

# Rendering dan Animasi

Irawan Setyabudi, ST.,MT



1. Pemahaman spesifikasi komputer

2. Pengenalan Vray Sketchup versi 2.0 dan 3.4

3. Tata cahaya, material, dan option pada vray

4. Pengenalan Animasi Realtime Landscaping Architect

5. Pengenalan Animasi Lumion

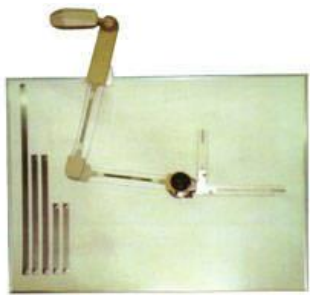
6. Pengenalan Editor Movie (Filmora) untuk membuat video

7. Latihan merender dan membuat animasi



# 1. Pemahaman spesifikasi komputer

Sebelum memulai pengerjaan proyek, kita perlu menyiapkan alat sebaik-baiknya. Jaman dahulu arsitek sudah terkenal dengan peralatannya yang cukup mahal, seperti meja gambar, rapido, penggaris acrylic, dsb.



## SPECIFICATIONS

|                       |                     |
|-----------------------|---------------------|
| Drafting Machine 7103 | Arm Type            |
| Super Drafting Stand  | W725 X H1900 X D058 |
| Manual Drafting Stand | W725 X H1900 X D058 |
| Drafting Board A1*    | 900 X 1200 mm       |
| Drafting Board A0*    | 900 X 1500 mm       |

\*Available in two colors: Light Creme and Light Green

\*Available in two types: Magna and Vinyl

Saat ini, semua serba instan. Peralatan tadi secara praktis dikemas menjadi satu yang namanya komputer. Semua orang bahkan diluar arsitek pun bisa menggambar dengan komputer, seperti slogan sketchup '3D for everyone'

Bahkan, orang yang bukan arsitek mengklaim dirinya arsitek karena bisa menggambar dan merender dengan kualitas baik. Tetapi tentu saja secara visual saja, namun organisasi ruang, kaidah ruang dan material adalah nol. Orang ini telah mendahului, karena mungkin kualitas komputernya bagus sekelas gaming.

Maka, dengan ini secara garis besar hendaknya kita tahu sejauh mana **peranan hardware** dalam menunjang pekerjaan dengan breakdown inti-intinya saja.



Komponen dalam komputer :

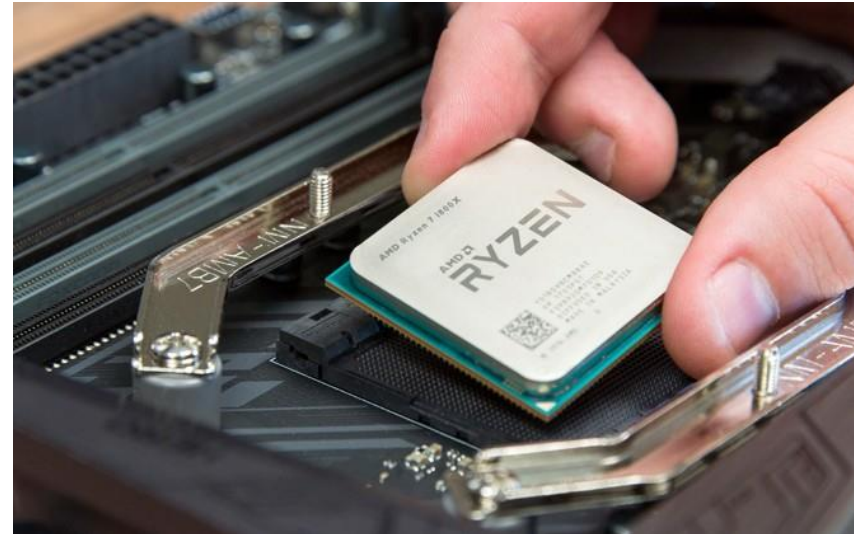
1. CPU/Prosesor
2. GPU/VGA
3. Motherboard
4. RAM
5. Harddisk
6. Power Supply
7. Monitor, casing, mouse, keyboard, stavolt, dsb.

Biasanya dalam membeli PC laptop atau desktop hal utama yang dipertimbangkan adalah prosesor, vga dan ram nya.

Lalu, bagaimana cara memilih spesifikasi komputer untuk menggambar? Bukan hanya untuk aplikasi office atau sekedar ngenet saja.....

## 1. CPU/Prosesor

Central processing unit disebut juga otak komputer



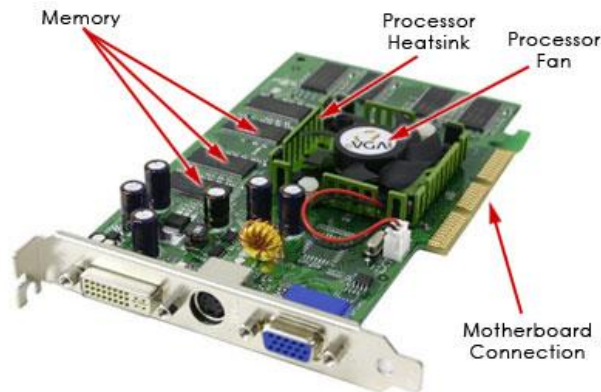
Anda dapat memilihnya berdasarkan jenis aplikasi apa saja yang akan Anda kerjakan, misalkan kalau sebatas untuk mengetik cukup pakai prosesor dual core yang biasa dalam netbook, contoh intel N3060. Kalau untuk yang serba bisa tapi skala pas-pasan, bisa pakai mulai intel i3 atau amd ryzen 3. Arsitek?



## 2. GPU / kartu VGA

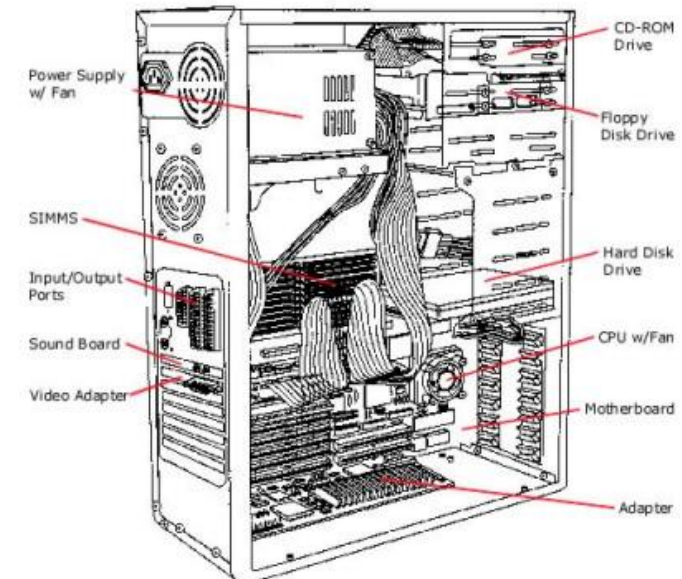
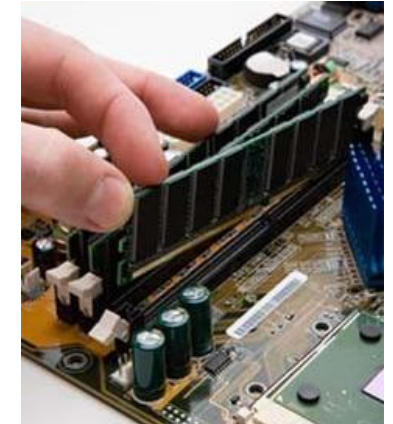
Komponen komputer dengan tujuan untuk mengolah gambar, umumnya untuk mengolah gambar 3D. VGA ini adalah external, karena untuk mengolah gambar ringan rata-rata dilakukan juga oleh prosesor.

Kalau komputer Anda hanya untuk mengetik atau browsing internet, tidak perlu untuk memilih komputer dengan VGA external. Tapi bagi Arsitek dan juga gamers, tentu membutuhkan VGA yang kuat. Saat ini vga yang powerful dengan harga yang realistis adalah nvidia gtx 1050 dan 1060



## 3. RAM

Random access memory adalah memori untuk menyimpan sementara program yang dibuka. Semakin besar ukurannya maka komputer berjalan semakin cepat. Saat ini rata-rata yang dipakai sudah 8-16 GB



## Issue:

This article provides the system requirements for Autodesk® AutoCAD 2018.

## Autocad

### Solution:

Anda tidak harus hapal tentang spesifikasi komputer tetapi cukup tahu saja dari review yang telah dilakukan.

### Caranya ?

1. Buka website program yang sering dipakai misalkan sketchup, autocad, atau lumion. Lihat system requirement nya, dengan browsing di google

| System requirements for AutoCAD 2018 |   |
|--------------------------------------|---|
| Operating System                     | <ul style="list-style-type: none"><li>• Microsoft® Windows® 7 SP1 (32-bit &amp; 64-bit)</li><li>• Microsoft Windows 8.1 with Update <a href="#">KB2919355</a> (32-bit &amp; 64-bit)</li><li>• Microsoft Windows 10 (64-bit only) (version 1607 and up recommended)</li></ul>                |
| CPU Type                             | 32-bit: 1 gigahertz (GHz) or faster 32-bit (x86) processor<br>64-bit: 1 gigahertz (GHz) or faster 64-bit (x64) processor  |
| Memory                               | 32-bit: 2 GB (4 GB recommended)<br>64-bit: 4 GB (8 GB recommended)  |
| Display Resolution                   | Conventional Displays:<br>1360 x 768 (1920 x 1080 recommended) with True Color<br><br>High Resolution & 4K Displays:<br>Resolutions up to 3840 x 2160 supported on Windows 10, 64 bit systems (with capable display card)   |
| Display Card                         | Windows display adapter capable of 1360 x 768 with True Color capabilities and DirectX® 9 <sup>1</sup> . DirectX 11 compliant card recommended.<br><br><sup>1</sup> <i>DirectX 9 recommended by supported OS</i>  |
| Disk Space                           | Installation 4.0 GB   |
| Browser                              | Windows Internet Explorer® 11 or later  |
| Network                              | Deployment via Deployment Wizard.<br><br>The license server and all workstations that will run applications dependent on network licensing must run TCP/IP protocol.<br><br>Either Microsoft® or Novell TCP/IP protocol stacks are acceptable. Primary login on workstations may be Netware |

1. Minimal memori 4gb untuk prosesor 64 bit
2. Os minimal win7



• **Software**

- An internet connection is required to install and authorize SketchUp and to use some of the features.
- Microsoft® Internet Explorer 9.0 or higher.
- SketchUp Pro requires .NET Framework version 4.5.2. For more information about the .NET framework, click [here](#).

**i** SketchUp requires a 64-bit version of Windows. Also, to install SketchUp, Windows 8.1 must be current with Windows Update.

**i** Boot Camp, VMWare, and Parallels are not supported environments.

• **Recommended hardware**

- 2+ GHz processor
- 8+ GB RAM
- 700MB of available hard-disk space
- 3D class video card with 1GB of memory or higher and supports hardware acceleration. Please ensure that the video card driver supports OpenGL version 3.0 or higher and is **up to date**.

**i** SketchUp's performance relies heavily on the graphics card driver and its ability to support OpenGL 3.0 or higher. To test your graphics card's compatibility, please download and run the [SketchUp 2017 Checkup application](#). Historically, people have seen problems with Intel-based cards with SketchUp. We don't recommend using these graphics cards with SketchUp at this time.

- 3-button, scroll-wheel mouse.

• **Minimum hardware**

- 1 GHz processor
- 4GB RAM
- 16GB of total hard-disk space
- 500MB of free hard-disk space
- 3D-class video card with 512MB of memory or higher and supports hardware acceleration. Please ensure that the video card driver supports OpenGL version 3.0 or higher and is **up to date**.

Communicating Your Designs

Using SketchUp Data with Other Modeling Programs or Tools

Fixing an Issue in SketchUp

Understanding Your License

**SketchUp Hardware and Software Requirements**

Downloading SketchUp

**Buy SketchUp Pro**

1. Prosesor min 1ghz
2. Ram 4gb
3. Memory vga 512

Need Help?



- **Graphics card:** Minimum **8,000 PassMark** points, **6GB** memory or more and compatible with DirectX 11 or later. [Click here](#) to see how to select a graphics card for Lumion.
- **OS:** 64-bit Windows 10
- **CPU:** As high a GHz value as possible, ideally 4.0+ GHz. A lower GHz value may act as a bottleneck for fast graphics cards such as the Nvidia GTX 1080 and Nvidia Titan X (Pascal). More CPU cores than 4 will not make a difference. CPUs such as the i7-4790K, the i7-6700K or the i7-7700K with 4.0+ GHz are good choices. Xeon CPUs with GHz values lower than 3.4 GHz are not recommended.
- **System memory:** 16GB or more with as high a MHz value as possible.
- **Monitor resolution:** 1920x1080 pixels or higher.
- **Hard drive:** 20GB of disk space
- **Power supply:** [Click here](#) to see which power supply you need.

#### Minimum System Requirements

- **Graphics card:** Minimum **2,000 PassMark** points, **2GB** memory or more and compatible with DirectX 11 or later. [Click here](#) to see how to select a graphics card for Lumion.
- **OS:** 64-bit Windows 10, 8.1, 7 Sp1 or Vista SP2
- **CPU:** As high a GHz value as possible, ideally 3.0+ GHz. Less than 4.0 GHz may act as a bottleneck for fast graphics cards such as the GTX 1080 and Titan X (Pascal). More cores than 4 will not make a difference.
- **System memory:** 8GB (for simple scenes) with as high a MHz value as possible.
- **Monitor resolution:** Minimum 1600x1080 pixels.
- **Hard drive:** 20GB of disk space
- **Power supply:** [Click here](#) to see which power supply you need.

**SIMPLE SCENES IN LUMION:** (e.g. a small building/interior with limited details)  
Minimum **2,000 PassMark points** and **2GB graphics card memory** (RAM). *DirectX 11* compatible.

**MODERATELY COMPLEX SCENES IN LUMION:** (e.g. a moderately detailed office complex)  
Minimum **6,000 PassMark points** and **4GB graphics card memory** (RAM). *DirectX 11* compatible.

**VERY COMPLEX SCENES IN LUMION:** (e.g. a large park or part of a city)  
Minimum **8,000 PassMark points** and **6GB graphics card memory** (RAM). *DirectX 11* compatible. The CPU should have as high a GHz value as possible, ideally 4.0+ GHz.  
Examples: [Nvidia GTX 1060](#) (6 GB memory), [Quadro K6000](#).

**ULTRA COMPLEX SCENES IN LUMION:** (e.g. a super detailed city, airport or stadium)  
Minimum **10,000 PassMark points** and **8GB+ graphics card memory** (RAM). *DirectX 11* compatible. The CPU should have as high a GHz value as possible, ideally 4.2+ GHz.  
Examples: [Nvidia GTX 1080 Ti](#) (11 GB memory), [Nvidia GTX Titan X](#) (12 GB memory)

## Spesifikasi paling berat = lumion

1. Prosesor ideal 3Ghz
2. VGA minimal 2000 passmark
3. Ram 8GB
4. Monitor widescreen
5. Instalasi 20 GB
6. OS hanya 64 bit

Lumion

#### Will Lumion run on your laptop PC?

Lumion requires a PC with a fast NVIDIA or AMD graphics card with at least 2GB memory. If your



2. Karena paling berat adalah lumion, maka kita jadikan dasar untuk mencari spesifikasi komputer kita. Kita lihat review cpu dan vga yang disyaratkan lumion. Cari di google kata kunci :

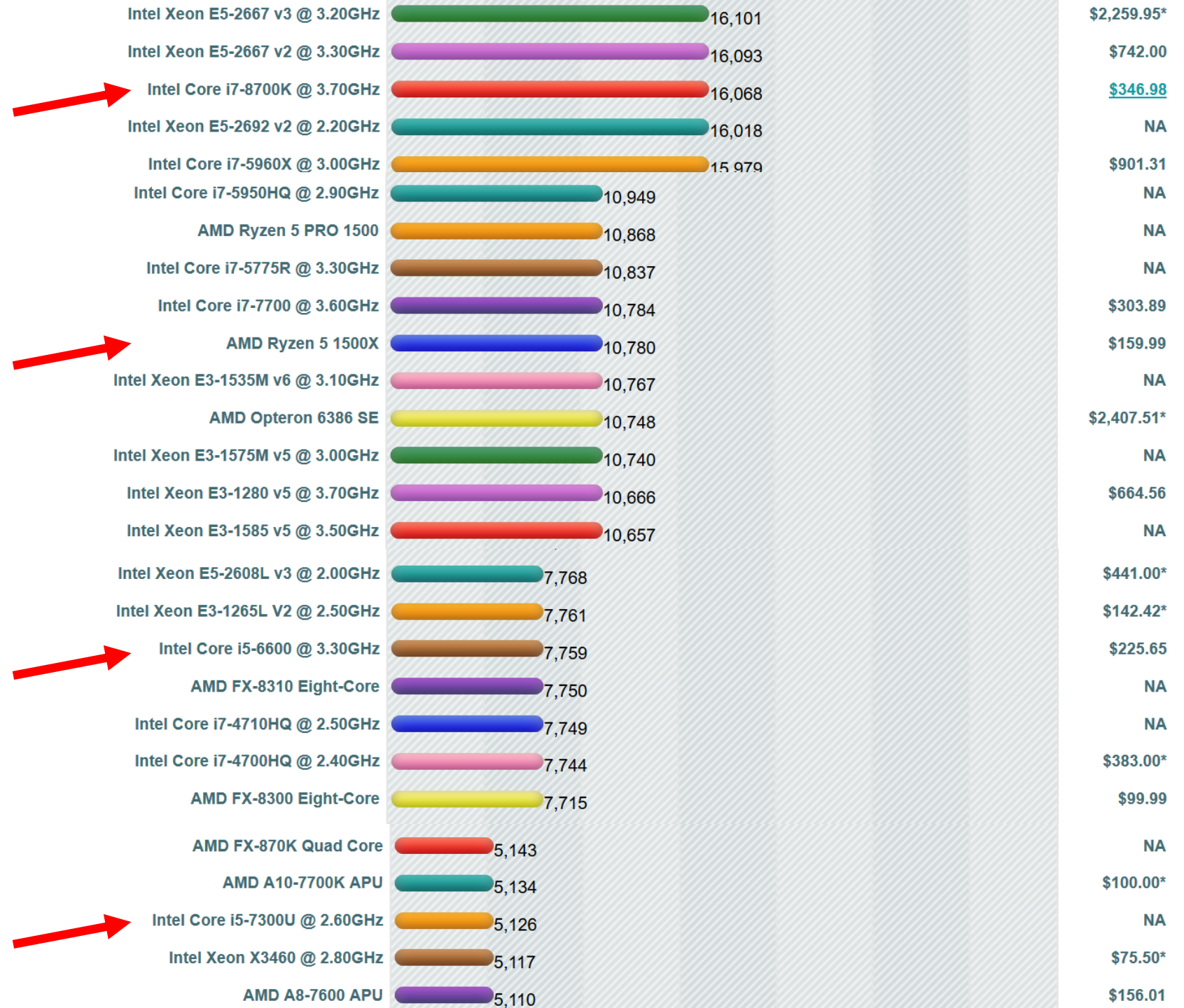
cpu benchmark

a. CPU >>

[https://www.cpubenchmark.net/high\\_end\\_cpus.html](https://www.cpubenchmark.net/high_end_cpus.html)

Masuk ke high end cpu

Syarat ideal 3Ghz bandingkan dengan nilai-nilai yg disebelah kanan. Cari poinnya yang tinggi dan murah



