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HIGHLIGHTS OF SOME AMAZING 3D PRINTED PROJECTS IN 2019

Editor
Subhra Bera

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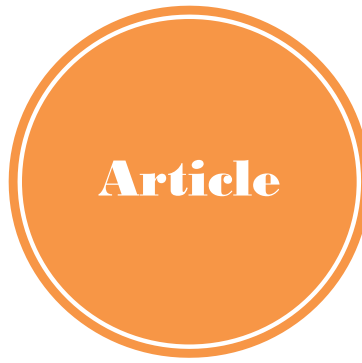
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HIGHLIGHTS OF SOME AMAZING 3D PRINTED PROJECTS IN 2019

The 3D printing technology allows any kind of design to be brought to life which releases architects from the limitations of standard construction.

3D printing or additive manufacturing is way of making three dimensional solid objects from a digital life. The creation or making of a 3D printed object is achieved using additive processes and in this process, an object is made by laying down successive layers of material till the object is created. Each of these layers can be visible as a thinly sliced horizontal cross-section of the eventual object. So basically 3D printing is the opposite of subtractive manufacturing which is cutting out a piece of metal or plastic with for specimen a milling machine.

SketchUp is just made for 3D printing and designing in SketchUp is cool as 3D printing is something that moves is cooler and unique than that. In this article we are going to discuss about a few features that can be include by the users to make their creations more than just interestingly shaped hunks of immobile plastic. Aidan Chopra and Rebecca Huehls this time comes up with new tricks about 3D printing in SketchUp.

SketchUp or Google SketchUp is owned by Trimble Inc., a mapping, surveying and navigation company. It is mainly a 3D modeling computer program that is used for a broad range of drawing applications used by architects, interior designer, landscape architects, civil and mechanical engineers, film and video game designers also.

3D printing technology has changed many industries globally and among them most impact can be seen on Construction industry which offers freedom and versatility in a right budget. This article will describe four new 3D Printed projects in 2019 among Construction industry.

Most of the companies that use 3D printed program in construction are startups businesses are still in their developing phase though the number of countries using 3D technology is growing every day. Dubai is the leader of those countries where the most famous and luxurious UAE city has started a new structure that will be going to be built by using 3D technology.

1. **Project Milestone:** This is based in Eindhoven (the Netherlands), the engineers of Netherlands are planning to build five 3D printed concrete homes; this unique project makes them the first commercial housing project using 3D technology. Where the homes will be of new ages, having all kind of comforts etc.
2. **Apis Cor:** It is a startup which is located in San Francisco made a demonstration of its own 3D technology by creating a house in Stupino, Russia in 2016. Their technology is versatile and mobile as they printed the whole home on site to cut the transport expense. In future they are expecting to make homes using dual extrusion that will allow printing components other than the concrete structure. Recently the company has collaborated with SEArch+ and entered the "3D Printed Habitat Challenge", a contest organized by NASA.
3. **New Story:** It is a nonprofit located in Texas who has partnered with Icon which is a company that creates printers, robotics and advanced materials to work on affordable housing solutions.
4. **WinSun:** WinSun created its first houses in 2013 using the first continuous 3D printer; they used a special mixture made of sand, cement and fibre along with suitable additions to print house components layer by layer in their Suzhou factory in China.

Source: https://www.dropbox.com/s/bwb0zw262ow9l59

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Best Wishes

Editor
Subhra Bera

AUTUMN STYLING WITH A FASHIONABLE TWIST

SketchUp Hub is fully dedicated to the interior decorations using SketchUp; they help the interior designers to get some new ideas about home decorations.

About SketchUp Hub: Anita Brown has established the SktchUp Hub 3D Visualization and here are a range of courses for helping Interior Designers and students, creating exact floor plans and elevations with a professional touch for the extreme benefit of their business or studies. The SketchUp Hub's total vision is to authorize Interior Designers especially women providing right technical abilities for making exact drawings and creative illusions at professional standards. Besides that, SketchUp Hub creates an available, engaged and fully supported learning environment for presenting the development of STEM related skills to a female driven industry.

In the month of January this year, the Sketchup Hub had announced their first ever 5 Day Challenge where they had challenged designers and SketchUp users to create an awesome kitchen design with the help of Free SketchUp download. The event was a big successful one and many people showed their wonderful skills where the best got the winner prize and made a place for his/her design. After that the SketchUp Hub has focused on designing the Interior sides of houses with elevations, these elevations are actually some kind of visual tools that allow Interior Designers to transfer perfectly their vision for a space, specifically they can work on the design of a wall and other items within nearly view.

Autumn is now in our door step and this is the best time when people think to decorate their places in a new way or want to make their places lovely and cheerful. Autumn is the season of cleaning houses, washing lawns and houses to give it a new and clean look to welcome winter and Spring. SketchUp Hub team is also excited to create changes in the interiors which can make lives even more beautiful and stylish. According to them, in autumn they will love to create dramatic, breath taking interiors for the season; their dark and moody atmospheric qualities give the right foundation for designers to drive boundaries, make a statement and experiment with new colors, patterns and materials. Autumn interior decorations is mostly done by Urban Luxe which is the best interior design styles to combine into an Autumn scheme; it has all the glamour, luxury and classic detailing perfectly balanced with modern design to create a consistent and modern aesthetic that emits undeniable warmth and sophistication.

The team has worked it on and designed a beautiful living space that replicates everything about an Urban Luxe Interior. First of all they focused on the color; they chose Cordoba from Little Greene as the aubergine shades in this hue were very evocative of the earthy notes of autumn as it is full of different color combinations to introduce individuality into the space. After getting the main color for the space they also chose feature wallpaper as they thought that floral prints will create a huge effect on interiors in the future. They love patterns and applied the Farrow & Ball's Lotus print which incredibly

rich and reflects all of the classic elements, they also used it on the sofa wall that gave a mild but sophisticated look to the place. While they put muted Scandinavian colors in this design with the muted pink and dashes of grey-ish blue for make a balance with the strong wall colors.

Next they worked with sofa covers and cushions, coffee table, walls, backdrops, curtains, chairs and fire place; they applied the contrast colors, mix and match the colors against each other to create a vivid but variant stylish look throughout the room.

About SketchUp: SketchUp or Google SketchUp is mainly a 3D modeling computer

Source:www.sketchuphub.com

program that is used for a broad range of drawing applications used by architects, interior designer, landscape architects, civil and mechanical engineers, film and video game designers also. SketchUp can be getting as a freeware version named SketchUp Make and a paid version with many more extra benefits called SketchUp Pro. SketchUp is software from Trimble Company and there is an online library of free model congregations and 3D Warehouse to which users can add other models; besides that, the program has drawing layout functionality with variable 'styles', supports third-party 'plug-in' programs hosted on the Extension Warehouse to supply other abilities and enables placement of its models in Google Earth.

As SketchUp users are most of architects, designers, builders, makers and engineers etc. who works hard to give a nice shape to our physical world, they need great tools to do the work. SketchUp is in mission to bring their best to produce some great tools for

drawing as drawing is the key thing of the SketchUp users. They draw to search ideas, to identify the things and to show other people their work that they do with love and love to build; SketchUp understands it truly and trying to improve their software day by day.

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DESIGN PARTS IN SKETCHUP TO CONNECT FOR 3D PRINTING

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SketchUp models are suitable for 3D printing but it only can happen when the parts of any model are assembled together, there are different ways to assemble those parts.
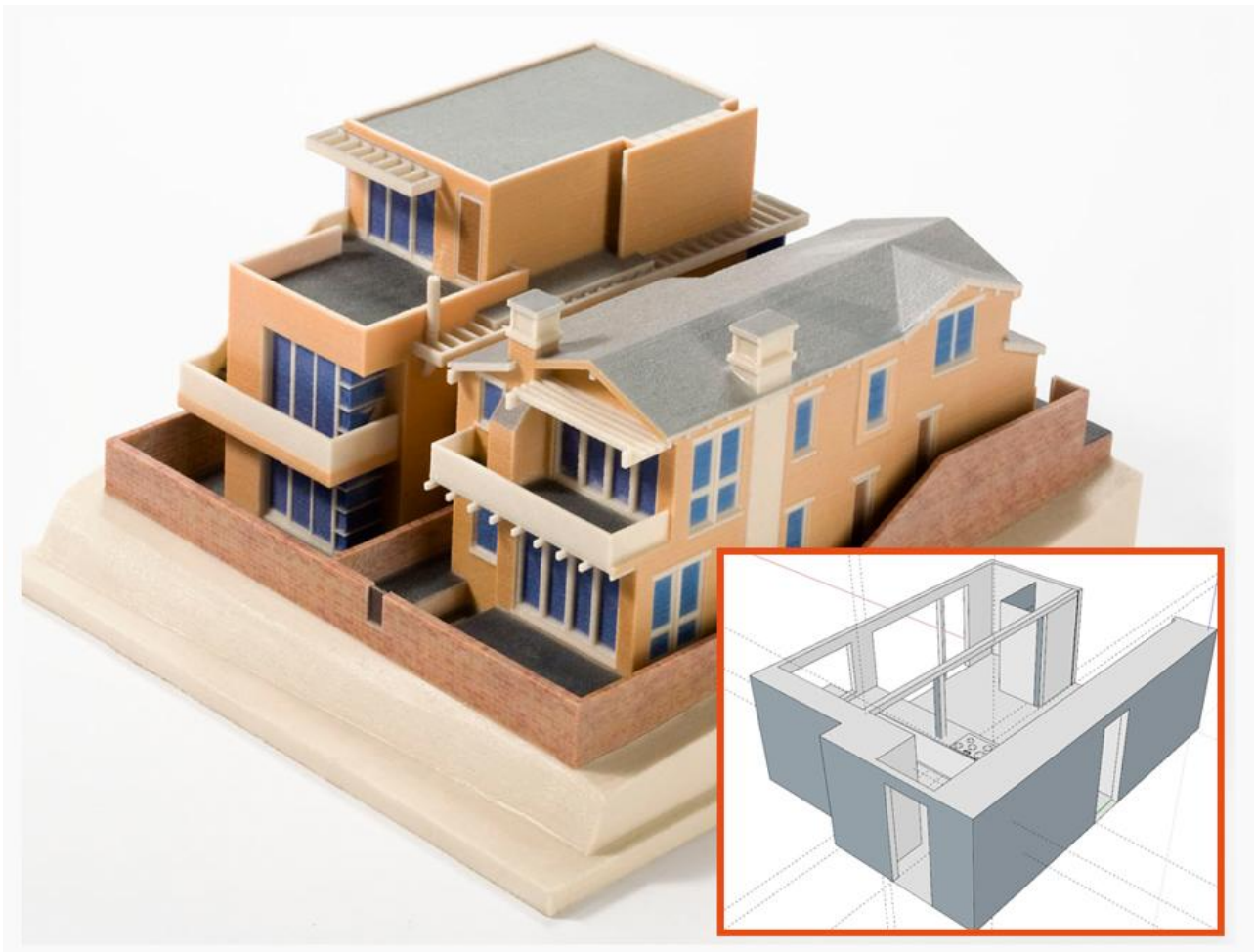
In the previous tutorials of Sketch Up, Aidan and Rebecca have shown us the way to cut Sketch Up model into parts but the matter is now to assemble them in a way for printing them. There are many other strategies and features in SketchUp like mechanical or else to help in building into the model to assemble the parts together. Aidan and Rebecca are going to show the users through different processes and here is a brief discussion on it.

