$$\frac{\frac{\sigma A(T_1^4 - T_2^4)}{\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1}}{A} = \frac{\sigma(T_1^4 - T_2^4)}{\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1} = \frac{(5.67 \times 10^{-8})(800^4 - 500^4)}{\frac{1}{0.1} + \frac{1}{0.1} - 1} = 1035.82 \ w/m^2$$

1% of the $\dot{q}_{net\,1-2}$: $\dot{q}''_{net\,1-2} = \dot{q}_{net\,1-2,\,n\,shields} = \frac{1}{100} \times \dot{q}_{net\,1-2}$

$\dot{q}_{net\,1-2,\,n\,shields} = \frac{\dot{Q}_{net\,1-2,\,n\,shields}}{A} =$

$$\frac{\sigma A(T_1^4 - T_2^4)}{\left(\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1\right) + \left(\frac{1}{\epsilon_{3,1}} + \frac{1}{\epsilon_{3,2}} - 1\right)\left(\frac{1}{\epsilon_{n,1}} + \frac{1}{\epsilon_{n,2}} - 1\right)} \Big/ A =$$

$$\frac{\sigma(T_1^4 - T_2^4)}{\left(\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1\right) + \left(\frac{1}{\epsilon_{3.1}} + \frac{1}{\epsilon_{3.2}} - 1\right)\left(\frac{1}{\epsilon_{n,1}} + \frac{1}{\epsilon_{n,2}} - 1\right)} =$$

$\epsilon_1 = \epsilon_2 = \epsilon_3 = \cdots = \epsilon_n = 0.1 \longrightarrow \boxed{\epsilon = 0.1}$

$$\longrightarrow \dot{q}_{net\,1-2,n\,shields} = \frac{\sigma(T_2^4 - T_1^4)}{(n+1)\times\left(\frac{1}{\epsilon} + \frac{1}{\epsilon} - 1\right)} = \frac{1}{n+1} \times \frac{\sigma(T_2^4 - T_1^4)}{\frac{1}{\epsilon} + \frac{1}{\epsilon} - 1} =$$

$$\frac{1}{100} \times \dot{q}_{net\,1-2} = \frac{1}{100} \times \frac{\sigma(T_2^4 - T_1^4)}{\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1} = \frac{1}{100} \times \frac{\sigma(T_2^4 - T_1^4)}{\frac{1}{\epsilon} + \frac{1}{\epsilon} - 1}$$

$$\longrightarrow \frac{1}{n+1} \times \frac{\sigma(T_2^4 - T_1^4)}{\frac{1}{\epsilon} + \frac{1}{\epsilon} - 1} = \frac{1}{100} \times \frac{\sigma(T_2^4 - T_1^4)}{\frac{1}{\epsilon} + \frac{1}{\epsilon} - 1} \Rightarrow n = 99$$

We need 99 shields, which $\epsilon = 0.1$.

