

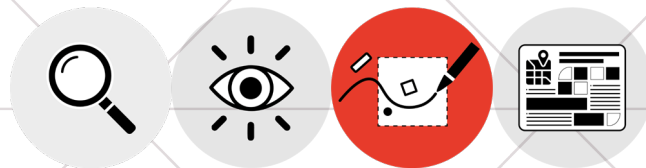


## Graphic Skills Lab

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### Handout series

Google SketchUp



URBAN  
**GRAPHICS**  
SKILLS

# Graphic Skills Lab

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BUPS – Bartlett Urban Planning Society (Established in 2012, the Bartlett Urban Planning Society (BUPS) is a student-run organisation, subsumed under the Bartlett School of Planning (BSP). BUPS represents, reinforces and protects the interests of planning students while inspiring the community-at-large of our role in the Built Environment.)

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# 1. Introduction



SketchUp is a modelling software to create 3D graphics that can be used for creating a 3D model, sections or aerial views.

## In SketchUp, you can:

- Create 3D models of buildings, furniture, interiors, landscapes, and more.
- Customize the SketchUp interface to reflect the way you work.
- Share 3D models as walk through animations, scenes, or printouts, with realistic light and shadows. You can even print a model on a 3D printer.
- Import files from other 3D modelling programs or tools, or export your SketchUp file for use with other popular modelling and image-editing software.

## Key skills:

- Making 3D objects
- Adding textures and shadows
- 3D Warehouse
- Setting scenes and styles
- Parallel vs. Perspective views

# 2. Downloading

SketchUp Pro is not free, and the UCL does not hold the licence for students and staff. Therefore, you have two options to use SketchUp:

1. Using the **Free 30 Day Trial** For higher education (<https://www.sketchup.com/try-sketchup#for-higher-education>), with the opportunity to:
  - Draw in 3D, analyse and improve your building's performance, and creatively document and share your ideas with your class.
  - 3D modellers for desktop, web, and iPad
  - 2D documentation
  - Building performance analysis
2. Using the **FREE version SketchUp for Web** (<https://www.sketchup.com/products/sketchup-for-web>). 

In this case, you do not have to download anything, but your project will stay online: The first time you use SketchUp, you need to sign in to activate your free version. After you're signed in, just click on "**start modelling**". This dialogue box is your starting point for creating a model and appears every time you start SketchUp (unless you choose to turn it off in the SketchUp Preferences dialogue box).

In terms of producing graphics in urban design and planning (therefore, not technical drawings), we strongly believe that the use of the FREE version provides the students with all the tools they need.

However, in the following page you can find an image showing the differences between SketchUp for Web (FREE) and SketchUp Pro.

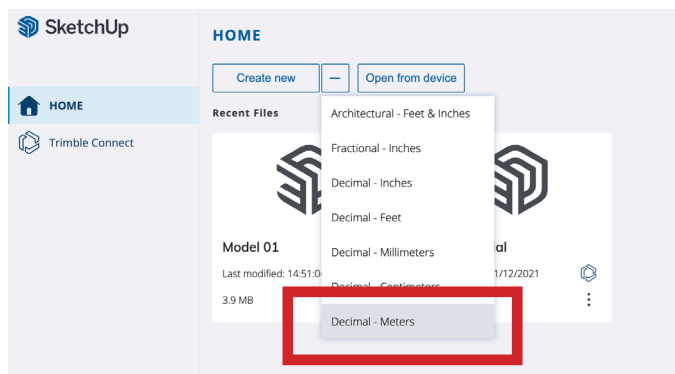
	SketchUp Free	SketchUp Go
<b>Platform</b>	Web-based 3D modeling	Web-based 3D modeling
<b>Drawing Tools</b>	<p><b>Basic</b></p> <p>All the core modeling tools you need to draw, extrude, and move geometry.</p>	<p><b>Advanced</b></p> <p>Create complex 3D shapes with Solid Tools. Intersect groups to combine, subtract, or isolate geometry with ease.</p>
<b>Materials</b>	<p><b>Standard</b></p> <p>Pull from a palette of predefined materials—from stone and brick to vegetation.</p>	<p><b>Custom</b></p> <p>Upload images from the web or import your own textures, and make your models pop.</p>
<b>Styles</b>	<p><b>Standard</b></p> <p>Add a hand-drawn touch to your model by applying a preset style.</p>	<p><b>Custom</b></p> <p>Control discrete illustration settings to create unique and compelling styles for your models.</p>
<b>Organization</b>	<p><b>Basic</b></p> <p>Organize your model with fundamental tools: Groups, Components, and Layers.</p>	<p><b>Advanced</b></p> <p>With the Outliner tool, you can see all model elements in a hierarchy. Select, nest, and arrange them in a way that makes sense to you.</p>
<b>Interoperability</b>	<p><b>Basic</b></p> <p><b>Import:</b> STL</p> <p><b>Export:</b> STL, PNG</p>	<p><b>Advanced</b></p> <p><b>Import:</b> STL, DWG, DXF, DAE, KMZ, 3DS, DEM</p> <p><b>Export:</b> STL, DWG, DXF, DAE, KMZ, 3DS, IFC, WRL, FBX, XSJ, OBJ</p>

### 3. Interface of SketchUp for Web



#### Template

Every model in SketchUp is based on a template, which has predefined settings for your model’s background and units of measurement. When you begin a new model, selecting a template with the correct unit of measurement makes modelling easier. On the Home panel, select ‘Create new’>choose the template



## Menu bar

The majority of SketchUp tools, commands, and settings are available within the menus on the menu bar.

