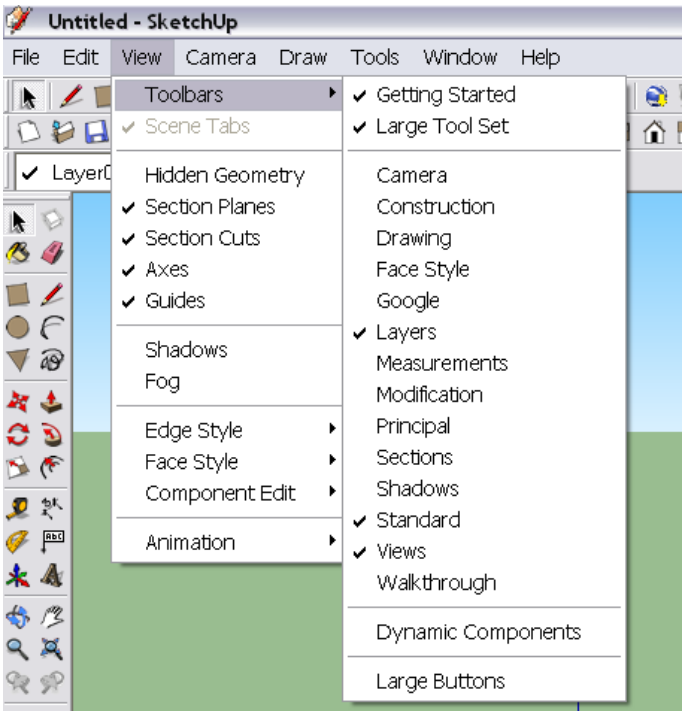
Create a 3D model for Google Earth with Sketchup 7.1

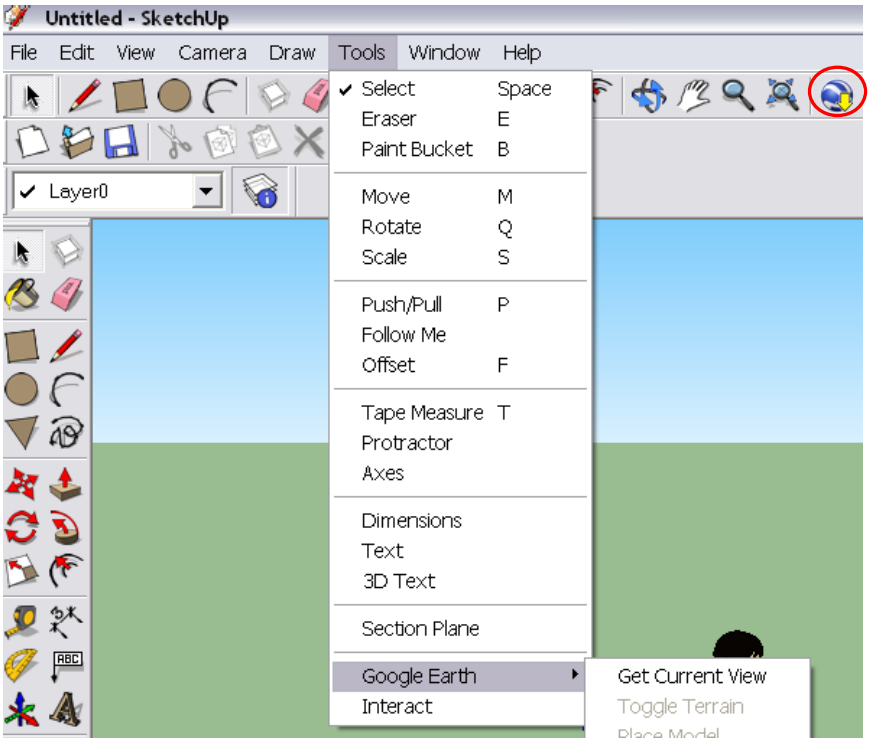
You will learn how to apply Google Sketchup to build a 3D model of Tatham Cente, University of Waterloo, for Google Earth.

1. **Start Sketchup**. You are going to turn on a few toolbars**. Go to View-> Toolbars**. Turn the following toolbars on: ***Getting Started, Large Tool Set, Standard and Views***.

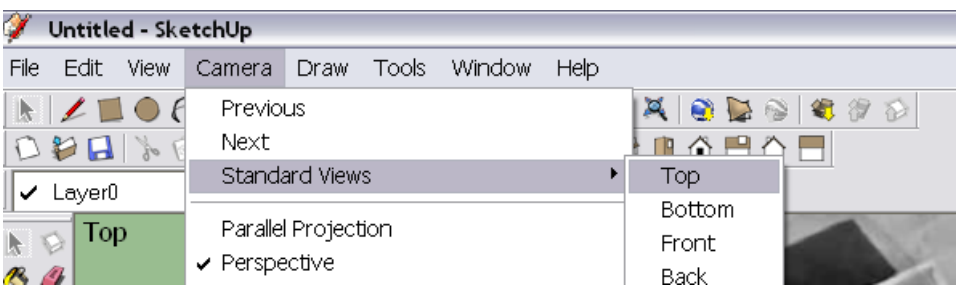


2. Add a high resolution airphoto showing the aerial view of Tatham Center in Google Earth**. Start Google Earth.** Go to **File-> Open**. Navigate **to E:\Sketchup and add tatham.kmz**. Zoom into the airphoto to a view similar seen below.

3. Now you are interested in using the current Google Earth view as a blueprint for Sketchup. In **Sketchup,** go to **Tools->Google Earth-> Get Current View**. The alternative is to click the **Get Google Earth View Icon** .



