



**BOY SCOUTS
OF AMERICA®**
NATIONAL CAPITAL
AREA COUNCIL



**The Michael Snowdon
Memorial
Wood Shop
Operating Manual**
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1. INTRODUCTION

In 2018, Camp Snyder built a woodshop for the general use of the NCAC Scouting Community. This shop has an extensive array of hand and power tools, work space, materials, and dust collection.

Woodworking is a serious activity, and the use of sharp hand and power cutting tools introduces a new level of risk and requires discipline safety and usage procedures to ensure those using the shop are safe.

This operating manual provides the policies for the use and maintenance of the shop, and the procedures for use.

1.1. USE

The Camp Snyder Woodshop is available for use by Scouting organizations within the NCAC district, and others if approved by the Camp Director. The following rules apply to usage:

- Any time the Shop is in use by youth organizations, a Camp Snyder approved Shop Steward or Trained Wood Shop Leader must be in attendance.
- Any time the shop is in use by youth organizations, at least one adult with current First Aid and CPR certification must be in attendance.
- Two deep leadership is required – for up to ten Scouts. One adult leader from the BSA Unit is required for every additional five Scouts.
- All participants will follow the directions of the Shop Steward or Trained Wood Shop Leader, as they are in charge of the shop.
- Failure to follow the direction of the Shop Steward or Trained Wood Shop Leader will result in immediate expulsion from the shop.
- All Safety policies and rules must be followed by all participants.
- The unit using the shop will clean up after themselves, and leave the shop in the same (Or better) shape than when they arrived.
- Participants will only use tools for which they have been approved, and in a manner directed by the Shop Steward or Trained Wood Shop Leader.
- All safety equipment (Fences, guides, etc.) will remain in use at all times. Removal or fail to use these devices will result in immediate expulsion from the shop.
- There are a great deal of donated wood and materials in the shop. The Shop Steward can authorize its use.
- Only the Shop Stewards can perform maintenance on tools, change blades, or make any adjustments beyond the standard tool use.
- Adult camp staff and volunteers may use the tools for which they are a Certified User.



1.2. The Rules

- There are many dangerous tools in the shop. Do not touch a tool unless you are given permission by the shop steward. Failure to comply will result in expulsion from the shop and a mark on your permanent record.
- No horseplay, shoving each other, or yelling allowed in the shop (well, ok, you can yell if you dismember something, which, means you violated rule #1 and will be thrown out of the shop anyway).
- As this Shop is owned by the Boy Scouts – it is a Leave No Trace Shop --- which means clean up after yourself. Leave each station as clean (or better) than you found it.
- Eye Protection to be worn at all times.
- If you don't know how to use a tool, or are unsure as to what tool to use, ASK. Most shop injuries are caused by the incorrect use of a tool or the use of the incorrect tool.
- If you are using a tool, and it starts smoking, flaming, or walking across the floor - or you feel it is not working right, shut it off. A tool can be easily replaced, a finger cannot. The shop stewards will never get mad if a tool is broken to save an injury.
- Hitting your finger with a hammer is part of growing up – you will get no sympathy here.
- Stupidity should be painful, no sympathy for that either.
- Your hands or any part of you should never be in the path of the blades – always to the side.
- This is a place of exploration and empowerment – learning how to use tools will make you more self-sufficient.

Have FUN!



1.3. Fees

The following table outlines the fees for the use of the Camp Snyder Wood Shop

Figure 1- Woodshop Usage Fees

Usage	Fees	Notes
District Sponsored Events	As directed by the district	Each user may need to provide supplies
Camp Hosted Pinewood Derby Build Day	\$5 Per Scout	Please bring weights in addition to the PWD car
Camp Hosted Events or Unit Use – Manual Focus/Basic Tools	\$5 Per Scout Per day – with a \$50 cap for a unit	Primarily hand tools use and non-cutting power tools – sanders, etc.
Camp Hosted Events or Unit Use – Full Shop/Major Tools	\$10 Per Scout Per day - with a \$100 cap per unit	This is for events where the full capacity of the shop is required – including use of major power tools such as the jointer, planer, table saw, and band saw.
Eagle Scout Project	\$25 per day	

1.4. Safety

The following general safety rules will always be followed in the shop

1.4.1. Always Wear Safety Equipment

The first and most important rule of woodworking is to wear appropriate safety equipment. While hearing protection is necessary for some very noisy tools such as routers and surface planers, and latex gloves may be necessary when applying finishes, there is no time in the wood shop that you should be without your safety glasses. Put them on when you enter the shop and don't take them off until you leave. Your eyesight is too important to take chances.

