

## A Long-Term Survival Guide - Simple Improvised Tools:

One of the most important skills, for long-term survival, is knowing how to improvise simple versions of basic tools and weapons. If you lose your equipment during a river crossing, or just get stranded away from your normal base of operations without your gear, you can make crude knives, axes, and other tools from available materials. These tools can then be used to build shelters, to carve fire-making bow drills, and to make a wide variety of primitive fishing, hunting, and trapping tools. Much as I like modern tools, making these improvised versions is both fun, and a good skill to have.



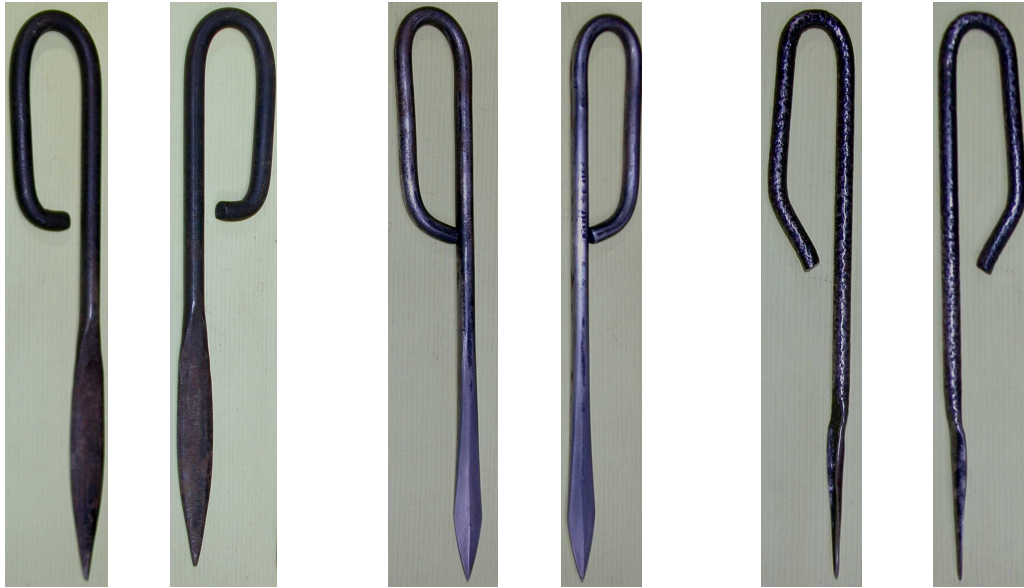
Simple scrap metal knives.

**Knife:** A knife can be made from almost any scrap metal, set into a wooden or bone handle, and then patiently sharpened on a rock. If the scrap of metal is long enough to use as both the blade and the handle (a full-tang design), you can just wrap the handle end with cordage, cloth, leather, duct tape, or rawhide, and then sharpen the blade end. If you have some scrap pipe, you can make a pipe handle, and secure it with bolts, rivets, wire wrapping, or welding. Even without being tempered, improvised steel blades make better tools than flint, obsidian, or bone, as they don't break as easily.



Broken hacksaw blades can be used to make tiny knives.

You could find an old tin can, flatten it, flex it to break off some of the metal, and sharpen the edge with a file, or by honing it on a rock. Do the same thing to any expended rifle casing you find, and you have a tiny brass knife. These expedient tools are not suitable for prying or chopping, but will cut surprisingly well. If you find an old hacksaw blade, it can also be made into a tiny knife.



These are nail knives, made with bent handles.

Even a large nail can be flattened on one end, and sharpened to make a tiny knife. The other end can be set in a stick handle, wrapped with tape or material to make a handle, or bent to make a handle. Oversized versions of these nail knives were even used as trench daggers, during the world wars.



If you can't find scrap metal to improvise tools, you can still make them using stones and bones. Here is a sharp stone flake, lashed into a split stick to make a cutting tool, an arrowhead-shaped stone blade, lashed to a wood handle to make a knife, and a flat bone, sharpened to make a bone knife. Of course these tools are inferior to metal blades, but can be made to work in a pinch.



**Sheath:** Here is a simple design for a knife sheath, which is made with no stitching at all. It is made from a single strip of leather, cut to fold over onto itself once for the blade, and once again for the handle. Then it is woven in and out of the slits, to hold itself together. The handle length should be doubled, since it will fold over. This sheath pattern is as simple as it gets, and you can add a leather thong, if desired, to use it as a neck sheath.



Improvised knife sharpening jig, being used to hone a scrap steel knife.

**Knife Sharpening Jig:** To make sharpening your improvised knives easier, you can make a simple improvised sharpening jig, like this example. A short piece of stick is split, then tied back together loosely. One end is beveled on the outside, to create the correct angle for sharpening a knife, and the other end is beveled on the inside, to take a small wooden wedge, which clamps the jig onto your knife blade. The knife can then be sharpened on a hone, or a suitable flat rock.



Simple axes, made from scrap steel or copper, and crooked tree limbs.