4. Set up a top model view which is similar to the view on Google Earth. Go to **Camera-> Standard Views -> Top.**



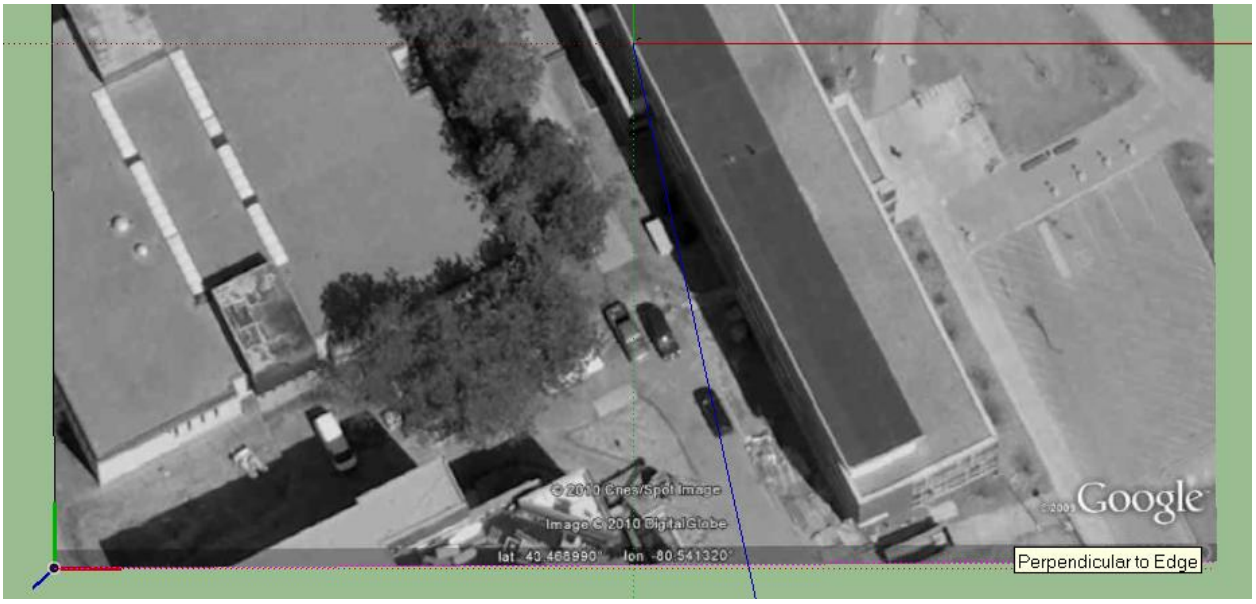
Set up drawing axes origin

SketchUp uses a 3D coordinate system whereby points in space are identified by position along three drawing axes: plus or minus X, Y, and Z (above ground/below ground) values. Plus or minus X is represented by solid red and dotted red lines; plus or minus Y are represented by a solid green and dotted green axis lines; plus or minus Z (above and below the ground plane) are represented by solid blue and dotted bluelines. The plane where the red and green axes lines lie is called the ground plane. The term origin is the place where all of axes lines begin.

.

1. You are going to set up the drawing axes. Click the **Axes tool**. The cursor will turn into an axes icon.
2. Place the cursor in the bottom left corner of imported airphoto. The origin will automatically snap to the bottom left corner.

3. Next you are going to set up the ground plane for the model (X and Y axis). As soon as you place the origin, move your cursor to bottom right corner. You will see a red dot line along the solid red X axis. Double click the mouse and this will set up the ground plane.

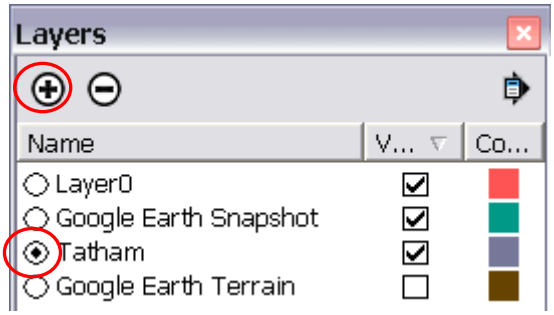


4. Click **Zoom Extents** to return to a full view of airphoto.

Make a new layer

Now you are going to add a new layer to store the building model.

1. Turn on the Layer Manager. Go to **View-> Toolbars-> Layers**.
2. You are going to add a new layer in Layer Manager. Click add button and enter new layer name as **Tatham** and designate it as the active layer

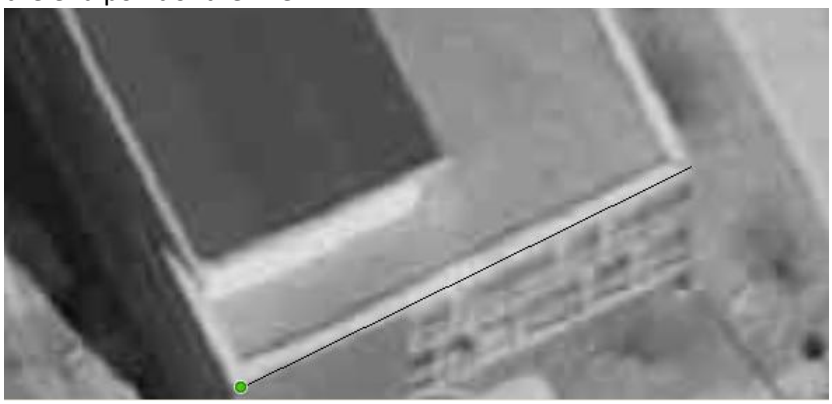


Drawing lines

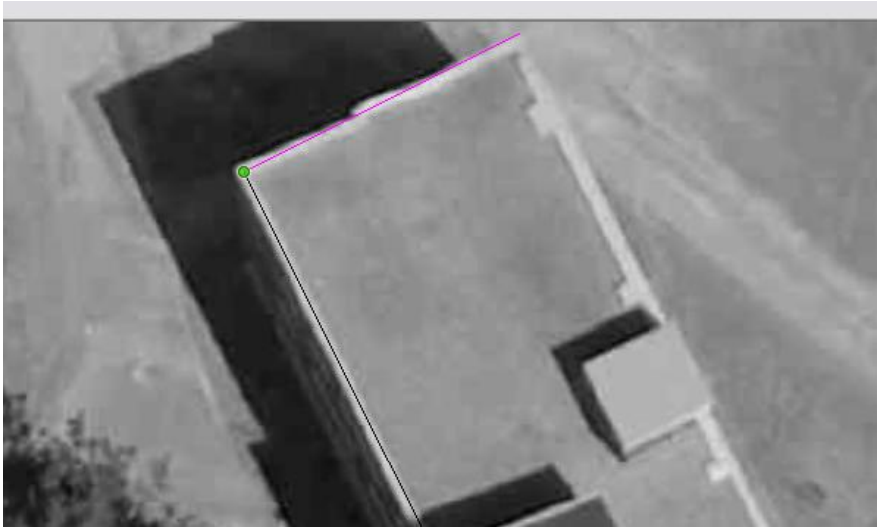
You are going to use the imported airphoto as a blueprint to create the building's outline on ground plane.

1. Select **the line tool** in the toolbars. The cursor changes to a pencil. .
2. Draw a starting point for the first line. Move your curser to the building's southeast corner and your mouse wheel forward. This will zoom in closer to the building corner. Click to set the starting point.

