

Hazard Shelter Location Using Google SketchUp and Google Earth

Grades

9-12



Overview:

Students will add texture to a model of a shelter created in Google SketchUp, then place the model in their community using Google Earth.

Objectives:

The student will:

- use Google SketchUp to complete a three dimensional (3D) model of a shelter;
- determine the best location for a shelter in his or her community; and
- place the model in the best location in Google Earth.

Materials:

- Computer with Microsoft Word, Google Earth and Google SketchUp installed and Internet access
- STUDENT WORKSHEET: "Hazard Shelter Location Using Google Earth and Google Sketchup"

Whole Picture:

Google SketchUp is a 3D modeling application. In this lesson, students will download a Google SketchUp model of a shelter from the ATEP website, add texture to the walls, roof, and door, then save the file. In Google Earth students will decide where the best location for a shelter in their community would be. Finally, students will place the shelter in their community using Google Earth.

Before doing this lesson, students should be familiar with basic computer use, Google Earth, and Microsoft Word.

If students are interested in building their own models in Google SketchUp, there are tutorials available at <http://sketchup.google.com/tutorials.html> and <http://sketchup.google.com/training/index.html>

Activity Preparation:

1. If not already installed, download and install the program Google Earth at <http://earth.google.com> for each computer. Click the **Download** button, then **Agree and Download** button to start the download. For Macintosh computers double click the downloaded file to extract it, then drag the Google Earth icon to the Applications folder. For PCs, double click the downloaded file to install it. Double click the Google Earth icon to launch the program.
2. If not already installed, download and install the program Google SketchUp (Free) at <http://sketchup.google.com/download/> for each computer. Click the **Download** button then the **Save File** button. For Macintosh computers double click the downloaded file to extract it, then drag the Google SketchUp icon to the Applications folder. For PCs double click the downloaded file to install it. Double click on the Google SketchUp icon to launch the program.

Activity Procedure:

1. Introduce the lesson by asking students which natural hazards could affect their community. Answers should include earthquakes, tsunamis, and ash fallout.
2. Ask students where the best place to build a hazard shelter would be. On the board list what factors need to be considered when deciding where it should be located. Continue the discussion by asking what materials it should be made from and with what the shelter should be supplied.

3. Give an overview of the lesson and the process of placing a model from Google SketchUp into Google Earth.
4. Distribute the STUDENT WORKSHEET: "Hazard Shelter Location Using Google SketchUp and Google Earth."
5. Guide students through downloading the file "SU_shelter" from the ATEP website.
6. Have students follow the steps on the worksheet to place the shelter in their community. When finished, they should complete the culminating assignment.

Answers:

1. *A screenshot from Google Earth should be included.*
2. *Answers will vary. They should include the correct latitude, longitude, and elevation.*
3. *Answers will vary.*
4. *Answers will vary. Reasons could include that the shelter is accessible by road or by foot, is close to the community, above tsunami runup heights, etc.*
5. *Answers will vary. They should include emergency items such as cots, blankets, water supply, food, flashlights, batteries, radios, first aid kits, masks, generator, fuel, etc.*

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Hazard Shelter Location Using Google SketchUp and Google Earth

Student Worksheet (page 1 of 7)

STEP 1. Launch a Web browser and go to the ATEP website at <http://www.aktsunami.com/lessons/GITExercises.html>. Scroll to the “Hazard Shelter Location” lesson, then click on the Google SketchUp file **SU_shelter** and save it to the desktop.

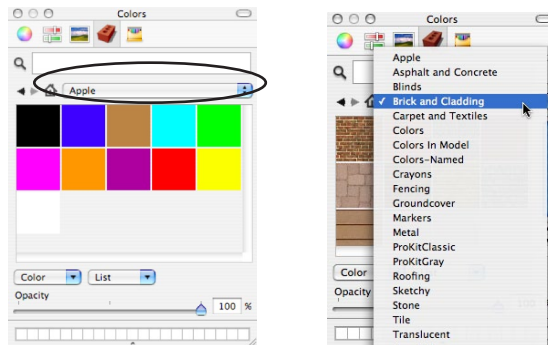
STEP 2. Launch Google SketchUp. Click on **File** → **Open** and select the file **SU_shelter** to open it.