**Axe:** An improvised axe can be made from almost any thick metal flat stock, such as a section of leaf spring, using the ancient method of securing it to a handle made from a crooked tree limb, or the sharp bend where roots grow out from a small tree trunk. These types of axes get some of their heft from the thick handle, as the blade is not as heavy as a modern axe, but they still chop wood surprisingly well. (Tom Hanks made a similar chopping tool by lashing an ice skate blade to a club, in the movie *Cast Away*.)



Primitive axe, and improvised ice skate axe, from *Cast Away*.

Some thicker pieces of steel may need to have an edge shaped onto one end using primitive blacksmithing methods, if you don't have a file or grinder, but most thinner steel stock can be sharpened by patiently grinding it against a flat rock, if nothing else is available. I would much rather have commercially made knives and axes cached some place where I could access them if needed, but improvised tools are much better than no tools.



Diagram of a stone axe head, and ground granite, and flaked flint examples.

Again, if metal is not available, stones can be shaped into less efficient, but still useable versions.

**Adze:** The Adze is a useful tool for primitive woodworking tasks, but today they are hard to find, except as antiques. Because the blade of an adze is at right angles to the handle, it cuts like a chisel, and can be used to hollow out logs or slabs of wood, something an axe is not designed for. It also makes a flat surface on logs with less effort than hewing with an axe.



Selecting a forked branch for an adze handle, and making a notch for the axe head to fit into.

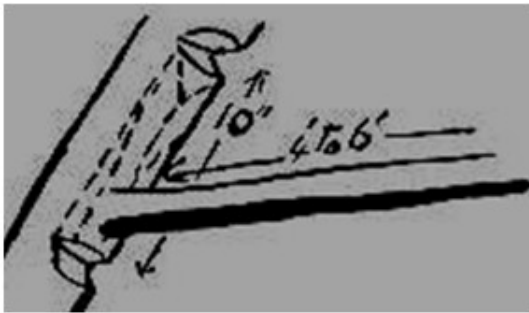
You can make an improvised adze from any axe or hatchet head, and here's how: Select a forked branch that is a good size for your handle, and which is solid and sturdy. Remove the bark, and cut one leg of the fork off short as shown. Make a cutout that fits the axe head, and holds it at the cutting angle you like best. Lash the head securely to the handle, using the eye of the axe head as shown. To prevent your lashings from working loose while the adze is in use, coat them with pitch, or any available glue. The hatchet head can be secured with green rawhide laces, sinew, or even a U-bolt.



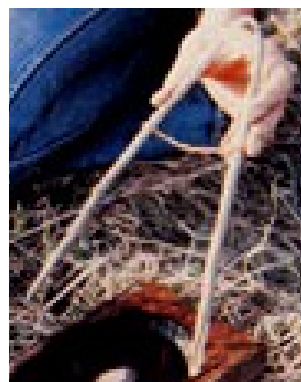
The completed improvised adze, showing the lashings, and using the adze and an axe to remove rotted wood from an open hollow log. (This log will be used, with the open side down, to make the entrance tunnel for a Den Trap).



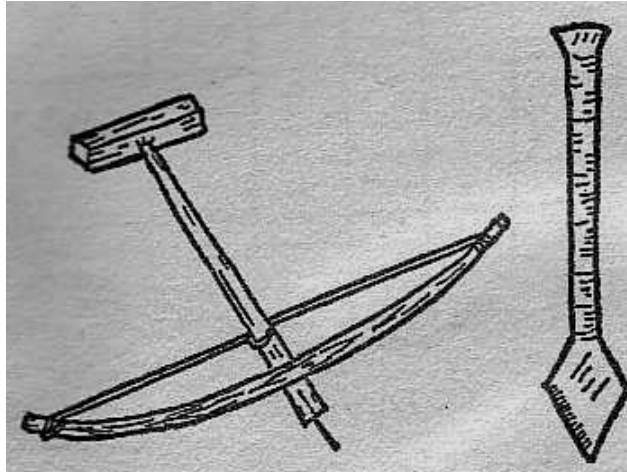
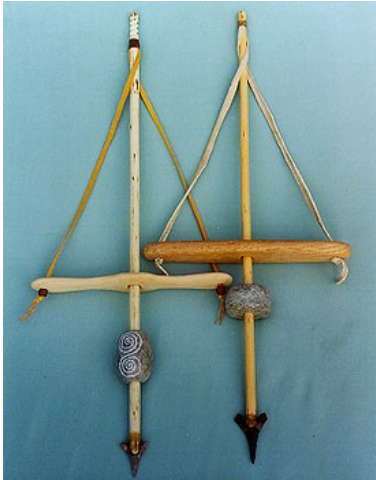
An adze can also be made using a flat piece of scrap metal, or a stone cutting head.