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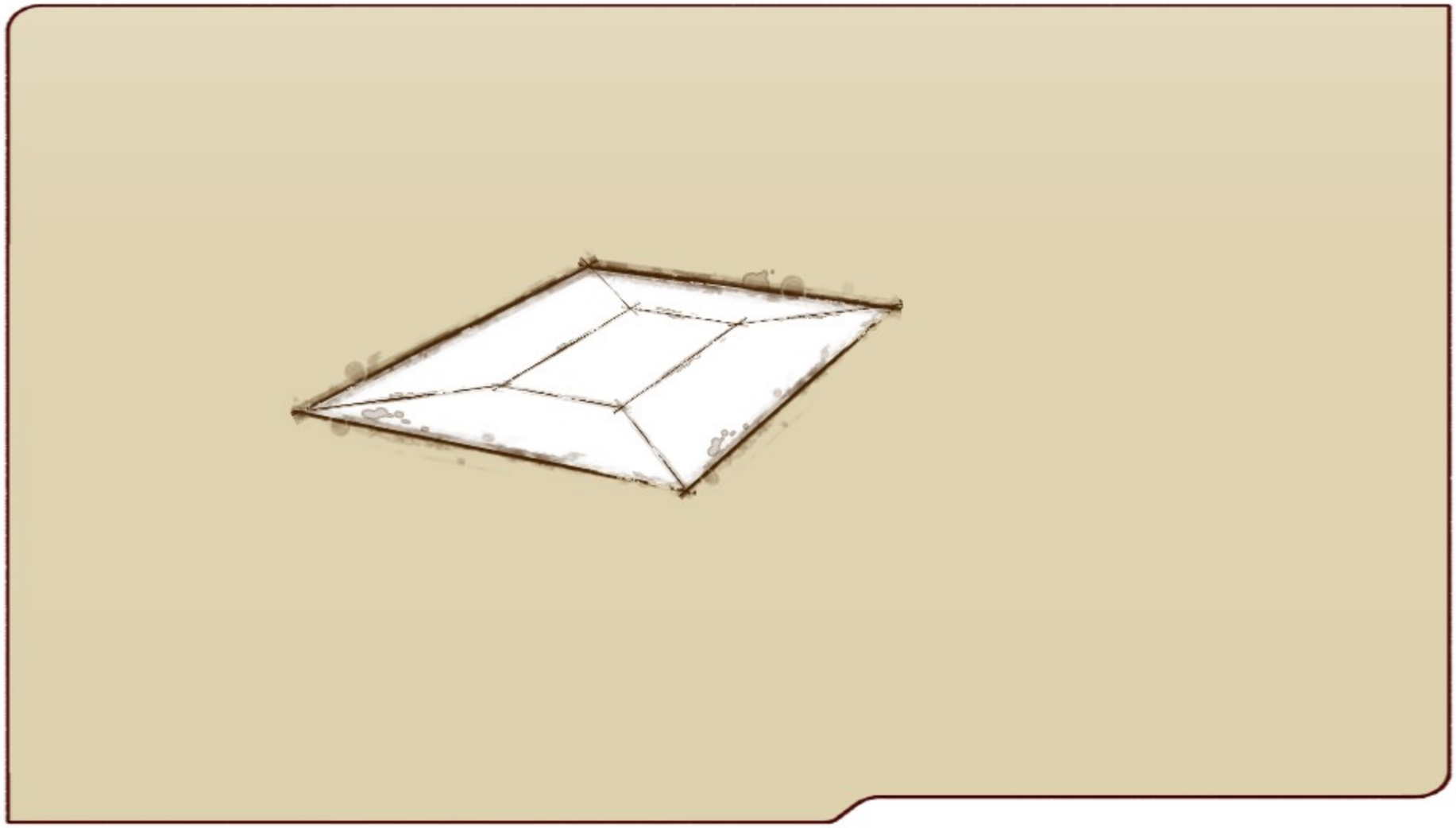
File Edit View Camera Draw Tools Window Extensions Help



Default Tray

Entity Info

Materials

Components

Styles

Stain Edges with Frame

Created by Reuben Chock. Loose, messy style, ala napkin sketch. Directional textures.

Select Edit Mix

Style Builder Competition Wir

Shadows

Instructor

Select objects. Shift to extend select. Drag mouse to select multiple.

