

# Troop 1911 Firem'n Chit Training Outline

November, 2021



## Supplies Needed:

- Boy Scout Handbook
- Training Outline
- Bucket, Shovel, Water
- Strike Anywhere and Storm Matches, Bic or Zippo Lighter
- Examples of Tinder, Kindling & Fuel
- Camp Lantern
- Camp Stove w/ Propane Bottle and Propane tree
- Backpacking Stove with Fuel
- Dutch Oven
- Metal plates with fire grate and/or Dutch Oven stand
- Flint & Steel w/ Charcloth\*
- Battery & Steel Wool\*
- Bow Drill\*
- Magnifying Glass\*
- Polished Soda Can\*
- Hot Spark/Ferro rod\*
- Magnesium Bar\*
- Fire Piston\*
- Charcoal w/ Charcoal Chimney & Pliers

\*Optional

## **PART ONE - FIRE**

Everyday Americans experience the horror of fire. But most people don't understand fire. Only when we know the true nature of fire can we be prepared ourselves. Each year more than 5,000 Americans die and more than 25,000 are injured in fires, many of which could be prevented. It is interesting to note that children of all ages start 100,000 fires annually. Approximately 25,000 of those fires are set in houses. Tragically, children make up between 20% - 25% of all fire deaths and that over 30% of the fires that kill children are set by children playing with fire. This is why fire safety is a very important skill to learn at an early age.

Building a campfire is a crucial skill for scouting. Not only is it a real-world survival technique, but sitting around the fire is a great way to get to know your fellow scouts and make life-long friendships. Fires can be used for cooking, for fellowship and for warmth. There are many ways to start a fire, but no matter how the fire is started, it's important to practice good fire safety, thus the Firem'n Chit Training we are starting now.

### **What is the Firem'n Chit:**

The Firem'n chit is a card issued to a Scout authorizing him to use fires and other hot objects.

### **BSA Requirements for the Firem'n Chit are:**

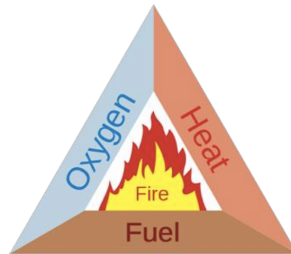
1. I have read and understand fire use and safety from the Boy Scout Handbook
2. I will secure necessary permit (regulations vary by locality)
3. All flammable vegetation to be cleared at least ten feet in all directions from fire
4. Fire must be attended to at all times
5. Fire-Fighting tools (water and/or shovel) must be readily available
6. Fire must be cold out before leaving
7. I subscribe to the Outdoor Code

### **What Does the Firem'n Chit Training Course Cover?**

- Safety, Safety, Safety
- Fires
- Stoves
- Lanterns
- Fire Starters
- Any Hot objects

## Science of Fire: The Three Main Ingredients

What is fire? Fire is the rapid combination of oxygen with fuel, typically characterized by flame, which emits light and heat. For a fire to occur three items must be present: **heat** (ignition source); **fuel** (something to burn); and **oxygen** (air). Remove any of them and the fire will not happen.



## General Information on Building Fires

- It is better to use a propane cooking stove than building a cooking fire.
- Campfires should only be built in locations where previous campfires have been built.
- Fires leave scars with long lasting effects on the Earth. Fire destroys all of the minerals in the soil. Making a new fire pit should be the option of last choice – and only used for heat.
- Using previously established fire pits is OK – the damage is done.

## Fire or No Fire?

Check local laws and regulations concerning the use of fires. Many locations have restrictions on the use of ground fires. In such cases a fire pit, which raises the fires off the ground will be needed. Many National and State Parks prohibit all open fires. Many allow fires, but only in established fire rings. Make sure you know the regulations where you are, before starting a fire. If on private property, make sure you have the property owner's permission before starting any fires. Often high heat and/or lack of precipitation will prompt local fire officials to declare a "burn ban", even where fires would otherwise be allowed. Make sure you check for such a ban before starting a fire. You may only build a fire once you know it is safe and legal to do so.

