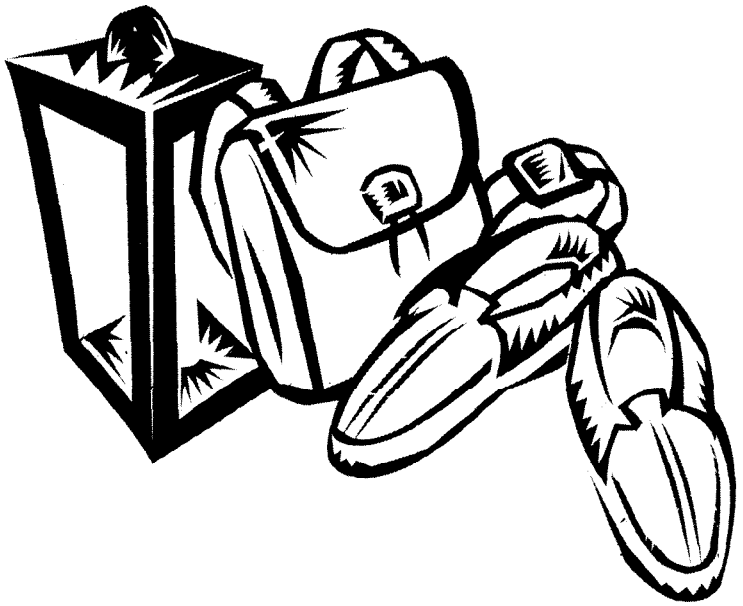
Historic Crafts & Skills

A Guide To Outdoor Heritage Skills



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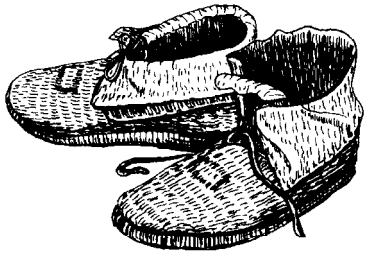
Note to teachers and youth leaders: *For instructor lesson plans of these materials, contact the Department's Outreach and Education Division.*

Introduction

Experiencing history through crafts and skills can help us realize the important role that the outdoors has played in our past and can encourage us to show respect and pride for our outdoor heritage.



History comes alive when you learn the crafts and skills of your ancestors.

LEARNING ABOUT HISTORY WITH HANDS-ON "LIVING HISTORY" TECHNIQUES

Experiencing early crafts and skills is an excellent way to learn history. The lives of our forebears leap from the pages of textbooks when we don their clothing and briefly assume their lifestyles. A flame licking against an iron pot, the wrenching resistance of beef jerky and the dull crack and blue smoke from a flint-lock speak eloquently of the way early Missourians lived.

GAINING A GREATER APPRECIATION FOR OUR OUTDOOR HERITAGE

To tan, sew and wear a leather garment teaches lessons other than the manual skills of tanning and sewing. First, it expresses how vital our wildlife resources have been to us. Second, it shows how challenging and complex the "good old days" really were. Walking 100 yards wearing moccasins in wet snow teaches respect for nature and for the endurance of our ancestors.

LEARNING SURVIVAL SKILLS FROM A HISTORICAL PERSPECTIVE

All outdoor enthusiasts face an element of risk when they step into the wild-matches get wet, batteries go dead and vehicles break down. Mostly these are annoyances, but they can be dangerous. The more people depend on technology while in the outdoors, the higher the personal risk if the technology fails. The early pioneer or explorer was a survival expert by necessity, and many of the methods are as applicable today as they were 150 years ago.

LEARNING SELF-RELIANCE

The most important item in any outdoor survival kit is not a knife, box of matches, string or whistle. The most important item is self-reliance. Without it, hunters and backpackers have died needlessly, with the technological means for survival within easy grasp.

The men and women who challenged the frontiers of North America were short on technology, but they had plenty of self-reliance. Their survival skills came from an attitude and an understanding of nature. Both the attitude and the understanding are as worthwhile and necessary today as they were then.

Contents

The guide begins with an overall historical perspective to put the projects which follow into a human context. Information is divided into the basic areas of concern facing a person

heading into Missouri and the western frontiers prior to 1820. Those basic areas–food, clothing, shelter and comfort–are also applicable today. Within each of these general headings is a discussion of methods and materials used during the time period just specified. Following the general discussion, techniques (some modified to modern circumstances) are presented along with specific activities and projects using those techniques.

Since many of the activities, particularly construction projects such as leatherworking, metalworking and sewing, involve similar skills, a description of basic techniques and a tool list is provided. Material sources and additional references are listed at the end of the unit.

A note about materials

Materials used in the construction projects are generally available, and you do not necessarily have to spend much money. Here is an opportunity to exercise some self-reliance.

Tanned leather is expensive, yet many butcher shops discard raw pigskin. It tans like any other hide. Road-killed animals are another source of tanning material. Deer processors often sell deer hides cheaply. You can buy steel to make a striker (Project l), but you will get more steel for the money (and higher quality steel) by using old files. These can be found at garage sales or junk shops for next to nothing. Remember, there were no catalogs on the frontier and trading posts were few and far between.

Obviously, certain items like sewing needles, thread and beads are beyond your manufacturing capabilities and have to be purchased or obtained through trade.

For group activities, large purchases can be financed by bake sales, wild game dinners and car washes (not historically accurate but definitely in the proper spirit).

Local living history buffs are another source of information and assistance. Watch county fairs and local celebrations or contact a library for names of individuals and organizations. While there are many people who call themselves "living historians," some are not historically accurate.

Tips on getting started

A variety of projects and skills are offered in this guide and you can choose ones to fit your interest and ability. Your priorities and reasons for making the projects will vary. For instance, if you want to demonstrate a historical event and need a garment to wear, a sewing machine is much faster than hand sewing. If you are emphasizing early craft skills, hand sewing or lacing is desirable. Each approach is valid.

When obtaining your materials and tools, don't forget to select necessary safety items or personal protective equipment for the project. Be sure to wear adequate eye protection (such as goggles or safety glasses) when working with wood and metal.

Finally, the guide presents an excellent opportunity for a multidisciplinary experience. Projects are set up to mix history with many other types of skills. Activities for groups could involve producing a play or spending several days living in the past.

Materials for projects do not have to he expensive.

Safety reminder:
When purchasing materials, don't forget to pick up safety glasses and other personal protective equipment needed for the project.

Why study historic crafts and skills?

The lure of the past

For many people, outdoor skills such as hunting, trapping, fishing, canoeing and backpacking are more than recreation. They are a means of rediscovering and reliving our outdoor heritage. More, they are a celebration of our past and those qualities–independence, courage and self–reliance–that we admire in our ancestors.

The hypnotic flames of a campfire, the call of a wild goose, the bite of an icy wind–these are all pathways to our past. We seek them as self-renewal.

For a growing number of people, however, these simple links are not enough. The feel of buckskin garments, the balance of a flintlock rifle and the satisfaction of striking fire with flint and steel help recapture the adventure of the past.

It goes beyond nostalgia. Most who seek the past and have experienced something of it will readily admit they don't want to give up modern conveniences, although the desire to explore their outdoor roots remains strong.

A caution

The past was not all glamour and our forebears were not all heroes. They were human like us and their deeds of greatness are mingled with darker deeds. While we can admire the courage and independence of the plainsmen, their ruthless slaughter of the buffalo is appalling.

As you explore the past, keep in mind that our ancestors viewed life much differently than we do today. Their closeness to nature blinded them to some of its beauty, delicacy and limited resources. Only through the actions of dedicated conservationists and the regulation of agencies have we restored parts of our wild heritage that were nearly lost at the hands of our ancestors. Perhaps it is best to think of the past as unique, and not compare it to the present. Concentrate on the positive, but do not attempt to ignore or distort the negative–there are lessons to be learned there, too.

Ethics

The study of our relationship with our outdoor past raises many ethical questions. Our ancestors viewed their environment quite differently than we do. Game animals were a source of food and income. Methods of taking game were ruthlessly efficient. The ideas of conservation and regulated harvest were unknown. Quite frequently, hunters and trappers killed in excess of what they needed, leaving unwanted animals for scavengers. This is in contrast to the native American who through the thousands of years had grown to recognize the interdependency of humans and nature. Some of their conservation measures took the form of tribal taboos and religious restrictions.

The effect of western man on the frontier was to quickly deplete it of major game species. Beaver declined to near extinction, the buffalo passed, antelope and deer dwindled, and prairie predators like the plains wolf vanished.

These aspects of our outdoor past should be considered. They need examination in light of both the past and the present.

What is the value of a buffalo? As meat? As shelter and clothing? As a symbol of the Great Plains? What are the effects of unregulated harvest of game? On nature? On humans? Does a generation have the right to do with natural resources as it pleases without regard to the legacy it leaves to the future?

These questions are topics to consider when examining the fur trade and frontier America. Buffalo, deer and beaver are found here today because our frontier ancestors were followed by generations who placed a different value on these creatures.

Contemporary ethical concerns include how the study of the past will be conducted. Remember, even though we are looking at the past, we are living in the present. Resources are scarce and should be conserved accordingly. Whether or not we hunt or fish, we still use our natural resources. Our existence requires it.

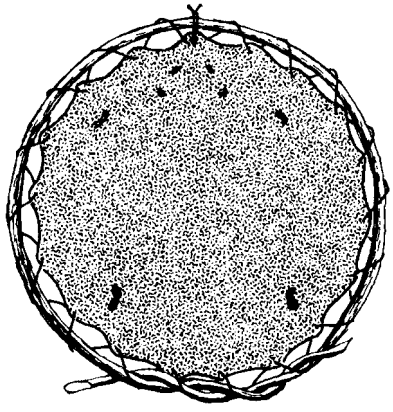
Note that snares and deadfall traps are mentioned for historical interest. They are illegal today. When working with natural materials, be conservative. You can severely hurt an area of larkspur if you collect plants for a large dye project. Be careful with fires. Frontiersmen often set forest and grass fires to drive game. In some areas the scars still haven't healed.

Carry into your study of the past a concern for the future. Remember those qualities we admire in our ancestors came about largely because they had a rich environment to exploit.

Does a generation have the right to do with natural resources as it pleases without regard to the legacy it leaves to the future?

Historical Background

In Europe there was a big demand for beaver fur which was used to make felt hats.



Traders and trappers moved westward in search of beaver pelts. The skins were stretched on willow frames to dry, then bundled and shipped for tanning.

The fur trade

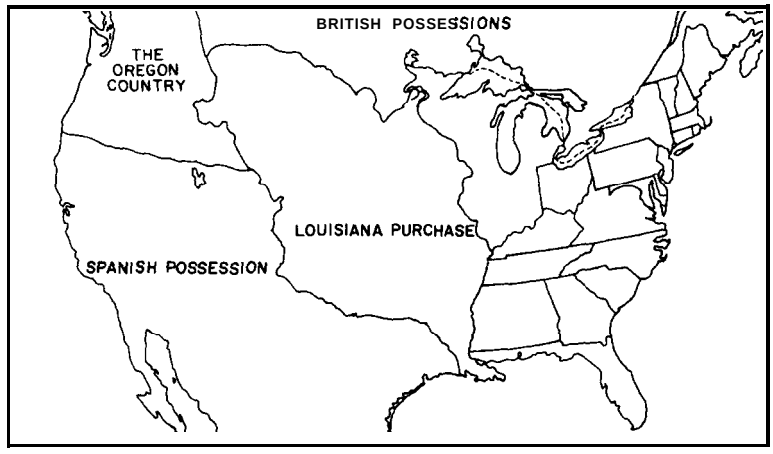
The history of the Missouri frontier is mostly a story of the quest for fur, primarily the fur of the beaver. Long before settlements and farms appeared in Missouri, men roamed the frontier seeking fur. The furs were obtained mostly by trading with native American tribes who had inhabited the Missouri country for thousands of years.

A beaver's fur consists of two kinds of hair-coarse outer or guard hair and downy soft underhair. Through a microscope, the underhair appears as slender strands studded with tiny barbs. This barbed characteristic results in superior felt. In an era when most occupations were outdoors and required sturdy headgear, high quality felt was important. For centuries, beaver felt was the primary material used in the construction of hats.

The French began the quest for beaver fur in the New World around 1600. They started in the north in what is now Canada, moved down the St. Lawrence River and split at the western edge of the Great Lakes. One branch of the trade continued west through the northern river systems, while the other branch followed the Mississippi River south to the mouth of the Missouri River then up the Missouri to the Rocky Mountains.

The French pioneered the quest for beaver, followed by the English, then the Americans. Thus, several types of frontiersmen appeared on the Missouri frontier, dressed and equipped according to the mix of their own culture and the native cultures among whom they lived.

Throughout most of the fur trade, business was conducted by bartering with the native Americans. European or American goods such as blankets, beads, jewelry, guns, ammunition, whiskey, sewing awls, cloth, mirrors, knives, cooking vessels and iron tomahawks were traded to the native Americans in return for beaver pelts. Later, following the Louisiana Purchase in 1803, native Americans became more aggressive toward intruders on their lands. Europeans then had to abandon the barter system and take up steel traps.



Louisiana Purchase, 1803

While beaver pelts were the basis for much of the fur trade in this area, they were not the only furs of value. Deer hides and buffalo robes also were in demand. These furs, like beaver, were bundled and shipped east for tanning, then manufactured into garments, shoes and boots.

People of the fur trade

TRADERS

The earliest fur merchants on the Missouri frontier were called *coureurs de bois* (kur-rur-duh-bwa) or "runners of the woods." These swarthy Frenchmen set out from settlements along the Mississippi with loads of trade goods. They circulated among the native American tribes until their goods were traded away; then they returned to the settlements. There they sold the accumulated furs, paid off any debts and either re-outfitted or used their earnings to launch into some other business.

Many of these early frontier businessmen enjoyed life among the native Americans and spent most of their time on the frontier. Often they took native American wives and adopted some of the religious and social attitudes of their chosen tribe.

Technically, the *coureur de bois* was an outlaw. Trading licenses were controlled by the French government and were restricted. Politics and a healthy bribe were usually necessary to procure a license. Even then, part of the proceeds of trade went to the government.

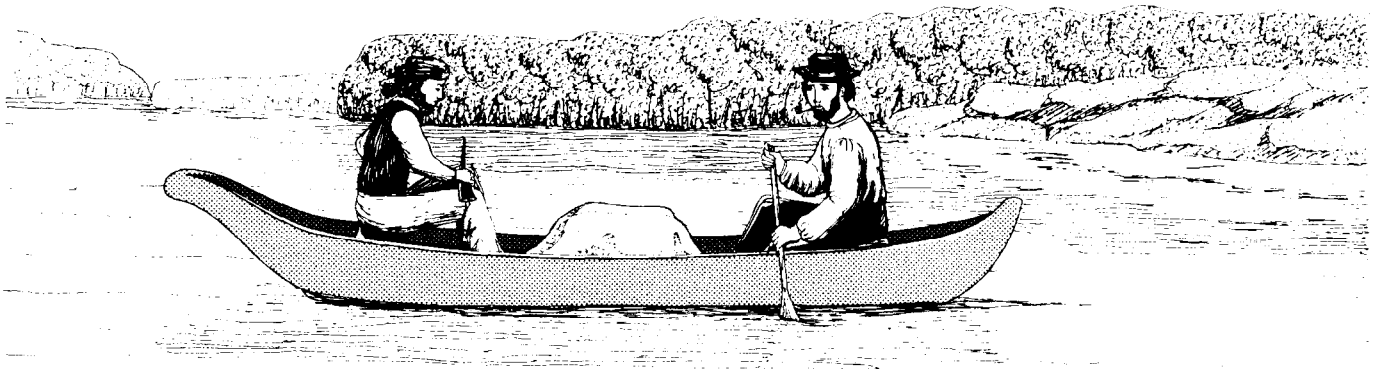
TRAPPERS

The traders dominated the Missouri fur business from its beginning in the late 1600s until the early 1800s. Between 1800 and 1820 trading began to give way to trapping. The trappers, rather than bartering with the native American tribes, went after furs themselves.

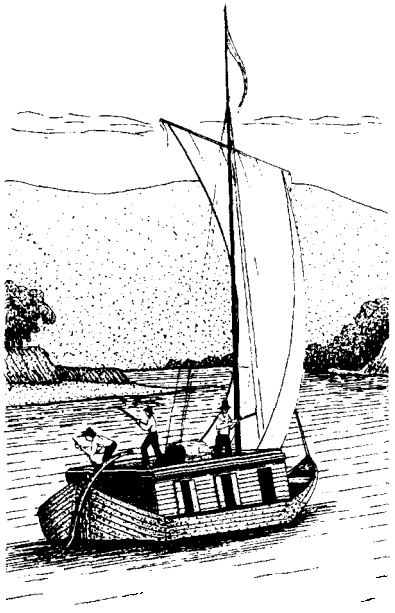
Each man carried 6 to 12 steel traps which were set in shallow water along river or stream courses. Above the trap, a willow twig, with its exposed end dipped in beaver scent (castor), was jabbed into the bank. The trap was anchored on a chain staked in deep water. A beaver swimming up to investigate the scent would put a foot into the trap. Once captured, the animal swam instinctively for deep water where the burden of the trap and chain caused it to drown quickly.

When steel traps were in short supply, trappers borrowed the native American methods of snares and deadfalls.

Coureurs de bois *carried trade goods to the native Americans.*



Trappers went after their own furs.



The keelboat, a unique creation of the Missouri River fur trade, was powered by sail, pole or tow rope.

Beaver skins were stretched on circular willow frames and allowed to dry. Then the dried pelts were compressed in a fur press, wrapped in deer hide and bound. Bales of beaver hides were shipped east for processing. St. Louis, founded in 1763 a few miles from the mouth of the Missouri River, quickly became a world center for the fur trade.

BOATMEN

Besides trappers and traders, there were others on the frontier. Furs often went to market on boats, thus a need for boatmen. Lone traders might simply chop down a cottonwood, hollow it out to make a dugout or pirogue, and transport the furs themselves. Larger operations, however, employed boatmen.

The *voyageur* (vwa-a-jur') was the truck driver of the eighteenth century. He piloted the great freight canoes used by the French fur companies. These canoes ranged from 25 to 36 feet (7 to 11 meters) in length and carried 1 to 3 tons (1,016 to 3,048 kilograms) of cargo and a crew of 4 to 8 people. A jolly, hardworking lot, the *voyageurs* dressed in bright colors and sang incessantly. In the north where portages were often necessary, these sturdy rivermen would shoulder 95-pound (43-kilogram) bales of fur, sometimes several at a time and jog the portage trail. Most of them were less than 5 1/2 feet tall (1.7 meters). Smaller men took up less space in the canoe.

The *voyageur* was replaced on the Missouri frontier by the keelboatman. The keelboat was a unique creation of the Missouri River fur trade. It was 60 to 80 feet long (18 to 24 meters), had a small central cabin flanked with two walkways and was capped with a mast. The keelboat was powered by sail, pole or cordelle (tow rope).

Voyageurs piloted the large freight canoes that carried bales of fur to St. Louis.

WOMEN

Women played a role in the early fur trade, although pioneer or European women were rare on the frontier. The woman of the fur trade was usually a native American woman. Traders often took a native American wife (sometimes while also maintaining a home in some downriver settlement). The skills of native American women made them valuable partners. They could handle horses, make and break camp speedily, cook, make clothing and, when necessary, handle weapons. In addition, part of the dowry of a native American bride was a large assortment of relatives. When a trader married into a village, he immediately acquired a host of in-laws as customers.

There are few instances of traders or trappers bringing their wives from the East onto the frontier. Gentlewomen were found generally in isolated forts and trading houses where they did their best to maintain some of the comforts of civilization.

NATIVE AMERICANS

The relationship the fur men had with the native Americans changed drastically through the 200 years of the fur trade. At first, traders found an eager market for trade goods and great support from the native Americans. Traders were encouraged to marry into the tribes and trade relationships were jealously guarded. As more Europeans poured onto the tribal lands, tensions developed. The use of alcohol as a trade item contributed to the decline of relations. Finally, animosity between the races and growing competition for land and wildlife resources led to open hostility.

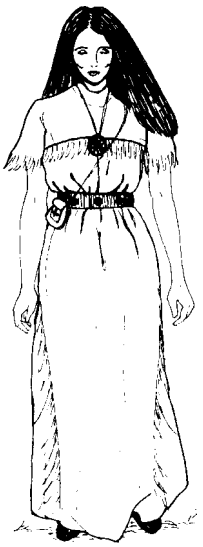
MOUNTAIN MEN

As relations with the native Americans deteriorated, trading became more difficult and trapping became more efficient. Groups of trappers, called brigades, worked river systems for beaver, frequently in defiance of treaties and federal laws. The peak of the trapping era came with the emergence of the mountain man. Often sited as examples of supreme independence, these free spirits roamed the West for the last 30 years of the fur trade. Most worked for large companies, but a significant number were free trappers who worked alone. They gathered furs to sell to the highest bidder at the summer rendezvous, when trappers met with fur companies and other traders at a camp in the north to buy supplies for another year.

The mountain man appeared in the early 1820s and faded with the collapse of the fur trade in the late 1840s. A combination of circumstances caused the fur trade to end rather abruptly. First, silk replaced beaver felt as the primary material for fashionable hats. Native American hostility made the risks outweigh the gains of dealing in furs. And finally, the beaver almost disappeared. Relentless trapping eventually reduced the beaver to near extinction. Not until people began practicing modern game management did beaver populations recover their former abundance.

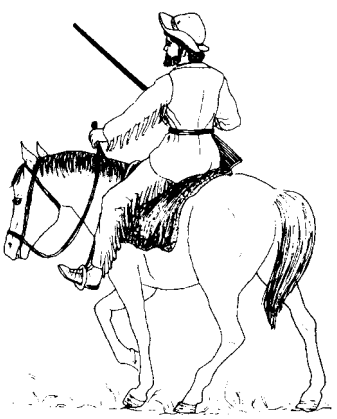
OTHER PIONEERS

As the fur trade abated, traders and trappers also passed from the scene. In their place came the buffalo hunters, cowboys, miners and sodbusters–all pioneers in their own right, but their lifestyles never required the same self-reliance and understanding of nature as those who went after fur.



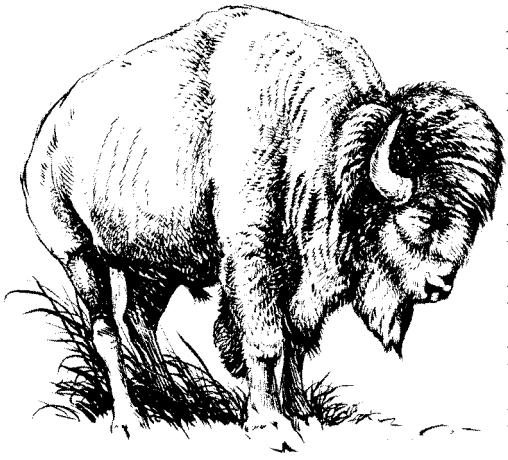
The woman on the frontier was usually a native American woman.

Native American women were valued for their skills.



The mountain man marked the peak of the trapping era from the 1820s to the 1840s.