## Getting Started toolbar

When you begin using SketchUp, the Getting Started toolbar is the one you see by default. It contains the basic tools you need to begin creating 3D models. If you want to open other tools, just long press on any icon (1).

## Drawing area

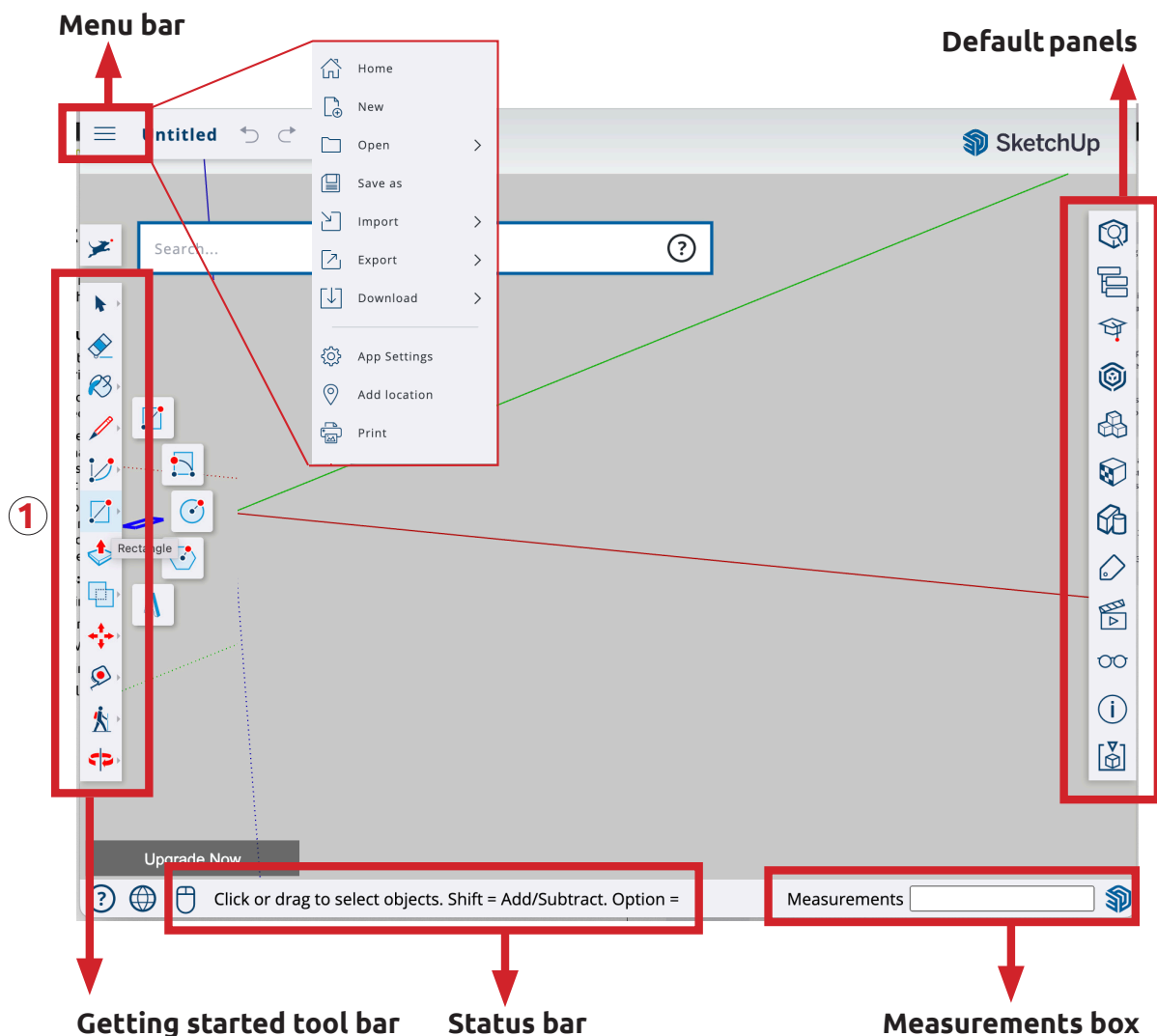
The drawing area is where you create your model. The 3D space of the drawing area is

identified visually by the drawing axes, which provide a sense of direction in 3D space while you work. The drawing area might also contain a simple model of a person to give you a sense of 3D space.

## Default panels

Windows Interface: On the right side of the screen, you see a tray of panels, including the Instructor, Materials, Styles, and so on.