## Fire Safety Rules

- You may only build a fire once you know it is safe and legal to do so (see above)
- You are only allowed to start a fire in you have your Firem'n Chit with you (and it has at least one corner remaining)
- Use existing fire rings or a fire pit
- Clear area 5 feet in any direction from the fire
- Bucket with sand or water and shovel, or fire extinguisher, close by.
- Use of liquid fuel to start fire is prohibited

- Ensure that fires are a safe distance from tents, tarps, ropes, propane and other fuels, bushes, trees, and any other flammable materials.
- NEVER have a flame in a tent, including lit matches.
- Do not play with matches.
- Do not wave or throw burning sticks. Once a stick is lit, it must stay in the fire. This is a source of continual problems with Scouts. Get caught – loose a corner. What goes in the fire stays in the fire!
- Do not put rocks from streams, lakes or ponds - these may explode and cause injuries.
- Do not put sealed cans in the fire - these may explode and cause injuries.
- Do not put plastic in a fire - it releases dangerous fumes.
- Do not put trash or food in a fire – Boy Scouts practice Leave No Trace. Pack it out!
- Do not jump over, wrestle around, or run near fires.
- Fire must always be attended. If you must leave a fire it must be put out-Dead Cold!

## The Three Types of Wood Needed to Start a Fire:

- **Tinder:** Pine needles, small twigs (pencil lead size), birch bark, dry grass and leaves, cattails, wood shavings, dryer lint, cotton balls, magnesium shavings. Keep your tinder dry! Scouts often try to start fire with too large wood, or not enough tinder, or both.
- **Kindling:** Like enough tinder, scouts often seem to forget the kindling, and then wonder why their fire won't light when they try to set spark to just tinder and a few large pieces of wood! Remember, large wood requires more heat to ignite. Therefore, it is essential that some form of kindling be used to feed a fire until it gets hot enough to ignite the larger pieces of wood. Examples of kindling: finger diameter sticks, fuzz sticks.
- **Fuel:** A good supply of fuel needs to be gathered BEFORE building the fire. Fuel includes all larger pieces of wood.

## Three main types of fire layouts:

- **Tepee**
  - The traditional standing triangular fire base, with tinder underneath the standing twigs and logs. Allow enough room for air circulation in and between the logs. This type of fire is used in calm weather when you want a tall flame.
  - A basic fire that is quickly built and can be used for small campfires, or to start other fires. Push two crossed sticks into the ground next to tinder. Lay kindling on the crossed sticks and over the tinder in the form of a teepee, and add larger pieces of wood to the outside. The high flames of a tepee fire are good for one-pot cooking and reflector ovens.
- **Log Cabin**
  - Rectangular layout of logs built on top of each other like a log cabin with ignition source in the middle and bottom. Will collapse on itself as fire consumes material. Method allows for adequate air circulation and ease of adding additional layers. This type of fire is better for harsh conditions, or when big fires are wanted.
  - This is a large fire that is built by criss-crossing logs and sticks in the shape of a pyramid with a hollow center. Place the largest logs at the base and build up to a top of kindling.

Tinder can be placed at the top, and the fire will burn from the top down, or a tepee of tinder and kindling can be placed in the center of the log cabin if it is well ventilated with an open framework. Log Cabin fires are good for group campfires with lots of people. Although they make lots of coals, which can be good for cooking, log cabin fires tend to be large, making it hard to get close to them.

- **Lean To**

- Alternate, stick the end of the stick in the ground at an angle and lean other smaller sticks against it. Put tinder inside and light from the open end. This type of fire is used when the wind is coming from only one direction, it is also great for cooking as the flames are all on one side.
- This type of fire is mainly a cooking fire that creates a nice bed of coals for Dutch Ovens or for roasting. Build the fire against a large log by placing tinder and kindling next to the main log and leaning wood against the log and over the tinder. As fuel is added, it is leaned against the main log, which acts as a reflector and allows coals to bank up against



the reflector.

## **Starting a Fire:**

Scouts love fires, and even though the ability to build a fire is one of the most important survival skills that a scout can master, many scouts have trouble getting a fire started. Remember this:

- Choose the Location for your fire carefully.
- Spark, Tinder, Kindling, and Fuel are all required to build a fire. Keep them dry. Have them ready.
- Light your Fire by shielding your match from the wind, and light the fire on the downwind side.
- Fires need Oxygen, so don't smother yours with too much wood.
- Extinguish your Fire properly when done.

## Spark/Ignition:

All fires begin with a spark. There are many ways to make a spark. Here are some of the more common.