Time Line for Missouri Frontier



Charles W. Schwartz illustration

1673	Marquette and Joliet discovered the mouth of the Missouri River
1673-1764	Missouri visited by French fur traders
1722	Ft. Orleans built near mouth of Grand River in central Missouri
1764	St. Louis founded by LaClede and Chouteau
1769	Ownership of Louisiana which included all lands drained by Missouri River transferred from France to Spain
1789	Juan Munier granted exclusive trading privilege with Poncas on Niobrara River (Nebraska)
1790	Jacques D'Eglise opened trade with Mandans (North Dakota)
1794	Jacques Clamorgan and other St. Louis merchants organized Company of Explorers of Upper Missouri (Missouri Company)
1800	Louisiana Territory reverts to French by secret treaty
1802	British traders reached Powder and Yellowstone Rivers
1803	Louisiana Purchase
1803-1806	Lewis and Clark expedition
1807	Manuel Lisa and Pierre Chouteau Jr. lead fur trading expeditions out of St. Louis
1808	St. Louis Missouri Fur Company founded American Fur Company organized in New York by John Jacob Astor
1808	Fort Osage built near Kansas City
1813-1817	War of 1812 interrupted fur trade
1822	First Ashley Henry expedition–European trappers instead of traders
1825	First trappers' rendezvous on Henry's Fork of the Green River (Wyoming)
1830	First use of wagons to outfit rendezvous–route was beginning of wheeled traffic, eventually becoming Oregon Trail
1838	Last rendezvous–decline of fur prices, scarcity of beaver, hostility of native Americans and use of silk to make hats, all spell doom for the mountain men

Food

Food on the frontier

Food and water were number one priorities for a frontiersman. Skills necessary to find nourishment were essential for anyone venturing beyond settled lands.

Fur traders and trappers mostly ate meat. When necessary, they could subsist on vegetable material–digging tuberous roots and eating ripe berries like a bear. They didn't consider themselves well-fed, however, unless they had prodigious quantities of meat. Accounts of mountain men eating 5 to 7 pounds (2 to 3 kilograms) of meat at a sitting are not uncommon and certainly within reason. The meat of game animals is lean and large quantities are needed to provide enough energy for outdoor living.

Meat was obtained mostly by hunting, but also as a by-product of trapping. Boiled or roasted beaver tail was considered a delicacy. Most meat, however, came from hunting large game animals such as bison, elk, antelope and deer. Small game was less important because the amount of meat obtained seldom justified the effort.

Hunting or shooting an animal was termed "making meat" by mountain men. Actual hunting methods are beyond the scope of this unit. (Consult the Department of Conservation's units on *Trapper Education* and *Hunter Education* for more detailed explanations.)

Early cooking methods

Meat was processed according to its intended use. If it was to be eaten immediately, it was cooked (usually, but not always). The cooking methods most often used were roasting, boiling and frying.

ROASTING

Roasting meant skewering the meat on an iron or green wood spit and suspending it over a fire. A good roasting fire had an abundance of coals and little flame. Meat was turned periodically for even cooking. On occasion, pieces of meat were simply tossed onto the fire. When done, they were pulled out, the ashes dusted off and the meat eaten. Since no skillets or pots were required, roasting was popular, especially among groups traveling light and fast.

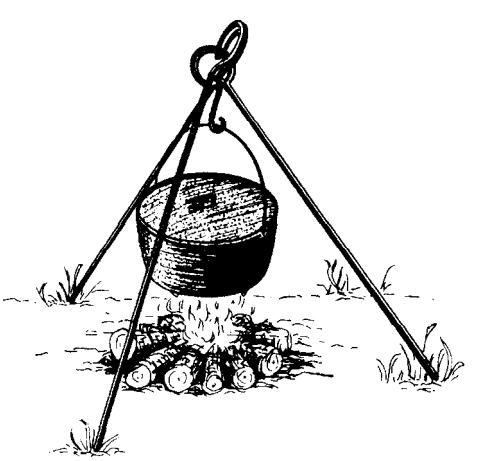
BOILING

Meat was occasionally boiled in a kettle. Native Americans also boiled meat; however, they used a skin or rawhide bag suspended from a tripod until they acquired an iron kettle. A fire could not be used because it would burn the hide. Therefore, the water was stone boiled, a method of boiling by adding rocks heated on a fire located some distance away.

FRYING

In early accounts, frying is mentioned less often than roasting or boiling. Frying produces less cooked meat for the preparation time since meat must

The diet of mountain men consisted primarily of meat with as much as 5 to 7 pounds eaten at a sitting.



One method of cooking was in a kettle suspended from an iron tripod.

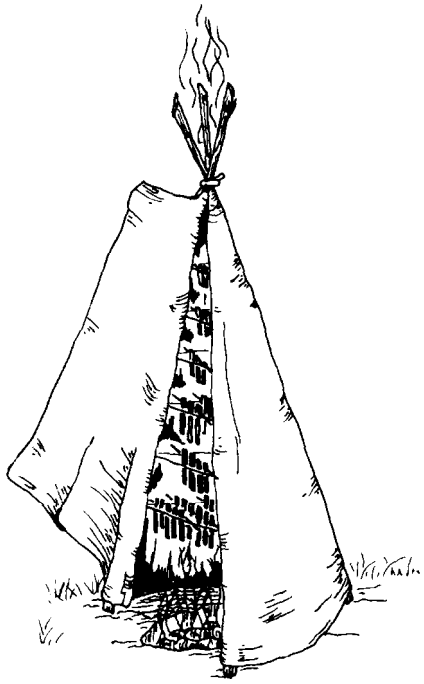
Bread was often made in a skillet.

be in contact with the heated surface. Also, the leanness of most game meats may have discouraged frying. A skillet or griddle was mostly used to prepare breads such as johnnycake or bannock.

UNCOOKED

Trappers and traders did not always cook meat before eating it. Like the native Americans, they often snacked on morsels of raw meat and liver when cleaning game animals. While such a practice may seem repugnant to some and certainly carries health risks (parasites), neither Europeans nor native Americans seemed to suffer. The mountain man was not a gourmet. His slogan was simply "meat's meat." His lack of squeamishness about what he ate and whether or not it was cooked saved his life on many occasions. History is filled with tales of lost and injured people subsisting on lizards, snakes, insects and even carrion.

If you are contemplating wilderness travel, it is a good exercise to consider your food prejudices. Most are culturally based; however, under survival conditions such prejudices need to be discarded.



For added flavor, jerky was made by drying meat over smoky coals.

Preservation of food

If meat was not eaten immediately, it had to be preserved. The abundance of game varied and fresh meat was not always available. Meat to be stored was preserved in several ways: drying, smoking or salting.

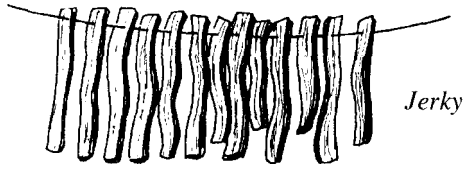
DRYING

Meat sun-dried in long strips was called jerky. The strips, 1/4 - to 1/2 - inch (.6 to 1.3 centimeters) thick by about 1 inch (2.5 centimeters) wide and up to several feet (decimeters) long, were hung from a wooden rack in a sunny place. After several days, they were leather dry and ready for storage. Sometimes drying meat was sprinkled with pepper to discourage insects.

Berries and roots were also sun-dried. In addition to preserving food, drying reduced the amount of water in the food and made it easier to pack and carry.

A high-energy food, called pemmican, was made from jerky, fat and dried berries. It was made by melting fat and stirring into it shredded jerky and dried berries such as chokecherries, currants or blueberries. When the fat cooled and hardened, it was cut into bars and wrapped in rawhide. Ounce for ounce, pemmican is still one of the most high-energy food sources available.

SMOKING



Jerky

Smoking consisted of drying meat in the heat of a smoky fire. Green hardwood such as hickory, placed on a bed of coals, provided the smoke. Fish to be smoked were split and hung on wooden racks above the fire. Meat was treated as for jerky. Smoking not only retarded spoilage, it also added flavor. The modern backyard smoker comes from this primitive technique; however, with modern-day smoking, the intent is not to dry the meat. The process, therefore, is carried out in an enclosure that reduces moisture loss. For details on how to make and use a smoker, see Project 4.

SALTING

Sometimes meat was packed in salt or a brine solution to preserve it. Large expeditions carried barrels of salted pork. The process of salt-curing is still used today.

Early fire building

Fundamental to most food preparation was a good fire. Since matches were not available on the frontier prior to 1840, other methods were used to light a blaze.

Native Americans and mountain men, during emergencies, used the drill and the bow-and-drill methods to start a fire. In simplest form, the drill was a hardwood rod held upright between the palms of the hand. The lower end of the rod rested in a shallow socket which was cut into a flat piece of hardwood. Tinder, in the form of dry grass, fine wood shavings or shredded bark, was crumbled around the base of the rod. The firemaker twirled the rod between his palms by rubbing his hands together. Friction of the rod against the hardwood block generated heat which made the tinder smolder. Once the tinder was smoking heavily, it was picked up and blown on until it burst into flame.

In the bow-and-drill method (see Project 3), a small bow replaced the hand twirling. The bow string was looped around the drill. A sawing motion of the bow made the drill spin.

Since these methods required only natural materials, they worked well during emergencies. When the Europeans arrived with their steel and iron goods, however, they brought a superior method of starting fires.

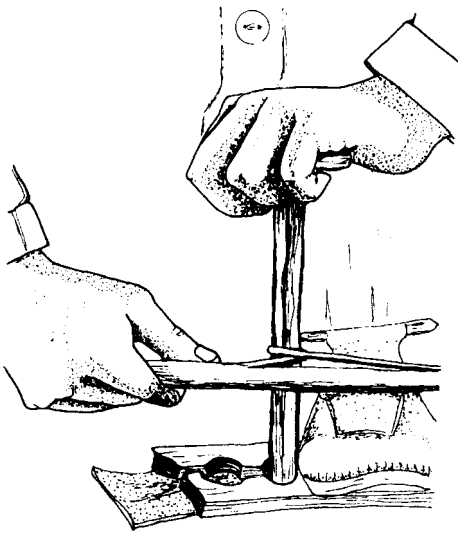
Among every frontiersman's equipment was a small piece of hard steel and several pieces of flint. Striking the flint and steel together produced a shower of sparks. Sparks would catch in dry tinder or charred cloth and be fanned into flames. For details on making a steel striker and charcloth, see Projects 1 and 2.

Other foodstuffs

While the frontiersman's staple diet was fresh meat, other food was eaten. Dried beans, dried corn, flour and salt pork were supplies carried along with condiments such as salt, pepper and sugar.

Corn was often boiled to make chowder. Flour and cornmeal were used to create biscuits, johnnycakes and hard breads like bannock. Baking soda was used as a leavening agent, although some breads were unleavened. Sourdough, a culture of live yeast, also was carried as a leavening agent.

For beverages, the frontiersman drank mostly water, coffee and tea. Although he occasionally overindulged in hard spirits, these were not staple beverages. First of all, liquor was a valuable trade item with native American tribes. It was too difficult to transport to be squandered on self-indulgence. Second, the lifestyle of the trapper demanded alertness, physical stamina and quick reflexes. Drunkenness was simply not safe most of the time.



Bow and drill

Flint and steel

Clothing

On the frontier, native American clothing soon replaced "civilized" clothes.

Truth and fiction in frontier clothing

The image of the frontiersman carried by most people is a mixture of fact and fiction. For example, it is true that early fur traders and trappers dressed primarily in fringed buckskin. But the handsomely tailored, honey-gold buckskins of television and movies bear little resemblance to the loose-fitting, grease-stained, gray-black skins found in museum collections and early journal accounts. Clothing, more than any other aspect of the life, reflects the position of the frontiersman—suspended between primitive and civilized worlds.

Types of clothing

The clothing of the trader or trapper was a mixture—part native American and part Anglo-Saxon. When available, wool trousers and wool flannel or linen shirts were preferred. Coats made of blanketing, called capotes, served as outer wear. A low-crowned, broad-brimmed hat protected the wearer from the prairie sun. Boots were favored when starting out, but they wore out quickly. Away from the settlements they were soon replaced by moccasins.

While crossing rough terrain, trousers fell victim to brush patches, wet weather and scorching heat. Without protection, cloth shirts suffered the same fate.

As "civilized" garments disintegrated, the trader or trapper turned to the clothing of the native Americans he lived among. Trousers were replaced by buckskin leggings and a breechclout (a long, wide cloth passed between the legs and suspended in front and back from a leather belt). The leggings were held up by the same belt that supported the breechclout. Strips of colored cloth called garters were bound around each legging just above the knee. When the leather became wet from wading or walking in wet grass, garters absorbed some of the additional weight, preventing the soggy leather from pulling loose at the belt.

Loose-fitting leather shirts replaced cloth ones. They sometimes consisted of nothing more than two tanned deer hides sewn or laced together, with openings left for head and arms.

Both leggings and shirts were decked with fringe. The fringe served to wick water away from soaked leather, which could be cold, clammy and uncomfortable. Fringe also served as decoration and a ready repair kit since individual strands could be cut off as emergency lashing material. The fringe may have acted as camouflage, breaking up the distinctively human silhouette of the wearer.

While leather garments were simple, they were not without style. The mountain man and trader acquired some native American tastes in decoration. Beads and quillwork brightened many garments. Designs were also painted directly on the leather

using dyes made from native plants. Necklaces of animal teeth, claws, cast metal objects and bones provided ornamentation.

A wide leather belt held the loose-fitting shirt to the body. Into the belt were thrust a knife, a tomahawk, pistols and a leather pouch containing fire-making materials, a pipe and tobacco. French *voyageurs* and *coureurs de bois* wore a brightly colored cloth sash in place of a leather belt.

Accessories

Over one shoulder went a hunting pouch containing bullets, a bullet mold, patching material, spare flints, a patch knife, a screwdriver, a powder measure and more. Over the other shoulder went a powder horn filled with gun powder. In addition, he often carried a small leather bag fastened to his belt. This possibles sack held items such as a fire-starting kit, eating utensils, pipe and tobacco, pocketknife and other essentials. Thus equipped with such *accoutrements,* the mountain man was not only a walking fortress, but also a hardware store, tailor shop and butcher shop.

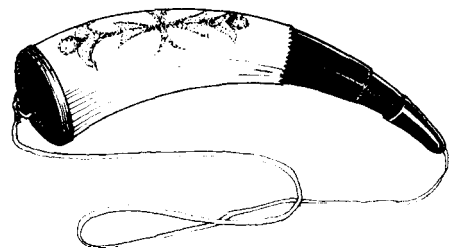
Clothing construction

Construction of leather garments began by preparing the hide. The animal was skinned and fleshed (a process of scraping all connective tissue and muscle from the skin). If desired, the hide was dehaired by soaking it in water or a mixture of water and wood ashes. The hide could then be dried to make rawhide. Or, the hide could be tanned and worked over a rope or wooden beam for greater softness and permanence. (For more information on skinning, see the units *Trapper Education* or *Hunter Education.)*

TANNING

Tanning was done by taking a mixture of animal brains and fat, and working it into the hide. The hide was then stretched and worked over a beam to soften it. This method, a so-called "Indian tan," is still superior to most modern chemical tans. (For details on tanning a hide, see Project 6.)

Once tanned, the leather was cut and sewn into garments using sinew-strands of animal tendon that served as a very tough thread.



Powder horn

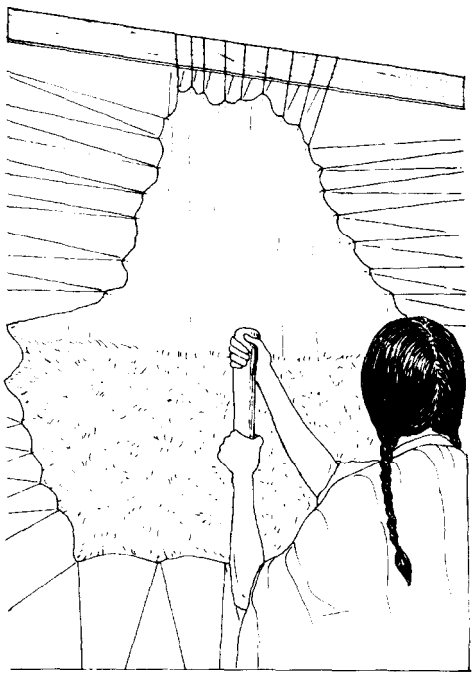
DECORATION

Leather garments were decorated with dyed porcupine quills, beads or painted designs. Native Americans used quills before glass beads were introduced by European traders.

Trading beads to native American tribes was a big business. In Europe, where the beads were manufactured, beadmakers' guilds protected production secrets. Anyone who revealed his methods was severely punished.

Beads were often sewn directly on the leather. (Beading techniques are discussed in Project 12.) Quillwork, while still practiced among native American tribes and historically inclined craftspeople, is not included in this unit.

Trade silver was a general term covering a variety of metal jewelry. Animal figures, religious symbols and other designs were cast or cut from pewter, tin or lead. These were sewn directly to garments, leather bags and rifle cases. Tin cones about 2 inches (5 centimeters) long were often affixed to garment fringe. They made a tinkling sound as they knocked together when the wearer walked. Native Americans



For most clothing, the hair had to be removed from the hide.

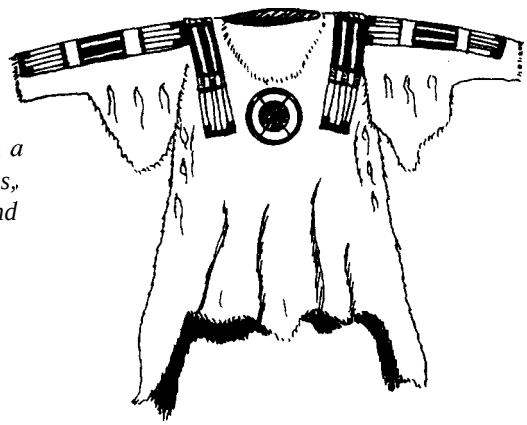
sometimes wore rifle parts or pieces of mirrors as decoration.

Painted designs were made using dyes manufactured from local plants. Designs were artistic or, if the trapper or trader had adopted some of the native religion, symbolic. (See Project 13 for instructions on how to make native dyes.)

The prevalence of native American dress and decoration expressed both the inclinations and the lifestyle of the wearer. Many traders and trappers took native American wives who were skilled in beading, quilling and sewing. As civilization spread westward, tailored buckskins appeared on the frontier. These combined the comfortable fit of European tailoring with the durability of leather.

Not all garments were made of leather, however. Heavy coats made of wool blanketing and shirts made of linen, wool flannel or cotton could be obtained from settlements or trading posts. Cloth shirts were loose-fitting with dropped sleeves and narrow cuffs and collars. Patterned fabrics had simple designs with only two or three colors. Colors were subdued because of the poor quality of dyes available.

Trousers were either drop-front or French-fly (fly front with buttons instead of a zipper). They were made out of wool, linen or cotton broadcloth and usually held up by cloth or leather suspenders (called galluses), instead of belts. Patterns and instructions for making leather and cloth garments are in Projects 7-11.



Clothing was decorated with a variety of items--beads, quills, bones, shells, teeth, metal and painted designs.

Shelter

Another type of protection from the elements important to frontier survival was shelter. Trappers and traders used a variety of shelters. The choice depended upon the season of the year, circumstances and lifestyle of the user.

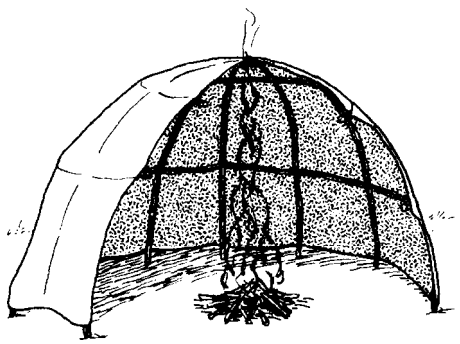
Types of shelter

Shelters were made of either hides or canvas. Construction ranged from simple to elaborate. The most sophisticated design, the tepee, was borrowed from the Plains tribes.

The simplest shelters were half-shelters and lean-tos. They were easily and quickly constructed, portable and reasonably protective. The shelters, which were pitched to block a prevailing wind, kept users out of the rain and snow. An open front allowed heat from an outside fire to radiate into the enclosure.

HALF-SHELTER

The half-shelter was made with a semi-circle of hide or canvas stretched over a willow frame.

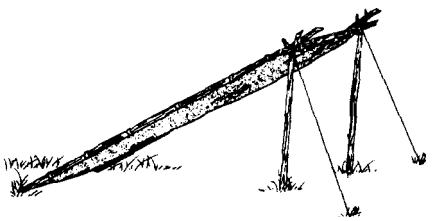


Half-shelter

Thumb-sized willows, trimmed of branches, were stuck in the ground in a shallow ellipse (about 7 feet or 2.1 meters along the open side by 3 to 4 feet or 1 to 1.5 meters at the deepest point). The free ends of the willows were bent together and lashed, creating a half-dome. A cover was then stretched over the frame and fastened.

LEAN-TO

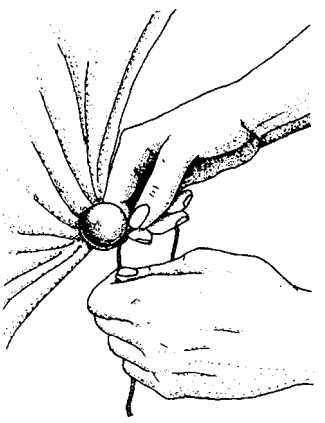
Lean-tos were constructed from a simple frame such as the one illustrated here. The cover was fastened over the frame. The Baker tent, a more elaborate version of the lean-to often seen at modern-day historical



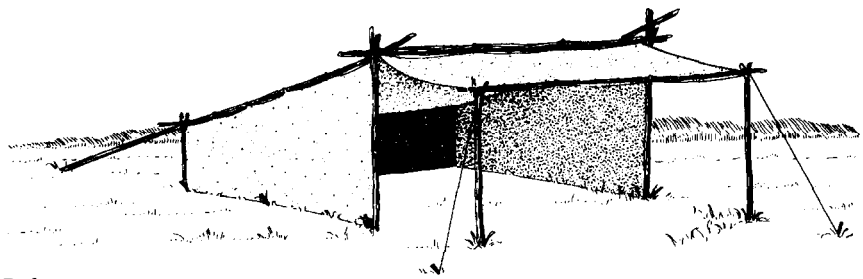
Lean-to

events, was not used on the early frontier. It appeared at a later time.

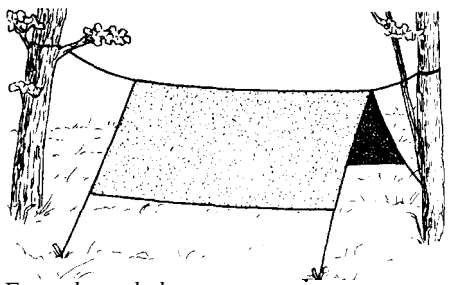
Coverings were fastened to the wooden frame in a manner borrowed from the native Americans. A pebble or rifle ball was twisted into the cover near the edge. A length of rawhide or cord lashed around the twisted fabric held the object in place and kept the lashing from pulling loose. The free ends of the cord were used to tie the cover to the frame. The cord ends also could be knotted together to make a loop for a stake.