Measurements

Type here to search

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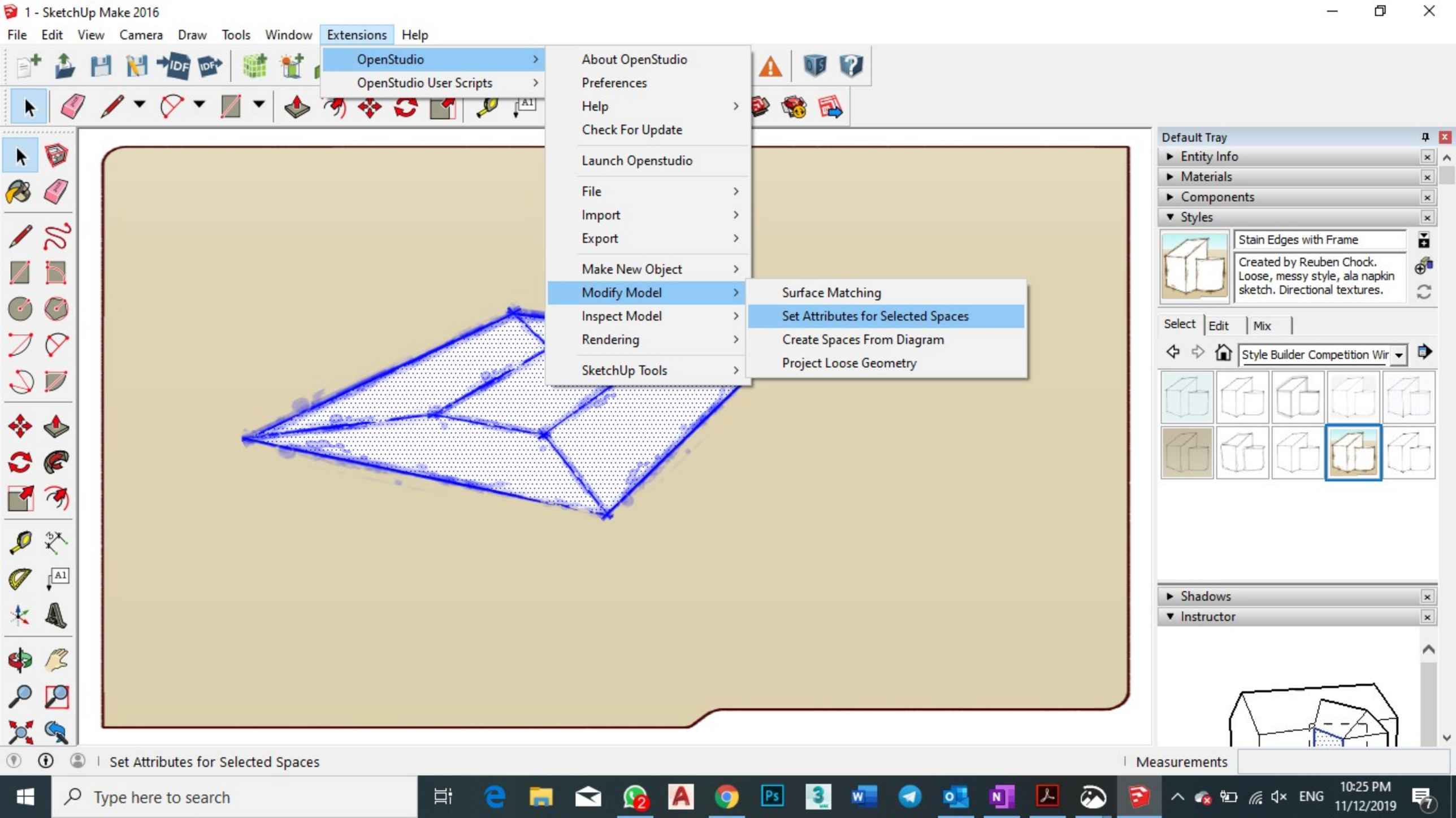
1 - SketchUp Make 2016
File Edit View Camera Draw Tools Window Extensions Help
OpenStudio
OpenStudio User Scripts
About OpenStudio
Preferences
Help
Check For Update
Launch Openstudio
File
Import
Export
Make New Object
Modify Model
Inspect Model
Rendering
SketchUp Tools
Surface Matching
Set Attributes for Selected Spaces
Create Spaces From Diagram
Project Loose Geometry
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Stain Edges with Frame
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Instructor
Set Attributes for Selected Spaces
Measurements
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1 - SketchUp Make 2016

