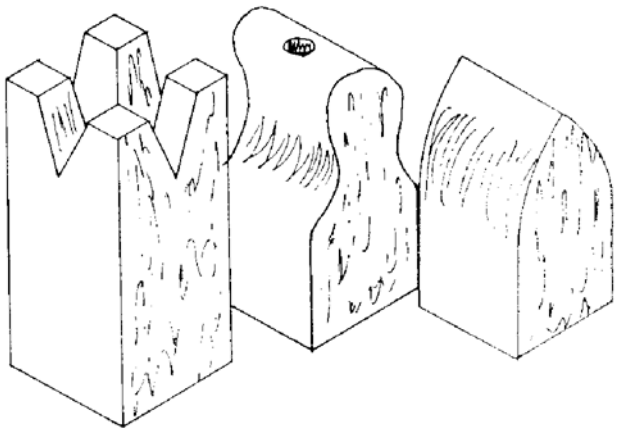


Instructions:

1. Mark and cut out the 16 pieces from the light wood and from the dark wood.
2. Use a sanding disc to trim the pieces to the exact length.
3. Mark out the desired design on the pieces, using a ruler, pencil, try square and marking gauge.
4. Cut with a tenon saw.
5. Shape and tidy up the cuts with a file and firmer chisel.

6. Use a sanding disc and belt sander where possible to assist in the shaping.
7. Do final sanding with glasspaper.
8. Varnish the pieces.
9. Glue green felt to the bottom of the pieces, so they do not scratch the board.





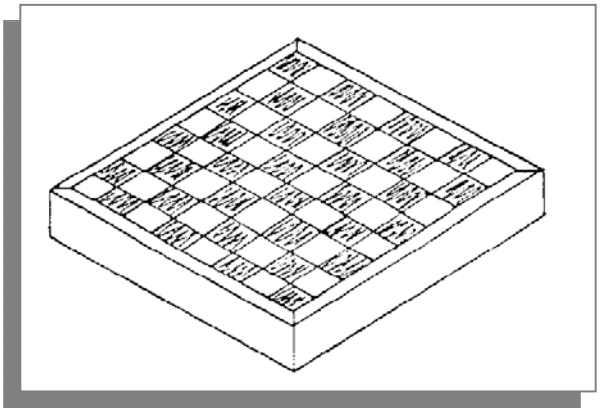
The Chess Board

Materials:

- 4 strips of white wood for the board 15mm x 35mm x 350mm
- 4 strips of dark wood for the board 15mm x 35mm x 350mm
- 4 strips for frame 10mm x 25mm x 350mm

Tools:

- measuring tools
- plane
- marking gauge
- table saw
- sandpapers
- nails
- nail set
- paste wax



Instructions:

Phase One

1. The strips are longer than the finished board, to allow for error and sanding
2. Lay the strips for the board side-by-side, alternating dark and light woods. Watch the direction of grains, so the pattern will be most pleasing.
3. Glue the inside edges of each strip and clamp tightly, using pipe clamps. Make sure all pieces remain level and even at one end. If you notice them buckling, unclamp, flatten them down, then reclamp. Do not rush this stage!
4. Allow to dry for 24 hours.

