
Basic Fire Building



In many survival situations, the ability to start a fire can make the difference between living and dying. Fire can fulfill many needs. It can provide warmth and comfort. It not only cooks and preserves food; it also provides warmth in the form of heated food that saves calories our body normally uses to produce body heat. You can use fire to purify water, sterilize bandages, signal for rescue, and provide protection from animals. It can be a psychological boost by providing peace of mind and companionship. You can also use fire to produce tools. Fire can cause problems, as well. It can cause forest fires or destroy essential equipment. Fire can also cause burns carbon monoxide poisoning when used in shelters.

Basic Fire Principles

To build a fire, it helps to understand the basic principles of a fire. Fuel (in a non-gaseous state) does not burn directly. When you apply heat to a fuel, it produces a gas. This gas, combined with oxygen in the air, burns.

Understanding the concept of the fire triangle is very important in correctly constructing and maintaining a fire. The three sides of the triangle represent air, heat, and fuel. If you remove any of these, the fire will go out. The correct ratio of these components is very important for a fire to burn at its greatest capability. The only way to learn this ratio is to practice.

Site Selection & Preparation

You will have to decide what site and arrangement to use. Before building a fire consider the following:

- The area (terrain and climate) in which you are located
- The materials and tools available
- How much time you have
- Why you need a fire

Look for a dry spot that meets the following criteria:

- Is protected from the wind and any rain or snow
- Is suitably placed in relation to your shelter (if any)
- Will concentrate the heat in the direction you desire
- Has a supply of wood or other fuel available



If you are in a wooded or brush-covered area, clear the brush and scrape the surface soil from the spot you have selected. Clear a circle at least 5 feet in diameter so there is little chance of the fire spreading beyond your control. If time allows, construct a firewall using logs or rocks.



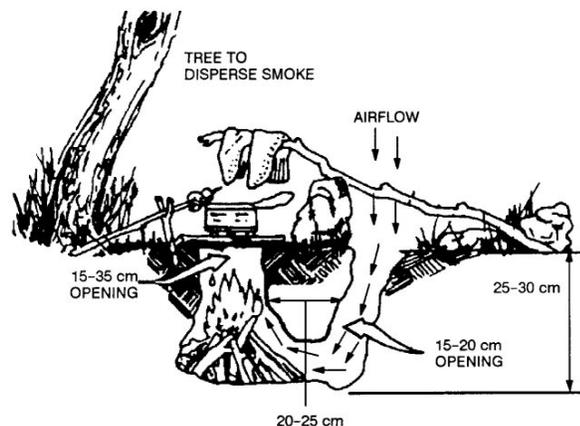
This wall will help to reflect direct the heat where you want it. It will also reduce flying sparks and cut down on the amount of wind blowing into the fire. Keep in mind that you will need enough airflow to keep the fire burning.

Warning: Do not use wet or porous rocks to construct your fire reflector - the water trapped in the rock may reach the boiling point and cause the rock to explode.

In some situations, you may find that an underground fireplace will best meet your needs. It protects the fire and serves well for cooking food, heating and purifying water and drying wet clothing.

To make an underground fireplace or Dakota Fire Hole

- Dig a hole in the ground
- On the upwind side of this hole, poke or dig a large connecting hole for ventilation
- Build your fire in the hole as illustrated





If you are in a snow-covered area, swamp or bog, or in an extremely wet environment, use green logs to make a dry base for your fire. Trees with wrist-sized trunks are easily broken in extreme cold. Cut or break several green logs and lay them side-by-side on top of the snow or wet ground. Add one or two more layers. Lay the top layer of logs opposite those below it. Build your fire on top of this platform of green wood.



Fire Building Materials

You need three types of material to build a successful fire:

- *Tinder*
- *Kindling*
- *Fuel Wood*

Tinder is dry material that ignites with little heat - a spark starts a fire. The tinder must be absolutely dry to be sure just a spark will ignite it. If you only have a device that generates sparks, charred cloth will provide an almost fool-proof means of starting a fire. It holds a spark for long periods, allowing you to put tinder on the hot area to generate a small flame.

You can make *charred cloth* by heating cotton cloth until it turns black, but does not burn. Place squares clean cotton cloth in a clean metal can (a tuna can works very well), cover the can tightly with a piece of heavy duty foil and poke one single pin hole in the center of the foil. Place this on the coals of a fire for a between 15 and 45 minutes until the cloth is completely charred, but not burnt. It will be completely black in appearance, and pretty delicate to touch.



Once it is black, you must keep char cloth in an airtight container to keep it dry. Prepare this cloth well in advance of any survival situation. Add it to your individual survival kit.

Kindling is readily combustible material that you add to the burning tinder. Again, this material should be absolutely dry to ensure rapid burning. The ideal kindling wood should be no thicker than a pencil and easy to break with only finger pressure. Kindling burns very rapidly and increases the fire temperature so that it will ignite the slower combustible material. You should always gather tinder until you think that you have a sufficient supply, and then gather three times more.

Fuel Wood is more slowly combustible material that burns slowly and steadily once ignited. The fuel wood is what sustains your fire. Once you have a hot base ready to add fuel wood, even mildly damp wood will start to burn. Again, gather what you feel is a sufficient supply, and then gather three times more.