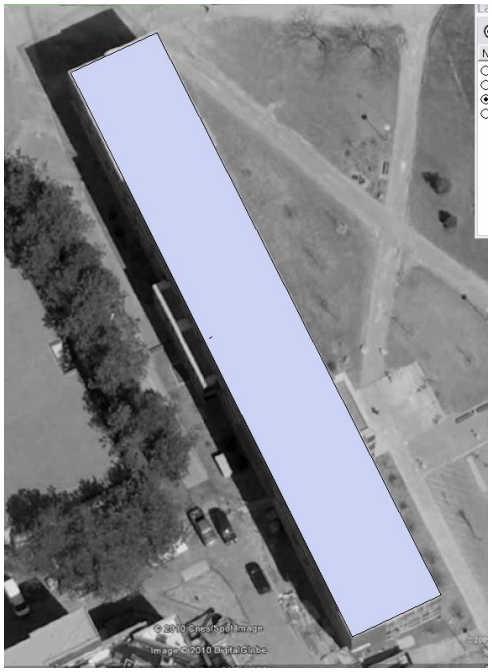
3. Move your cursor to the southwest corner and your mouse wheel forward. Click to set the end point of the line.



4. This end point is automatically treated as a starting point for another line. Click Zoom Extents . Navigate the cursor to the northwest corner. Click to create another line. These two lines are coplanar, intersecting lines (intersecting at starting and ending points).



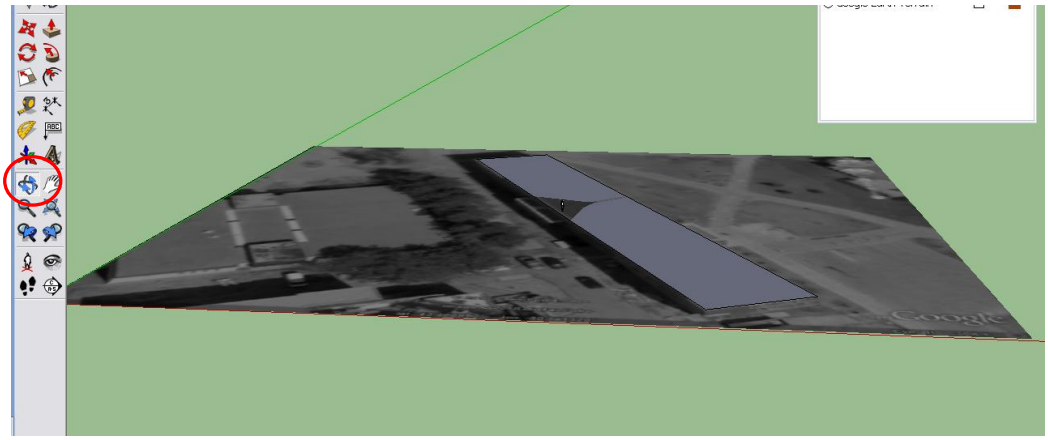
5. Continue to create two lines along the other two building corners. The four lines will form a face (building outline) and it will look like below:



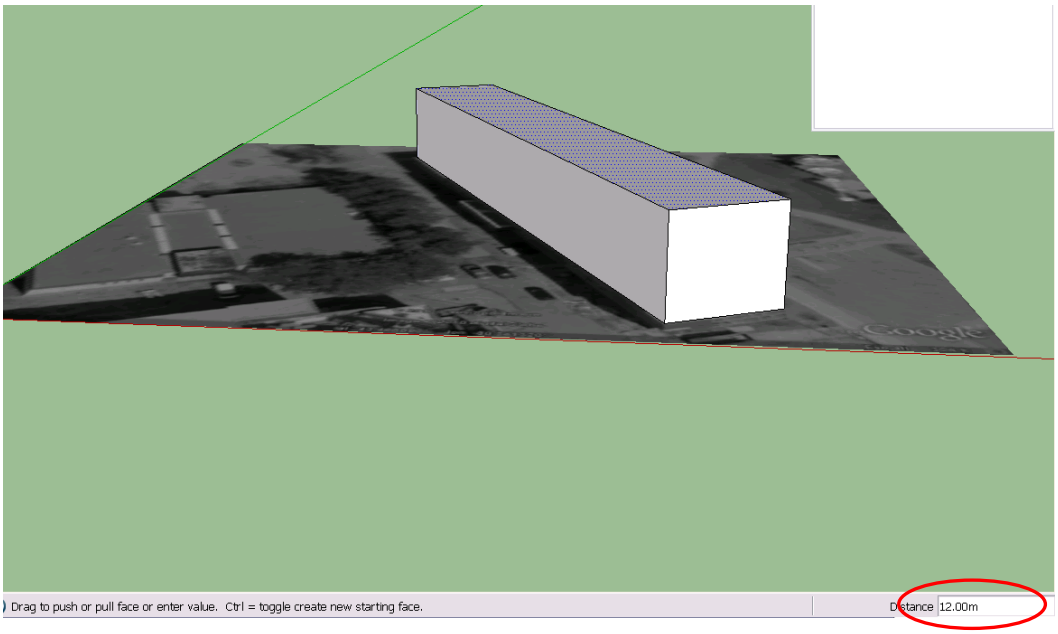
Creating a Volume with Push/Pull tool

You are going to use the Push/Pull Tool to add volume from the face to the building height.

1. Click the **orbit tool** , the cursor will change to . Click and hold anywhere of the airphoto, move your mouse up or down to orbit the ground plane.



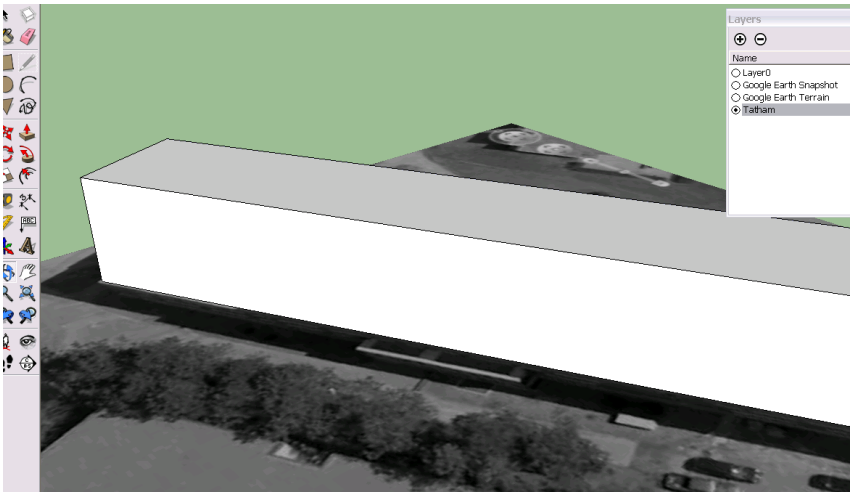
2. Click the **push/pull tool** , the cursor will change to . Click anywhere inside the face and pull it up by 12 m (this is the building height). The more precise way is to drag it up slightly; input **12m** and hit ENTER. The displacement of a push/pull operation is displayed in the Value Control Box.



