

Calculating Volume

(5.10C) Select and use appropriate units and formulas to measure length, perimeter, area, and volume.

Problem: You want to build a container to store dirt and you need to know how much dirt you will be able to store. For this, you will need to calculate the volume of the container.

1. First we need to form a right angle using our axis lines.


Note: how you have 3 axis lines in the picture below.

- Blue = length
- Red = width
- Green = depth

Where they meet right in the middle is called the origin. (see yellow dot below)



2. Click on the **orbit tool** and rotate your screen until your x and y axis lines form a 90 degree right angle as shown below.

3.  Click on the **rectangle tool**.

Put your mouse right on top of the origin (intersection point of all 3 axis lines)

Now hold down your mouse and drag up and out to form a rectangle (*also known as a polygon or parallelogram*) as shown to the left.

Do **not** click on the screen, but wait...

Dimensions: 3' 7 15/16", 3' 4 1/2"

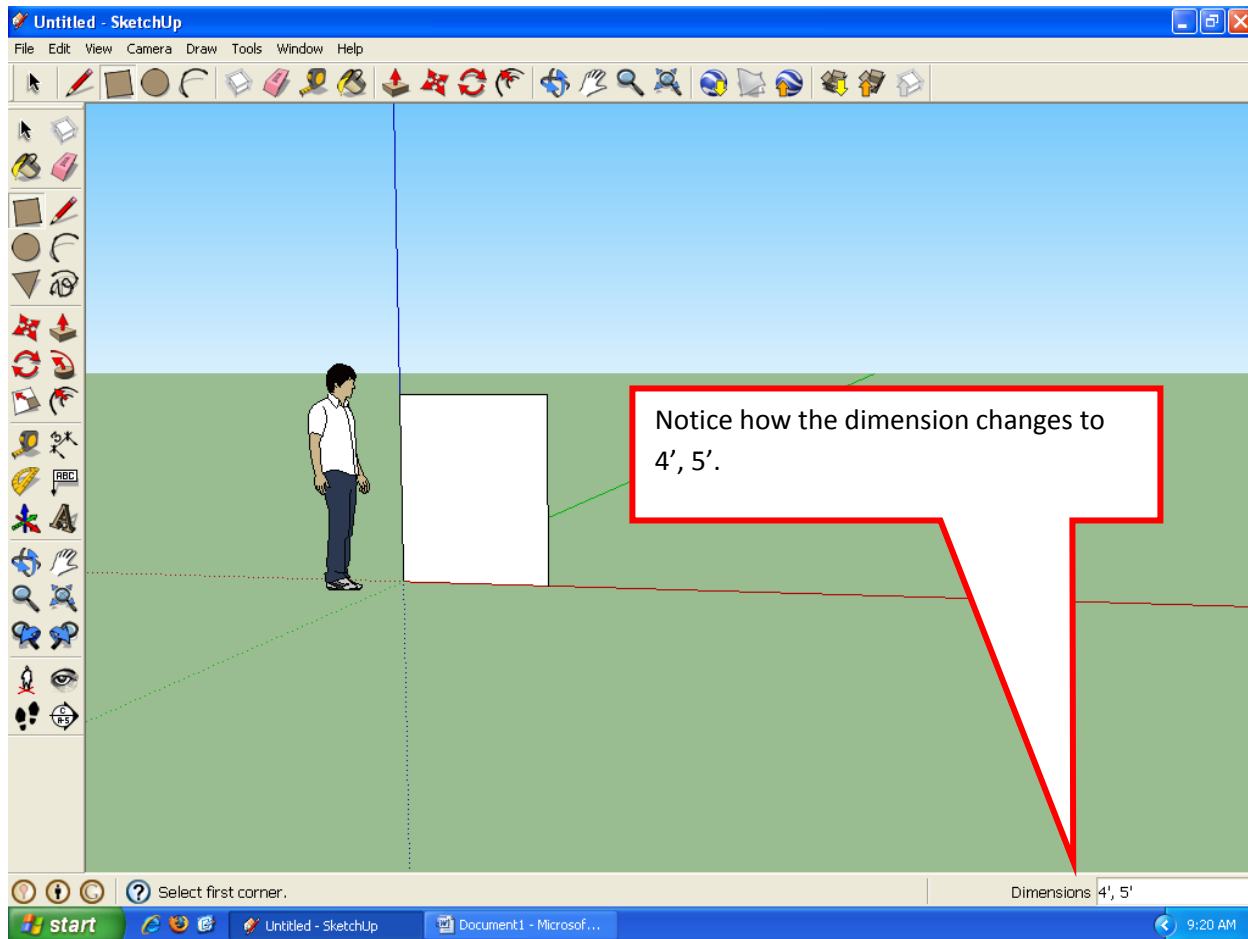
Notice how the dimensions say 3' 7 15/16", 3' 4 1/2"

Let's change the depth dimension to 4' x 5' (four feet by five feet.)