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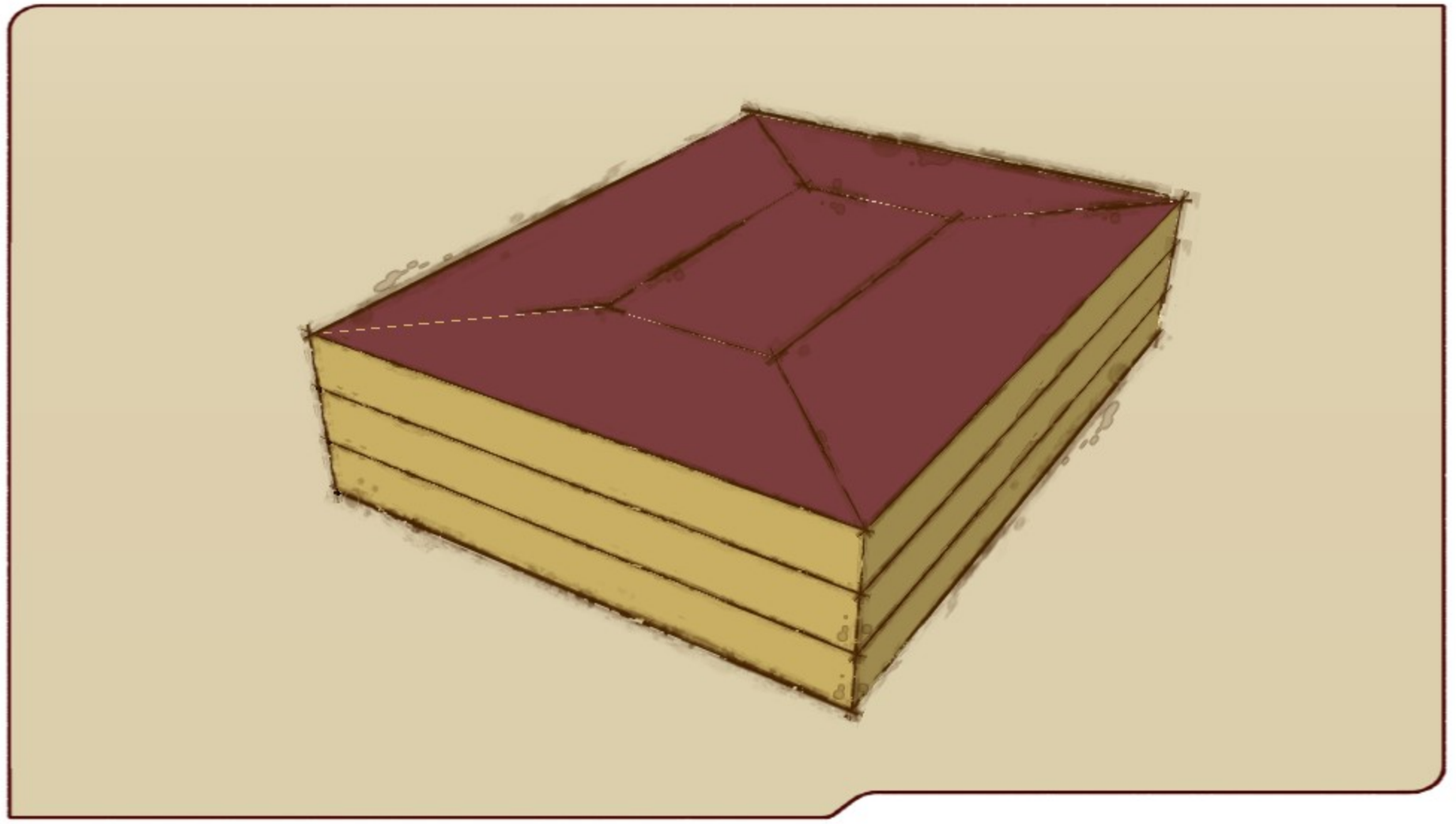