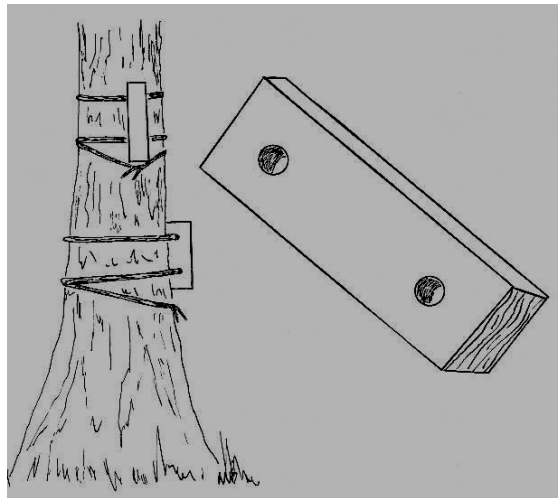
**Mattock:** A very effective wooden digging tool can be made from a seasoned dead tree limb, as shown. The edge of the mattock should be fire-hardened, and then sharpened to a chisel edge. Make the head of the mattock nice and thick, so that it is heavy enough to dig into the ground easily. The limb which forms the handle can be made as long as needed. See how it resembles the adze designs?



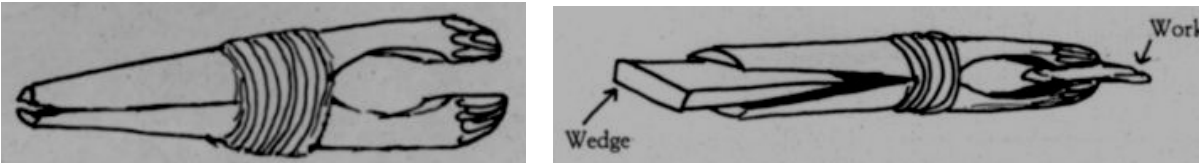
**Blowing Tube and Tongs:** Two simple tools that are easily made are a blowing tube, made from a hollow reed or bamboo stalk, used for blowing air on fires, and burning out hollows in wooden containers, and wooden tongs, used for moving hot rocks, and as campfire tongs.



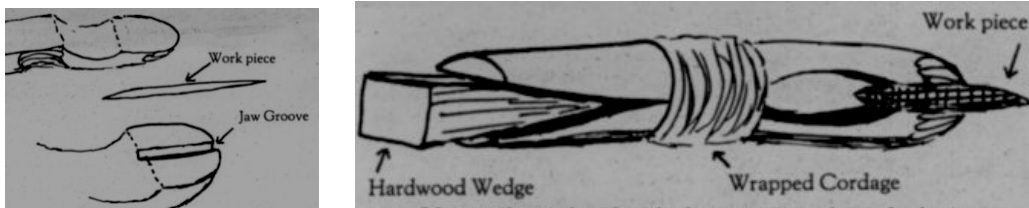
**Pump Drill, and Bow Drill:** The pump drill is a primitive tool used for making small, round, conical holes. Holes can be drilled in antler, bone, shell, wood, or soapstone with this device. The four main components of the pump drill are: the vertical spindle, the horizontal crosspiece, the flywheel weight, and the drill bit. This example is made from wood, a brain tanned buckskin thong, a soapstone flywheel, sinew, and a stone drill bit, but you can improvise with whatever materials you have available, such as a flattened steel nail for the drill bit. The flywheel weight makes the drill keep spinning after each press of the crosspiece, so that the thong winds itself up for the next press. A pump drill is fun to use, and also has a primitive appeal in its operation. A small bow can also be used to spin a simple drill of this type, and this is very similar to a fire drill set.



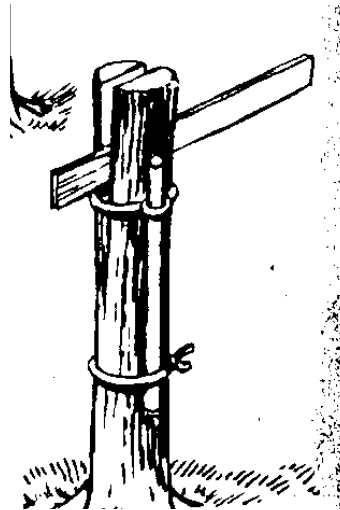
**Tree Steps:** Improvised tree steps can be made from short lengths of lumber, or split wood, and some rope. Drill two holes in each length of wood, as shown, and tie them to the tree with rope. An extra loop of rope wrapped around the tree makes weight on the steps cause the rope to tighten around the tree trunk, instead of slipping. Tree steps make it easier to reach fruit, nuts, or deer stands. If you don't have a drill, holes can be burned through the wood, using irons heated in a fire.



