Axe and Saw Permit: *Safe Use of Axes*

Objective:

The objective of this workshop guide is for the Scout Leader and/or Scout youth to be able to describe and demonstrate safe use of the Axe.

Axe or Hatchet: What's the difference?

An axe is larger than a hatchet and requires both hands. An axe is typically 30 inches or larger and can weigh 6lbs or more. There are many types of axes, the most common being the Felling Axe and Splitting Axe.

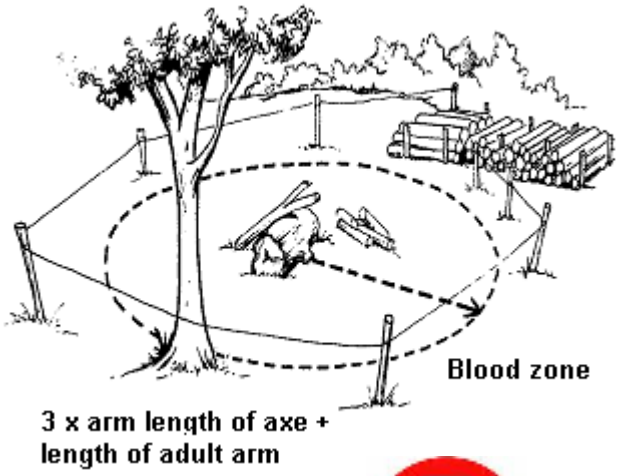
- Felling Axes are designed for cutting through the grain of wood (limbs and trunks) of live or dead trees.
- Splitting Axes are more 'wedge' shaped than the Felling Axe as they are designed to split the grain of the wood rather than cutting through it, especially if the blow is delivered with a twisting action.

A hatchet *(or hand axe)* is typically less than 20 inches in length. It is designed to be held with one hand and to cut and trim small firewood blocks (less than 4 inches in diameter).

It is important that the correct axe is chosen. It is both difficult and dangerous to control an axe of an inappropriate size and weight. No one should attempt to use an axe until they are competent with a hatchet.

Establishing a safe Chopping Area

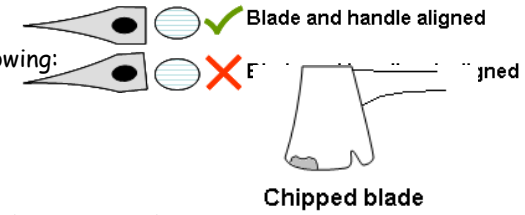
- Whether you are conducting a training activity or at camp, if you plan to chop wood, a chopping area with a clearly visible perimeter must be setup in order to establish an area where axes can be used without fear of hitting anyone else.
    - Identify an area that is relatively flat, has little people traffic, free of overhanging branches, ropes or other obstructions.
    - The restricted area should be at least 3 x the length of the axe + arm length of an adult. ***<u>This is called the "Blood Zone"</u>***
- Ensure that there is a marked entry/exit path into the chopping area. This helps keep people away from the chopping area.
- Ensure that there is suitable first aid kit within easy reach of the chopping area



Safety Precautions when using the Axe

Check the axe

- Do not unsheathe the axe until you are in the safe chopping area.
- Inspect the axe before use. Never use the axe if you note the following:
    - *The head is not secure*
    - *The head and handle do not line up straight.*
    - *The blade is cracked or chipped*
    - *If the handle is split, chipped or otherwise damaged or broken*
- Never use a blunt axe as it can slip or bounce off the wood you are chopping wood. A blunt axe may bounce off the wood and can penetrate flesh



Clothing

Do not wear sandals or bare feet" when working with axes.
Running shoes offer little protection except maybe secure footing.