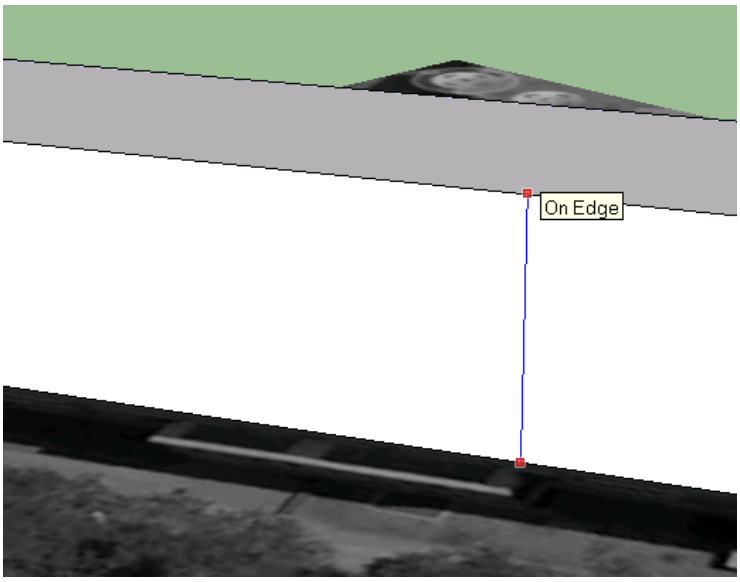
Build the building's back entrance

You are going to apply line and push/pull tools build a back entrance for the building.

1. Click the orbit tool to orbit a view showing the back entrance's airphoto footprint.



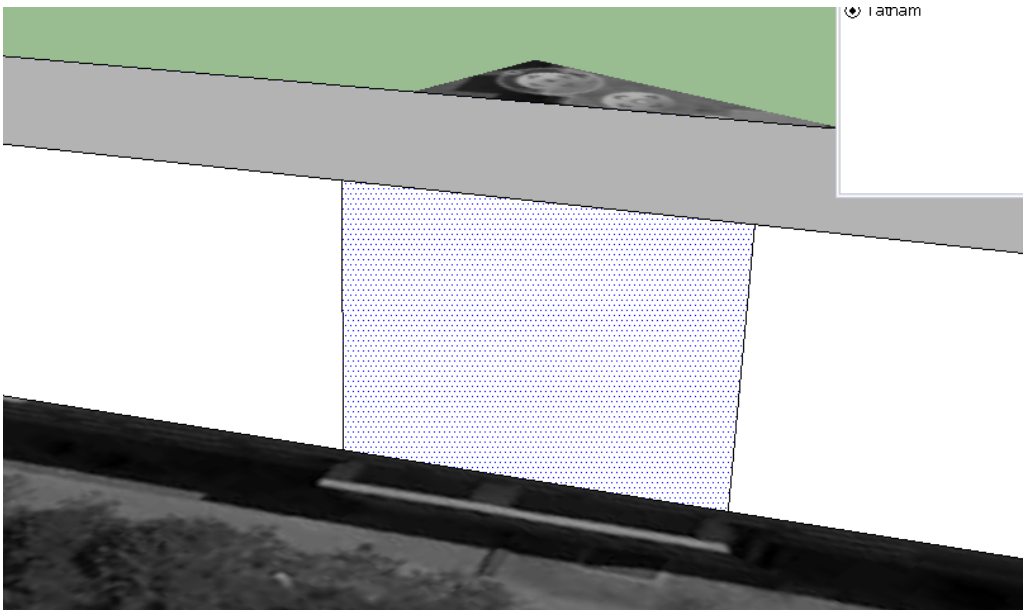
2. In Sketchup, when a line is drawn from one edge of a face to the opposite edge, a face (rectangle) is being split. You are interested in applying line tool to split a face. Click the **line tool** , draw a point in the face bottom showing the end of the building entrance at airphoto.



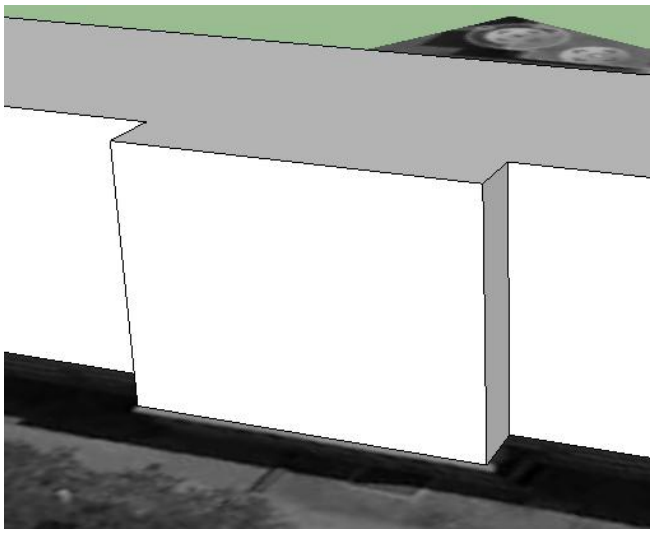
3. Move the cursor up until it snaps to top edge of the face and a line will appear. You can move the cursor slightly left or right until the line color turns blue. Click the mouse to create a line.

4. Create another line on the opposite side of the building entrance.

5. Now you are going to create the model's back entrance. Click **Push/Pull tool**, position the cursor somewhere between two lines.

