



ELP Station Handout Fire Starting

INTRODUCTION

This is the fire starting handout for the Environmental Living Program at Sutter's Fort State Historic Park. All parents participating in ELP who have been assigned as a designated fire starter should read this handout prior to their ELP day. This handout is different from and does not follow the same format as the other ELP station handouts because fire starting is not a station like the other ELP stations. It is not a station that the students visit during the day and as a result, this handout will not emphasize what students should learn, as do the others. Instead, this handout will cover only what the assigned fire starter needs to know for starting fires safely and effectively on the morning of his or her ELP day.

ARRIVAL

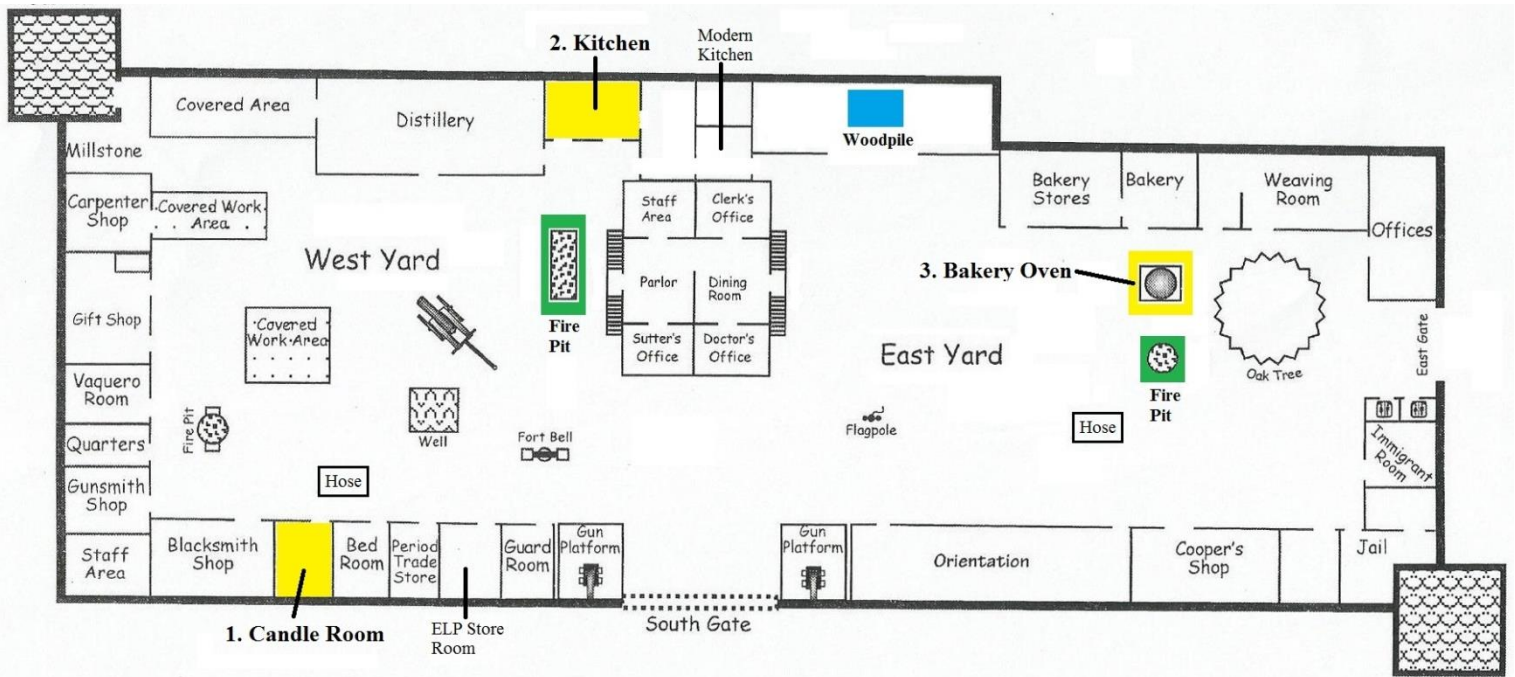
It is very important that you arrive at 8:00 am sharp; **DO NOT BE LATE!** The reason for this is that you will have several fires to start and they must be started early in order for the stations to be ready by the time the students arrive. Please be at the South Gate of the fort by 8:00 am; a member of staff will open the gate promptly at 8:00. As soon as the gate is opened proceed to the stations as outlined in the following section before you do anything else, such as help others bring in items.

IMPORTANT LOCATIONS

Before your ELP day, you should confirm with your teacher which stations your school is running which require fires. 95% of schools will require use of the candle room, kitchen and the bakery oven and these are therefore the primary fires you should start upon your arrival (labeled in yellow on the following map). The order in which you should start these is: 1. Candle Room; 2. Kitchen; 3. Bakery Oven. It is very important that the candle room fire is started first; this is to ensure that the wax has enough time to melt before the students arrive. After you start these three fires, there are two more which might need to be started: the outdoor fire pit in front of the kitchen and the outdoor fire pit next to the bakery oven (labeled in green on the following map). Double-check with the parents running the kitchen and the bakery to see if you need to start these fires. Another location with which you need to be familiar is the woodpile (labeled in blue on the following map). A few other locations about which you should know are the ELP Store Room, the Modern Kitchen, and the two hoses in the fort.



