

# Fire Building



**Desired Outcome:** Participants will learn to work in partnerships with girls to plan, implement, and evaluate activities.

**Learning Objectives:** By the end of the session participants will be able to:

1. Lay, light, use, and extinguish a fire safely.
2. Demonstrate LNT principles in outdoor activities covered in this course.

## **Fire Building**

### Preparation

Before starting – things to think about

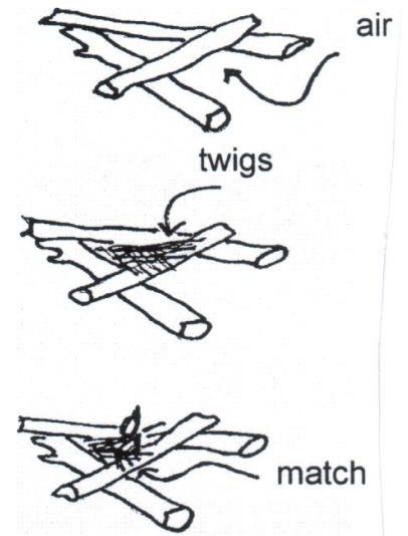
1. What is the purpose for the fire?
2. What size fire do you need – Too big is unnecessary and wasteful of fuel.
3. What material is available? Found locally or need to bring it in?
4. What are the weather conditions?
5. What are the rules for fires? Where can fires be built?
6. Plan enough time for the fire to burn down and for appropriate clean-up

## **Fire Safety – Your Primary Concern**

- Keep hair tied back, remove loose or baggy clothing that might fall into the flames.
- Review with the girl “Stop, drop, and roll” so they know what to do if clothing catches fire.
- Use a designated fire ring, away from overhanging branches and leaf litter.
- Have a bucket of sand or water on hand before lighting the first match.
- Keep a shovel or rake nearby for beating out sparks that fall to earth.
- Avoid putting leaves into the flame, bits of burning leaf float on hot air and may cause wildfire.
- NEVER leave a fire unattended!
- Pile firewood on the windward side of the fire, well away from the flames.
- Use care and follow manufacturer's instructions while using cook stoves. Bottled gas (propane) is preferred. Liquid fuel stove (white gas, alcohol) are often used while back packing.
- Keep flour or baking soda near stove for smothering grease fires.
- Restrict the number of people around the stove or campfire.
- Keep matches away from the stove and the fuel.
- Make sure the stove is stable and away from high traffic walking areas.
- Store extra fuel away from the cooking flame and lower than the stove
- Propane is the most widely used fuel, but it is highly volatile and explosive! It must be used properly.
- Dispose of pressurized cans properly. Keep bottles away from fire, direct sunlight, or high heat.

## **Building a Foundation Fire – A Frame**

1. Prepare a safe fireplace.
2. Collect enough wood (3 times more than you think is necessary).
3. Gather bucket of water or sand, rake or shovel.
4. Lay thumb-sized or larger sticks in the shape of an A. If there is a breeze, orient the open end so that the breeze will blow into the A.
5. Prop tinder against the crossbar of the A, twigs
6. allowing the breeze to blow under it. Tinder should be piled loose enough to allow air circulation, but close enough to share the flame with each other.
7. Hold lighted match under the tinder until it catches fire.
8. Gradually add more tinder, increasing in size.



***Won't light? Odds are you've done one of these things:***

- Used sticks that are too large, too wet, or too green
- Tinder was too sparse or too tightly placed
- Held the match in the wrong place
- Not had extra twigs on hand to feed the flame

Rebuild your fire and try again!

**Extinguishing a fire**

1. Spread out coals in fire ring
2. **Sprinkle** coals with water and rake. Repeat until coal bed is cool.
3. Use shovel to lift remaining fuel logs and soak in water bucket.
4. Then replace on smoothly raked, cool fire bed. Hold hand above coals and feel for heat. If it feels warm, continue to sprinkle.
5. **For fireplace**, plan on letting your fire burn to ash. Remove coals/ash to outside ring to sprinkle. Putting water on the fireplace bricks can crack the fireplace. Sweep fireplace.

**Minimize Use and Impact of Fires**

Campfires are an important part of camping. However, sometimes they are not appropriate. Think about whether you need to have a fire.

**May You Have a Fire?**

There are times, such as when the weather is very dry, that a campfire could be dangerous. At other times, there is a burn ban because of air quality concerns or because of a fragile environment. In fragile environments, such as deserts and alpine meadows, fires leave scars for many years and deplete slow-growing wood supplies.

If you want to build a fire, ask local land managers about fire restrictions or closures and whether a campfire permit is required in the area you plan to visit. Build fires only if they

are allowed, there is plenty of wood that will be replenished quickly, and fire danger is low.