1.4.2. Wear Appropriate Clothing

Whenever working in the wood shop, remember to avoid loose-fitting clothing, as you wouldn't want any of your attire to become entangled in a saw blade or cutting head. Wear clothes that are comfortable for the environment in which you're working, but also will protect your body from any wayward wood chips that might result from cutting. Before beginning, remember to remove any dangling jewelry such as neck chains or bracelets.



1.4.3. Drugs and Alcohol are Prohibited

Intoxicating substances and woodworking are a dangerous mix. Stay out of the wood shop if you are even remotely under the influence of any intoxicants. Alcohol and Drugs are not allowed anywhere in BSA, and the shop is no exception.

1.4.4. Disconnect Power Before Blade Changes

Please note – only the Shop Stewards can change blades. Whenever you need to change a blade or bit on a power tool, always disconnect the electricity to the power tool before even beginning the blade change. (Don't just check to see that the switch is off, as a switch could get bumped or malfunction.) Many a woodworker has lost fingers (or worse) by forgetting this simple but very important rule. I've seen woodworkers even go as far as to affix the wrenches to the power cables so there is no chance they'll forget to disconnect the power.

1.4.5. Try Using One Extension Cord

Use one heavy-duty extension cord. Not one per tool, but one TOTAL. This way, you're forced to switch the cord from tool to tool before the tool can be used. In this manner, you are always remembering to plug and unplug the power when moving from one tool to another, and you'll be more cognizant of the need to disconnect the power when making bit or blade changes.

1.4.6. Use Sharp Blades and Bits

This one seems like a no-brainer, but a dull cutting tool is a dangerous tool. If a saw blade is not as sharp as it ideally should be, the tool and the woodworker will have to work harder to complete the desired task. In such cases, the tool will be more likely to kick-back or bind. Besides, a sharper cutting tool will produce a cleaner cut, so there are more than just safety advantages here. Keep the blade sharp and clean of pitch, and you'll be safer and have better results. If you believe a tool, blade or bit is dull, please notify the Shop Steward immediately.

1.4.7. Always Check for Nails, Screws, and Other Metal

Always check the stock you're preparing to cut for any metal (nails, screws, staples, etc.) before beginning a cut. Nails and rapidly spinning saw blades are not a good mix. Not only can this damage the cutting head and the stock, but at the very minimum, can cause the stock to kick back, which is a common cause of injury. Inspect the stock (or better yet, use a metal detector) before cutting.

1.4.8. Always Work Against the Cutter

Woodworking power tools are designed so that the direction that the wood moves through the tool (or the direction that the tool moves across the wood) is in the opposite direction of the movement of the cutting head. In other words, a router bit or saw blade should cut against the motion and not with it. The cutter should cut *into* the stock, not with the stock.

1.4.9. Never Reach Over a Blade to Remove Cut-Offs

When working on a table saw, miter saw, etc., never put your hands anywhere near the moving blade, especially when attempting to remove waste or cut-offs. Wait until the blade has stopped moving and



then reach for the cut-off. Better yet, once the saw blade has stopped, use a piece of scrap or a push stick to move the waste away from the blade. Remember that switches can be inadvertently bumped or malfunction, so just because the blade has stopped, don't relax and put your hands too close.

1.4.10. Avoid Distractions

Distractions are a part of everyday life, and working in the wood shop is no different. When you are summoned or distracted while in the middle of performing an action with a power tool, remember to always finish the cut to a safe conclusion before dealing with the distraction. Taking your attention away from the woodworking tool is a recipe for disaster. No music device and headphones are allowed to be used in the shop.

1.4.11. Break the Tool, Not the Kid

We can replace tools, blades, etc., but not a child. If the choice comes between breaking a tool or a kid, break the tool.

1.4.12. No Running or Horseplay

There is absolutely no running, horseplay, or goofing off in the shop. The Shop Steward will immediately expulse any youth who does not demonstrate the self-control to be safe in the Shop.

1.4.13. Only Use Tools For the Purposes They are Built

Forcing tool to perform functions for which they are not intended is a recipe for disaster. If it seems the tool is having trouble, shut it off and consult the shop steward.



2. TOOLS IN THE SHOP

The Camp Snyder wood shop has a wide variety of tools for use. These have been donated to further the knowledge of woodworking by the NCAC Scouts.

2.1. Dimensioning Tools

Wood is either purchased rough from lumber yards or in standard dimensions from large home supply stores. If it is purchased rough, it needs to be machined into standard dimensions for use in projects. There are two primary tools that perform this function – the jointer and the planer.