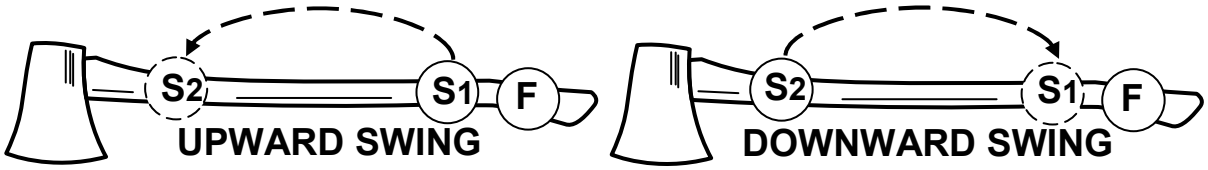
Reference: An Axe to Grind. A practical Axe Manual. US Dept of Agriculture. Forestry Service
Authors: Paul Young-Davies, Chuck Fraser, Chris Baldry, Garth Jonah
Version: 001: August 18th 2009

Axe and Saw Permit: *Safe Use of Axes*

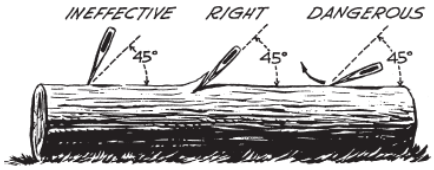
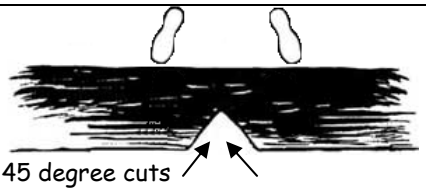
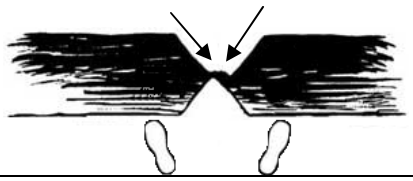
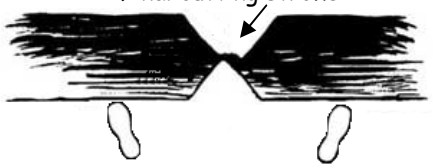
The Art of Chopping

Chopping is something that has to be practiced as it (1) combines movement of the hands up and down the handle, (2) the angle of the blade as it impacts the log and (3) foot position for optimal balance.

Hand position on the Axe: One hand should be in a fixed position and the other hand will slide up and down the axe. The fixed position "F" is an inch or two from the end of the handle and the other hand will hold the axe handle just above the fixed position and slide up or down depending on whether you are raising the axe upwards or downwards. On the up-stroke, the hand slides upwards on the handle from "S1" to "S2". On the down stroke the hand slides down the handle from "S2"to "S1". At the point of impact the two hands should be close together. With experience, the hand action will land each chopping blow close on target and with consistent force, angle and with little or no shock to the hands, arms or shoulders.



Chopping position and Chopping Angle

	When chopping, attempt to strike the log at an angle of 45 degrees. If the axes strikes the log at too then the axe will dig in and be hard to free. If the chopping stroke is a much shallower than 45 Deg then this is a dangerous stroke as the axe could deflect away from the log and cause an injury to the person who is chopping.
 45 degree cuts	The best stance is behind the log. Here you can and practice your chopping action with slow practice swings. Once you are comfortable with axe, its weight and how it feels during the swing, you should start chopping at an angle of 45 degree cuts. You should only chop halfway through the log as shown.
Cut from other side 	Once you have chopped halfway through the log, Reverse your position and stand on the opposite side of the log and repeat chopping through the other side of the log. Continue to chop until the log is almost cut through.
Final cutting stroke 	Before cutting through the log, move your feet apart as the final blow may cut through the log and the axe could continue through an impact your body. Resist the urge to deliver the final cutting blows at higher speed or intensity.

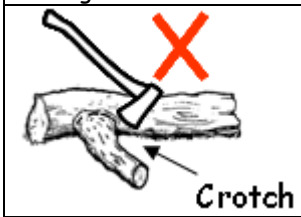
Axe Chopping Methods

There are three types of wood cutting methods that you can perform with an axe: **Limbing**, **Bucking** and **Splitting**. Your chopping environment will be different for each of these cutting methods.