How: Type 4', 5' in the dimensions box and press the Enter key.

Important Note: When changing the dimension, you must type the new dimension **before** you click on the screen or do any other command; otherwise the dimension gets set and you cannot change it.

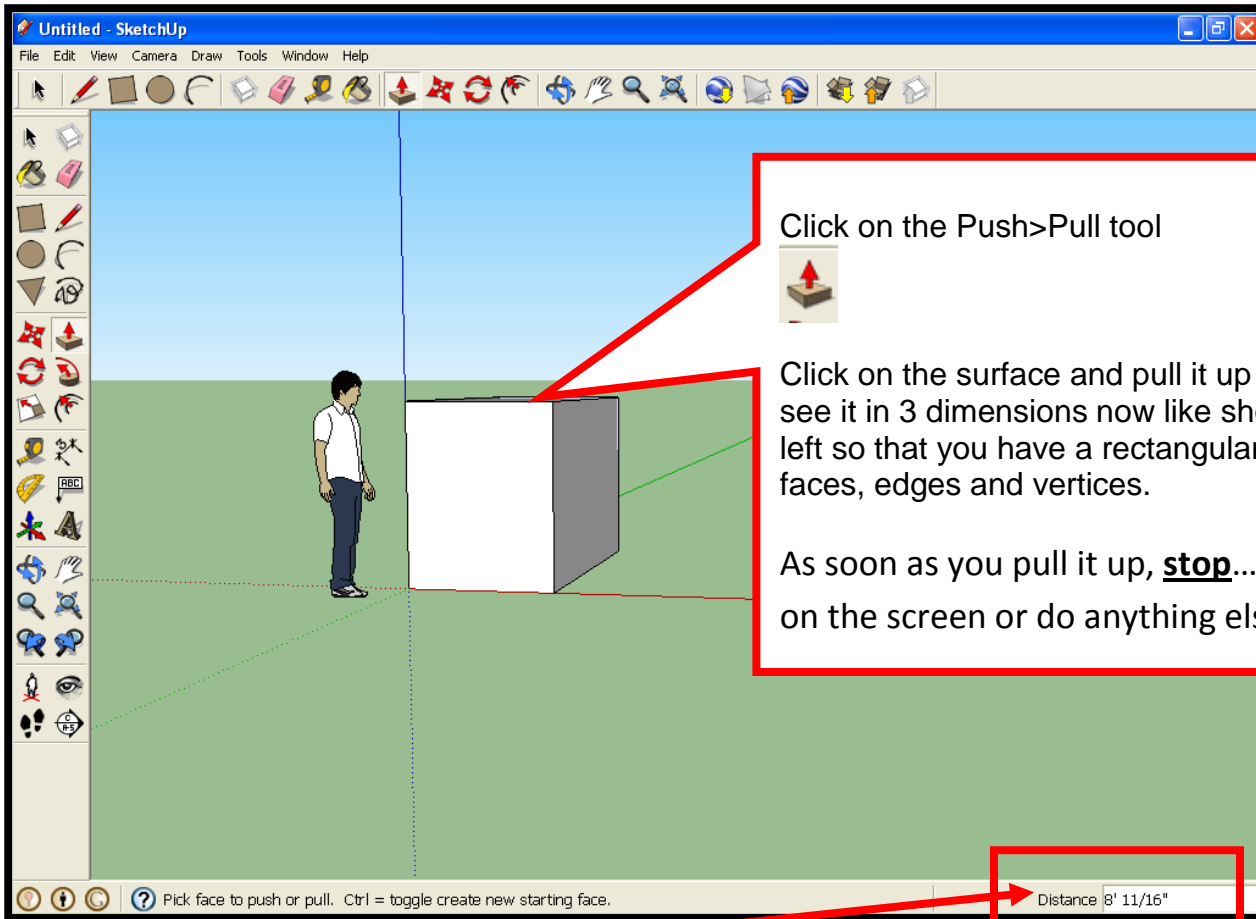
You should now have a rectangle that is 4 ' 5' in dimension. How do I check this?