Tolerance in SketchUp: It is the difference between the sizes of users' part in SketchUp and the size of the part produced by their 3D printer. Suppose a user has drawn a 10mm cube in SketchUp and printed it, none of the sizes of the printed cube will be shown exactly 10mm; though these are very small differences like a few tenths of a millimeter more r less. But they can create problems if their 3D printed parts have to connect with the parts that already exist in the real world. That's why the manufacturer of the 3D printers gives a unique number for the machine's tolerance which may be in either plus or minus value. This value is called the Maximum variation for that machine and users both need to be aware while working.

Tolerance in SketchUp: Clearance is like an extra space for parts to slide past one another but users may face a little difficulty while installing similar size peg in a similar sized hole as they will not go together. The peg and the hole will not fit properly with each other in SketchUp but in real world they will not react like this as there the peg needs to connect with friction. The exterior of the peg is similar as the exterior of the hole that the friction between them will keep the peg from veer going in if the fit is too perfect for them. In that case, users need to add a small amount of space called clearance which will help the two parts to slide past each other; the amount of clearance depends on the exact movement of the part.

Glue in SketchUp: Glue is the universal way to stick things but it is also the weakest and most unreliable way as it has very little strength o keep the things tighter for long.

    a) The plastics which are used in 3D prints defined by the names ABS, PLA, PVA, nylon and PETT; all these plastics need a special glue to stick and the glues have to order online.

b) Biodegradable starch plastics consists a crystalline structure that doesn't go well with liquid superglue which stays liquid and move unexpectedly across the surface of the part.

c) Instead of glue, users can use epoxy which is though a messy stuff but will stick to anything.

d) No glue can stick to the flexible materials for 3D printers so to attach parts, a process called thermal welding.

Snap fittings in SketchUp: These are properly designed to pop the models together after the parts come off the printer and as these are removable so users can change out many parts of the model as per design. In SketchUp, snap fittings are created by two general steps: 1) creating the tongue with the Line and Push/Pull tools; 2) creating a matching capture point on the opposing part.

Press Fit in SketchUp: A press fit is the very little clearance between the two parts while designing and when the parts are pressed together forcibly, friction keeps the joint together without any extra hardware or glue. To make a press fit, the Offset tool is used to create an outer lip on one side of the connection and an inner lip on other side.

Bolts, Screws and Hardware in SketchUp: The strongest connection between 3D printed parts is holding together with metal hardware and these connections are great for things that are more than just prototypes. While integrating hardware into the design, include hardware in the SketchUp model as it will take measurements of the parts users need to use and model them in SketchUp. Then save the components in the component library for using them in further models.

Source:www.sketchuphub.com

DOWNLOADING FREE TEXTURES FROM POLIIGON AND USING THEM IN SKETCHUP/VRAY RENDERINGS

Textures add the realistic look in any model and Polygon's website is full of different textures which will increase the rendering view in SketchUp 3D models or in Vray.

Justin Geis: Justin Geis is the founder of The SketchUp Essentials and started using SketchUp while he was working as a general contractor in 2008 and after using it he found that SketchUp is extremely powerful that he just started to use it in his personal works also. Then he started The SketchUp Essentials as a place where he could share his ideas of using SketchUp easily through some tutorials and tips to help other users controlling the power of 3D modeling in everyday lives.
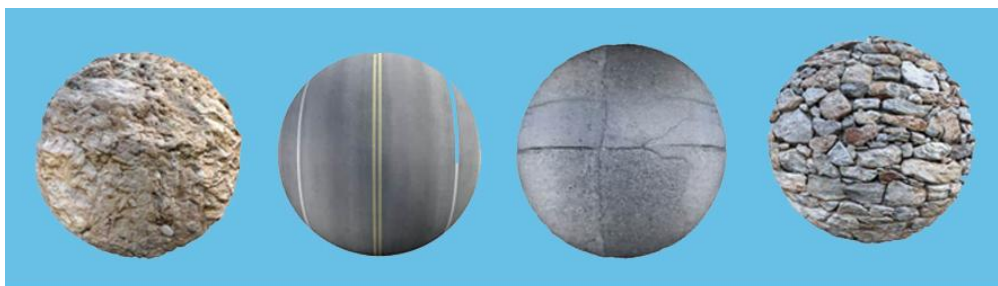
In today's article we will discuss about an online source that is contained of textures which can be used in any 3D models and renderings. There are many different websites which can also be used to download textures to use both in the SketchUp models, as well as for some programs like Vray, Unreal Engine and many more. This is a guidance to help the users in downloading and importing materials from Polligon.com into every SketchUp model, besides that there are some tips for setting the materials up within Vray for really creating more realistic renderings.

These free textures can get from www.poliigon.com, where users need to go on the top of the page to click the Sign Up button and it is absolutely free of cost website. After signing up, users can find there premium textures that can be purchased access to, as well as there are some great free textures that can be downloaded. Next they will find the texture stab, from where they have to go down to click on "Free textures" option; after clicking on this it will show a list of all the free textures available through Polygon where are list of wonderful materials to work.

Here is an example of texture-

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Plaster 17: When users will select this texture they will get a preview window that will show the material and its look while rendering. It also shows a list of different maps that can be downloaded such as normal maps, reflections etc. They also have a pretty worthy set of free textures and one of the nice things about them is that they have different maps which users may need to link up various things like normal maps to coarsen the surface or reflection maps to make the rendered reflections look better and more. Users can select very high resolutions also but it should keep in mind that though higher resolutions look more realistic but SketchUp may face some trouble with working them. After downloading the file, users can unzip it and place the materials in their file; next it need to bring into Vray by

opening up the Asset Editor, then go to the Material List and click the "Add Material" button at the bottom of the page and select "Generic". From here, users can add the maps into Vray material, clicking on the right arrow button will help to expand the window off to the right where they can add texture to this material by selecting the little box next to "Diffuse" and finding the color map. This option will add the texture image to the material and going in the material section, the size of the material can adjust; also adding different maps from the material it become more realistic.

Source: www.thesketchupessentials.com

FREDOCORNER IS THE NEW SKETCHUP EXTENSION

Fredo6 has released their new extension named FredoCorner which is an upgrade version of previous Round Corner that become now a paid version to work in the corners and splits.

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About Extension Warehouse: It is an online resource with various plug-ins developed made especially for SketchUp and these extensions help to add some special tools and features to SketchUp. These extensions can be found for any particular application like drawing or 3D printing and some industry specified tools for architecture, interior design, construction and many more. So basically in this Extension Warehouse people can do the following things:

- Users can search extensions by name or as per the functionality.
- They can also install various extensions with a single click of a button.
- Or users can also control all the extensions from easy-to-use location in the My Extension page.