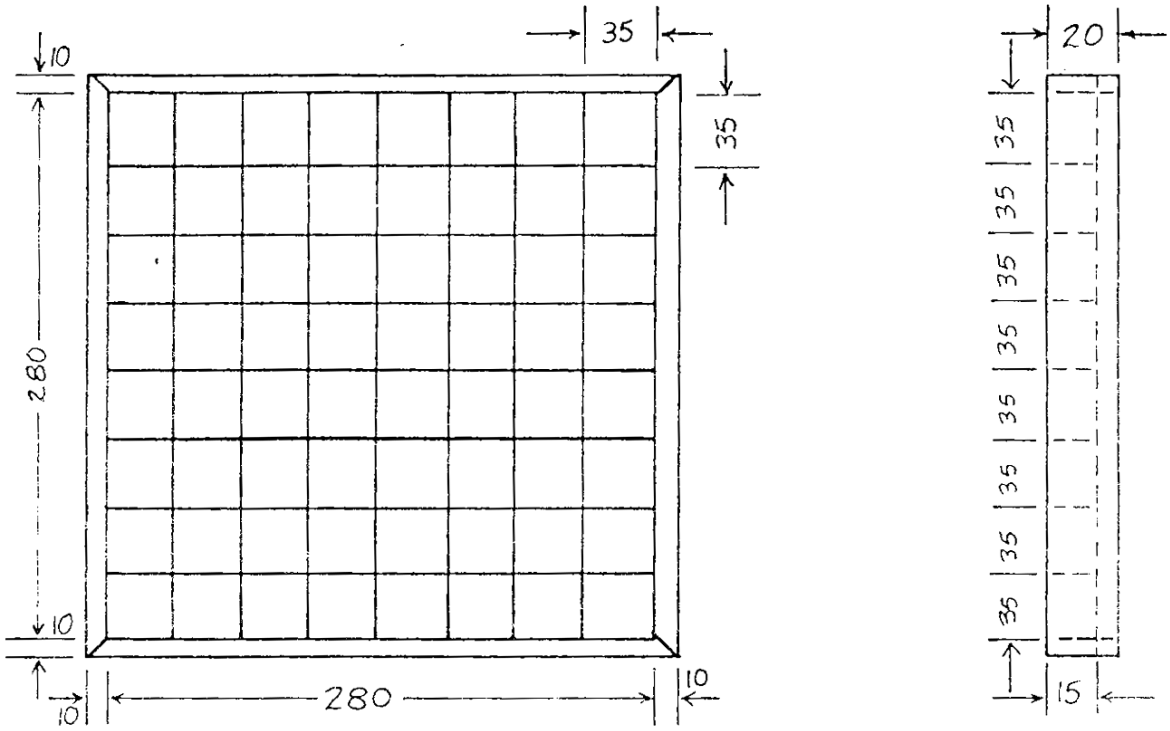
Phase Two

1. Recut the board into 35mm strips, across the coloured strips of glued wood.
2. Lay the strips out in a chess board pattern. Match the corners perfectly.
3. Glue and clamp.
4. Allow to dry for 24 hours.

Phase Three

1. Plane one side flat and smooth. Do not remove any more wood than is necessary.
2. Mark the board to thickness using a marking gauge.
3. Plane the board to thickness.
4. Plane the edges smooth and 90 degrees to the best side.
5. Measure board to length (check the numbers of squares required!).
6. After triple checking, cut off the extra length of board.
7. Sand all sides and edges flat and smooth using increasingly finer grades of sandpaper.
8. Measure and cut your frame strips.
9. Fit frame strips to the board using mitred corners.
10. Nail the frame to the board. Set and fill the nail holes.
11. Sand all surfaces.
12. Varnish. Let dry 24 hours.
13. Sand with 400 wet/dry sandpaper.
14. Apply second coat of varnish.
15. Sand lightly with 400 wet/dry sandpaper.
16. Apply two coats of paste wax allow 20 minutes between coats. Polish.
17. Invite someone over for a game of chess!

Chess Set Illustration



Paddle

You can make this project from hardwood or softwood. With hardwoods, you will be able to achieve a thinner blade. Woods that work well for a paddle include spruce, cherry, maple, pine, butternut and ash. Some people like to use a combination of woods in a paddle, especially if it is to be displayed.

The correct size for a personal paddle? If you can rest your chin on it while standing, it is the correct length for you. The instructions given are for a generic paddle, made of fir. This paddle is good for both lake and river use. The Lee Valley Tools web site gives instructions on making a marking jig which helps in marking the shape you would like in your paddle shaft. Visit www.leevalley.com.

