



# SketchUp

FOR SCHOOLS

Lesson Plan:

MIKE'S MALT SHOP

Advanced lesson • Time to complete: 2-3 hours



Learn the ins-and-outs of modeling in SketchUp for Schools as you build Mike's Malt Shop.

# outline

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## Before you start...

In this lesson, we assume you already know where most of the tools are, and know how to [navigate](#) comfortably in your model.

We'll be much lighter with directions, so [visit the previous tutorials](#) if you need help finding tools. Strap in, we'll be modeling fast!

# Learning Objectives

In this lesson, students will learn how to use the following SketchUp tools:



pan



orbit



zoom



rectangle



push/pull



offset



tape measure



move



select



2 point arc



rotate



scale



paint



eraser



circle

At the completion of this lesson, students should feel comfortable with the following on their own:



Creating cubes, cylinders, and gable roofs



Additive and subtractive modeling



Modeling to scale



Working with groups and components

# K-12 Standards

## ISTE | standards for Educators

### 1 Learner

Educators continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning.

[This lesson fulfills 1a, 1b](#)

### 4 Collaborator

Educators dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems.

[This lesson fulfills 4b, 4c](#)

### 6 Facilitator

Educators facilitate learning with technology to support student achievement of the ISTE Standards for Students.

[This lesson fulfills 6a, 6b, 6c, 6d](#)

## Common Core Standards

### Geometry

>> Apply geometric concepts in modeling situations

- o [CCSS.MATH.CONTENT.HSG.MG.A.1](#)

# Intro to SketchUp for Schools

5 minutes

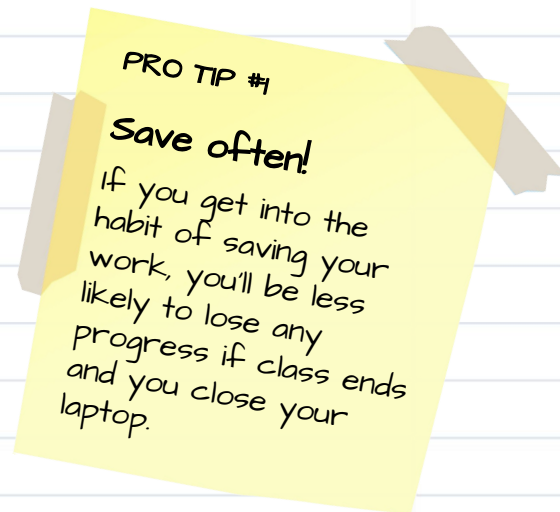
Before we get started, let's go through some of the basics together.

## Getting Access

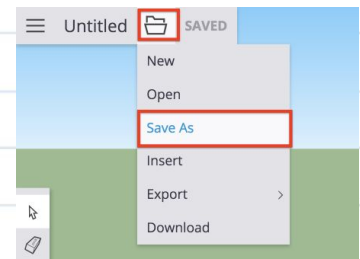
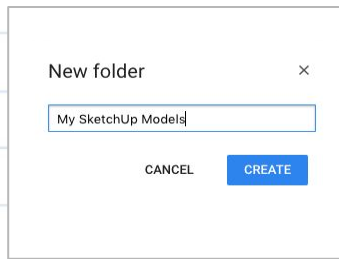
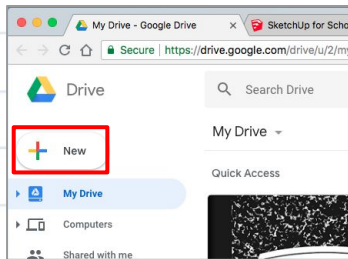
- 1 Go to <https://edusketchup.com/app>
- 2 Sign in with the Google or Microsoft email address provided by your school.

Note: If you have trouble logging in, check with your administrator that your school or district has installed SketchUp for Schools

(Instructions for [Google](#) & [Microsoft](#) Admins)



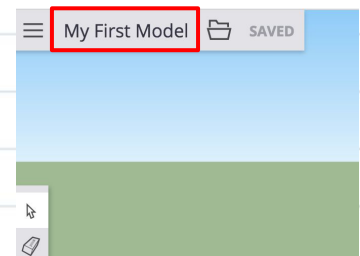
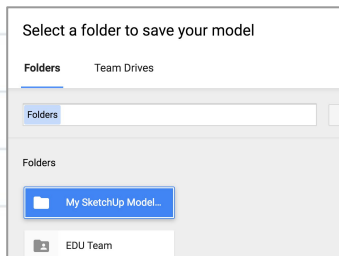
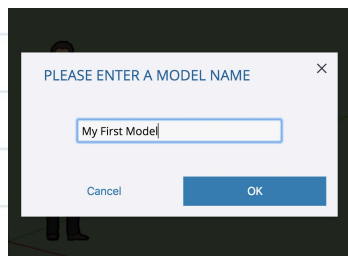
## Saving Files



**A** Before you build your first model, go to your [Google Drive](#) or [Microsoft OneDrive](#) and create a new folder.

**B** Give your folder a name.

**C** Whenever you start a new model, it's a good idea to save your file first. Click on the folder icon on the top left, then click 'Save As.'



**D** Give your model a name, then press 'OK.'

**E** Next, you'll be asked to save your model to a folder in your Google Drive or Microsoft OneDrive. Click on the folder you just created, then click 'Select.'

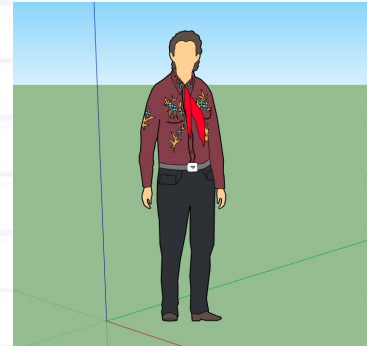
**F** If you've done everything correctly, you'll see your file name in the top left corner along with a 'Saved' message.

## The Scale Figure

Every time you open a new model in SketchUp for Schools, you will see [Temple Grandin's](#) scale figure.

Temple's job is to give us a sense of the size of the objects we draw in our model.

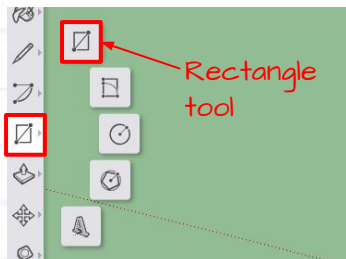
For example, Temple is 5'9". If we draw a 3 foot cube next to her, the cube will be about half her height.