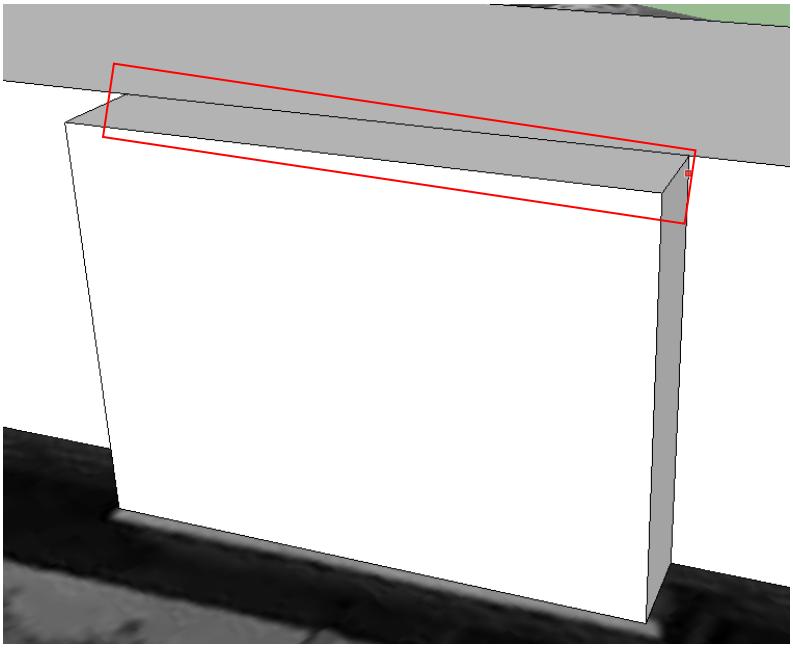


6. Click and hold the mouse, pull it out towards the end of back entrance's footprint in the airphoto.

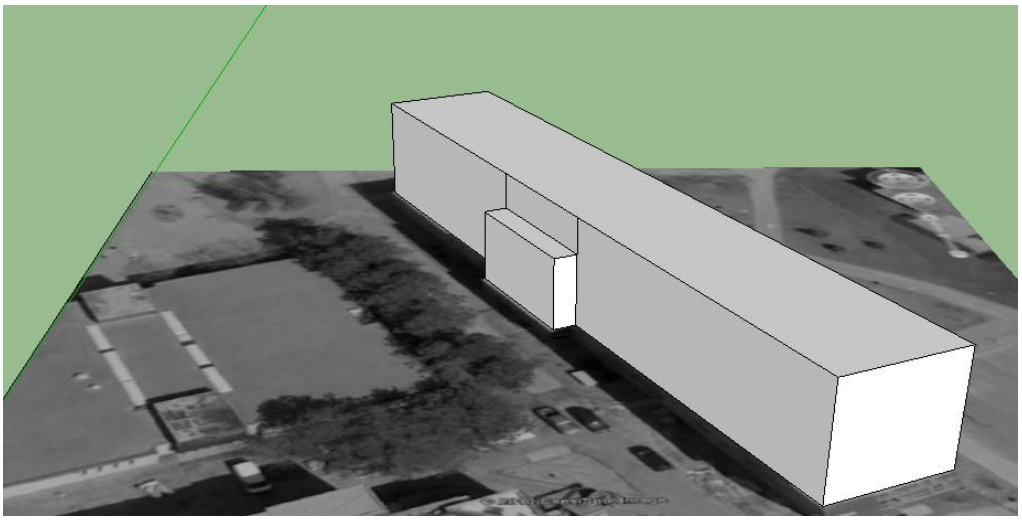


7. Since the back entrance is only 8 meter height, you are going to separate the back entrance from the main building and lower its height by 4 meter.

8. Click the line tool again and create a line on the back of the back entrance (as shown below).



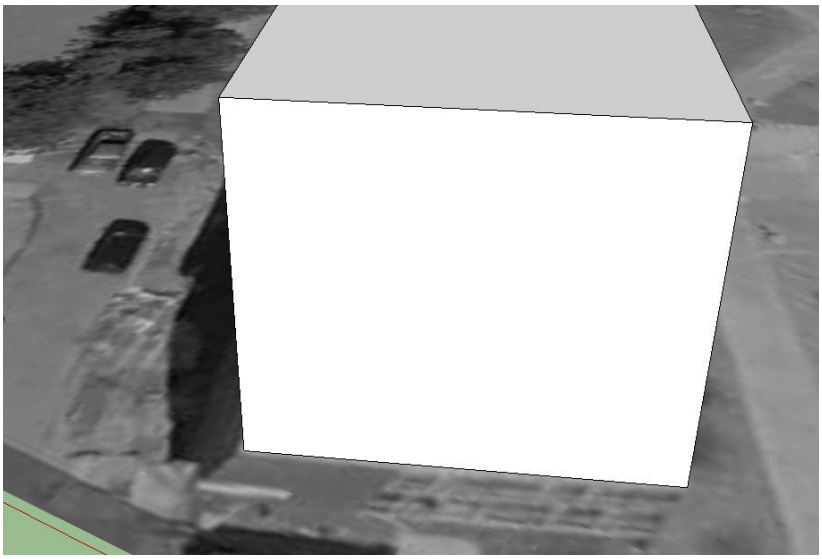
9. Click the **push/pull tool again** and push the front entrance model lower by 4 meter.
10. You can apply **Click Zoom Extents Tool** and **then Orbit tool**. Orbit the 3D model to a view looking like below.



