

Fire Building Tips

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I. Four handy rules to remember:

- a. **"Fire triangle"** = all fires need 3 essential ingredients: sufficient heat + sufficient oxygen + sufficient fuel that matches the size of your fire
- b. **"Fire fuels are like food for people"**
 - i. Baby-sized fires need baby-sized fire food (tinder); child-sized fires need child-sized fire food (kindling); adult-sized fires need adult-sized fire food (larger pieces of wood)
 - ii. Do not skip steps when feeding a fire. For example, do not try starting a baby fire with kindling or large sized wood. Likewise, do not try maintaining a big fire with just tinder.
- c. **"Fires are hungry"**
 - i. Always have a LOT of tinder, kindling, and large size wood sorted into piles **BEFORE** you start your fire. Be prepared & be organized!
 - ii. Plan well ahead of time for your next fire. Planning examples include...
 1. During daylight hours, gather everything you need for a night-time fire.
 2. If you are expecting rain, gather materials before it rains and store them in a dry place.
 3. Gather very dry tinder before your campout; carry it a bag inside your backpack as you travel to your campsite.
 4. During a campout, if you need a fire for breakfast in the next morning, set aside your fire-building supplies the night before.
- d. If rain or snow has made everything wet, the **"interior of wood branches or logs usually are dry."** Use a knife or axe to expose the interior dry areas of wood for tinder, kindling or large fuel. Dead branches still on a tree or dead standing tree trunks usually are much dryer than wood found lying on the ground. Also look for dead branches that became caught in bushes when they fell off the tree.

II. Tinder:

- a. Should be VERY dry

- b. Should be **VERY** small and have high surface-to-volume ratio
- c. Should be **EASILY CATCH ON FIRE** at a low temperature
- d. Gather tinder when you can and carry it with you to your campsite. **Be prepared for making your next future fire. Do not wait until dark or until the last minute** to find the materials you need. Plan ahead!
- e. Form a tinder bundle into a "bird's nest" shape that has thick bottom and sides:
 - i. Your initial sparks or flames should be in middle of the "nest"
 - ii. Loosely cover the initial flames by pulling the sides of the "nest" over the flames
 - iii. Kindling loosely goes on top of the tinder bundle. The **flames from the tinder will travel straight upwards** and should be able to **easily reach the kindling**. (See "Fire lay" section below for more details)
- f. Can use both natural and human-made materials for tinder. In Atlanta area, examples include...
 - i. Shredded dry inner bark from dead tulip magnolia tree branches or trunks. (NOTE: Tulip magnolia trees often are incorrectly called tulip poplar trees. They are not related to true poplar trees.)
 - ii. Crushed pine needles that have been run over by cars in the street
 - iii. Dry grasses & dry goldenrod flower heads
 - iv. Dryer lint from cotton or linen clothes (not from wool or synthetic fabrics)
 - v. Very thin and tiny shreds of birch bark
 - vi. Shreds of natural fiber string or cord (e.g., jute twine, etc.)
 - vii. Natural fabric or cotton first aid gauze pads that has been presoaked in melted paraffin. Or you can buy various similar products.
 - viii. Shredded cotton balls or dryer lint rubbed with Vaseline or alcohol-based hand sanitizer
 - ix. Alcohol wipes (like what you might use in a first aid kit)
 - x. Extra-fine steel wool will catch sparks surprisingly well. (Note: this will not work with heavier grades of steel wool)
 - xi. Tiny wood shavings, especially from basswood trees or birch trees. Related to this are "feather sticks" you make with your knife
 - xii. **Solidified resin or fatwood** from dead white pine trees is fantastic tinder!
 - xiii. **Char cloth** is fantastic tinder!
 - xiv. **Char punk wood** also is fantastic tinder!

III. Ways to start your tinder on fire include...

- a. Wood matches: learn the right technique to use them. **Must keep them dry.**
Avoid cardboard matches - they absorb humidity from air and stop working.
- b. Portable lighters (don't work well when cold)
- c. Friction methods (e.g., bow drill or hand spindle)
- d. Striking methods:
 - i. Traditional flint & steel
 - ii. Ferrocerium rods
- e. Solar power using a magnifying glass
- f. Air compression with a fire piston
- g. People have invented many other methods all over the world! See bibliography.

IV. Wood types for kindling and main fuel:

- a. As with tinder, you want your kindling and main fuel wood to be as dry as possible
 - i. Avoid wood from fresh-cut living trees
 - ii. Avoid rotted wood (except for making char punk wood tinder)
 - iii. Best to avoid non-native trees that may release hazardous smoke. Same with anything in the rhododendron or azalea family
- b. Not all woods have the same burning qualities.
- c. Some types easily catch on fire, but do not make good coals for cooking or heating. These include....
 - i. Most coniferous trees (pines, etc.)
 - ii. These usually are good for kindling
 - iii. Tend to be sooty and smokey
 - iv. Pines and tulip magnolia tend to shoot off a **lot of sparks (fire safety hazard)**
- d. Other types of wood are difficult to catch on fire, but make long-lasting cooking or heating coals (e.g., oak, maple, hickory, dogwood, etc.)
- e. Hardwood charcoal often burns hotter than fires made with regular wood and tends to be less sooty or smokey. **NOTE:** the quality of the charcoal you buy makes a big difference! You often will get what you pay for.
- f. If using "match-lite" style of charcoal briquettes, completely **seal the bag opening with duct tape if you do not use the whole bag.** This will keep the

lighter fluid in the briquettes from evaporating. Also **store briquette bags off damp ground and out of the rain.**