### 3. Lihat harganya di <http://www.rakitan.com/>

|  |             |
|--|-------------|
| intel i3-7300 (Box) (ITPSSS11510020X) (4Ghz, C4MB,Kabylake series) Intel LGA 1151                                | 2.185.000,- |
| intel i3-7350K (Box) w/o fan (ITPSSS11510019X ) Intel LGA 1151   | 2.128.000,- |
| intel i3-8100 (Box) (ITPSSS11510018X) (3.6Ghz,Cache 6MB,Coffeelake Series) Intel LGA 1151                        | 1.760.000,- |
| intel i3-8350K (Box) w/o fan (ITPSSS11510017X) (4.0Ghz,Cache 8MB,Coffeelake Series) Intel LGA 1151               | 2.743.000,- |
| intel i5-6400 Box (ITPSSS11510016X) (2.7Ghz, C6MB, Skylake Series) Intel LGA 1151                                | 2.520.000,- |
| intel i5-6500 Box (ITPSSS11510015X) (3.2Ghz, C6MB, Skylake Series) Intel LGA 1151                                | 2.803.000,- |
| intel i5-6600 Box (ITPSSS11510014X) (3.3Ghz, C6MB, Skylake Series) Intel LGA 1151                                | 3.100.000,- |
| intel i5-6600K Box w/o fan (ITPSSS11510013X) (3.5Ghz Up To 3.9Ghz, C6MB, Skylake Series) Intel LGA 1151          | 3.220.000,- |
| intel i5-7400 (Box) (ITPSSS11510012X) (3.0Ghz, C6MB, Kabylake Series) Intel LGA 1151                             | 2.488.000,- |
| intel i5-7500 (Box) (ITPSSS11510011X) (3.4Ghz, 6MB, Kabylake Series) Intel LGA 1151                              | 2.798.000,- |
| intel i5-7600 (Box) (TPSSS11510010X) (3.5Ghz, C6MB, Kabylake Series) Intel LGA 1151                              | 3.235.000,- |
| intel i5-7600K (Box) w/o fan (ITPSSS11510009X) (3.8Ghz Up To 4.2Ghz, C6MB, Kabylake Series) Intel LGA 1151       | 3.390.000,- |
| intel i5-8400 (Box) (ITPSSS11510008X) (2.8Ghz Up To 4.0Ghz,Cache 9MB,Coffeelake Series) Intel LGA 1151           | 2.708.000,- |
| intel i5-8400 (Tray + Fan) (2.8Ghz Up To 4.0Ghz,Cache 9MB,Coffeelake Series) Intel LGA 1151                      | 2.875.000,- |
| intel i5-8600K (Box) w/o fan (ITPSSS11510007X) (3.6Ghz Up To 4.3Ghz,Cache 9MB,Coffeelake Series) Intel LGA 1151  | 3.888.000,- |
| intel i7-6700 Box (Quad-Core 3.4GHZ, C8MB, Skylake Series) Intel LGA 1151  | 4.460.000,- |
| intel i7-6700 Tray + Fan (Quad-Core 3.4GHZ, C8MB, Skylake Series) Intel LGA 1151                                 | 4.210.000,- |
| intel i7-6700K Box w/o fan (Quad-Core 4.0GHZ, C8MB, Skylake Series) Intel LGA 1151                               | 4.520.000,- |
| intel i7-7700 (Box) (ITPSSS11510004X) (3.6Ghz, C8MB, Kabylake Series) Intel LGA 1151                             | 4.305.000,- |
| intel i7-7700K (Box) w/o fan (ITPSSS11510003X) (4.2Ghz Up To 4.5Ghz, C8MB, Kabylake Series) Intel LGA 1151       | 4.805.000,- |
| intel i7-8700 (Box) (3.2Ghz Up To 4.6Ghz,Cache 12MB,Coffeelake Series) Intel LGA 1151                            | 4.758.000,- |
| intel i7-8700K (Box) w/o fan (ITPSSS11510001X) (3.7Ghz Up To 4.7Ghz,Cache 12MB,Coffeelake Series) Intel LGA 1151 | 5.708.000,- |

| AMD AM4   |             |
|---|-------------|
| AMD AMD Bristol Ridge Athlon X4 950 3.5Ghz Up To 3.8Ghz Cache 2MB 45W/65W Socket AM4 - 4 Core (AMPSSSAM4P017) AMD AM4   | 740.000,-   |
| AMD Bristol Ridge A10-9700 (Radeon R7 series) 3.5Ghz Up To 3.8Ghz Cache 2MB 65W Socket AM4 - 4 Core AMD AM4   | 1.085.000,- |
| AMD Bristol Ridge A12-9800 (Radeon R7 series) 3.8Ghz Up To 4.2Ghz Cache 2MB 65W Socket AM4 - 4 Core AMD AM4   | 1.340.000,- |
| AMD Bristol Ridge A6-9500 (Radeon R5 series) 3.5Ghz Up To 3.8Ghz Cache 1MB 65W Socket AM4 - 3 Core (AMPSSSAM4P015X) AMD AM4                                     | 650.000,-   |
| AMD Bristol Ridge A8-9600 (Radeon R7 series) 3.1Ghz Up To 3.4Ghz Cache 2MB 65W Socket AM4 - 4 Core (AMPSSSAM4P014) AMD AM4                                      | 795.000,-   |
| AMD Ryzen 3 1200 3.1Ghz Up To 3.4Ghz Cache 8MB 65W AM4 [Box] - 4 Core - YD1200BBAEBOX - With AMD Wraith Stealth 65W Cooler (AMPSSSAM4P009X) AMD AM4             | 1.285.000,- |
| AMD Ryzen 3 1300X 3.5Ghz Up To 3.7Ghz Cache 8MB 65W AM4 [Box] - 4 Core - YD130XBBAEBOX - With AMD Wraith Stealth 65W Cooler (AMPSSSAM4P008) AMD AM4             | 1.619.000,- |
| AMD Ryzen 3 Raven Ridge 2200G (AMPSSSAM4P019) 3.5Ghz Up To 3.7Ghz Cache 4MB 65W AM4 [Box] - 4 Core - YD2200C5FBBOX - With AMD Wraith Stealth 65W Cooler AMD AM4 | 1.395.000,- |
| AMD Ryzen 5 1400 (AMPSSSAM4P007X) With AMD Wraith Spire 95W Cooler AMD AM4  | 2.190.000,- |
| AMD Ryzen 5 1500X (AMPSSSAM4P006X) With AMD Wraith Spire 95W Cooler (AMPSSSAM4P006X) AMD AM4  | 2.135.000,- |
| AMD Ryzen 5 1600 3.6Ghz Up to 4.0Ghz (AMPSSSAM4P005X) AMD AM4   | 2.585.000,- |
| AMD Ryzen 5 1600X (AMPSSSAM4P004X) AMD AM4  | 2.950.000,- |
| AMD Ryzen 5 Raven Ridge 2400G 3.6Ghz Up To 3.9Ghz Cache 4MB 65W AM4 [Box] - 4 Core - YD2400C5FBBOX - With AMD Wraith Stealth 65W Cooler (AMPSSSAM4P018) AMD AM4 | 2.280.000,- |
| AMD Ryzen 7 1700 3.0Ghz Up To 3.7Ghz Cache 20MB 65W AM4 [Box] - 8 Core - YD1700BBAEBOX - With AMD Wraith Spire Cooler (AMPSSSAM4P003X) AMD AM4                  | 4.130.000,- |
| AMD Ryzen 7 1700X 3.4Ghz Up To 3.8Ghz Cache 16MB 95W AM4 [Box] - 8 Core - YD170XBCAEWOF AMD AM4   | 4.280.000,- |
| AMD Ryzen 7 1800X 3.6Ghz Up To 4.0Ghz Cache 20MB 95W AM4 [Box] - 8 Core - YD180XBCAEWOF AMPSSSAM4P001X AMD AM4  | 4.985.000,- |

Coba klik :

CPU intel Klik intel LGA 1151

CPU AMD Klik amd AM4

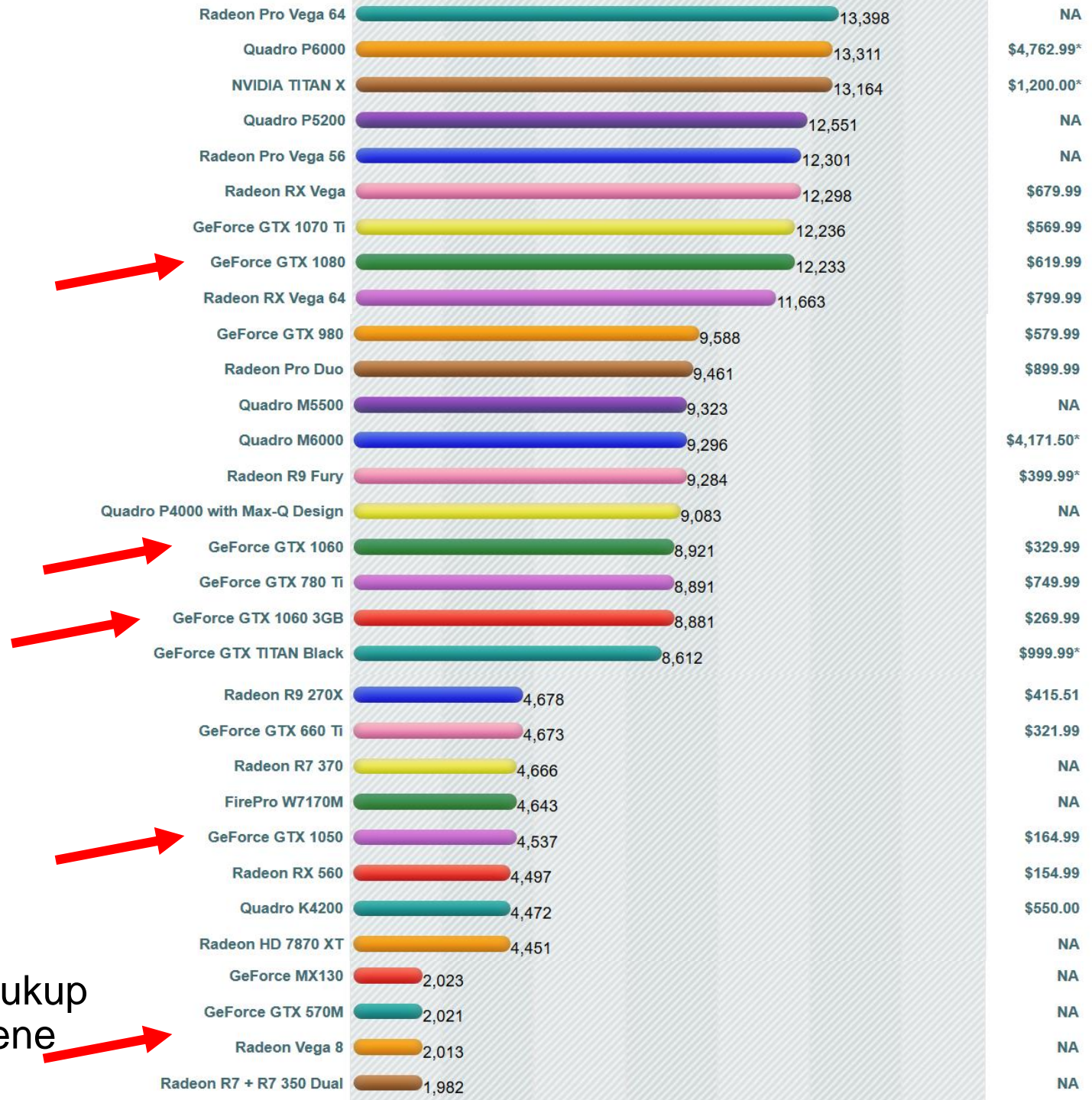


4. Dengan cara yang sama kita lihat untuk VGA dengan mencari kata kunci di google : Gpu benchmark dan kita masuk ke

<https://www.videocardbenchmark.net>

Pilih high end videocards, dan cari yang disyaratkan minimal oleh lumion yaitu 2000 passmark dan memori 2GB atau idealnya 8000 passmark

Di angka 2000 ini sebenarnya sudah cukup untuk membuat scene sederhana



## 5. Lihat harganya di <http://www.rakitan.com/>

|   |              |
|---|--------------|
| Asus GT 710 2GB 64Bit DDR3 NVidia PCI Exp.  | 585.000,-    |
| Asus GT 730 Kepler 2Gb 64Bit DDR3 NVidia PCI Exp.                                 | 785.000,-    |
| Asus GT 730 Kepler 2GB 64Bit DDR5 NVidia PCI Exp.                                 | 940.000,-    |
| Asus GT 730 Tweak 2Gb 128Bit DDR3 (ASUVGANVD036X) NVidia PCI Exp.                 | 975.000,-    |
| Asus GTX 1050 2GB DDR5 EX NVidia PCI Exp.   | 2.120.000,-  |
| Asus GTX 1050 2GB DDR5 Dual NVidia PCI Exp.                                       | 2.120.000,-  |
| Asus GTX 1050 2GB DDR5 EX OC NVidia PCI Exp.                                      | 2.220.000,-  |
| Asus GTX 1050 2GB DDR5 PH NVidia PCI Exp.   | 1.875.000,-  |
| Asus GTX 1050 Ti 4GB DDR5 - Strix OC NVidia PCI Exp.                              | 3.280.000,-  |
| Asus GTX 1050 Ti 4Gb DDR5 Cerberus NVidia PCI Exp.                                | 3.900.000,-  |
| Asus GTX 1050 Ti 4Gb DDR5 Dual OC NVidia PCI Exp.                                 | 2.720.000,-  |
| Asus GTX 1050 Ti 4GB DDR5 EX NVidia PCI Exp.                                      | 2.620.000,-  |
| Asus GTX 1050 Ti 4GB DDR5 EX - OC Version NVidia PCI Exp.                         | 2.870.000,-  |
| Asus GTX 1050 Ti 4GB DDR5 Phoenix - PH-GTX1050TI-4G ASUVGANVD026X NVidia PCI Exp. | 3.120.000,-  |
| Asus GTX 1060 3GB DDR5 PH NVidia PCI Exp.   | 3.580.000,-  |
| Asus GTX 1060 Dual - OC Version 3GB DDR5 NVidia PCI Exp.                          | 3.780.000,-  |
| Asus GTX 1060 Dual - OC Version 6GB GDDR5 NVidia PCI Exp.                         | 5.675.000,-  |
| Asus GTX 1060 Strix DCII OC 6GB DDR5 (ASUVGANVD016X) NVidia PCI Exp.              | 6.530.000,-  |
| Asus GTX 1060 Strix OC 6gb GDDR5 NVidia PCI Exp.                                  | 6.900.000,-  |
| Asus GTX 1060 Turbo 3GB DDR5 NVidia PCI Exp.                                      | 4.315.000,-  |
| Asus GTX 1060 Turbo 6GB DDR5 NVidia PCI Exp.                                      | 4.675.000,-  |
| Asus GTX 1070 Dual OC 8Gb DDR5 (ASUVGANVD012X ) NVidia PCI Exp.                   | 8.000.000,-  |
| Asus GTX 1070 Strix 8Gb 256Bit DDR5 NVidia PCI Exp.                               | 7.980.000,-  |
| Asus GTX 1070 Strix OC 8Gb DDR5 (STRIX-GTX1070-08G-GAMING) NVidia PCI Exp.        | 8.700.000,-  |
| Asus GTX 1070 Ti 8GB DDR5X - Strix A NVidia PCI Exp.                              | 9.300.000,-  |
| Asus GTX 1070 Ti Advanced Cerberus 8Gb DDR5 NVidia PCI Exp.                       | 11.300.000,- |
| Asus GTX 1070 Turbo 8Gb DDR5 NVidia PCI Exp.                                      | 7.700.000,-  |
| Asus GTX 1080 Strix 8Gb 256Bit DDR5X NVidia PCI Exp.                              | 11.670.000,- |
| Asus GTX 1080 Strix Advance 8Gb 256Bit DDR5X NVidia PCI Exp.                      | 11.190.000,- |
| Asus GTX 1080 Strix OC 8Gb 256Bit DDR5X NVidia PCI Exp.                           | 12.990.000,- |
| Asus GTX 1080 Ti 11GB DDR5X - ROG Poseidon NVidia PCI Exp.                        | 16.090.000,- |
| Asus GTX 1080 Ti 11GB DDR5X - Strix OC (ASUVGANVD002X) NVidia PCI Exp.            | 16.900.000,- |
| Asus GTX 1080 Turbo 8GB DDR5X - Turbo NVidia PCI Exp.                             | 8.440.000,-  |
| Asus GTX 780 Ti DirectCU II OC 3GB DDR5 NVidia PCI Exp.                           | 5.870.000,-  |
| Asus GTX TITAN X 12GB 384Bit DDR5 (GTXTITANZ-12GD5) NVidia PCI Exp.               | 17.800.000,- |

Coba cari vga nvidia (GT/GTX) atau ATI radeon

Karena harga berdasar merk, maka akan bervariasi

| VGA Ati Radeon   |              |
|--|--------------|
| Asus HD 5450 1Gb 64Bit DDR3 EAH5450 SILENT/DI/1GB/D3/LP Ati Radeon PCI Exp.                    | 450.000,-    |
| Asus R5 230 1Gb 64Bit DDR3 Ati Radeon PCI Exp.   | 450.000,-    |
| Asus R5 230 2Gb 64Bit DDR3 Ati Radeon PCI Exp.   | 520.000,-    |
| Asus R7 240 2Gb 128Bit DDR3 Ati Radeon PCI Exp.  | 840.000,-    |
| Asus R9 390 8GB DDR5 DirectCU II OC STRIX Gaming (R9390-DC30C-8GD5-GAMING) Ati Radeon PCI Exp. | 4.912.000,-  |
| Asus RX 460 2GB Dual-OC Version DDR5 Ati Radeon PCI Exp.                                       | 1.580.000,-  |
| Asus RX 460 4GB DDR5 STRIX OC Ati Radeon PCI Exp.  | 2.180.000,-  |
| Asus RX 460 Dual 2Gb DDR5 Ati Radeon PCI Exp.  | 1.625.000,-  |
| Asus RX 460 Strix OC Gaming 4GB DDR5 Ati Radeon PCI Exp.                                       | 2.200.000,-  |
| Asus RX 470 4Gb DDR5 Mining Ati Radeon PCI Exp.  | 4.795.000,-  |
| Asus RX 470 Strix OC Gaming 4GB DDR5 Ati Radeon PCI Exp.                                       | 3.375.000,-  |
| Asus RX 480 4GB DDR5 Dual Ati Radeon PCI Exp.  | 3.580.000,-  |
| Asus RX 480 Dual-OC Version 4GB 256Bit DDR5 Ati Radeon PCI Exp.                                | 3.855.000,-  |
| Asus RX 480 Strix OC 8GB 256Bit DDR5 Ati Radeon PCI Exp.                                       | 4.425.000,-  |
| Asus RX 480 Strix OC Gaming 8GB 256Bit DDR5 Ati Radeon PCI Exp.                                | 4.430.000,-  |
| Asus RX 550 2GB DDR5 Ati Radeon PCI Exp.   | 1.435.000,-  |
| Asus RX 550 4GB DDR5 Ati Radeon PCI Exp.   | 1.480.000,-  |
| Asus RX 560 OC 2Gb DDR5 Ati Radeon PCI Exp.  | 1.940.000,-  |
| Asus RX 560 Strix 4GB DDR5 Ati Radeon PCI Exp.   | 2.670.000,-  |
| Asus RX 570 4Gb Expedition OC DDR5 (EX-RX570-04G) Ati Radeon PCI Exp.                          | 4.795.000,-  |
| Asus RX 570 4Gb ROG Strix OC Ati Radeon PCI Exp.   | 4.995.000,-  |
| Asus RX 580 8GB DDR5 - Dual Fan OC Ati Radeon PCI Exp.   | 5.800.000,-  |
| Asus RX 580 8GB ROG STRIX OC Ati Radeon PCI Exp.   | 8.200.000,-  |
| Asus RX VEGA 56 8GB HBM2 - ROG STRIX GAMING Ati Radeon PCI Exp.                                | 11.495.000,- |
| Digital Alliance R5 230 2GB 64Bit DDR3 Ati Radeon PCI Exp.                                     | 430.000,-    |
| Digital Alliance R7 240 2Gb 128Bit DDR5 Ati Radeon PCI Exp.                                    | 885.000,-    |