Native American method of securing or staking shelter covers



Baker tent



Frameless shelter

Wall tent

When time was short and materials were limited, other shelters were also constructed. These often used an A-frame, tripod or no frame at all. Frameless shelters were constructed by suspending the cover from a tree limb and staking the shelter edges.

WALL TENT

A more permanent shelter, often used by trapping and trading parties, was the wall tent. The tent offered more protection from the elements but was less handy because of its more elaborate frame. Also, its narrow entrance and floor flaps prevented an outside fire from warming the shelter. Fires were not possible inside the shelter because of poor ventilation and close quarters.

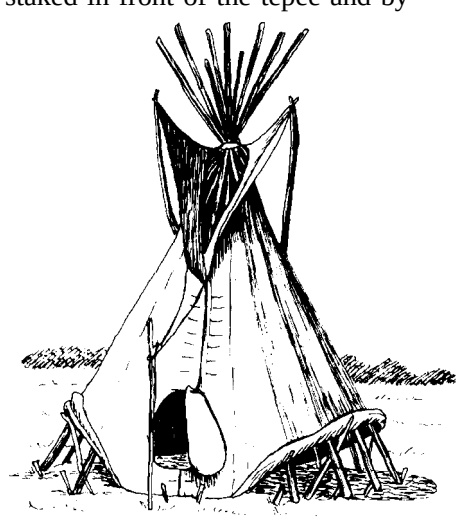
THE TEPEE

The most elaborate shelter was the tepee. This was used by trappers and traders living among native Americans or those who had married native American women. (In many native societies, the tepee or lodge belonged to the woman.) Although it was portable, the bulk of the tepee (poles and cover weighed several hundred pounds) made it an impractical shelter for parties traveling light and changing location frequently.

The tepee, at first glance, seems to be a simple shelter; yet, its design is actually highly sophisticated. Over the centuries, it evolved among nomadic tribes whose sustenance depended on their ability to follow the roving herds of buffalo. The tepee was extremely stable in high winds, offered better ventilation than most tents and stayed reasonably warm in winter and cool in summer. In addition, it was one of only two primitive portable shelters that were safe to build a fire inside. Some have described the tepee as a great chimney–a well-pitched tepee was never smoky inside, thanks to its design.

The tepee's frame consisted of 3, or sometimes 4, poles lashed together near one end, stood upright and spread to form a tripod. Upon the tripod were placed 10 to 16 poles that served to stretch the cover. These support poles were placed around the tripod in a specific sequence. To get the chimney effect, poles were arranged so their bases created an oval, with the wider portion toward the back of the tepee.

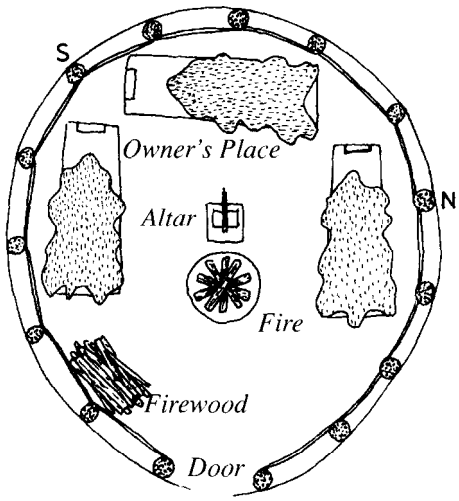
The cover of hide or canvas was stretched over the pole frame so that the back of the tepee faced the prevailing wind. The door was on the opposite side. Above the door was a large slit-like opening flanked by two flaps. This was the smoke hole. Draft for the interior fire was regulated by the position of these smoke flaps. The flaps were controlled by two cords attached to their base and staked in front of the tepee and by



An "air conditioned" tepee

two long poles whose upper ends were attached to the smoke flap tops while the bottom of the poles rested on the ground behind the tepee.

Inside the tepee a liner of hide or canvas was suspended from a cord running around each pole at a height of about 5 feet (1.5 meters). The liner and cover were both staked to the ground near the poles to create airspace between liner and poles. This helped insulate the tepee and also created a chimney effect with hot air rising from the fire carrying cooler air up along the sides of the tepee. The draft prevented smoke from building up inside.

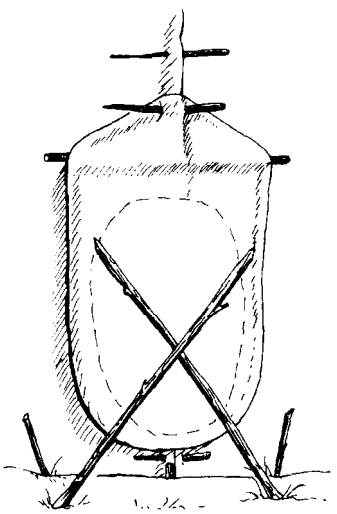


Tepee floor plan

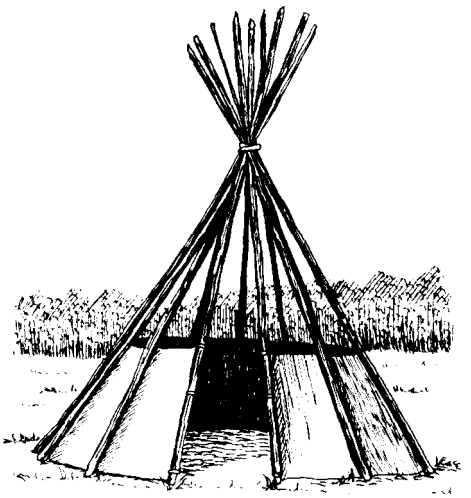
The tepee has enjoyed something of a resurrection among those people interested in getting back to nature and frontier history buffs. (Native Americans have never stopped using them completely.) A modern-day rendezvous usually has many tepees.

To the native American, the pitching, orientation and interior floor plan of the tepee reflected mystical as well as practical beliefs. Elaborate practices evolved around the use of tepees and tepee etiquette is still practiced by many who use the shelter.

To follow proper tepee etiquette, you should not enter without first asking permission. A greeting, such as "Hello the lodge," can be used. Crossed sticks over the door indicate that the owner is away or does not wish to be bothered. In this case, an outsider should not enter the lodge. The position opposite the door of the tepee is occupied by the owners. When entering, the person seated at that position will direct the new arrival toward a seat. Never pass between the fire and seated individuals. Walk behind them or, if this is not possible, ask permission to pass in front. Never pass between the lodge owner and the fire. This area was sacred to its native American owners and was the site of their family altar and religious effects. More information about tepee design, construction and history is listed in Project 14.



Tepee door indicating "do not enter"



Tepee liner

Comfort

Beyond essentials, the mountain man's equipment list was short. The need to travel light and fast and the limited means of transportation prevented him from too much self-indulgence. But like anyone else, he tried to make life as comfortable as possible under his particular circumstances. The hardships he faced while living as a mountain man were not enjoyed, they were endured. What conveniences he could carry, he did. He usually had a pocketknife and might carry a pocket compass or sundial.

Candle lantern

Sleeping gear

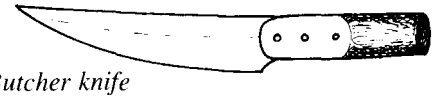
Wool blankets provided warmth and bedding material. Buffalo robes served the same purpose, but were much heavier.

Lighting

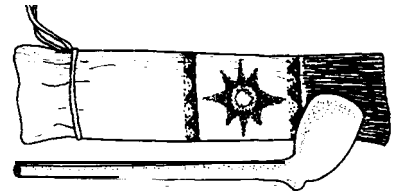
His shelter was lit by a candle, preferably one inside a lantern so it was protected from the wind. A campfire also provided minimal light.

Eating utensils

Eating utensils were simple. A large spoon and the ever-present butcher or scalping knife were sufficient for most occasions. He sipped water, coffee or tea from a tin cup or wooden noggin.



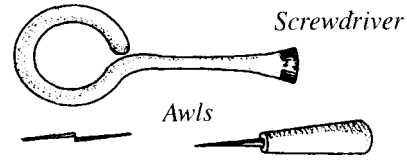
Butcher knife



Clay pipe and tobacco pouch

Pipe and tobacco

Usually present in a frontiersman's kit were a clay pipe and some tobacco. Smoking around the fire in the evenings was a form of relaxation. Also, and perhaps more important, tobacco curbed the appetite, a valuable aid in a world where food was not always abundant.



Repair kit

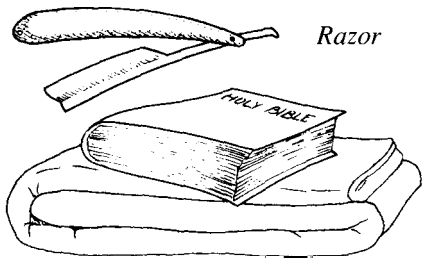
Since clothing and shelter were not easily replaced, a repair kit was necessary. This included some sewing needles, strands of sinew, perhaps a button and assorted odds and ends. A separate kit was needed for maintaining weapons. This might include a screwdriver, ball puller and spare gun parts.

Miscellaneous comforts

A deck of cards might be included for amusement. A straight razor and mirror were carried by some.

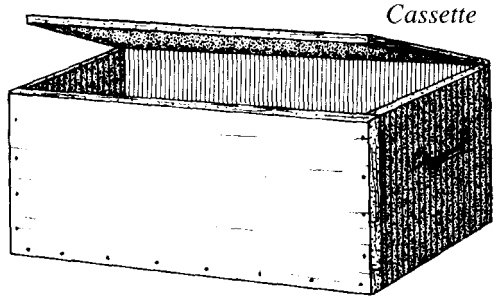
Not all frontier dwellers were uneducated. Books such as the Bible, Shakespeare and works on geology, botany and zoology appeared among the belongings of a few traders and trappers.

All of these odds and ends were carried either on the person or packed in his duffel. If traveling by boat or working from a fort, wooden boxes called cassettes might be used for storage also.



Razor

Books and blankets



Cassette

Summary

The era of the fur trade represents a unique and colorful time in American history. For a time, furs were a major industry in North America. In addition, traders and mountain men contributed greatly to the exploration and settlement of the western frontier. Most of the paths and many of the highway routes we follow today began as the trade routes of beaver hunters. By studying the implements, clothing and lifestyles of these early outdoorsmen, we can gain a better understanding of our own heritage and the importance of natural resources in our past.

Glossary

ACCOUTREMENTS Accessories

AWL A sharp, pointed tool used to punch holes in leather prior to sewing.

BANNOCK A simple bread made by mixing flour, water, sugar and baking powder, then frying it in a skillet. Also called frying pan bread.

BARTER To trade or exchange items of value directly, rather than through a medium of exchange (money).

BOW AND DRILL Primitive fire-starting method in which a small bow is used to twirl a wooden stick (drill), generating heat by friction.

BREECHCLOUT A long, narrow cloth run between the legs and suspended in front and back from a leather belt.

BUCKSKIN The skin of a deer after fleshing and tanning. If the hide is fleshed, but not tanned, it is called rawhide.

CAPOTE A heavy coat made from wool blanketing.

CASSETTE A large wooden box used to carry supplies.

CASTOR A secretion of the castor gland of the beaver. Trappers removed the castor when skinning beaver and used the highly scented chemical to lure other beavers into traps.

COUREUR DE BOIS Literally "runner of the woods." An unlicensed French trader.

DEADFALL A type of trap in which a heavy rock or log is positioned to fall on an animal that trips a sensitive "trigger" device.

FLESHING Scraping the muscle and connective tissue from a fresh animal skin.

FLINT Hard rock which when struck against hardened steel throws a shower of sparks; also used by native Americans to make points, scrapers and ax heads.

FUR TRADE A general name for the business of gathering furs by trading with natives or trapping. For a time it was a large and powerful industry.

GARTERS Strips of cloth or leather bound around leather leggings just above the knee.

HALF-SHELTER Primitive shelter made from canvas or hide and willow sticks. Used by traders.

JERKY Sun-dried lean meat, usually made from deer or buffalo.

JOHNNYCAKES A cake-like bread made with cornmeal and water, then fried in a skillet.

KEELBOAT A shallow, covered riverboat used for freight and usually rowed, poled or towed.

LEAN-TO A simple shelter of cloth or hide stretched over a frame.

LEGGINGS Hollow sleeves that fit over each leg and fasten to a belt around the waist. Worn with a breechclout in place of trousers.

LINER A long cloth hung around the inside of a tepee to guard against moisture and to improve the tepee's ability to draw air for a fire.

LOUISIANA The region lying west of the Mississippi River bounded on the south by the Red River and on the north by the furthest drainage of the Missouri River. The state of Missouri was part of the Louisiana Territory. Originally French, Louisiana was transferred to Spain in 1769, back to France in 1800 and finally to the U.S. in the Louisiana Purchase of 1803.

MOUNTAIN MAN A non-native American trapper who worked either for one of the large companies or as a "free trapper" selling his furs to the highest bidder.

NOGGIN A wooden drinking vessel often carved from the burl of a tree.

PEMMICAN Dried meat powdered and mixed with fat and dried berries.

PIROGUE A dugout boat like a canoe.

POSSIBLES SACK A buckskin bag containing essential items such as a fire kit, eating utensils, small knife, etc.

RAWHIDE Untanned leather made by fleshing, dehairing and drying animal hides.

RENDEZVOUS A gathering of trappers held annually at a pre-determined location in the Rocky Mountains. The rendezvous, at which trappers cashed in their furs and obtained supplies for the coming year, was first held in 1825. The last rendezvous was held in 1839.

SINEW Strands of animal tendon used as thread in native Americans' and frontiersmen's garments.

SNARE A trap which uses a loop of cord or wire attached to a trigger.

TANNING The process of making leather soft, pliable and weather resistant.

TEPEE (LODGE) Portable cone-shaped shelter used by Plains tribes. Originally made from hides, later tepees were made from canvas stretched over wooden poles.

TRADE GOODS Items given to native Americans in exchange for furs. These include utensils such as sewing awls and knives, guns, gunpowder and ammunition and ornaments such as beads and silver or pewter trinkets.

TRADER A frontiersman who made his living trading merchandise to the native Americans in return for furs.

TRAPPER A frontiersman who made his living trapping beaver rather than trading for the furs.

VOYAGEUR Specifically, a trader. On the early frontier, a man who carried trade goods to the native Americans for a licensed trader. Later the term was applied to French boatmen.

Leatherworking

Leatherworking requires few specialized tools. Most materials can be found at home in your workshop or sewing kit. The few special items listed here can be obtained from most hardware stores or leathercraft dealers (look in the yellow pages under crafts or hobbies).

Basic Materials

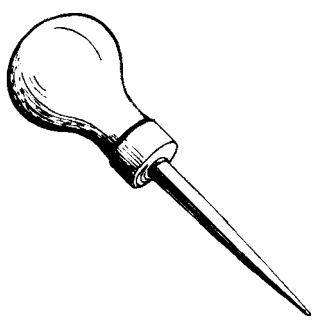
A basic leatherworking kit, suitable for the projects listed in this unit, should include:

scissors or razor knife
awl or leather punch
ruler (steel or wood)
rubber, plastic or rawhide mallet
wood block–at least 6" x 6"
harness needles–2 minimum
glover's needles–2 minimum
waxed linen thread, waxed dental floss or artificial sinew
beeswax
rubber cement
conditioner–neat's–foot oil or mink oil
leather dye (black, dark brown)
heavy paper (grocery bags) or cardboard for patterns

All of these items will fit into a small fishing tackle box. In addition to the items listed above, there are several optional tools that can make leather projects move faster. They are not necessary, however, and in some cases may detract from the "handmade" look of genuine frontier articles.

Leather

Tanned leather must be purchased from a leather dealer. Occasionally shoe factories or shoe repair shops have some leather available for purchase.



Awl

An alternative to purchasing tanned leather is to obtain raw leather and tan it. Often deer hunters discard the hides. By simply inquiring of hunting friends or conservation agents, you may yield enough deer skin for several projects. Check with conservation agents for road-killed woodchucks, raccoons or other animals. A group project could be to visit a local deer check station during hunting season and offer to help hunters skin their game in return for hides. (Instructions on skinning are in the *Hunter Education* guide; instructions on tanning are provided in Project 6 of this unit.)

Tanned leather is sold by weight per square foot. Thus, one-ounce leather weighs one ounce per square foot, two-ounce leather weighs two ounces per square foot and likewise for other weights. One-ounce leather is approximately $^{1}/_{64}$" thick, two-ounce leather is $^{2}/_{64}$" or $^{1}/_{32}$", and the measurement continues to get thicker with heavier weights. Leather is usually sold by the hide, half-hide or by parts such as back or shoulder and charged per square foot.

Intended use determines the type of leather purchased. Common uses and weights are:

belt leather	7-9 oz. cowhide, pigskin, calfskin
handbags	4-10 oz. cowhide or garment leather
garment leather	2-3 oz. buckskin, garment suede, chamois

Leatherworking steps

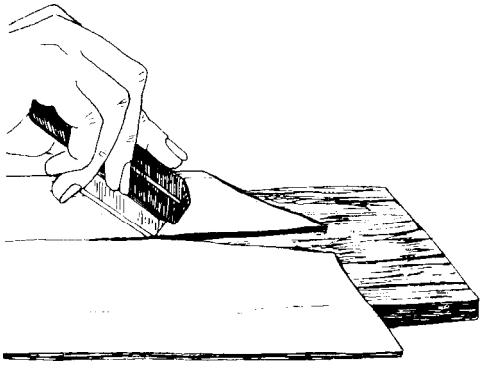
The steps in most leatherworking projects can be grouped as follows: layout, cutout, assembly and finishing. Layout involves making a full-scale pattern of all pieces. Cutout involves cutting the pieces of leather. Assembly includes dyeing the leather, marking and punching the stitch lines and stitching. Finishing includes oiling, polishing and burnishing.

LAYOUT

Begin the project by making patterns of all required pieces. The patterns should be actual size. Cut out the patterns with scissors.

Arrange the pieces on the wrong side of the leather, being careful to minimize waste and to take advantage of the shape of the leather.

Next, attach the paper or cardboard patterns to the wrong side of the leather with rubber cement. (The wrong side is the side that will not be visible in the finished product, such as the inside of garments and bags.) Use the cement sparingly–tack the patterns in place. Be careful not to get any cement on areas of the leather that will be visible in the finished product–especially if the leather is to be dyed.



Cutting leather with a razor knife.

CUTOUT

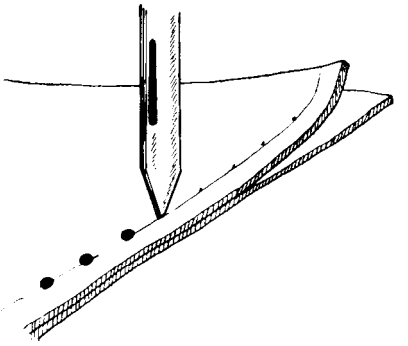
Cut the pieces using a sharp knife or scissors. A razor knife works well. Be sure to provide a backing of wood or cardboard to protect tabletops or floors. Hold the knife or scissors so the cut edge is perpendicular to the face of the leather.

When cutting thick leather, make several passes with the knife, being careful to follow the previous cut.

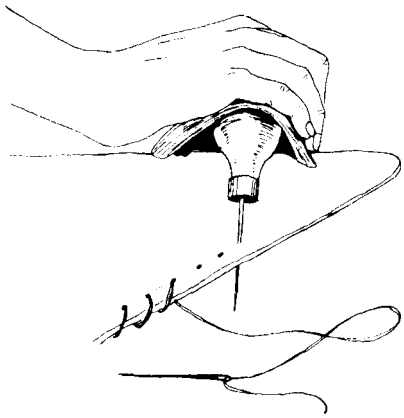
ASSEMBLY

Assembly procedures are generally similar for all projects with one important exception: heavy leather must be pre-punched before stitching. With soft leather, a glover's needle (which is triangular with sharp edges) eliminates the need for pre-punching.

For heavy leather, begin by making the stitch lines l/8 to l/4 inch (l/2 cm) from the edge. Using an awl or punch, make regularly spaced holes through.



Holes made with a leather punch and mallet.



Holes made with an awl

all the leather pieces that are joined. If possible, glue pieces together with rubber cement as they will be stitched. This will assure proper alignment of stitch holes. Consistent holes are important so seams don't pucker. Drive the awl by hand; drive the punch with a mallet.

When punching the leather, strive for uniformity, but recognize that small inconsistencies are the mark of human craftsmanship. Tools are available to make stitching uniform, but these tend to give a machine-made look.

Buckskin may or may not have to be pre-punched. Glover's needles will usually penetrate several thicknesses of buckskin. For thicker buckskin, a sewing awl can be used, punching holes as you sew. Use a thimble and skin pad (folded leather in the palm of the hand) to protect hands while punching. A good leatherworker will hold both needle and awl in the same hand and simply alternate tools as they sew. Do not try to pre-punch individual pieces of soft leather and then join them. The stitch holes invariably will not match, giving the seams a puckered appearance.

Leather should be dyed with a leather dye after the stitch holes are punched. Alcohol-based dyes penetrate well and produce excellent results. Follow the instructions that come with the dye.

To sew a garment, select one of the stitches described in the next section and sew all pieces.

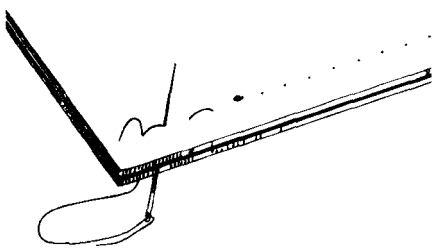
FINISHING

Once all of the seams are sewn, the project is ready for finishing. Finish hard leather by working neat 's-foot oil or mink oil into the leather. Protect exposed edges by rubbing briskly with beeswax. Do not oil buckskin or suede garments.

Stitches

There are several stitches that can be used to sew leather. The most common ones are the running stitch, saddle stitch and whipstitch.

For all stitches, begin by cutting a length of thread about an arm's length. If the thread is not pre-waxed, wax it now by passing it several times across a cake of beeswax. Thread one or both ends of the thread with needles (this will depend upon the stitch). When sewing a single thickness of thread, pass the strand through the needle's eye and pull several inches through. Twist this end around the main thread. When sewing with a doubled thread, pull the strand through the needle until both of the ends match up. Knot the thread with an overhand knot.



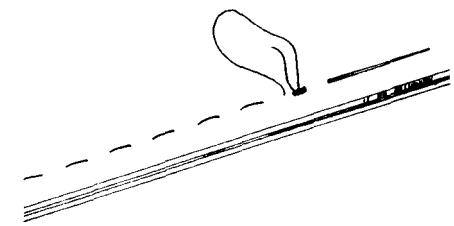
Backstitch

Always begin and end seams by backstitching. Backstitching is not a type of stitch, it is a technique for beginning and ending a seam, or joining a new piece of thread into the seam. The purpose of backstitching is to lock the thread and prevent unraveling at the ends of the seam.