MAP



MATERIALS

As a fire starter, you will have to bring a few items from home to help start the fires. Below is a list of the materials you must bring and those the fort already has.

Materials to bring

1. Old newspapers or other dry paper for starting the fire
2. Matches, lighter or other type of fire starter

Materials Available at Fort

1. Kindling
2. Wood
3. Hatchets and axes
4. Period wheelbarrow

There will be wood for you to use located in our woodpile. This wood is purchased previously by your teacher and is available for your class to use throughout the day. If you would like, you can also purchase and bring fatwood (available to purchase at most hardware stores) which is highly combustible and helpful in starting fires. But please do not bring or use Duraflame or other types of artificial firelogs.

STARTING THE FIRES

The three main fires are very different from each other and so this section will lay out the best way to start each fire. But for every fire, make sure that you have at least one bucket of water before you start. Buckets can be found either in the room of the fire or in the ELP Store Room. Buckets can be filled at either hose in the fort or in the sink in the Modern Kitchen. Also, each room with a fire has a fire extinguisher (usually behind the door to the room). Please know where



the fire extinguishers in each room are before you start the fire. They should only be used if there is an emergency.

1. Candle Room

The fire in the candle room should be started in the fire pit under the cauldrons of water and wax. Initially it should be towards the front of the pit, in front of the cauldrons; after the fire has been built up it can be pushed back under the cauldrons. Once the fire is going, build it up so it is fairly large; you want enough heat to make the wax melt before the students arrive. However, make sure the fire is not too big; you do not want flames reaching above the top of the cauldron. Once the wax has melted, the fire should be small for the rest of the day. Ensure you open the window to the room to help reduce the amount of smoke. It will be fairly smoky initially; don't worry. The smoke will lessen once the fire is pushed back under the cauldrons.

2. Kitchen

The fire in the kitchen should be started in the back left corner of the fireplace as you are looking at it from the middle of the room. Ensure you open the window to the room; this helps reduce the heat as well as the smoke.

3. Bakery Oven

The fire for the bakery should be started in the outdoor bakery oven not too far in from its door. As you start adding larger pieces of wood when the fire gets bigger, ensure that the logs you add are not much bigger than 4 inches in diameter. As you build the fire up, also ensure that the flames do not get higher than the top of the oven door.

DURING THE DAY

Once the fires have been started, the parents at each station usually watch and maintain their fire during the day which means that fire starters are usually done with their primary job by the time the rotations start. However, there are many things fire starters can do to keep busy during the day.

Often, teachers will assign fire starters to help somewhere else once the fires are started; so make sure to double-check with your teacher to see if he or she has any plans for you. If you do not have another assignment, you can see if there are any stations that need any extra assistance and help them out. Sometimes fire starters will spend the day just walking back and forth checking on the rooms with fires to see if the parents there need any help or if they need their wood supply restocked. However, some parents like to send students from their station to go get more wood. So just check with the parents running the stations to see what amount of help they would like during the day.





Another good task for fire starters during the day is to watch the kitchen's outdoor fire pit if the kitchen is using it. This fire (like all fires) needs to always have someone specifically watching and maintaining it and often the kitchen staff is too busy cooking or going back and forth between the kitchen and the fire pit to give it adequate attention. Therefore, this is a good spot to be during the day. If you choose this option and want to interact with the public, a good activity to demonstrate is period fire-starting with flint and steel. This fits your assigned task for the day and is very entertaining for the general public. Flint and steel fire starting kits are available to purchase from the Sutter's Fort Trade Store, the gift shop at the fort. Alternatively, if your school has the trapper station, they will have access to the fort's supply of period fire-starting tools and you could possibly borrow some flint and steel from them.

SAFETY

- Whenever you are working with fire, make sure you are being as safe as possible.
- Always have a bucket of water nearby before you start the fire.
- Ensure there is nothing flammable too close to the fire you start as it might ignite.
- Although the fort provides hatchets and axes, most fire starters will not need to use them; you will already have a supply of fairly small pieces of kindling and most pieces of wood will not need to be split.
- If you do need to split wood, please be very careful. Make sure you are in a clear location with no debris or other people nearby. Keep your body parts out of the way of the swing of the axe as much as possible.
- If splitting kindling, don't cut towards your hand or foot if it is holding the kindling in place. Hold the hatchet and kindling against each other (one in each hand) as you chop for better accuracy. Once the hatchet is in the kindling, bring the whole thing up and then down against the ground like a hammer to finish cutting. Alternatively, you can use another piece of wood to hit the back of the hatchet head like a hammer.
- While splitting larger pieces of wood, if the axe gets stuck in a large piece of wood, do not lift the whole thing up and bring it down like a hammer; instead, pull out the axe and try again or use another piece of wood as a hammer on the back of the axe head to push the axe through the wood.
- To carry an axe or hatchet, hold it just below the head with the thumb on the back of the head, the index finger along the side of the axe head and the three other fingers around the handle just below the head. The blade should be facing down when your arm is hanging by your side.