You can now calculate the area by multiplying the length times the width.

$$\begin{aligned} \text{Formula: } 2L + 2W &= \\ 2(4) + 2(5) &= \\ 8 + 10 &= 18 \text{ square feet} \end{aligned}$$

- **Now we are going to add depth to turn our 2 dimensional object- into 3D.**



Click on the Push>Pull tool



Click on the surface and pull it up so you can see it in 3 dimensions now like shown to the left so that you have a rectangular prism with faces, edges and vertices.

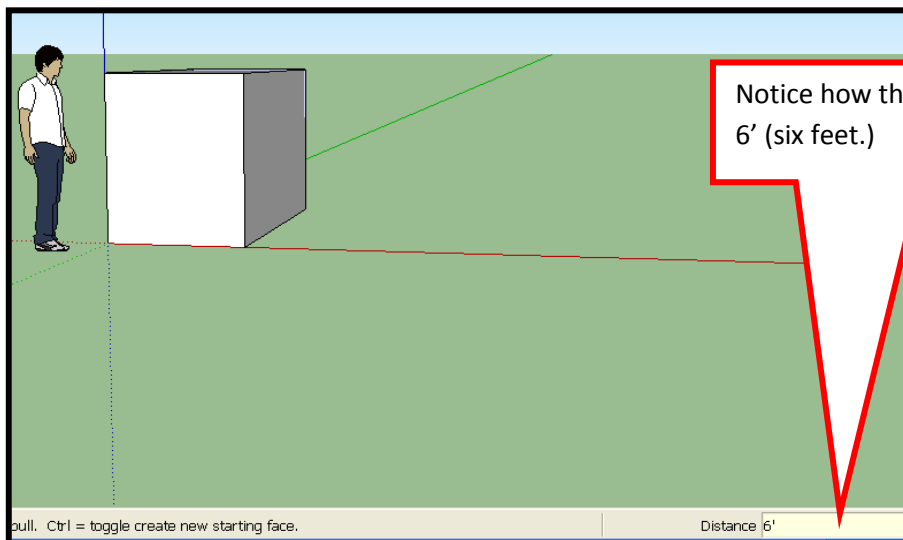
As soon as you pull it up, **stop**... do not click on the screen or do anything else yet.

Notice how the distance says 8' 11/16".

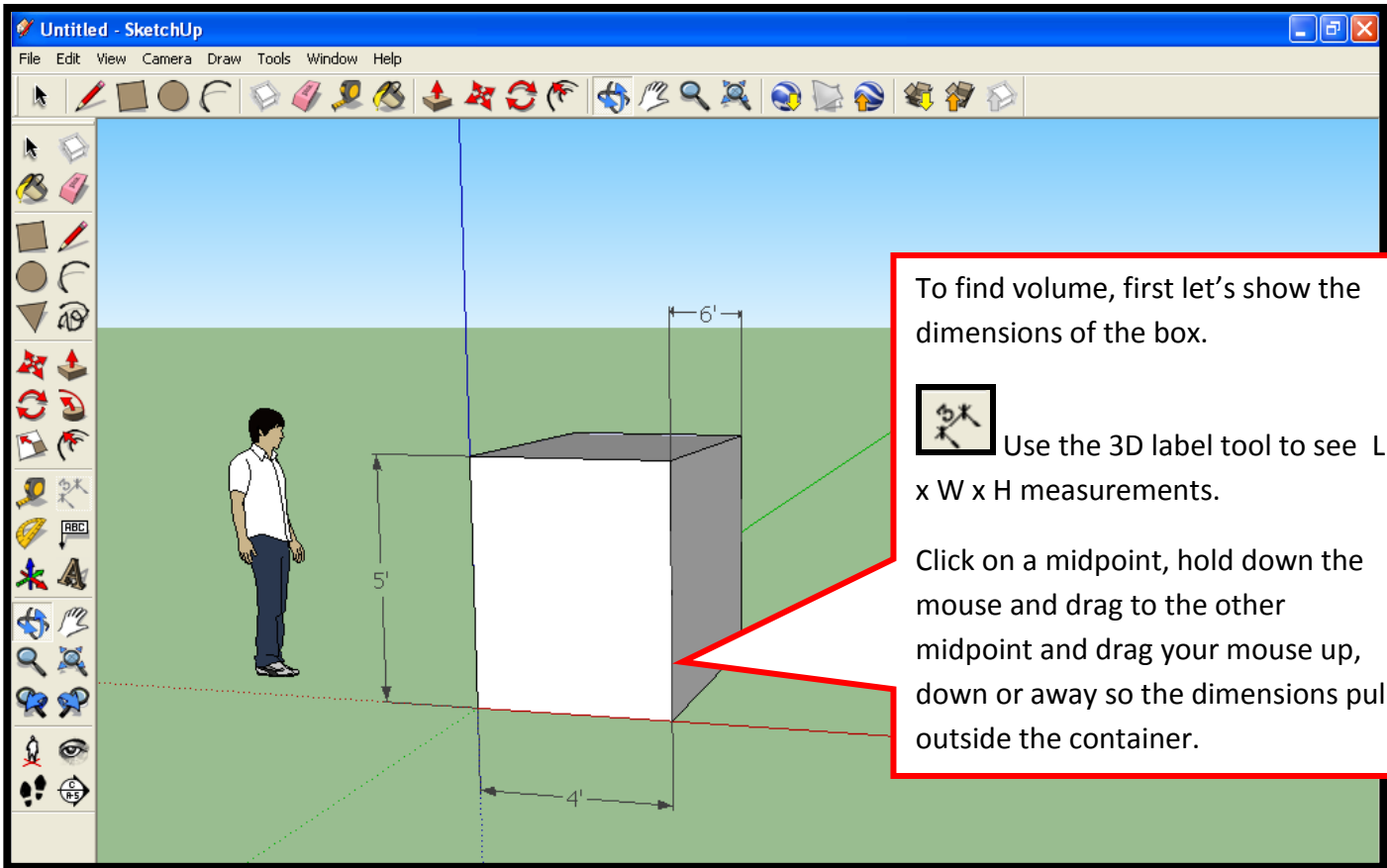
Let's change the depth distance to 6' (six feet.)