FredoCorner is a new extension from Fredo6 designed to help the users in generating rounded corners or edges within SketchUp; this extension is as similar as the old Round Corner extension, but it creates rounded edges with an improved algorithm and also has added some new tools. It works in stripping of edges and corners of 3D shapes, in 3D modes: Round, Bevel and Subdivision Mesh; this tool also has a Repair tool to undo any kind of generated shape rounding. But it doesn't exchange the old Round Corner
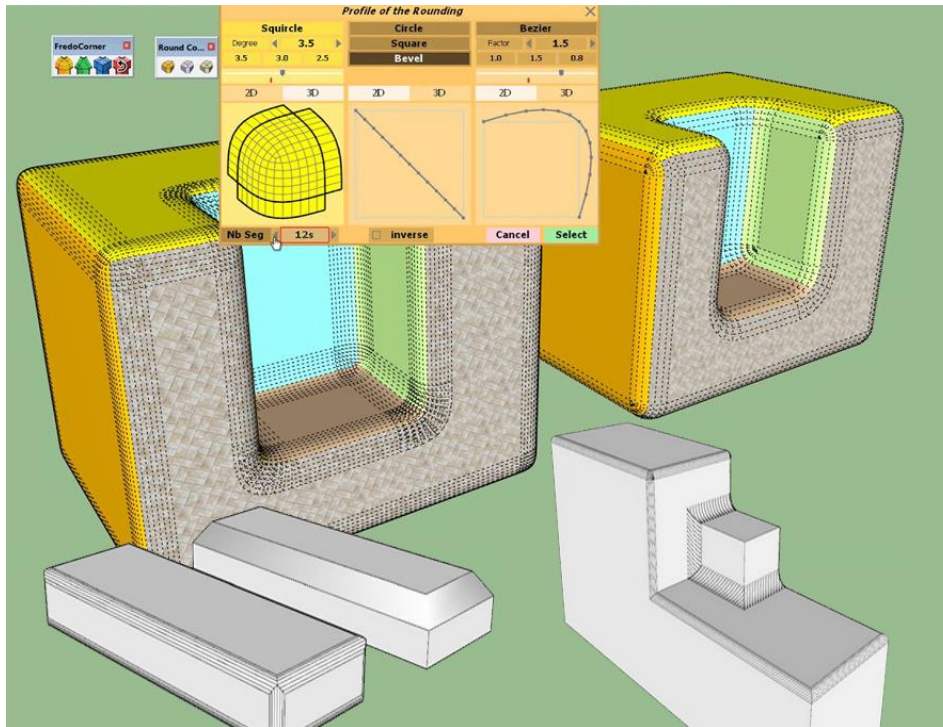
extension and remains supported as it will become a paid plugin after a 2-3 month free period.

FredoCorner is placed on a different algorithm and has many additional features, like:

- Handling more difficult shapes with triangulation at vertices
- Subdivision mesh
- Repair/ Undo/ Redo
- Preview mode
- Asymmetrical offset
- Variable offset with borders
- Works across boundaries of groups and Components
- Corners are symmetrical
- Edible corner profiles with Squrcles and Bezier
- More types of corner geometrics are supported

New functions of FredoCorner:

- It is may be the biggest change within FedoCorner as it is opposed to RoundCorner where the corners are all balanced and they can be edited with the Profile Rounding Function; this tool allows users to adjust the way of creating rounded curves with FredoCorner.
- This new upgraded tool also offers the ability for reversing the curves that allow creating corners which move both inward and outward.
- This extension can also handle much more difficult corners now than previous did in RoundCorner.
- There is a new preview button added which helps users to quickly view the created geometry with the look without creating it.
- Besides that, it also allows live editing the curves by clicking and dragging with preview mode active.
- The offset line lengths can also be edited now by clicking on them and adding a new value; users can offset individual lines or full offset by double clicking.
- The major thing is that users can now select a group or component and active FredoCorner without editing the raw geometry.
- There is also a subdivide function that allows to split object into squads that allows users to use an extension like SubD or Artisan to subdivide the shapes without any deformation.

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Source:www.thesketchupessentials.com/fredocorner/

BENDING AN OBJECT IN SKETCHUP

David Richards always works on different tools from different SketchUp extensions to create some differentiates in his models and this time he made a tutorial on Radial Bend tool.

About David Richards: He is a Biomedical Equipment Technician and provides anesthesia and Respiratory equipment for the largest medical facility in southeast Minnesota. Beside that he works in his garage woodworking shop where he has made various wooden items, he is a regular SketchUp user who uses it for designing projects, working out joinery details and solving the order of operations in time. He has made a various range of SketchUp models like tiny parts for medical equipment, large architectural and other construction projects. Most of his models are furniture and other woodworking related things, besides being a SketchUp users and woodworker; he helps other woodworkers around the world to use the program through his blogs in 'Fine Woodworking' which has become very popular among the woodworkers.
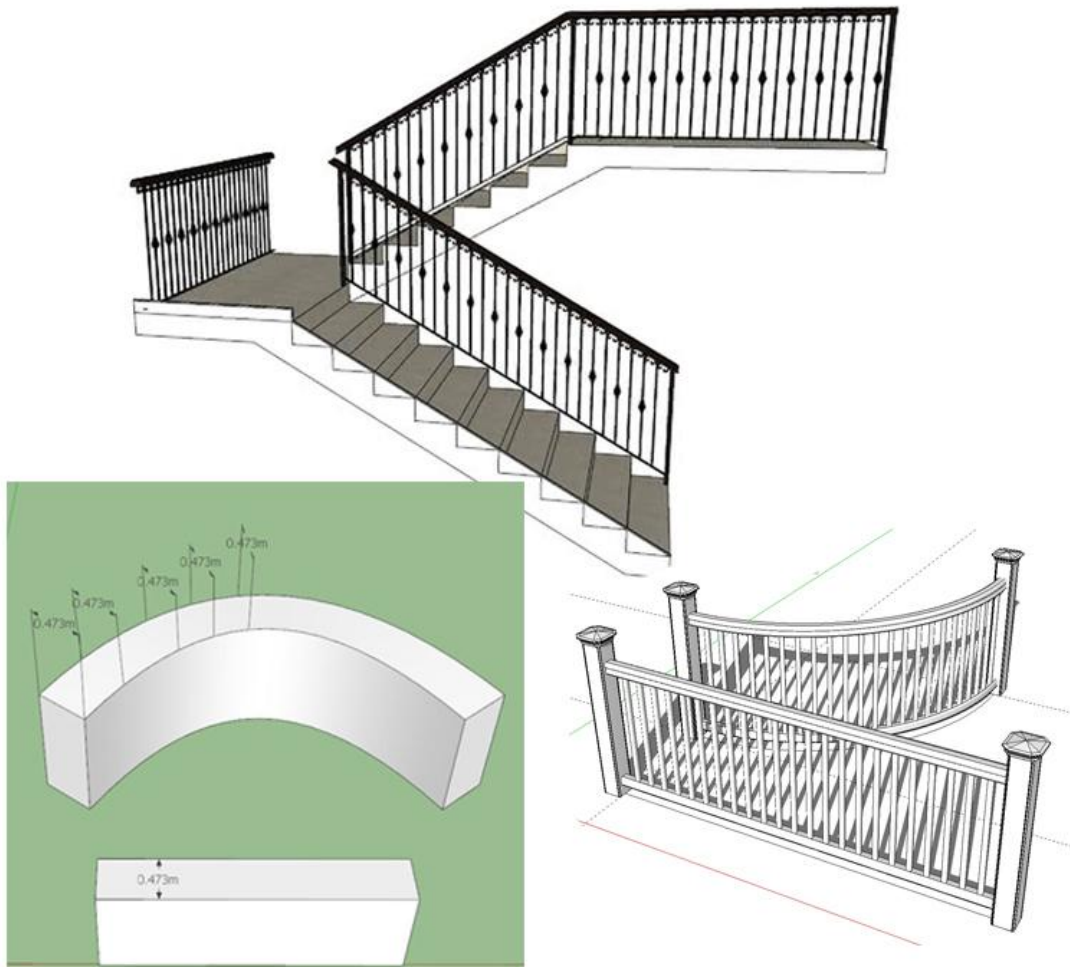
David Richards has drawn a SketchUp model and going to show his viewers the tip of bending any object in it; at first he drew a SketchUp model while creating plans for Michael Robbins's Contemporary Desk that is marked in the current issue of Fine Woodworking Magazine. The desk mixes practical utility with elegant details like its slender base with turned legs and curved side profiles; the construction is divided into two parts that are top and base. The joinery for the top section is elementary mortise and tennos; the two-part desktop is part solid wood and part plywood and covered with leather to make a blotter. The base with its turned legs is a straightforward frame secured by bridle joints. This leather on the blotter surface is represented by creating a component at first that is twisted up at one corner.

The work of this bending is easily done with the help of the Radial Bend tool in the FredoScale extension and here is a little detail of that work.

Radial Bend tool: Radial Bend deforms an object by radically bending the deformation axis which is perpendicular to the base reference plane. The radial bend is applied to the selected end of the deformation axis while the opposite end stays fixed and when the mouse moves, the shape radically bends in either a clockwise or counterclockwise direction as per a circular bending track that is displayed and is subdivided in degrees. The orientation of the bend may be rotated around the deformation axis and done

through the rotation handle attached at the bottom of the axis. This control is activated by clicking on it and an extra rotational track is shown to assist users with the positioning of the rotation.

In this model, David started working from the base for the blotter; he took a component, copied it pasted outside the component. Next he took Push/Pull tool to give the component a little thickness; next he thought took the curve tool to start the guideline to set the arbitrary. Now it is the time to bend the object, so he took the Radial Bend tool from FredoScale extension, placed it on the object, here users can set the number of faces they want in the curved object, next he drag the cursor along the guideline click on the corner and bring that corner up to make it a bended corner.