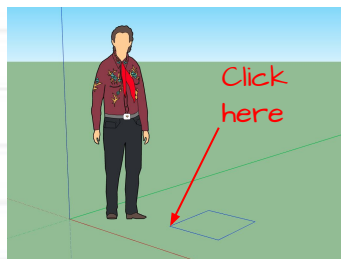
**PRO TIP # 2**  
 Unless otherwise specified, a click in SketchUp is executed as "click and release."

## Drawing a Cube

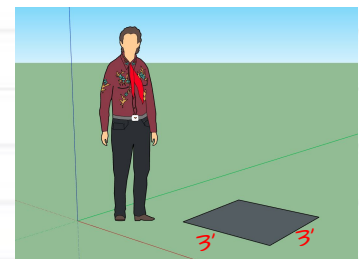
Let's test it: let's draw a 3 foot cube next to Temple.



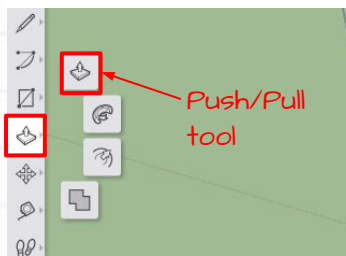
**A** Select the rectangle tool from the menu on the left.



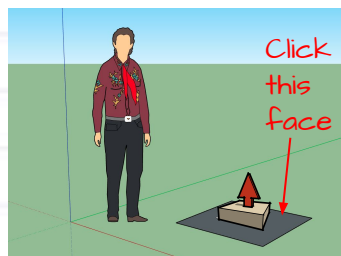
**B** Click once on the ground near Temple's feet to set one corner of your cube.



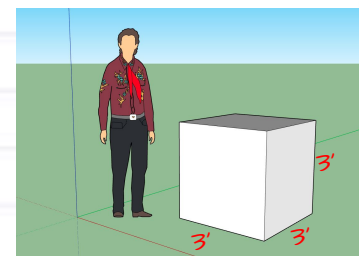
**C** Without clicking again, move your mouse anywhere on the screen, then type "3', 3'", then hit 'enter'.



**D** Select the push/pull tool from the menu on the left.

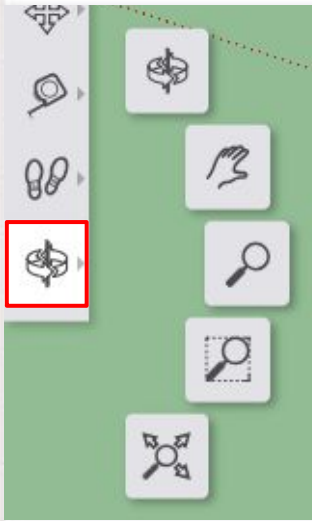
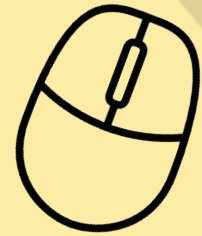


**E** Click once on the face you just drew. Without clicking again, move your mouse to make your cube 3D.



**F** Type "3'", then hit 'enter' to complete your cube.

**PRO TIP #3**  
 We recommend using a mouse with a scroll wheel when modeling in SketchUp. Using a trackpad is totally possible, but not as fun.



## Navigation Tools

One of the most important things to learn in 3D modeling is how to move around in your model window. Click the orbit tool from the menu on the left to expand all the navigation tools.



orbit

The Orbit tool allows you to rotate around your model.

Click on the Orbit tool, then left click-hold-drag your mouse from side to side in the model window.

**Mouse shortcut:** hold down the scroll wheel to activate the Orbit tool, then move your mouse in any direction to orbit.



pan

The Pan tool allows you to move your model across your screen.

Click on the Pan tool, then left click-hold-drag your mouse from side to side in the model window.

**Mouse shortcut:** hold down the scroll wheel, then hold down the shift key at the same time. Move your mouse in any direction to pan.



zoom

The Zoom tool allows you to look closer at the details in your model.

Click on the Zoom tool, then left click-hold-drag your mouse up and down in the model window.

**Mouse shortcut:** use the scroll wheel to zoom in and out.



zoom window

The Zoom Window tool allows you to select an area of your model to view closer. Click on the Zoom Window tool, then left click-hold-drag your mouse to highlight an area of your model.



