



Candle-Making

I. Goal:

The Candle shop will provide an interpretive experience to help the student understand the basic life and work of the inhabitants of the Fort. It will also illustrate the dull and laborious nature of many period crafts.

II. Objectives:

A. Students will recognize how candles were made and used in a historic setting.

B. Students will participate in the candle making process and will produce at least one candle each.

III. The People:

The only known reference to a chandler (candle maker) at the Fort occurs in a letter from Sutter to U.S. Consul Thomas Larkin on the 15th of July 1845. As postscript to the letter, Sutter appends a list of immigrants who arrived from Oregon on the 10th of July 1845 along with their occupations. Included on this list is an F. Lichtenstein soapmaker and chandler. The Bancroft Pioneer Register shows a Lightston, Frank, 1845, German soapmaker and chandler, original name Franz Lichtenstein, who came from Oregon in the McMahon-Clyman party, in the spring of 1846.

IV. The Place:

The existence of a storage shop for candles, oil, and lanterns within the walls of the Fort is supported by the Kunzel map of 1846. Candles were probably manufactured in the east yard or outside the Fort walls. Tallow, which is rendered animal fat, was used for candle making at Sutter's Fort. Tallow was generally stored in a rawhide bag sewn with the hair out, averaging 25lbs., called an arroba. Tallow was made from beef, mutton, or venison and was used not only for candles, but also for hide dressing, water proofing, lubrication, and as a base for some medicinal salves.

V. The Craft:

Wicking

1840's period wicking was soft loose cotton yarn, usually cut to double the candles length and twisted. It was either home spun or purchased in bulk as wicking yarn. All sources of reference agree that Turkish cotton produced the best wicks. This wicking was being imported to Yerba Buena and it is reasonable to believe Sutter obtained his wicking there. It is also possible that Sutter made his own wicking. As early as 1844, cotton was grown by Sutter and California Missions.



Tallow

Beef, mutton, or venison suet is cooked in an iron cauldron. When the grease is cooked out and fibrous portions (cracklings) float on top of the grease, they are removed. The tallow remaining is strained with a sieve to another tub where it is washed with boiling water. When the dirty water has settled to the bottom and the purified tallow floats on the top, it is skimmed off and set in tubs to harden. Tallow at this stage is yellowish in color. It can be bleached by re-melting and floating it thinly on cold water. The resulting flakes are then laid in the sun and occasionally sprinkled with water until white.

Hand Dipping Candles

Wicking was cut to length and tied to sticks called broaches. Usually, two to seven wicks were secured to each broach. The tallow was melted in a double boiler and using the broach as a handle, the wicks were dipped in the melted tallow and allowed to cool on a cooling rack between dippings. It took about 30 dippings to make a decent sized candle. If the candles had too heavy a wick, or were made too big, they would smoke and drip excessively.

If the tallow was too hot, it would melt the previous coat of tallow off of the candle. If the tallow was too cool, the candle would be bumpy instead of smooth and sleek.

VI. Candle Room Guidelines

Supplies Needed to Make 50 Candles:

1. Wax (paraffin or beeswax)- one 11 pound block per class
2. Cotton wicks, pre-prepared
 - a. 100%-cotton- about 50ft will make 50 candles at 12" per candle to make a 10" candle.
 - b. 15 to 18 ply wicking for 7/8" thick candles (suggested)
 - c. 24 ply wicking for 1 1/2" thick candles
 - d. 24 ply wicking for beeswax candles
3. Newspaper and matches for the fire starting; there may be a firestarter already assigned to the task. (flint and steel, if desired)



Group Size:

1. No more than seven children per group are recommended. This number will allow for ample time for the candles to cool between the dippings. Additionally, if the group is too large, children may become restless before the candles are completed.
2. One adult is required two will make the station more comfortable and allow for some relief.

Candle Room Use:

1. Unlock gate and relock it to the door handle
2. Open Window
3. Get two buckets of water to keep proper water level in double boiler. Water level should be approximately 4 inches below the level of the wax. NOTE: The wax pot could tip and spill if any higher.
4. Start the fire - The melting time is about 2 hours. The temperature should be between
5. 150 and 180 degrees.
6. String wicks through the broaches and adjust them so the wicks are even. The overall wick length is approximately 24 inches, to make two 10" candles.
7. After the first dipping, stretch the wicks as they cool to straighten them.
8. Each set of candles is dipped once in a rotating pattern.
9. If the candles bend, they can be straightened by gentle pressure while the candle is warm.
10. Trim the lower end of the candle after about 20 to 25 dips to keep the wax from extending too far beyond the wick.
11. Trim the candle again when it is finished. Candles should be 3/4 to 7/8 of an inch in diameter (approximately 30 dippings). Put the wax trimmings back into the wax pot.
12. Use the cutting block provided. DO NOT CUT ON CANDLE ROOM FURNITURE.
13. Hang the broach on the rack until the candles harden and are straight.

Safety:

1. The fire extinguisher is located behind the door.
2. A pail of water should be near the fire.
3. No pushing or crowding near the fireplace: one at a time to dip-single file.
4. AN ADULT MUST BE PRESENT AT ALL TIMES WHEN CHILDREN ARE IN THE ROOM. The gate must be secured if the adult leaves the room.
5. Safeguard all artifacts in the room by not handling them.
6. NO VISITORS are to be permitted in the room during the ELP.
7. NO candles are to be burned in the room during ELP.
8. Report any accidents or injuries to the Park Aide at the entrance station (ticket sales).
9. Remember metal gets hot – use the pot holders
10. Ensure the iron gate is kept closed so the Fort visitors DO NOT enter.



Suggestions:

1. 5-6 candles should be set aside for use during night watch. This is the only place in the Fort candles may be lit.
2. Each child will make a candle to take home.

Clean Up:

1. Scrape the wax off broaches
2. Clean wax shavings from the cutting board
3. Return equipment to its proper place in the room
4. Refill wood box