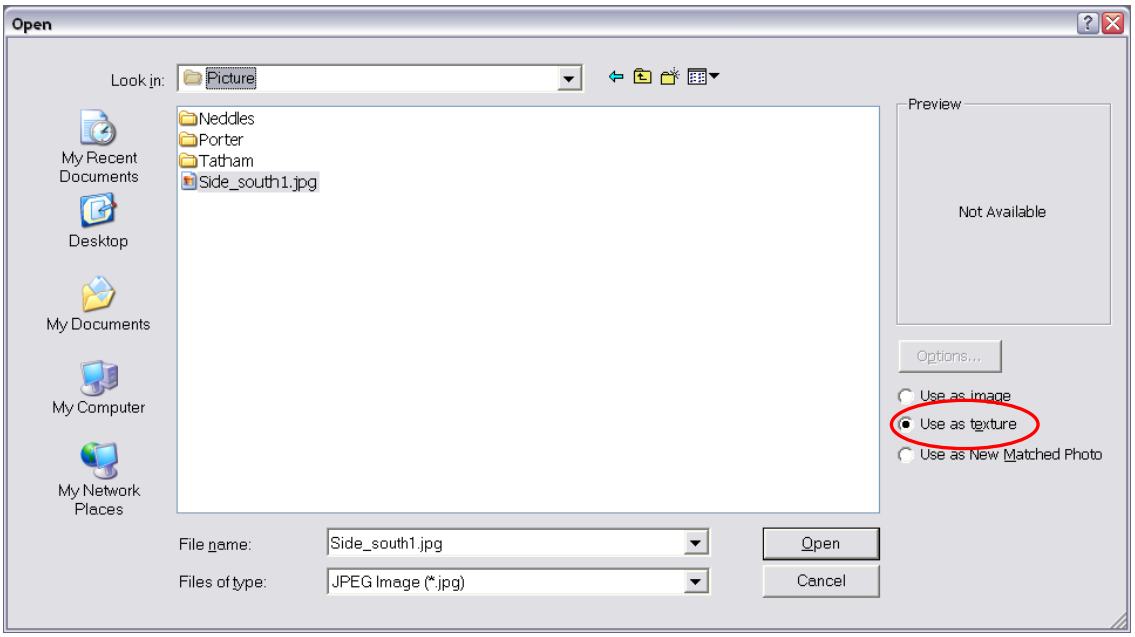
Apply photo texture to the 3D model

You are going to give the 3D model a realistic looking building by using the texturing function- applying photo to a face.

1. Click the orbit tool . Orbit the model to the building's south side and zoom in to a view similar to one below.

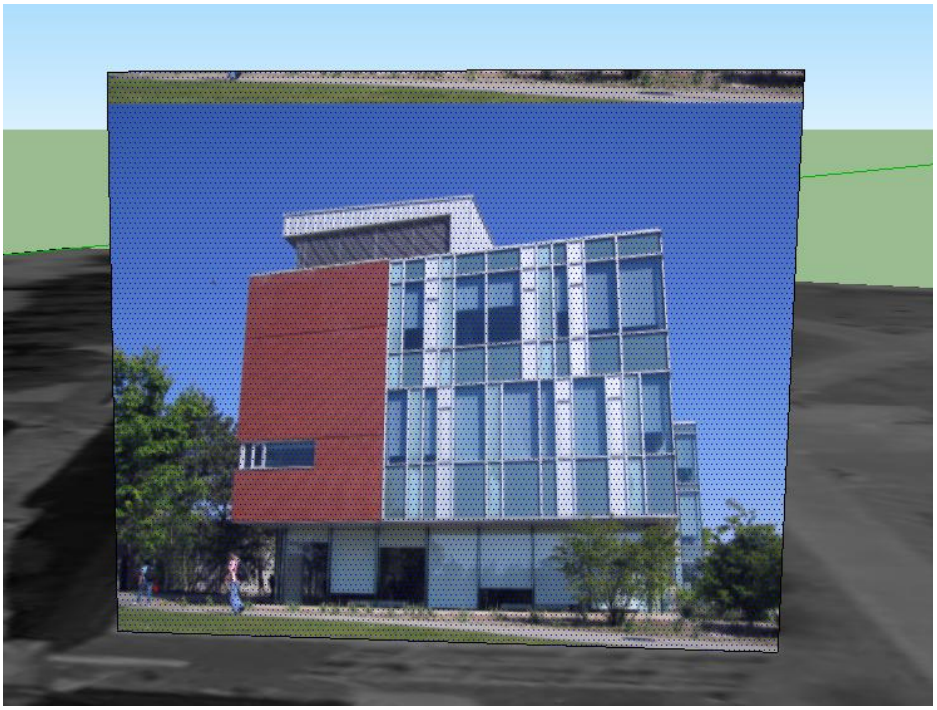


2. Now you are going to import a photo to paint the south side face. Go **to File->Import**. This will bring out a dialog window. Browse to **E:\Sktechup\Picture** and select **Side_South1.jpg**. Make sure Options set as texture.

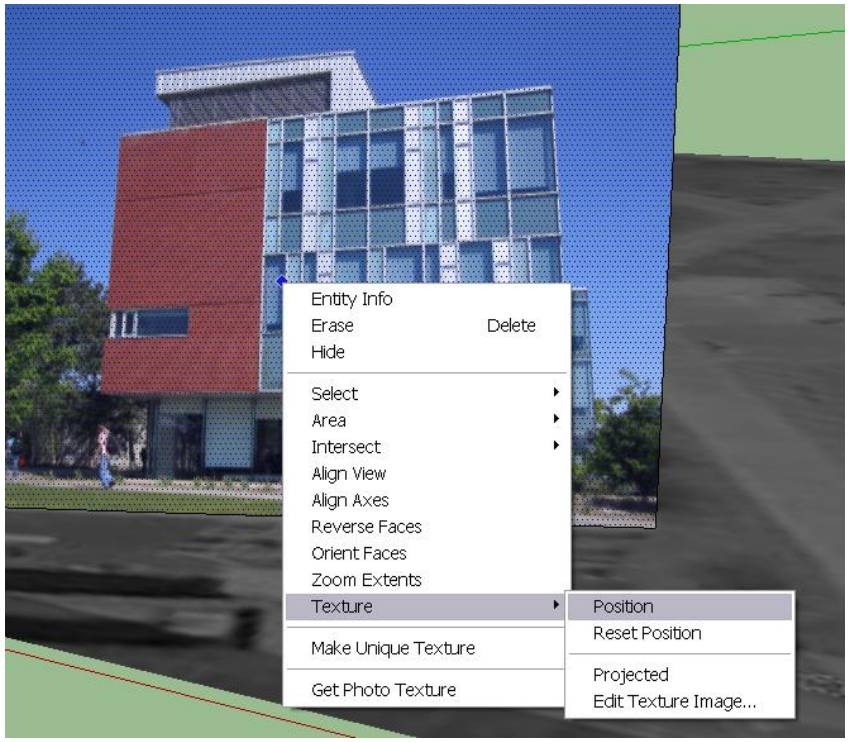


3. Now you are going to anchor the first picture point on the face. Snap the point on the bottom left corner of the face. Click the mouse to anchor it.