Reference: An Axe to Grind. A practical Axe Manual. US Dept of Agriculture. Forestry Service
Authors: Paul Young-Davies, Chuck Fraser, Chris Baldry, Garth Jonah
Version: 001: August 18th 2009

Axe and Saw Permit: *Safe Use of Axes*

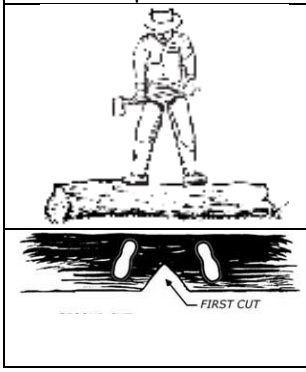
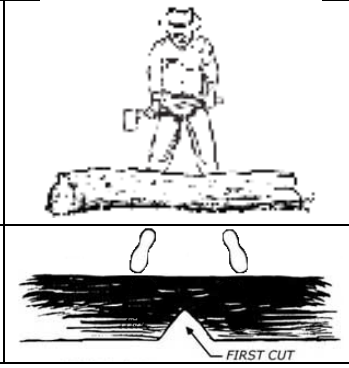
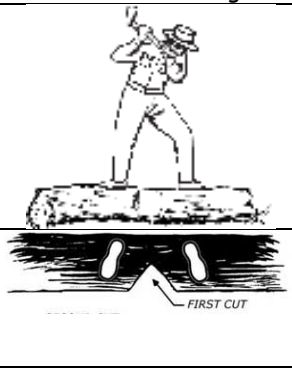
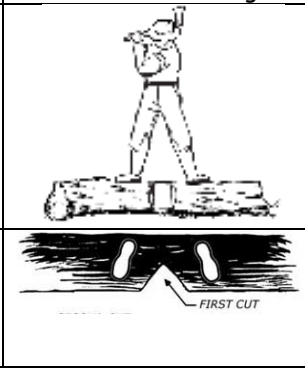
Limbing: Refers to cutting branches off a log. When limbing, stand on the side of the log opposite the branch you intend to cut. Chop close to the point where the branch joins the log, driving the axe into the top of the limb. Keep the log between yourself and the cuts because if the axe slips it will be deflected away from you or be absorbed by the trunk.

Wrong	Wrong	Wrong	Correct
			

Bucking: Refers to cutting a log into pieces. There are two correct foot positions.

1. Standing behind the log. This is the most common and recommended position as it is the safest position. The feet are positioned directly behind the log - the toes may touch the log to make a more stable posture if this is desired. <u>This position DOES NOT require the user to make wood cuts below the level of the feet.</u>
2. Standing on top of the log. This position **<u>should not be used unless you are an experienced with the axe.</u>** The benefit of this position is the ability of the user to leverage the additional height to swing the axe harder. The down side to standing on the log is balance. <u>This position requires the user to make wood cuts below the level of the feet.</u>

The images below show the position and the kinds of backhand and front hand swings that are to be learnt when cutting wood when "bucking", It is important to note that a full swing with the axe positioned over your shoulder is best as it allows the most force to be applied with chopping – but is more awkward when standing on the log. When making your swing, move the hands up and down the axe as described above and let the weight of the axe do the work. Chop at 45 degree angles, free the axe and repeat the stroke. You should aim to cut a "V" shaped notch through alternating front and backhand swings. The V-shaped notch twice as wide as the top of the log is thick.