The Default Tray appears when you open SketchUp, but you can close the Default Tray of panels by click the Close button in the upper right. Toggle the tray so it's visible or hidden via the Window > Default Tray submenu.



## Status bar

When you're getting started with SketchUp, the two important elements on the status bar are the **tips in the middle** and the **Measurements box** on the right:

- **Tips for using the tools:** In the middle area of the status bar, click the question mark icon to display the Instructor window, which offers basic information about using whatever tool you select in the toolbar. The middle area also displays a brief sentence about using the selected tool. This area is helpful when you're not sure how a tool works.
- **Measurements box:** This box is a critical tool for creating accurate models. The box displays dimensions as you draw. You can also use this box to manipulate currently selected entities (such as creating a line that's a specific length) or to create evenly spaced copies of entities (such as columns, fencing, or housing blocks in a post-industrial dystopia).

## Axes

The Global axis lines are the red, green and blue lines that are normally seen in the drawing window. The point where these lines cross is called the **Origin**. The **red line is the X-axis**, **green is the Y-axis** and **blue is the Z-axis** (see image on the right). The Z-axis is the vertical one. Components get their own axes. The solid axis lines are the positive direction while the dotted axis lines are on the negative side.

## How to use the mouse

### Middle Button (Wheel)

Scroll: *Zoom*

Click-Drag: *Orbit*

Shift+ Click-Drag: *Pan*

Double-click: *re-centrer view*



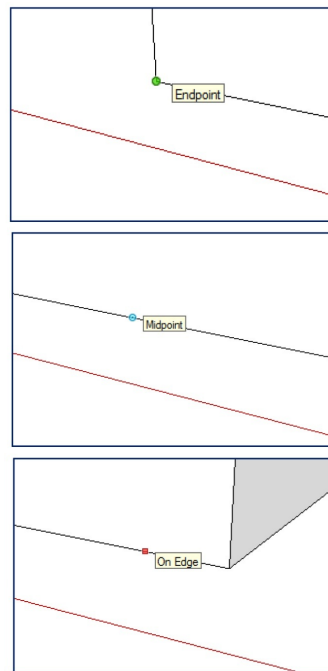
## Edges and surfaces

Edge can exist on their own, surface cannot.

Draw a full closed loop of edges to create a surface. This closed loop of edges must also be **co-planar** – you can check this by using...

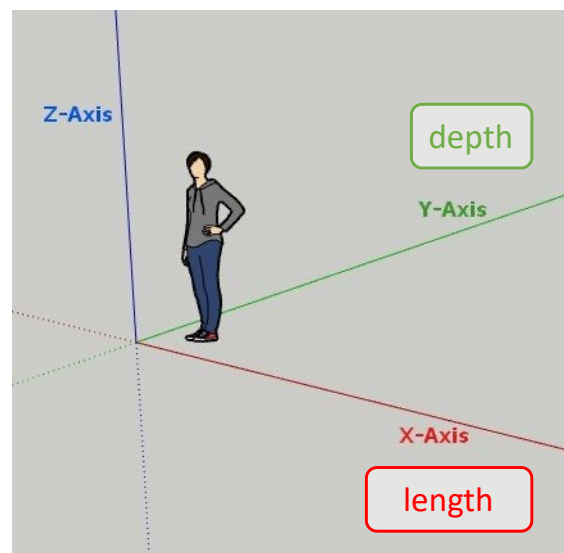
**Inferring:** SketchUp's ability to use directions of the three axes to line up edges together.

Use **Inference points**, such as endpoints, midpoints and any other point.



*NOTE: Hover over points and planes by allowing a few seconds on inactivity over them; ensure that the edges that are being created follow the colour of the axes (x, y, z) you want them to move along.*

height



## Layers

It is very important to work with layers and divide layers consistently. This will make your life easier with complex 3D models, as well as it will smooth the views and styles setting for exporting. In SketchUp for Web, layers are called **TAGS**, and you can find them in the **Default Panels tab**.

## Model Info

All the informations regarding your model are in **Model Info**, in the **Default Panels tab**. Here you can change your format, precision, etc.