2.1.1. The Jointer

The jointer's main function is to create a 90° angle between the face of the board and one edge. It is usually the first machine used on rough cut lumber to provide a base for all future board making activity. The shop has a massive industrial planer that the Shop Stewards can use to create a 90 degree angle on the rough cut board. A jointer can also be used to create a perpendicular face to the 90 degree angle if it is less than 6" wide.

2.1.2. The Planer

The Planer creates a flat board, which is dimensionally standard for thickness. It is a very loud and violent machine, and the Shop Stewards will operate it for any Scout who needs a board dimensioned. It uses a cutterhead with three blades spinning at high speeds to remove material. It is important to go slow, and remove minimal content (1/8") with each pass. The amount of material removed varies with the width and hardness of the board. Take it easy, and make multiple passes. If it sets off the smoke alarm, you are trying to remove too much material in ones pass.

2.2. Width and Length Tools

Once you have created a finished board, you need to rip (cut it with the grain) and crosscut (across the grain) it to the dimension you need. For ripping, the only tool to use is the table saw (the radial arm saw may not be used for ripping). The table saw provides a solid base to cut stock to a consistent width. For crosscutting, either the radial arm saw or the miter saw can be used. The Radial Arm Saw is somewhat old school, but is a very solid platform for cutting to length.

2.2.1. Table Saw

The table saw is the workhorse of a wood shop. It can be used to rip (cut with the grain) or crosscut (cut across the grain). It can be used to cut miter, dados, and kerfs. The table saw must always be used with all safety guards, using push sticks and hold down clamps.



2.2.2. Radial Arm Saw

The radial arm saw is primarily used to cut long boards to length. Unlike the table saw, where the blade stays in position and the wood is pushed through the blade, the wood is stable and the blade moves on a radial arm saw.

2.2.3. Miter Saw

The miter saw is used to cut angles to join wood – such as a 45 degree angle. The blade can be adjusted to cut at angles from 0 to 50 degrees left and right. If it is a compound miter saw, it can cut two angles at once, such as that needed to install crown molding.

2.2.4. Band Saw

The band saw is used to re-saw lumber – cutting thick boards into thinner stock. It can also be used to cut patterns in thick boards, but does not cut as tight curves as the scroll saw.

2.2.5. Scroll Saw

The scroll saw cuts tight patterns and is used for cutting pinewood derby cars. It can cut very intricate patterns if used with patience.

2.3. Other Power Tools

2.3.1. Drill Press

The drill press is a highly accurate tool to cut holes in wood and other stock. It has a table that is perpendicular to the drill bit, ensuring 90 degree holes. It can also cut angled holes if the table is adjusted. A drill press is more powerful and accurate than hand drills, and should be used for any drilling activity that either requires great accuracy or large bore (>1/4 in) holes.

2.3.2. Router

The router spins bits at very high speed to add decorative edging patterns to products, as well as cut inset patterns in wood stock. It can also be used to cut patterns using template. The number and size of router bits is vast, and can be used to cut raised panel doors, fluting, and many other projects.

2.3.3. Sanders

Sanders are used to remove stock and make projects look great. There are multiple types of sanders – belt sanders, random orbital sanders, and high power circular sanders. The shop stewards will assist you to pick the right sander to use for your project.

2.3.4. Hand Held Power Drills and Drivers

These are your basic electric and cordless drills and drivers that are used to drill small holes and drive screws.



2.4. Hand Tools

Before there were power tools, wood working was done by hand. With the exception of saw mills, which were usually driven by water wheels, all woodworking tools were hand driven. Saws, sanding, and drills were human powered. While woodworkers benefit from both corded and cordless tools, there are still a number of hand tools in use.

2.4.1. Hammers

There are a great number of types of hammers – Framing, tack, ball peen, copper, and claw hammer to name a few, the basic wood shop uses moderate sized claw and tack hammers. Framing hammers are used by construction workers to drive large nails in home frames. Ball peen hammers are used in metal work, and copper hammers are used for tasks where a soft metal is required.

2.4.2. Hand Saws

While we have power saws for most cuts, there are hand powered versions of both crosscut and rip saws. In addition, there are specialty saws such as coping, dovetail, and flush cut saws that are used for specific purposes.

2.4.3. Screwdrivers

For the most part, power drivers have replaced screwdrivers, but hand screwdrivers are still used when finesse is required, or large screws that go beyond the capability of drill drivers.

3. TOOL USAGE RULES

The actual procedures, limits and restrictions for each tool or process are outlined below. They include age limits as well as specific tool by tool procedures for processes that may be performed, use of hold down clamps, push sticks and level of direct supervision required. All tool set up, blade changes and adjustments must be performed by a Shop Steward or Certified Adult. The ability to use the tools is a privilege that must be earned through demonstrated safe behavior including ability to focus, ability to take instruction and willingness to follow safety rules. A Shop Steward or Certified Adult must agree that each Youth is capable before they are allowed to use a machine. Sufficient adult supervision must be present to permit the Shop Steward or Certified Adult to focus 100% of their attention to supervising the tool use.