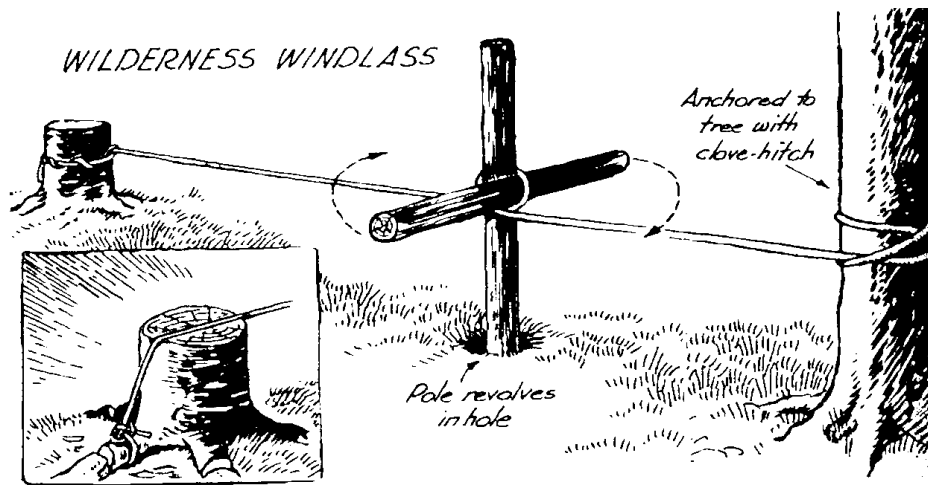
**Vise-Grips:** Improvised Vise-Grips can be made out of a thick hardwood limb. Such a hand-vise is useful for many small jobs, such as stone and bone working. It can also be wedged between two rocks, or into a tree trunk, to provide a very steady holder for making small objects (arrowheads, fish hooks, bone needles, etc.). This tool is similar to the knife sharpening jig shown earlier.



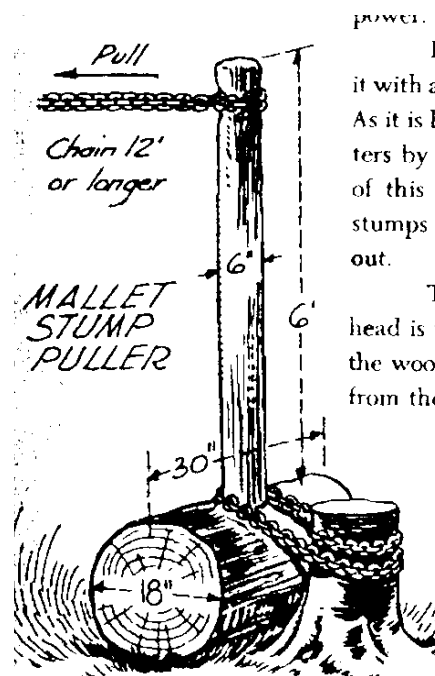
The jaws are shaped to fit the intended work, and a space is carved out behind them. The handle end is beveled on the inside, so a wooden wedge can be used to tighten the jaws.



**Stump Vise:** A green sapling can be cut off at a convenient height, then split down the middle, to form an improvised stump vise. Wedge the piece to be worked into the split, and then tighten the stump by using a tourniquet, as shown.



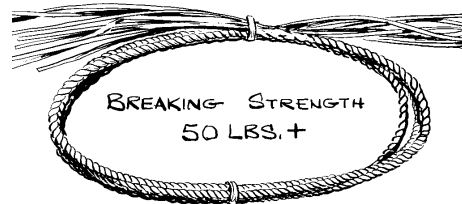
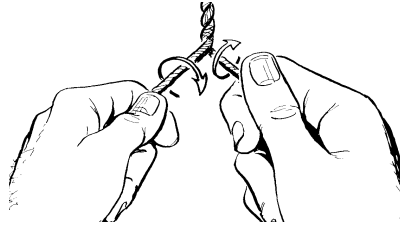
**Rope Winch:** This simple winch is good for many jobs, such as tightening rope bridge support lines, or shifting heavy logs. It is made by driving a stake into the ground (or digging a hole for the stake), between an anchor and the item that is to be moved, or tensioned. A lever bar is then used to tighten the rope around the stake. A longer lever bar will give you more leverage, of course. If the job is just to apply tension to the rope, the lever bar can be lashed to the rope, once it is tight enough.



**Mallet Lever:** Another simple leverage tool is this design for a mallet lever, made from a log section with a sturdy side-branch. (This is just an oversized version of a mallet rope wrench.)



**Cordage and Lashings:** Cordage is one of the most useful “tools” for survival tasks. Many materials are strong enough for use as lashing and cordage. For example, you can make a cotton web belt much more useful by unraveling it. You can then use the string for other purposes (fishing line, thread for sewing, and lashing). Before making cordage, there are a few simple tests you can do to determine a material's suitability. First, pull on a length of the material to test for strength. Next, twist it between your fingers, and roll the fibers together. If it withstands this handling and does not snap apart, tie an overhand knot with the fibers, and gently tighten. If the knot does not break, the material is usable.