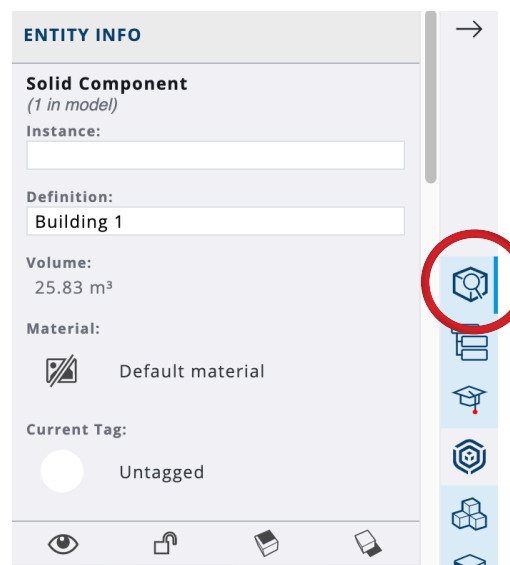
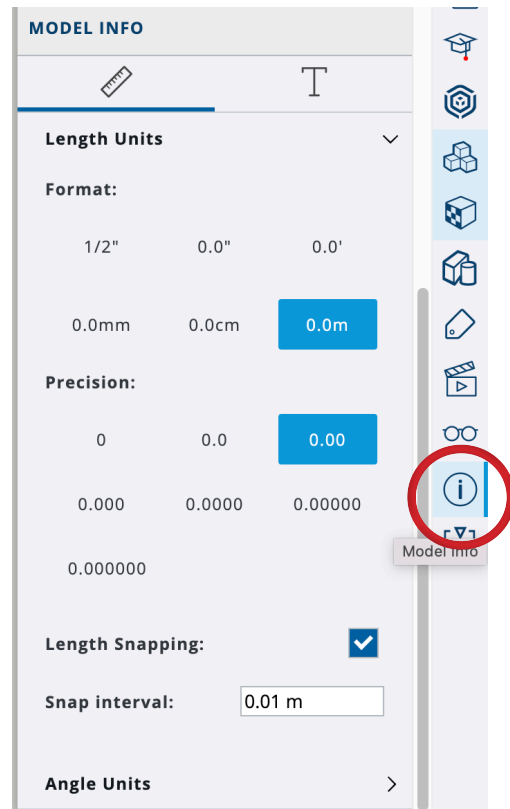
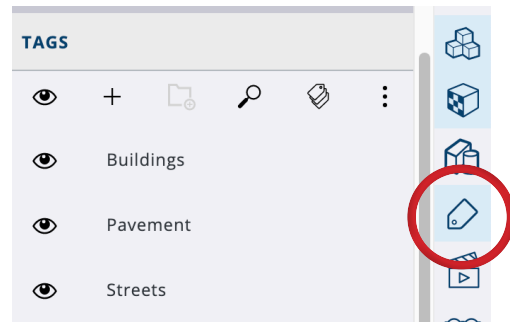
## Entity Info

As you create 3D models in SketchUp, you create an entity whenever you draw a line or face. Combining lines and faces into a group or component creates a special group or component entity.

Each entity in a model has attributes, such as its measurement, the layer it's on, and more.

Depending on what you're doing in SketchUp, you might need to know or change an entity's attributes. To do so, look in the **Default Panels tab**.

Select an object with the **select tool** > open the **Entity Info** > The entity's details appear before you. If you select multiple entities, you see the number of selected entities.

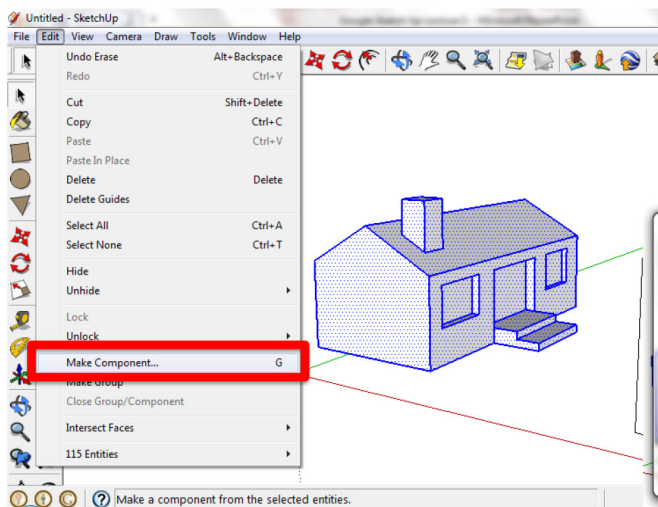




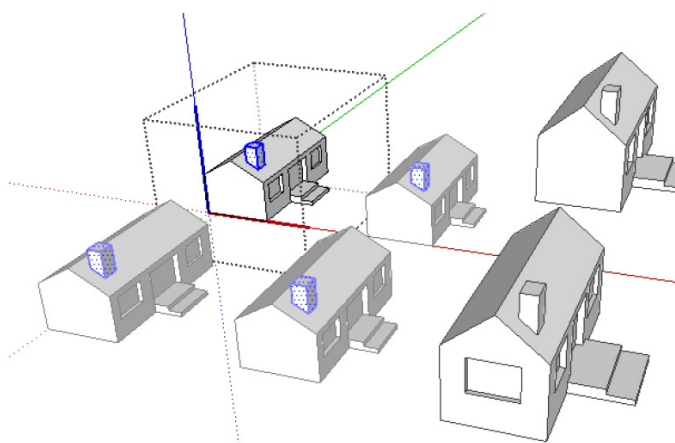
## 4. Components

SketchUp components are objects that made your 3D model. You can obtain components in two ways:

1. By downloading them from free collections of generic objects to help you populate your 3D models. You can find those object in the **3D Warehouse** in the **Default Panels bar** (<https://3dwarehouse.sketchup.com/collection/a7a3afcdbc6059ef8d6d7bc83a5f35bf/SketchUp-Components>)
2. By creating them by your own: when you create an object using SketchUp, then you can select it by drag the selection tool from one corner to the other >right click on it > make component.