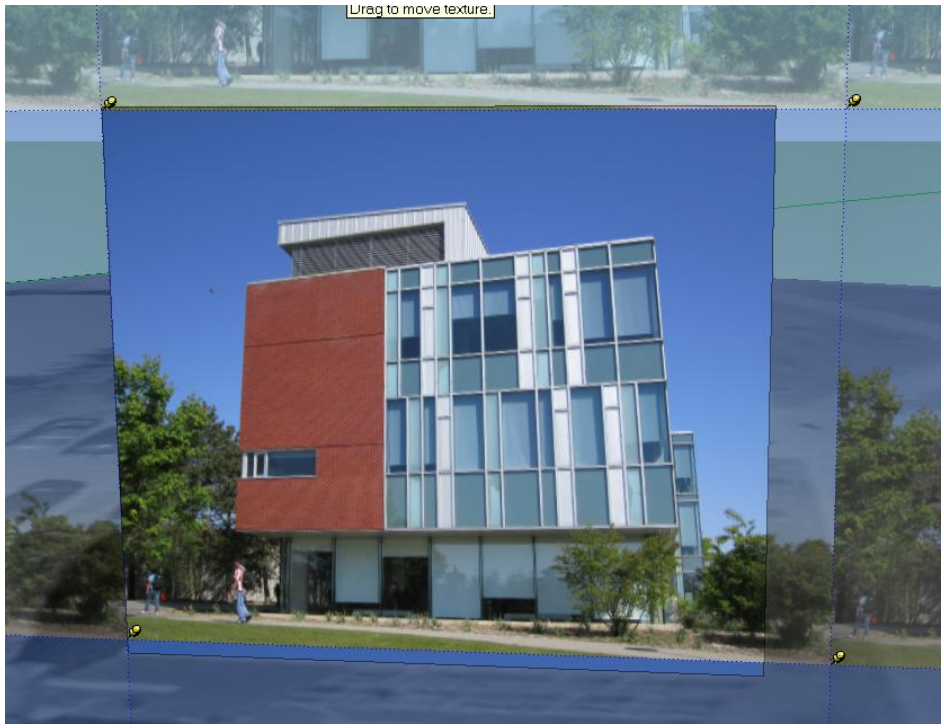
4. The next step is to pick the second point to anchor. Move the cursor up and the photo size will increase. Increase the size of photo until the building picture is still inside the face. Then click OK to anchor the second point.



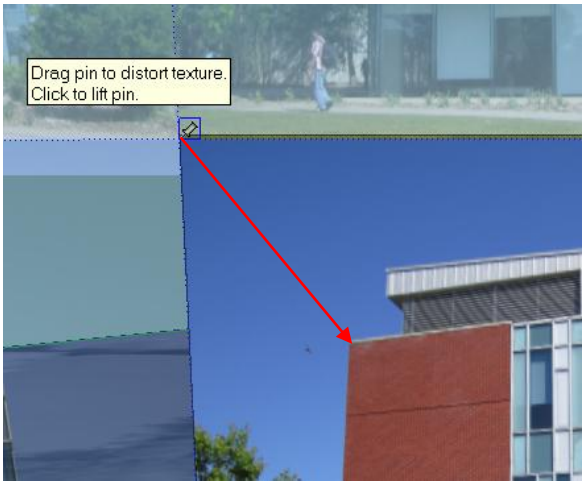
5. Now you are going to select a portion of the building photo as texture to paint the building's south side face. Right click your mouse anywhere inside the building photo, a dialogue box will appear. Select **Texture -> Position.**



6. Now you will see 4 pins at each face corner and you are going to use them to position texture.

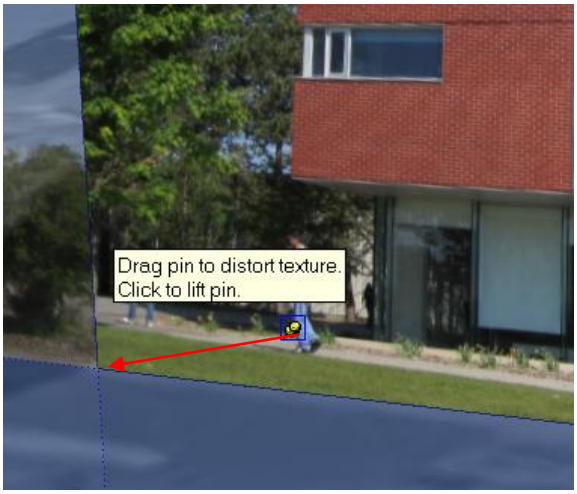


7. You are going to start moving a pin to position texture. Single click the top left pin, and the pin icon will change to . Move the pin (cursor) to building's top left corner and apply the mouse wheel forward to zoom in. Click the mouse again to anchor the pin.



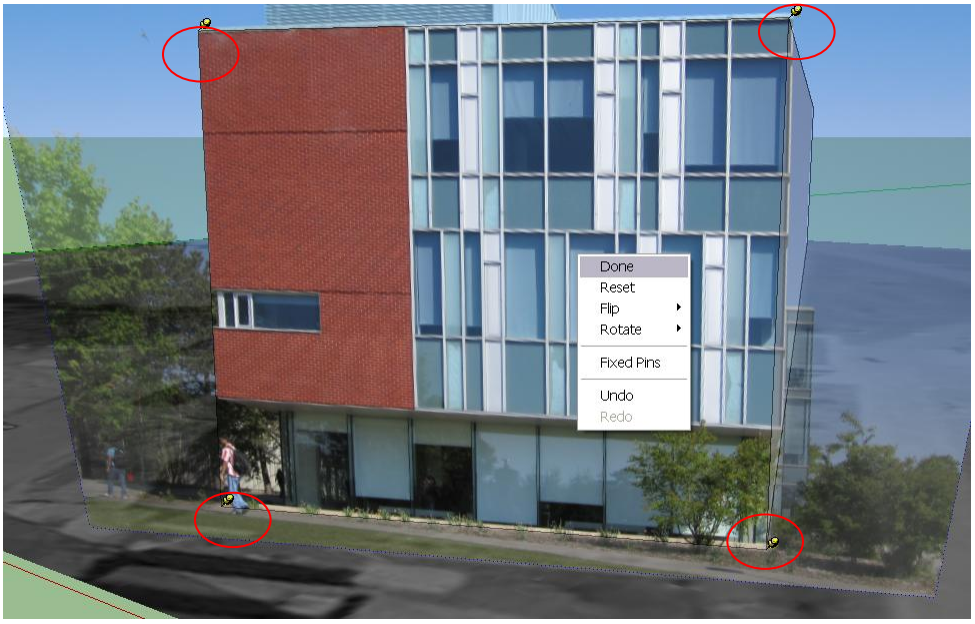
8. Repeat the same process to move the pins to the other three building corners. The final view will look like one below.

9. Now you are going to drag a pin over the face corner to distort the texture. Place your cursor on top of the pin and a blue box will appear.