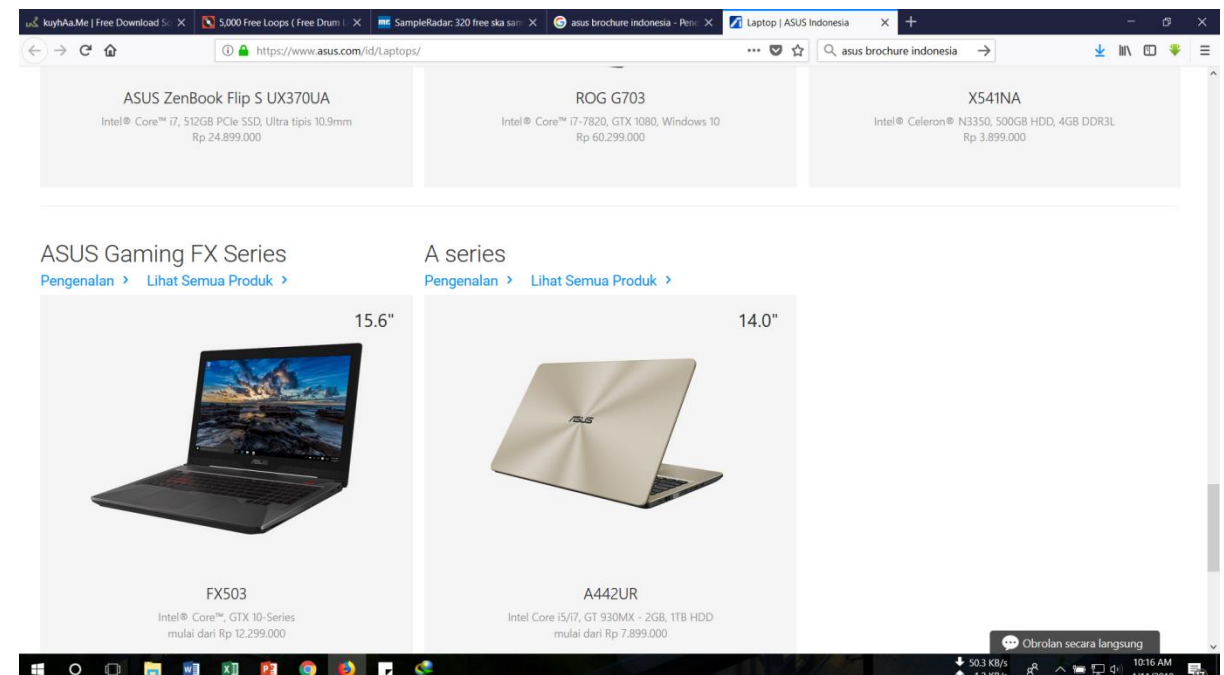
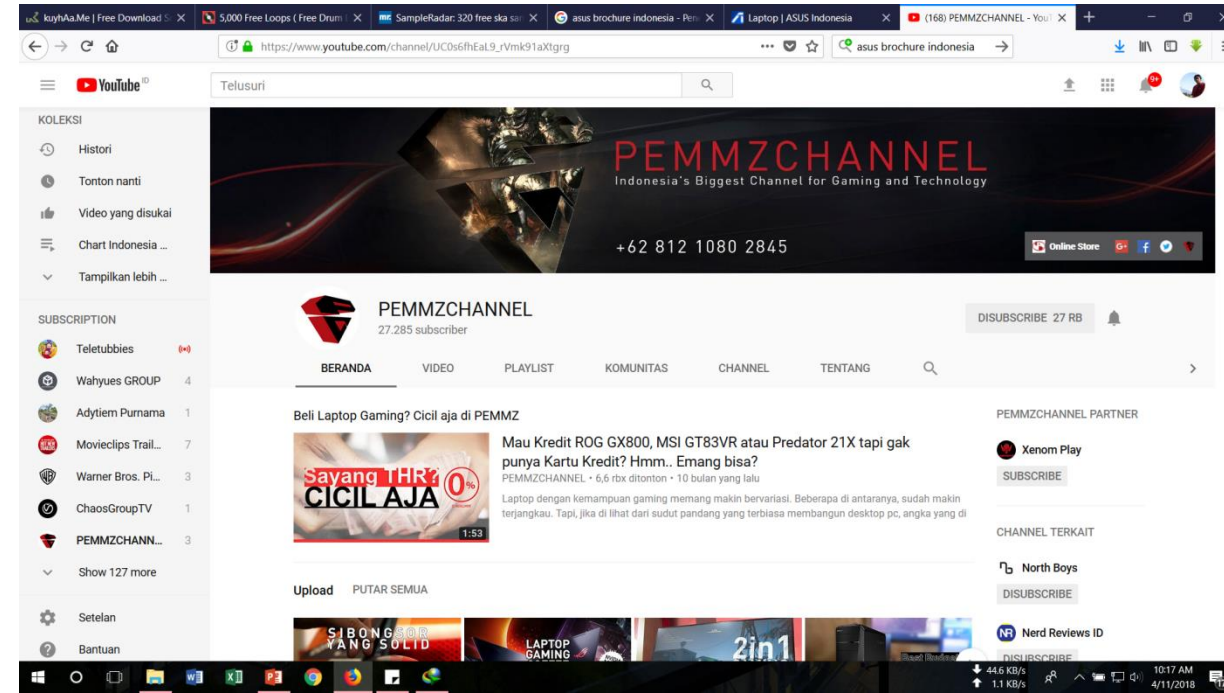


# Arsitek Pilih PC Desktop atau Laptop?

Jika Anda seorang dengan karakter yang mobile atau mengerjakan di berbagai tempat maka pilihlah laptop, tetapi jika memiliki kantor khusus maka pilihlah desktop

Kemampuan laptop cukup terbatas tidak bisa disandingkan dengan desktop apalagi jika mengerjakan proyek terus menerus sepanjang hari. Kecuali Anda memilih laptop gaming

Sebelum anda membeli komputer, haruslah melihat review dahulu semisal dari youtube ataupun melihat website resminya







**acer** Aspire E5-476G

INTEL CORE I7-8550U | 14 INCH  
MEMORY 4GB DDR4 | HD 1TB | DVD-RW | GEFORCE MX-150 2GB

The 8th GEN  
INTEL CORE

**ASUS** A442UR

INTEL CORE I5-8250U | 14 INCH  
MEMORY 4GB DDR4 | HD 1TB | DVD-RW | GEFORCE GT-930MX 2GB

The 8th GEN  
INTEL CORE

**Arsitek**  
**Pilih PC Desktop**  
**atau Laptop?**



**Sesuai kebutuhan saja**



- Summary
- Operating System
- CPU
- RAM
- Motherboard
- Graphics
- Storage
- Optical Drives
- Audio
- Peripherals
- Network

**Operating System**  
Windows 10 Pro 64-bit

**CPU**  
Intel Core i5 7200U @ 2.50GHz 48 °C  
Kaby Lake-U/Y 14nm Technology

**RAM**  
8.00GB Dual-Channel Unknown @ 1064MHz (15-15-15-36)

**Motherboard**  
ASUSTeK COMPUTER INC. X456UQK (U3E1)

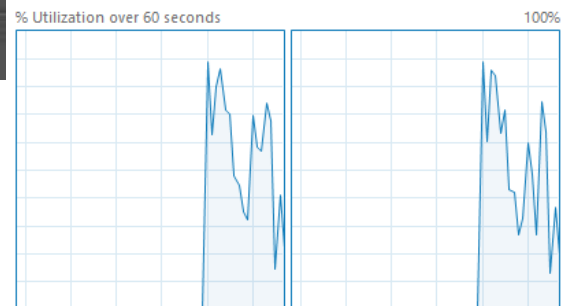
**Graphics**  
Generic PnP Monitor (1920x1080@60Hz)  
Intel HD Graphics 620 (ASUSTek Computer Inc)  
2047MB NVIDIA GeForce 940MX (ASUSTek Computer Inc) 44 °C  
ForceWare version: 390.77  
SLI Disabled

**Storage**  
931GB Hitachi HGST HTS541010A9E680 (SATA) 35 °C

**Optical Drives**  
HL-DT-ST DVD-RAM GUE1N

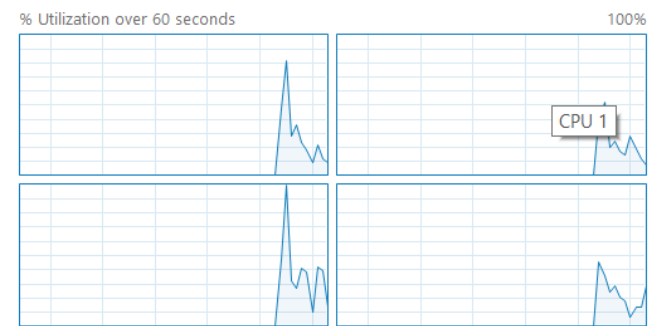
**Audio**  
Conexant SmartAudio HD

**CPU** AMD A9-9420 RADEON R5, 5 COMPUTE CORE...



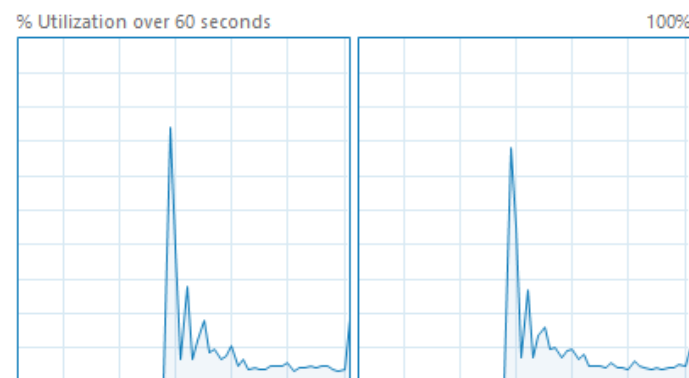
| Utilization | Speed    | Maximum speed: | 3,00 GHz                 |
|-------------|----------|----------------|--------------------------|
| 21%         | 1,83 GHz | Sockets:       | 1                        |
|             |          | Cores:         | 2                        |
| Processes   | Threads  | Handles        | Logical processors:      |
| 139         | 1846     | 44125          | 2                        |
|             |          |                | Virtualization: Disabled |
|             |          |                | Hyper-V support: Yes     |
| Up time     |          | L1 cache:      | 256 KB                   |
| 0:00:02:12  |          | L2 cache:      | 2,0 MB                   |

**CPU** Intel(R) Core(TM) i5-7200U CPU @ 2.50GHz



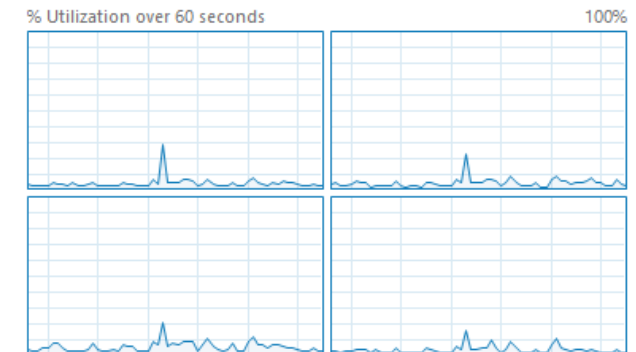
| Utilization | Speed    | Base speed: | 2,71 GHz                |
|-------------|----------|-------------|-------------------------|
| 15%         | 2,13 GHz | Sockets:    | 1                       |
|             |          | Cores:      | 2                       |
| Processes   | Threads  | Handles     | Logical processors:     |
| 178         | 2367     | 139830      | 4                       |
|             |          |             | Virtualization: Enabled |
|             |          | L1 cache:   | 128 KB                  |
|             |          | L2 cache:   | 512 KB                  |
|             |          | L3 cache:   | 3,0 MB                  |
| Up time     |          |             |                         |
| 2:09:00:32  |          |             |                         |

**CPU** Intel(R) Celeron(R) CPU N3060@ 1.60GHz



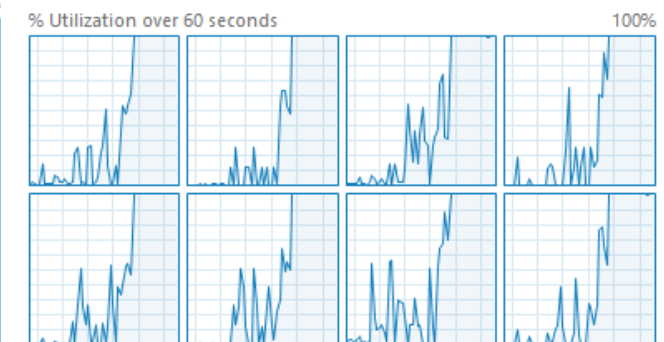
| Utilization | Speed    | Base speed: | 1,60 GHz                |
|-------------|----------|-------------|-------------------------|
| 14%         | 1,21 GHz | Sockets:    | 1                       |
|             |          | Cores:      | 2                       |
| Processes   | Threads  | Handles     | Logical processors:     |
| 75          | 1078     | 33902       | 2                       |
|             |          |             | Virtualization: Enabled |
|             |          | L1 cache:   | 112 KB                  |
|             |          | L2 cache:   | 2,0 MB                  |
| Up time     |          |             |                         |
| 13:12:31:28 |          |             |                         |

**CPU** Intel(R) Core(TM) i5-6600 CPU @ 3.30GHz



| Utilization | Speed    | Maximum speed: | 3,30 GHz                |
|-------------|----------|----------------|-------------------------|
| 2%          | 3,73 GHz | Sockets:       | 1                       |
|             |          | Cores:         | 4                       |
| Processes   | Threads  | Handles        | Logical processors:     |
| 79          | 1230     | 30139          | 4                       |
|             |          |                | Virtualization: Enabled |
|             |          | L1 cache:      | 256 KB                  |
|             |          | L2 cache:      | 1,0 MB                  |
|             |          | L3 cache:      | 6,0 MB                  |
| Up time     |          |                |                         |
| 19:01:46:10 |          |                |                         |

**CPU** Intel(R) Core(TM) i7-6700 CPU @ 3.40GHz



| Utilization | Speed    | Maximum speed: | 3,40 GHz                 |
|-------------|----------|----------------|--------------------------|
| 100%        | 3,67 GHz | Sockets:       | 1                        |
|             |          | Cores:         | 4                        |
| Processes   | Threads  | Handles        | Logical processors:      |
| 59          | 746      | 20337          | 8                        |
|             |          |                | Virtualization: Disabled |
|             |          |                | Hyper-V support: Yes     |
|             |          | L1 cache:      | 256 KB                   |
|             |          | L2 cache:      | 1,0 MB                   |
|             |          | L3 cache:      | 8,0 MB                   |
| Up time     |          |                |                          |
| 0:00:22:59  |          |                |                          |

Mengenal  
system  
komputer

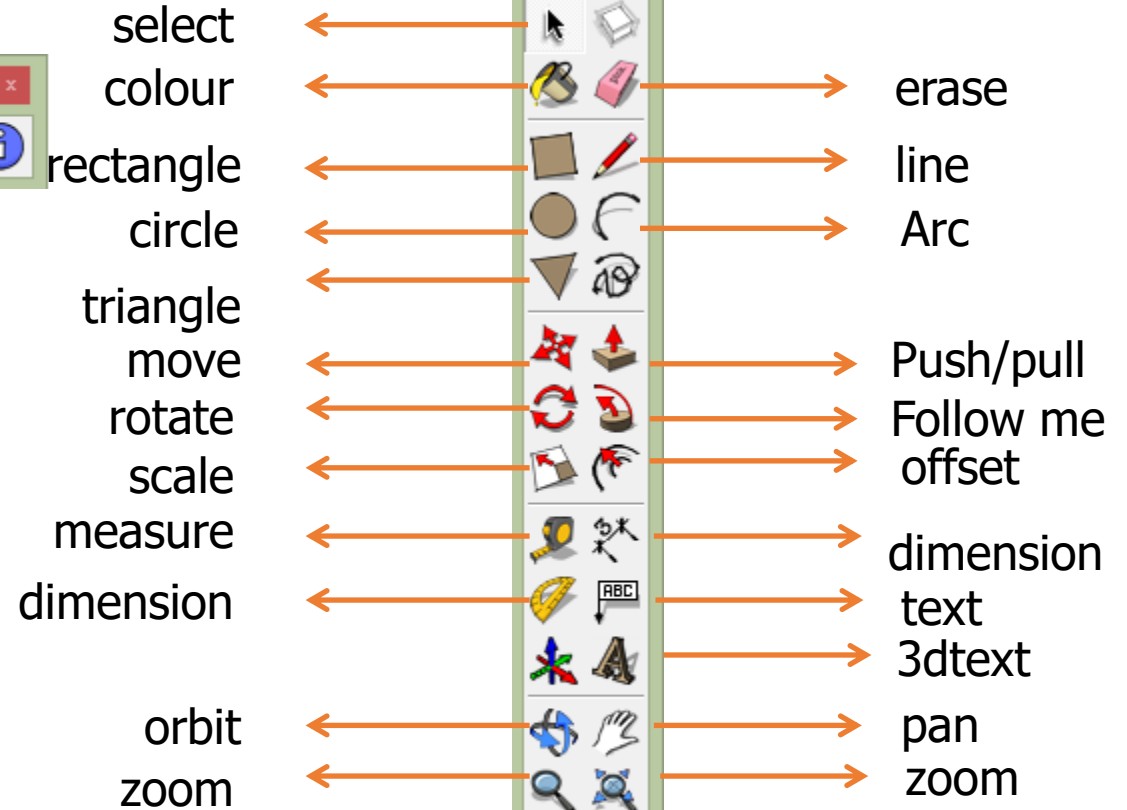
# dasar

## Belajar sketchup



Standar toolbar  
Merupakan tool standar untuk memulai membuka, menyimpan, mengedit, seperti pada aplikasi ms word

## Memahami toolbar



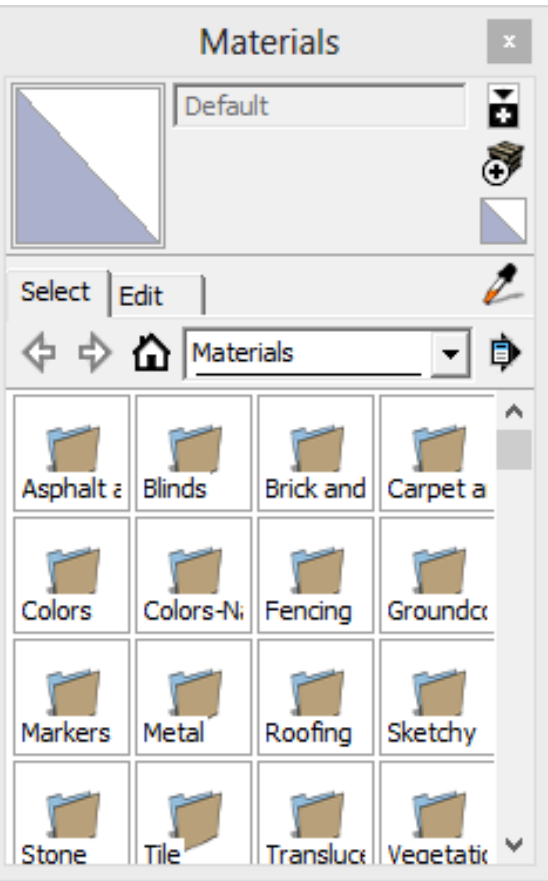
Large tool set, berisi tombol operasi inti yang penting di sketchup



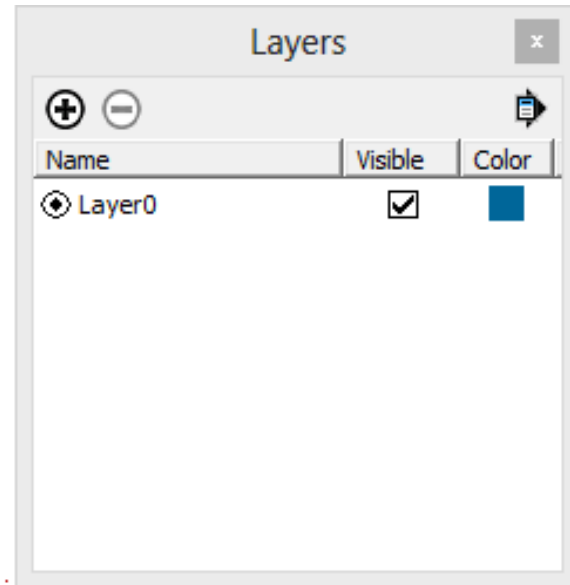
View berisi, tombol arah hadap model



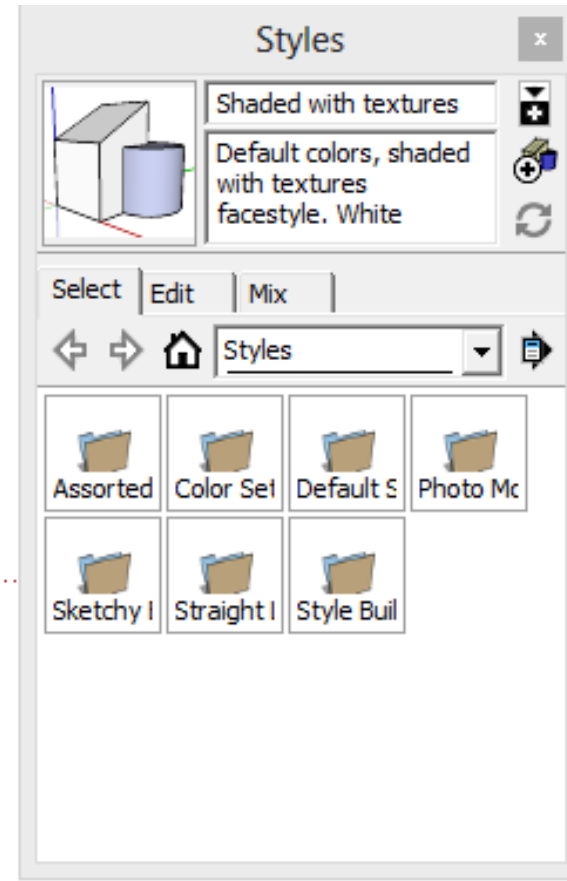
# dasar



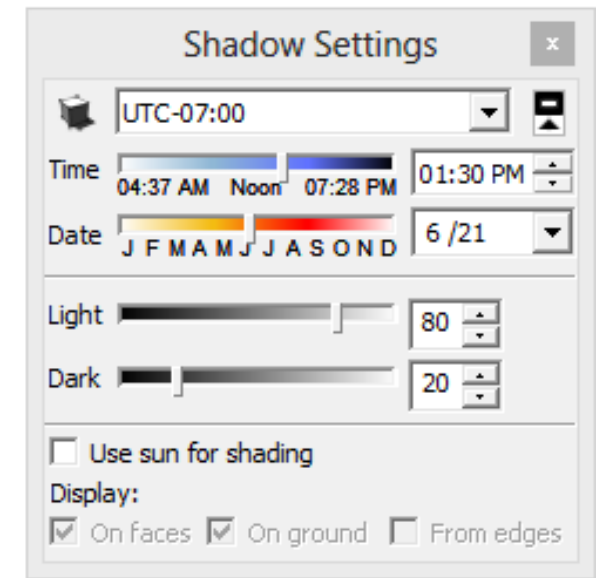
Material, berisi pilihan bahan yang dipakai seperti warna & tekstur