- Matches - These should be carried with you at all times in the outdoors (remember they are one of the ten essentials). Make sure your matches are "strike anywhere" type and waterproof them by dipping each match in nail polish or paraffin wax. After dipping, place the matches in corrugated cardboard to dry, and roll the matches up in cardboard. It is a good idea to put a piece of sandpaper in your waterproof match container to use as a striker.
- Flint and Steel - One of the safest and most reliable ways of starting a fire is with flint and steel. Strike your steel against the flint to shower sparks against your tinder (a charcloth works great here), and watch for a wisp of smoke or a glowing red spot when a spark catches on your tinder's nest (the tinder). Once a spark catches, blow on the tinder until it bursts into flame.
- Lighters - Actually just a modern form of flint and steel. It is a good idea to always have at least a couple of cigarette lighters among your ten essentials.
- Battery - A little known trick is to conduct electricity from flashlight batteries through steel wool. Use a very-fine grade roll of steel wool, cut or tear the roll into strips 1/2" wide, and unroll the strips to 7" or 8" long. Although one battery will work, two are better. Place the batteries on top of each other in upright positions. Take one end of a strip of steel wool and hold it against the bottom of the lower battery, then rub the other end of the wool across the top of the top battery. When the steel wool sparks, place it next to the tinder, and blow on it to start a fire.
- Magnifying glass - A magnifying glass in direct sunlight with the point of light focused on dry tinder will cause the tinder to smoke and eventually break into flame. In an emergency any convex lens will do, including camera or binocular lens.
- Bow Drill/Hand Drill - This is a primitive fire starting method that requires practice but can be accomplished with only a strong string (such as a boot lace) and a cutting tool. Woods that are easy to use are cottonwood, aspen, and cedar used were A notch is cut in the side of the fireboard through which a drill will pass and rest on a flat, shallow grooved surface below. A socket (lubricated with grease) is held in the hand and allows the drill, which is rotated back and forth with the bow string, to turn freely without hurting the hand. As the drill rotates, a fine dust results that becomes hot from the friction of the drill. When the dust starts to smoke, it is placed on the tinder, and blown on until it bursts into flame. Starting fire by rubbing two sticks together is a difficult skill to master, but some experts can start a fire in literally just a few seconds using this technique.
- Ferro Rod/Magnesium Bars - These generate lots of very hot sparks that can ignite char cloth, lint, cotton balls, or natural materials such as finely-shredded birch bark, thistle down, or cottonwood fluff. These can also be used to safely ignite stoves and lanterns.
- Fire Piston - a bit of char cloth is ignited when air is pressurized inside a sealed piston compressed by hand

## Putting Out a Fire:

Knowing how to extinguish a fire properly is just as important as knowing how to start one.

- Break up the fire with a shovel spread out the coals evenly.
- If water is available, sprinkle it over the coals while stirring them with a shovel. Continue sprinkling water until the coals are cool enough to touch. Do not to pour large quantities of water on hot coals, lest a sudden rush of steam burn you or any bystanders.
- If water is not available, stir dirt thoroughly through the hot coals, and cover with dirt at least two inches deep. Buried embers can continue to smolder for quite awhile, so check them frequently, and don't leave until all the coals are cool enough to touch.

## **Charcoal:**

- Charcoal is used for Dutch Oven and Foil Bag Cooking.
- Place charcoal in a charcoal chimney. Light one of three ways.
  - Place crumpled newspaper under chimney and burn
  - Place chimney on stove burner to light charcoal
  - Place chimney on existing fire to light charcoal
- Wear gloves and use pliers to lift the chimney when charcoal is ready
- Be careful when dumping charcoal as hot sparks will fly.
- Use fire ring, fire pit, or metal ground sheets or dutch oven stand for cooking with charcoal. Never place chimney directly on ground to light unless in an established fire ring.
- All charcoal ash goes into the fire ring when finished

## **Demonstrations:**

- Have scouts demonstrate collecting the proper wood, building a fire lay, starting a fire that lasts several minutes, and extinguishing the fire completely when completed.
- Have scouts demonstrate how to set up charcoal chimney with newspaper to light charcoal. Use only single layer of charcoal for demonstration.
- Optional: Have scouts use other methods (flint & steel, magnifying glass, etc.) to start a fire

## **Conclusion:**

A fire is a good tool when use safely and carefully, but can turn deadly if not used properly. Keep an eye on everything, don't let things get carried away. Remember Safety First, Safety Always.

## PART TWO – STOVES AND LANTERNS

### Fuels for Camp Stoves and Lanterns:

White Gas- Not allowed at many scout camps. Used primarily on high-adventure backpacking trips, if at all, or when camping in very cold conditions where compressed liquid fuels do not perform as well.

Propane- Economical, comes in a variety of sizes. Used with camp stoves, lanterns and Bertha. Will burn at altitude and at temps below freezing. Burns hotter.