- V. "Fire lay" = how to arrange your fire-building materials
- a. Good tip: Arrange some medium-sized dry sticks to create a raft-shaped platform on the bare ground. Build your fire on top of the raft. This helps your fire avoid moisture that may be present in the dirt. Especially important to do this after rain or snow has soaked the ground
 - b. Regardless of the fire lay design, arrange your materials in the following order:
 - i. **Tinder bundle:** smallest most flammable tinder materials inside the bundle. Larger tinder materials on outside of tinder bundle. Place tinder bundle low in center of your fire lay. The starting flames need to climb straight upwards and easily reach the kindling
 - ii. **"Stage 1" kindling:** Outside and above tinder bundle loosely place sticks that are approximately the diameter of pencil lead
 - iii. **"Stage 2" kindling:** outside of Stage 1 materials place sticks approximately the diameter of pencils
 - iv. **"Stage 3" kindling:** outside of Stage 2 materials place sticks approximately the diameter of your thumb
 - v. **Main fuel logs:** Outside Stage 3 materials place your main fuel logs. These should be approximately the diameter of your wrist
 - c. Common fire lay designs: each has pros and cons
 - i. **Tipi:** starts fast but burns down fast. May be smokey.
 - ii. **Log cabin:** starts medium fast and can make good coals. But logs may roll, making this fire lay potentially unstable
 - iii. **Lean-to:** Most stable and will make good long-lasting cooking/heating coals. Likely the least smokey. But might not start as quickly as a tipi fire lay
- VI. **Always practice rigorous fire safety precautions** when starting, using, and putting out your fires!!!!
- a. Build your fires in existing fire rings whenever possible (Leave No Trace)
 - b. Never leave your fire unattended

- c. Avoid building fires on soil with a lot of organic materials or tree roots - your fire might travel underground and start a forest fire many days later after you leave your campsite!
- d. Beware of wind blowing sparks away from your campsite
- e. Be well prepared for instantly putting out your fire in case it starts getting out of control

VII. Wood yard: Sometimes you need to reshape wood for fire-making use. Set up a safe roped off wood yard area where one person at a time can use axes, splitting mauls, saws, and knives safely without risking injury to other people in your group.

VIII. Bibliography:

- a. Hume, Daniel. (2018) Fire Making: The Forgotten Art of Conjuring Flame with Spark, Tinder, and Skill. New York: The Experiment.
 - i. Daniel Hume's impressive book provides a wealth of information about multiple ways to start fires. He learned these methods by traveling to many countries.
- b. Marcoux, Paula. (2014) Cooking with Fire. North Adams, MA: Storey Publishing.
- c. Mears, Ray and Falt, Lars. (2016) Out on the Land: Bushcraft Skills from the Northern Forest. London: Bloomsbury Publishing.
- d. Robinson, Leigh. (2018) Bushcraft - The Bow Drill Bible. Kindle Direct Publishing.
- e. Robinson, Leigh. (2019) Bushcraft - The Hand Drill Bible. Kindle Direct Publishing.
- f. Warren, Mark. (2015) Secrets of the Forest, Volume 2. Walden, TN: Waldenhouse Publishing.
 - i. There are 4 volumes in this excellent series; volume 2 includes fire-making tips specifically useful for camping in Georgia's forests.
 - ii. Also note that Mark Warren teaches many excellent in-person Native American and outdoor wilderness skills classes --- including traditional fire-making methods --- at his forest school located southwest of Dahlonega, GA. See www.medicinebow.net for his class schedule. You can buy many of his books at the Eagle Eye Book Shop in Decatur, GA.

IX. Sources for buying fire-making tools:

- a. Excellent U.K. vendor for very high-quality flint and steel supplies:

<https://www.beaverbushcraft.co.uk/> This same vendor also has excellent YouTube instructional videos.

- b. Vendor for both bow drill & hand drill friction fire kits:

http://www.grannysstore.com/Wilderness_Survival/Bowdrill_Fire_Kit.htm

- c. Amazon for ferrocerium rods. Buy a rod approximately 5" long & $\frac{1}{4}$ " in diameter, with a pre-drilled hole; tie a colorful lanyard through the hole to help avoid losing your ferro rod (otherwise they easily blend in with dirt, rocks, dead leaves, etc., making them very hard to find)

- d. Amazon also for a fire piston. The "SXTL Fire Piston Kit" is excellent quality.

- e. Brass tinder box with magnifying glass for solar lighting:

<https://www.trackofthewolf.com/Categories/PartDetail.aspx/22/1/TOBAC-BOX-B>

- f. Go to Michaels arts & crafts store to buy a small metal box for making char punk or char cloth. You also can re-use Altoids metal boxes for making char cloth. **IMPORTANT SAFETY REMINDER:** Make certain you drill a tiny smoke escape hole in the lid before you put your box in a fire!