Layers berisi pengelompokan objek



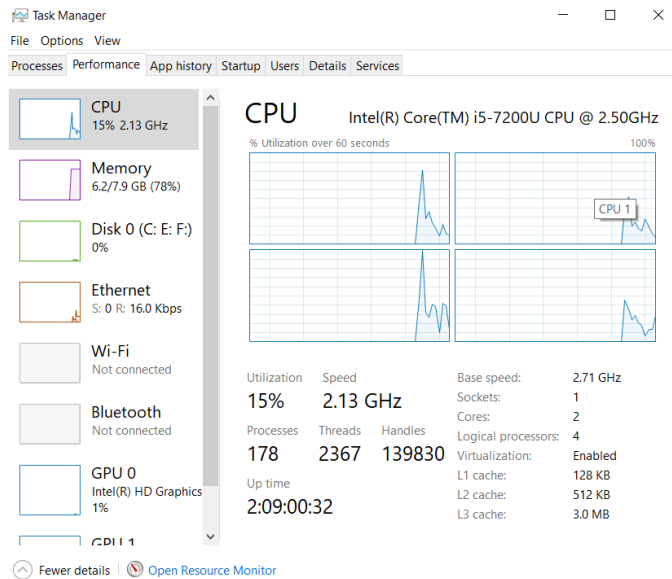
Style berisi gaya yang dipakai dalam tampilan utama



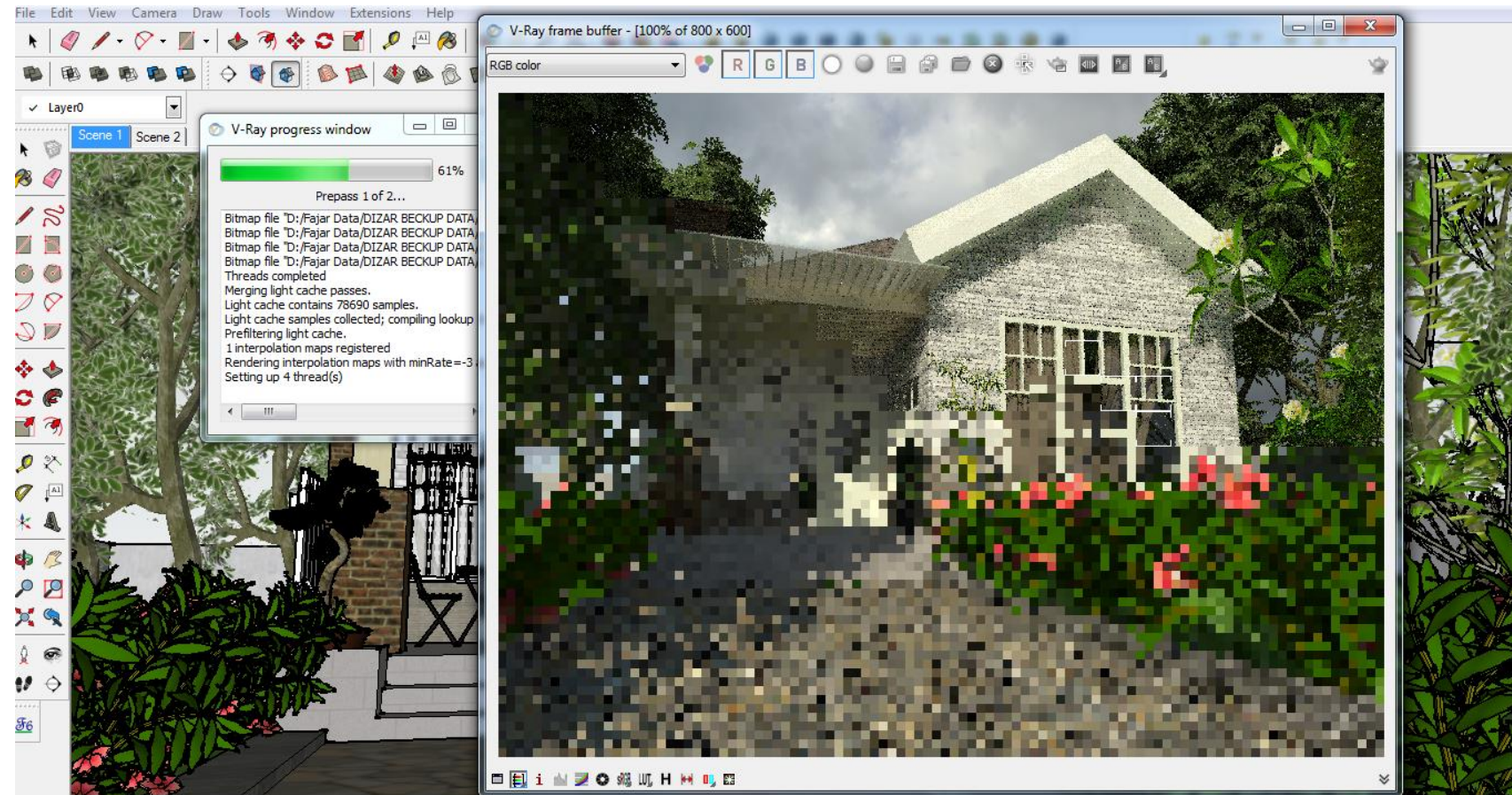
Shadow berisi tatanan bayangan objek berdasar matahari

# Apa itu rendering ?

sederhananya **rendering** adalah suatu proses membangun / menampilkan gambar melalui data - data berupa objek yang disertai texture, sudut pandang, pencahayaan, informasi bayangan serta banyak lagi, yang diproses sehingga menghasilkan suatu output berupa gambar digital.



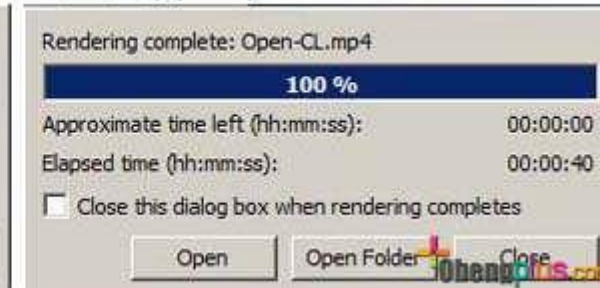
Rendering ada 2 :  
Output image dan animation



## CPU only



## CPU + GPU (OpenCL)

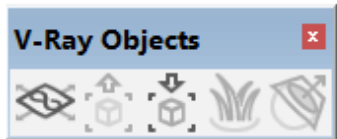
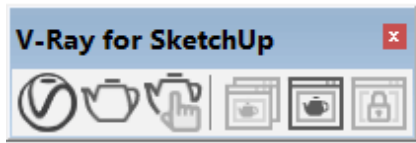




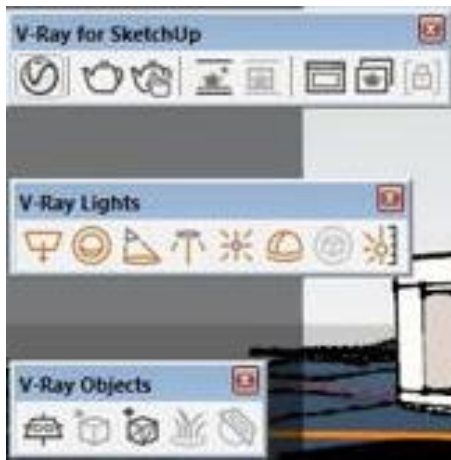
# 3. Pengenalan Vray Sketchup versi 2.0, 3.4 dan 3.6



Vray 2.0 Sketchup 2016

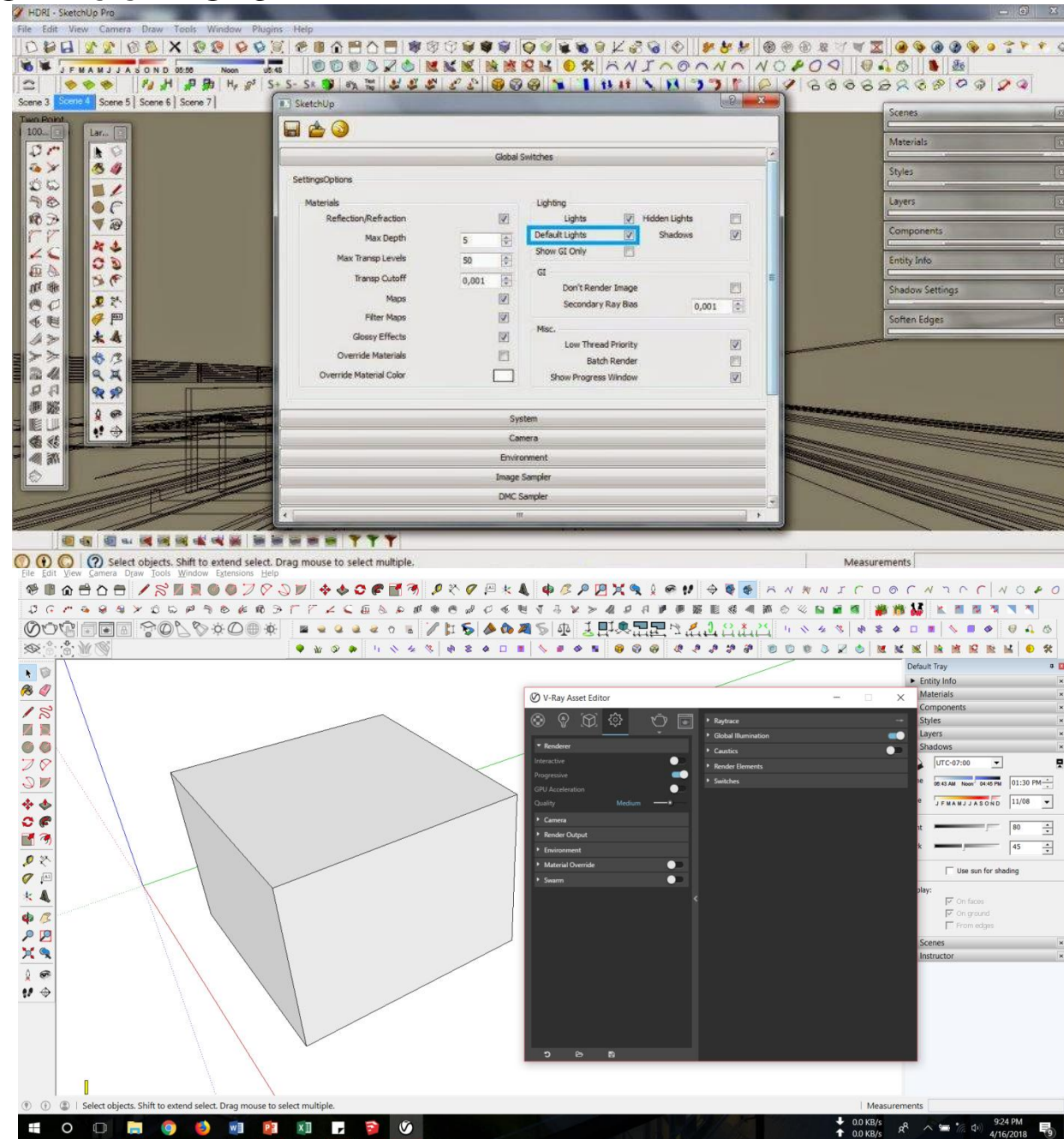


Vray 3.4 Sketchup 2017



Pada dasarnya kita harus menguasai 1 macam software render secara penuh, daripada mengenal bermacam software tetapi tidak menguasai, misal podium & keyshot. Pada Vray versi 2 sedikit berbeda dengan versi 3.4 dan 3.6. Secara tampilan dan fitur-fiturnya

Vray 3.6 Sketchup 2018

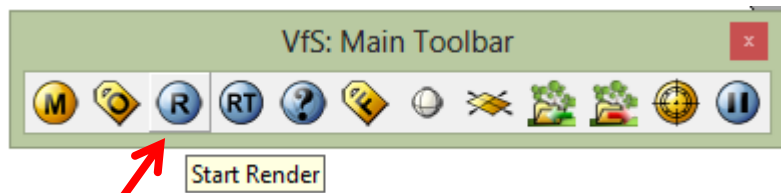




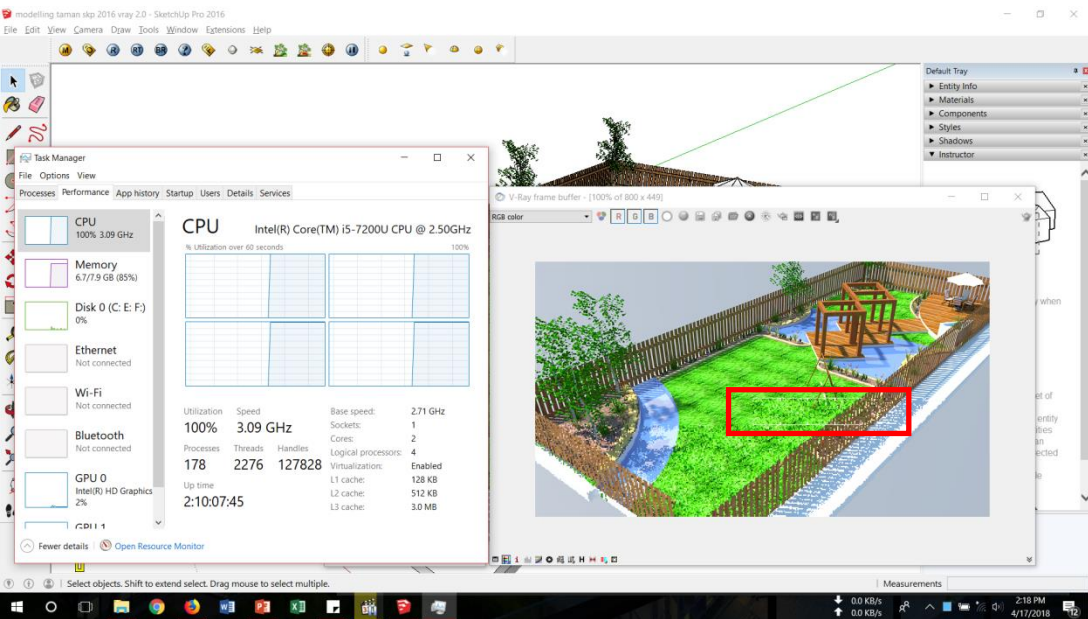
# Rendering image sederhana dengan Vray 2.0



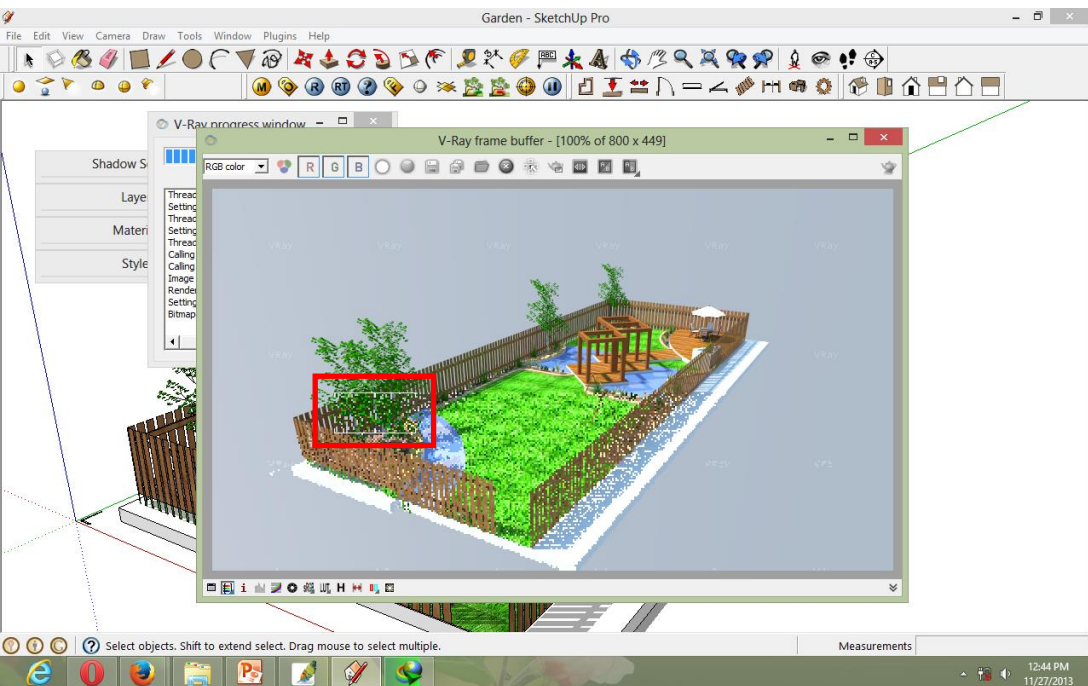
1. Bukalah file skp sebelumnya
2. Coba renderlah dengan setting default





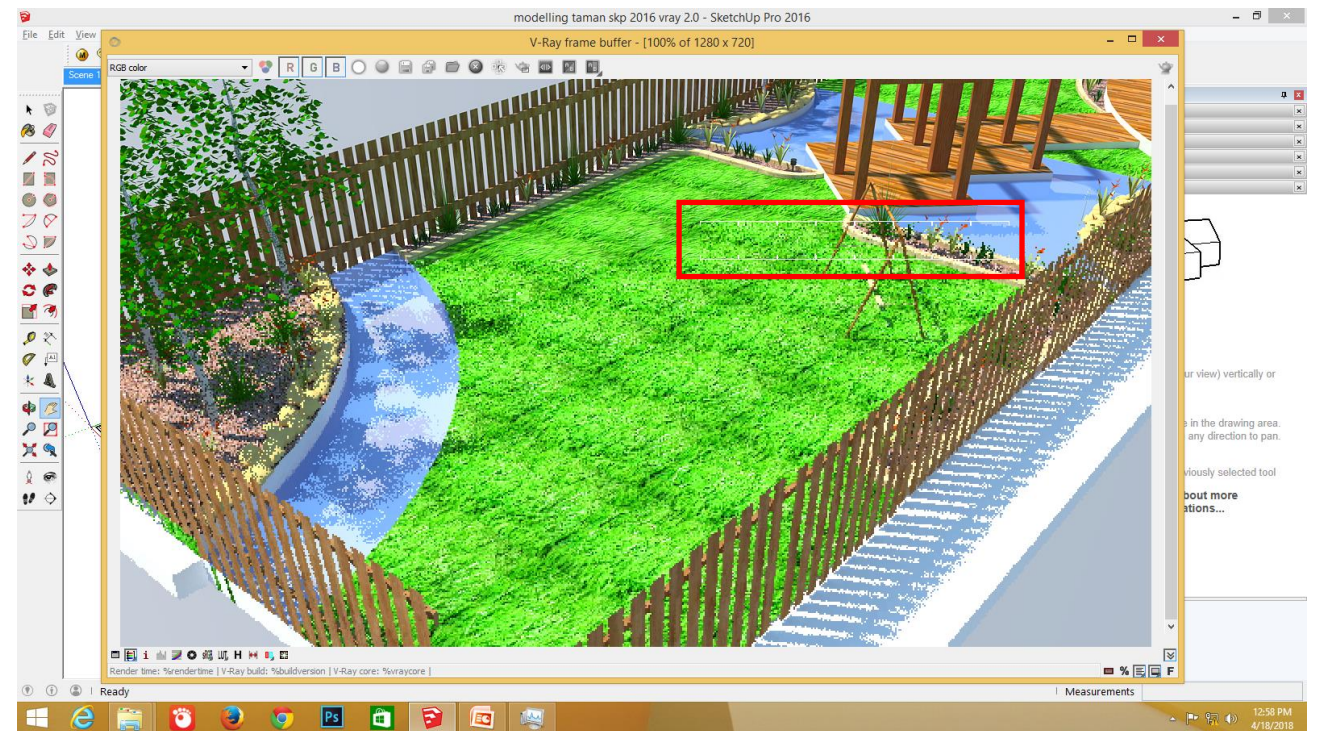


Core i5 7200U jumlah thread 4, waktu 5 menit 24 detik



Core 2 duo jumlah thread 2

Gunakan software render untuk menjadikan gambar sketchup menjadi tampak nyata. Umumnya sekarang arsitek menggunakan vray. Prinsip kerjanya menggunakan kemampuan prosesor komputer. Semakin besar prosesor akan semakin cepat. Hal ini ditunjukkan dengan jumlah kotak (thread) saat render.