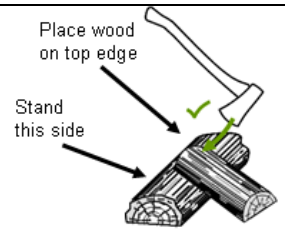
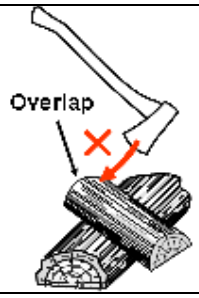
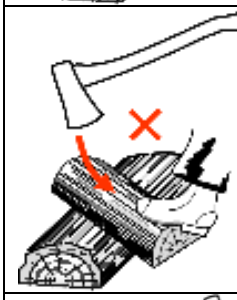
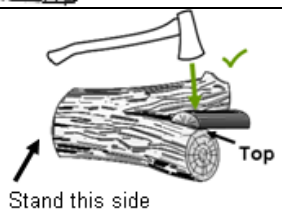
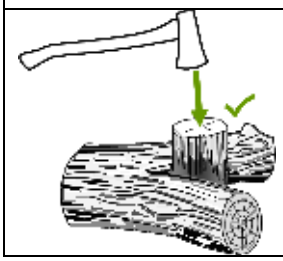
Feet on top -- Correct	Feet behind -- Correct	Back hand swing	Front hand swing
			

Splitting: Refers to splitting logs length-wise *(or down the middle)*. This is the chopping method that splits wood into sizeable chunks from which firewood can be cut with a hatchet. The ideal length of wood for splitting is between 18" to 24" long. Splitting wood is easier if a *chopping block* is used. The chopping block serves to keep the wood in a stable position and reduces the potential for wood to fly away when it is split. The following illustrations provide some examples of chopping blocks when splitting wood.

Avoid Serious Injury: DO NOT ASK ANYONE to hold the wood for you while you are chopping with an axe.
Avoid Serious Injury: DO NOT LET ANYONE hold the wood for you while you are chopping with an axe.

Reference: An Axe to Grind. A practical Axe Manual. US Dept of Agriculture. Forestry Service
Authors: Paul Young-Davies, Chuck Fraser, Chris Baldry, Garth Jonah
Version: 001: August 18th 2009

Axe and Saw Permit: *Safe Use of Axes*

	This image shows the log that is to be split is placed with the top edge at the top of a single wooden trunk (chopping block). The person who is doing the chopping is standing on the side which maximizes the axe strike against wood and minimizes the potential for injury. In this position, an axe strike at the top if the block will have maximum impact and the log will be split.
	This image shows the log that is to be split is placed with the top edge overlapping the top of the wooden trunk (chopping block). The person who is doing the chopping is standing on the side which maximizes the axe strike against wood. **However in this position, an axe strike at the top if the block will have little impact and the log will be catapulted upwards back towards the person who is doing the chopping.**
	This image shows the person who is doing the chopping has their foot on the bottom of the log that is to be split. An axe strike on the log may cause injury to the person who is doing the chopping because: 1) The axe may miss the wood and impact the user in the leg 2) The axe may skip off the wood and impact the user in the leg 3) The wood may split and fly upwards 4) The wood may split and allow the axe to continue and hit the user
	This image shows the log that is to be split is laid between the fork of a tree trunk with the top edge on the top edge of one fork. The person who is doing the chopping is standing on the side which maximizes the axe strike against wood and minimizes the potential for injury. In this position, an axe strike at the top if the block will have maximum impact and the log will be split.
	This image shows the log that is to be split is placed upright between the fork of a tree trunk. The person who is doing the chopping is standing on the side which maximizes the axe strike against wood and minimizes the potential for injury. In this position, an axe strike at the top if the block will have maximum impact and the log will be split.

Twisting the Axe

The secret of splitting wood with an axe is in this little twist right at the end of the stroke as the axe strikes the wood. The user should practice twisting the axe just prior to the blade strike. A small twist breaks the grain and wrenches the wood apart and prevents the axe from sticking. When splitting, try to chop the wood through the grain and not through the knots in the wood. Knots are much harder areas of wood.