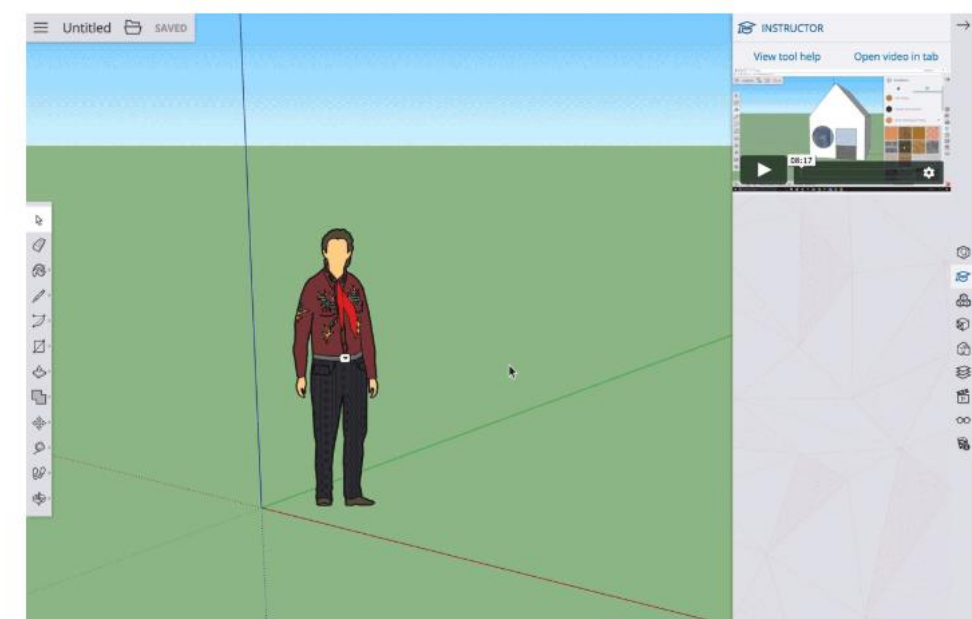**Source:**www.finewoodworking.com

SketchUp for Schools has started a year ago where the creators have started to put some information to manage SketchUp tools for students and teachers they are adding features now.

SketchUp for Schools: It is a free 3D modeling browser application which is available to any primary or secondary school that has signed up with G-suite for Education. This is the first time SketchUp ever offered an education-specific product and SketchUp team has taken the view of users and their EDU community about the classes. SketchUp management are bringing SketchUp for Schools out of beta just in time for the school year and after an wonderful Summer of sifting through many positive feedback the team has brought the two most needed features: STL exploring for 3D printing and SketchUp curriculum. So Sketch Up for Schools also offering age-definite curriculum attached to the International Society for Technology in Education (ISTE) Standards and also the curriculum is made by Teachers like Mike and Mike.

Last year, the SketchUp for Schools had started various classes to teach the students about SketchUp and people gave feedback which helped them to make improvements so that students and educators can use it more smoothly in 3D. So, this year they are again bringing SketchUp for Schools with new improvements, let's check them out.

Better 3D printing functionality: After SketchUp for Schools launched, SketchUp has come in now Chrome books and then they have added a couple more features to make the 3D printing experience better. The features are:

1. **Solid Inspector:**
2. It is the web-child of Solid Inpector2 and is ranked number 1 extension to prepare models for 3D printing on SketchUp's Extension Warehouse. It is located on the right side of the new 3D printing panel.

3. **3D Printing Guide:**
4. 3D printing guide is a complete guidance package consisting with three new lesson plans and these plans are now delivered in Google Slides. They all can be found either on the Web or directly in the SketchUp for Schools application.

5. **Solid Tools:**
6. Solid tools have different kind of tools which are Outer Shell, Union, Subtract, Trim, Intersect and Split. All these features are very useful to create cool geometry and can also help in preparing any model for 3D printing.

1. **STL import:**

There are many exciting Thingiverse models in the SketchUp for Schools application which students will love to play around with and it is as easier as exporting to STL.

Better 3D printing functionality: The team also added more of SketchUp's desktop functionality to SketchUp for schools and here are those new features:

1. Style Editor:
2. It allows users to create own custom styles or to edit one of SketchUp's many default styles.

3. Downsave .skp files to 2016 or 2017:
4. SketchUp team has added the ability to downsave the files of users' while working on any earlier version of SketchUp Pro in Desktop so that they can work between SketchUp for Schools on the Chromebook and SketchUp Pro on the desktop.

5. Importers & Exporters:
6. Last year, the most popular exporters were used in primary and secondary schools: in both STL and PNG. So, this year they have added a lot more exporters so that students can flex their creative skills on the last cutter, image editing software and other 3D modeling tools.

7. Material Editor:
8. Users can give their own unique touch in the SketchUp's material library by editing material fuzziness.

MEDEEK WALL IN SKETCHUP EXTENSION

The Meedek Wall Plugin is another one from SketchUp Extension Warehouse that provides a simple interface to create accurate 3D Wall framing geometry within SketchUp.

About Extension Warehouse: It is an online resource with various plug-ins developed made especially for SketchUp and these extensions help to add some special tools and

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About Meddek Wall (BETA): The Medeek Wall Plugin is another SketchUp Plugin that provides a simple interface to create accurate 3D wall framing geometry within SketchUp. This plugin also uses the SketchUp Ruby API programming interface and is consistent with the newest SketchUp versions like SketchUp Make 2017 and SketchUp Pro 2018 as well as earlier versions like 2015, 2016 and 2017.

Currently the plugin allows the making of the following types or panels of wall which are in Metric and US/Imperial:

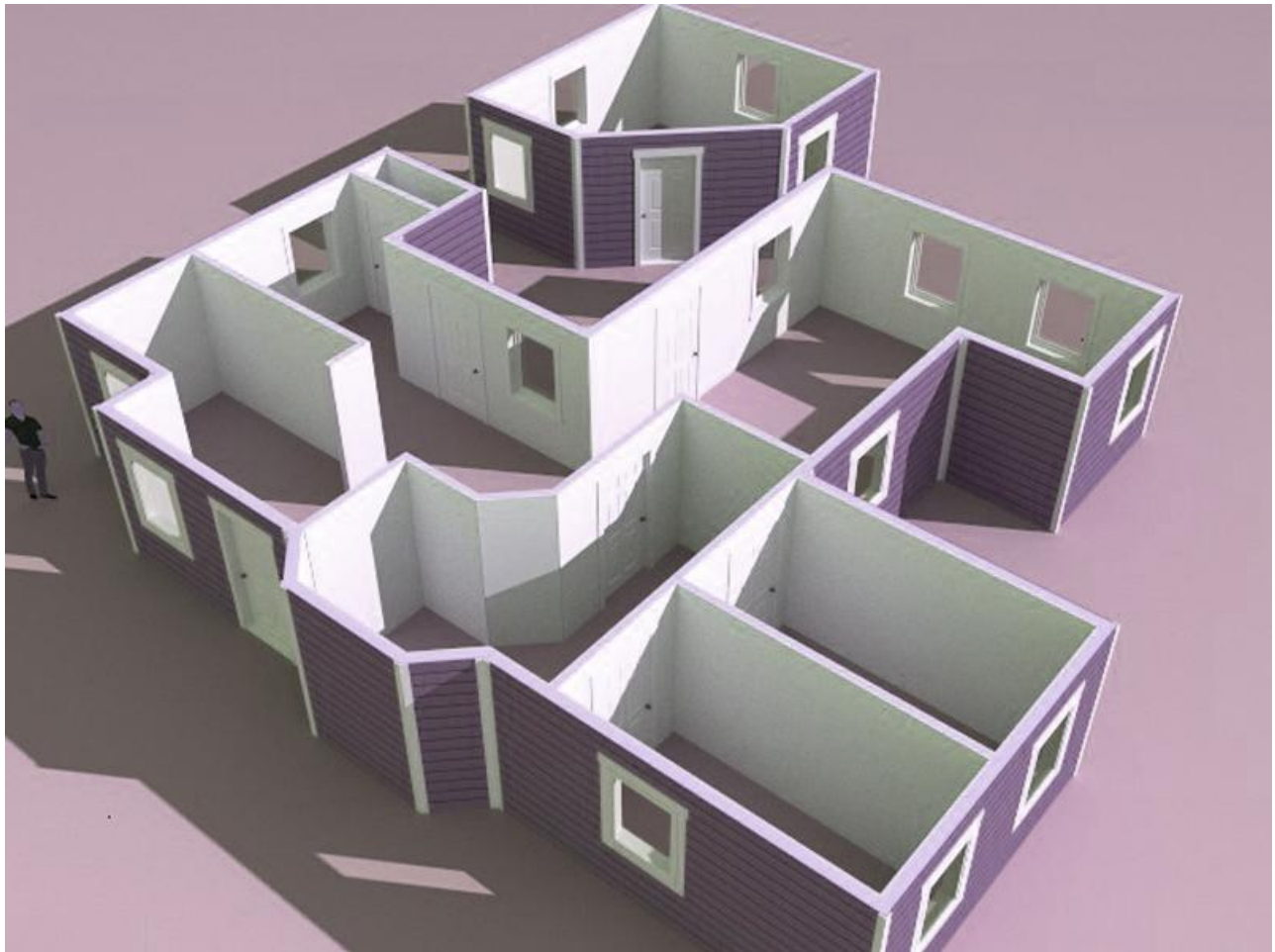Rectangle (Ext-Int), Rectangle (Int-Int), Gable and Shed.

o **Door types in Rectangle:** Solid, Six panel, Half Glass, Full Glass, Double Solid, Double Six Panel, Double Half Glass, Double Full Glass
o **Window types in Rectangle and Half Round:** Picture, Slider, Single Hung
o **Garage Doors:** Under Construction
o **Columns in Wall:** Dimensional Lumber and Timbers, Parallel Strand Lumber
o **Pre-Fabricated Shear Panels:** Simpson Strong-tie Wood Strong Wall®, Simpson Strong-tie Steel Strong Wall®, Mitek Hardy Frame® HFX Panel.
o **Engineering(US/Imperial):** It is under construction

All these wall types are designed using industry standard practices, there are some other wall types for doors and windows which are in the process to add on weekly basis. Some Advanced options and features like crown moulding, baseboard, chair rails and wainscoting are also now under development. So basically this plugin allows users to create wall panels in a polyline mode; after selecting the rectangular wall tool and choosing the line mode, the wall is then defined by selecting two points from the start to end of the wall panel. After choosing this polyline mode each point defines a wall panel end point and the next wall panel starts point, when the auto-corner configuration is allowed within the global settings the wall panels will automatically form inside or outside corners as per the angles between the wall panels. When the wall panel is created then it can be moved while at the same time

remaining fixed to other adjacent wall panels; wall framing with other options are automatically re-calculated and re-drawn. This automation will provide a design tool that will reduce the need for manual modifications to the model; custom layers can be

enabled in the global settings to allow various walls, window and door components to be placed on specific layers.