How: Type 6' in the distance box and **Press the Enter key.** (*The apostrophe stands for feet.*)

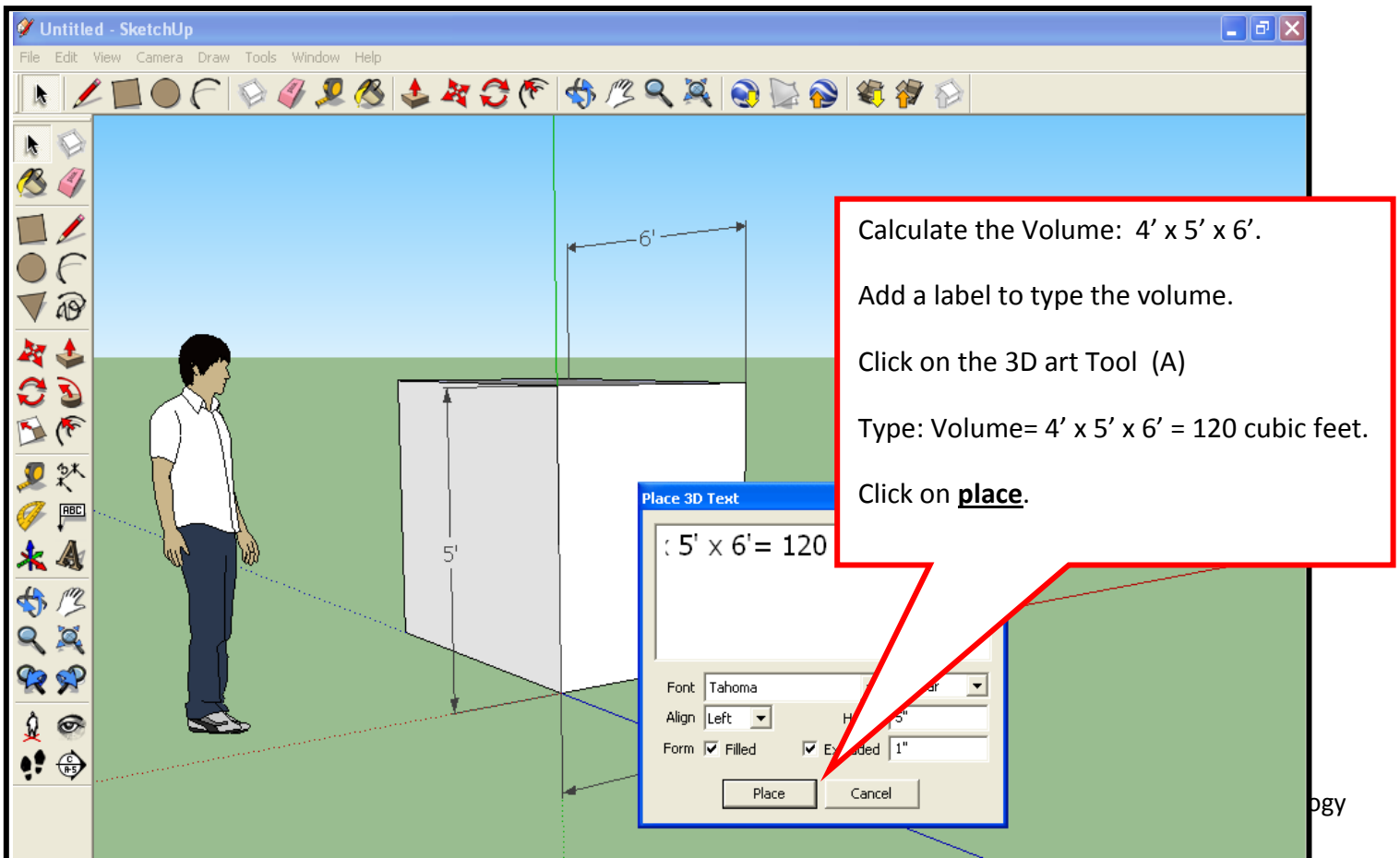
Important Note: When changing the dimension, you must type the new dimension before you click on the screen or do any other command; otherwise the dimension gets set and you cannot change it.