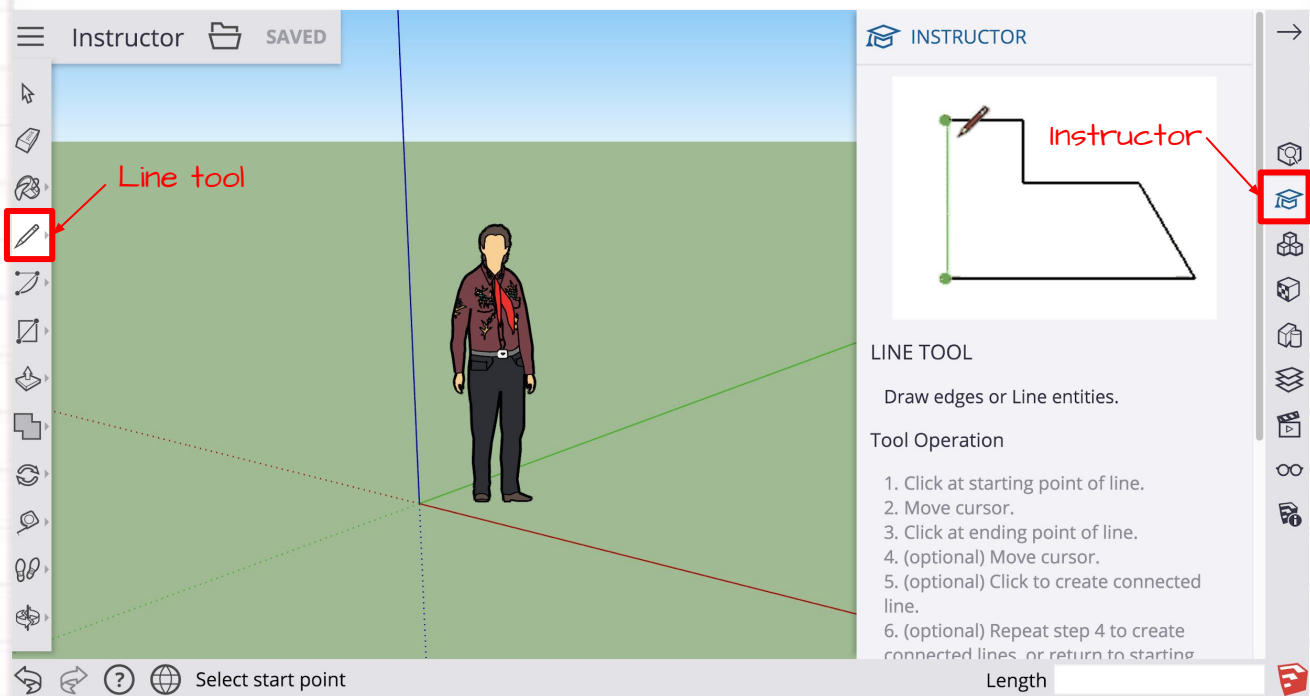
zoom extents

The Zoom Extents tool allows you to see all the geometry in your model. Click on the Zoom Extents tool and everything in your model will come into view.

## The Instructor Panel

Open the 'Instructor' from the SketchUp panels for help with understanding how to use any of SketchUp's tools.

The way it works: click on a tool with the instructor panel open and you will see a description of the tool and a step-by-step guide on how to use it.



★ That's it for the intro.  
You're ready to get started on modeling!



# step-by-step tutorial: Mike's Malt Shop

## Pre-flight checklist

- You're logged in at [edu.sketchup.com/app](https://edu.sketchup.com/app) with the Google account provided by your school.
- You've [setup at least one folder in Google Drive](#) for your SketchUp models
- You are super excited about making your own Malt Shop!



Here's a breakdown of the steps required to complete this lesson plan:

1. [Drawing the structure](#)
2. [Adding the front door and windows](#)
3. [Making the awnings](#)
4. [Adding materials](#)
5. [Adding a drive-thru window, pediment, and details](#)
6. [Customize your shop: materials & the 3D Warehouse](#)

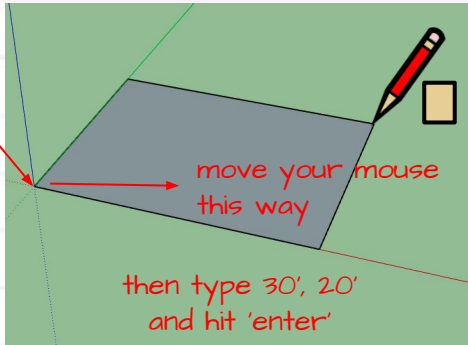
# 1 Drawing the structure

## PRO TIP #4

When you type in measurements, they will appear in the bottom right-hand corner of your screen in the 'Dimensions' box. No need to click into the box to type though -- simply type anywhere on the screen!

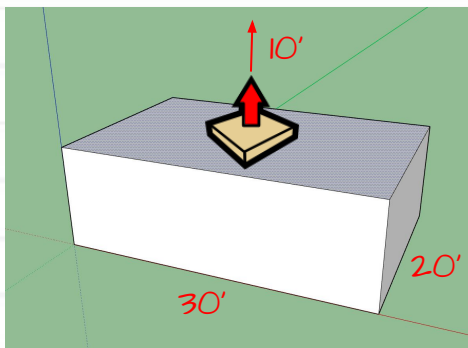
Dimensions 8',6"

first click here



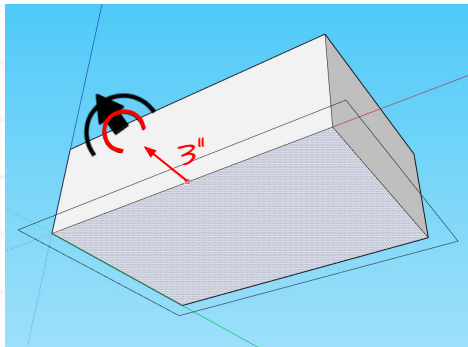
**A** First things first: save your file!

Now we can start drawing your Malt Shop! Select the rectangle tool from the menu on the left, then draw a 30' x 20' rectangle starting at the origin.



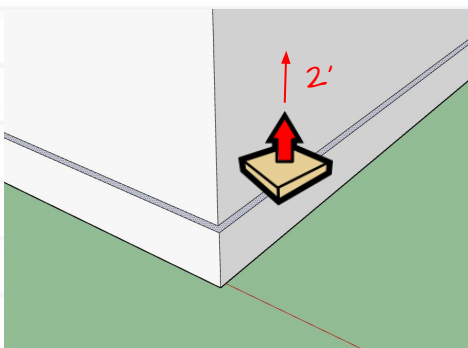
**B** Next, let's extrude the rectangle to the height of the Malt Shop's walls.

Select the push/pull tool from the menu on the left. "Pull" your rectangle up 10' to set the height of your walls.

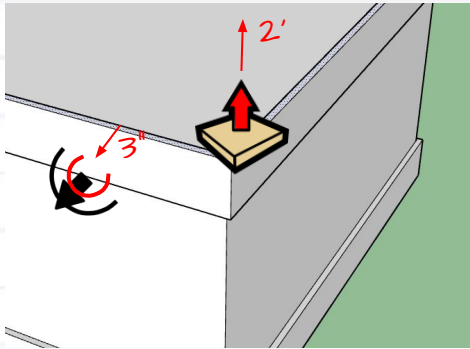


**C** Now let's add some trim.

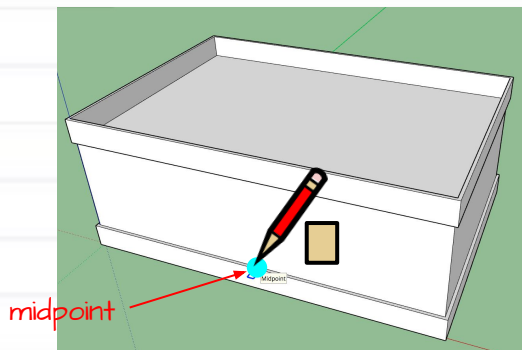
Navigate to the bottom of your model, then select the offset tool from the menu on the left. Click once on the bottom surface to start the offset. Move your mouse outside of the surface and type 3", then enter, to complete the offset.