The Medeek Wall Plugin thus help users to accurately depict conventional wood frame construction will fully integrated windows and doors within SketchUp and better confirm the architectural models.

Source:www.extensions.sketchup.com/sv/content

THE CONSTRUCTIBLE MODEL WITH M MOSER ASSOCIATES

M Moser Associated has specialized in the design and delivery of workplace environments since a long time and now using SketchUp, VDC process to deliver 3D modeling designs.

Over past fifteen years, M Moser, a global AEC firm with an extensive track record in workplace design and construction which has used SketchUp not only for design and conceptualization but also as a key communication tool throughout the project delivery process.

According to the Jason Li, Associate and Charles Corley, Director of Organizational Development at M Moser Associates the company believes design can positively impact on people's well-being and productivity trough work and life. They are also passionate about allowing transformative workplace culture and the team is continuously engaging into new areas of expertise, new applications of design and new regions around the world through the trust of their clients.

Here are a brief discussion about their work, life experience and many more:
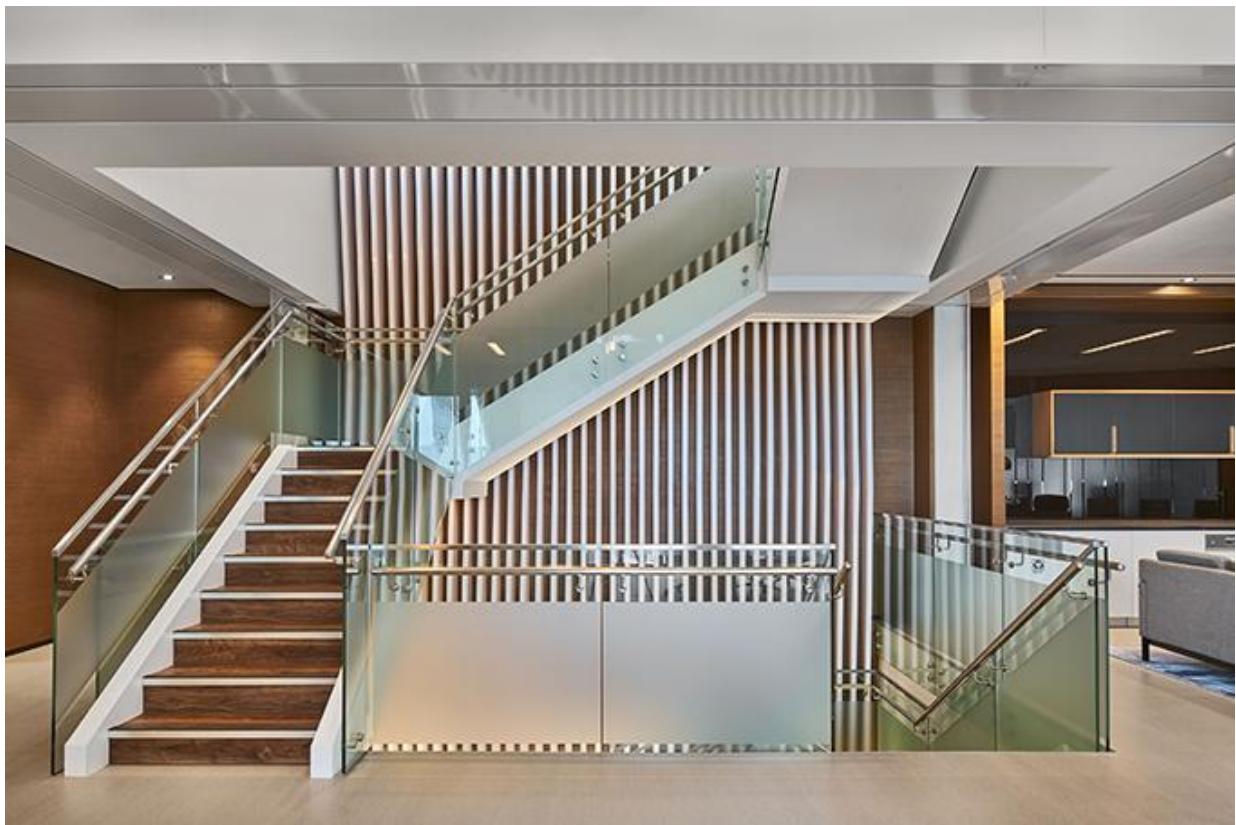
The term "VDC" mean to M Moser: The term VDC stands for Virtual Design and Construction that mean the team is an entirely constructible 3D modeling workflow to authorize any stakeholder for understanding and taking part in a project. They believe in creating a working virtual environment that can clearly shows to all project participants in spite of training or experience and without depending on a highly flat and disassembled, abstract set of documents, a visual reference is universal. M Moser prefers to own equal responsibility on every project as possible and throughout all of their offices they use virtual design and construction to make the projects understood for everyone. They also have an array of cultures, understandings and backgrounds in construction as they want to engage people meaningfully and get the best out of each other's participation and expertise by constructing a project in SketchUp well before going to the site. So VDC is a type of communication tool that connects and gets everybody on the path to the right result.

Projects to focus on as a business: They mainly design and build workplaces like corporate offices, corporate campuses, laboratories, private hospitals, private education facilities and workplaces of all types. According to them, SketchUp is very important to do these kind of projects as these projects are ever-changing and with more traditional building projects the things like permitting, structural calculations and ordering materials can be done finely before construction. But also the workplaces can remain fluid in design though many changes happen.

Unique clicks: They are extreme about changes and are continuously engaging the way of thinking about construction information, they also trying to create any record of construction information a by-product of the real collaboration and 3D work. Their all trades, contractors, suppliers and the client working together in 3D from concept to

completion; basically M Moser could be known as quite unique in the industry to focusing on different things in a time.

About designers: Though not every designer has the exact experience to understand construction fully but they tend to draw design intent as after that they have to work with others to find the possibilities. The team collaborates daily as they take their projects trough discussion and brainstorming for giving the best; people have different backgrounds and this way they all can truly avoid misconceptions on the exact need in design. In their every meeting, there would be a group of people from different professions come for a model being rotated on a large screen; the leader of the meetings is not the one with all queries and questions it should be everyone's participation and advice together they will solve problems. The notion of success comes mostly from the client but opinions are multiple which blend together to form a successful project. They use VDC method as a methodology to assure designers, engineers, professionals, specialists and client can communicate on the same platform.

Time: It is said that AutoCAD is faster than SketchUp but if it is used intelligently SketchUp is always better option. But there is often a false understanding of time efficiency as the drawings need to complete and checked by multiple peoples which VDC make in less time as modeler creates everything in SketchUp and then split the model into different viewports in LayOut to see the faults. They have made a way to complete works faster in SketchUp.

So basically M Moser is taking SketchUp as their main design software through using VDC that can consume less time but deliver 3D modeling works.