Table 1 - Tool Usage Age Requirements, Stationary Equipment

Tool	Age	Use Limitations	Safety Requirements
Scroll Saw/ Jig Saw	< 10	Must have direct adult hands on support for use	Hold down clamp in place, stock must not be larger than the table or exceed 2" in thickness.
	>= 10 and < 16	Limited use with direct adult supervision	Hold down clamp in place, stock must not be larger than the table or exceed 2" in thickness.
	>=16	Limited use with direct adult supervision; trained youth can use independently	Hold down clamp in place, stock must not be larger than the table or exceed 2" in thickness.
	>=18	May use	
Miter Saw	<12	No use	
	>=12 < 18	With direct adult supervision and hold down, Youth can make cut.	No complex miter cuts, stock must not exceed 4" x 4"
	>=18	May use	Stock cannot exceed 6" width or 4" x 4"
Band Saw	< 12	No Use	
	>=12 < 18	With direct adult supervision, Youth can make cut.	Stock must be <2" thick for softwood, <1" thick for hardwood and small enough to be handled safely
	>=18	Can use only if certified by Shop Steward	
Router Table	< 14	No Use	
	>=14 < 18	With direct adult supervision, can use tool.	Adult must ensure bit, fence and router are secure, that material can be handled safely and that the feed path is clear
	>=18	Can use only if certified by Shop Steward	
Drill Press	< 10	Must have direct adult hands on support for use	Hold down clamp in place, stock must not be larger than the table
	>= 10 < 14	Limited use with direct adult supervision	Hold down clamp in place, stock must not be larger than the table
	>=14	Limited use with direct adult supervision; trained youth can use directly	Hold down clamp in place, stock must not be larger than the table
	>=18	May use	
Planer	<18	No Use	
	>=18	Can use only if certified by Shop Steward	Safety zones must remain clear throughout planing process



**Table 2 - Tool Usage Age Requirements, Stationary Equipment
(continued)**

Tool	Age	Use Limitations	Safety Requirements
Spindle Sander Belt/Disc Sander	< 10	Must have direct adult hands on support for use	Stock must be <2" thick and small enough to be handled safely
	>= 10 and < 14	Can use with direct adult supervision	Stock must be <2" thick and small enough to be handled safely
	>=14	Can use with direct adult supervision; trained youth can use directly	Stock must be <2" thick and small enough to be handled safely
	>=18	May use	
	>=18	Can use only if certified by Shop Steward	
Jointer	<18	No Use	
	>=18	Can use only if certified by Shop Steward	Safety zones must remain clear throughout jointing process
Table Saw	<14	No Use	
	>=14 <18	Limited use with direct hands on supervision by Shop Steward	Ripping only with guard in place. Stock must be at least 18" long and no longer than 4' and no thicker than 1 1/2" for softwood and 3/4" for hardwood. Rip must be wide enough to allow safe, unrestricted use of a push stick.
	>=18	Can use only if certified by Shop Steward	
Radial Arm Saw	< 14	No Use	
	>=14 <18	Limited use with direct hands on supervision by Shop Steward	Stock must be > 15" long, <=8" wide, < 1 1/2" thick for softwood (<=3/4" for hardwood). Bevel/miter <=15 degrees
	>=18	Can use only if certified by Shop Steward	
Lathe	<12	May not use	
	>=12 <18	Limited use with hands on or direct supervision by Shop Steward	Spindle turning only, stock >1" & <4" diameter or pen turning on mandrel
	>=18	Can us only if certified by Shop Steward	



Table 2 - Tool Usage Age Requirements, Handheld Power Tools

Tool	Age	Use Limitations	Safety Requirements
Circular Saw	< 18	No Use	
	>=18	May use	
Handheld Jig Saw	< 14	No Use	
	>= 14	Limited use with direct adult supervision	Stock must not be >12" wide or > ¾" thick; stock must be clamped to bench
	>=18	May use	
Handheld Drills	< 10	Limited use with hands on adult supervision	Stock must be secured, no bits > 1/8"
	>= 10 <18	Limited use with direct adult supervision; trained youth >=14 can use independently	Stock must be secured Youth >=10 & <14, bits <= ¼" Youth >=14 bits <3/4"
	>=18	May use	
Palm Sander	< 10	No Use	
	>= 10 <18	Limited use with direct adult supervision; trained youth >= 14 can use independently	Stock must be secured or be large enough to hold safely
	>=18	May use	
Handheld Belt Sander	< 14	No Use	
	>= 14 <18	Limited use with direct adult supervision	Stock must be secured with clamp or vise
	>=18	May use	
Handheld Router	< 14	No Use	
	>= 14 < 18	Limited use with direct adult supervision	Stock must be clamped in place. Edge work only using bits with guide wheels; Roundovers <= ½" (softwoods), <= ¼" (hardwoods), Rabbets < 3/8"
	>=18	May use	
Brad Nailer	< 12	No Use	
	>= 12 < 18	Limited use with direct adult supervision	Stock must be secured or held safely; nailer must be oriented to drive brads towards bench or wall
	>=18	May use	