Add texture to the walls, roof, gabled end, and door

STEP 3. Add texture to the shelter by clicking on the Paint Bucket from the SketchUp toolbar. The Colors window will open.



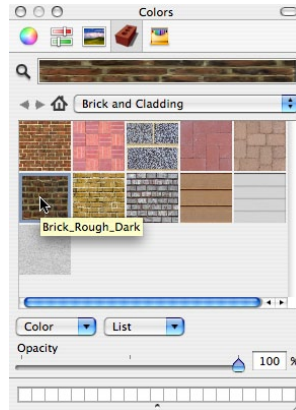
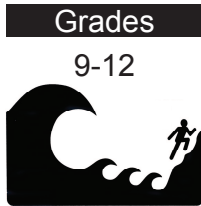
STEP 4. In the Colors window, click and hold the pull down menu to select Brick and Cladding or Asphalt and Concrete.



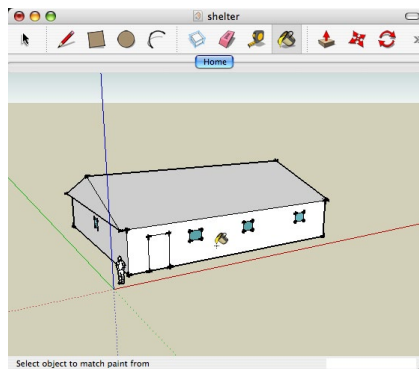
STEP 5. Click on a texture to select the walls for your shelter. In this example Brick_Rough_Dark is selected.

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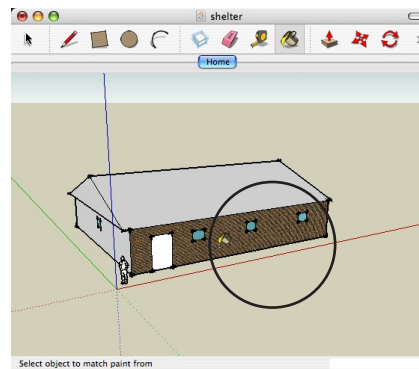
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STEP 6. With the Paint Bucket tool selected, click on one of the walls of the shelter.

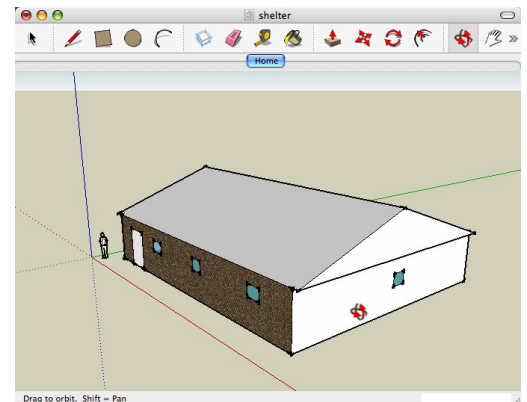


Before texture



After texture

STEP 7. From the SketchUp toolbar click on the Orbit tool. Click and hold the orbit tool on the shelter while moving the mouse to turn the building. The zoom (magnifying glass) and move (hand) tool can also be used to orient the building in the window. Continue adding texture to all the walls of the shelter using the Orbit and Paint Bucket tool.