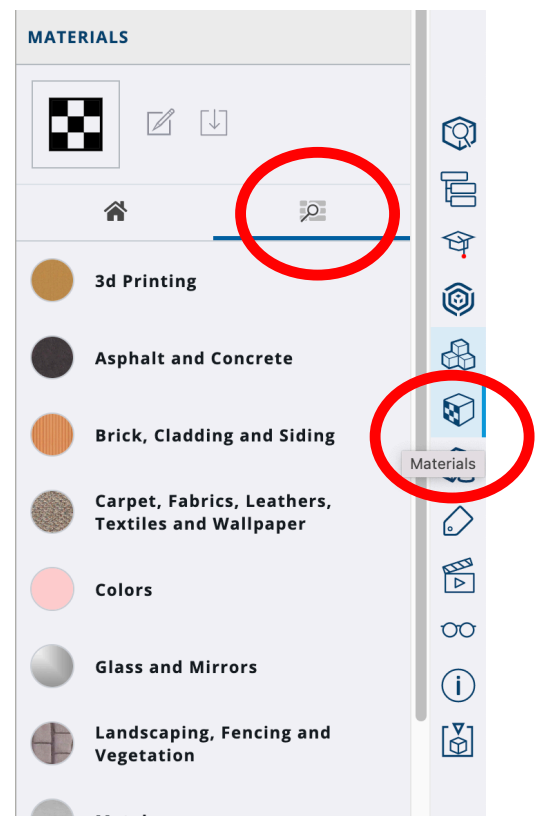


Once you create it, you can edit it by right click on it > edit component



## 5. Materials

You can add patterns and materials directly in SketchUp using the panel 'materials' in the **Default Panels bar**

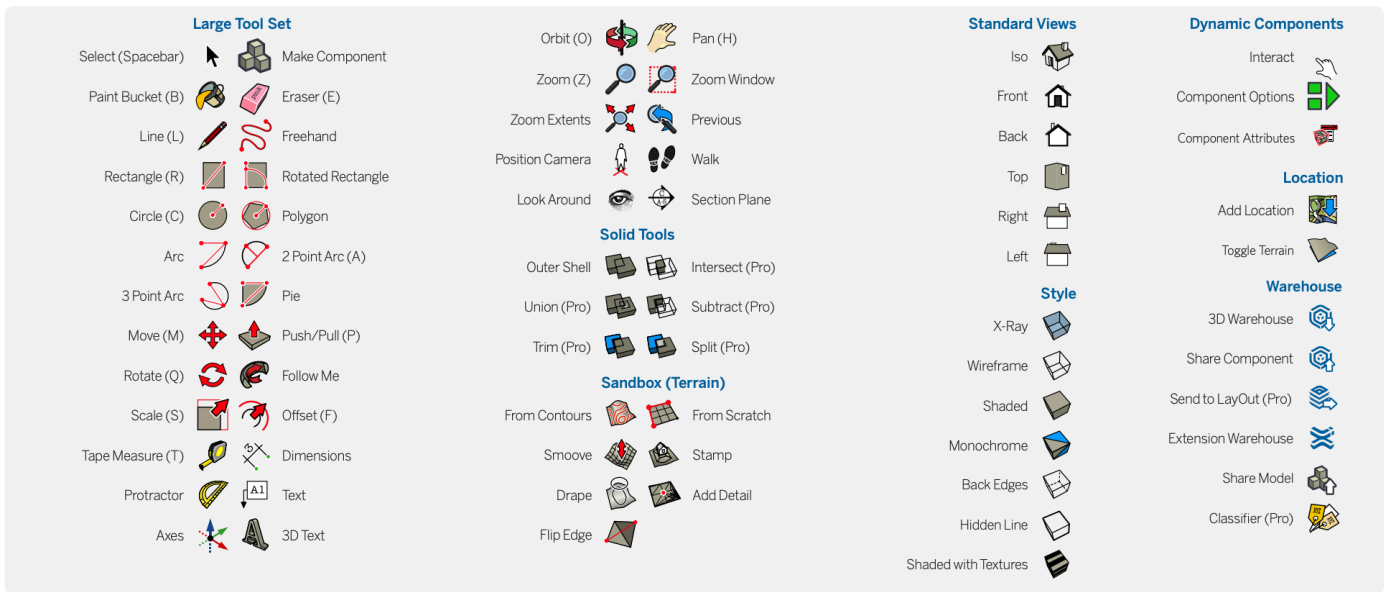


You can also just add colours to the surfaces of your model. To add materials /colours to a surface, use the **Paint bucket**.