4. MATERIALS

There are a variety of materials in the shop for use by the Scouts at minimal cost. This section describes them and provides suggestions for buying material for use in the shop.

4.1. Lumber Dimensions

Lumber dimensions are not true. A 2" x 4" is really 1 1/2" by 3 1/2". You can count on losing a 1/2 inch on each dimension when buying lumber at the big box stores in the US.

When buying raw lumber, this problem does not occur. Rough cut lumber is sold based on 1/4 increments, and will be listed as 4/4 or 6/4.

4.2. Board Feet

The standard unit for selling lumber is the board foot – 12" by 12" by 1". It is one cubic board foot. Multiply all the dimensions and divide by 144.

If you buy a 6 (72") foot board that is 6 inches wide and 1 inch thick – it is 3 board feet.

4.3. Pressure Treated Lumber

Pressure treated lumber is recommended for outdoor projects such as benches, tables, and sign posts. However, it is shipped bound tightly into pallets, which prevents the evaporation of the moisture from the treatment. It is recommended that the material is purchased at least one week in advance, and dried in a garage. Drying requires air to circulate freely around all surfaces of the material, so using sticks to separate the materials is recommended.

On rare occasion, pressure treated lumber may warp after drying, but it is better to have that happen before it is cut for a project. The shop has lumber shaping tools, including a planer and a jointer, that can be used to shape warped boards.

4.4. Softwoods

Soft Woods are species such as Pine, Spruce, and other evergreen trees. It is readily available, cheap, and easy to work. It is used for a great deal of Scout projects, but is never to be used for outdoor projects. It is not as strong as hardwoods, but finishes nicely. It is very easy on tools, and is great for manual projects. It usually does not require drying when purchased, because it is often kiln dried before shipment. It can have sap, and warps easily. When purchasing softwoods, don't be afraid to dig through the stack to get boards that are straight.



4.5. Standard Hardwoods

Soft Woods are species such Poplar, Maple, Oak, and Cherry. Poplar, while technically a hardwood, is often as easy as softwoods to work. However, it has a light brown color, and does not look as nice as other hardwoods when finished. Maple comes in two types – soft maple and hard maple. There are a lot of soft maple species, but hard maple is one species – acer saccharum, known as Sugar or Rock Maple. Soft maple can be found at regular home supply stores, but hard maple requires going to a lumber yard.

Oak comes in two main varieties – Red Oak (which is sold in home supply stores) and White Oak. Red Oak is very strong, but it has a tendency to chip when worked, and does not readily accept stain. It is the standard for when you need strong supports that do not look really pretty.

White oak is very strong, and is a favorite among woodworkers for jigs. It's hardness means it is usually more dimensionally consistent than red oak, and it is naturally a very smooth surface.

Cherry is the premier wood for furniture makers. It looks beautiful when finished, and ages to a nice smooth reddish brown over time. It is more expensive than other woods, but is worth it.

4.6. Exotics

Exotics are non-domestic hardwoods such as jatoba (Brazilian Cherry), purpleheart (Amaranth), Zebrawood, Ebony, and others. These are very hard, very expensive, and best left to experienced woodworkers. They can make stunning visual impacts, but often require special cutters and tools. Please consult the shop stewards if considering using exotics.



5. SANDING MATERIALS

Sanding is an important step in making projects look professional. A well sanded product takes stain and finishes well, and is smooth to the touch.

5.1. Sandpaper

Sandpaper comes in various Grits, which refer to the number of sanding particles per square inch. The higher the grit, the finer the sanding material.

Figure 2 - Sandpaper Grades

Grit	Use
60	Very rough – used for significant material removal. Not usually used for general woodworking projects.
80	Rough - used as a first step on rough lumber such as 2" x 4"
120	This is the usually starting point for hardwood projects.
220	Second pass – smooth.
300	This level makes it like glass – you can't feel imperfections with your hand.
400	Final level of sanding for most high end projects.