Building A Fire

There are several methods for laying a fire, each of which has advantages. The survival situation in which you find yourself, the available resources, and the available daylight that you have will help you to determine which type of fire will be the most effective and advantageous to use. The four basic methods of fire construction detailed here are by no means meant to be the only method used. There are several other ways to lay a fire that are quite effective. Your situation and the material available may make another method more suitable.

Tepee

To make this fire, arrange the tinder and a few sticks of kindling in the shape of a tepee or cone. Light the center.

As the tepee burns, the outside logs will fall inward, feeding the fire.

This type of fire burns well even with wet wood.



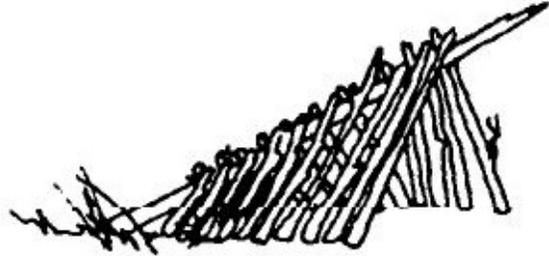


Lean-To

To lay this fire, push a green stick into the ground at about a 30-degree angle. Point the end of the stick in the direction of the wind.

Place some tinder deep under this lean-to stick. Set your pieces of kindling against the sides of the lean-to stick, forming a closed lean-to. Light the tinder.

As the kindling catches fire from the tinder, add more kindling to the outer sides, eventually adding larger and larger pieces of fuel wood. This type of fire works well in a wet and windy environment.



Log Cabin or Pyramid

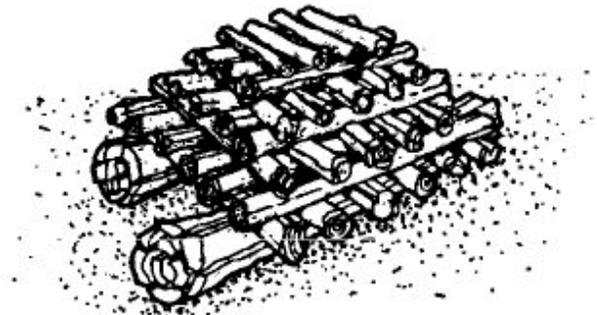
To lay this fire, place two small logs or branches parallel on the ground. Place a solid layer of small logs across the parallel logs. Add three or four more layers of logs or branches, each layer smaller than and at a right angle to the layer below it.

Make a starter fire on top of the pyramid.

As the starter fire burns, it will ignite the logs below it.

This gives you a fire that burns downward, requiring little to no attention during the night.

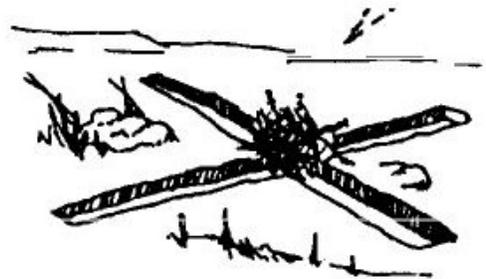
This type of fire also works well in a snow or wet environment.



Cross-Ditch

To use this method, dig a cross about 2 to 3 feet in length and about 10 or more inches deep.

Put a large bundle of tinder in the middle of the cross, and build a kindling pyramid above the tinder. The shallow ditch allows air to sweep under the tinder to provide ventilation.





Lighting A Fire

When possible, try to light your fire from the upwind side. Make sure to lay your tinder, kindling, and fuel wood so that your fire will burn as long as you need it. Igniters provide the initial heat required to start the tinder burning. They fall into two categories: Modern Methods and Primitive Methods.

The real key to successfully starting a fire using any of the methods listed is to construct a well formed "birds nest" from dry grass, natural fiber rope or twine that is arranged in a bowl shape, loose enough to allow air to flow through the fibers, but with enough structural integrity to hold up to your fire-starting attempts.

Modern Methods

Modern igniters use modern readily available devices - items we normally think of using to start a fire.

- Matches

Make sure that your matches are dry. Store them in a waterproof container along with a dependable striker pad.

- Convex Lens

Use this method only on bright, sunny days. The lens can come from binoculars, glasses, camera, or magnifying glasses.

Use dry grass, natural fiber rope or twine to form a "birds nest" and place your tinder in the center fully exposed.

Angle the lens to concentrate the sun's rays on the tinder. Hold the lens over the same spot until the tinder begins to smolder. Gently blow or fan the tinder into flame, and place the tinder bundle into a well-prepared.



- Metal Match or Magnesium Fire Starter

Use dry grass, natural fiber rope or twine to form a "birds nest" and place your tinder in the center fully exposed. Place the tip of the metal match at the center of the tinder, holding the metal match in one hand and a metal striker in the other.

Scrape the steel edge against the metal match to produce sparks. Continue until sparks hit the tinder.

When the tinder starts to smolder, gently blow or fan the tinder into flame, and place the entire birds nest into a well-prepared fire.