To backstitch, simply take several stitches of whatever type is being used in the opposite direction of the desired seam, then return through the same stitch holes in the direction of the seam. When starting to sew a seam, don't begin with the first hole or at the very edge of the leather. Instead, skip several holes and begin sewing about an inch from the edge. Stitch back to the edge of the leather or first hole. Reverse directions and proceed along the seam until the thread is almost exhausted or the end of the seam is reached. Now backstitch several holes, approximately an inch. If joining a new thread, backstitch so that it begins where the old thread ends. Backstitching should be visible only on close inspection.

RUNNING STITCH

The simplest stitch in leatherworking is a running stitch. Use single or doubled thread and one needle. Simply pass the needle through one hole and then back through the next hole from the opposite side. The finished stitch looks like a dashed line. Small stitches are stronger and look better than large ones. A running stitch can be used for heavy leather or soft leather.

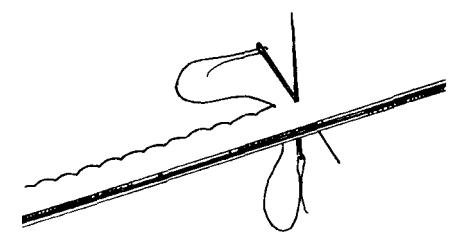


Running stitch

SADDLE STITCH

The saddle stitch requires a single thickness of thread with harness or round needles at both ends. It is recommended for pre-punched stitches since both needles pass through the same holes.

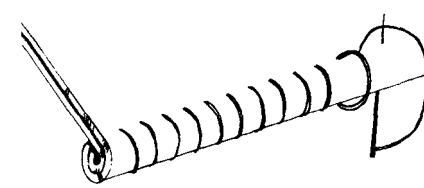
Begin saddle stitch by passing one needle through the aligned holes at one end of the seam. Pull through until there are equal amounts of thread on both sides of the leather. Take one needle and start it through the next stitch hole from the same side of the leather. Start the other needle through the same hole from the opposite side. Grasp both needles and pull through until the stitch is taut. Put equal tension on both needles. Repeat the procedure at the next stitch hole and so on until the end of the seam. If possible, grip the leather pieces between your knees so that the work is perpendicular to the floor. This makes it easier to pass the needles back and forth.



Saddle stitch

WHIPSTITCH

The whipstitch is used for both hard and soft leather. The leather may or may not be pre-punched. Either a single or double strand of thread may be used, but a double strand is preferable. Use only one needle. Pass the threaded needle through the work, and pull all but a few inches through. Move to the next stitch hole and push the needle through, starting from the same side as for the previous stitch. In this way, when the thread is pulled taut, the stitch passes over the edge of the joined leather pieces. The stitching motion for the whipstitch is circular. Keep stitches fairly close together.



Whipstitch

Sewing

The sewing projects in this unit do not necessarily have to be hand sewn. Consider the purpose of the article to be constructed. If the sole purpose of making a drop-sleeve shirt is to have a historical garment to wear, machine sewing may be appropriate. A machine will perform the task easier and quicker, provided you have some experience with sewing machines.

Remember, however, that sewing machines did not arrive in Missouri until after the frontier era had passed. Most of the garments used by frontier Missourians were handmade. If the purpose for constructing a piece of clothing includes gaining an appreciation for a vanishing skill, hand-sewing is a must.

Cloth garments in early Missouri were handmade from necessity. Sewing skills were needed to make and repair garments of cloth or skin. Some acquaintance with needle and thread was part of every frontier dweller's experience.

Although clothing was simple in construction, it would be a mistake to conclude that garments were primitive–some were highly tailored. Only basic skills for sewing are presented here, however. Tailoring is beyond the scope of the guide. Additional information may be gained using the resources at the end of this guide.

Basic Materials

needles (betweens or sharps size 8 to 12)
thread (mercerized cotton for natural fabrics, polyester for synthetics)
straight pins
cloth tape measure
scissors
thimble

Fabric

Cotton and wool broadcloth, flannel and linen were all commonly used materials on Missouri's frontier. These were often coarsely woven (scratchy) fabrics, heavier than their modern counterparts. Solid colors were not as brilliant as today and fabric designs were simpler, using only two or three colors.

To obtain the appropriate "look," visit a museum and study the garments. If possible, ask to feel some of the fabrics. Sketch the designs, noting colors and construction. Do not rely on television or movies for appropriate clothing styles. Hollywood accuracy ranges from excellent to pure fiction.

Purchase fabrics and sewing supplies at a fabric shop. For historically accurate fabrics, consult the resources listed in the back of this guide.

Techniques

Clothing construction follows the same basic procedure as other types of construction projects–layout, cutout, assembly and finishing.

LAYOUT
Layout consists of making the pattern. Use old newspaper or tracing paper. Pin the pattern pieces to the fabric, taking care to conserve material. On patterned fabrics, consider how the pattern should appear when laying out pieces. (For example, on a striped shirt, if the stripes on the body are vertical, the stripes should run along the sleeves rather than around the arm.)

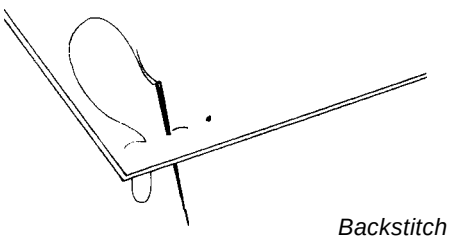
CUTOUT
Cut pieces with a sharp pair of scissors.

ASSEMBLY
Assemble all pieces using straight pins to hold them together where they will be sewn. Sew using an appropriate stitch (see stitches section).

FINISHING
Finish by adding buttonholes and buttons (zippers hadn't been invented yet).

Sewing

Begin by threading the needle. Use a double thread with the ends knotted together. Start most stitches on the wrong side of the fabric. (The wrong side of the fabric will become the inside of the garment; the right side will become the outside.) Push the needle in at one end of the intended seam. Pull the needle through until the knot is snug against the wrong side of the fabric. If the knot pulls through, it may be necessary to backstitch (see drawing).



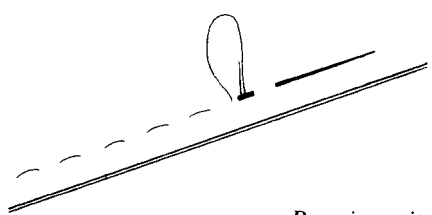
Backstitch

To backstitch, start slightly in from one end of the intended seam. Push the needle through from the wrong side. Take a stitch toward the closest end of the seam (away from the direction of the seam). Push the needle through and angle the tip toward the direction of the seam. Continue to push through, pick up needle and continue. The motion here is to have the needle perform a series of backflips as it moves along. Individual stitches are taken in the opposite direction of the intended seam.

Continue stitching, using the desired stitch, until the end of the seam is reached. At the end of the seam, backstitch several stitches and cut off the excess thread, again, on the wrong side of the fabric. If more than one length of thread is required to sew a seam, backstitch as the first thread nears the end. Start a second thread the same way as the first thread and continue to the end of the seam.

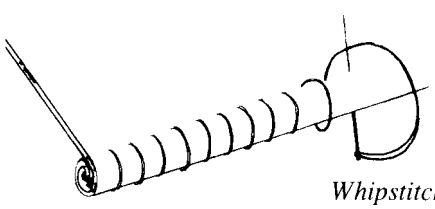
Stitches

RUNNING STITCH
Start needle through from the wrong side. Push the needle in and out through the fabric, making small stitches. The motion is to actually wiggle the fabric onto the needle. What should result is a series of evenly spaced, tiny stitches. Pay attention to thread tension to avoid bunching the fabric or leaving loose areas.



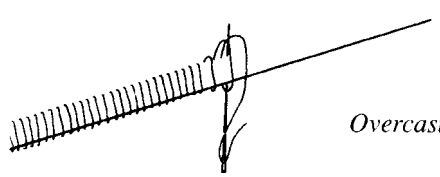
Running stitch

WHIPSTITCH
Roll the edges of the fabric together. Start the needle from the wrong side and spiral the needle and thread around the rolled fabric.

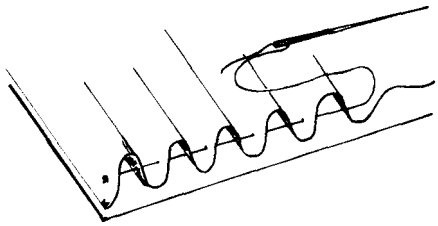


Whipstitch

OVERCAST
This stitch is used to finish the raw edges of material so they will not unravel. Start from either side of the fabric. Take the needle over the raw edge, push through the fabric about 1/4 to 3/8 inch (1/2 to 1 cm) in from the edge and continue. The result is a series of diagonal stitches crossing over the fabric edge. Be careful not to bunch fabric.



Overcast

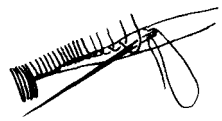


Gathering stitch

GATHERING STITCH

Some garments have sleeves, necks or waists that are gathered. That is, one piece is larger than the piece to which it will be joined. In order to make the seam, the longer edge must be gathered until its length matches the shorter edge of the seam. To gather the longer edge, run a series of loose, evenly spaced running stitches, putting tension on the thread so the fabric bunches or gathers between stitches. The tension will determine the size of the gathers while the number of stitches will determine the number of gathers. When the gathered edge matches the length of the other edge, the fabric pieces can be pinned and sewn as with other seams.

Marking and cutting



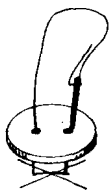
Finishing hole

BUTTONHOLES

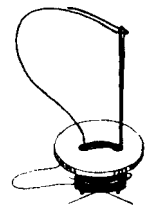
Mark the position of the buttonhole(s) with a pin at each end. Cut a slit between the two pins. Start the needle through from the wrong side. Push through and carry the needle over the edge of the fabric and push from the wrong side again. Bring the needle through, guiding it through the loop of thread formed by the previous stitch. Repeat to the end of the buttonhole. Stitches should be short and closely-spaced. To finish, pass the needle through the knot of the first stitch and draw the two sides of the buttonhole together. Take several stitches back and forth at the end of the buttonhole for added strength.

SEWING BUTTONS

Knot the thread. Start by making one stitch where the button will be located, beginning from the wrong side. Pull the needle through the fabric, then guide it through a hole in the button from the back. Pass the needle several times up through one hole in the button and down through another. Repeat for any other holes in the button. Do not pull the button tight against the fabric. Leave about l/8 inch (3 mm) of slack so you can button your garment. When enough threads are through the button, finish with the needle between the button and the fabric. Wind the thread around the shank several times. Pull tight and finish with several tightly spaced backstitches.



Sewing button



Finishing

To make authentic buttons, use a handsaw or table saw to slice cross sections (l/4-inch or l/2-cm thick) of deer antler or hardwood sticks. Drill two or four holes in the center of each button and sew as explained.

Metalworking

Basic Materials

A metalworking kit suitable for the projects in this unit should include the following tools:

- protective eyewear
- hearing protection
- hammer (ball-peen is preferred)
- rubber mallet
- file, flat mill bastard with handle
- file, triangular with handle
- hacksaw
- tin snips or aviation shears (aviation shears cut easier and come in right- and left-hand models)
- scribe or scratch awl
- pliers
- heat retention material (such as Fyrex paper or other asbestos sheeting substitute)
- propane torch with pencil tip
- solid wire solder
- paste flux
- 3 hardwood blocks for bending metal (each approximately 1" x 1" x 10")
- 2 C-clamps (6")
- graph paper
- ruler
- T-square or combination square
- emery cloth
- steel wool
- optional: brake bar–This tool is used for bending metal; it is considerably more expensive than hardwood blocks.

In addition you will need a bench or machinist's vise and a sturdy work surface. Like leatherworking tools, most items listed will fit in a small tool box.

The primary difference between the frontiersman and the native Americans he encountered was that the native people knew little or nothing about metals, but the trader, trapper or mountain man depended on metal goods (knives, guns, traps, sewing needles) for his livelihood and survival. Because he lived far from trade sources and blacksmiths, the frontiersman's comfort and safety also depended on his skill in metal repair. To venture into the wilderness alone required him to be a blacksmith as well as tailor, hunter, carpenter, butcher and more.

Metalworking tools can be purchased at a hardware store. Supplies such as tin (black iron), sheet metal and sheet brass can be obtained either from a hardware store or by consulting the sheet metal heading in the yellow pages of a large city's phone directory.

Metal

Metal used for projects in this unit falls into several categories. For projects such as a steel striker, old files and saw blades are superior. They are made from high carbon steel that can be worked easily and hardened well.

For projects such as the candle lantern, sheet metal, sheet brass or tin are best. Brass and sheet metal must be purchased. The best source of tin is old tin cans. Make sure the cans are not aluminum or alloy. True tin cans have crimped seams fastening the ends to the side. The side is one piece of metal soldered to form a cylinder. Soup cans and fruit juice cans are usually tin.

Metal comes in gauges indicating thickness. The lower the number of the gauge, the heavier the metal. For example, metal ductwork in a home heating system is approximately 24 to 28 gauge. This is probably the heaviest metal necessary for any project in this book. Tin cans are suitable for light projects–a candleholder, for example.

Old files and saw blades can be obtained from junk shops, flea markets and garage sales. Their cost should be almost nothing (unless they are antiques which should be avoided anyway).

Metalworking steps

The steps for completion of a metalworking project are the same as those for leatherworking, woodworking and sewing.

LAYOUT

First lay out the design on paper or cardboard. In many cases, layout can be done right on the metal without using a separate pattern. Use a straightedge and combination square to draw lines. Use a scratch awl to scribe the lines. Use a pencil to indicate for each line whether it is a bend line or a cut line.

Safety reminders:
Freshly cut metal is very sharp. File all edges and handle with care.

For your safety, be sure to wear proper hearing and eye protection (such as goggles or safety glasses).

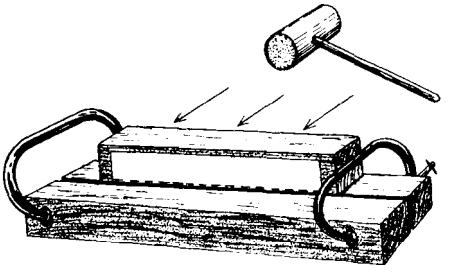
CUTOUT

Next, cut out the pieces with a hacksaw or tin snips. Lightly file freshly cut edges with the flat file to remove any burrs or irregularities.

If you are using hardened metal, it must be softened or annealed before you can cut and "work" it. To soften, simply heat the metal to glowing red with the propane torch; then allow it to cool slowly. While heating, move the torch over the entire piece. Once the metal has cooled, it can be cut or bent with much less risk of breaking.

ASSEMBLY

Drilling–Assemble the project by first drilling any necessary holes. Before drilling, mark the center of the hole by dimpling the surface with a nail or metal punch. This guides the drill bit and prevents it from wandering.



Homemade bending break

Bending–Next, make any bends required. Bends are accomplished in two ways. The simplest way is to use the brake bar or bending brake. Put the metal in the tool and align the scribed bend line with the proper marks on the brake. Work the handle and the bend is made.

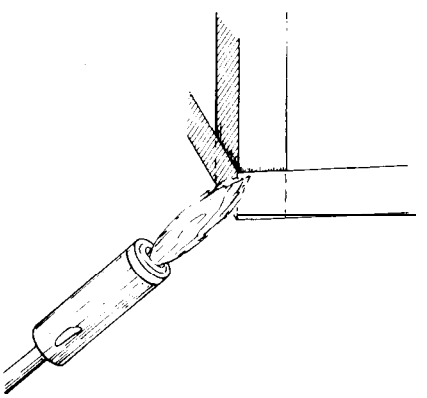
If a bending brake is not available, three hardwood blocks will perform the same task. Be sure the blocks are square. Clamp the metal between two of the blocks using C-clamps. Before clamping, align the blocks along the bend line. Put the entire assembly in a vise. Lay the third hardwood block on top of the clamped block on what will be the outside of the bend. With a hammer or mallet, begin tapping the free hardwood block so the metal begins to bend. Continue, working back and forth along the block until the angle is formed.

Soldering–Use a propane torch to solder your pieces. (A soldering iron such as one used in stained glass or electrical work does not generate enough heat.) First clean the area to be soldered until it shines. Use fine sandpaper, emery cloth or steel wool to buff it. Apply a thin film of paste flux to any surfaces to be joined in the area where the solder should adhere.

After fluxing, lay the pieces in the position they should be in when finished. They should be resting securely in this final position. If necessary, use clamps to hold the pieces in position. The parts should be secure enough that an accidental bump of the torch cannot affect alignment.

If the pieces must be clamped into position, pad the clamp jaws with heat retention material. Otherwise, the clamps will absorb the heat from the torch and prevent the metal pieces from getting hot enough to form a good joint.

With the pieces fluxed and securely positioned, apply heat to the metal near the intended joint. After several seconds of heating, touch the solder wire (unroll about 6 inches or 15 cm and hold so it projects from the palm of your hand between your thumb and forefinger) to the seam where the metal pieces overlap. If the metal is hot enough, the solder should melt immediately and flow into the fluxed area. If the solder does not melt immediately, remove it and apply more heat. Do not heat the solder directly with the torch. The result will be a weak joint.



Solder a joint

The secrets of a good solder joint are (1) metal heated sufficiently so solder flows easily; (2) a clean, well-fluxed joint; and (3) a minimum amount of solder. Globs of solder indicate a poor, and probably weak, joint. Remember–the object of soldering is to heat only the parts being joined. Anything touching the metal will draw heat from the area being joined. Therefore, always pad clamp jaws, pliers and vise jaws with heat retention material to prevent heat loss.

Metal is hardened by heating it to a high temperature, then cooling it suddenly. Hardening works best with iron or steel of fairly high carbon content, such as metal used in files and saw blades.

FINISHING

To harden or reharden metal, heat until the piece glows bright red. Then, holding the piece with pliers and padding of heat retention material, drop it quickly into a container of cold salt water.

Metal is polished by rubbing briskly with emery cloth and then crocus cloth. Sandpaper and steel wool will also remove file marks and scratches.

Woodworking

Basic Materials

TOOL LIST

claw hammer
backsaw or dovetail saw
protective eyewear
tape measure
steel square (framing square or try square)
hatchet

Safety reminder:
For your safety, be sure to wear proper eye protection (such as goggles or sqfety glasses).

Frontiersmen needed only rudimentary woodworking skills in the wilderness. Cabinetry and furniture-making were necessary only at fixed posts. Most items were brought in from settlements. Hewing a dugout from a cottonwood log or assembling a fur press was more the style of carpentry used by fur traders and trappers. Still, the skills necessary to build boxes, wagon beds and boats were useful.

The woodworking projects presented in this unit require only basic skills and tools. The projects are items found among the accoutrements of wilderness travelers. For additional ideas, consult the library for sources on early American furniture and accessories.

Steel Striker

Construct a working replica of the steel strikers used by frontiersmen.

Materials:

protective eyewear
hacksaw or cold chisel
ball-peen hammer
machinist's vise
propane torch
heat retention material (such as Fyrex paper or other asbestos sheeting substitute)
vise grip pliers
salt water
old flat file (approximately 8" x 1" x l/4" file or 20 cm x 2.5 cm x .5 cm) for striker file

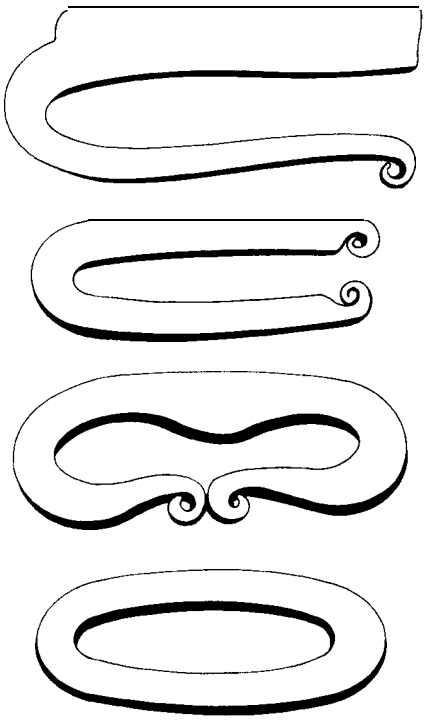
Procedure:

1. Refer to general instructions for metalworking. Soften the file by heating it to a glowing red and letting it cool gradually. While it is still warm, either saw the file in half lengthwise or lay it on a hard surface and split it using the cold chisel and hammer. In either case, the end result should be two pieces of metal about 8 inches (20 cm) long by l/2 inch (1.5 cm) wide by l/4 inch (.5 cm) thick.

2. After putting an end of the metal piece securely in the vise (be sure jaws are padded with heat retention material), grip the exposed end of the file with the vise grip pliers. Heat about l/3 of the length from the upper end of the file until it is cherry red. Slowly bend the metal into the shape shown. Be sure not to twist the metal while bending. Pause occasionally to reheat the metal. When one bend is made, let the file cool and reverse it in the vise. Now, make a bend in the other end.

3. When the striker is properly shaped, file the outside surface smooth. Then re-harden the metal by heating it to glowing red (an orange-red) and plunging it into salt water.

4. Test the striker with a reliable piece of flint. It should throw a shower of sparks; if not, repeat the hardening process.



Striker shapes

Charcloth

Note: It is important to use only 100 percent cotton to make charcloth. Fabrics containing synthetic fibers will not char. Be sure that the inside of the can is clean and without any paint or shellac residue.

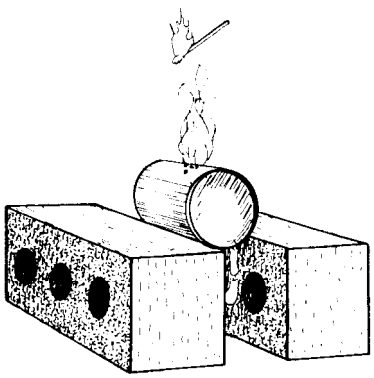
Make a cloth that can be used for starting fires with primitive methods such as flint and steel or bow and drill.

Materials:

100 percent cotton cloth (old T-shirts) cut into 1" x 1" squares (2.5 cm x 2.5 cm)
tin can with closable lid (old shellac can)
2 bricks
propane torch
kitchen matches

Procedure:

1. Punch two or three small holes in the side of a tin can that has been heated thoroughly to burn off any residue in the can.
2. Pack the can loosely with cotton squares and replace the lid.
3. On a flameproof surface, lay the two bricks side by side leaving 1 to 2 inches (2.5 to 5 cm) of space between them. Lay the can on its side, supported between the bricks, with the holes facing up.
4. Begin heating the can with the propane torch. Move the torch to heat the can evenly over its entire surface. Smoke and vapor should begin to escape through the holes.
5. Ignite this vapor with a kitchen match (not the propane torch, which will blow out the flame) and continue heating the can. Try to keep the vapor flame lit.
6. When the flame goes out and cannot be relit, stop heating the can and allow it to cool.
7. Open the can and remove the charcloth. If the charcloth is brown it has not been heated sufficiently and will have to be returned to the can for more heating. If the cloth is brittle and crumbles at the slightest touch it has been "overcooked" and must be discarded.
8. Test the charcloth with a flint and steel. A glowing spark should catch in the cloth and spread.
9. Store finished charcloth in an airtight jar or sealable plastic bag.