Butane- Small canisters for backpacking stoves. Does not burn well at altitude and will not burn at all below freezing.

Isobutane/Propane blends- Small canisters for backpacking stoves. Burns better at altitude and below freezing than straight butane.

### Prohibited Equipment and Fuels:

These prohibitions are effective in 2012.

#### **Prohibited Chemical-Fueled Equipment**

*Equipment that is handcrafted, homemade, modified, or installed beyond the manufacturer's stated design limitations or use. Examples include alcohol-burning "can" stoves, smudge pots, improperly installed heaters, and propane burners with their regulators removed.*

#### **Chemical Fuels not Recommended**

*Unleaded gasoline; liquid alcohol fuels, including isopropyl alcohol, denatured ethyl alcohol, and ethanol; and other flammable chemicals that are not in accordance with the manufacturer's instructions for chemical-fueled equipment.*

### Camp Stove and Lantern Safety:

- Be sure to follow all instructions and markings on your camp stove or lantern and in the owner's manual.
- Always operate camp stoves outdoors in an area free of overhead obstructions and never use a camp stove or lantern in a tent or in any enclosed or poorly ventilated location.
- Set up and use your camp stove or lantern following the manufacturer's instructions. Be sure to check and recheck the fuel system for proper installation and freedom from leaks.
- Camp stoves and lanterns are made of metal and metal gets very hot! Be careful around hot appliances during and after use.
- Before you go, check to make sure that cook stoves and lanterns are allowed in camping areas, especially in national and state forests during high fire danger periods.
- Avoid operation of your cooking appliance in rainy or windy conditions.
- Never leave an operating or hot cooking appliance unattended.
- Keep the work area clean and free of clutter, especially paper and other flammable materials.
- Be particularly careful during dry periods to keep dry leaves and pine needles away from your cooking area.



- Be sure to include hot potholders and cooking utensils in your camp kitchen.
- Be very careful with gas canisters. Keep them upright at all times. Keep them outside in a well-ventilated area. Check for leakage by putting a little soapy water on all connections.
- Never install or remove propane cylinders while a stove or lantern is lit, near flames, pilot
- Make sure all fuel connections are tight.
- Light match and hold near mantle or burner.
- Slowly turn on gas until lighted.
- Adjust gas to desired flame or brightness.

### **Changing a Lantern Mantle** (requires adult supervision-mantles are fragile):

- Turn the gas valve completely off.
- Unscrew the lantern cover. Remove the cover and the glass globe that surrounds the mantle
- Remove any remnants of the old mantle.
- Tie a new mantle into place on the gas outlet pipe using the attached string or clip
- Replace the glass globe and cover.
- Hold a lighted match or lighter near the mantle. Open the gas valve slightly. The mantle should begin to burn

### **Demonstrations:**

Have scout demonstrate properly lighting the following. Use long-lighters and ferro rod/sparks.

- Camp Stove
- Backpacking Stove
- Lantern

Trainer should demonstrate to students changing lantern mantle

## PART THREE – WRAP UP SESSION

### Firem'n Chit Privileges and Responsibilities:

Firem'n Chit privileges can be taken away if a Scout fails in his responsibility. Corners are cut from the Firem'n Chit card for each infraction. If four corners are cut away or you conduct a serious infraction with fire, stove, or lantern, the card is taken away. You will have to re-earn your card by re-taking this course. You may not manage a Troop campfire, cooking fire, or light a lantern or stove without having re-earned your Firem'n Chit card.

### The Outdoor Code:

The Outdoor Code is a creed an oath to remind a Scout of the importance of caring for the environment.

*AS AN AMERICAN, I WILL DO MY BEST TO - BE CLEAN IN MY OUTDOOR MANNERS,*

I will treat the outdoors as a heritage. I will take care of it for myself and others. I will keep my trash and garbage out of lakes, streams, fields, woods, and roadways.

*BE CAREFUL WITH FIRE,*

I will prevent wildfire. I will build my fires only where they are appropriate. When I have finished using a fire, I will make sure it is cold out. I will leave a clean fire ring, or remove all evidence of my fire.

*BE CONSIDERATE IN THE OUTDOORS,*

I will treat public and private property with respect. I will use low-impact methods of hiking and camping.

*AND*

*BE CONSERVATION-MINDED.*

Congratulations! You have now earned the privilege of carrying a BSA Firem'n Chit Card. Use it wisely (or lose it)