- **Battery & Steel Wool**

Use a formed "birds nest" and place your tinder in the center. Place a small piece of stretched "0000" steel wool at the center of the tinder.

When the tinder starts to smolder, gently blow or fan the tinder into flame, and place the entire birds nest into a well-prepared fire.

Touch both poles of a 9-volt battery to the steel wool at the center of the tinder bundle to ignite the steel wool and tinder.

Use of this method works well even in a damp environment as long as your tinder is dry.

Primitive Methods

Primitive ignition methods are those attributed to our early ancestors, the pioneers, and older experienced outdoorsmen.

- **Flint and Steel**

The direct spark method is the easiest of the primitive methods to use, and the flint and steel method is the most reliable of the direct spark methods.

Strike a flint or other hard, sharp-edged rock edge with a piece of carbon steel, aiming into the tinder placed in your birds nest tinder bundle. (Stainless steel will not produce a good spark)

This method requires practice. When a spark has caught in the tinder, blow on it. The spark will spread and burst into flames.

- **Fire Plow**

The fire plow is a friction method of ignition.

You "plow" a hardwood shaft against a softer wood baseboard.

To use this method, cut a straight groove in the base and plow the blunt tip of the shaft up and down the groove.

The plowing action of the shaft pushes out small particles of wood fibers. As you apply more pressure on each stroke, the friction ignites the wood particles.

Place the smoldering particles into your prepared birds nest tinder bundle to ignite your fire.





- Bow and Drill

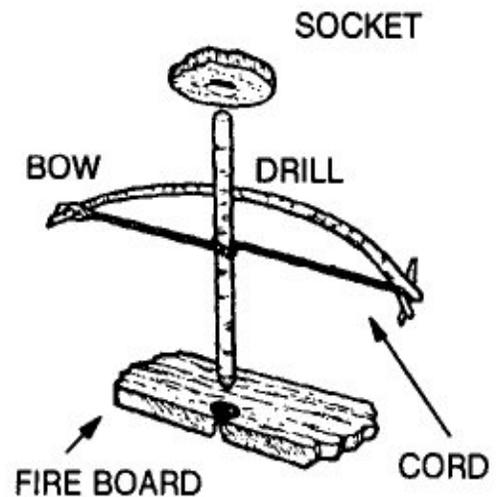
The technique of starting a fire with a bow and drill is simple, but you must exert much effort and be persistent to produce a fire. You need the following items to use this method:

Socket - the socket is an easily grasped stone or piece of hardwood or bone with a slight depression in one side. Use it to hold the drill in place and to apply downward pressure.

Drill - the drill should be a straight, seasoned hardwood stick about an inch in diameter and about 12 inches long. The top end should be rounded and the bottom end blunt to produce more friction.

Bow - the bow is a resilient, green stick about an inch in diameter and a string. The type of wood is not important. The bowstring can be any type of cordage. You tie the bowstring from one end of the bow to the other, without any slack.

Fireboard - the size is up to you. A seasoned softwood board about an inch thick and 8 inches wide is preferable. Cut a depression about 1 inch from the edge on one side of the board. On the underside, make a V-shaped cut from the edge of the board to the depression.



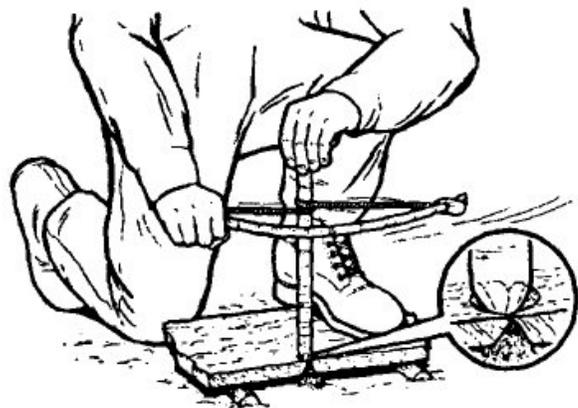
To use the bow and drill, first prepare the fire. Place a bundle of tinder under the V-shaped cut in the fireboard. Place one foot on the fireboard.

Loop the bowstring over the drill and place the drill in the pre-cut depression on the fireboard.

Place the socket, held in one hand, on the top of the drill to hold it in position. Press down on the drill and saw the bow back and forth to twirl the drill.

Once you have established a smooth motion, apply more downward pressure and work the bow faster. This action will grind hot black powder into the tinder, causing a spark to catch.

Carefully blow on the tinder until it ignites.





Fire Building Hints

Use non-aromatic seasoned hardwood for fuel, if possible

Collect kindling and tinder along the trail, and keep in a zipper-lock plastic bag

Make tinder balls of natural fiber cotton saturated with petroleum jelly and store in a waterproof container

Carry short lengths of natural fiber rope or twine to make a birds nest when needed

Collect dryer lint to use as a tinder source

Adding insect repellent to the tinder will help it to ignite

Keep the firewood as dry as possible

Dry damp firewood near the fire

Bank the fire to keep the coals alive overnight

Do not select wood lying on the ground to make your fireboard for the plow or drill method. It may appear to be dry but generally the fibers will be damp and will not provide a sufficient surface to produce enough friction