Materials:

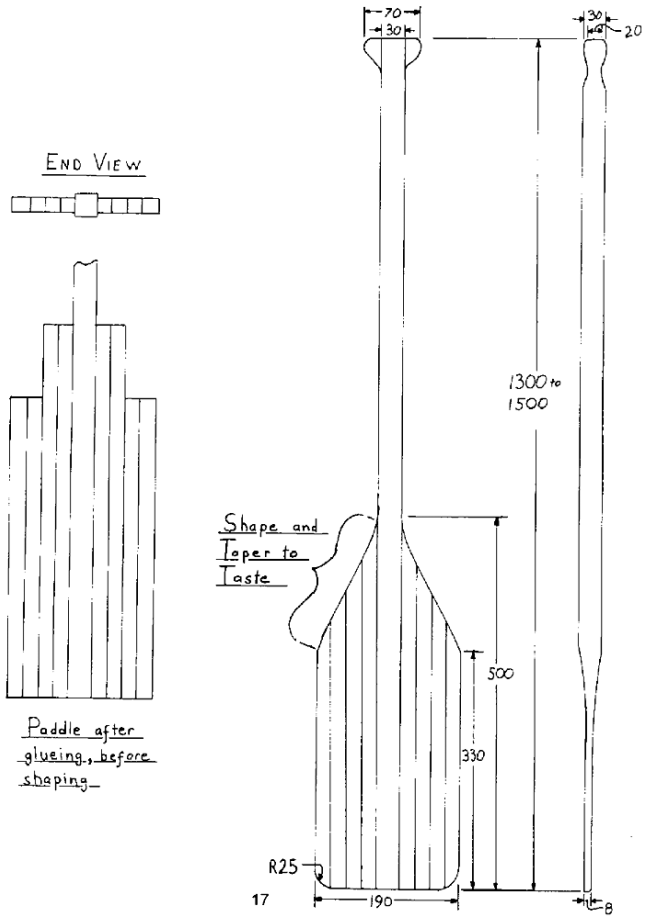
- 1 30mm x 30mm x 1500mm
- 4 20mm x 20mm x 550mm
- 4 20mm x 15mm x 450mm
- 2 30mm x 30mm x 100mm
- waterproof glue (titebond II)
- sandpaper
- marine varnish or urethane

Tools:

- table saw
- jigsaw
- rasps
- clamps
- planes

Instructions:

1. Make sure that the main shaft piece (the longest one) is straight, true and without flaws.
2. Glue 2 – 20mm x 20mm x 550mm pieces directly onto each side of the main shaft with ends flush. Clamp well and let dry.
3. Glue 2 – 15mm x 20mm x 450mm to the sides of the pieces you glued on in step 2. Clamp and let dry.
4. Glue the 2 – 30mm x 30mm x 100mm pieces to opposite sides of the handle end of the paddle. Clamp and let dry.
5. Pencil the outline of the blade shape on the paddle. Pencil the desired handle shape on the
6. handle. If you already have a paddle you like, you could use it as a pattern.
7. Bandsaw or jigsaw the shape.
8. Using rasps and planes, shape and taper the blade to about 8mm on the edges and tip. The
9. middle of the blade should remain a bit thicker, about 12mm (for strength). The blade should thicken a bit as it reaches the shaft.
10. Round the shaft until it feels comfortable in your hands.
11. Shape and taper the handle so it comfortably fits your hand. A bad fit to your hand can cause blisters. Blisters are not fun on a canoe trip.
12. Sand smooth. Remove dust. If you wish, you can put



some kind of identification mark somewhere on your paddle at this time (initials, phone number etc. It's optional, but a good idea.)

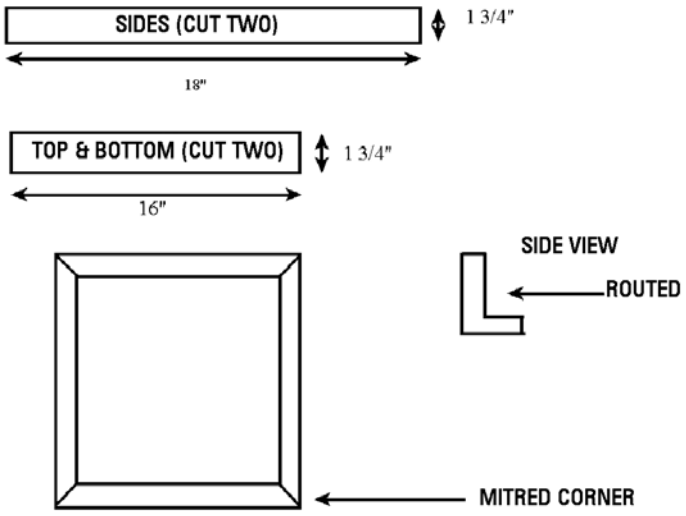
13. Apply three coats of marine varnish or urethane.