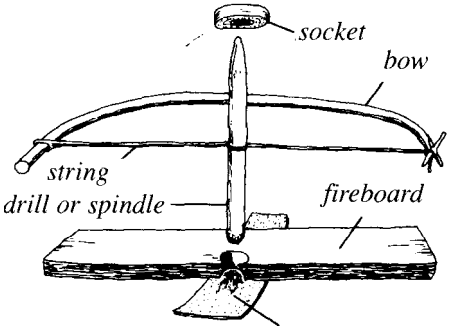
Lighting vapor from smoking cloth

Bow and Drill Fire Starter

Experience techniques used by native Americans for lighting a fire before steel was introduced. These methods can be used in survival situations today.

Materials:

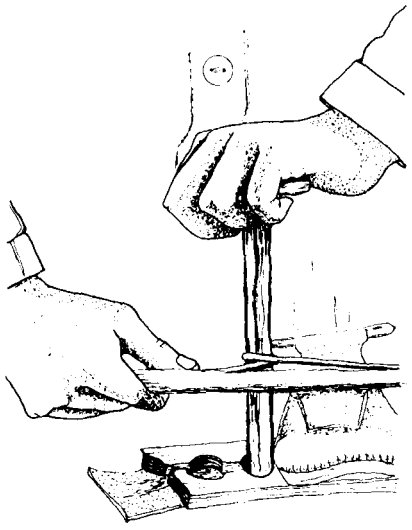
dowel (l/2" x 12" or 1 cm x 30 cm)
pine or hardwood board (1" x 2" x 12" or 2.5 cm x 5 cm x 30 cm)
pine board (1" x 2" x 4" or 2.5 cm x 5 cm x 10 cm)
green stick such as willow (1" diameter x 2' or 2.5 cm x 60 cm long, shaped as shown)
length of leather thong
grease



tinder or charcloth underneath (spark tray)

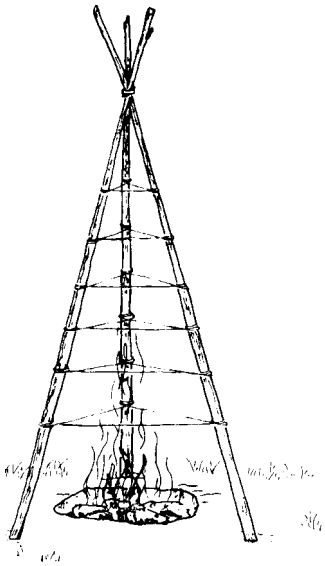
Procedure:

1. Round edges of 1" x 2" x 4" board so that it fits comfortably in your hand.
2. Drill or carve a 1/2-inch (1 cm) diameter shallow socket in the center of the piece.
3. Round one end of the dowel and sharpen the other end to a short bevel.
4. Notch the footpiece as shown and drill or carve a shallow depression.
5. Assemble the bow and drill illustrated. Note that the thong is wrapped once around the drill so that it spirals upward toward the handle.
6. Lubricate the headsocket with grease (ear wax will do in a pinch).
7. Place one foot on the footpiece. Kneel so that the opposite knee is on the ground.
8. Sprinkle tinder in the notch of the footpiece.
9. Insert the bow and drill in the socket of the footpiece. Insert the top of the drill in the headsocket.
10. Steady the hand holding the headpiece against the shin, while applying light pressure on the headpiece. Slowly saw bow back and forth. If drill does not turn, increase tension on the thong. Gradually increase speed until the bottom of the drill begins to smolder.
11. When it is smoking well, give 20 or so fast strokes with the bow and pull the drill quickly from its socket. There should be a small pile of smoldering punk in the notch with the tinder.
12. Gently fold tinder over the smoldering punk and blow. As the volume of smoke increases, keep blowing until the tinder bursts into flame.
13. Do not expect instant results; this technique takes practice. Using a bow and drill will not always result in a fire, but it will create a deep affection for matches.

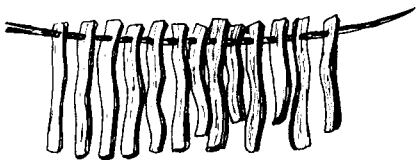


A bow and drill creates fire by friction. The drill and fireboard should be the same wood.

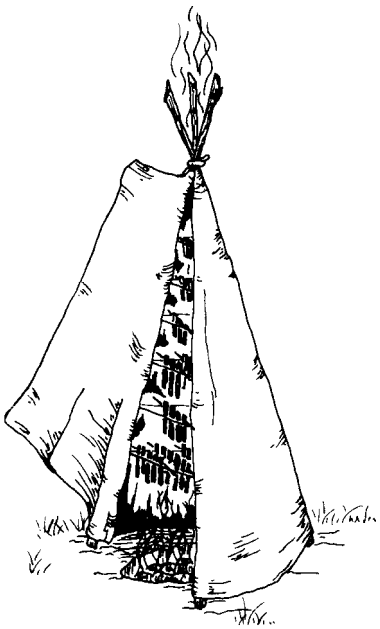
Smoker



Smoker tripod ready for meat



Strips of meat strung for smoking



Finished smoker (door is closed during smoking)

Construct a means of drying and smoking meat to taste a type of food frontiersmen ate.

Materials:

3 poles (6’ to 7’ or 2 m long)
heavy wire (25’ or 7.5 m)
canvas tarp (approximately 6’ x 10’ to 15’ or 1.8 m x 3 m x 4.5 m)
willow skewers (approximately 2’ or 60 cm long)
hardwood chunks or chips soaked in water

Procedure:

1. Dig a fire pit approximately 6 to 8 inches (15 cm) deep and 12 to 18 inches (40 cm) in diameter.
2. Build a fire using wood that will make good coals (oak or hickory). Maintain the fire until you have a good bed of coals.
3. While the coals are building, construct a tripod using the three poles and 2 to 3 feet (60 to 90 cm) of wire. Lay the poles together and wrap tightly with the wire near one end. Stand the poles and spread into a tripod over the fire pit.
4. Run strands of wire around the tripod at several heights starting about 18 inches (45 cm) above the ground. Wrap the wire once around each pole to secure it.
5. When ready to begin smoking, skewer meat onto the willow sticks and lay the sticks across the wires surrounding the tripod.
6. Cover the coals with a layer of moist hardwood chips or several chunks of soaked hardwood.
7. Wrap the tripod with canvas to exclude most draft.
8. Watch the smoker constantly, adding damp wood as needed. Do not leave the smoker unattended. If the wood dries completely, it may burst into flames taking the canvas and meat with it. Allow at least 4 hours to smoke thin strips of beef. More time may be required depending on the weather and condition of the fire. Finished meat should be leathery dry, but not brittle. There should be no pinkness or moisture inside the strips.

Frontier Foods

Experience the kinds of foods eaten on the frontier and the methods used to prepare them.

Tips on campfire cooking:

- Coals should do the cooking on a campfire. Flames do not serve any function except to create coals. The only exception is when baking by reflected heat, a hearty blaze is needed.
- Skillets can be set directly on coals or raised slightly between sticks of wood (be careful, these will eventually burn through). As coals burn down, the skillet can be temporarily moved while more coals are raked from the campfire.
- Dutch ovens can be handled the same way, except coals are added to the top of the oven also.
- Pots can be suspended from an iron tripod over the campfire.

Note: Recipes for cooking game can be found in Cy Littlebee's Guide to Cooking Fish & Game, *available from the Missouri Department of Conservation.*

Beef Jerky

several pounds of flank steak
salt and seasoning salt
pepper

INSTRUCTIONS

Trim fat and slice steak with the grain into l/4- to l/2-inch (1 cm) strips. Lightly salt strips or soak them overnight in a solution of water and 2 tablespoons salt. Arrange strips on skewers, season with seasoning salt and pepper and hang in the smoker (see Project 4) or lay them on oven racks in an oven set to its lowest temperature (175 to 200° F or 75° C), with door slightly ajar to permit moisture to escape. (If you are using an oven, place a shallow pan under the meat to catch drippings.) Drying time varies. In an oven, 8 to 10 hours is usually sufficient. Dried meat should be tough and leathery, not quite brittle. Store in plastic or cloth bags in a cool, dry place.

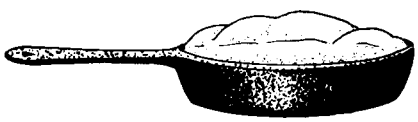
Pemmican

Note: This is an extremely high-energy food. A little goes a long way.

equal quantities jerky and animal fat
dried berries (optional)

INSTRUCTIONS

Pound jerky to break up fibers. In a skillet, melt fat, making sure it does not boil or smoke. Stir pounded jerky into fat, along with dried berries, if desired. Let fat cool and cut pemmican into candy-bar-sized chunks. Store in plastic, cloth or rawhide bags in cool, dry place.



Bannock or Frying Pan Bread

1 cup flour
1 tsp. baking powder
1/4 tsp. salt
water

INSTRUCTIONS

Thoroughly mix dry ingredients. Add just enough cold water to make a stiff dough. Working dough as little as possible, form a l-inch (2.5-cm) thick cake. Lay the cake on a greased, pre-warmed skillet. Brown the bottom of the cake lightly and flip or turn with a spatula to brown the other side. When both sides are lightly browned, prop the skillet in front of the fire and let it bake. Test for doneness by thumping the cake with a spoon handle or stick. A hollow ringing sound indicates doneness. An alternative test is to jab the cake with a twig or matchstick. If the twig comes out clean (no clinging dough), the cake is done.

Hoecakes or Johnnycakes

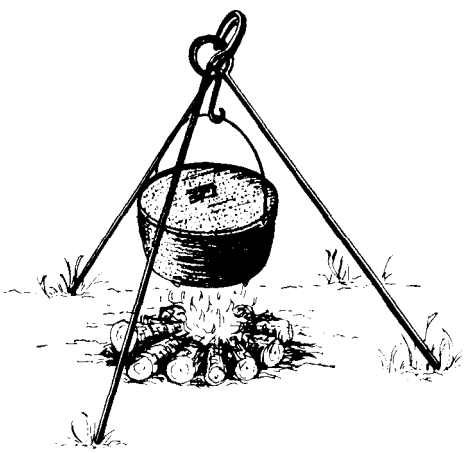
1 cup white cornmeal
1/2 cup flour (optional)
1/2 tsp. salt
water

INSTRUCTIONS
Combine the dry ingredients and mix well. The flour is optional, but it will improve the texture of the cake. Add just enough cold water to make a stiff batter. Drop large spoonfuls of batter onto a lightly greased skillet and cook slowly.

Ash Cakes

1 cup white cornmeal
1/2 cup flour (optional)
1/2 tsp. salt
water

INSTRUCTIONS
Mix dry ingredients. Add enough cold water to make a firm dough. Form the dough into thin cakes. Clear coals from an area of the campfire and lay the cakes on the hot earth. Rake coals and ash over the cakes and let them bake for about five minutes. Test for doneness by thumping the cake with a spoon handle or stick. A hollow ringing sound indicates doneness.



Pea Soup

1 lb. dry green split peas
meaty ham bone or 1/2 lb. chopped pork
1/2 tsp. salt
1/4 tsp. pepper
water

INSTRUCTIONS
Rinse peas. In a kettle or Dutch oven, mix peas, pork, salt, pepper and 8 cups of water. Bring to a boil. Reduce heat, cover and simmer for 1 l/2 hours, stirring often. Remove ham bone and clean meat from bone. Makes 8 servings.

Basic Stew

1 meaty soup bone (such as beef shank)
salt
assorted vegetables
(carrots, potatoes, onions, celery, tomatoes and others)
chopped game meat (optional)
water

INSTRUCTIONS
Put soup bone in 8 to 10 cups of cold water. Bring to a boil. Reduce heat and simmer for several hours. Remove soup bone and trim off any meat. Return trimmings to soup pot. Add assorted vegetables whole, chopped or sliced. Simmer for one hour or as long as you like, replacing liquid as it evaporates. Season with salt, pepper, bay leaves, garlic or other seasonings. If meat such as elk or deer is available, chop some up and throw it in. You can't hurt it.

Indian Tanning

Learn a historical tanning technique that uses only natural materials and produces superior leather.

Materials:

fresh hides (see methods)
animal brains or neat's-foot oil
scraper (knife or crooked knife)
wooden frame (approximately 4' x 6' or 1.2 m x 2 m made from 2" x 4" wood)
four 30' (9 m) lengths of nylon cord (l/8" or l/2 cm)
20-gallon (75 liter) plastic trash can
latex or rubber gloves

For information on modern tanning methods, see Trapper Education.

Procedure

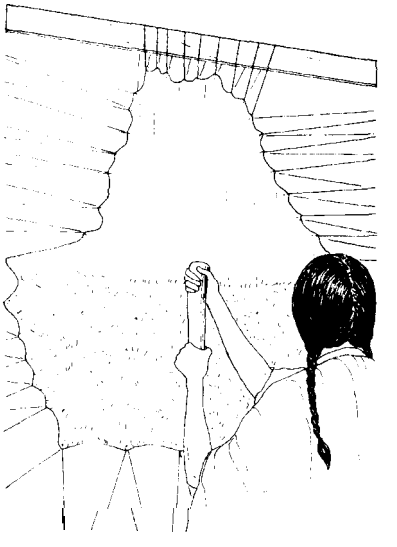
1. Obtain fresh deer or elk hides from sympathetic hunters or from butcher shops that handle wild game. Butcher shops may have pigskins available also. If possible, flesh the hides while they are still fresh. Connective tissue and fat will come off fresh hides much easier. If hides will not be worked immediately, fold flesh side in and then roll or fold and freeze solid until ready to use. The tanning process requires at least three days, so don't begin unless you can be near to watch and work with the hides.

2. Place hides in a 20-gallon plastic trash can, weight down with rocks and cover with cool water. Make sure hides are completely submerged. Check periodically through the day and change the water if it becomes cloudy. Never soak it more than 12 hours without changing the water. Soak for one to three days. Avoid oversoaking because the hair will begin to slip.

3. To stretch, make a frame from 2" x 4" lumber. The frame should be a foot larger than the hide on each side. Lace the hide to the frame by running nylon cord through holes spaced 3 to 4 inches (7 to 10 cm) apart along the edges. Use a knife point or awl to make the holes. Begin lacing at the head end and lace loosely at first. At the end of each side, tie the cord off with half-hitches. After the lacing is completed, go back and tighten it until the hide is taut. It is easier to lace the hide to the frame while it is lying on the ground.

4. Flesh the hide by using a sharp knife or scraper blade to remove fats and other tissues from the stretched hide. Lean the frame against a tree or building (preferably in the shade) and begin scraping at the head end. Avoid cutting into the hide. The finished hide should be pink or white. Tighten the lacing so the hide remains taut. Allow the hide to air dry where there is good ventilation. The dried hide is rawhide which will keep indefinitely.

Stretching the hide on a frame



Scraping hair from the hide

5. Dehairing the hide is necessary to make buckskin. (If you wish to tan the hide with hair on, omit this step.) Start with a sharp scraper. Clean a section of the top of the hide by scraping sideways. Scrape downward with long strokes in the same direction that the hair lies. Hair and the top layer of skin should come off together. Sharpen the scraper as needed.

6. For braining, use brains obtained from a butcher shop or grocer. Two pork brains should be sufficient for a deer hide. Neat' s-foot oil may be substituted for brains since it is a natural oil extracted from marrow. Boil the brains, then cool in a cup of water for about 15 minutes. Let them cool until they are just slightly warm and squeeze them between your fingers to remove the membranes. Rub the brains onto both sides of the hide as if they were a bar of soap (flesh side only if hair is left on). When all portions of the hide are covered with the paste, use a large brush to apply the broth in which the brains were cooked. Leave the hide in a shaded place for half a day. You can also make a solution of brains and water (cream consistency) and soak hides, squeezing solution through the hides.

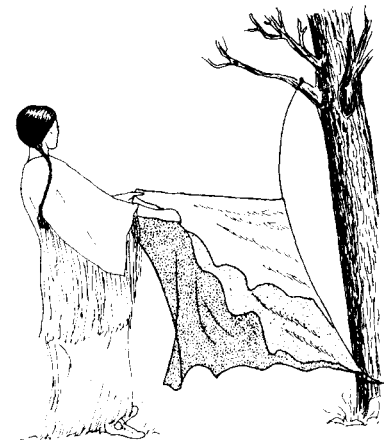
7. Soak again by first dampening the hide with warm water (use a paintbrush). When the hide is pliable, unlace it from the frame and soak it in lukewarm water for 24 hours. If tanning with the hair on, do not unlace the hide. Instead, cover the flesh side with warm wet rags and allow the hide to soften.

8. To re-stretch, remove the soaked hide from the water and lace it to the frame again. Use a 5- to 6-inch (12 to 15 cm) blade of wood or metal to squeegee water from the hide. While the hide is drying, continue to remove water using the scraper. Keep the hide stretched by applying pressure on the scraper as you scrape. Keeping the hide stretched while it dries is essential to getting a soft tar.

9. Move the hide into the sun or turn a fan on it to dry. Continue to scrape or knead the hide with your hands until the hide feels warm and slightly damp. Cut the hide from the frame with a knife, leaving an inch margin that includes the lacing holes attached to the frame.

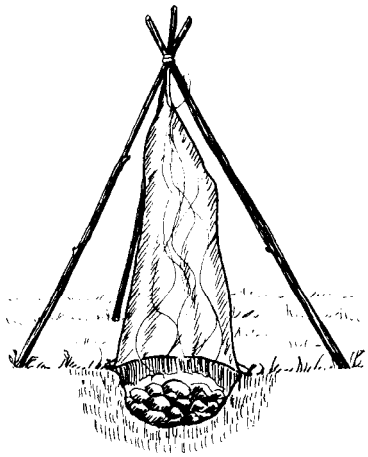
10. Rubbing is done by tying one end of a rope (l/2-inch diameter) to a tree limb that branches at 6 or 7 feet (2 m) from the ground. Tie the other end of the rope at the tree's base. Make the rope tight, but take care not to damage the limb or tree.

11. Pass the hide around the rope and grasp the ends on both sides, beginning at the top. Pull back and forth, causing the hide to stretch over the rope. Re-grip the ends slightly lower and repeat. Continue until you reach the bottom of the hide. Rotate the hide 90 degrees (so the edges are now the ends) and repeat the stretching.



Stretching and softening the hide

12. Now repeat the procedure until the hide is dry and soft. Remove and store the hide for several hours. If it begins to feel moist again (a result of water coming to the surface from within the hide), rub it over the rope. The finished hide should be dry, fluffy and white.



To waterproof the hide, it may be smoked. Sew the top and side of the hide together to form a bag. Suspend the bag over a smoldering hardwood fire (use green or rotten wood). The fire should be placed in a pit 6 to 8 inches deep and no more than a foot in diameter. Build up a bed of coals, then add the wet wood. Make sure the bag completely covers the fire pit with the bottom held in place by rocks.

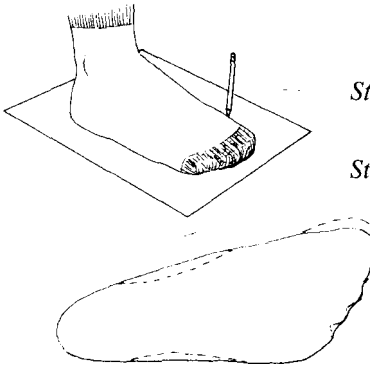
Check the hide periodically for color and to make sure it does not burn. When the desired shade of brown is reached, turn the bag inside out and smoke the other side. After smoking, roll the hide in a paper bag for a day to cure. Smoked buckskin remains pliable after wetting. This makes it especially suitable for garment leather.

Soft Sole Plains Moccasins

Make a type of shoe worn by native Americans and travelers on Missouri 's frontier.

Materials:

2 pieces of leather for moccasins
leather for tongues
2 laces
needle and thread

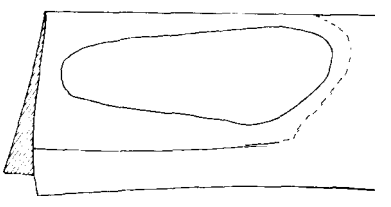


Step 3, 4

Procedure:

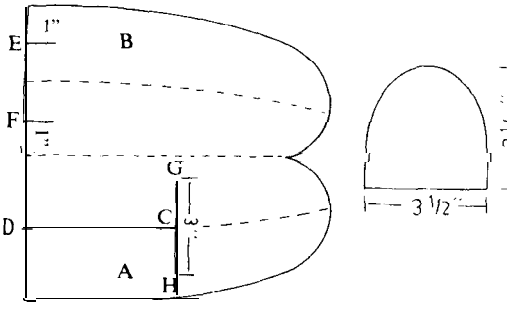
1. Trace your stocking foot onto a piece of heavy cardboard. It is best if someone else does this. Be accurate.

2. Round out the toe line and arch lines as shown in the illustration at right. Cut out the footprint.



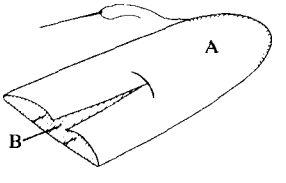
3. Take a piece of heavy paper, large enough when folded, to use as a pattern. Fold it in half, then lay the footprint down upon it as shown and trace around it.

4. Draw the moccasin pattern as shown. Be sure the distances between your footprint and the edges of the fold, and the footprint and the other lines, are as shown. If you have a very thick foot, you may wish to add l/8 inch (3 mm) around.



5. Cut out the moccasin pattern, then unfold and lay out as shown.

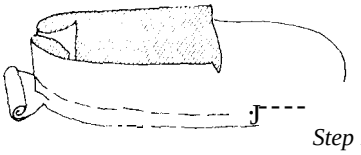
6. Draw a center line between the two sides of the pattern. Fold side A over to the center and crease. Do the same for side B. On side A, draw a line from C to D (half of moccasin length). On side B, measure 1 inch (2.5 cm) on either side of the crease and make two 1-inch (2.5 cm) lines–E and F. Now fold the pattern crosswise to make a horizontal crease in the middle of the pattern. Make a 3-inch (8 cm) horizontal line–G, C, and H–as shown. Cut out around the outside line, then cut the other lines you drew so as to have a complete pattern.



7. Cut out a tongue pattern as shown.

8. Cut out the moccasins. Be sure that the stretch of the hide goes around your foot. Also be sure to cut a right and left, suede out.

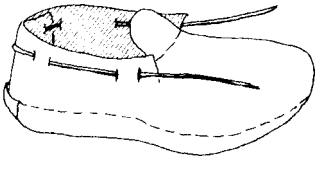
9. Fold your first moccasin–suede side in. Sew it around the toe and down the side to the heel.



10. Turn the moccasins right side out and try them on. Work your toes forward until the fit is right. Pinch the heels together and mark them. Now trim and sew as shown.