*NOTE: It is suggested to do NOT add material in SketchUp, but instead exporting just simple drawing (with surfaces+black lines), and post-producing them using Adobe Photoshop or Illustrator.*

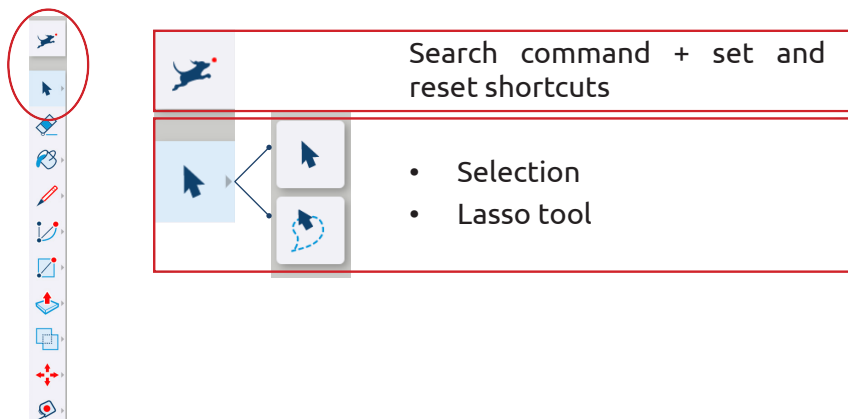
# 6. Tools in SketchUp for Web

In this section you can find the basic tools you must know to use SketchUp. Tools in SketchUp Pro are almost the same as the FREE version, but they just look different (different icons, colours and style). The following image gives an overview of all the **available tools in the Pro version**:





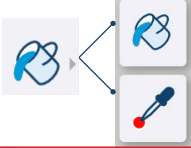
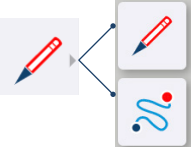
If you are using the **FREE version of SketchUp for Web**, the next section will explore the basic tools you can find in the 'getting started tool bar'.

## Fundamentals




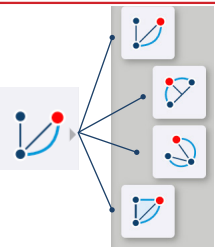
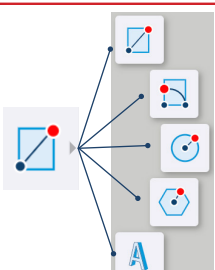
## Basic actions

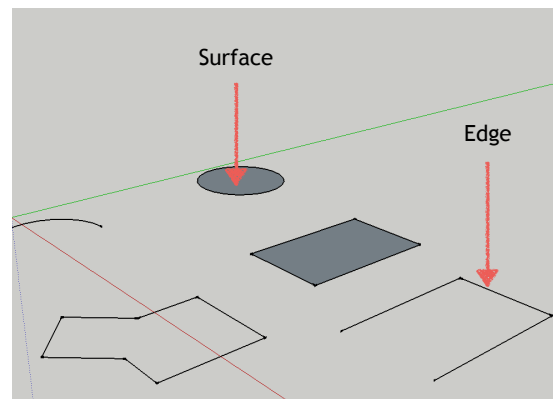


	Eraser edges (not surfaces)
	<ul style="list-style-type: none"> <li>• Bucket</li> <li>• Sample material</li> </ul>
	<ul style="list-style-type: none"> <li>• Pen tool (line) – right click&gt;pull away &gt; right click to finish</li> <li>• Freehand</li> </ul>


## Basic shapes


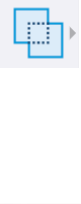
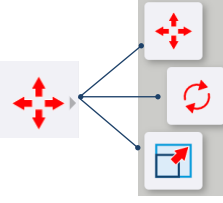
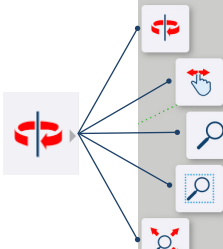


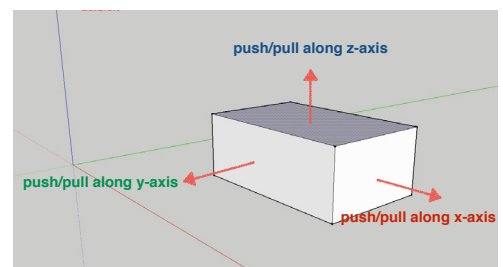
	<ul style="list-style-type: none"> <li>• Arc</li> <li>• 2 point arc</li> <li>• 3 point arc</li> <li>• Pie</li> </ul>
	<ul style="list-style-type: none"> <li>• Rectangle</li> <li>• Rotated rectangle</li> <li>• Circle</li> <li>• Polygon</li> <li>• 3D text</li> </ul>



## Moving and modifying tools



	<ul style="list-style-type: none"> <li>• Push and pull</li> </ul>
	<ul style="list-style-type: none"> <li>• Selection - outer shell</li> <li>• Selection - union</li> <li>• Selection - subtract</li> <li>• Selection - trim</li> <li>• Selection - intersect</li> <li>• Selection - split</li> </ul>
	<ul style="list-style-type: none"> <li>• Move</li> <li>• Rotate</li> <li>• Scale</li> </ul>
	<ul style="list-style-type: none"> <li>• Orbit</li> <li>• Pan</li> <li>• Zoom</li> <li>• Zoom window</li> <li>• Zoom extents</li> </ul>



# 7. Importing a basemap

Quite often, you need a base map to start your 3D model – this will help in terms of scale, proportions, and relationship with the context. Moreover, working on a base map it will be useful for photomontages: for instance, if you want to create a 3D model of a building to be inserted in an existing street view photo of the context.