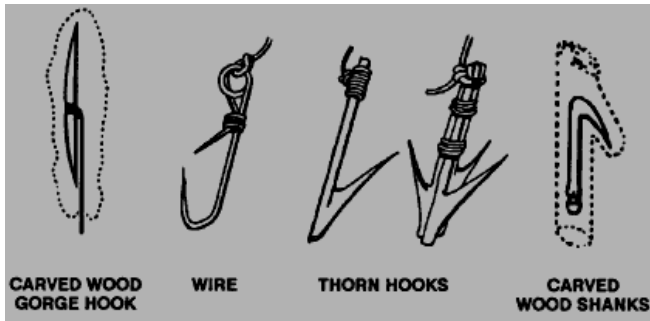
You can shred and braid plant fibers from the inner bark of some trees to make cord. You can use the linden, elm, hickory, white oak, mulberry, chestnut, and red and white cedar trees. After you make the cord, test it to be sure it is strong enough for your purpose. You can make these materials stronger, by braiding several strands together.

**Lashing Material:** The best natural material for lashing small objects is sinew. You can make sinew from the tendons of large game animals, such as deer. Because of its strength, sinew is especially good for making bowstrings, fishing lines, snares, wrappings, and threads. Another useful property of sinew is that, when wetted with saliva before wrapping, it shrinks and dries as hard as glue. As a result, knotting the ends of a sinew wrapping is sometimes unnecessary. (Rawhide is very strong, too, and also shrinks as it dries.)

The longest sinew is found in the white cords that run along either side of an animal's backbone, but you can get usable lengths from the tendons and ligaments attached to muscles and bones, as well. Simply cut out the sinew, remove its protective sheath, and clean and dry it. (When dry, it'll be very hard and brittle.) To separate the individual fibers, pound each strand with a rock, as you would for plant stalks, then put it in hot water, to soften and use. (The primitive way to get dried sinew ready to use is to hold some in your mouth, until it is softened by saliva.)



You can use rawhide for larger lashing jobs, made from the skins of game animals. After skinning the animal, remove any excess fat or pieces of meat from the skin. Dry the skin completely, and cut it into laces while it is dry. Make cuts one-quarter inch wide. Start from the edge of the hide, and make one continuous circular cut, working clockwise, until you have reduced the entire hide to rawhide laces. Soak the rawhide until it is soft. Use it wet, stretching it as much as possible while applying it. It will shrink tight when it dries.



**Fish Hooks:** Hooks can be whittled in the traditional shape from wood, shells or bone. A simpler type is a gorge, which is a short (1 inch or less), straight piece of hard material sharpened at both ends and slightly notched in the middle where it's attached to the line. Sink the gorge in a piece of bait. Allow a fish that takes the bait time to swallow it, then a quick yank jerks the gorge crosswise, lodging it in the fish's throat. Hooks can also be improvised from many other materials, including needles, safety pins, nails, paper clips, thorns, or a piece of metal cut from a can.



Line may come from threads in clothing and equipment, pieces of wire, dental floss, sinew from the leg of a deer, twisted bark fibers, thin laces of gut from a previous catch, or whatever is available.



Bone or antler fishhooks can also be made by using two parts which are tied together, like these examples. Small wedges are used to keep the cord tight. They are driven between the hook and lashing, on both sides of the hook.



**Speargun:** This improvised speargun is very simple in design, but still quite effective. The crude steel grip, held in place by rubber bands, is the simplest kind of lever; squeezing the grip lifts the catch off the tang at the end of the spear. You can carry this spear gun slung under-hand, gripping around the trigger mechanism. Squeezing the front end holds the spear tight, to use for probing or stabbing, and a quick squeeze with the palm releases the trigger.



The rubber bands both secure the trigger lever to the gun, and provide the tension needed to hold the spear in place against the force of the elastic bowstring. The wire loop on the end of the bowstring fits into a notch filed into the side of the spear. When stalking a fish, it may be timid of your approaching face and body, but you merely extend your arm, giving yourself an extra 5ft reach, and shoot the fish with the spear from below, catching it by surprise. (The cord under the gun is just nylon rope used to string captured fish together, not part of the gun.) The elastic 'bowstring' is made from a heavy rubber band, but bungee cord, surgical tubing, slingshot elastic, or even light metal springs can also be used, or you can make a small bundle bow, & mount it like a crossbow.



The spear goes through a hole drilled in the front of the gun.



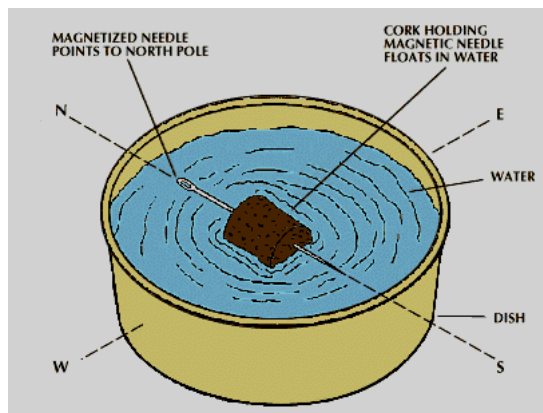
In this example, the spears are made of stainless steel or plain iron. But you can also make arrows and spears from bamboo, by splitting one end into four sections, tying the pole below the splits to keep the splits from spreading, wedging small wood pieces into the splits to spread the sections out, whittling each section to a sharp barbed point, and seasoning the points over campfire coals.