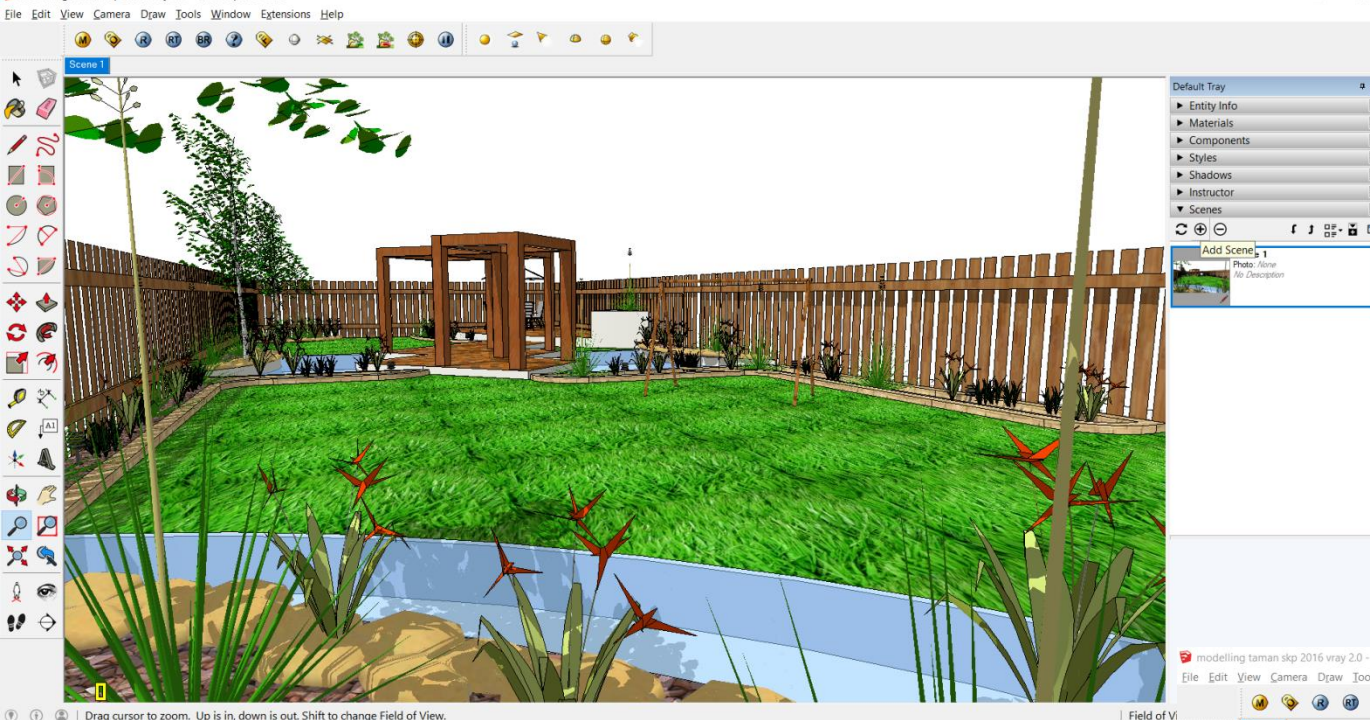
Core i7 6700 jumlah thread 8, waktu 4 menit 22 detik



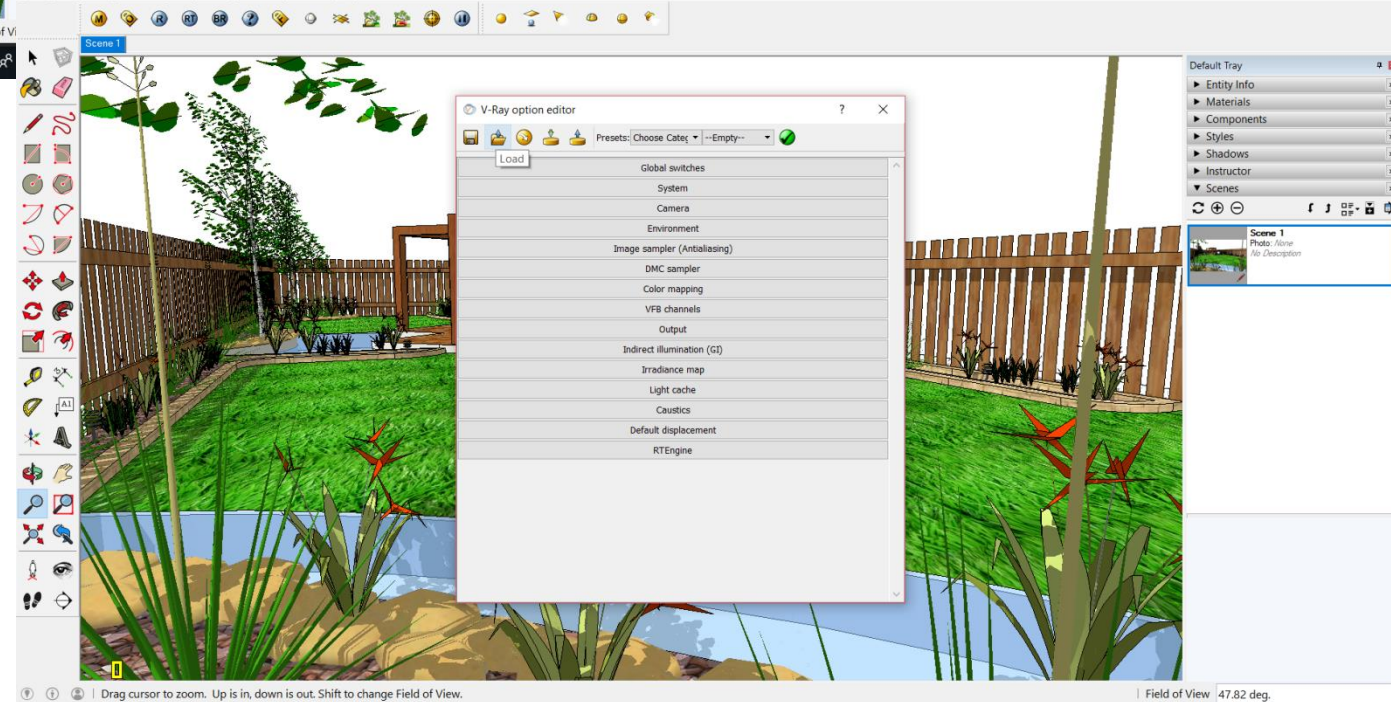


Render time: 0h 5m 24.5s | V-Ray build: Unknown revision - compiled on Nov 24 2015 at 18:28:29 | V-Ray core: 2.00.02 |



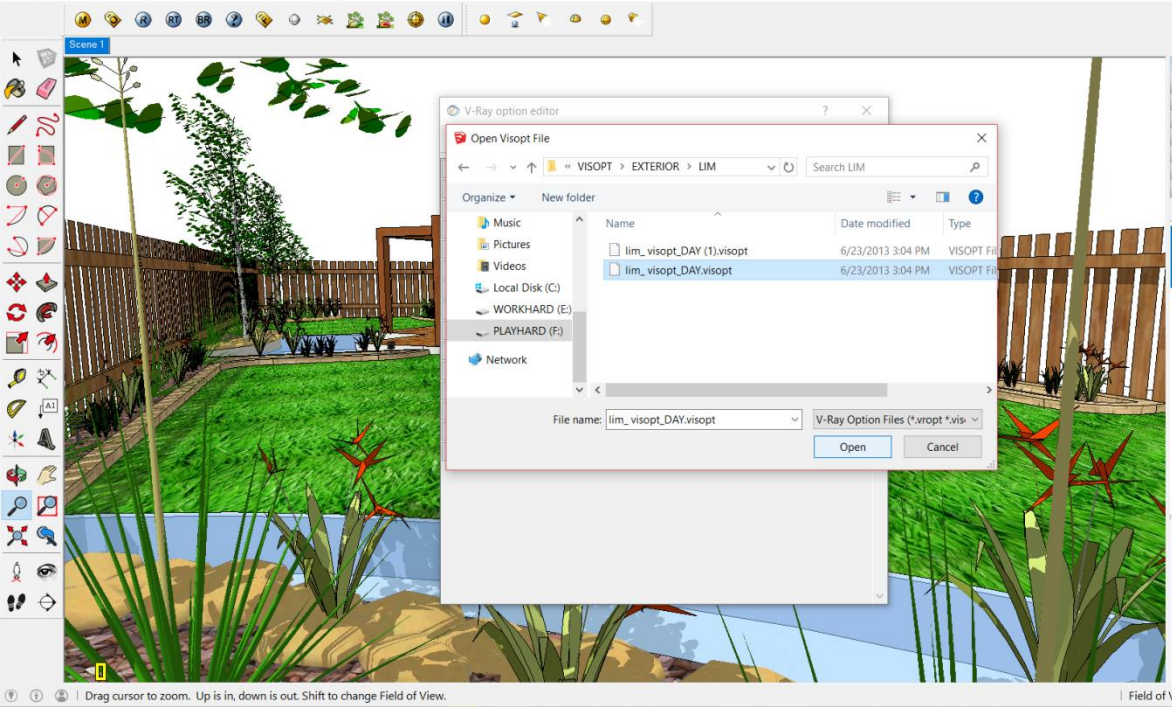


2. Keluarkan vray option, di dalamnya banyak terdapat menu-menu penting



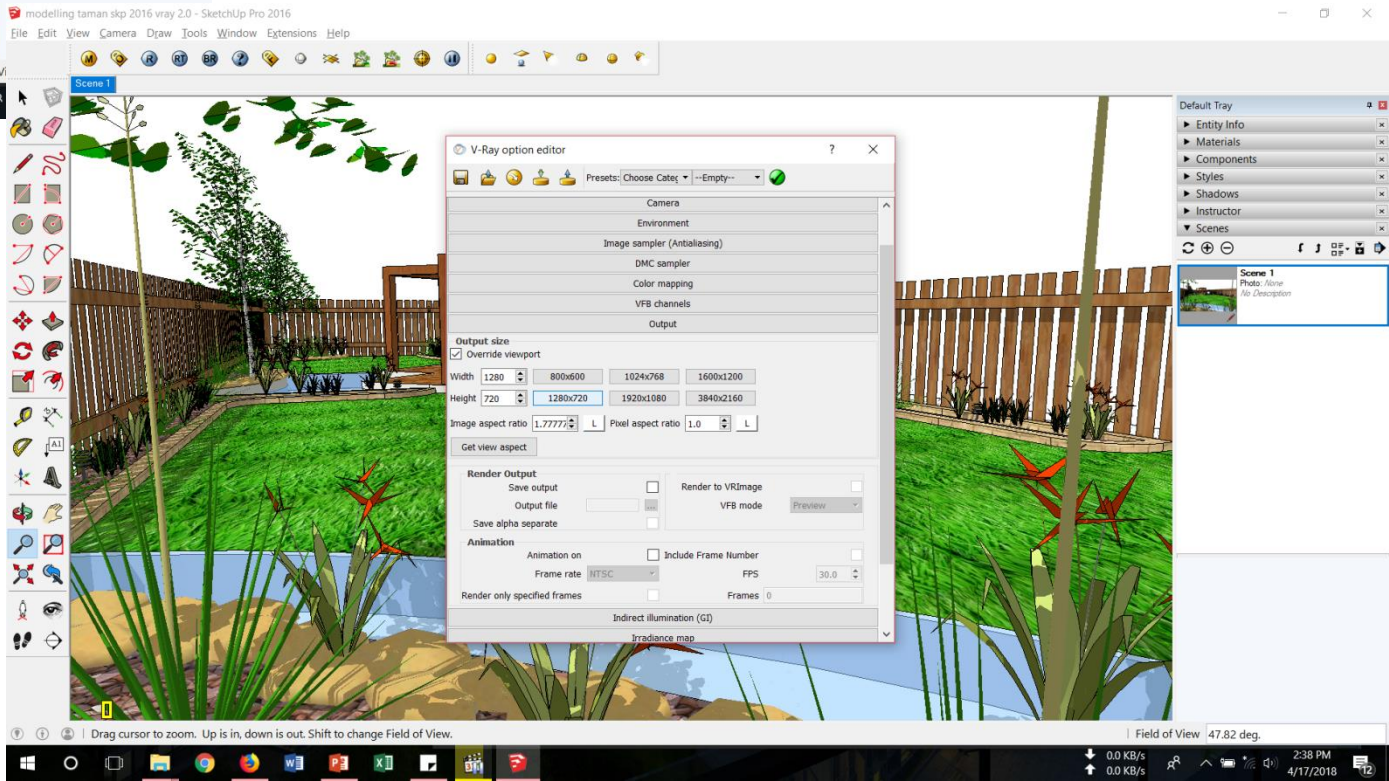
1. Pilihlah view yang terbaik dan simpanlah dalam scene



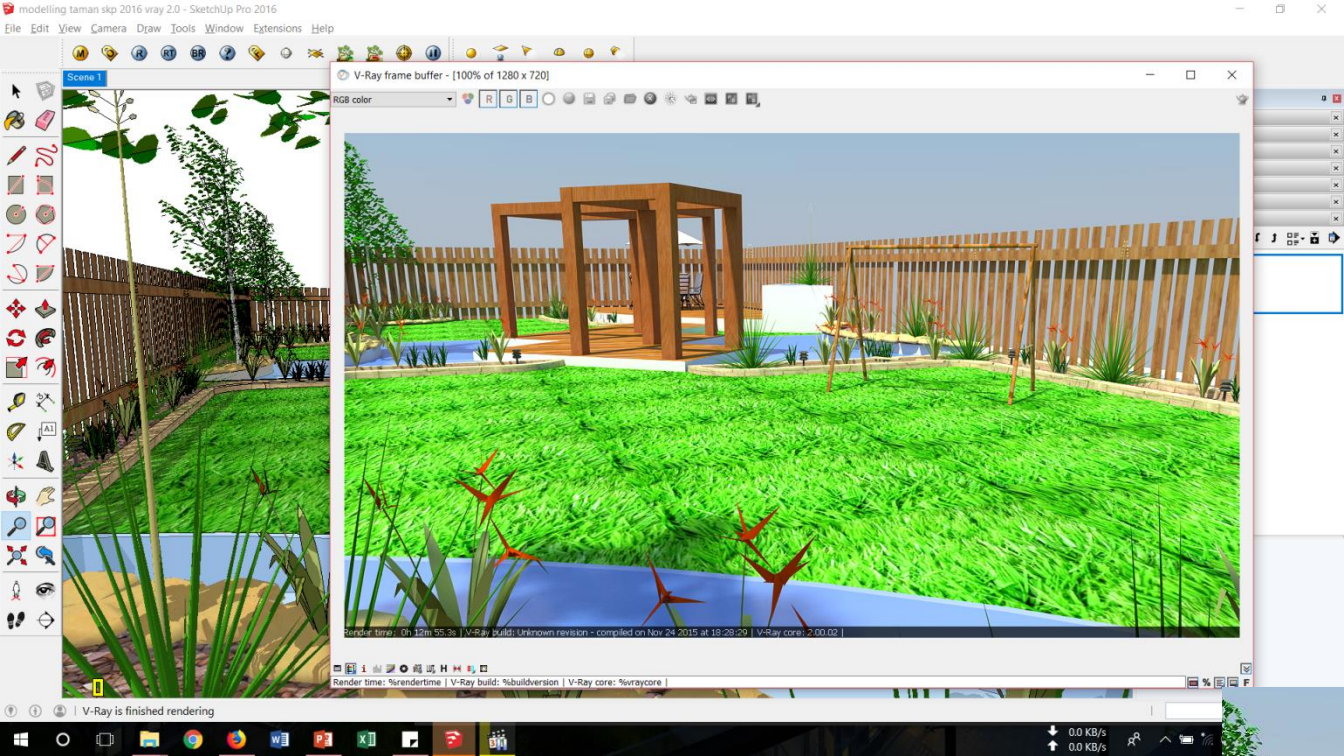


3. Setingan vray option yang di custom oleh orang bisa kita pakai untuk model skp kita dengan cara memasukkan vsopt misal punya liem

4. Render output bisa kita setting, untuk gambar draft cukup resolusi kecil, sedangkan gambar final bisa resolusi maksimal

