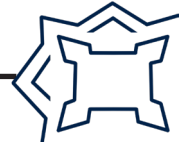# BUILDING A SOLDIERS' HUT

GRADES 4-5

Soldiers of the 4th Pennsylvania Battalion had been living in tents since July, 1776! Imagine you are a soldier in September 1776, living in those tents. With defensive fortifications complete, you and your fellow soldiers can now build more comfortable housing. Help your fellow soldiers with the math to build a small house, called a soldiers' hut, from boards from the army's sawmill. Please use the measurements provided in the diagram below:

8 Feet

5 Feet

6 Feet

10 Feet

10 Feet

(Not to Scale)
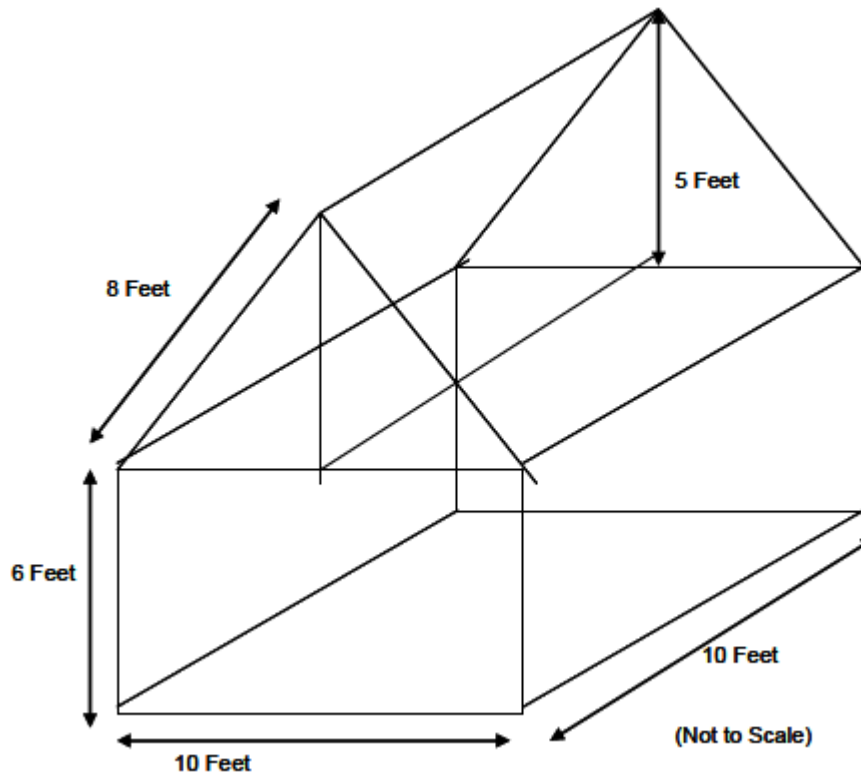
1. Digging the foundation: First you must dig a foundation for your hut. Each hut was set approximately 2 feet into the ground. Although the huts are only 10 feet wide and 10 feet long, you need to dig an extra foot on each side of the hut.
    a. How many feet long will you need to make the foundation?
    b. How many feet wide will you need to make the foundation?
    c. How many cubic feet will you need to dig?

2. Setting in the Floor: The floor of this hut will be made of wooden boards that are 10 feet long by 10 inches wide. How many planks will you need?

WORKSHEET
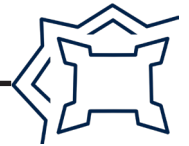
3. Covering the Walls: You need enough boards to cover all four walls of the hut. The army's sawmill has available wooden planks that are 8 inches wide by 10 feet long.
   a. How many planks do you need for one wall?
   b. How many planks will you need for all four walls? (We'll ignore the door for now.)

4. A roof over your head! In order to prevent your roof from leaking each wooden board will have to be laid in horizontally and overlap the board below it. You have boards from the sawmill that are 11 inches wide by 10 feet long, and they each overlap the next board by 1 inch. How many boards will you need for one side of the roof? You will have a little extra overhang.

5. Building a door: You need a door that is 3 feet wide and 5 ½ feet tall . You have some smaller wooden boards that are only 4 inches wide. If you saw them all to the right height, how many planks will you need?

6. Moving in: Now it's time to move into your hut!
   a. If each soldier takes up an area 2 feet wide by 6 feet long on the floor, how many soldiers can sleep in this hut?
   b. With this many soldiers sleeping in a hut, how many huts will you need to build to house 1,400 soldiers?

To help you, here's a graph of the floor where each square represents one square foot. You can shade an area for each soldier. You'll have a little room left over for them to store their equipment, but not much!
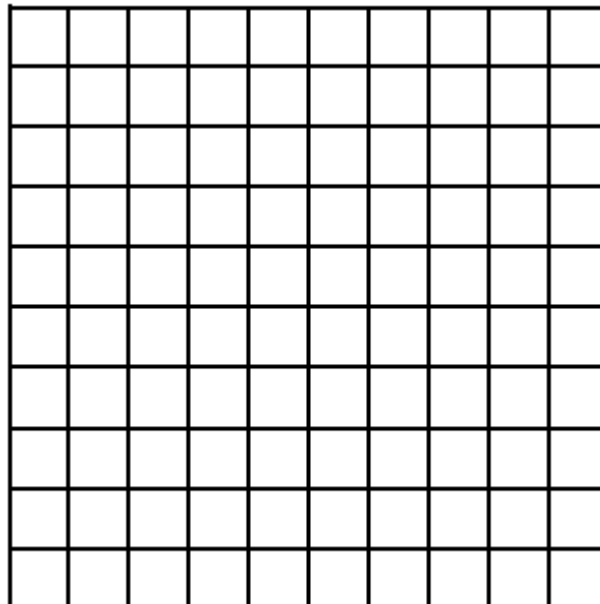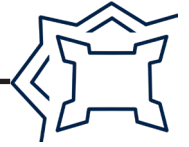
7.   Bonus 1: Back to the Foundation: Each time you use a shovel, you move about 1/4 cubic foot of dirt. How many times will you need to shovel to dig the foundation of one hut?

8.   Bonus 2: How many times will you need to shovel to dig the foundations of all the huts you need for 1,400 soldiers? You'll need an army just to do the digging!