Source:www.blog.sketchup.com/article/constructible-model-m-moser-associates

Tips
&
Tricks

BROWSING FOR EXTENSION IN SKETCHUP

SketchUp Extension Warehouse has a huge amount of tools or extensions under it and these are very useful for the users, there is a right way to browse extension for SketchUp.
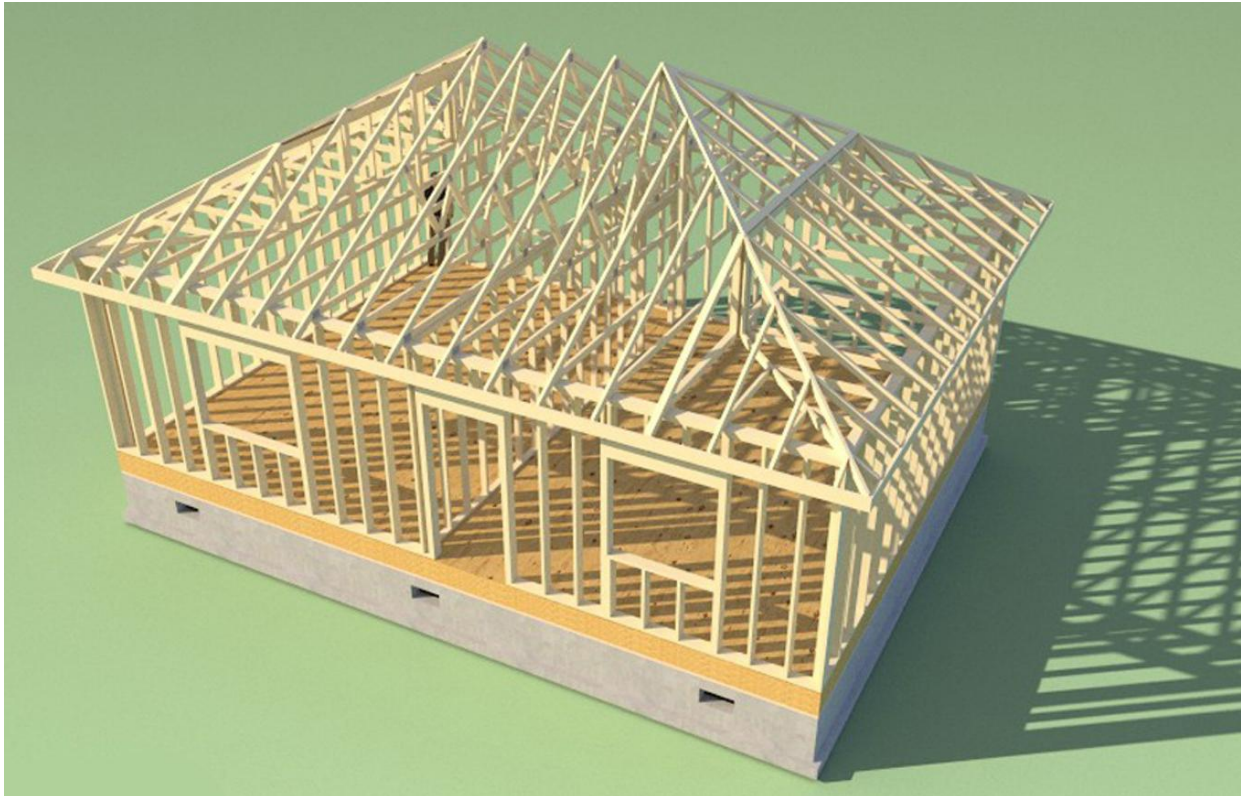
About Extension Warehouse: It is an online resource with various plug-ins developed made especially for SketchUp and these extensions help to add some special tools and features to SketchUp. These extensions can be found for any particular application like drawing or 3D printing and some industry specified tools for architecture, interior design, construction and many more. So basically in this Extension Warehouse people can do the following things:

a) Users can search extensions by name or as per the functionality.
b) They can also install various extensions with a single click of a button.
c) Or users can also control all the extensions from easy-to-use location in the My Extension page.
d) The SketchUp Extension Warehouse has many tools to search and browse extensions to find SketchUp extensions:

e) There is the Search Box at the top of every page where tools are mentioned.
f) There are many Highlighted groups on the Extension Warehouse home page.
g) Users can filter the extension in the list as per the search results

h) The category, industry and author tags on the extension details page

Here are some steps explained that will describe how the users can use the extensions or tools on their hunt for the perfect extension for the model:

- At first users have to go to the Extension Warehouse, then they have to type the name of an extension or graphic search terms in the Search box and click the Search button. Or, users can go to the Categories or Industries area to click an option; a page of search results will appear.

- If users want to refine the search results more, they need to select one or more filters in the sidebar on the left; the Extension Warehouse will filter the search results after selecting the checkbox. After applying a filter it will appear at the top of the sidebar where users can see quickly before applying other filters to the search results.
- For changing the sorted search results, users can select an option from the drop-down list in the upper right of the search results page. By default, the results will get sorted by application which users can change as per creation date or popularity or alphabetically by title or author.
- Clicking an extension's title will help to open its extension details page and if users can find the right extension and want to install it, they can do it by Adding Extensions to SketchUp option. To browse more, there are two more options left which are: 1) Starting a new search in the Search box and 2) In the sidebar of

statistics on the right, click any category, industry, SketchUp version, operating system or language to see any other search results related to that item.

Source: help.sketchup.com/

CREATING WALKTHROUGHS IN SKETCHUP

SketchUp users should create the walkthroughs in SketchUp models as it will help to move the model continuously even with turns and corners by giving it smooth steps.

About SketchUp: SketchUp or Google SketchUp is mainly a 3D modeling computer program that is used for a broad range of drawing applications used by architects, interior designer, landscape architects, civil and mechanical engineers, film and video game designers also. SketchUp can be getting as a freeware version named SketchUp Make and a paid version with many more extra benefits called SketchUp Pro. SketchUp is software from Trimble Company and there is an online library of free model congregations and 3D Warehouse to which users can add other models; besides that, the program has drawing layout functionality with variable 'styles', supports third-party 'plug-in' programs hosted on the Extension Warehouse to supply other abilities and enables placement of its models in Google Earth.
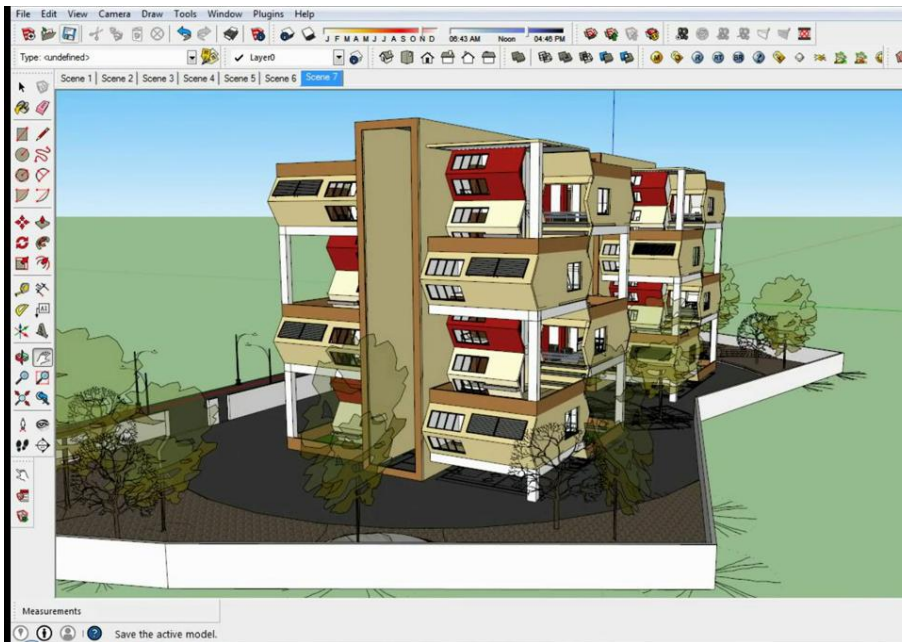
As SketchUp users are most of architects, designers, builders, makers and engineers etc. who works hard to give a nice shape to our physical world, they need great tools to do the work. SketchUp is in mission to bring their best to produce some great tools for drawing as drawing is the key thing of the SketchUp users. They draw to search ideas, to identify the things and to show other people their work that they do with love and love to build; SketchUp understands it truly and trying to improve their software day by day.

Aidan Chopra was a beloved member of the SketchUp team for 10 years; he is the creator of SketchUp Blog where SketchUp members and professionals share their new designs and tells some tips and tricks to design various designs that help users a lot. This Blog has attracted huge number of people and helps them to know more about SketchUp tools and extensions, moreover that users can now easily use SketchUp in their everyday life. Aidan also taught countless classes on SketchUp, he authored the SketchUp for Dummies Book.

Walkthrough is a really great method to use scenes as here users have to pretend as walking or flying through their SketchUp model; just need to set up the scenes continually and here they can add a seamless tour without messing around with the navigation tools. This setup is very easy to use while walking and talking at the same time, so here are some tips about simulating a person walking or flying through the model wit scenes:

- Adjusting the field of view:
- Users can adjust their field of view for interior animations and it follows some steps- at first the camera has to see in a wider "see" area by setting the field of view to 60 degrees. If they want to adjust the exterior view, they just need to try a field of view that is between 30 and 45 degrees.

- Scenes should not be too far apart:
- Adding scenes in the SketchUp model gives the model more lively attractions and it will also make the model more attractive.

- Adding scenes at equal distance intervals:
- It is good to add scenes in an equal distance as SketchUp only allows users to control the scene transition timing for all the scenes in one time.

- Always set the animation settings in the Model info Dialog box:
- The users can set the scenes delay to 0 seconds that will help to continue the animation at every scene and it will gives the audiences time to look around and notice every scene in detail.

- Slide around corners:

While setting up a walk animation, users can have an easy and certain way to turn corners without making it to technical. Generally the trick is to add a scene just short of where the users want to turn like a few feet ahead of the doorway. The reason is to angle the view into the turn slightly and then set the next scene just past the turn, close to the inside and facing the new view; this whole technique makes the model like turning corners naturally.

CURIC SPACE FOR SKETCHUP FUNCTION DESCRIPTION

SketchUp Extension Curic Space is designed to help users to space objects inside the models quickly and users can use this extension for making copies of single objects etc.

This article is about the new SketchUp Plugin, Curic Space is an extension that gives users many options for spacing objects equally within SketchUp.