**D** Orbit back to a top view of your model. Select the push/pull tool again and "pull" the trim up 2'.

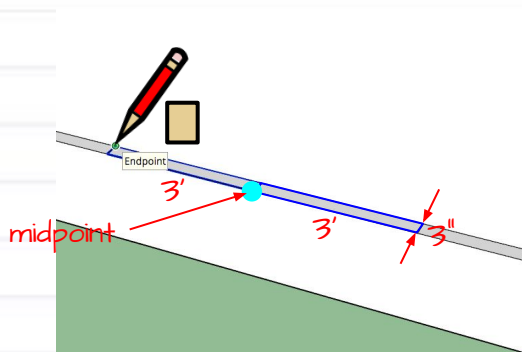


**E** Repeat steps C & D -- this time at the top of your model.

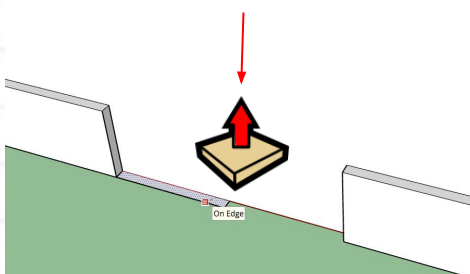


**F** Now, let's draw an opening in the trim for the front door.

Orbit to a front view, then select the rectangle tool. Find the midpoint of the base trim (represented by a cyan dot) and click once to start a rectangle.

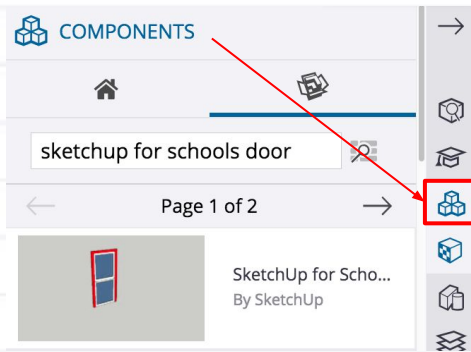


**G** Create a 3' x 3" rectangle on the top surface of the trim. Repeat on the opposite side of the midpoint.

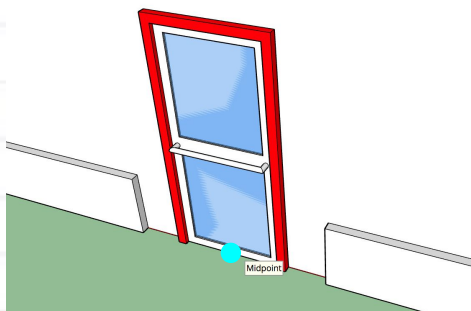


**H** Select the push/pull tool and "push" the rectangles down to the bottom surface of your model, creating an opening in the trim.

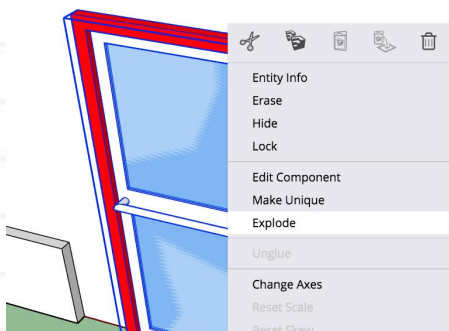
## 2 Adding the front door and windows



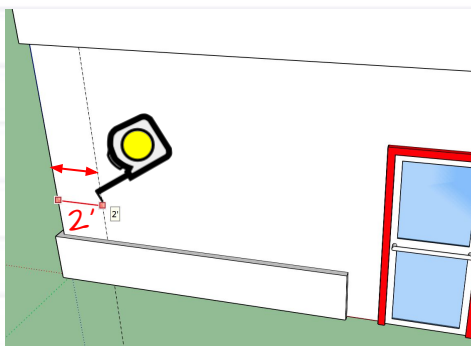
**A** Click the 'Components' panel on the right, then type "Door - SketchUp for Schools" in the search field.



**B** Click on the door made by SketchUp, then click on the midpoint of the opening you created to place the door.

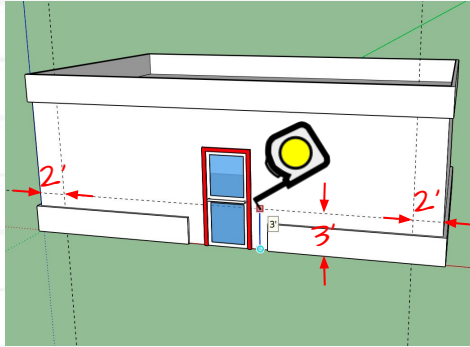


**C** When you first place the door, it will be sitting on top of the wall surface. You will want to cut a door-sized hole in the wall. You can either 1) draw a rectangle where the door intersects the wall, then delete the inner surface, OR 2) right-click on the door component and select "Explode" to automatically delete the surface

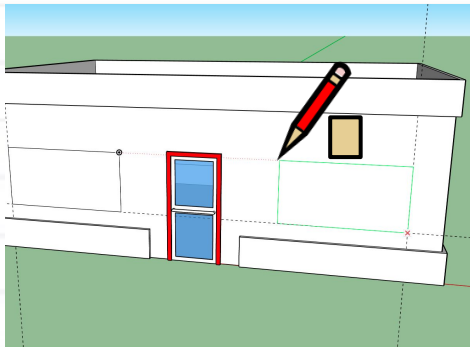


**D** Let's move onto the windows. We'll start by adding guides to the model to help you draw your windows in specific locations.

Select the tape measure tool from the menu on the left. Click on the left corner of the building, move your mouse to the right, then type 2', and hit enter.