Step 11, 12

11. Sew the tongue in.



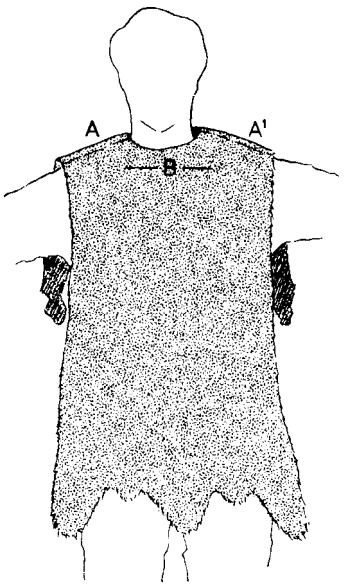
12. Cut four sets of 3/8-inch (1 cm) slots in the cuff of each moccasin and thread the

Buckskin Shirt

Sew a type of shirt worn by outdoorsmen on Missouri's frontier.

Materials:

Review general instructions on leatherworking and gather items listed under basic materials.



Procedure:

1. Obtain three medium to large deer hides.

2. Hold one hide against the front of the individual who will wear the shirt. Hold so the hind legs of the hide hang and the forelegs lay over each shoulder.

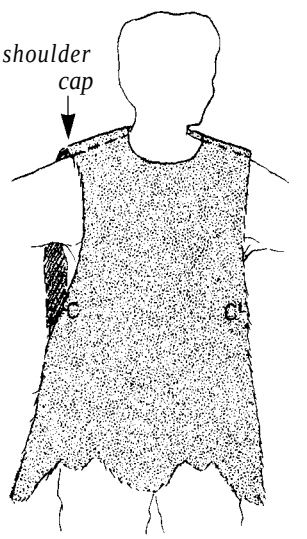
3. Draw lines A and Al across the top of the shoulder. Cut along both lines. The position of A and Al and the width of B will depend on the desired shirt length and size of the wearer. The shirt should hang at least to mid-thigh. Be careful that cuts A and Al are symmetrical and B is centered on the hide. (To assure symmetry, it may be desirable to fold the hide in half lengthwise and cut both A and Al at the same time.)

4. Place second hide on back of individual who will wear the shirt. Position as for first hide, mark and cut lines A and Al. Before cutting, adjust length so hides one and two are the same.

5. Lay hides right sides together with A and Al aligned. Roll the seam edges one full turn and whipstitch by running the stitch over the rolled edge.

6. Turn right side out and put on wearer.

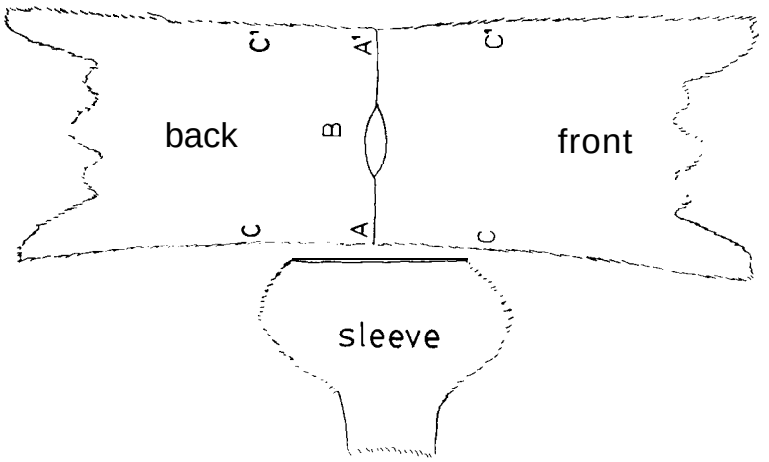
7. Mark C and Cl on both the front and back hides. Position C and Cl to allow for ample arm movement. Again, the marks should be symmetrical.



8. Remove shirt and lay out as illustrated, wrong side out.

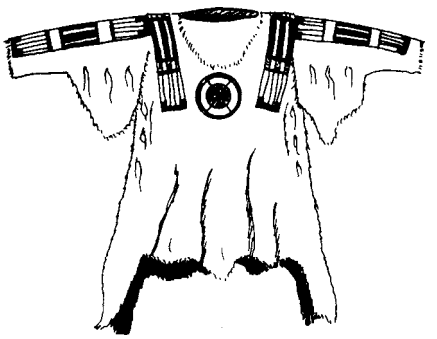
9. For sleeves, cut from third hide two equal rectangles with width C to C and length determined by measuring from cap of shoulder to wrist of wearer. Before sewing sleeves, see fringing note on next page.

10. Lay sleeve on top of the body, right side out. Align between B and roll edges of body and sleeve together and whipstitch. Repeat with second sleeve on opposite side of body.



Buckskin shirt hide pieces

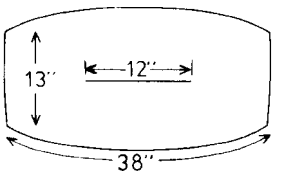
11. Open sleeves so the *right* sides of front and back are together. Shirt should be laying inside out at this point. Roll sleeve edges together and whipstitch.
12. Roll edges of shirt body together and whipstitch. Seam should run from sleeve to waist.
13. Turn completed shirt *right* side out.



Finished shirt with decorations

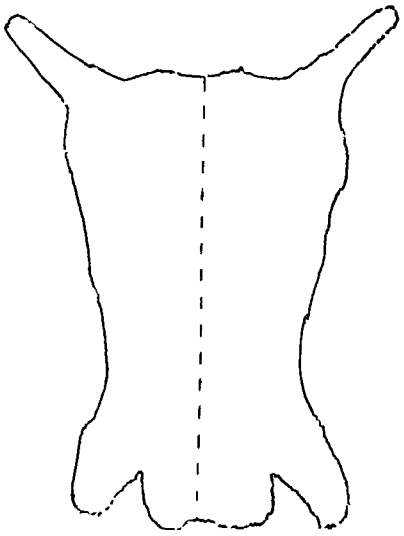
Note: Fringing may be added to seams where sleeves join body and along sleeve seams, if desired. To attach fringing, use strips of leather that are the same length as the seam and 4 to 6 inches (10 to 15 cm) wide. Roll these strips into the seams before whipstitching. Position the pieces so they will hang on the outside of the shirt when right side is out. Cut strips into fringe after sewing.

A yoke may be added in front or back by sewing a rectangular or triangular leather piece to the edge of the neck opening. As with other seams, roll together on wrong sides before whipstitching. The yokes were often heavily beaded or quilled.



Optional yoke

Leggings



Hide for one legging

Make a type of clothing worn by outdoorsmen on Missouri's frontier.

Materials:

Review general instructions on leatherworking and gather the items listed under basic materials.

Procedure:

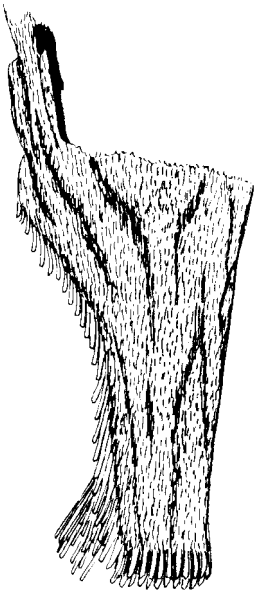
1. Obtain two medium to large deer hides. Hides should be large enough to encircle leg and long enough to reach from your waist to the ground.

2. Fold one hide in half lengthwise with right sides out. Insert fringing strips, if desired, so strip protrudes from between halves of folded hide. Sew seam using a saddle stitch. Leggings may also be sewn together wrong side out with fringing strips protruding on the inside. Use a whipstitch. When legging is turned right side out fringing will protrude and seam will be concealed.

3. Cut fringe strips into fringing.

4. Attach leather strap to upper outside edge of legging. This can be done by taking a piece of leather approximately 1 inch x 24 inches (2.5 cm x 60 cm) and inserting one end through a hole punched in the legging near the seam. Push the leather strip halfway through and knot. The strip is used to hold the legging to a belt at the waist.

5. Repeat procedure with other hide to complete second legging.



A finished legging with fringe

Note: Since leggings were nothing more than hollow tubes, they were always worn with a breechclout. The breechclout is simply a long piece of heavy cloth (approximately 12" x 60" or 30 cm x 1.50 cm for an adult). The cloth was passed between the legs and over the top of a soft leather belt in front and back.

Breechclout to be worn with leggings

Plains Indian Dress

Create a dress worn by native American women on Missouri's frontier.

Materials:

Review general instructions on leather-working and gather the items listed under basic materials.

Procedure:

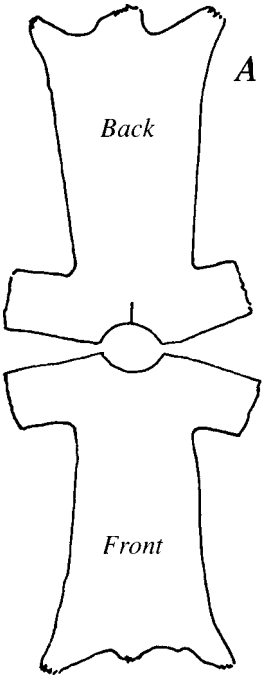
1. Obtain two large deer hides. Each hide should be long enough for desired length of dress. (Three hides may be needed if the dress is to have a yoke.) Cut as shown, using either pattern A or B.

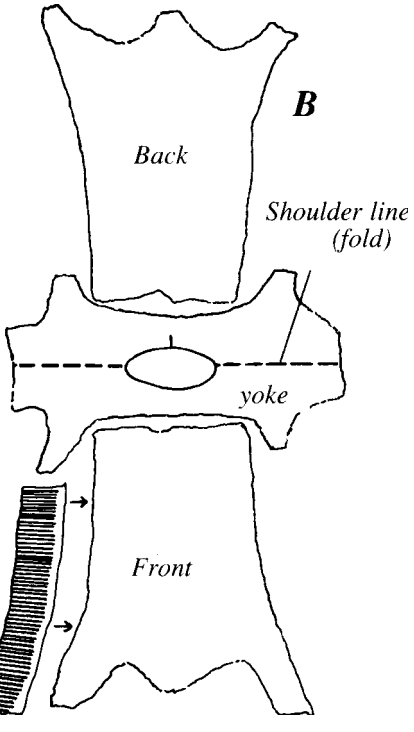
2. Lay the hides, right sides facing each other, matching the head, ends and sides.

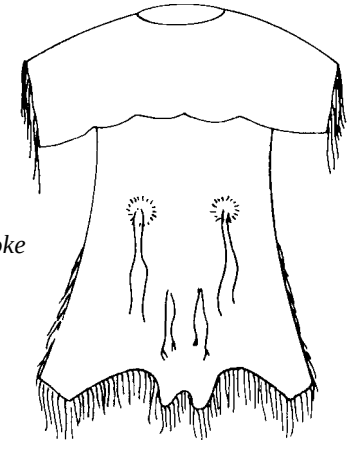
3. For pattern A, sew shoulder seams, leaving sufficient neck opening. For pattern B, attach yoke to front and back sections of dress as shown. Cut neck opening.

4. Sew sides using a whipstitch. Leave sufficient openings between the side seams and shoulder seams to allow movement of arms.

5. Either fringe edges of the leather as shown or attach separate fringe. Decorate with cowrie shells or beadwork.







Finished dress with yoke

Drop-Sleeve Shirt

Basic Pattern (Medium Size)

Fabrics 36" to 45" wide: *Fold crosswise for 48" length. Cut body, 30", cuffs, collar and gussets from 18"-- 2 1/4 to 2 1/2 yards required.*

Fabrics 48" to 54" wide: *Fold crosswise for 30" length. Cut body, 30", cuffs, collar and gussets from remaining side strip–1 3/4 to 2 yards required.*

For full-length shirtdress, extend body to about 45" (3 yards). For floor length, extend to 60" (3 1/2 yards).

Sew a type of shirt worn by outdoorsmen on Missouri's frontier.

Materials:

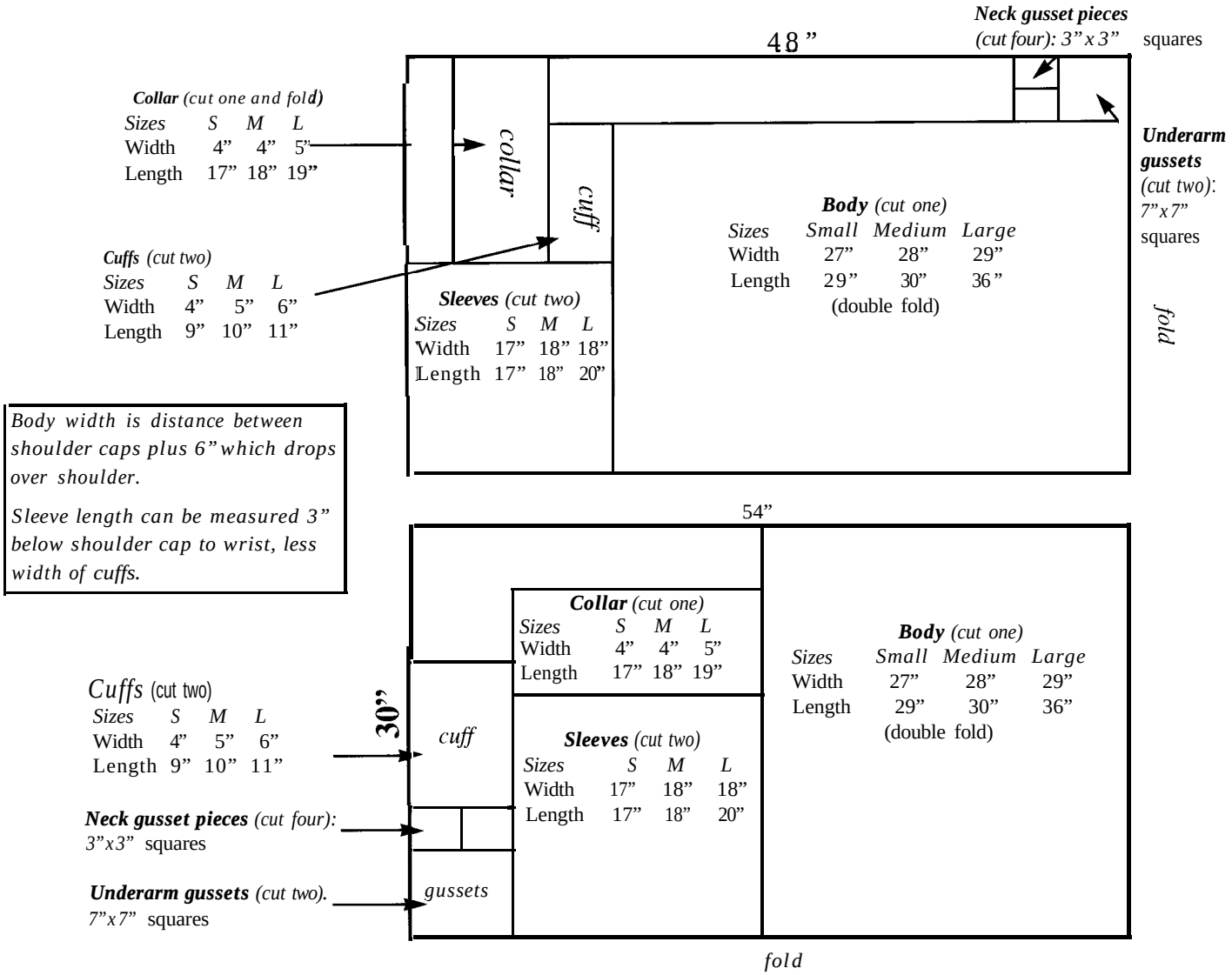
Review general instructions on sewing and gather the items listed under basic materials.

Procedure:

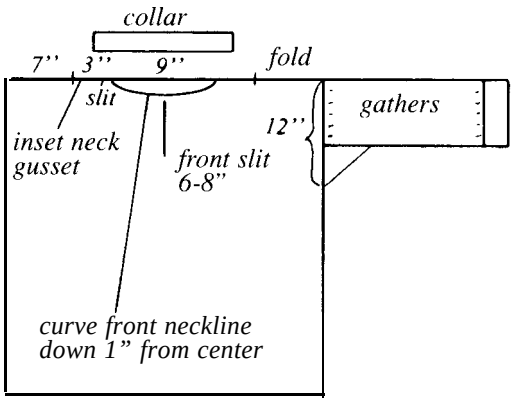
1. Obtain calico, linen or cotton print fabric. (See fabric requirements at left.)

2. Cut out pieces according to the illustration. Note that fabric is folded double.

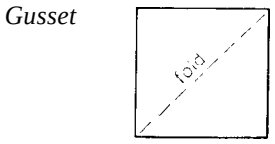
Figures show approximate measurements of small (S), medium (M) and large (L) sizes.

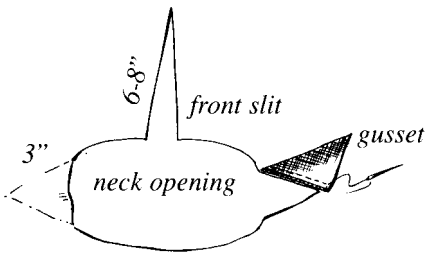


3. Cut neck opening, front slit and two 3-inch slits on either side of neck opening.



4. Fold gussets to make a triangle. Stitch a triangle into each slit at the side of the neck opening.



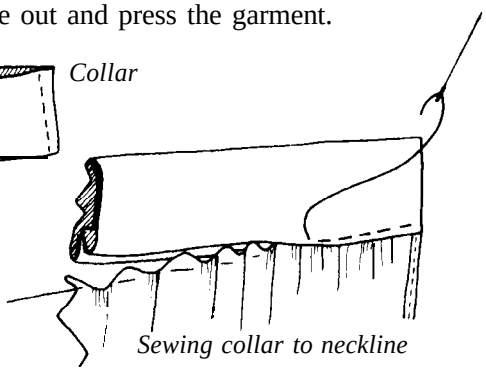


5. Hem front slit of neck opening and attach button loop.

6. Run a gathering stitch (see general instructions) on front and back neckline.

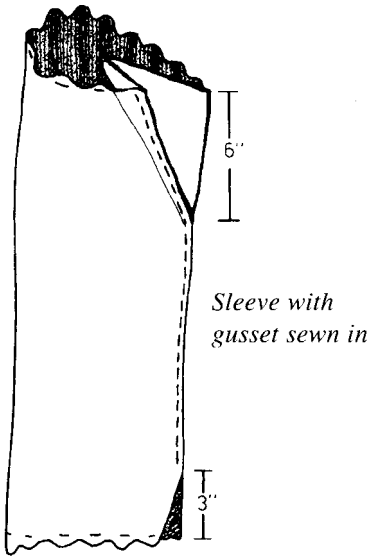
7. Stitch collar as shown. Turn right side out and press the garment.

8. Attach collar neckline to adjusting gathers.



9. Run a gathering stitch at the top and bottom of each sleeve. Fold the sleeve right side in and seam 3 inches from the cuff to 6 inches from the underarm. Insert gusset and finish seam.

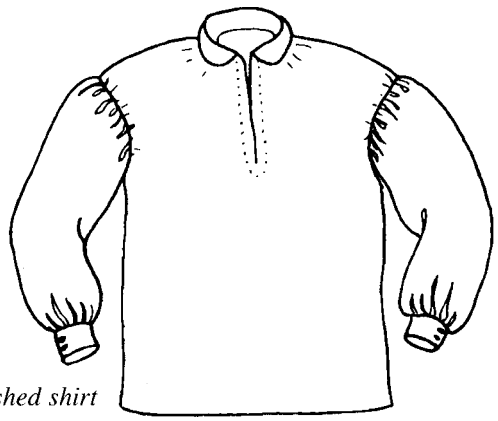
10. Attach sleeve to shirt body, adjusting gathers and sew. The easiest way to do this is to turn the shirt body inside out and insert the sleeve (also inside out) through the sleeve opening. Pin the upper edge of the sleeve to the edge of the shirt body and sew. Adjust the gathers so they appear evenly spaced.



11. Hem the sleeve inseam opening at the cuff. Attach the cuff as you did the collar.

12. Make buttonholes on the outer side of the cuff. Sew buttons at collar and on cuffs.

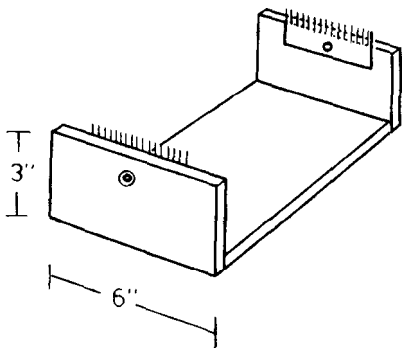
13. Hem the shirt bottom.



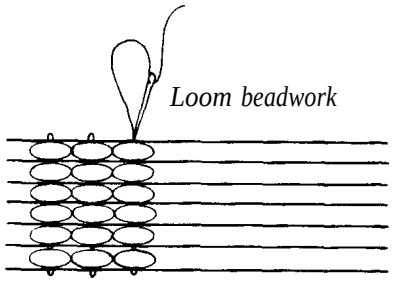
Beadwork

Early beadwork (before 1840) was done with larger beads called pony beads. Later beads are the smaller seed beads. Strips of beadwork were usually made on a loom. Moccasins and pouches were usually decorated with beads applied directly using a lazy stitch or applique technique.

Begin any beadwork by drawing a full color pattern on graph paper. If you are using regular graph paper instead of bead graph paper, use two adjacent squares to represent each bead. Obtain design ideas from books, paintings and museum objects.



Homemade beading loom



Decorate clothing as native Americans and early frontiersmen did.

Materials:

beads (seed beads or pony beads)
beading thread
beading needles (2)
long-nose pliers
beading graph paper (see sample included)
colored pencils to match bead colors
loom materials:
- 2 pocket combs
- wood--2 pieces 3/4" x 3" x 6", 1 piece 3/4" x 6" x 1' to 3'
- (or 2 pieces 2 cm x 7.5 cm x 15 cm, 1 piece 2 cm x 15 cm x 30 cm)
- eye screws
- nails

Procedure:

BEADING ON A LOOM

1. To make beaded strips, first construct a simple loom. Nail pocket combs to two pieces of 3/4" x 3" x 6" wood (as shown). On the opposite sides of each piece of wood, center an eye screw. Nail the two wooden blocks to either end of a wooden piece 3/4" x 6" x 1' to 3'. This piece should be 3" to 6" longer than the desired strip of beadwork.

2. Cut lengths of beading thread long enough to pass from eye screw to eye screw when stretched over the comb spacers. The number of thread lengths should be one more than the number of beads in the width of the strip.

3. Fasten the thread to the loom separating each strand between the comb teeth at each end of the loom.

4. To bead, first thread a beading needle and tie the loose end of the thread to an outside loom strand, near one end of the loom. Pick up enough beads on the needle to complete one width of the strip.

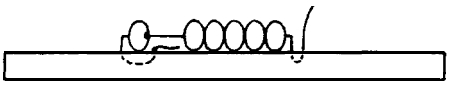
5. Pass the needle and thread under the loom threads and bring the thread up snug so there is one bead between each of the loom strands.

6. Bring the needle back over the loom threads and pass it through each bead. Pull tight.

7. Repeat this until the desired strip is completed. If the beading thread runs out, simply tie it off to one of the loom threads. Tie on a fresh beading thread and continue.