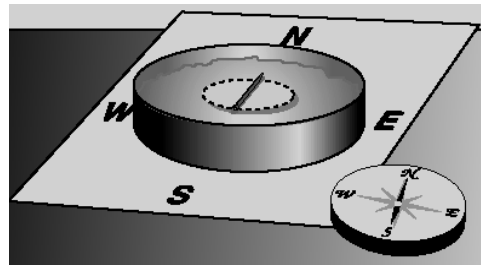
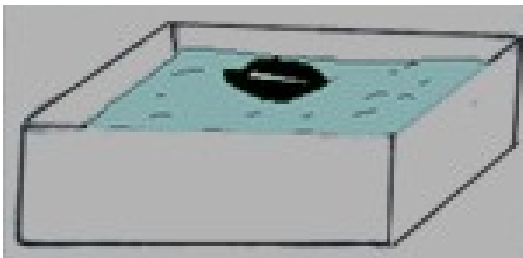
Stainless barbed spear, iron barbed spear, and barbed split bamboo spear.



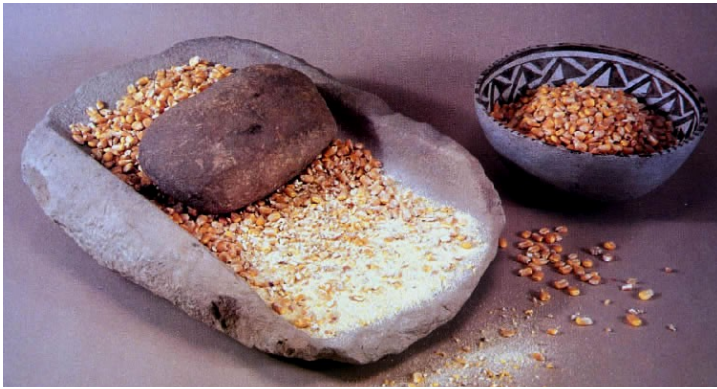
**Swimming Goggles:** You can make crude swimming goggles by gluing glass in wooden frames as shown, for diving and spear-fishing. Plexiglas or other clear plastic works well, and glue can be made by boiling horn and hoof shavings, or bones. If your goggles leak against your face, you can apply coconut oil or rendered animal fat to your skin, for a better seal.



**Compass:** You can make a crude but workable improvised compass by magnetizing a needle, and then sticking it in a cork and floating it in some water. To magnetize the needle for use as a compass, rub the needle on some cloth, 50 to 100 times in one direction. Silk works best, but any cloth will work. You can even run the needle through your hair, or against the fur pelt of any game animal you may have killed, to get the same mild magnetizing effect.



You don't need a cork to make a compass; a magnetized needle will work just as well when set on a floating leaf, or scrap of bark. For portability, any small container that will hold water makes a good casing, such as half of an aluminum soda or beer can, or half a coconut shell, or a clam shell. A small nail, or a short piece of wire also make ok compass needles. It takes a minute to work, but the needle will slowly stabilize, and point to the north.



**Metate:** Almost any flat stones can be used as a metate, or grain grinder.



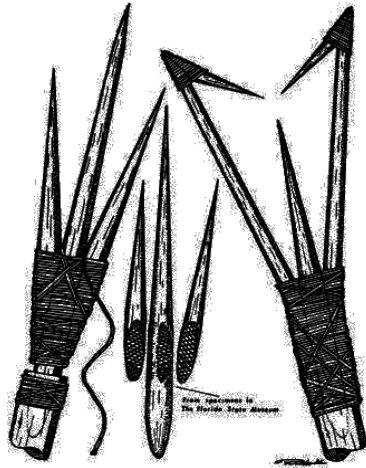
**Pestle:** A stone pestle like this one can also be used to grind grain in any rock with a hollow area.



**Needles:** Small bones or wood sticks can be made into needles, like these examples.



**Thimble:** This is an Eskimo thimble design, which is just an oval or circle of leather, with a half-circle cut on one side, used to make a retaining strap. This simple tool will protect your thumb from getting sore while whittling, or pushing an improvised needle through heavy material.



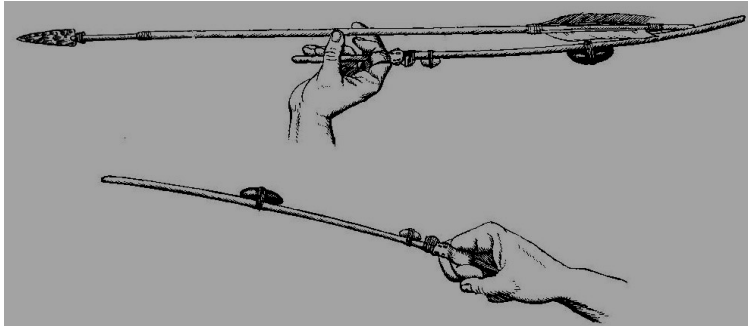
**Fish Spears:** Small bones, or fire-hardened sticks, can be made into fish spears, like these. Note how the ends are scarfed (cut at an angle), to fit together better.