Default Tray

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Measurements

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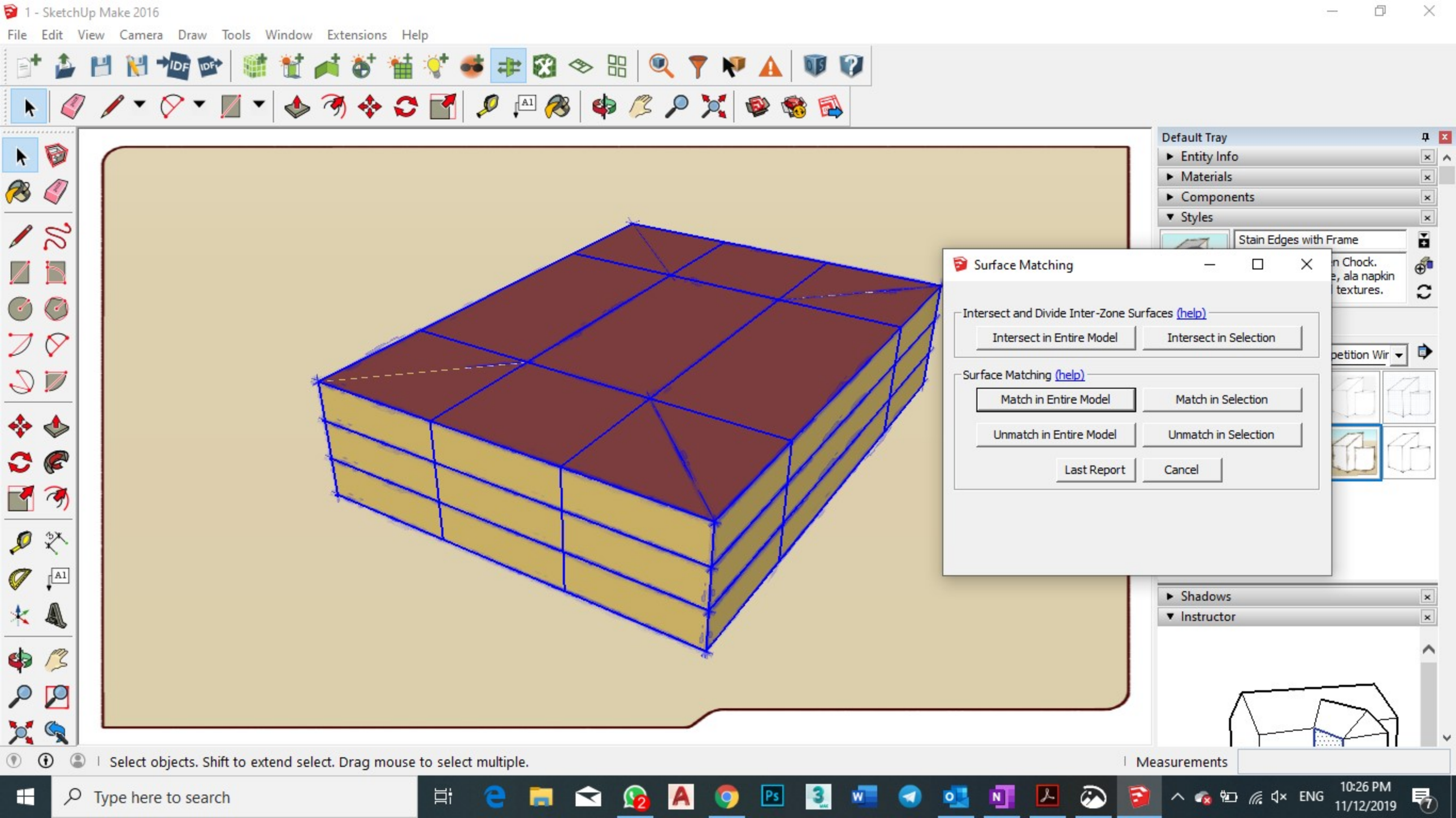
1 - SketchUp Make 2016
File Edit View Camera Draw Tools Window Extensions Help
Default Tray
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Styles
Stain Edges with Frame
Surface Matching
Intersect and Divide Inter-Zone Surfaces (help)