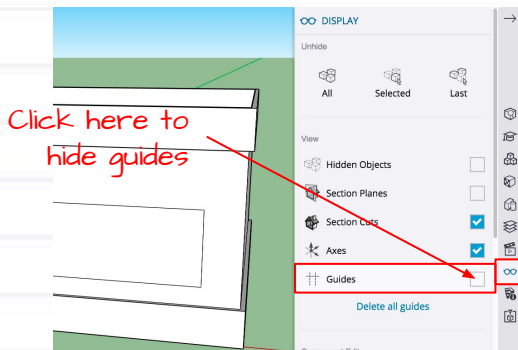


**E** Create two more guides on the front facade: one spaced 2' from the right side of your building, and the other 3' from the bottom of the building

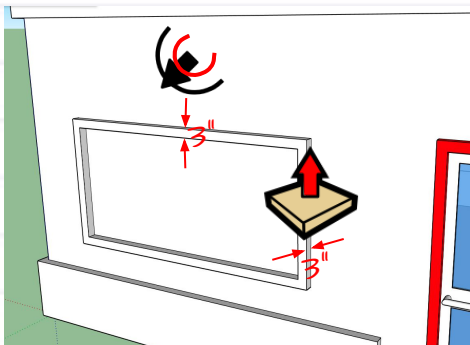


**F** With your guides in place, you can start drawing the windows.

Select the rectangle tool, then create two 8' x 4' rectangles on the front face of your model. Use the intersection of your guides as the starting point.



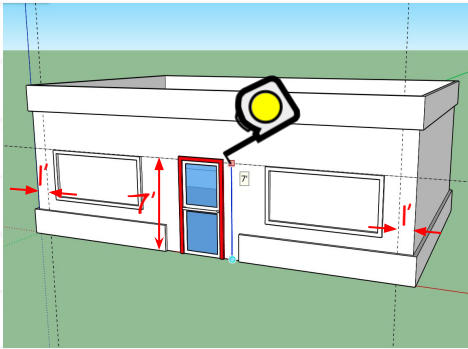
**G** You will no longer need the guides you just created. You can either delete them from your model using the erase tool, or, if you want to keep the guides in your model, you can hide them in the Display panel on the right.



**H** Complete your windows by giving them a trim. Select the offset tool to create a 3" thick trim (the offset should go inside the original rectangle). Using the push/pull tool, pull the trim out 3" from the building face. Repeat for the other window.

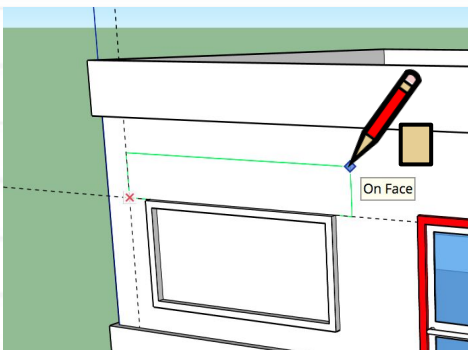
We will make the window transparent when we apply materials later on in this lesson plan.

### 3 Making the Awnings

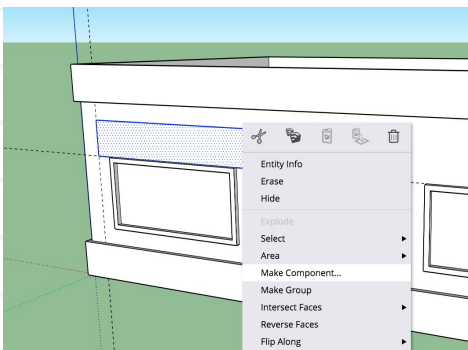


**A** You will need to create a few more guides before you start drawing your awnings. Remember to unhide your guides in the Display panel if you hid them earlier.

Draw three guides on the front of your building: one 7' from the bottom, and another two 1' from the left and right side of the building.

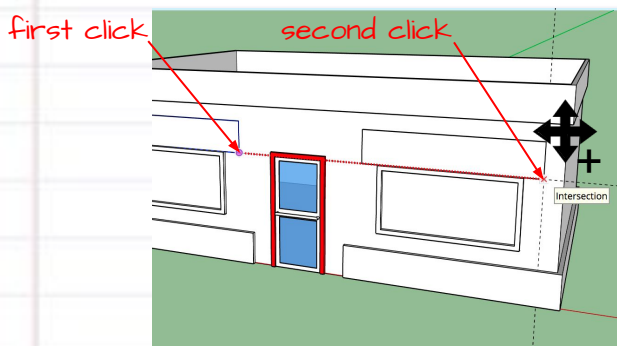


**B** Select the rectangle tool, then create a 10' x 2' rectangle on the front face of your model. Use the intersection of your guides on the left as the starting point.



**C** Double click inside the rectangle to select the surface and all of its bounding edges, then right-click and make it a component.

Click "Glue to: Horizontal" in the components dialog box, then click "Ok."

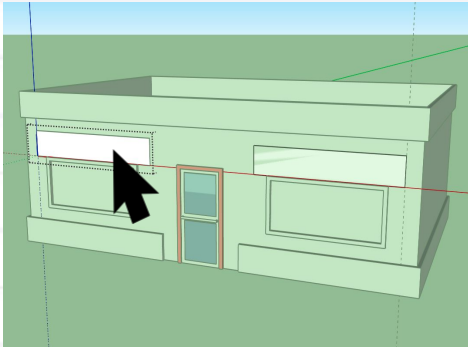


**D** Select the move tool from the menu on the left, then click the bottom-right corner of your awning component. Tap option (Mac/ Chromebook) or ctrl (PC) to activate the copy tool (the + symbol indicates you are in copy mode), then "paste" a copy of the component where the guides intersect on the right.



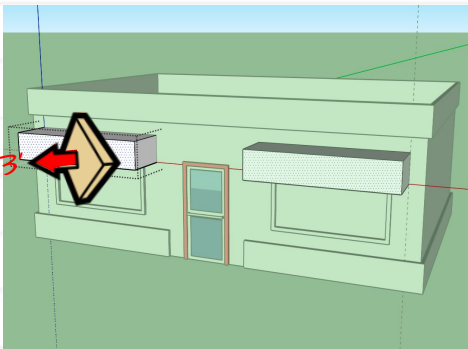
## Components

Components are one way to organize geometry in SketchUp. Components are special because you can make copies of your geometry, and then edit all the copies simultaneously. Components save a ton of time in models with lots of repeating elements.