Reference: An Axe to Grind. A practical Axe Manual. US Dept of Agriculture. Forestry Service
Authors: Paul Young-Davies, Chuck Fraser, Chris Baldry, Garth Jonah
Version: 001: August 18th 2009

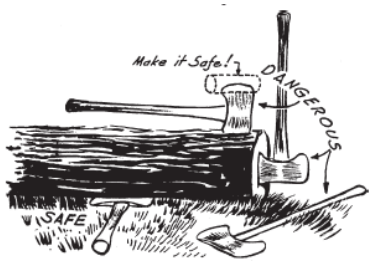
Axe and Saw Permit: *Safe Use of Axes*

Felling Trees

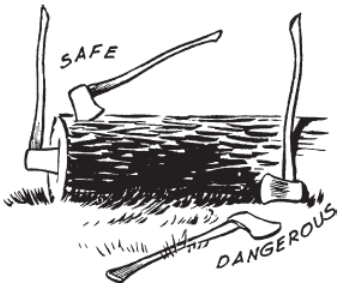
Tree Felling is a highly skilled and dangerous activity. It requires the user to judge many different aspects of axe work which

When you are not using your Axe.

Keep careful eye on your axe when you have finished using it. Be careful where and how you lay it down, and remember where it is. If you must leave your axe unsheathed, lay it flat with the edge toward a solid object like a log or a wall.



Serious accidents may be caused by tripping or falling on a carelessly placed axe. For temporary safe storage, stick a single-bit axe in a log or a stump. Never lay it down flat out in the open.



Never lean it up against a tree, a wall, or any other object where the edge is exposed nor leave it stuck for long in a block of wood because it can rust.

A double-bit ax should never be stuck in a log with one edge sticking out. Place your double-bit axe underneath a log lying flat or put one bit into a small piece of wood and then stick the other bit into a horizontal log.

A sheath is better than any of these methods.

Carrying and passing a axe.

- Carry the axe parallel to the ground with the sharp edge of the sheathed blade pointed away from you and to the ground. If you were to trip and fall, the axe will fall away from you out of harms way and you will avoid landing on it.
- When passing a axe to someone else, hold the axe by the handle with the head facing down.
- Allow the other person to take the axe by the head and only allow the axe to pass when the other person has acknowledged that they have the axe.

Care of a Axe

- Sheath the axe when not in use, using a correctly fitting sheath and not by sticking it in the ground. An axe may be sheathed temporarily in the chopping block but make sure that the blade follows the grain of the wood, is secure in the wood, and that the handle is not overhanging the block and can trip anyone.
- In camp, keep all axes and saws dry. Never leave them out overnight. Sheath the blades and pack all tools in a secure storage area [][](never place but not just inside where someone might kneel or step on them going into the tent!).
- Replace a damaged handle with a new one

Reference: An Axe to Grind. A practical Axe Manual. US Dept of Agriculture. Forestry Service
Authors: Paul Young-Davies, Chuck Fraser, Chris Baldry, Garth Jonah
Version: 001: August 18th 2009

Axe and Saw Permit: *Safe Use of Axes*

Sharpening your Axe

Sharpen the axe with a round carborundum stone (available in different grades of coarseness). You should start with a coarse stone and then finish with a fine stone depending on how much sharpening the axe requires. (It should be used with oil.)