Name: _____

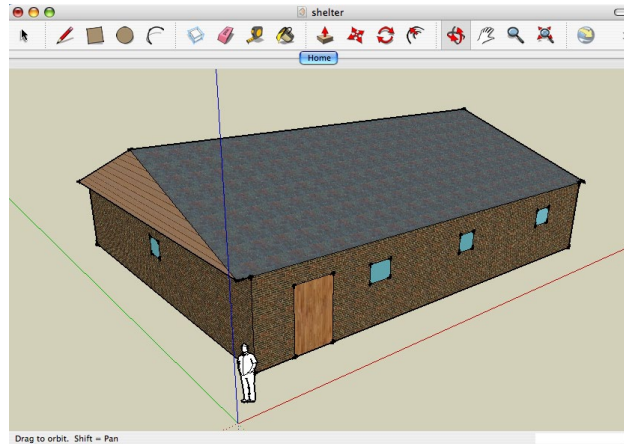
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STEP 8. With the Paint Bucket, and Orbit tools use the same procedure to add texture to the roof, gabled ends, and door. For the roof use Roofing from the Color Palette pull down menu, for the gabled ends use Bricks and Cladding, and use Wood or Metal for the door.



STEP 9. When the building is complete click on File à Save from the SketchUp menu to save the completed model.

Deciding on the location for the shelter in Google Earth

STEP 10. Launch Google Earth. Type the name of your community in the search box and click the magnifying glass to have Google Earth fly to your community.

STEP 11. Use the navigation tools in the Google Earth window to move around and analyze where the best location for a community shelter would be.

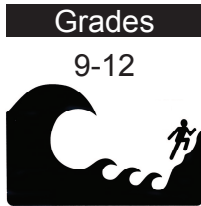
STEP 12. With the location of the shelter in the middle of the Google Earth window zoom in to the area so the Eye alt is between 300 to 400 feet or 100 to 150 meters. The Eye alt information can be found at the bottom of the Google Earth window.



Keep Google Earth open while the location is added to Google Sketchup.

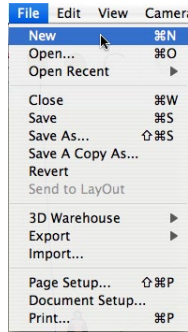
Name: _____

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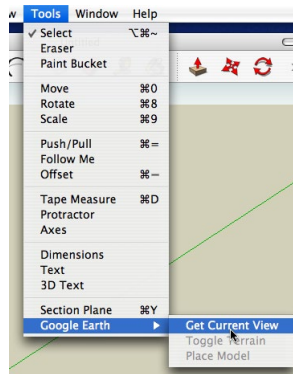


Adding the Google Earth location to Google Sketchup

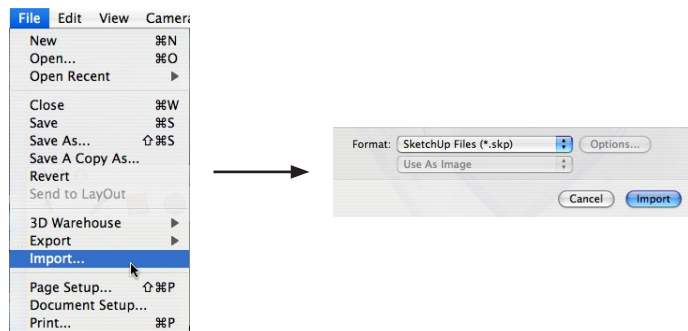
STEP 13. In Google SketchUp create a new file by selecting File à New from the menu.



STEP 14. From the SketchUp menu, add the location to the window by clicking Tools à Google Earth à Get Current View.

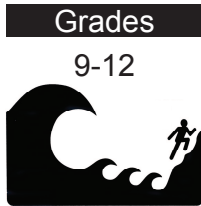


STEP 15. On the SketchUp menu select File à Import. Select the completed SU_Shelter file then click the Import button.