**Bamboo Knives and Spears:** Bamboo can be made into many useful tools and weapons, like these knives and spears. Bamboo blades can't cut hard materials like wood or bone, but they kill game just like steel blades, and easily cut up meat and vegetables. After shaping the bamboo by splitting it, and sanding it on a rock, harden it by holding it over your campfire coals.



If you don't have any bamboo, there are other plants which can make workable blades and spears. Crepe-myrtle holds a good edge when tempered, but try any local wood, and see how it works.



**Atlatl:** The atlatl is an ancient weapon that preceded the bow and arrow in most parts of the world. An atlatl is basically a stick with a handle on one end, and a hook or socket that engages a fletched light spear or “dart” on the other. The flipping motion of the atlatl propels the spear much faster and farther than throwing it by hand. It is an effective hunting weapon that can kill any size game, and it is much easier to make than an improvised bow. Since the atlatl throws a five foot long dart which looks like a giant arrow, it is an impressive primitive weapon.



There are many ways to make a hook on an atlatl. Here is a hook made from a forked tree branch, one made by tying an extra piece on the atlatl with cordage, and one carved into the atlatl itself (the shaft end is bent up, to make this hook work).



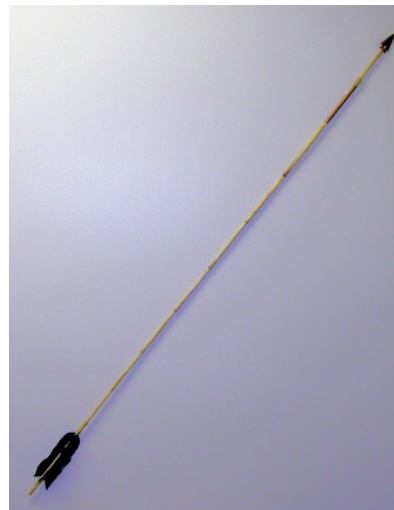
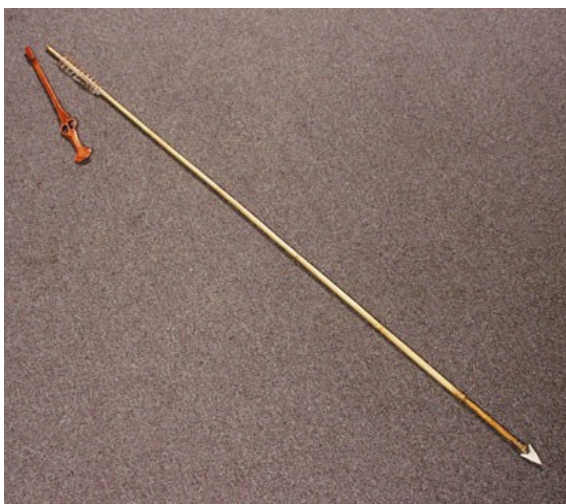
Notice how the end of this atlatl thrower is bent up, to make the carved-out hook work properly.

I tend to throw my atlatl away when launching a dart, so I use a wrist lanyard for all of my atlatls.



Atlatls can also be made with forked ends that have a cross-thong, and throw darts with nocked ends.

**Atlatl Darts:** These are just oversized arrows. They are about five feet long, and are made from wooden shafts, bamboo poles, or river cane. The best darts are made with a separate foreshaft, which has the broadhead attached to it. The foreshaft is mounted in a socket on the front of the main dart shaft, and is usually just held in the socket by friction, so that it will separate from the main shaft, and stay in the target after impact. Several extra foreshafts are carried, so that the dart can be picked up, re-armed with a fresh foreshaft, and fired again. It is easy to use foreshafts with bamboo or river cane, since the ends are already hollow, but the ends should be reinforced with a wrapping of sinew or cordage, to help prevent splitting. The end of the dart is fletched with feathers, or you can use whatever else is available, such as leather, plastic, or tape. The back end of the dart is hollowed out to fit the hook on the atlatl thrower, and here again bamboo and river cane are already hollow.



Two examples of atlatl darts, showing broadheads, foreshafts, and fletching.