Intersect in Entire Model
Intersect in Selection
Surface Matching (help)
Match in Entire Model
Match in Selection
Unmatch in Entire Model
Unmatch in Selection
Last Report
Cancel
Shadows
Instructor
Select objects. Shift to extend select. Drag mouse to select multiple.
Measurements
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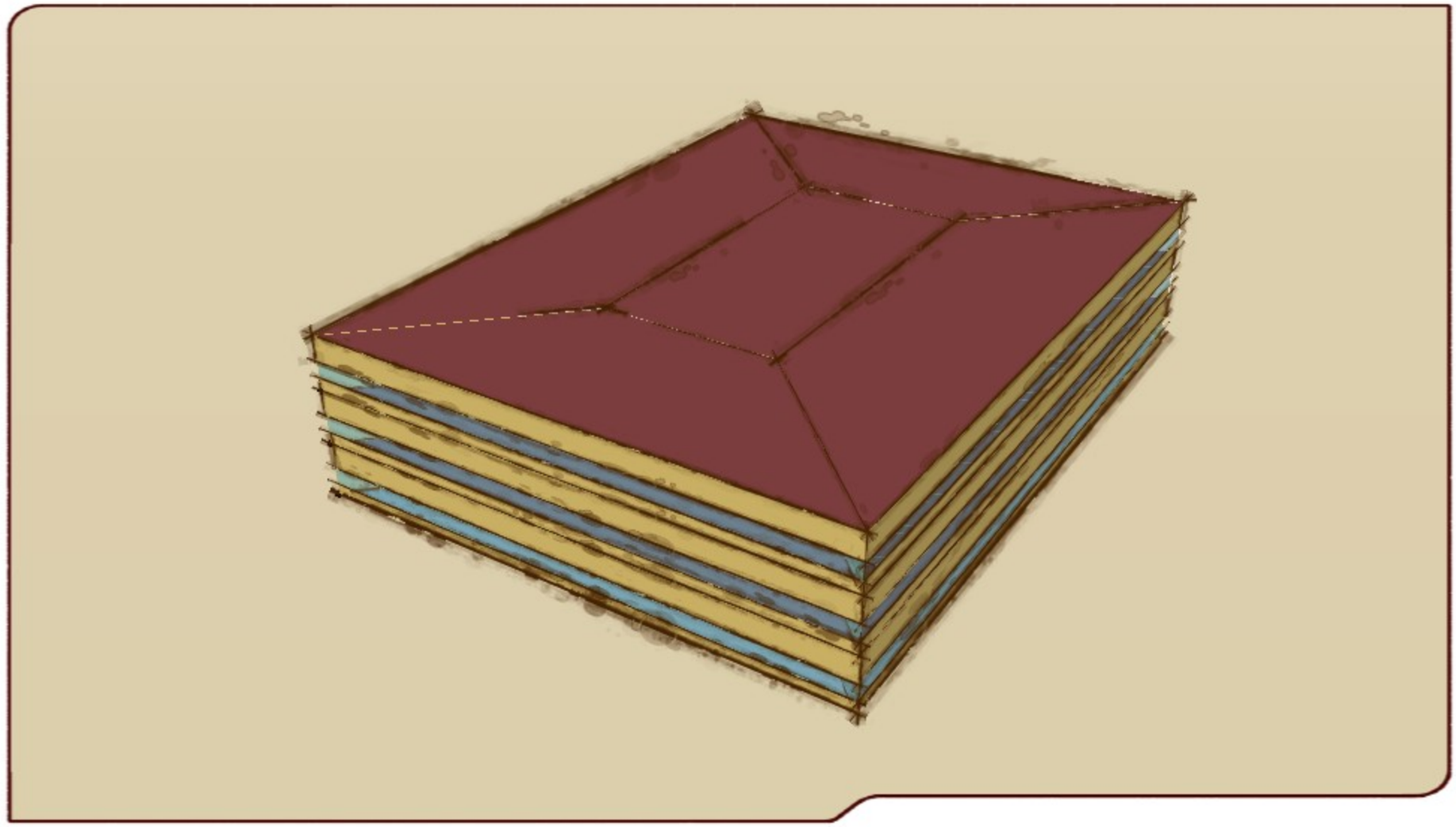