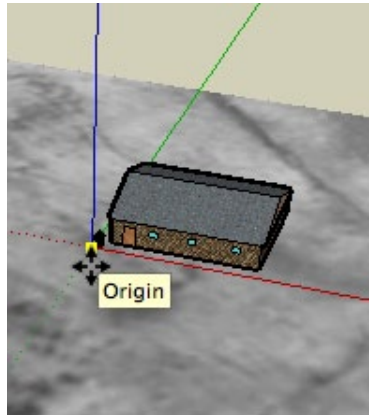


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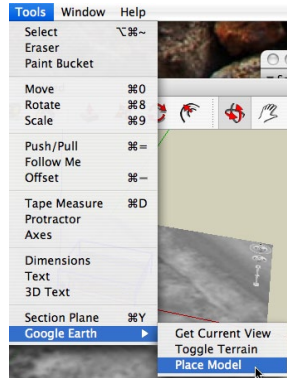
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STEP 16. Use the mouse to move the building in the image. A popup message with the word “Origin” will appear when the building is on the axis. Click the mouse to set the building in place.

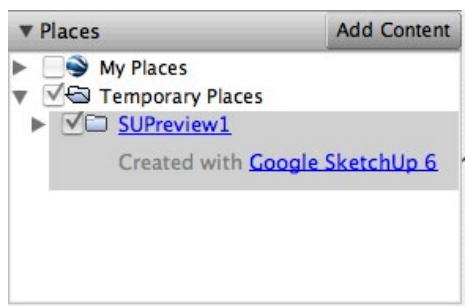


STEP 17. On the SketchUp menu select Tools à Google Earth à Place Model.



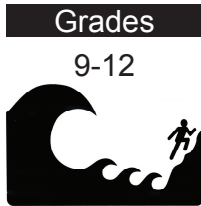
Saving the model as a Google Earth file

STEP 18. In the Google Earth sidebar, find Places then scroll down to Temporary Places. The SketchUp file will have the file name SUPreview1.

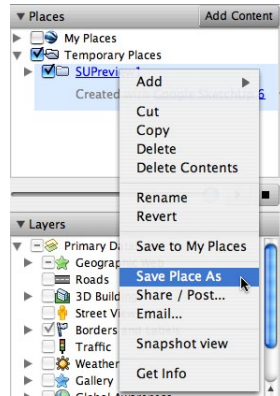


Name: _____

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To save the file on a PC, right click on the **SUPreview1** file, then choose **Save Place As**. For a Macintosh, control-click on the **SUPreview1** file, then choose **Save Place As**. Give the file a new name and save it as a KMZ file on the desktop.



The KMZ file can be shared on a server or flash drive, or emailed to others, so they can open and view it in Google Earth.

Culminating Assignment

Use the navigation tools in Google Earth to fly around the completed model that was placed in the community.



Name: _____

Grades

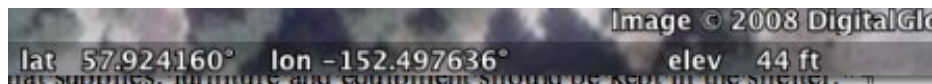
9-12



Hazard Shelter Location Using Google SketchUp and Google Earth Student Worksheet (page 7 of 7)

Launch Microsoft Word, and open a new blank document. Type your name at the top of the page.

1. Take a screen shot of the shelter in the Google Earth window. Paste the screen shot in the Word document under your name.
 - Mac Screenshot: press **Command-Control-Shift-3**. The image will be copied to the clipboard, which can then be pasted (command-v) into a Word document.
 - PC Screenshot: press the **printscreen** key on the keyboard. The image will be copied to the clipboard, which can then be pasted (control-v) into a Word document.
2. Find the coordinates and elevation at the front door of the shelter at the bottom left and right of the Google Earth window. List the coordinates and elevation in your Word document.



3. Use the measurement tool in Google Earth to determine how far the shelter is from your school and from the ocean. List these measurements in your Word document.
4. List the three most important reasons you considered in choosing the location of the shelter.
5. Describe what supplies, furniture, and equipment should be kept in the shelter.
6. Print the completed assignment, and hand it in to your instructor.