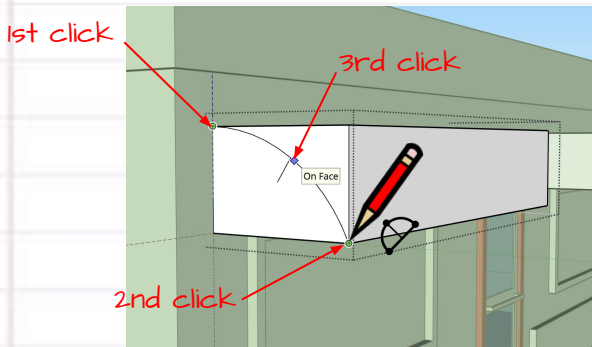


**E** Next, you'll experience the magic of components.

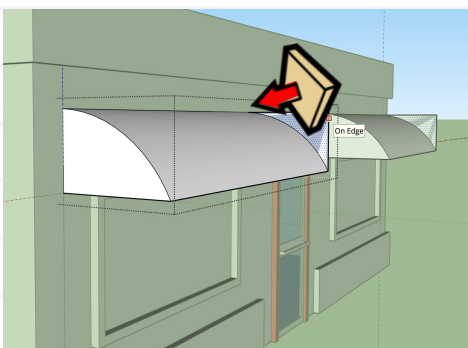
Click the select tool, then double-click on one of the awnings to enter into the component's edit mode.



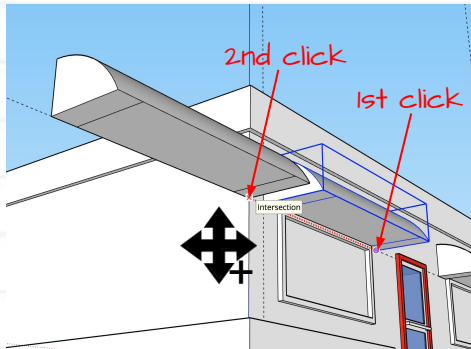
**F** Select the push/pull tool and pull your awning 3' from the face of your building. Notice how the other awning is also extruded! When working with components, you only have to edit one component to see your changes reflect across all components.



**G** Next, select the two point arc tool from the menu on the left. The first click will set the start of your arc, the second click will set the end of your arc, and the third click will set the arc radius. Make sure that when you set the radius, your entire arc is inside the bounds of the rectangle you are drawing on.

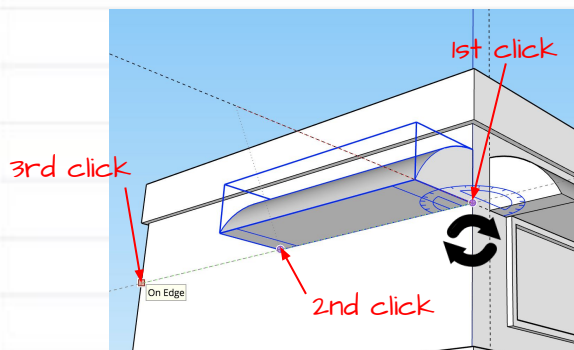


**H** Select the push/pull tool and push the geometry above the arc until you reach the opposite side of the awning. The excess geometry will disappear, and the remaining geometry will be awning-shaped. Good job!



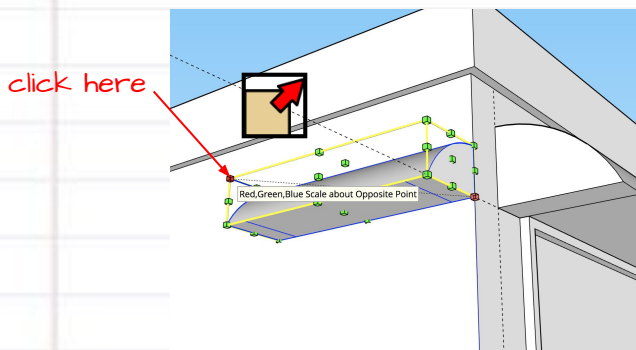
I Let's add one more awning to the side of the building. Exit out of the component's edit mode by clicking anywhere outside of its bounding box.

Like in [step D](#), select the move tool, then activate copy mode. Select the awning to the left of the door and copy it another 11' to the left, along the red axis.

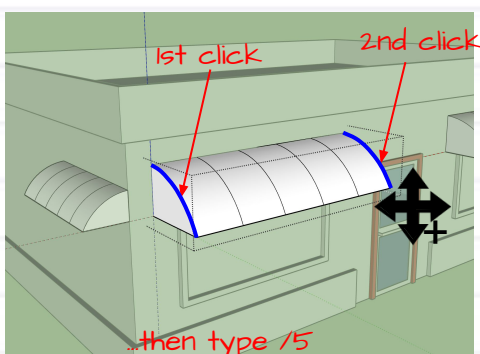


J Select the rotate tool from the menu on the left, then tap the up (↑) arrow key to lock rotation around the blue (z) axis.

The first click will set the pivot point, the second click will grab the opposite edge of the awning, and the third click will align the awning edge to the left-side face of the building.



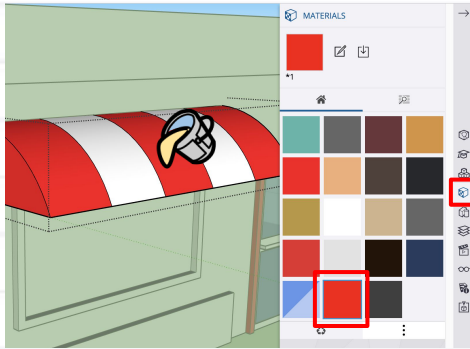
K Now select the awning, then select the scale tool from the menu on the left. Click on the green corner grip referenced in the image, then type ".6" to scale it 60%.



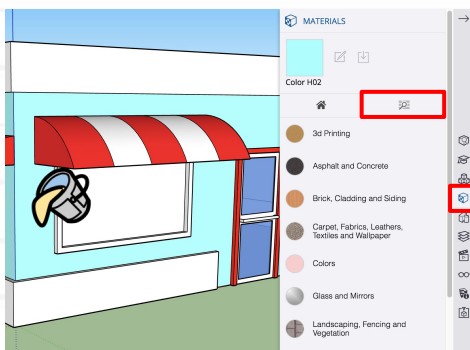
L Last drawing step for the awnings: let's draw stripes to add visual appeal! Double-click on any of the awnings to enter the component's edit mode. With copy mode activated, select one of the arc edges and paste it on the opposite side. Then type "/5" to create 5 equal subdivisions on your awning. We'll apply color in the next section.