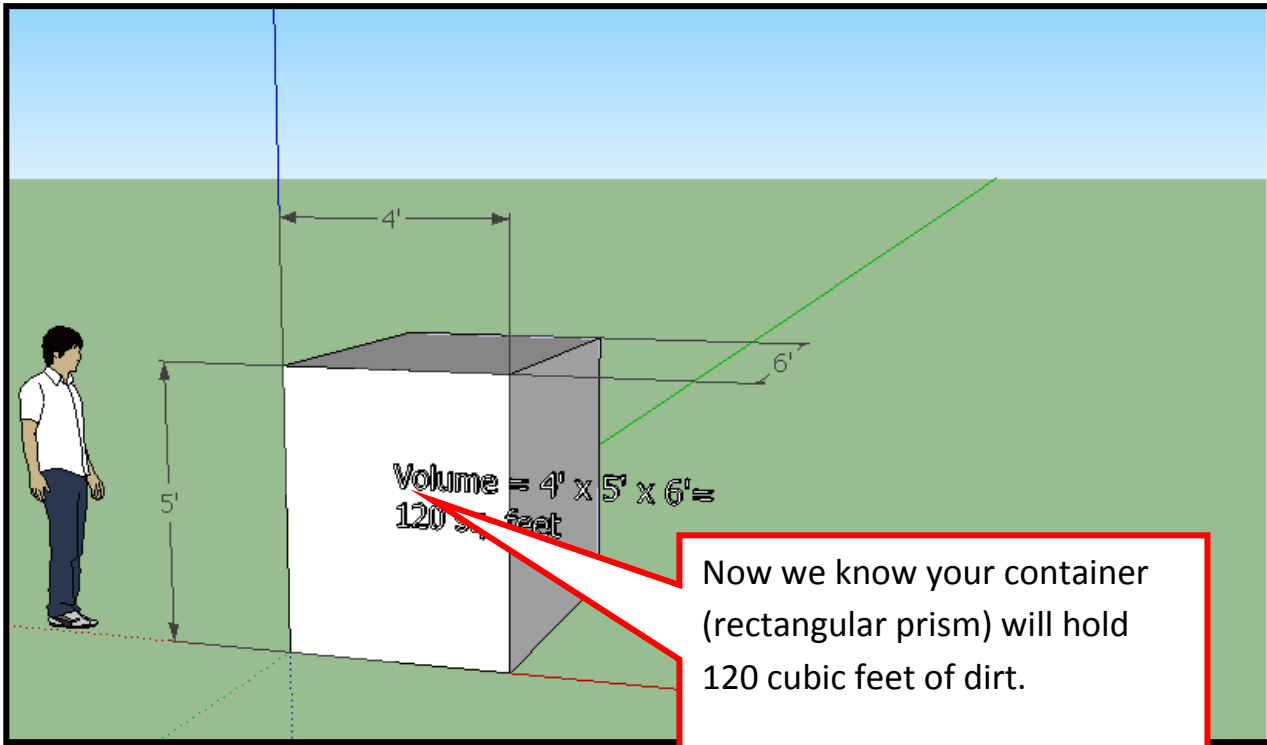


Notice how the distance changes to 6' (six feet.)



Let's look at our problem again: How much dirt will this container (rectangular prism) hold?





Now we know your container (rectangular prism) will hold 120 cubic feet of dirt.