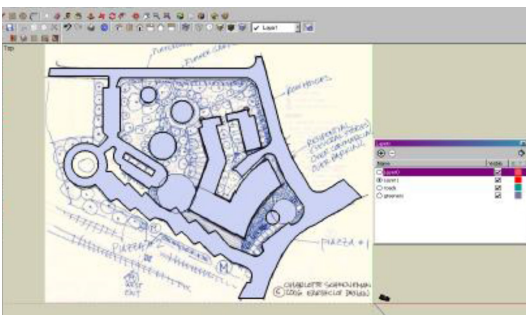


With SketchUP for Web, you can import:

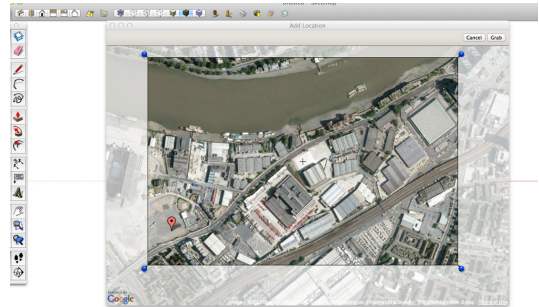
- Other SketchUp file
- PNG file
- JPG file

There are several options to work on a base map:

1. The easiest (if you have good sketching skills) one is to import **hand drawing sketches and trace-over them**. Scan your sketches> choose a high resolution (from 300-600dpi), import in SketchUp for Web by clicking **'import'** in the **Menu bar**



2. If you are inexperienced, the best way is to import a **Google map**. Take a screenshot of the area you want from Google Maps, import it in SketchUp by clicking **'import'** in the **Menu bar**.



NOTE: Before to start tracing over, it is suggest to **SCALE the Google map according to real dimensions**. To do it, follow the next steps:

- In Google maps, take any dimension (i.e., a length of a building) by right click > **measure distance** > click in one corner (A) > click in the next corner (B).
- Once you know this dimension, go back to SketchUp > with the **pen (line) tool** click in the same corner (A) as you did in Google maps > just move the cursor in the direction of the second corner (B) without clicking > **type the dimension**

Now you have a line that is the real length, it could be shorter or longer compared to the image you imported thereby, you should **scale the image in SketchUp accordingly to this line**:

- with the **scale tool** select one corner of the image > re-sized the image accordingly to the line you drawn > with the **move tool** selected the image > move it in order to match the corner (A) with the beginning of the line.

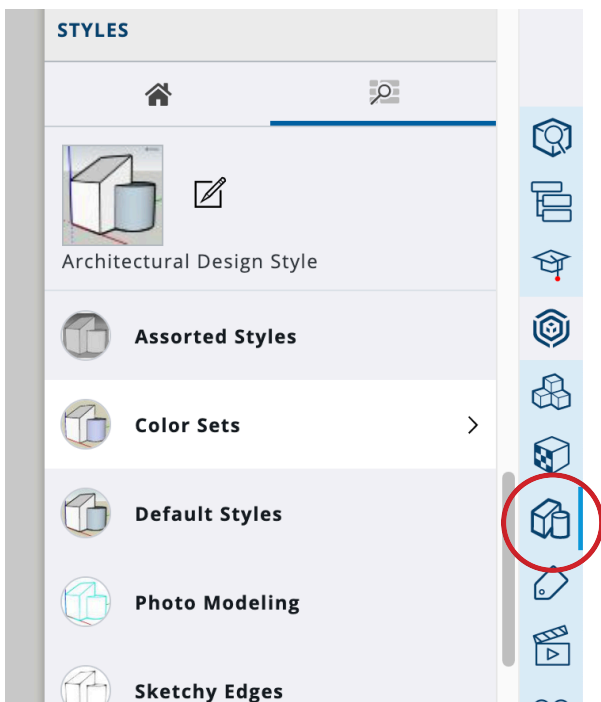
**NOTE: you may repeat this process several times to adjust the image.**

3. Importing **DWG map** is possible only with SketchUp PRO.
4. A complex and very precise way to import a satellite image with terrain from Google maps or Google earth. Importing this information will allow you to have the topography or contours of your site. Here you can find a step-by-step tutorial: <https://youtu.be/ZE6lOXsrbbA>

## 8. Setting style and Creating scenes

### Setting style

In SketchUp, you can create and edit styles so that you can apply your preferred style settings with a single click. Different styles you may want to apply are in the **Default Panels tab**.