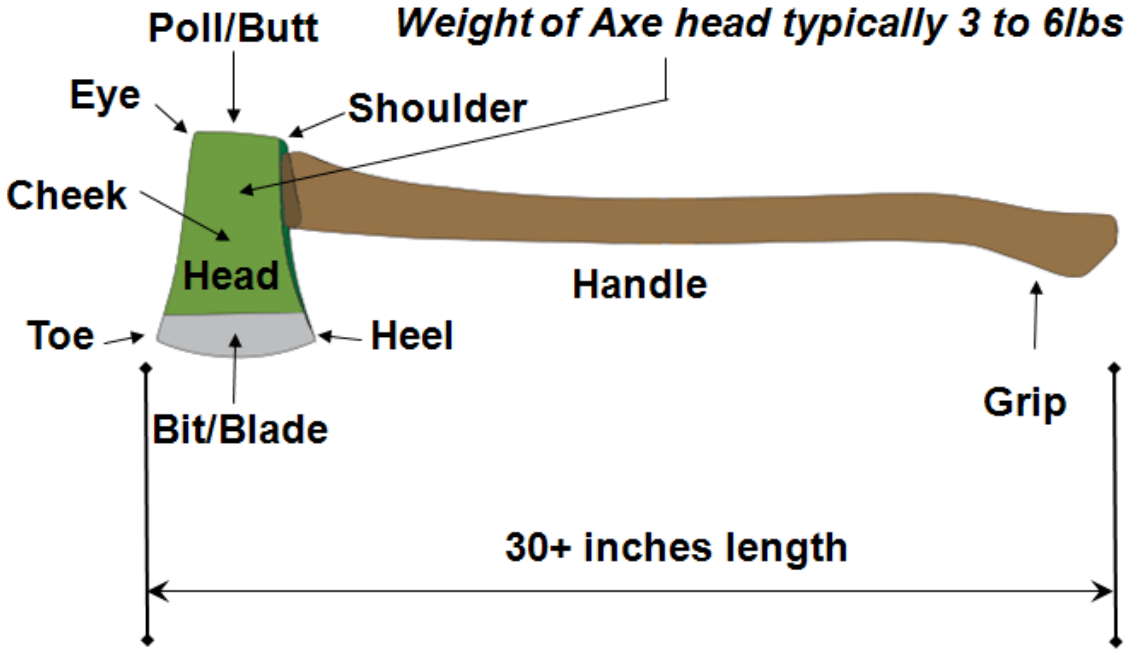
Move the stone round in small circles on each side of the axe face. Keep your fingers away from the bit.

Keep the axe head greased to prevent it rusting and oil a wooden handle regularly with linseed oil.

Chopping with an Axe in winter

The blade of an axe is more susceptible to chipping and/or breaking when used in winter. This is because the cold makes the metal more brittle. Warm the axe over a fire for a few moments.

ILLUSTRATION OF AN AXE



Reference: An Axe to Grind. A practical Axe Manual. US Dept of Agriculture. Forestry Service
Authors: Paul Young-Davies, Chuck Fraser, Chris Baldry, Garth Jonah
Version: 001: August 18th 2009

Axe and Saw Permit: *Safe Use of Axes*

PERMIT DEMONSTRATION

In the presence of your instructor, perform the following:

Questions to be answered

1. State why a axe is a better tool to use than an hatchet
    a. *Axes can be used for spitting large firewood logs into smaller pieces*
    b. *For splitting small sticks for kindling*
    c. *Axes weigh less than axes making them more suitable for youth to use*

2. Identify the parts of a axe
    a. *Handle*
    b. *Head*
    c. *Blade*

3. Identify three items on a axe that need to be inspected prior to use?
    a. *Handle is in good shape*
    b. *Blade is sharp and not chipped*
    c. *Head is not loose or misaligned*

4. How much space is needed to setup a chopping area?
    a. *Three x length of axe + length of adult arm if axes are being used (as this is a larger area)*

5. What are the key elements to setting up a chopping area?
    a. Clear of obstructions
    b. Boundary is clearly marked
    c. Chopping block is setup
    d. Chopping area must have sufficient area (3 x axe length + arm length)

6. Describe the three main chopping methods that can be performed with an axe.
    a. Limbing
    b. Bucking
    c. Splitting

7. What equipment should always be present when chopping?
    a. *Suitable first aid kit*

Demonstration

1. If a chapping area has not been setup, do so and talk about what you need to setup
    a. If a chopping area has already been setup, perform an inspection of the chopping area and talk aloud what you are expecting to find.
2. Do two of the following:
    a. Demonstrate the limbing chopping method
    b. Demonstrate the Bucking chopping method
    c. Demonstrate the Splitting chopping method
3. Demonstrate chopping with the grain and across a knot
4. Demonstrate what you would do to an axe when you have finished chopping.

Reference: An Axe to Grind. A practical Axe Manual. US Dept of Agriculture. Forestry Service
Authors: Paul Young-Davies, Chuck Fraser, Chris Baldry, Garth Jonah
Version: 001: August 18th 2009