14. Ask someone to take a picture of you with your new paddle. Congratulations! Long may your paddle sing.

Alternative:
You may also paint the paddle with exterior grade paint. You can also paint or burn a design into the paddle, then varnish over it for protection.

Picture or Mirror Frame

You can make this to any dimensions, of course. Varnish the frame, if you wish to show off the grain. Paint it, if you want to emphasize what the frame will hold. Or leave it unfinished, if you are using a material such as old barn board! The choice is yours.



Materials:

- wood of your choice
- glue
- thin panel pins (optional)
- glass or mirror cut to fit (have this cut after you have made the frame!)
- matting for picture (optional, but recommended)
- small screws and wire for hanging
- small scraps of felt

Tools:

- mitre box and saw
- router
- sander
- saw

Cut List:

- 2 1 3/4" x 1 3/4" x 18" (sides)
- 2 1 3/4" x 1 3/4" x 16" (top and bottom)
- 1 piece of thin board to fit within the finished back (measure and cut to fit finished frame)

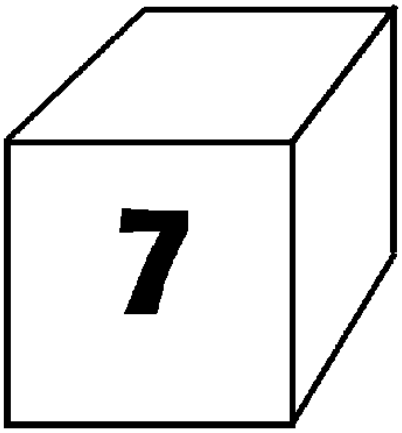
Instructions to make a 18” by 16” frame:

1. Cut wood, using a mitre saw and box. Cut at a 45 degree angle. Take great care to avoid splinters.
2. Test assemble the pieces, to make sure everything will fit together snugly.
3. On the back side of each piece, rout out a groove on the inside of each piece. This will form a ledge that the picture or mirror will rest on.
4. If you are routing hard wood, it may take more than one pass to make the depth of ledge you want. Do not force your router.
5. Glue and clamp the four pieces together. Lay on a flat surface. Let dry overnight. It might be a good idea to put a clean piece of paper or cardboard over top, with a bit of weight, to hold things flat as they dry.
6. If you want extra reinforcement, use very thin panel pins to nail the pieces together.
7. Have the glass or mirror cut now to fit the finished product. Insert the glass or mirror into the frame. Secure it with fine panel pins.
8. Attach picture wire frame between small screws.
9. Glue small pieces of felt to bottom corner of frame so it will not mar the wall.

Tip: To avoid tilting pictures, hang frames from two, not single hooks on the wall.

Date Cubes

This project requires you to make two identical cubes from hardwood. With only two cubes you will be able to display all the days of the month. This project calls for a steady hand with a router. You can make the cubes with scraps of hardwood.



Materials:

- enough hardwood to make two cubes the size that you want
- glue

Tools:

- table saw
- square
- measuring tools
- hobby knife or carbon paper to transfer patterns
- pencil
- disc sander
- sandpaper
- clamps
- router
- if starting with rough lumber, you will need access to a joiner or a planer
- patterns for numbers

Instructions:

1. First, practice on scrap wood making numbers using the router tip you plan to use for the numbers. This step will help you decide how big you should make your cubes. Anything smaller than two inches would be very difficult to work with, or to read.

2. If you are starting with rough lumber, smooth it so that it will glue together perfectly.

3. Measure, cut, glue and clamp your two cubes of hardwood. Take care to line up the grain in a way that you find pleasing.