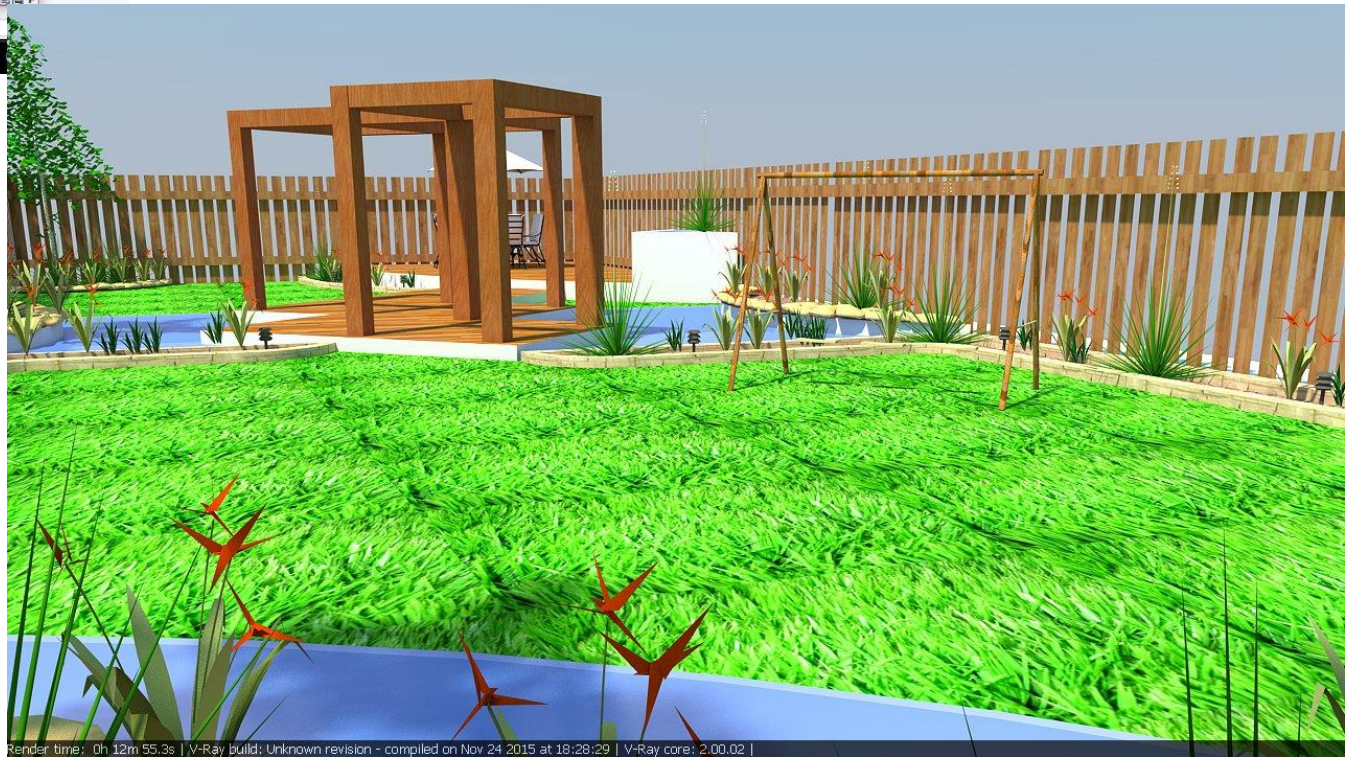




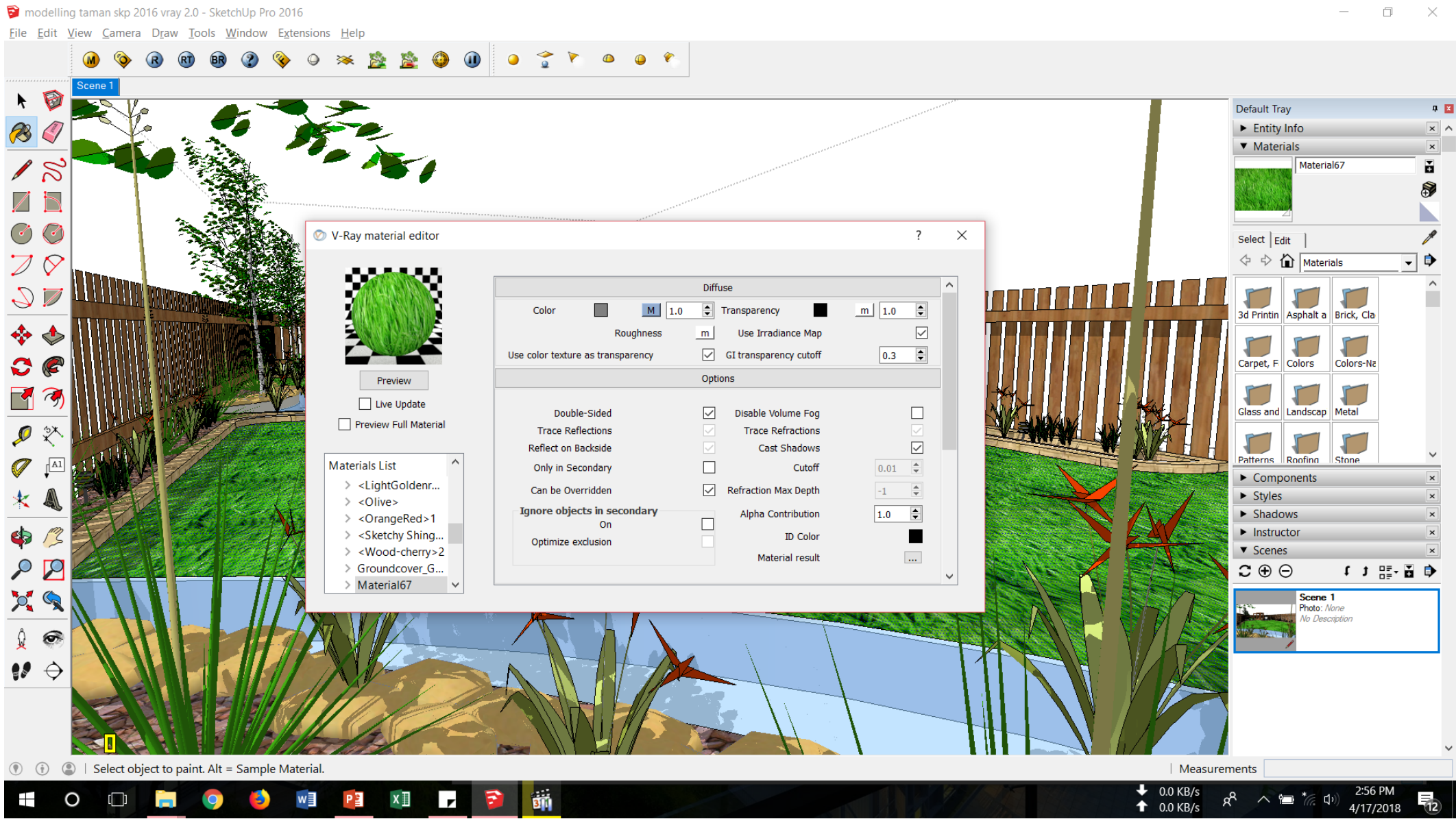


6. Hasil render bisa dalam bentuk jpg

5. Coba render file dengan menekan huruf R



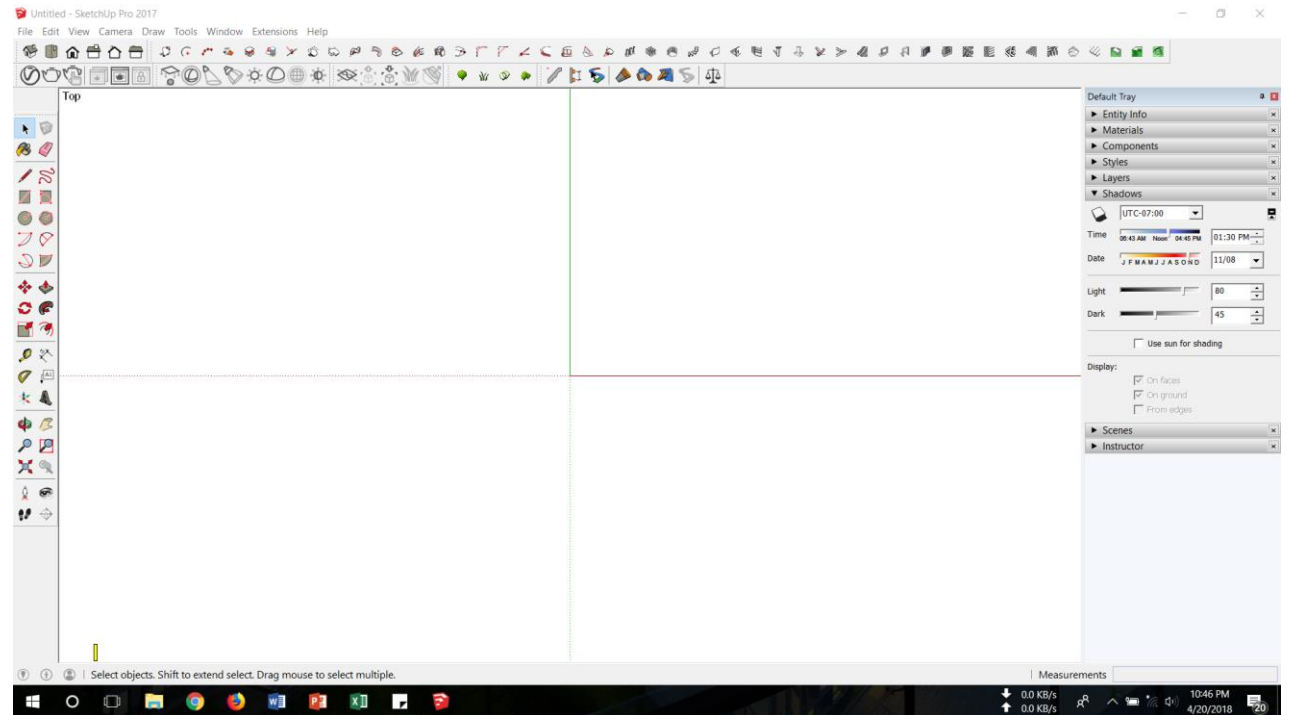
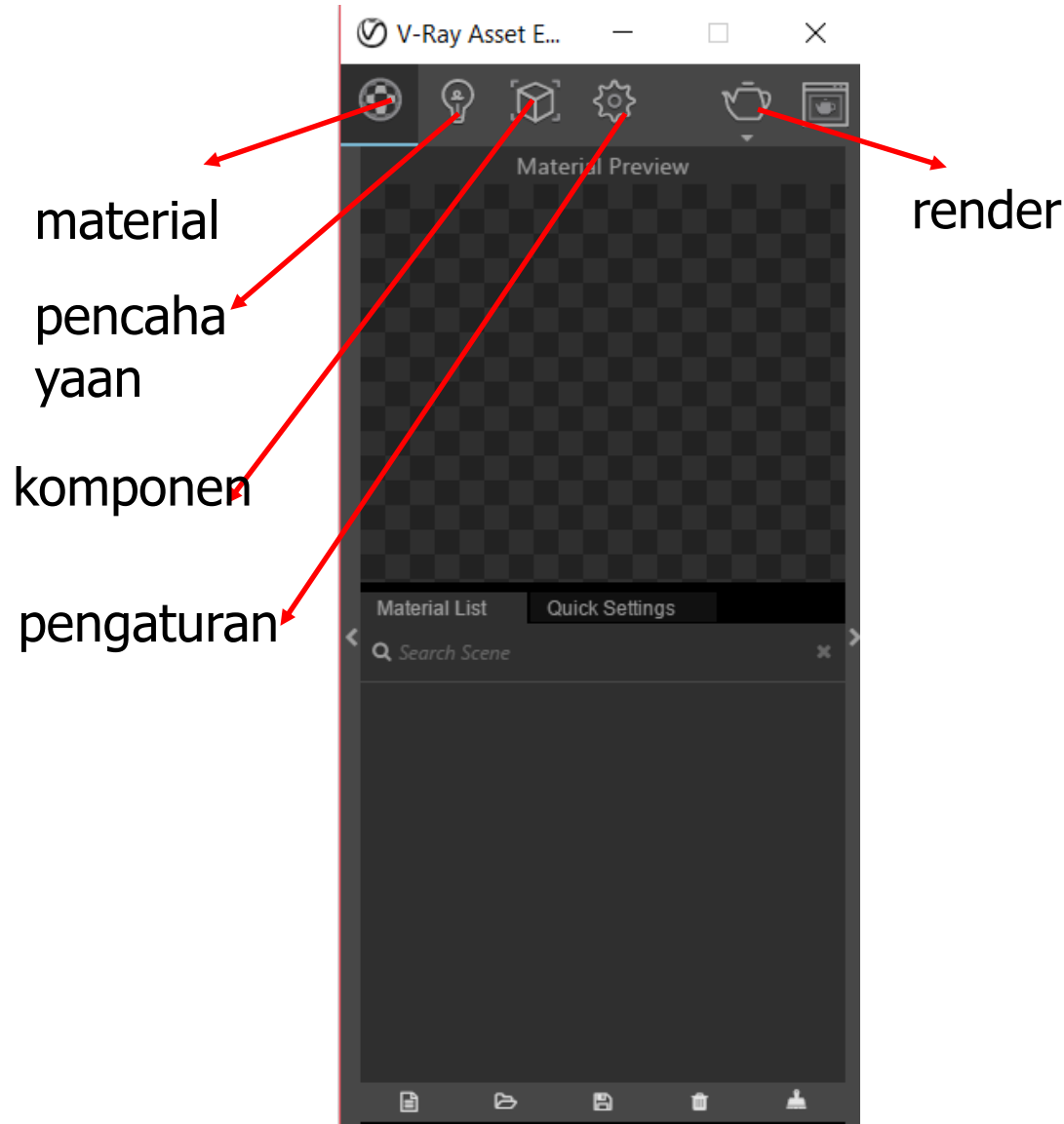




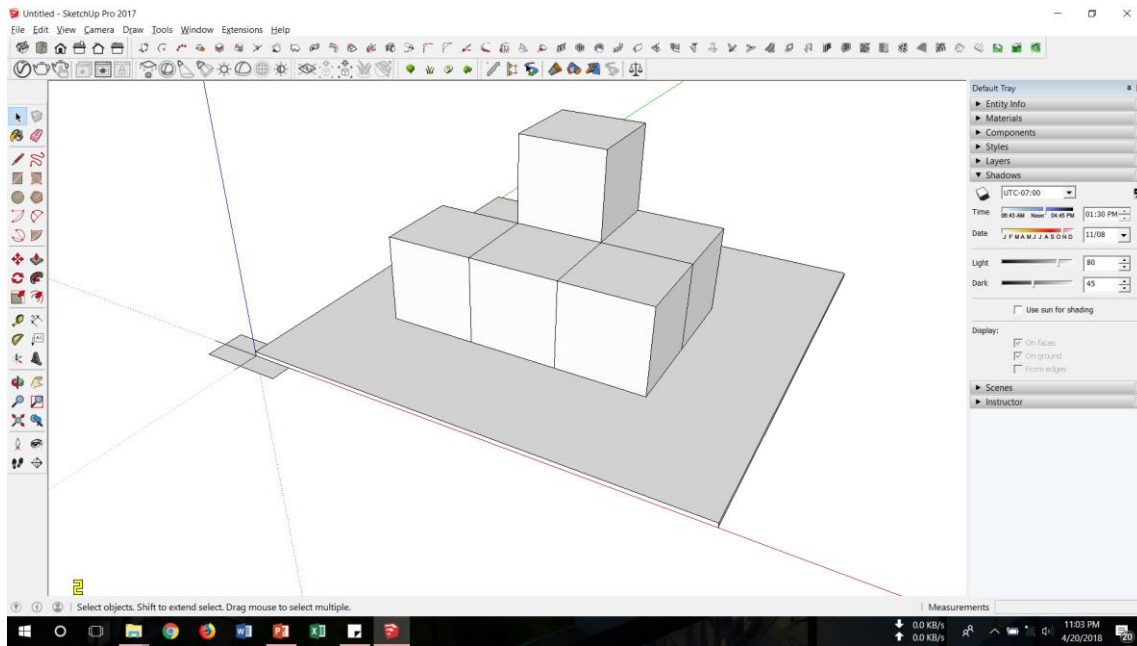
7. Settinglah material-material, kuncinya ada di refleksi dan refraksi objek



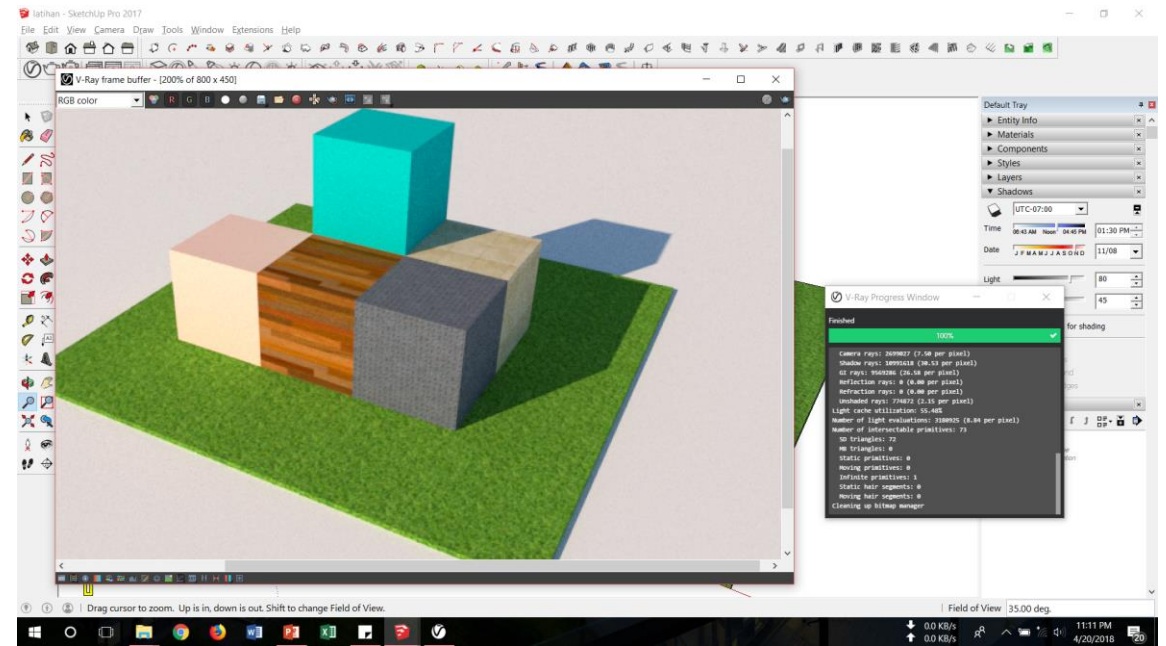
# Rendering image sederhana dengan Vray 3.4 + skp 2017



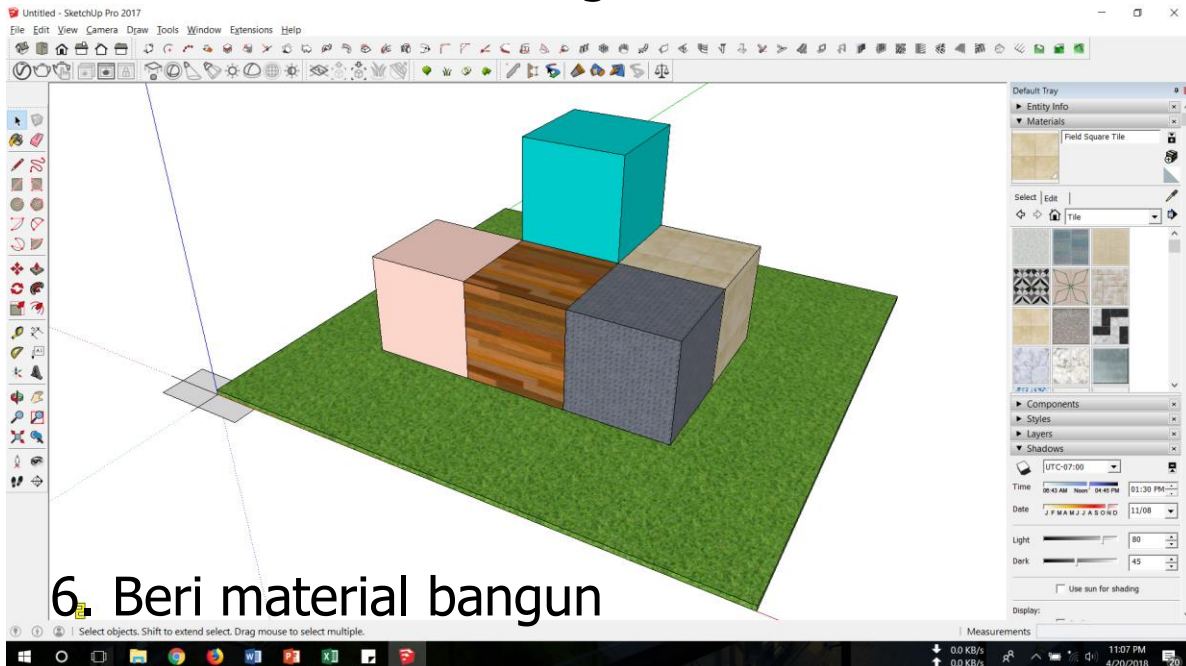
1. Bukalah sketchup 2017 yang terinstal vray 3.4
2. Buatlah komponen infinite plane
3. Buatlah Objek rumput dengan ukuran 5000mmx5000mm
4. Buatlah kubus-kubus dengan ukuran 1000mmx1000mm