Curic Space: The simplest function of this extension is to choose multiple different objects, then selecting the axis with which users like the objects to be spaced and users can give any value to adjust the spacing. The entering of space values can be done as long as users don't click out of the tool; they can also space across multiple axes by clicking on a new axis and typing in a value. Besides all of this, this extension also has an object duplication tool that can be activated in two simple steps: at first users need to click on a single instance of an object and then click on the Curic Space icon.
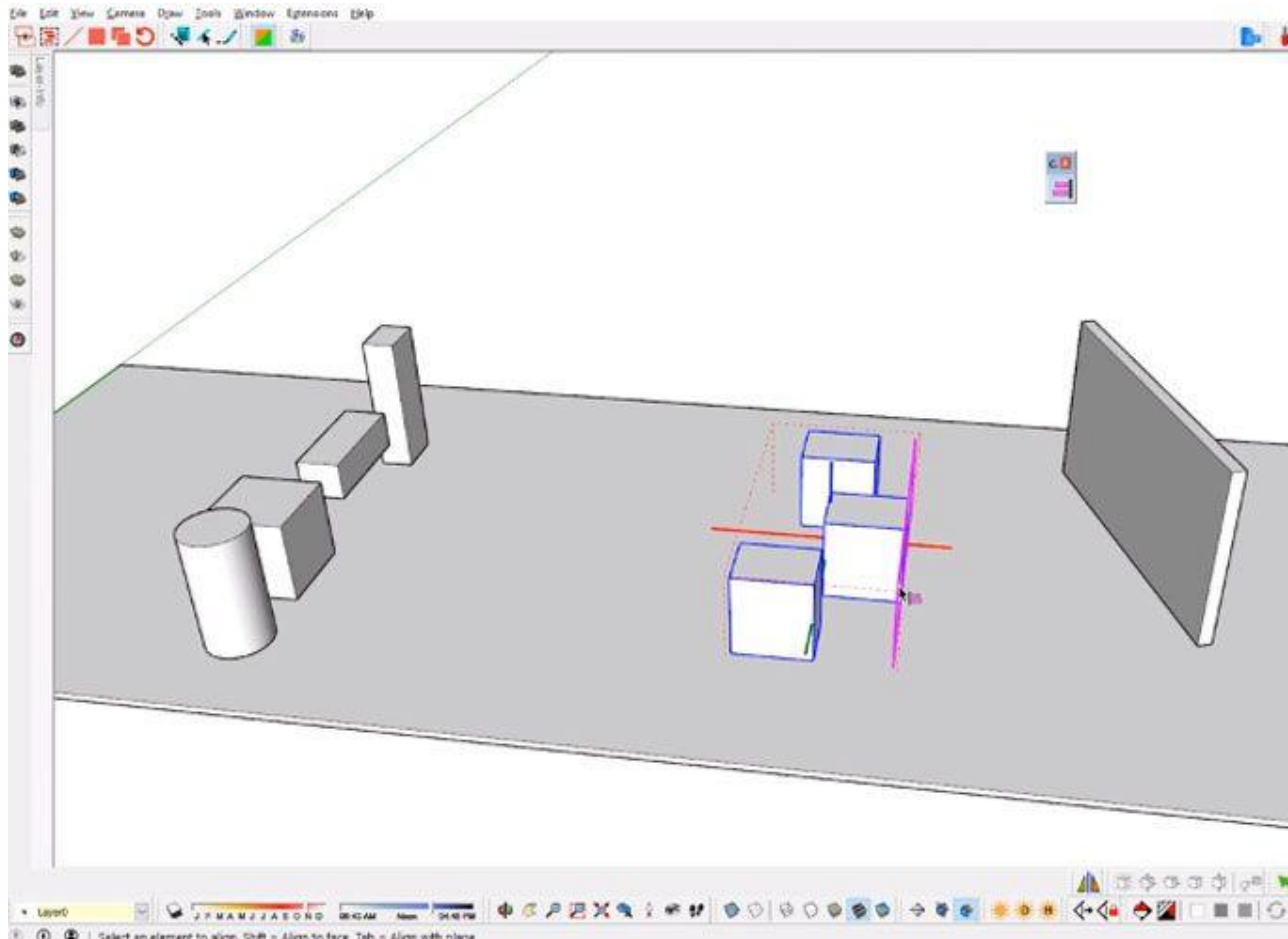
This extension does three things which are:

a) Creating Copies of Single Objects
b) Space objects based on the object centers
c) Space objects based on object origins

Copying objects: Users can create copies of objects with Curic space by selecting a single object and clicking the curic space button. If user selects only one object, the extension will ask the number of copies want to create and after creating the copies, all are inserted at the same point that can only space out by Curic space.

Spacing objects based on centres: The following extension allows users to neglect objects based on object centers where the center is found as pr the selected objects, then space every along a selected direction. Users can type in a numerical value and press the enter key to space every object; also users can enter a different value and press enter key to put different spacings.

Spacing objects based on origin: Curic space also has the option where users can space objects based on the object origin which can be useful while dealing with objects which are not the same width.

Source: www.thesketchupessentials.com

QUICKLY ALIGN OBJECTS IN SKETCHUP WITH CURIC ALIGN

SketchUp Extension is coming up with new plugin every time to grow up the limit of modeling and use of extensions in the model; Curic Align extension is the newest addition.

Justin Geis: Justin Geis is the founder of The SketchUp Essentials and started using SketchUp while he was working as a general contractor in 2008 and after using it he found that SketchUp is extremely powerful that he just started to use it in his personal works also. Then he started The SketchUp Essentials as a place where he could share his ideas of using SketchUp easily through some tutorials and tips to help other users controlling the power of 3D Modeling in everyday lives.

About Extension Warehouse: It is an online resource with various plug-ins developed made especially for SketchUp and these extensions help to add some special tools and features to SketchUp. These extensions can be found for any particular application like drawing or 3D printing and some industry specified tools for architecture, interior design,

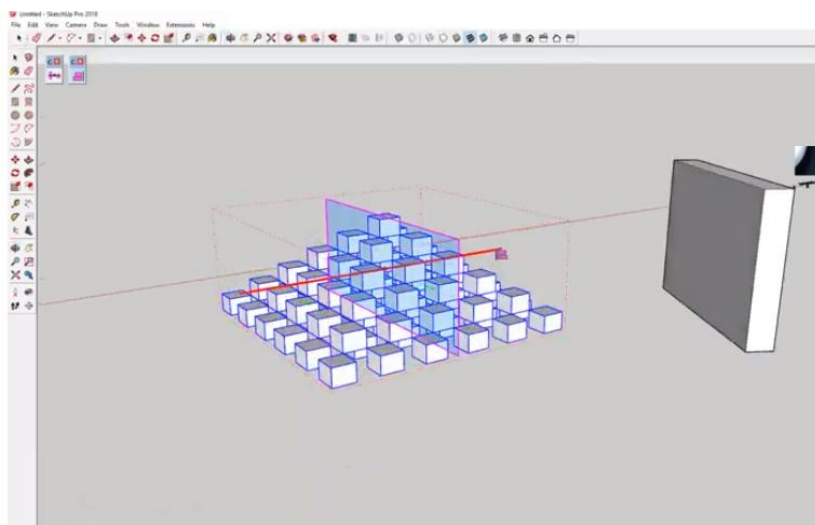construction and many more. So basically in this Extension Warehouse people can do the following things:

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This article is about the new SketchUp Plugin, Curic Align available in the extension warehouse and this plugin is consistent with SketchUp 2016, SketchUp 2017 and SketchUp 2018. This plugin is very useful for Architecture, Construction, Engineering, Interior Design, Landscape Architecture, Urban Planning, Woodworking etc. and many more. This plugin is used to align one or more following elements:

a) Aligning objects with the faces or axes of BoundingBox (Left-Center-Right)
b) Aligning to edge, face, and section plane.
c) Ctlr is defined as Copy.
d) Shift is used to move from one Point to plane.

This tool is designed to help the users to align various objects within SketchUp and this tool is very useful while trying to take multiple objects that are already exists in the model and arrange them well. To use the plugin, users at first need to select a series of objects and activate Curic align after that it will automatically add a bounding box around the objects which can be clicked on to align objects to various lines, axes etc. Users can also align their objects along any of the axes or edges of the bounding box made by the Curic preview view. Besides that, users may also align to a plane and for this they have to tap the tab key at first, after clicking on the tab key Curic align will try to move the objects to make them in line with the plane and also align the objects along lines.

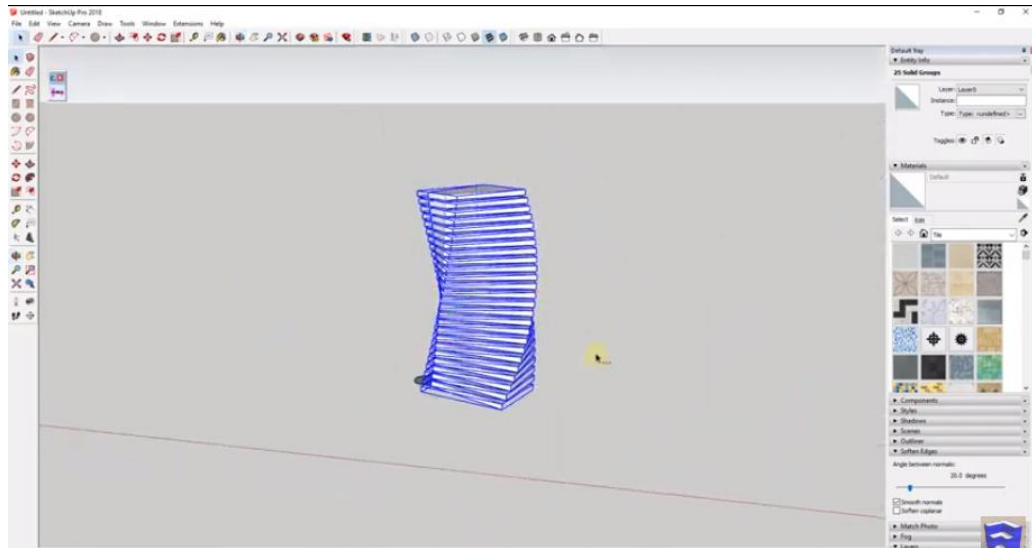**Source:**www.thesketchupessentials.com

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Justin Geis: Justin Geis is the founder of The SketchUp Essentials and started using SketchUp while he was working as a general contractor in 2008 and after using it he found that SketchUp is extremely powerful that he just started to use it in his personal works also. Then he started The SketchUp Essentials as a place where he could share his ideas of using SketchUp easily through some tutorials and tips to help other users controlling the power of 3D Modeling in everyday lives.