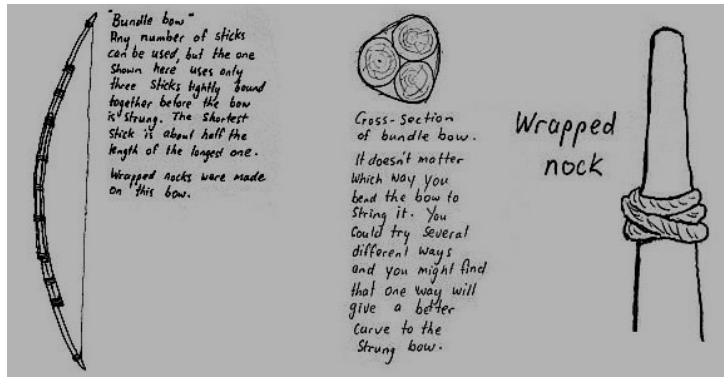


If you make extra foreshafts for your darts, they can be quickly re-armed and used again. A length of cordage tied to a foreshaft allows you to pull in fish, ducks, geese, or many types of small game after a successful hit with a barbed point.



Closeup of foreshaft, showing broadhead and wrapping. End of dart is hollowed, to fit hook on thrower.





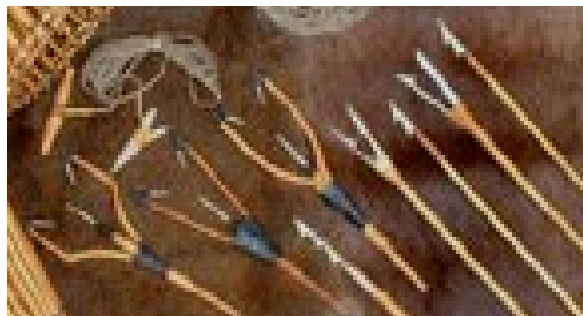
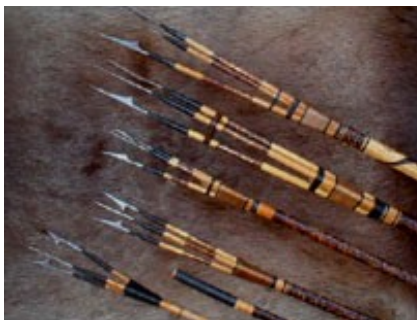
**BUNDLE BOW:** This is a bow made from several, reasonably straight sticks (or similar objects, such as split bamboo pieces) of fairly uniform thickness, that are bound together into a bundle. A single, plain stick with a string tied to it will make a bow of sorts, but it may be likely to bend too much in the middle, and be inefficient. An efficient bow carved from a single piece of wood will generally be quite tapered towards both ends, to balance the leverage applied by the string, so that the bow bends evenly throughout both limbs. A bundle bow is generally made up of sticks that are tied together in such a way to achieve a similar taper.



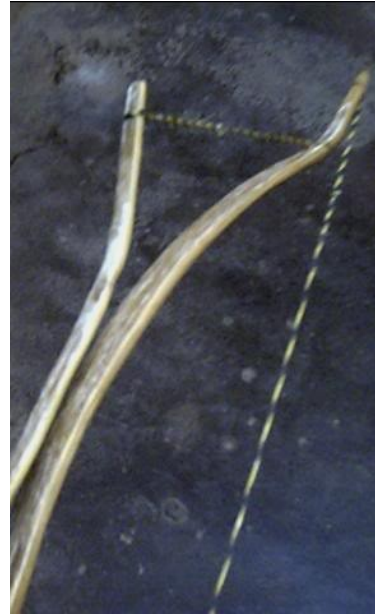
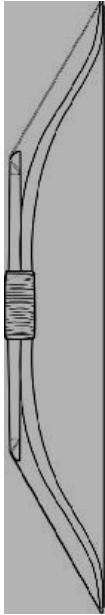
Bundle bow; these can also be made from split sections of bamboo, or any other springy material.



**Arrowheads:** Here are some scrap metal broadheads, and some traditional arrowhead shapes.



Fishing spears and arrows can be made with improvised heads, like these examples.



**Penobscot Bow:** Also known as a Two-Stick Bow, or Father-Son Bow, this design uses a second bow lashed to the front of the main bow, to give the weapon more springiness. The limbs of the second bow is tied to the limbs of the first bow, so that they must flex together. Many kinds of wood are flexible, but don't have enough "spring" to make a decent bow. The extra bow effectively doubles the spring, making for a much better weapon.

There are many variations on these types of bows, including how large the second bow is, how much curve the strung and unstrung bows have, and whether or not small blocks of wood are wedged between the two bows, to adjust the angle of the second bow's limbs.

**Sling:** The sling is a simple weapon made from cordage, that is used to throw rocks faster and farther than you can throw them by hand.



This type of sling is made from a single piece of para-cord. The pouch is a sheepshank knot.

To use a sling, place a rock in the pouch, stand with the sling hanging from your lowered arm, and spin the sling in one complete circle, in a plane with your right side, going forward, overhead, behind, and back to the start. Release the knotted end of the sling as the stone moves forward again, at a point where it will continue forward. Don't make multiple rotations of the sling; a proper slinging action requires just one rapid rotation. The more times you swing it, the less likely you'll hit anything. (Some slingers will rotate the sling slowly once or twice, to seat the projectile in the cradle.) A little practice will show you where the best place to let go is, to get the best trajectory.