### **Do You Need A Fire?**

When a fire is permitted, think about whether you need to have one. For instance, cooking on a wood fire might not be the best choice. It is easier to do Leave No Trace cooking on a stove rather than on a wood campfire. Another choice is cooking on a charcoal fire. A propane or white gas stove is economical and lightweight, provides fast, clean cooking, produces fewer emissions than a fire, and requires little clean up. In addition, it is far easier to use a stove in bad weather!

### **When you do decide to have a fire, keep the following in mind:**

- Use only dead, downed wood. Green trees and branches won't burn and standing dead snags provide animals habitat.
- Sawing trees and branches leaves ugly stumps and scars.
- Collect small sticks from the ground, wrist size or smaller, that can be broken by hand. To help remember the right size, think "dead, down, and dinky."
- If your campsite has a woodpile, be sure to leave it as tidy as you find it. If it did not have a woodpile, scatter unbroken sticks back into the woods.
- Some campgrounds allow you to bring wood with you while some forbid it. Check with the site manager.
- Small sticks burn completely and provide good coals. The remaining white ash is easier to dispose of than partially burned logs.
- Never leave a fire unattended.

## Wood Types

Tinder – Material that will catch easily from a lighted match and burn sufficiently to catch larger material.

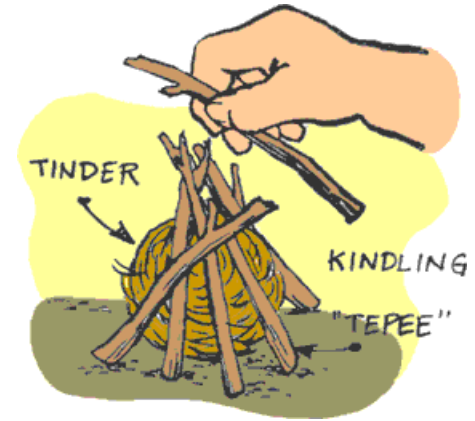
1. Dry twigs from bushes and weeds.
2. Red and white cedar bark
3. Pinecones and spruce needles
4. Fuzz sticks and shavings

Kindling – Next in size after tinder. Should be graduated to size of thumb – soft wood or small twigs of hardwood to catch easily.

1. Poplar family
2. Conifers
3. Rhododendrons

Fuel – The wood that really makes the fire: hardwood.

1. Oak
2. Maple
3. Dogwood
4. Iron wood
5. Beech
6. Sycamore



## *Alternatives to Fires in Fire Rings*

If no fire rings exist, a new ring is unnecessary. Fire rings do not prevent fires from spreading, and the blackened rocks are hard to conceal. Instead, build your fire in:

- A "fire pan" raised off the ground with rocks. Use a metal oil pan or light-weight barbeque grill, purchased at a discount outlet or auto parts store. The rocks will not be blackened by the fire and the soil under the fire pan will be protected from heat.
- Make a mound fire. Collect sand or dirt from a stream bank or from beneath the roots of a downed tree. Using a tarp as a base for easy clean up, form sand or dirt into mound six to eight inches thick and 12-18 inches across. Use this mound as your fire platform. Build the fire on top of the mound, using only small pieces of wood. Wood should be small enough to break with your hands. Burn the fire until it is completely gray ash-no cinders. Let the ash cool to the touch. Scatter the ashes and return the soil to where you got it.

## Fire Clean Up

- Always make sure your fire is completely out. A fire is out when the coals are cold enough for you to rest your hand upon them.
- In an established site, pick up trash in or near the fire area.
- If the fire circle is filling with ash, collect and then scatter the cold ashes several hundred feet from the campsite. Leaving a clean, usable fire circle will encourage the next campers to use the same site.

## Girls Activities

### Edible Fires

Teach Fire Building with Edible Fires

(Use your imagination to substitute items and reduce cost)

	Salad Fires	Snack Fires
Fire Circle	Paper Plate (lettuce leave optional)	Paper Plate or paper towel
Rake	Fork	Fork
Fire Bucket	3 oz cup of salad dressing	3 oz cup of salad dressing
Wood Pile	Napkin to stack "wood" on	Napkin to stack "wood" on
Fuel	Celery, carrots, or bread sticks	Rod pretzels or large tootsie rolls, cheese puffs
Kindling	Split carrot or celery sections	Pretzel sticks or small tootsie rolls
Tinder	Shredded lettuce or cheese, carrot shavings or chow mein noodles	Coconut or shredded cheese
Match	Bread stick pretzel stick or thick strip of green pepper	Licorice whip or stick
Flame	Chopped tomato or red pepper, bacon bits or croutons	Red-hots or candy corn
Emergency Fire Starter	Peppermint kiss, slice of radish	Chocolate kiss or chips

# Edible Fire



← Existing Fire Ring

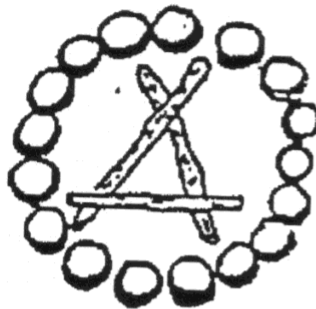
Mini-Marshmallows, M&M's, Gumdrops or Jelly Beans - (rocks outlining boundary for fire tenders.)