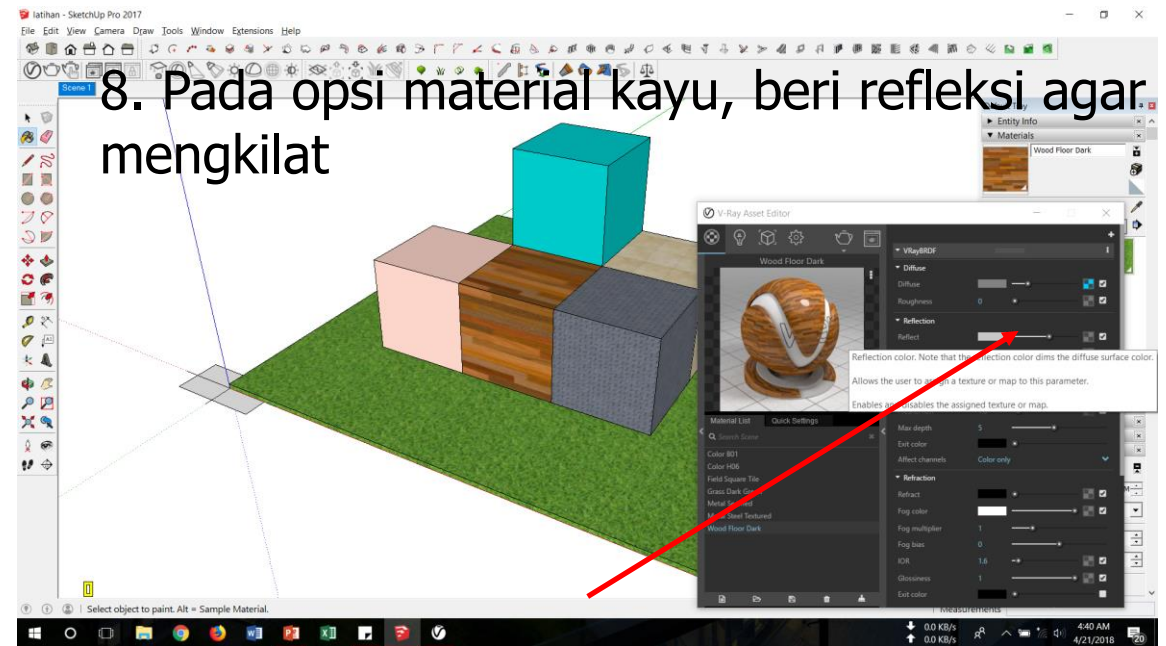
5. Hasil bentukan bangun



7. Coba render bangun tersebut

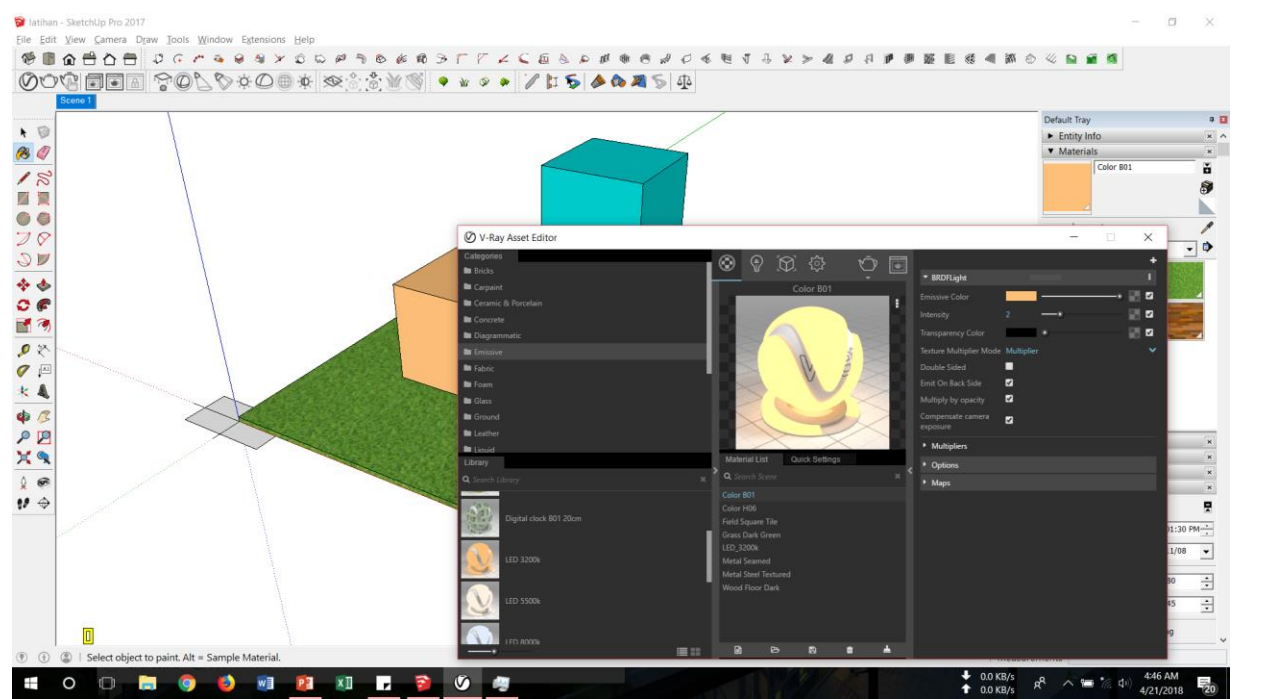
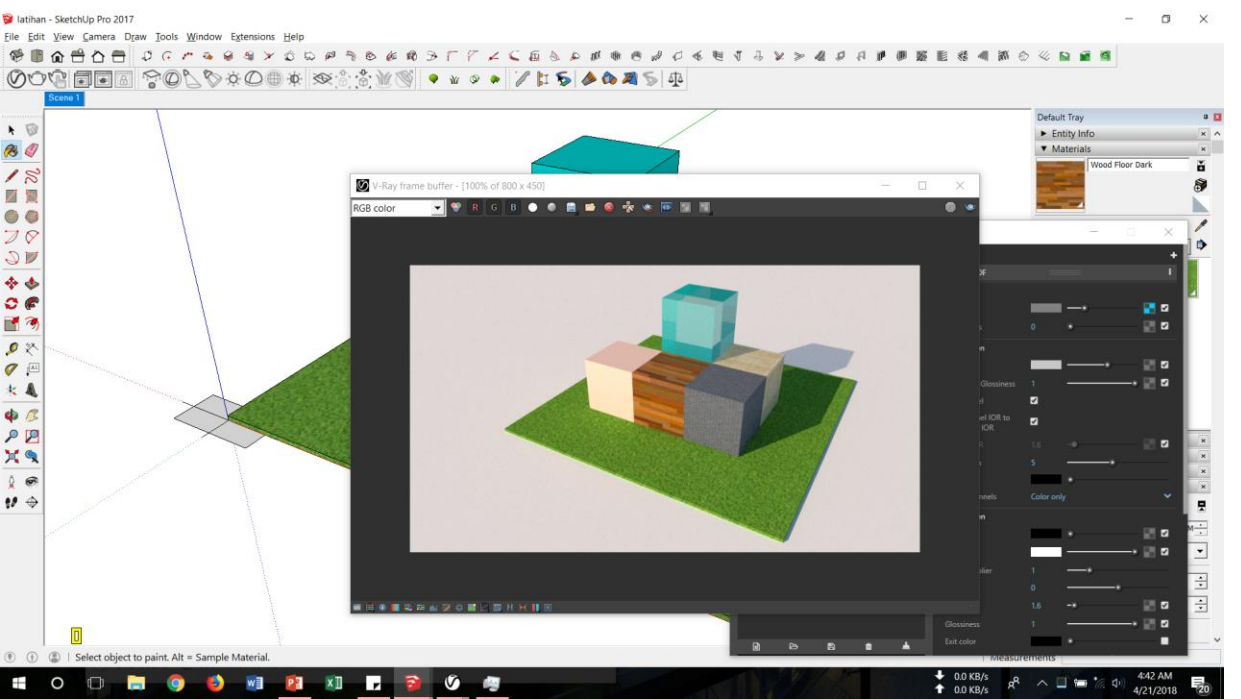
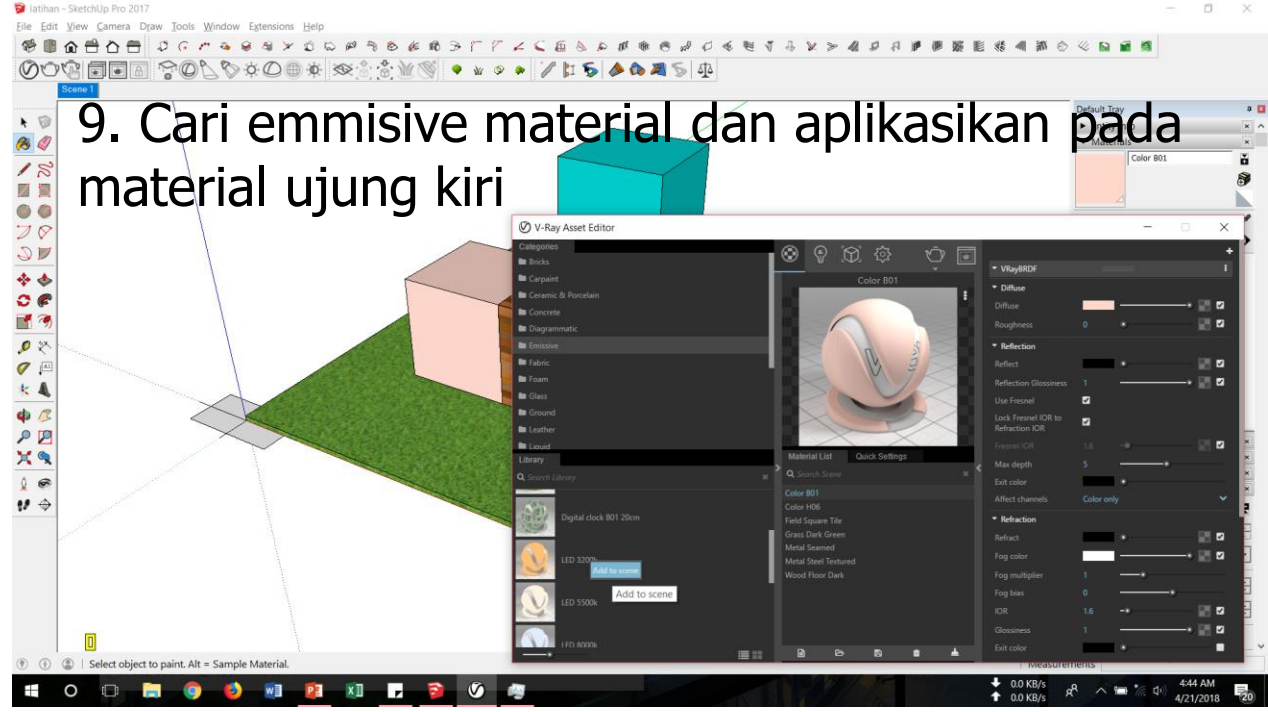
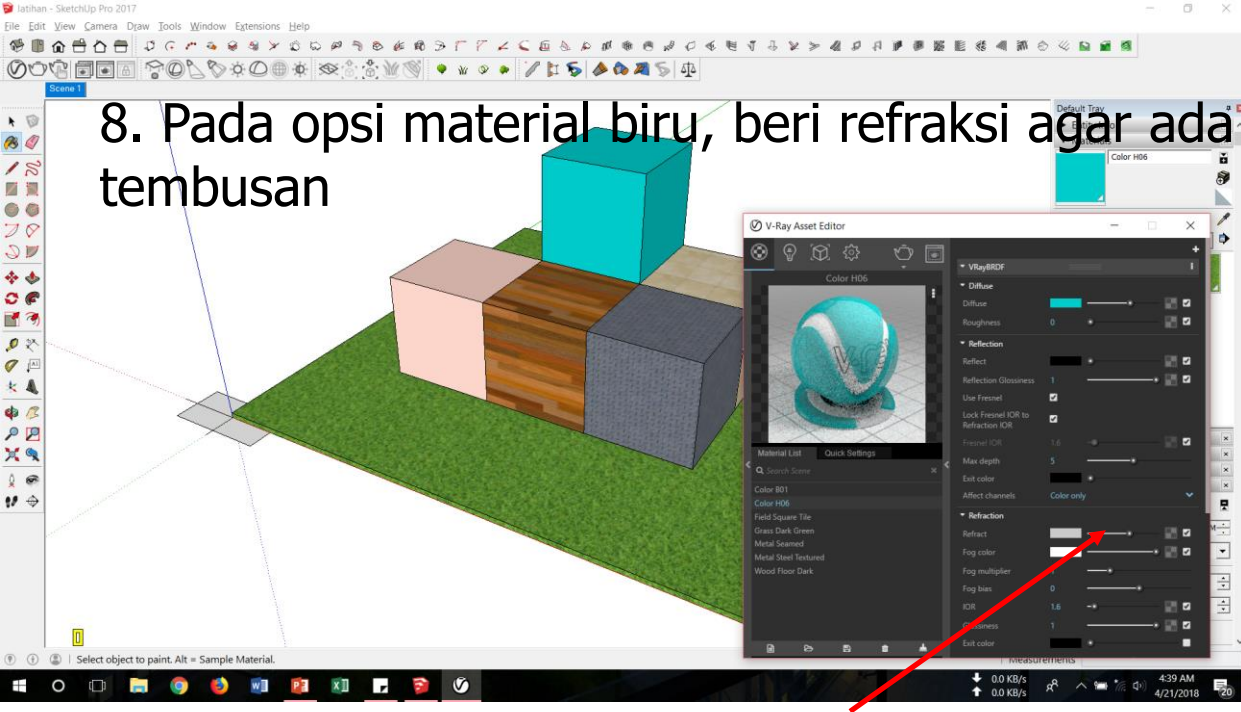


6. Beri material bangun

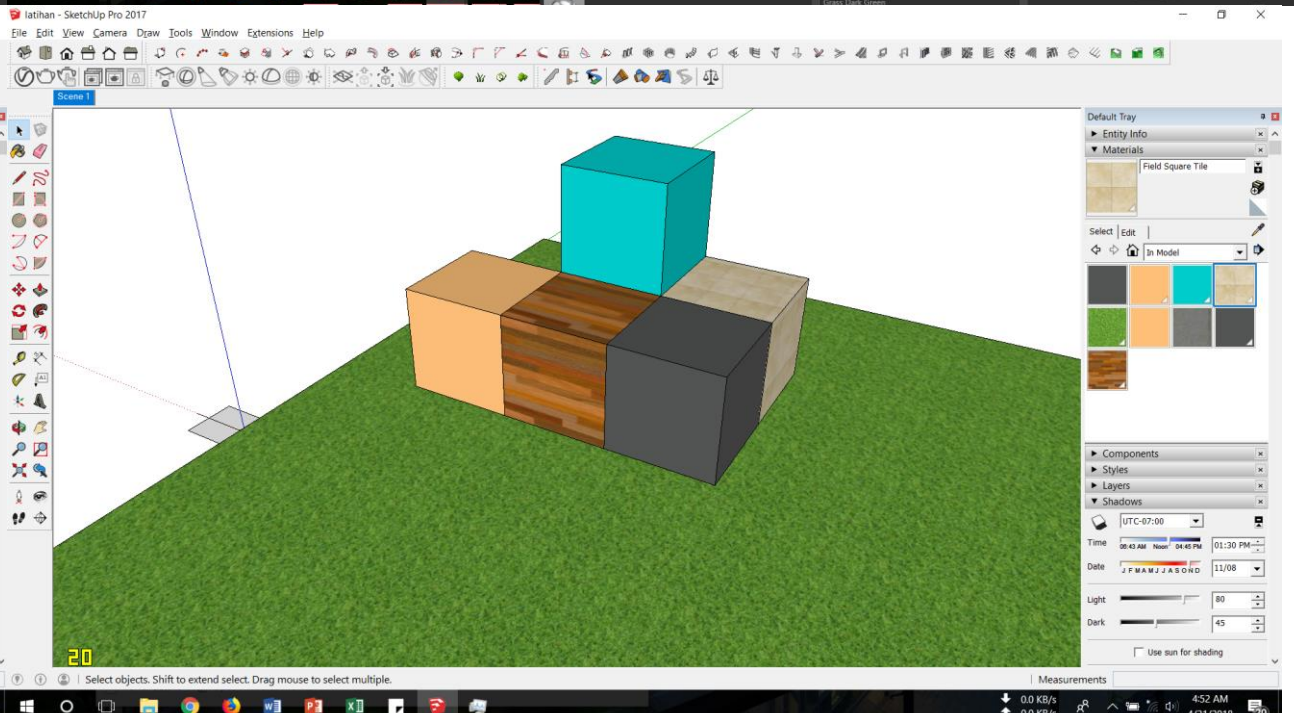
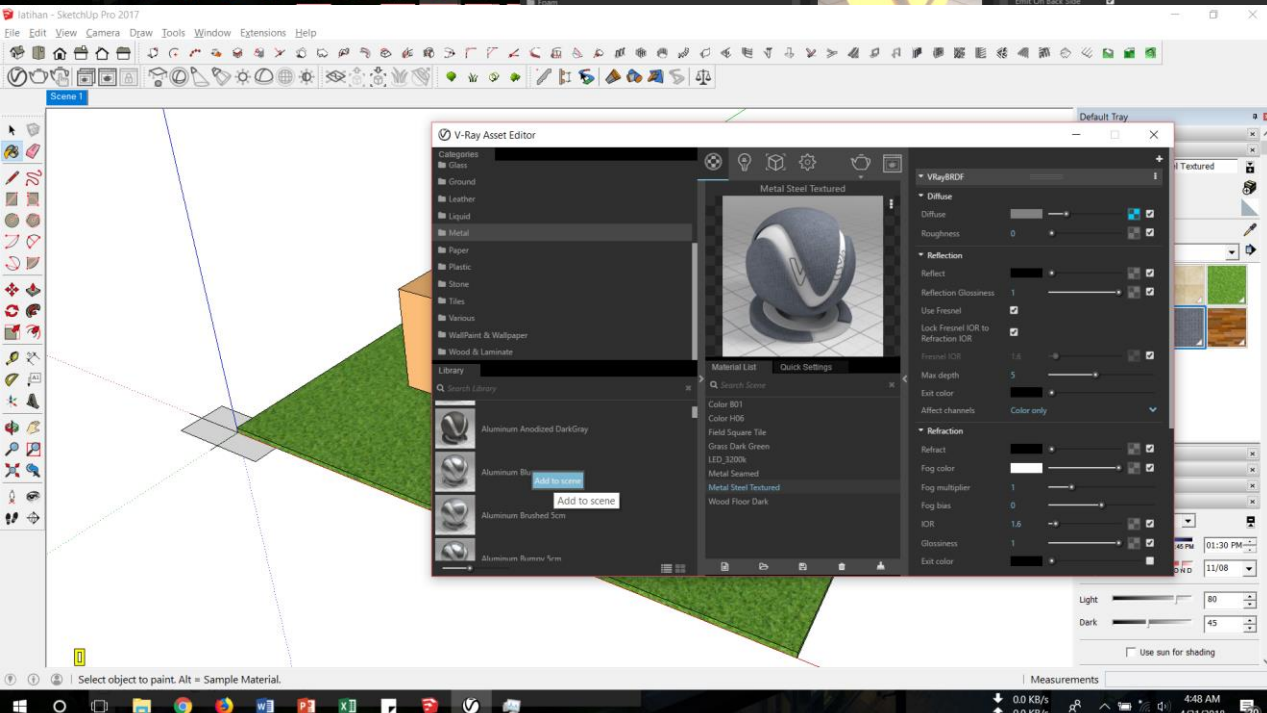
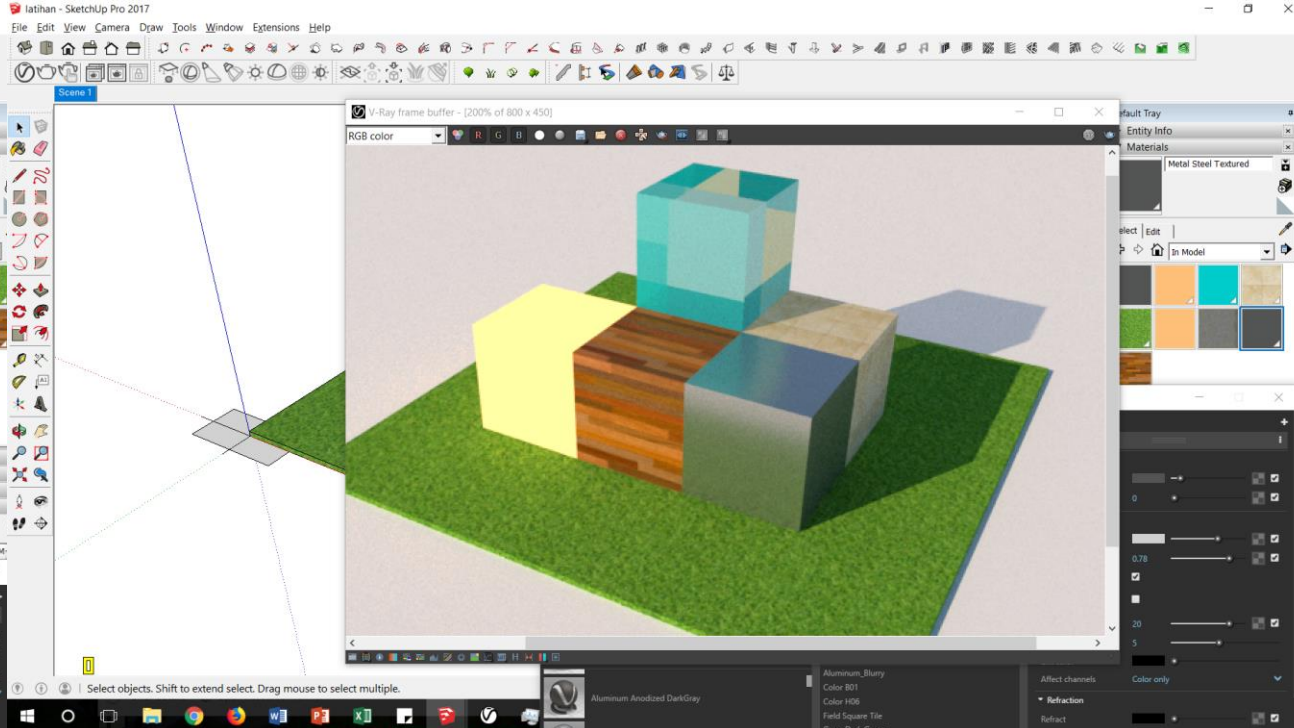
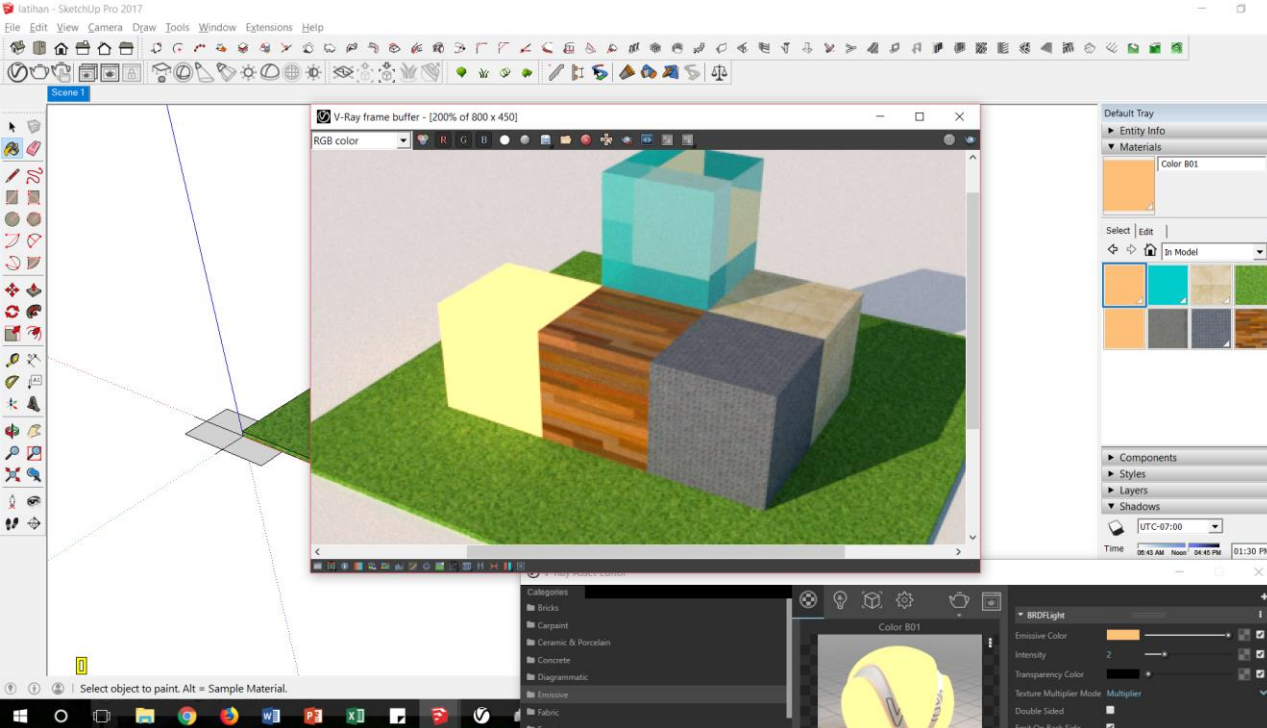