10. Drag pin to the corresponding corner of the face. This will distort the picture texture.

11. Continue to drag the other three pins to the corresponding face corners. When you finish, place the mouse anywhere inside the face. Right click the mouse and a dialogue will appear. Select **Done**.

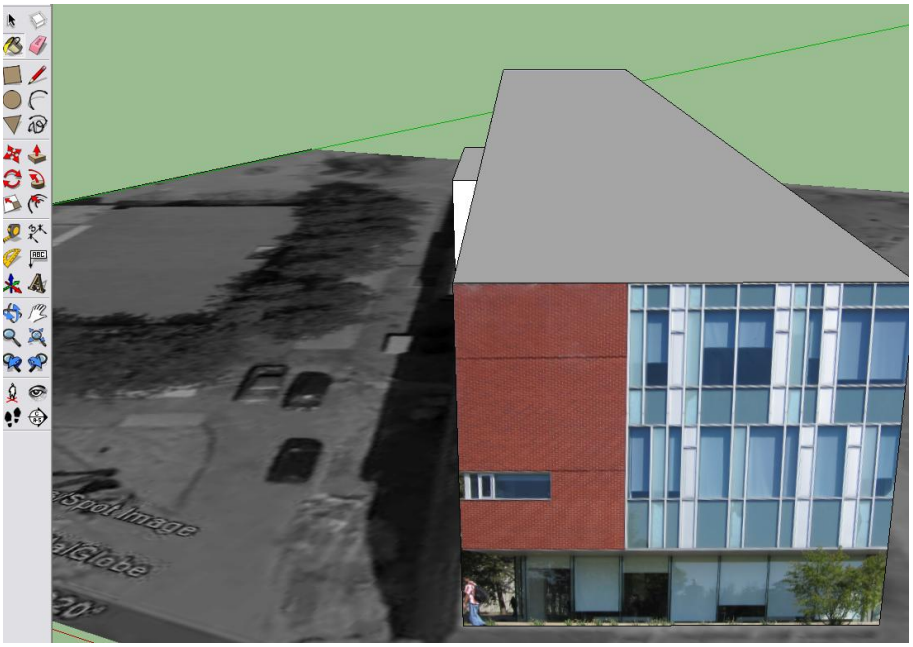


12. This will create a building texture for the south side face.

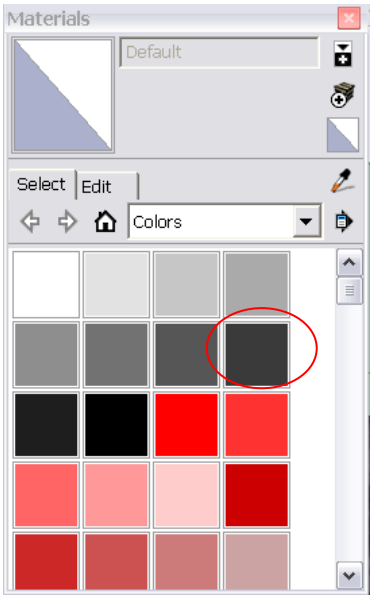
Apply a color to the building roof

In addition to photo texture, you can apply paint bucket to color a face. You are going to apply a dark grey color to the building roof.

1. Click the **orbit tool**. Orbit the model to the building's south side and zoom in to a view similar to one below.



2. Click the **paint bucket** tool . This will bring out a new material dialogue window.

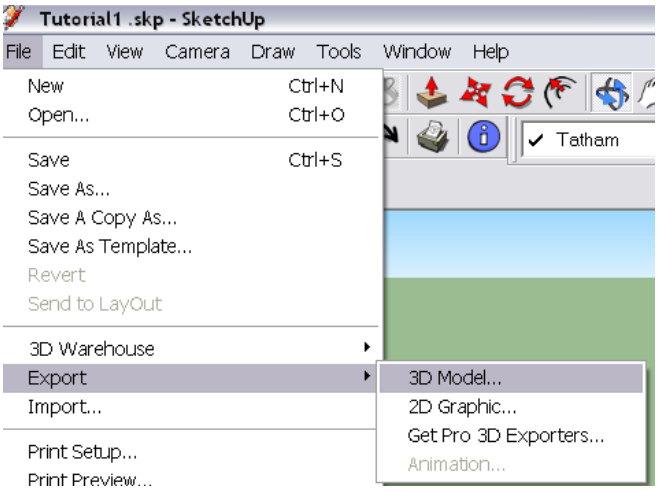


3. Select a color as dark grey. Move the cursor to anywhere of the building roof and click the mouse.

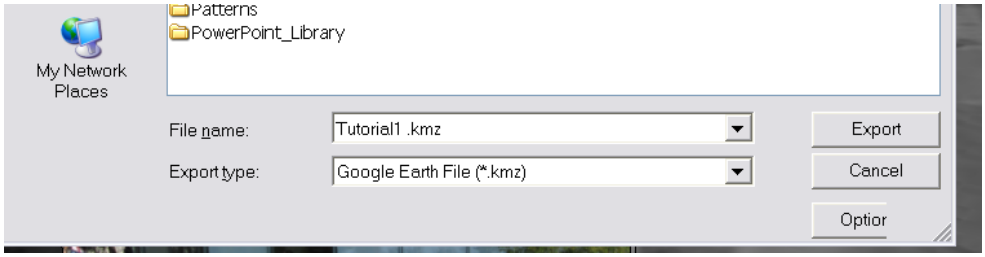
Model export.

You are going to export the 3D model out as a KMZ file and open it with Google Earth.

1. Go to **Export ->3D model**. This will bring out a new dialogue window.



2. Set the Export Type **as Google Earth File**, file name as **Tatham.kmz**. Save the file to **E:\Sketchup.**



3. Navigate to the **E:\Sketchup** folder.. Double click **Tatham.kmz**. This will load the Google Earth application and bring you the 3D model that you just created.

   Congratulations, you have learned how to build a 3D model for Google Earth with picture and color texture.

   Note: You can download Sketchup 7.0 at http://sketchup.google.com/download/.

   After downloading the file, please follow these steps to install Google SketchUp:

   1. Log in to the computer with a user account that has administrator rights. For more information, click here.
   2. Double-click on the EXE install file.
   3. Click Next in the Welcome dialog box.
   4. Click on the I accept the terms of this license agreement button in the End User License Agreement if you agree to the terms.
   5. Click the Next button to install SketchUp in the default location.
   6. Click the Install button if you're satisfied with the settings.
   7. Click on the Finish button when prompted.
   8. Launch Google SketchUp once before logging out of the administrative user account.