4. Use the disc sander to smooth all surfaces. Make sure that all sides are square to each other and have the same dimension.
5. Print a style of number that you like (the simpler the better for a first try) using a computer. Trace or cut the pattern into the wood. The cut outline of the numbers will guide you when you are routing.
6. On one cube you will rout these numbers : 0, 1, 2, 3, 4, 5. On the other cube, make these numbers: 0, 1, 2, 6, 7, 8. (One “6” will serve also as a “9”.)
7. Sand the routed cubes, using increasingly finer sandpapers. Finish with your preferred finishes.
8. Take a picture for your record book! Congratulations!

The numbers on the cubes can also be painted or burned in using wood burning tools.

Wooden Letters

This is a good way to practice using a band saw, jigsaw or scroll saw. You could make a set of letters as a gift for a child, or for a local school. You could also make separate letters that spell out a name or messages, which could be used at home or on a shelf at school or at a Seniors' Centre. E.g. Happy Birthday! Joy! Congratulations! Welcome! Etc.

Materials:

- plywood or hardwood (how thick will the wood need to be, so that the letters will stand up easily?)
- paint or stain – if these are to be used by a young child, select a child safe finish
- patterns for letters

Tools:

- band saw or jig saw or scroll saw
- sandpaper
- paintbrush
- ruler

Instructions:

1. Mark the letters you are going to cut out on the wood, using either a pattern or by drawing freehand.
2. Cut out the letters. With letters that have an interior opening drill a hole first, then use an appropriate saw.

3. Sand carefully, working to avoid splintering the wood.
4. Finish, using a child-friendly paint.
5. Take a picture for your record book or e-mail it to us! Congratulations!

Business Card Holder

Makes a great gift. Also a great item for bazaars or fundraisers! Very simple, useful item which requires careful use of band saw, orbital sander and router. It uses up those scraps of hardwood!

This would be a very nice thank you gift for sponsors, guest speakers or judges!

Make one long holder, rout the channel out, then cut to desired width. If you try to make just one, it is too tricky to rout out the channel.

Materials:

- 1 scrap of hardwood, 1” thick
- finishing supplies
- sandpaper

Tools:

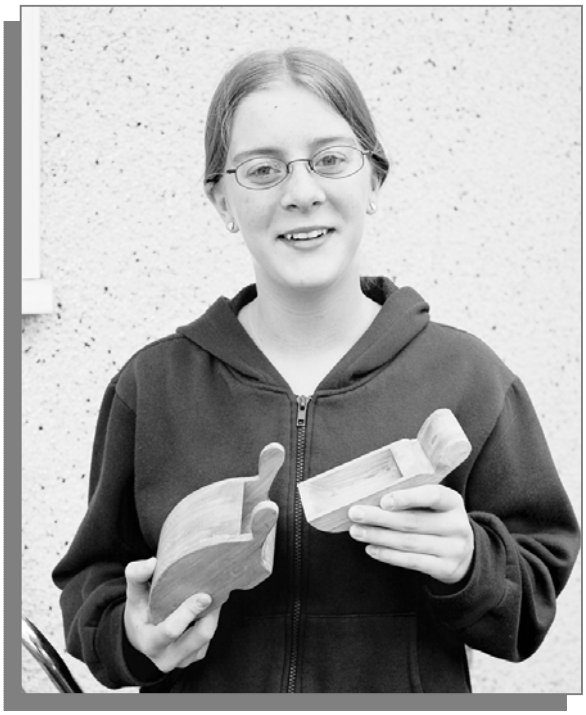
- Band saw
- Router

Instructions:

1. Cut a strip of hardwood about 2” wide and slightly longer than three business cards are wide.
2. Secure the wood. Using a 1/2” bit, cut a 2” deep channel in the top. The business cards will sit in this channel.
3. Sand and finish.

Turtle Box

This is a clever container made of a 2” x 4”!