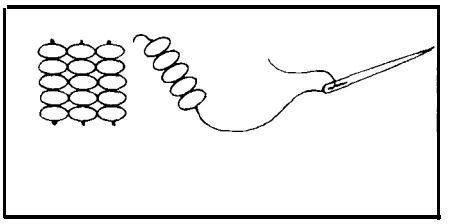
8. At the end of the strip, tie off the beading thread to one of the outside loom strands. Cut the strip from the loom. The complete strip can be sewn to leather or cloth.

BEADING BY HAND–LAZY STITCH



Note: When sewing beads down, do not pass the thread completely through the leather. No stitches should be visible from the back side of the leather.

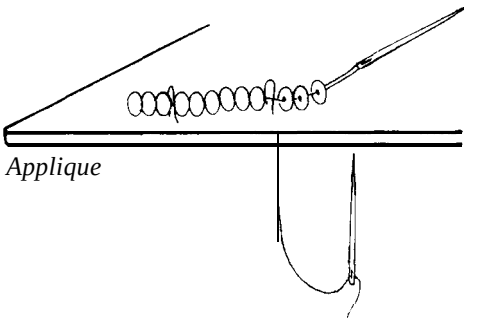
1. Start by threading a needle and knotting the end.
2. Pass the needle through the surface of the leather (not through the entire thickness) to secure the knot.
3. Pick up 5 to 10 beads and lay them on the leather in a straight line.
4. Take a small stitch at the end of the bead row with the thread going into the leather at the end of the completed row and coming out where the next row will start.
5. Thread 5 to 10 more beads and lay these adjacent to the previous row.
6. Stitch as before and repeat.
7. At the end of the design, backstitch before cutting the thread.
8. If the design is more than 5 to 10 beads wide, simply lay another series of rows adjacent to the first. Never string more than 10 beads to a row because the beads will sag noticeably.



Lazy stitch

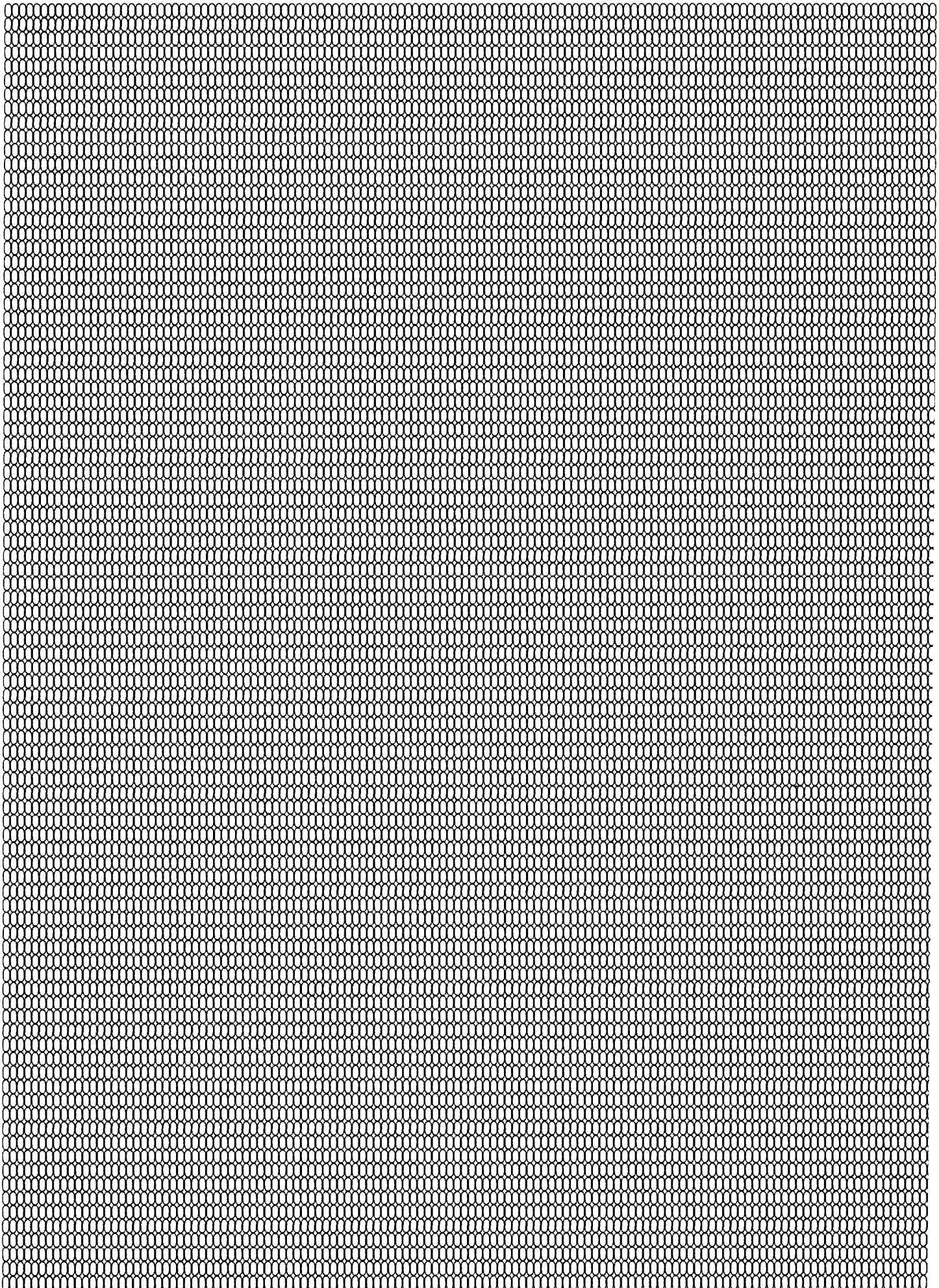
BEADING BY HAND–APPLIQUE

1. Applique beading is similar to lazy stitching in that no loom is required. Applique, however, requires two needles, each threaded with a single strand.
2. String the beads on one strand and use the second strand to sew down the bead strand between every 3 to 5 beads. This technique works best for irregular designs and the floral patterns used by eastern native tribes.
3. In any type of beading the neatness of the finished work depends on the uniformity of the beads and their tightness. Sometimes irregular beads are discovered after a row has been sewn in place. Rather than unstringing the row or cutting the thread, break the bad bead with long nose pliers. Then pull the thread tight again or sew another bead into the place.



Applique

COPY PAGE Beading graph paper



Natural Dyes

Learn methods of decoration used on the frontier.

Materials:

plant materials for dyes
- yellow–sassafras bark, goldenrod flowers and stems
- black–black walnut root
- brown–leaves, hulls and whole nut of wild black walnut; butternut bark
- orange–root of bloodroot
- blue–flower of blue larkspur
- green–green leaves
- red–pokeberries, chokecherries, elderberries, sumac berries

alum
baking soda
large kettle (4 gallons or 17 liters)
aluminum or stainless steel pots
cream of tartar
bucket
vinegar
salt

Procedure:

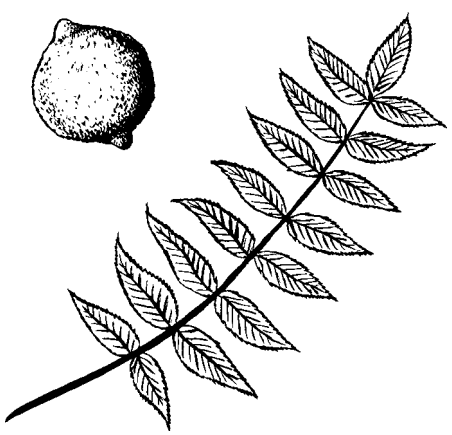
l. The first step in natural dyeing is to gather the plant material. Materials such as flowers and roots may be gathered and dried for prolonged storage. Some natural plant dyes are available commercially at weaving or health and nutrition stores.

2. Before dyeing, fabrics must be treated with a mordant to set the dye. Instructions for making and using mordants follow. Natural dyeing as practiced on the frontier was not an exact science. Some experimentation may be necessary to achieve desired results.

3. To make a dye–prepare the plant material by cleaning and chopping roots, scraping stems and crushing leaves of flowers and nuts. Soak the prepared materials overnight. After soaking, boil until the dye has reached the desired shade (l/2 to 6 hours).

4. Natural dyes will not hold their color unless the fabric is first treated with a mordant. A mordant for wool or silk is made by dissolving 1 ounce of alum in 1 gallon of water and adding l/4 ounce of cream of tartar. For cotton or linen, add l/4 ounce of baking soda instead of cream of tartar.

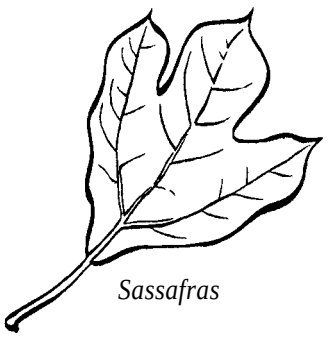
5. Soak the material to be dyed in the mordant for about an hour. Rinse thoroughly before dyeing.



Black walnut

Chokecherries

6. Dyeing–after dye has reached the proper shade, strain it into a kettle filled with 4 gallons of hot water and a little salt and vinegar. Mix thoroughly. The dye solution should be darker than the desired final color.
7. Immerse the fabric in the dye and simmer for 15 to 30 minutes. Turn the material with a wooden stick or spoon while dyeing.
8. Rinse the dyed material in cold water and hang to dry in a shady place.



Sassafras

Note: If you are collecting bloodroot or larkspur, take precautions not to deplete the plant population in any area. If plants are rare, either do not use or use only a few to experience the colors.

Be sure to ask permission from private landowners before collecting or digging plants. Many public areas have regulations about plant collection, so check with site managers before gathering. Digging plants is prohibited on roadsides and public lands in Missouri.

Sumac

Be careful when collecting and handling plants that may be poisonous. Bloodroot and larkspur may cause dermatitis. Parts of bloodroot, larkspur, pokeberry and elderberry can be poisonous if eaten.

Butternut

Tepee Model

Learn the unique design of the Indian tepee.

Materials:

18 dowel rods (l/2" diameter x 4' or 1.2 m)
light canvas, cotton sheet or similar fabric (6' x 6' or 1.8 m x 1.8 m)
cotton cloth (2' x 9' or 60 cm x 2.7 m)
18 to 24 dried peas or similar sized gravel
nylon cord (l/8" or 3 mm)
12 toothpicks
sewing kit and/or sewing machine
pocketknife or rasp

Note: You may need to special order the 4-foot dowel rods from a hardware store.

Procedure:

1. Use a pocketknife or rasp to taper the dowel rods toward one end. Try to make the dowels look somewhat irregular like real tepee poles.

2. Cut out the tepee cover and liner using the patterns provided on page 62. Hem all cut edges. Attach ties and reinforcements at the points shown on the pattern. Insert the triangular gussets and sew.

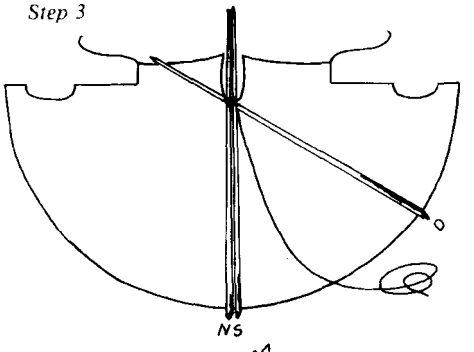
3. Select 3 poles (dowels). Spread the tepee cover as shown and lay out the tripod poles. The two poles lying side by side should be labeled N and S. These are the north and south poles and in actual practice would be located at those positions. Label the other pole D because it is the door pole.

4. Arrange the poles so they intersect at the upper tie located between the smoke flaps. Lash the poles together at this point using a clove hitch followed by several turns and half hitches. Use a length of cord about 9 feet (3 meters) long and tie so there is a length of at least 6 feet (2 meters) remaining.

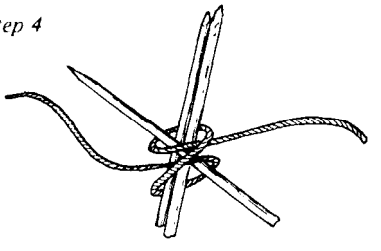
5. Stand the tripod by lifting from the top. You may wish to move the tepee cover aside to avoid walking on it. Face the poles from their tops, lift and pull the N pole (the right pole of the pair) toward you. This should lock the N pole securely into the crotch formed by S and D. The locking feature is what gives the tepee its stability.

6. Position the tripod poles so they are around a circle about 3 feet (1 meter) in diameter. The N and S poles should be the same distance from the center of the tripod. The D pole should be slightly farther. Thus the tripod actually forms an oval on the ground and is tilted slightly toward the door pole. This is another unique feature of the tepee and is important in maintaining the stability of the shelter in strong winds and permitting the tepee to draw properly when a fire is built inside. When first raising the tepee, it is difficult to position the poles accurately. Be prepared for several trials.

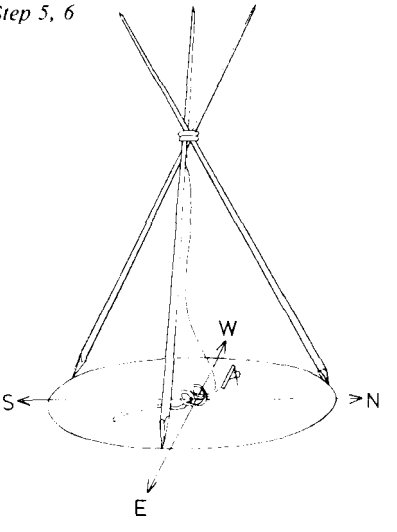
Step 3



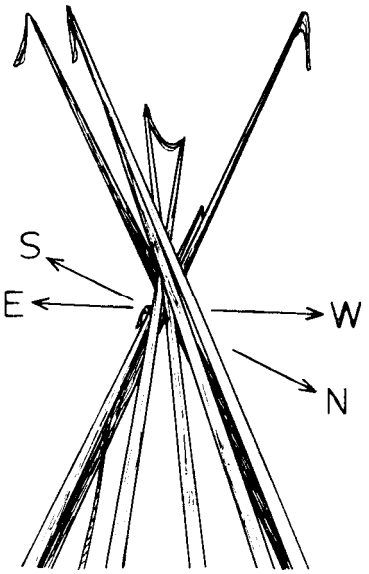
Step 4



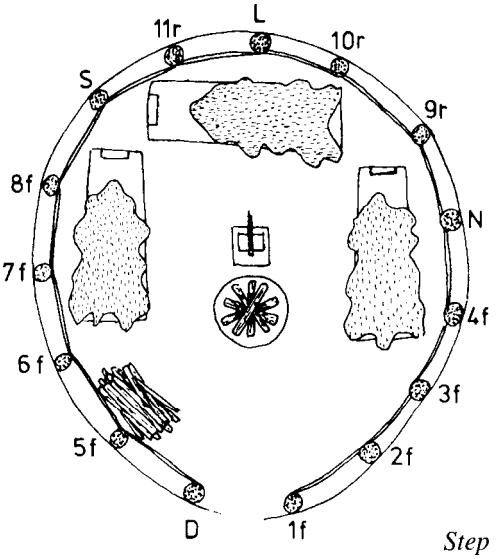
Step 5, 6



Step 7

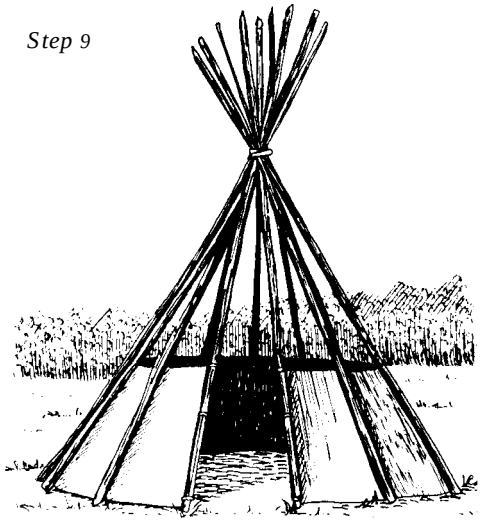


7. Once the tripod is up, it is time to place the support poles. Position each pole according to the diagram in the order given. Poles 1 through 4 go to the right of the door pole with their tops stacked in order in the front crotch. Poles 5 through 8 go on top of the first four in the same crotch. This placement puts the poles where they will create the least bulk under the tepee cover. Lay poles 9 through 11 in the rear crotch. Skip a space between poles 10 and 11. This is for the lifting pole, which carries the tepee cover.



Step 7

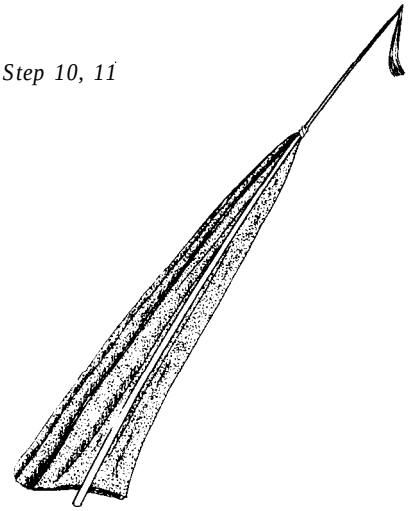
Step 9



8. With all the poles (except the lifting pole) in place, wrap the cord, which secures the tripod, clockwise around the assembly. Make four revolutions (one for each cardinal direction on the compass). After the fourth revolution, loop the cord over the N pole and let the free end fall into the center of the framework. In actual practice, this rope was often staked near the center of the tepee for added stability.

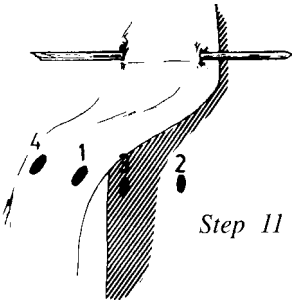
9. Next install the tepee liner. On an actual tepee the liner would not be installed until the cover was in place. In the model, however, the liner must be positioned first. Begin by tying a 12-foot (4-meter) length of cord to the door pole 18 inches (50 cm) above the ground. Take the cord around the framework, wrapping it once around each pole at the same height. Wrap so the cord reaches and leaves each pole on the inside of the framework. Finally, tie off the cord near its starting point. Tie the longer edge of the liner to base of each pole.

Step 10, 11



10. Spread the tepee cover as you did in Step 3. Bring both straight edges of the cover together in the middle. Again fold the outer edges in toward the center. Continue in this way until the cover forms a long, triangular bundle. Fold the cover one last time so that its midline forms one edge of the bundle. Lay a pole along the midline with the butt of the pole slightly below the bottom edge of the cover. Where the upper tie intersects the pole, tie the cover securely.

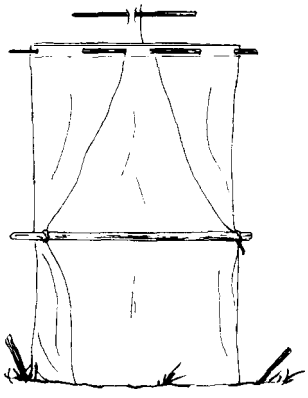
11. Lift the cover and pole together and turn them so the cover is outside the pole as it is laid in position (between poles 10 and 11). Bring the cover around the framework from both sides until the flat edges overlap. Lap the south edge over the north (left over right). Match the lacing holes and secure by intersecting a toothpick (lacing pin) in one set of lacing holes and out the adjacent pair. Tie the cover sides together at the base of the smoke flaps.



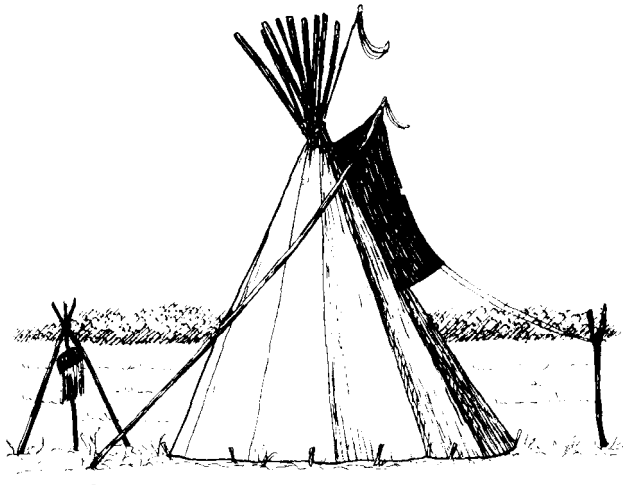
Step 11

12. Insert two remaining poles in the cups at the top of the smoke flaps. Arrange these poles so they cross over the rear of the tepee. The poles should be adjusted until the smoke flaps are fully extended and taut. Tie a 3-foot (1 meter) cord to the lower corner of each smoke flap. These cords can be brought out to an 18-inch (50 cm) pole anchored in the ground about 1 foot (30 cm) in front of the door.