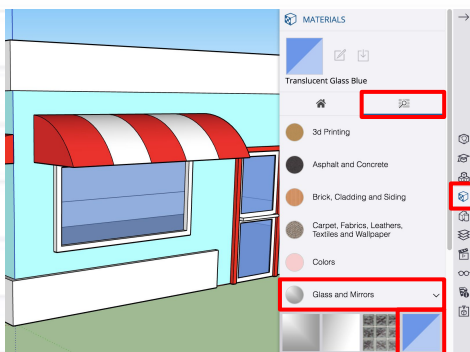
## 4 Adding materials



**A** Since we were just working on the awnings, let's start there with materials. Make sure you are in the awning component's edit mode, then select the paint tool from the menu on the left. The materials panel will automatically open on the right -- select a color and click on the surfaces you want to "paint."



**B** Exit out of the awning component (again, by clicking anywhere outside of its bounding box), then select another color or material for the walls. Get creative with all the options from SketchUp's material library. Remember to orbit around your model to get the back sides of your building, too.

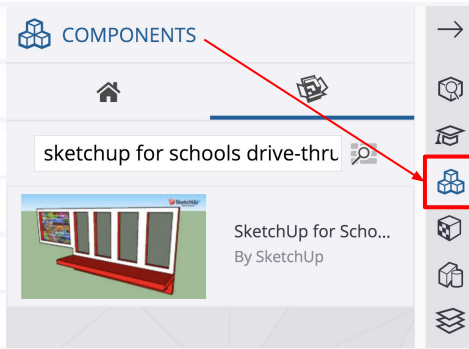


**C** Paint your windows and any other part of your model that you'd like materialized!

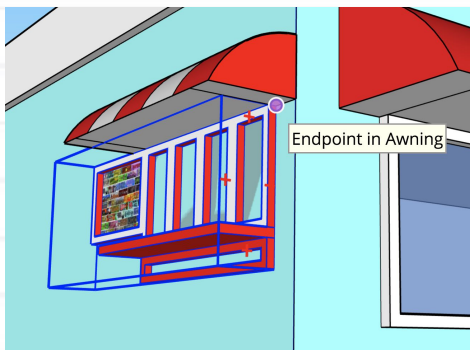
We will continue modeling in the next section, so we'll come back to adding more materials at the end of this lesson.

★ Keep going! This lesson continues →

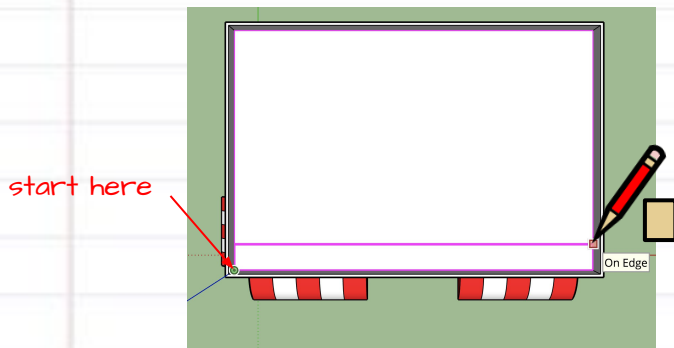
## 5 Adding a drive-thru window, pediment, and details



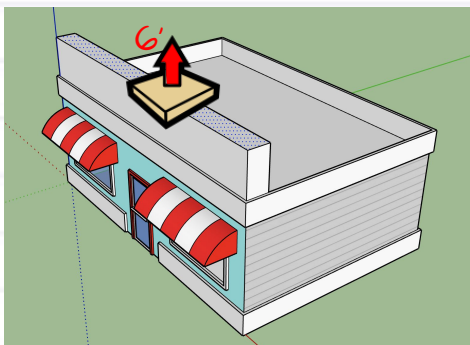
**A** Click the 'Components' panel on the right, then type "Drive-thru window - Sketchup for Schools" in the search field.



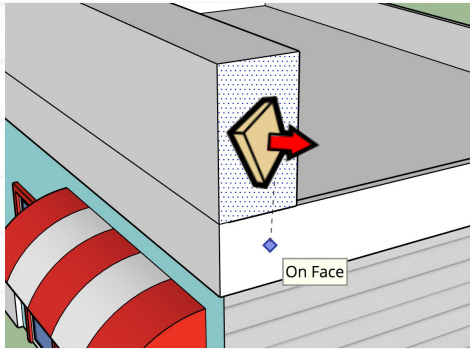
**B** Click on the window made by SketchUp, then place it under the small awning on the side of your building.



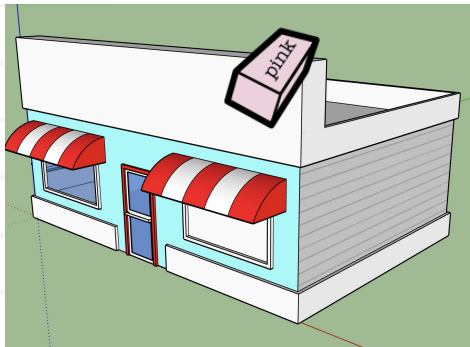
**C** Next, orbit to the top of your building where you will draw a pediment. Select the rectangle tool and draw a 30' x 2' rectangle on the roof, starting from the corner referenced in the image.



**D** Select the push/pull tool and pull the rectangle up 6'.



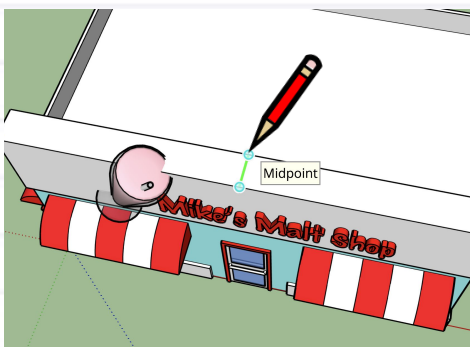
**E** Continue using the push/pull tool to pull the pediment faces until they match the depth of the trim.



**F** Select the eraser tool from the menu on the left. Clean up your model by erasing the lines between the pediment and the original roof line. This is called healing the surface in SketchUp.

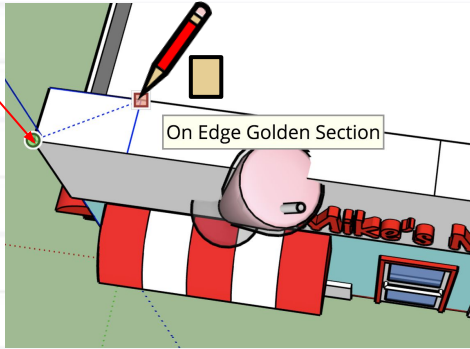


**G** Next, we'll add the malt shop sign to the pediment. Click the 'Components' panel on the right, then type "Malt shop sign - SketchUp for Schools" in the search field. Place the sign right in the middle of the pediment.