Materials:

- 1 2 x 4 x 24”
- glue
- sandpaper
- varnish or other finish of your choice

Tools:

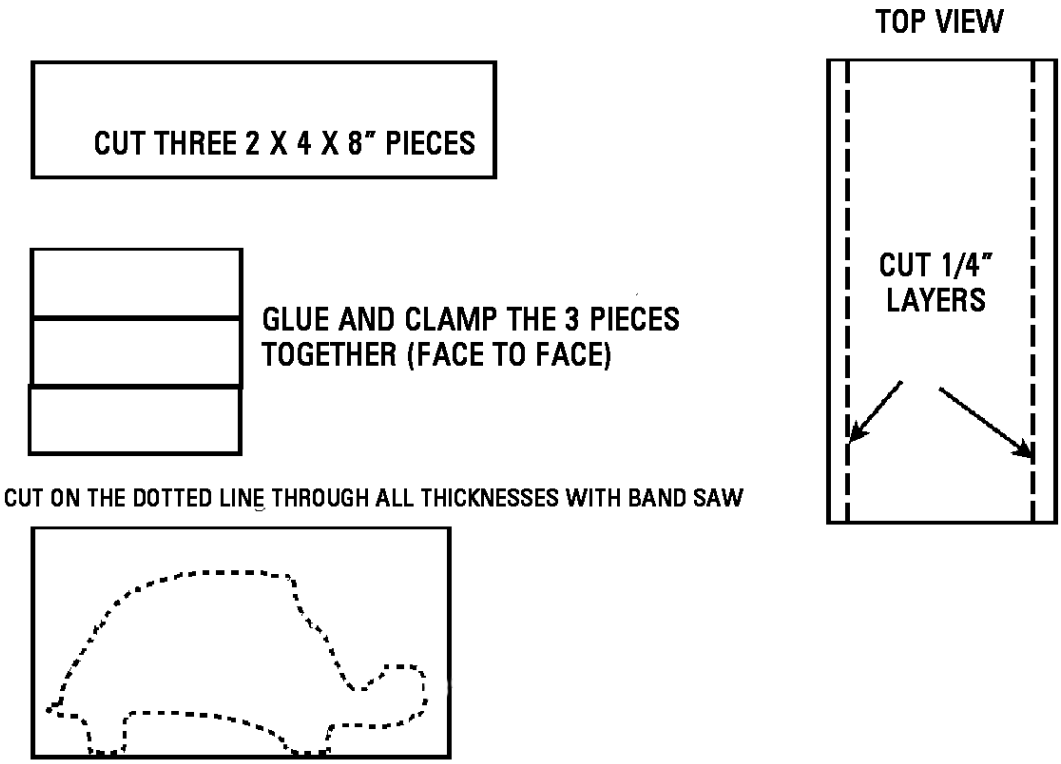
- joiner or planer
- clamps
- band or scroll saw
- pencil
- disc sander

Instructions:

1. Run the 2 x 4 through the joiner or planer to get completely smooth surfaces.
2. Cut the 2x4 into three equal lengths (approximately 8” each).
3. Glue one piece of 2 x 4 on top of another. Clamp and let dry.
4. Glue the third piece of 2 x 4 to the top of the other two. Clamp and let dry.
5. Draw the pattern of the turtle on the top of the glued wood (on the side with no seams).
6. Use a band saw or scroll saw to cut out the turtle.
7. Cut a 1/4” layer of turtle off both sides. You will have two thin turtle shapes and one thick one.
8. Trace the drawer pattern on the thick turtle.
9. Use the band saw to cut out the drawer.
10. Use the band saw to cut a 1/4” layer off both sides of the drawer. You will end up with two thin drawer pieces and one thick one.
11. Trace the drawer cavity on the thick piece of drawer.

12. Use the band saw to cut out the drawer cavity out of the thick piece of drawer.
13. Glue the thin drawer pieces to the thick drawer piece, to make a complete drawer! Test to make sure it will go into the turtle. Clamp and let dry.
14. Glue the thin turtle pieces to the thick turtle pieces to make a turtle. Clamp and let dry.
15. Sand to remove all traces of glue and to smooth the surfaces.
16. Stain and varnish the way you would like.

17. Take a picture for your record book!



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