Source: www.thesketchupessentials.com

INSTANT FENCE AND RAILING FROM VALI ARCHITECTS IN SKETCHUP

SketchUp models are created using many extensions with their related tools; one is Instant Fence and Railing from Vali Architects that allow users to create quickly fences and railings.

Almost everything can designed in 3D with SketchUp and who have splattered in 3D drawing or are interested to learn the basics of design, SketchUp for Dummies has made it faster and easier to learn the ropes of a powerful, user-friendly tool that bring life into the design ideas. Users can get guidance here from creating a basic 3D model to showcase their work through 3D print or animation, literally everything in SketchUp that can help in anywhere like from redesigning the house to mocking up the future great invention. More than that, SketchUp's vast usability has gotten very wide success as a tool that even non-designers can also make basic drawings; there are also many expert tips from former SketchUp product director Aidan Chopra and co-author Rebecca Huehls that help to draw and access SketchUp.

This article is going to focus on a new tool from Chuck Vali's extensions named Instant Fence and Rail used to draw some easy fences and rails in SketchUp models.

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Instant Fence and Rail Functions: This extension is one of the extensions of Chuck Vali extensions that help users to create many different kinds of fences and railings in SketchUp including wood and metal fences, stair rails, handrails and many more. This extension has a wide library of nearly 300 preset styles to choose from; this extension

works in a very natural way- at first a grouped path is selected, the extension is activated and then it will create a fence based on a selected style. This extension also follows the straight and curved paths and also allows selecting the direction of facing; besides that it will drop the fences along a face and draw a straight line between points on the sandbox fence automatically. This extension also co-up well with other Chuck Vali's extensions like instant fair to create very different kinds of railings; users can also set parameters of the different made fencing pieces everything from while getting dropped on terrain.

Source:www.thesketchupessentials.com

SKETCHUP FOR WEB – FREE VS SHOP

SketchUp for Web is a free version of SketchUp paid version, also almost everything about SketchUp Pro is created into the SketchUp Web as it is easier and free to use.

About SketchUp: SketchUp or Google SketchUp is mainly a3D modeling computer program that is used for a broad range of drawing applications used by architects, interior designer, landscape architects, civil and mechanical engineers, film and video game designers also. SketchUp can be getting as a freeware version named SketchUp Make and a paid version with many more extra benefits called SketchUp Pro. SketchUp is software from Trimble Company and there is an online library of free model congregations and 3D Warehouse to which users can add other models; besides that, the program has drawing layout functionality with variable 'styles', supports third-party 'plug-in' programs hosted on the Extension Warehouse to supply other abilities and enables placement of its models in Google Earth. As SketchUp users are most of architects, designers, builders, makers and engineers etc. who works hard to give a nice shape to our physical world, they need great tools to do the work.

SketchUp for Web: It is a free version of SketchUp which works in a web browser and there is a simple interface where the users can simply draw and make 3D models. The aim of the team is to help the users to create anything they imagine in 3D and this new free version of SketchUp make the 3D modeling more convenient and easier to try than ever before. As SketchUp for Web works in a browser there is a few advantages over the desktop version of SketchUp described below:

- **Access via a broad range of devices:** Hardware matters here as mentioned in the Hardware requirements but the users are not bounded by operating system needs.
- **Versionless:** It is browser-based software so it doesn't need to update after a certain time and this will always work on the latest version.
- **Storage and backups:** The created 3D models are saved to the web by default and users will get 10MB of free storage; it also can work with Trimble Connect to keep the work up to date across desktop, web, mobile and XR software.

The users, who are familiar working with the desktop version of SketchUp, can find similar tools in SketchUp for Web but as it runs in a browser, some things about SketchUp for Web will work differently from the desktop version. Like Creating and Editing Models in SketchUp for Web have the features and points users to helpful articles in the SketchUp area of the Help Center.

Here we described both the features about SketchUp and SketchUp for Web, so here is a quick description about all the features of this both versions:
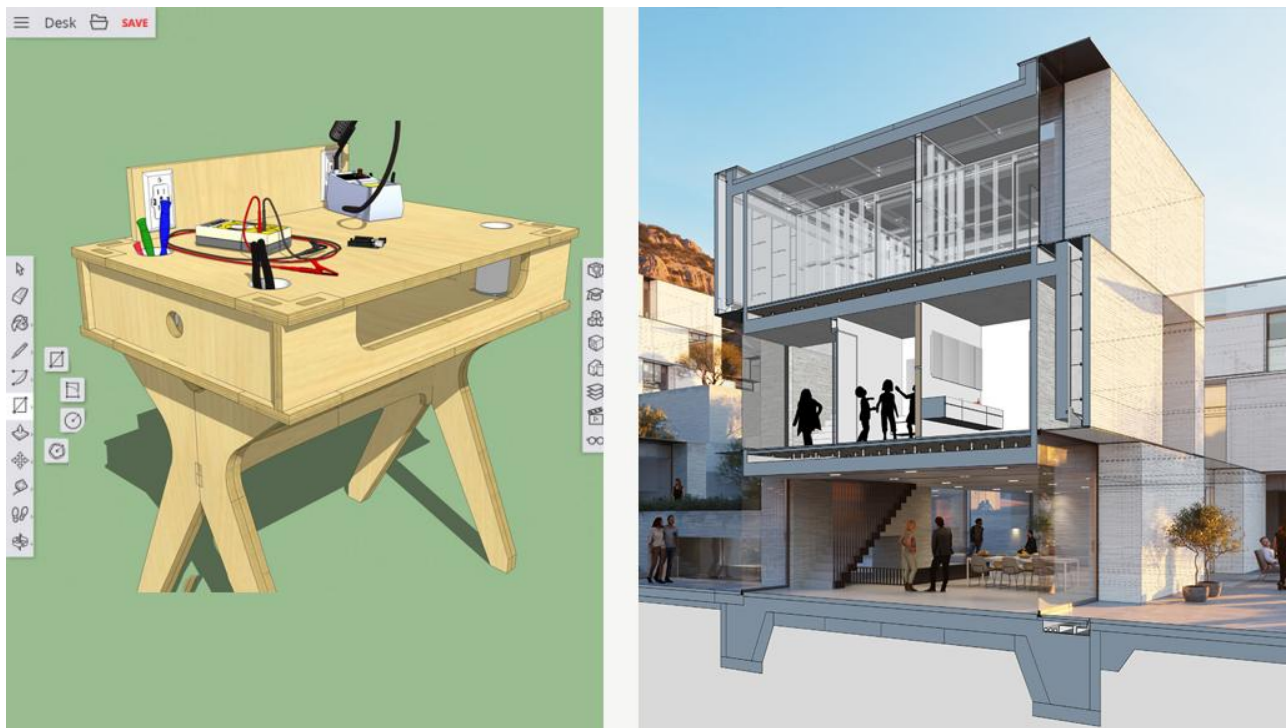
SketchUp Shop features:

- Import Formats: stl, dwg, dxf, dae, kmz, 3ds, dem, ddf
- Export Formats: stl, dwg, dxf, dae, kmz, 3ds, wrl, fbx, xsi, obj
- There are options like Advanced Solid Tools, Outliner, Create Custom Materials, Create Custom Styles in it
- Users can store their models in the Unlimited Storage via Trimble Connect, Business
- Online Collaboration can be done by Unlimited Users and Projects via Trimble Connect, Business

SketchUp for Web features:

1. Import Formats: stl
2. Export Formats: stl
3. There is no option like Advanced Solid Tools, Outliner, Create Custom Materials, Create Custom Styles in it
4. There is 10GB Online Storage facility via Trimble Connect, Personal to save the 3D models

5. For online collaboration, only 5 users can connect for 1 project at a time via Trimble Connect, Personal

Source:www.help.sketchup.com

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SURFACE IMPERFECTION MAPS IN VRAY TO CREATE REALISTIC MATERIALS IN SKETCHUP

</div>

This article is about the using method of surface imperfection maps to add realism on the rendered materials within VRay for SketchUp which Justin Geis has shown through a tutorial video. Here are some details about this Surface Imperfection and its use in SketchUp.

Surface Imperfection maps are very high quality textures which are scanned from real surfaces. These maps are not like traditional scatter textures but are scans of the delicate imperfections that are shared by most materials. The resulting grayscale maps can be used as glossiness, bump, anisotropy and reflective maps for adding those imperfections back into any 3D material.

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This time Justin Geis has used maps from the website called Poliigon.com; the textures in this tutorial are all free textures which can be used in the renderings; Poliigon also has a paid option with access for many materials. One of the other map types has Poliigon is the surface imperfection map which is designed to apply with the other materials from poliigon to use them. In real life, materials are rarely perfect as in the renderings so in maps they can be used to add a little realistic feel to the renders. Justin has downloaded and used the free Smudged Large texture; he also created a material for the texture and applied surface imperfection map to the opacity section under color correction. This option allowed them to drive the opacity of the material as it is basically see-through material except for the Smudged areas. The power of the brightness can be adjusted later to change the power of effect; next they created a 3D material and the type of this one allows to blend multiple materials together. While creating a 3D material blend there will be an option to add a base material to create a wonderful texture.

Source:www.thesketchupessentials.com