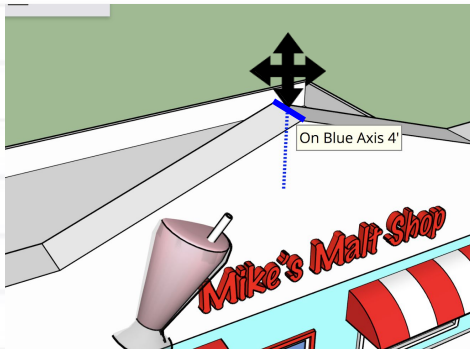
**H** Now let's make the pediment look more like, well, a pediment! Orbit to the top of your model, then select the line tool. Draw a line down the middle of the top surface.

start here

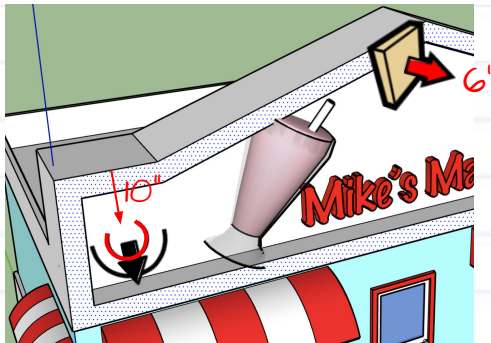


- I Select the rectangle tool, then draw a rectangle starting from the corner referenced in the image. Click again to set your rectangle when you see "On Edge Golden Section."

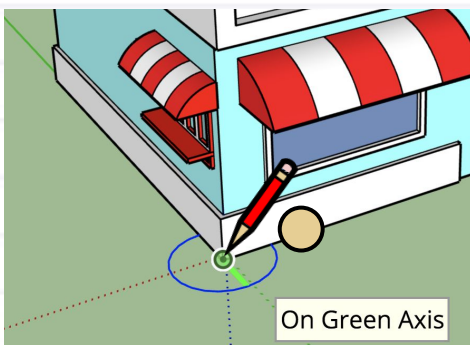
Repeat on the opposite side.



- J Select the move tool, then select the line you created in step H. Tap the up (↑) arrow key to lock translation to the blue (Z) axis, then move the line up 4'.

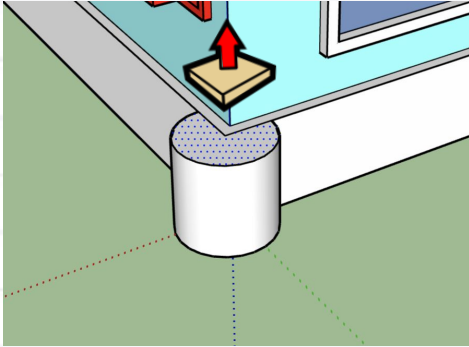


- K Select the offset tool and create a 10" trim inside the pediment. Then select the push/pull tool and pull the trim out 6".

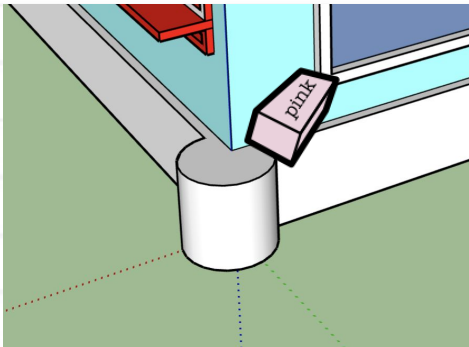


- L The last thing you'll draw on your model are the exterior details on the trim!

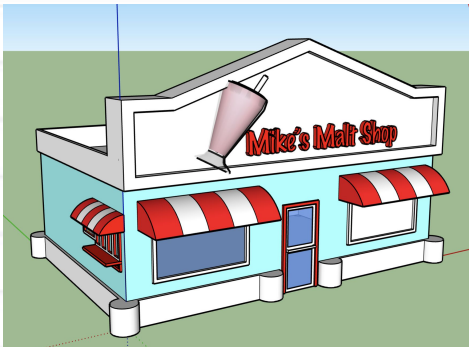
Select the circle tool from the menu on the left. Click on any of the bottom corners of your building, then tap the up (↑) arrow key to lock the circle to the blue (Z) plane. Type in 1' to define the circle's radius, then hit enter.



**M** Select the push/pull tool and match the height of the circle to the height of the base trim.



**N** Erase the lines separating the trim and the cylinder so that you have one surface instead of two.



**O** Repeat steps L, M, & N on all corners of the building and on either side of the entrance where the trim stops. When you're done, you'll have a total of six cylinders around your malt shop.

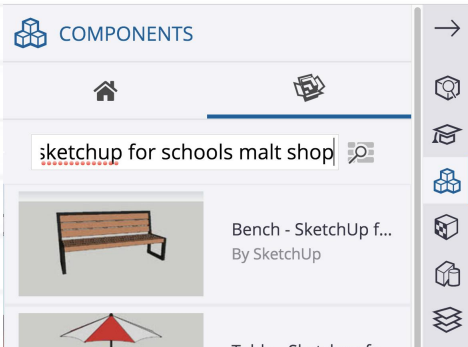
☆ Keep going! This lesson continues →

## 6 Customize your shop: materials & the 3D Warehouse



- A** Select the paint bucket tool and add materials to the rest of your model: the trim, windows, and pediment.

In the image, the trim is colored with 'Polished Concrete' from the Asphalt & Concrete section in SketchUp's material library. Feel free to give your model your own unique color scheme.



- B** Your malt shop is almost complete! Let's jazz it up with more models from SketchUp's 3D Warehouse.

Click the 'Components' panel on the right. Then, type "sketchup for Schools Malt Shop" in the search window.



- C** Click on any of the models uploaded by SketchUp, then click inside your model to place them.

★ That's it, you're done! Have fun with your new SketchUp skills and look out for more tutorials from SketchUp.



Make your malt shop your own by adding unique colors and more models from SketchUp's 3D Warehouse!