Don't forget your fire bucket - small cup of Kool-Aid or water. →



Foundation →

Three large pretzel sticks represent large logs for teepee frame. (About the size of your arm.)



← Tinder

Coconut or small pretzels represent small sticks (match-stick size or smaller than your little finger), dry leaves or wood shavings.



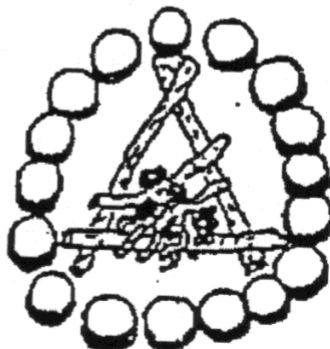
Kindling →

Broken middle-sized pretzel sticks or chinese noodles for thin wood (pencil or thumb size.)



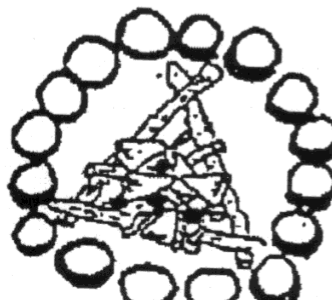
← Alternative Fuel

Raisins or licorice sticks represent charcoal needed for cooking, instead of large logs. Carrot and celery sticks or large pretzel sticks can be logs.



Flame →

Candy corn or Red Hots are placed on top to represent a successful fire.



Now it can be consumed!

### **To build your fire:**

1. Tie hair back.
2. Check for items that might dangle into the fire and/or synthetic fabrics.
3. Give out "fire circles" and clear with "rakes."
4. Place your folded wood pile next to the plate.
5. Make a wood pile by stacking "wood" on your napkin.
6. Fill a fire bucket and place nearby.
7. Make an A-frame with kindling in the middle of the "fire circle."
8. Add to mini-handfuls of "tinder."
9. Put "match" under the A-frame to light the fire.
10. Add "flames."
11. Add kindling.
12. Add fuel.
13. Put fire out by sprinkling or sipping from "fire bucket."
14. Eat everything up so you leave a clean fire site.

There ARE rainy, wet days when it's tough to get a fire going. In that case, you may need a safe fire starter to get your fire blazing. Below are options for fire starters. Making these at a troop meeting gets the girls involved and planning for those wet emergencies.

Safety Tip: If you select a fire starter that uses melted wax, you must use a double boiler (a small can inside a larger can that has some water in it). If wax gets too hot it can literally explode. Have a fire extinguisher handy in case of emergency. Do not microwave.

1. Kisses. Use small candle pieces and wrap them up in waxed paper. Twist both ends of the waxed paper to seal in the candle (looks like a salt water taffy candy.) Light an end when you are ready to start your fire.
2. Use pine cones covered with wax.
3. Pack charcoal in paper egg cartons and tie shut. When ready to use, just light the carton.
4. Put a piece of charcoal in each section of a paper egg carton. Cover with melted wax. Tear apart and use as needed. You can also use wood chips or shavings, dryer lint (cotton only) or pistachio shells instead of the charcoal.
5. Take 100% cotton balls and thoroughly rub petroleum jelly into them. Keep in a zipper plastic baggie.
6. Trench candles: Newspaper cut into strips (3"-4" wide.) Roll up and tie with string. Dip into melted wax.
7. Use cotton lint from dryer as a fire starter.
8. Bundle about 10-12 "strike-anywhere" wooden kitchen matches together with waxed dental floss. The heads of the matches should all be pointing in the same direction. Generously soak the bundle of matches (except heads) in melted paraffin wax to waterproof and to provide a long burn time. Dip heads lightly only to waterproof them. Simply strike on flat rock to ignite.
9. Make a fuzz stick: Cut into the sides of a dry stick to make curls that remain attached to the stick.
10. Use dried pine needles
11. Cut a cotton cord into 1" lengths and soak in melted wax. Let dry and store in empty film container or zipper plastic baggie.



12. Cut waxed milk cartons or tomato shipping boxes into strips to be used as kindling for your campfire.
13. Stuff paper towels or toilet paper rolls with paper.
14. Use small condiment or "sample-size" cups. Add a long wick to each cup and fill with melted wax. You can also fill them with sawdust, wood shavings or dryer lint.
15. Stack of small pieces of cardboard covered with wax.
16. Use cotton string about 3"-4" long, put in wax paper bathroom cup with about an inch hanging over the edge. Fill cup nearly to the top with saw dust and pour melted wax into the cup. The saw dust will compact and become waterproof. The extra string length is a wick to start burning the starter, but can also be tied to another starter string through a pack loop to carry outside your pack.
17. Roll up a ball of wax paper.

AND, you can waterproof "Strike Anywhere" matches by dipping them in wax or coating them with clear nail polish.