Default Tray

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Select Edit Mix

Style Builder Competition Wir

Shadows

Instructor

Select objects. Shift to extend select. Drag mouse to select multiple.

Measurements

Type here to search

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final.osm

File Preferences Components & Measures Help

Run Simulation | Output | Tree

Run

25%

Running

Warnings: 0

Errors: 0

Output

```
ExpandObjects Started.
 Begin reading Energy+.idd file.
 Done reading Energy+.idd file.
ExpandObjects Finished. Time:    0.188
```

Type here to search

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final.osm

File Preferences Components & Measures Help

Results Summary

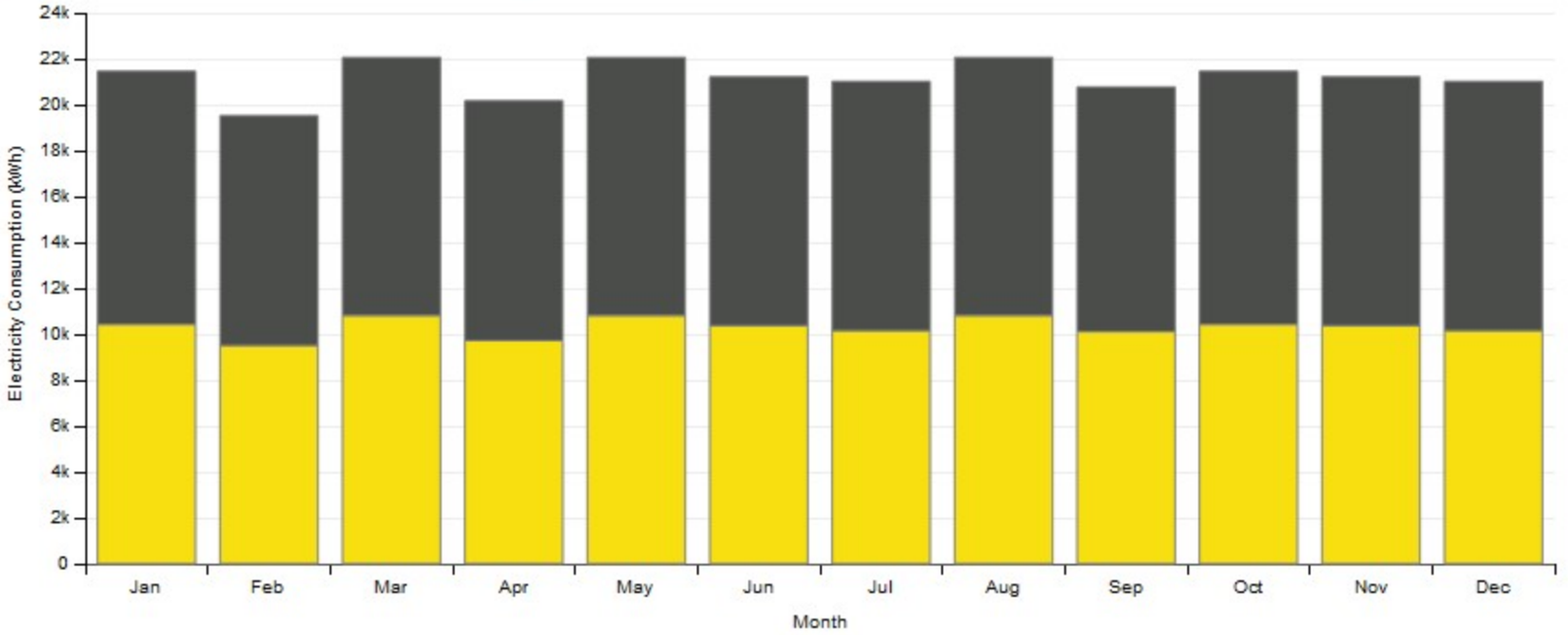
Reports: OpenStudio Results

Open ResultsViewer for Detailed Reports

- Model Summary
- Annual Overview
- Monthly Overview
- Utility Bills/Rates
- Envelope
- Space Type Breakdown
- Space Type Summary
- Interior Lighting Summary
- Plug Loads Summary
- Exterior Lighting
- Water Use Equipment
- HVAC Load Profiles
- Zone Conditions
- Zone Overview
- Zone Equipment Detail
- Air Loops Detail

Monthly Overview

Electricity Consumption (kWh) - view table



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