TIPS

- Be flexible, quick and check your fires often. Although you should start the fires in the order stated above, you should check on fires already started before moving on to the next fire. For example, once you start the candle room fire, move onto the kitchen. Once the kitchen is started, go back to check on and build up the candle room and then move onto the bakery



oven. Or, if the candle room fire had gone out and you took a long time starting it again, go back to the kitchen before proceeding to the bakery oven. And after you start the bakery oven, check the kitchen and then the candle room before moving onto either of the outdoor fire pits, if they are needed.

- If you want to learn about flint and steel fire-starting that is great. As mentioned above, you can demonstrate it during the day if you are not assigned to something else. However, in the morning, please use modern fire-starting tools as the fires need to be started quickly; also, because we are not yet open to the public at that time, modern items are allowed. Conversely, if you are showing period fire-starting during the day to the public, do not use any modern items, such as newspaper.
- Kindling is good for starting your fires, along with the newspaper you bring, but please do not use too much. Once the kindling has caught, you can move onto small logs, then medium sized ones and then larger ones.
- Wood with bark on it will not catch as easily when first starting a fire as that without it. So when first starting, try to use pieces without bark. Once the fire is going however, it doesn't matter.
- Fires need air! Make sure you do not smother your fire with too much wood, too close together; space the pieces far enough apart for air flow. Also, blowing on a struggling fire can help it greatly.
- Once you have started all the fires, build up the wood pile at each station for the parents for the day and check with them to see if they expect your help during the day.
- Most of the fires take only small to medium sized pieces of wood but the kitchen's outdoor fire pit can take larger ones. If you want to get rid of some of the larger, more awkward pieces of wood from the wood pile, please do so only in that fire pit.

FLINT AND STEEL

This section is only necessary to read if you intend to demonstrate period fire starting during the day, as mentioned above. It provides a brief history of flint and steel fire starting and then lists the materials needed and the technique to make fire using flint and steel.

History

Archaeological evidence suggests that pre-humans (*Homo erectus*) learned to make and control fire about one million years ago. Scant physical evidence exists today to show the technique these early people used to make fire, but the stone tools they manufactured were made from flint and other similar rocks and so it is assumed that in banging rocks together to make tools, they created sparks. These sparks were generated by pieces of metallic minerals that occurred naturally in the rock. Over time, experimentation helped refine which rocks and which metals worked the best to make sparks and when *Homo sapiens* appeared, they refined the fire-making process. They learned that the combination that makes the best sparks is a rock with a sharp edge that is harder than the metal it is striking. The rock must also have enough tenacity (resistance to



breaking) that it won't shatter upon impact with the metal. From this time on individuals began to carry fire kits with them which consisted of flint, steel and tinder and over the next several thousand years, the use of flint and steel was one of the most common ways to start a fire. By the 1840s (the time of the fort), early matches had been invented but were often so expensive and dangerous that most people continued to use the flint and steel method to make fires.

Materials

1. A hardened, high carbon steel bar
2. Flint
3. Char-cloth (a flammable fabric cooked, or charred, under low oxygen conditions)
4. A metal can for making char-cloth
5. Tinder or jute (the starting fuel)

As mentioned above, a kit which contains all of these items is available at the Sutter's Fort Trade Store or to borrow from the Trapper Station if your school has it.

Technique

1. Make char-cloth.
 - a. Put a hole in the middle of the top of the tin can.
 - b. Loosely pack the can with a flammable cloth that has been shredded or cut into small squares.
 - c. Place the can into the coals of a fire or in an oven. Heat the can until it stops smoking.
2. Separate the tinder (jute) into small hairs and loosely ball the hairs into a "bird's nest."
3. Put some char-cloth on the piece of flint near the edge you are going to strike. Grip the flint firmly in one hand with your thumb holding the char-cloth in place.
4. Hold the steel striker in your other hand and using a long smooth sweeping motion, strike the steel against the edge of the flint. Don't jab at the flint or use short choppy strokes. Sparks will fly and one or more of those will land on the char-cloth. You will see a small ember appear on the char-cloth. Remove the char-cloth from the flint and loosely wrap the bird's nest around the char-cloth.
5. Lightly blow on the bird's nest to stoke the ember. Remove your hat or bonnet and hold the bird's nest away from your face. The bird's nest will start to smoke and will suddenly burst into flame (be prepared)!
6. Immediately place small pieces of flammable material on the burning bird's nest and you have successfully made fire! Congratulations!