13. Hang the door from the lacing pin immediately above the door opening. This completes the tepee.

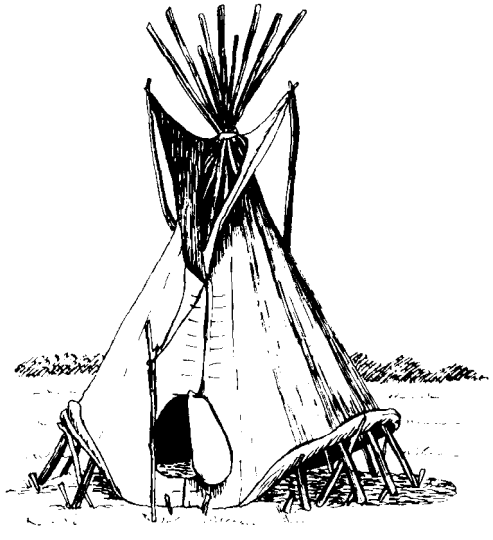


Step 13



Side view showing tilt

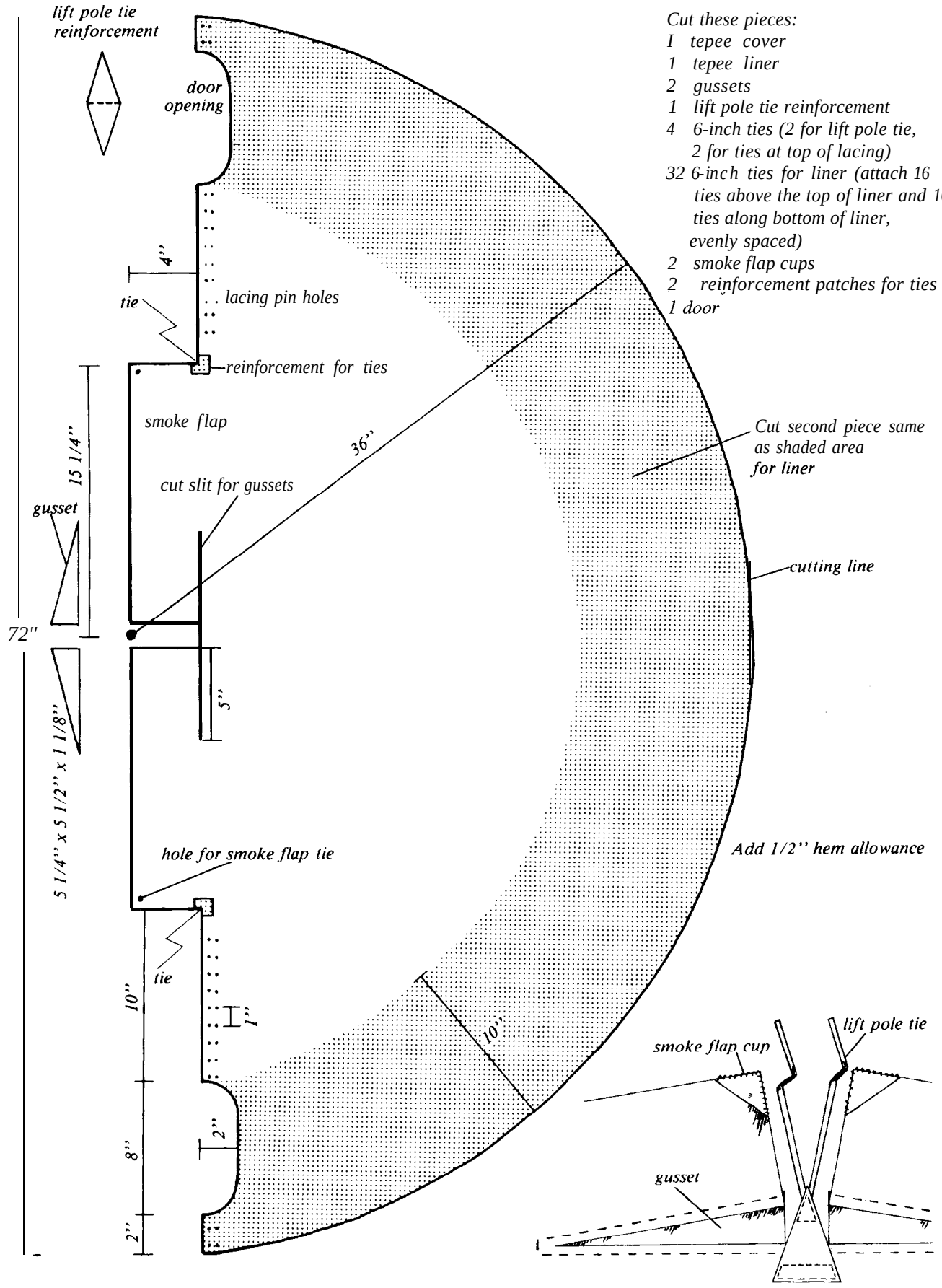
14. The design and pitching procedure for this scale model follow those required for pitching a full-sized tepee. As with a full-sized tepee, the smoke flaps can be opened or closed by adjusting the smoke flap poles. If you want to stake the tepee cover, make stakes from l/4-inch dowel rods. Make stake loops by twisting a dried pea into the fabric along the lower edge of the tepee and secure with a piece of cord.



Tepee in summer

Model Tepe Pattern

Cut these pieces:
I tepee cover
1 tepee liner
2 gussets
1 lift pole tie reinforcement
4 6-inch ties (2 for lift pole tie, 2 for ties at top of lacing)
32 6-inch ties for liner (attach 16 ties above the top of liner and 16 ties along bottom of liner, evenly spaced)
2 smoke flap cups
2 reinforcement patches for ties
1 door



Hunting Bag

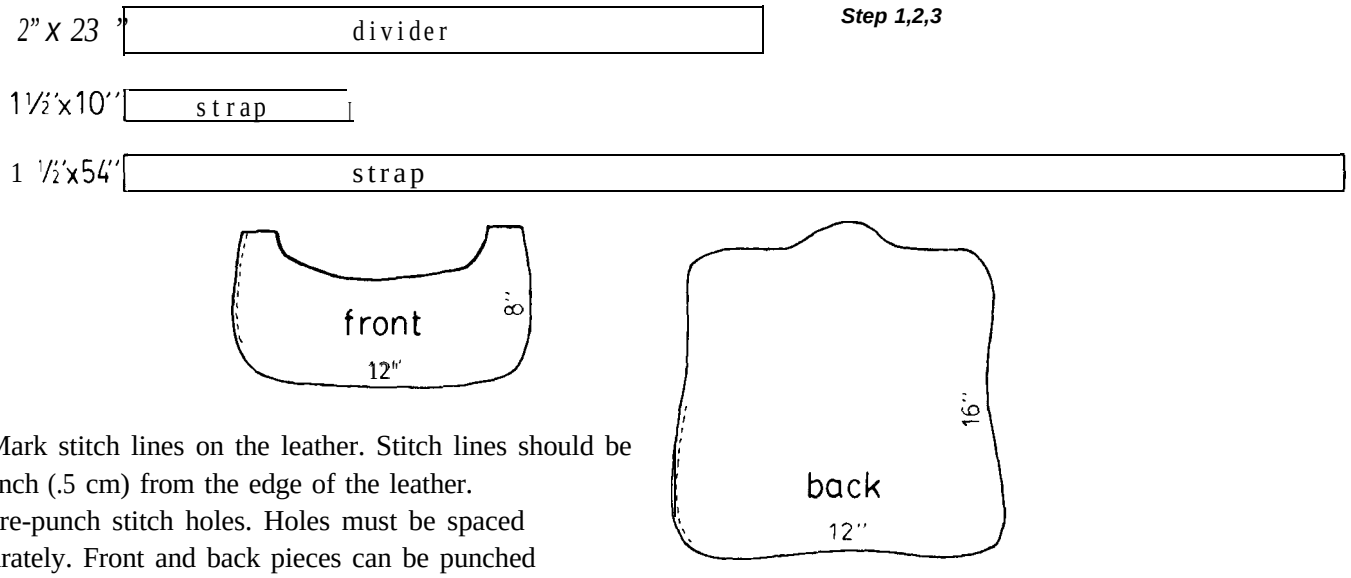
Make a hunting bag of the type used by outdoorsmen on Missouri's frontier. The bag may be used for hunting articles, camera equipment, binoculars or other items.

Materials:

7-9 oz. cowhide for front (8" x 12" or 20 cm x 30 cm)
7-9 oz. cowhide for back (16" x 12" or 40 cm x 30 cm)
7-9 oz. cowhide for strap (1 l/2" x 10" or 4 cm x 25 cm)
7-9 oz. cowhide for divider (2" x 23" or 5 cm x 58 cm)
7-9 oz. cowhide for strap (1 l/2" x 54" or 4 cm x 1.4 m)
1 l/2" (4 cm) belt buckle
1" (2.5 cm) diameter button (antler or metal)
heavy cloth or soft leather for button loop (l/2" x 4" or 1.3 cm x 10 cm)
Review general instructions on leatherworking and gather the items listed under basic materials.

Procedure:

1. Cut leather pieces as shown.



Step 1,2,3

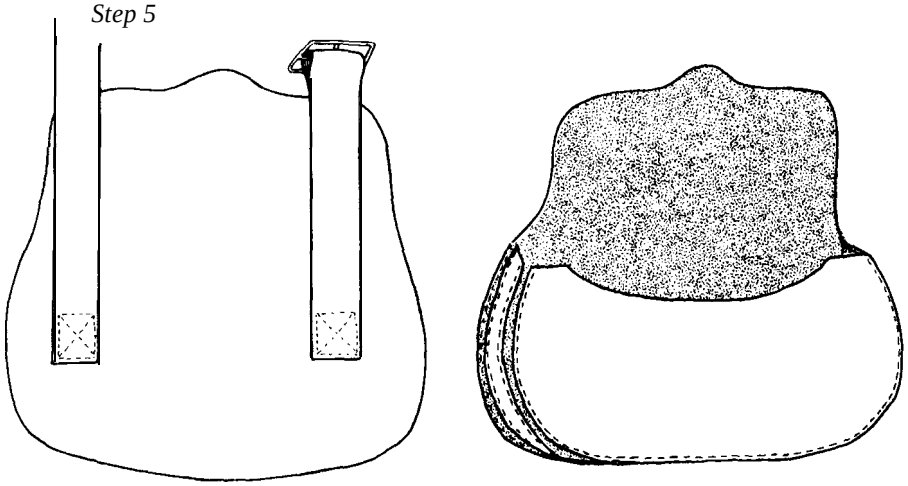
2. Mark stitch lines on the leather. Stitch lines should be l/4 inch (.5 cm) from the edge of the leather.

3. Pre-punch stitch holes. Holes must be spaced accurately. Front and back pieces can be punched simultaneously by tacking them wrong sides together with rubber cement before punching.

4. Dye leather, if desired.

5. Sew all seams using a saddle stitch. Sew pieces in the following order: (1) straps to back (longer strap should be sewn so it will be in front on whichever side the bag is worn), (2) divider to back and (3) front to divider.

Step 5

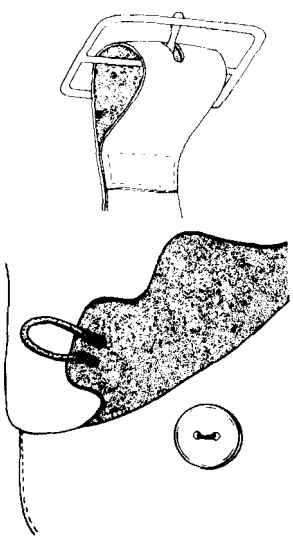


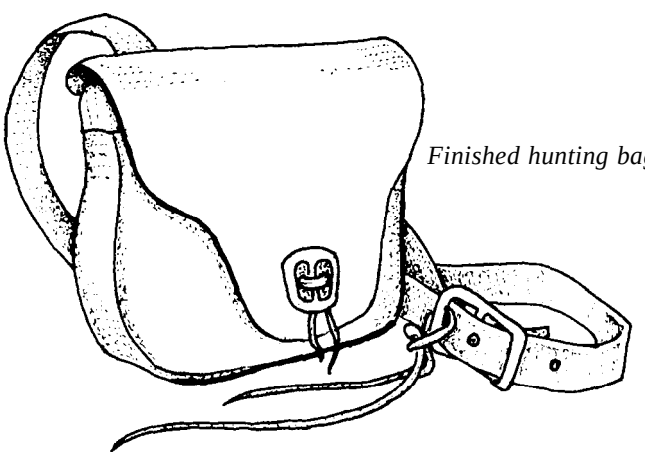
6. Sew belt buckle onto shorter leather strap. Put the longer strap through the buckle, put on the bag and adjust the length so the bag hangs near the hip. Mark where the longer strap and buckle meet, cut off any excess leather and punch holes for the buckle tongue. Attach the button loop and button as shown.

7. Finish by treating liberally with conditioning oil.

8. The bag may be decorated with heart- and diamond-shaped cutouts on the flap. These should be backed with colored felt held in place with rubber cement. The flap should then be lined with buckskin or heavy cloth.

Step 6





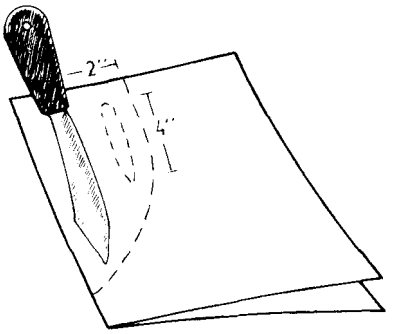
Finished hunting bag

Knife Sheath

Create a knife sheath similar to that used during the fur trade era in Missouri.

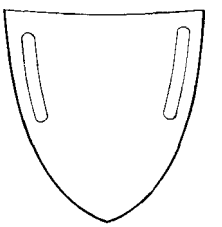
Materials:

About 1 square foot (30 cm x 30 cm) of heavy leather (7-9 oz.). It may be desirable to make the pattern before selecting the leather.
Review general instructions on leatherworking and gather the items listed under basic instructions.

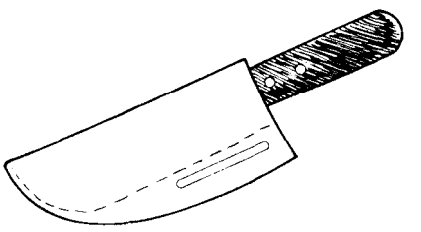


Procedure:

1. Make a pattern by laying the knife on a folded sheet of heavy paper as shown. Remove the knife and cut out the pattern. The pattern, when opened, should appear as illustrated.
2. Attach the pattern and cut leather as explained in leatherworking instructions. Dye if desired.
3. Moisten leather where it will be folded. Fold tightly, right side out. It may be desirable to tack leather in place with rubber cement.
4. Draw seam lines as illustrated.
5. Punch with awl or drive punch, then saddle stitch.
6. Moisten upper inside area of sheath and insert knife to the desired depth. (Handle should go only part way into the sheath.) Keep knife in the sheath until leather dries.
7. Oil liberally.



Sheath is worn by passing a large belt over the knife and through the belt loop.



To protect the seam near the knife edge, a welt may be added. This is simply a narrow piece of leather between the two halves of the sheath where the seams meet.

As an alternative to stitching, two rows of rivets may be used. This would simulate the brass tacks used on Plains sheaths of the 1830s and 1840s.

Brass Candle Lantern

Construct a replica of an early lighting device used on the frontier.

Materials:

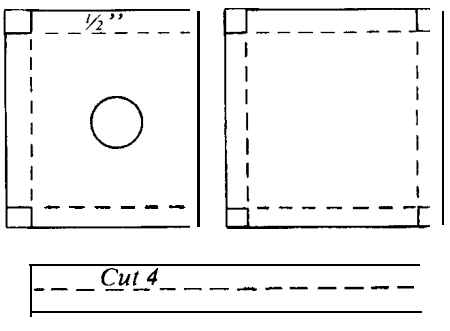
brass (approximately 0.030", purchased as shim stock at many machine shops)
- 1 piece for bottom (4 l/2" x 4 l/2" or 11.5 cm x 11.5 cm)
- 1 piece for top (3 3/4" x 4 l/2" or 9.5 cm x 11.5 cm)
- 4 pieces for posts (1" x 8" or 2.5 cm x 20.5 cm)
- 1 piece for candle holder (3/4" x 3" or 2 cm x 7.5 cm)
- 1 piece for heat deflector (2" x 5" or 5 cm x 12.5 cm)
- 1 heavy coat hanger wire (10" or 25 cm length for handle)

glass (use the type of glass used in stained glass projects, if possible)
- 3 pieces (3 l/4" x 7 7/8" or 8.5 cm x 20 cm)
- 1 piece (3 l/4" x 8 l/4" or 8.5 cm x 21 cm)

eye protection

Review generalinstructions on metalworking for tools and techniques.

Step 2, 3, 4



Procedure:

1. If brass is curled, pound it flat on both sides with a rawhide mallet.

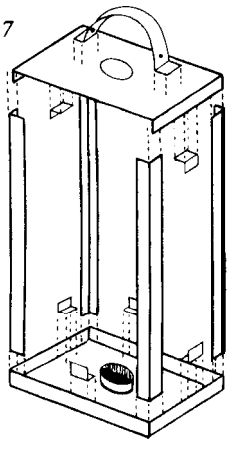
2. Cut pieces as indicated. Cut out corners of top and bottom as shown. Lay the corner cutouts aside. They will be used as tabs to hold the glass in place. File all cut edges to eliminate roughness.

3. Mark the top center as shown and drill a l-inch diameter hole. Smooth the edges of the hole with a round file or sandpaper wrapped around a pencil.

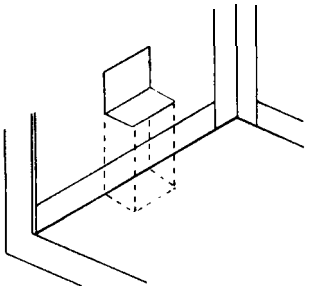
4. Bend parts along the dotted lines as shown. See metalworking instructions for bending techniques. Bend the candleholder to make a closed ring. Hem the sides of the deflector by bending them back on the center. Work the deflector into a horseshoe shape by bending it over a tool handle.

5. For soldering techniques, see the general instructions on metalworking. First solder the candleholder to the center of the bottom. Solder posts to the bottom, taking care that they are perpendicular to the bottom and parallel to each other.

Step 5, 6, 7



Step 6

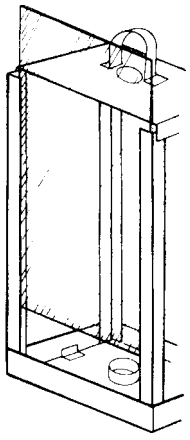


6. Take the square cutouts from the comers of the top and bottom and bend them to an L-shape. Solder them into the positions shown placing three on the top and four on the bottom, then solder the top on. Solder the heat deflector in place.

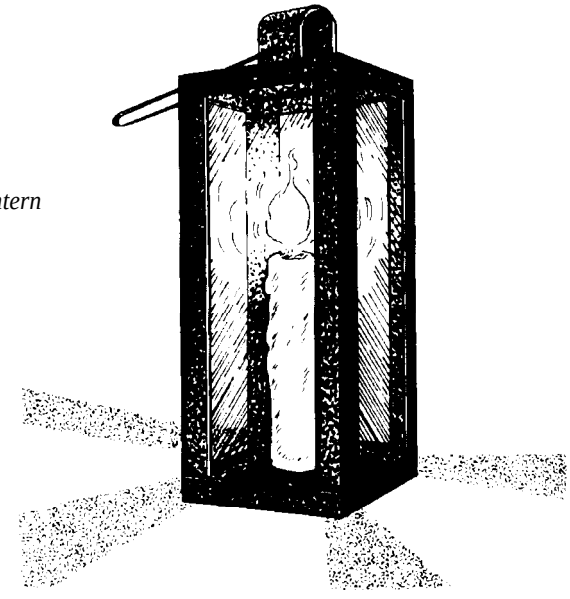
7. Mark and drill two l/8-inch holes in the heat deflector as shown.

8. Now wash the candle lantern in soapy water, dry and polish with steel wool.
9. Install glass by bending tabs flat, inserting glass and carefully re-bending the tabs.
10. Bend the coat hanger wire to shape and install in heat deflector.
11. Insert candle and you now have a brass candle lantern like those used on the frontier.

Step 9



Finished lantern



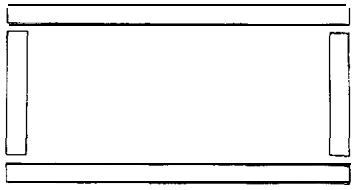
Wooden Cassette

Construct a supply chest similar to those used in the fur trade.

Materials:

pine board (1” x 12” x 14’ or 4.2 m)
nails
2 brass handles
3 brass hinges
red leather dye or wood stain
varnish
eye protection

Procedure:



Ends set inside

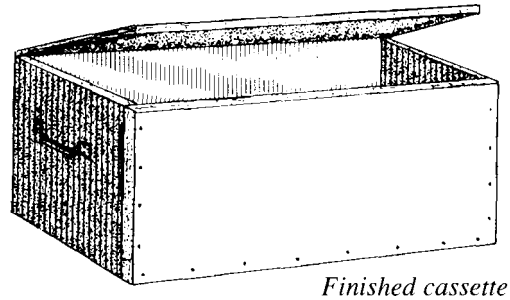
1. Cut the pine board to yield the following:

3 pieces 1” x 12” x 36”

2 pieces 1” x 12” x 9 3/4”

1 piece 1” x 9 3/4” x 34 l/2”

2. Construct a rectangle using two of the 1” x 12” x 36” pieces as sides and the two 1” x 12” x 9 3/4” pieces as ends.
3. Set the ends inside of the sides as shown. The rectangle should measure 11 l/2” x 36”.
4. Insert the 1” x 9 3/4” x 34 l/2” piece into the rectangle to make a bottom.
5. Nail the boards in place. (To avoid splitting the wood, drill pilot holes with a bit slightly smaller than the nail being used.)
6. Fasten the hinges to the 1” x 12” x 36” top and then attach the hinges to the box.
7. Center and attach the handles at both ends of the box.
8. Sand the entire box and stain it with woodstain or red leather dye. Apply several coats of varnish if the box is to be used outdoors.



Finished cassette

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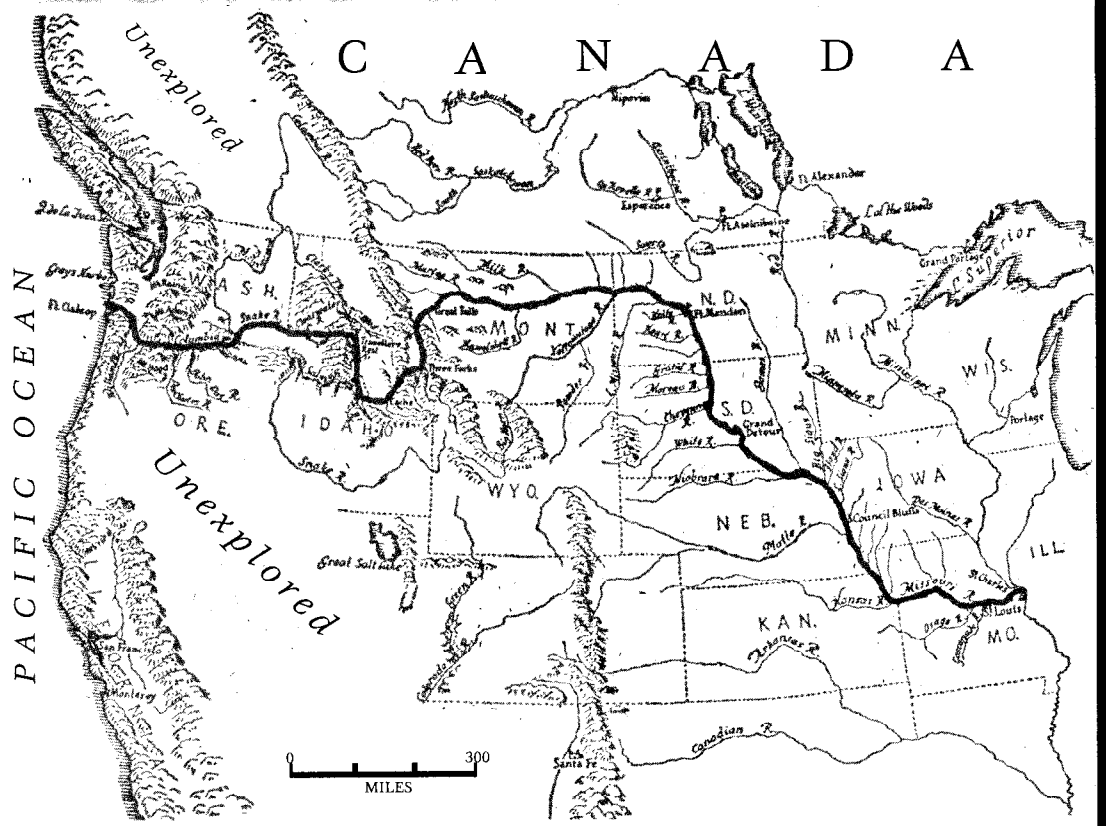
TRAVEL WITH

Lewis and Clark



In 1803, Meriwether Lewis and William Clark set out to explore a new land purchase for President Thomas Jefferson. Along the way, the expedition lived the life of the native Americans and fur traders they encountered.

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