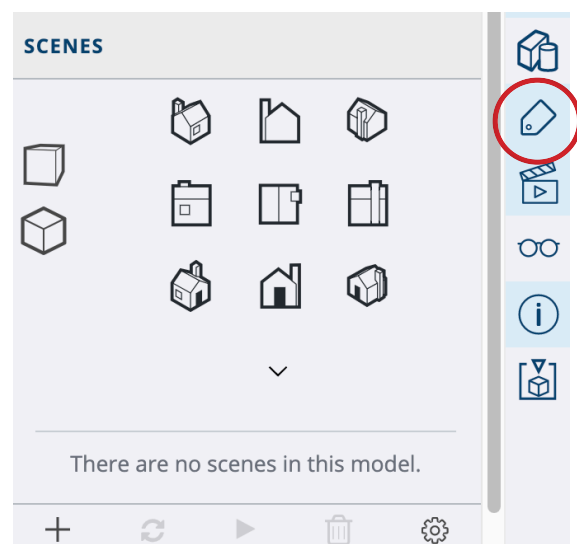


To this link you can find the explanation of different styles available: <https://help.sketchup.com/en/sketchup/creating-and-editing-style#:~:text=Click%20the%20Select%20tab%2C%20click,select%20your%20desired%20face%20options.>

*NOTE: It is suggested to do NOT add material in SketchUp, but instead exporting just simple drawing (with surfaces+black lines), and post-producing them using Adobe Photoshop or Illustrator.*

### Making scenes

Making a scene help you save different model views and properties and then present those views to other people. Each scene you create appears as a tab in the **Default Panels tab**.



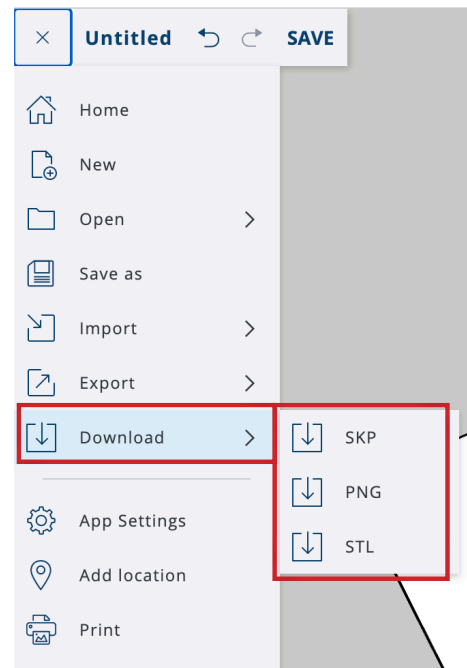
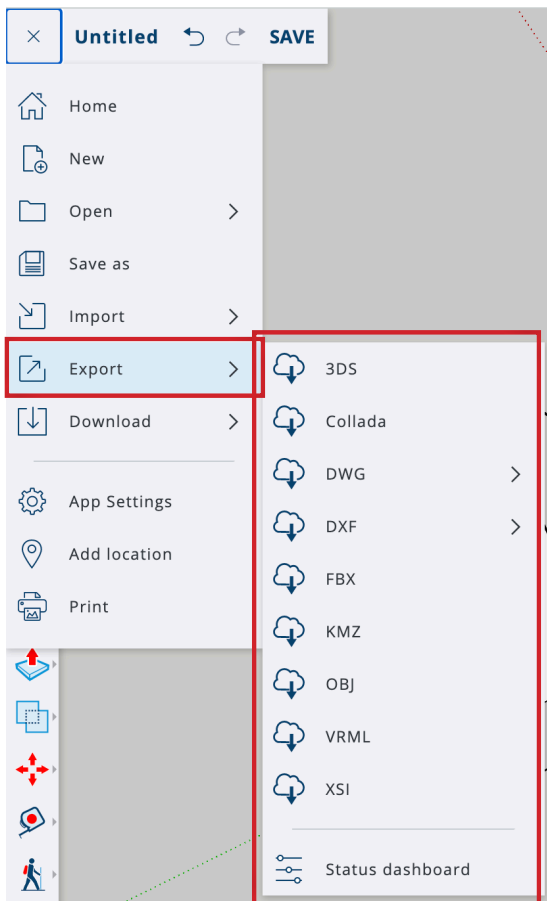
## 9. Exporting

As you're creating a 3D model, creating scenes helps you quickly change to a different view of your model. You might save views from different angles, like the front, back, and side of your model. Also, saved scenes can help you present your model. Selecting a scene tab is much easier than pausing a presentation to orbit, pan, or zoom while your audience watches and waits.

Once you are ready with your 3D model, you can export or download it in several formats from the **Menu bar**.

SketchUp for web allow the following formats:

Is suggested to always download in **PNG** if you want to modify the image using **Photoshop**, or exporting in **DXF** if you want to modify the image using **Illustrator or AutoCAD**.



## Examples of graphic you can realise with SketchUp:



SKETCHUP  
Masterplan views



SKETCHUP  
Isometric vs. Perspective

**Isometric (axonometric)**



**Perspective (human view)**





**THE BARTLETT**  
**SCHOOL OF PLANNING**