8. Pada opsi material kayu, beri refleksi agar mengkilat

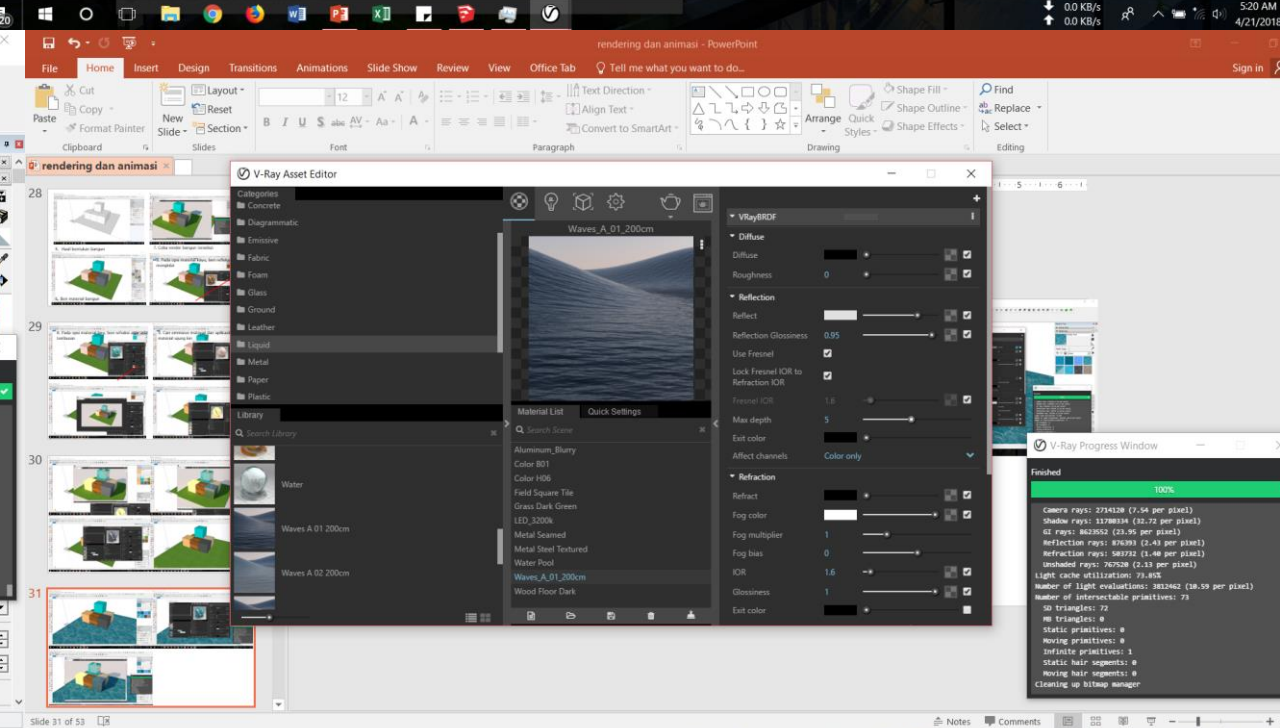
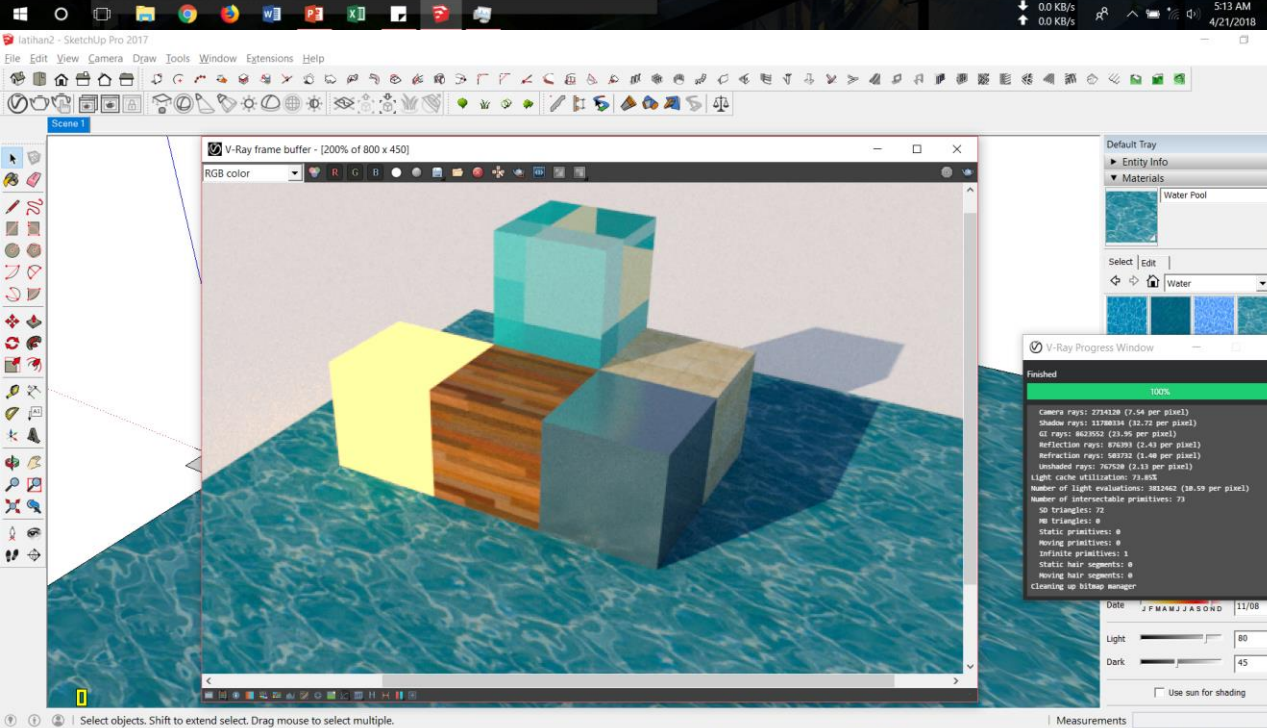
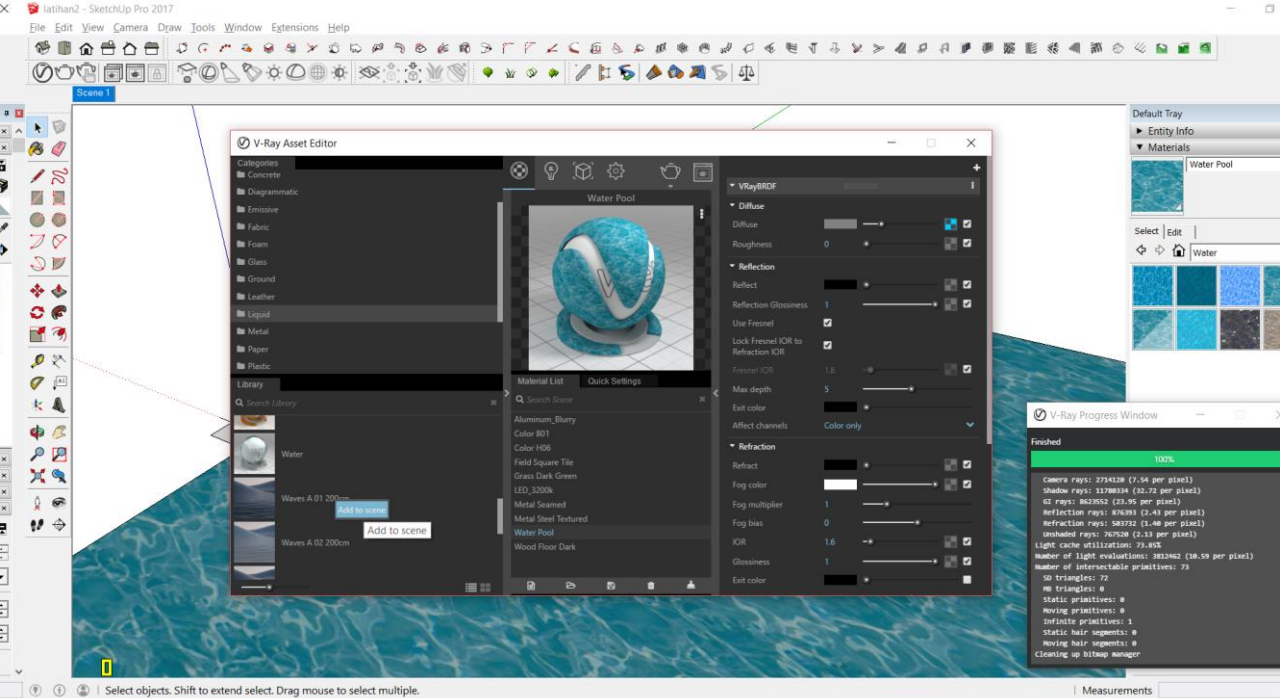
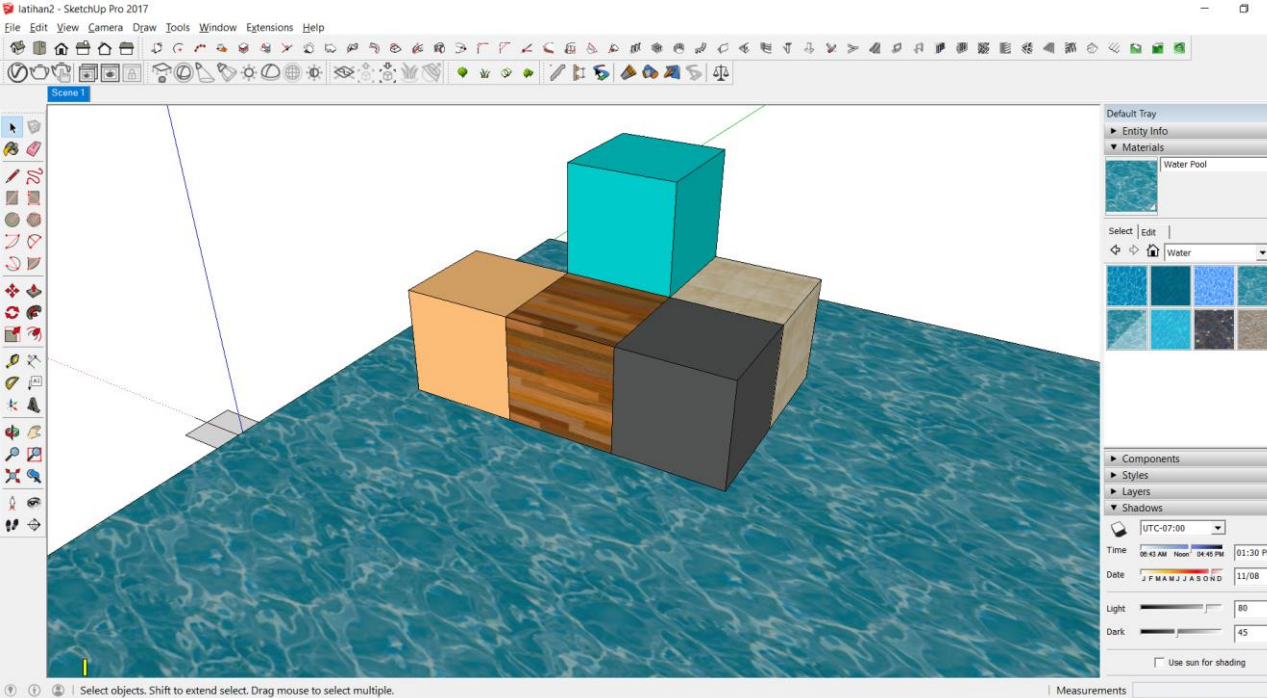




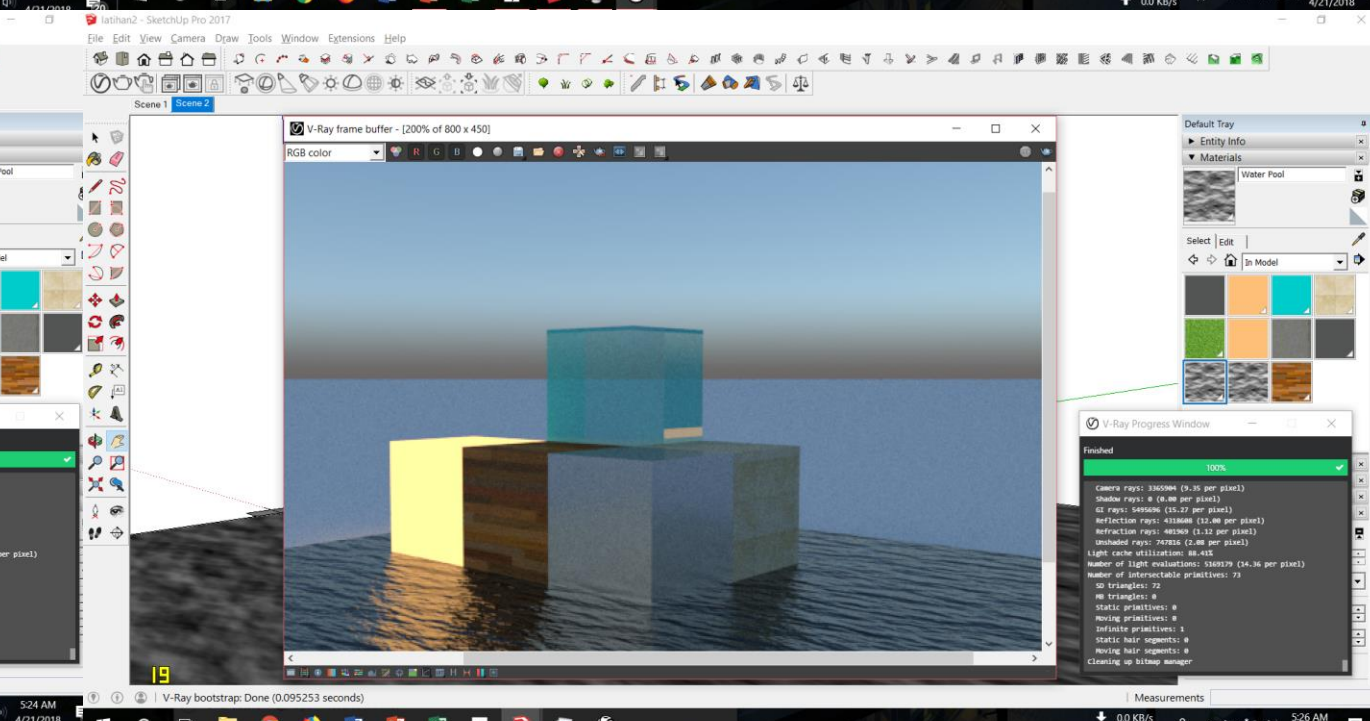
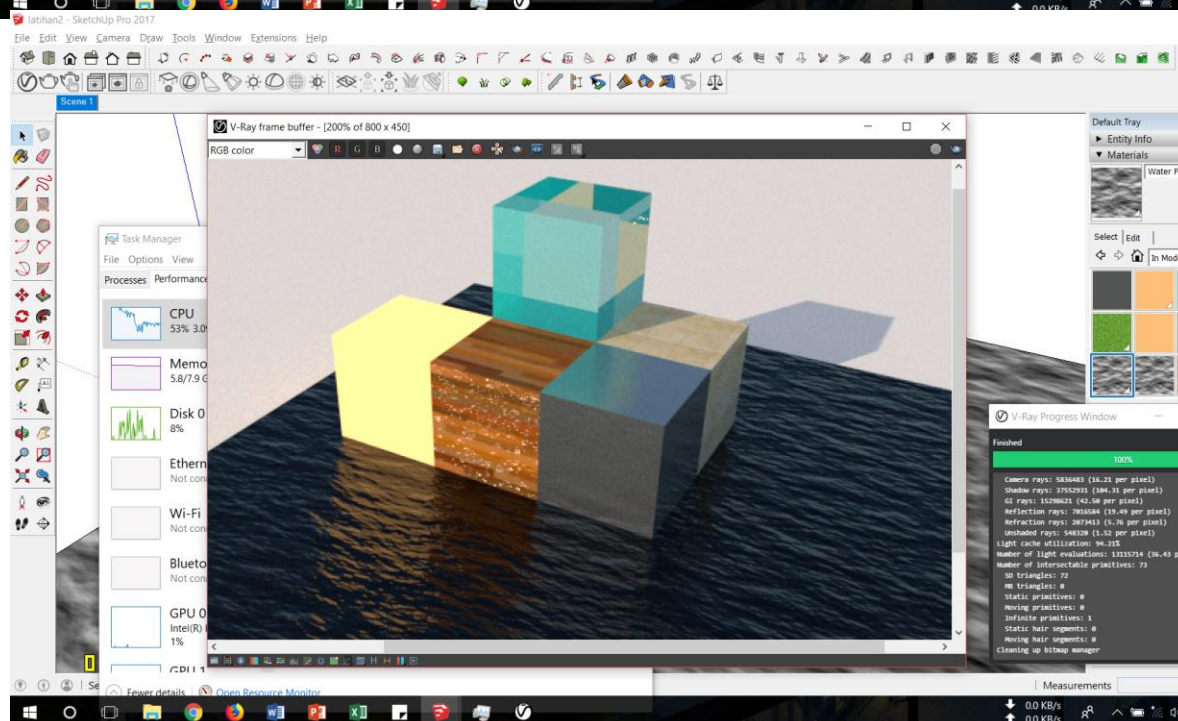
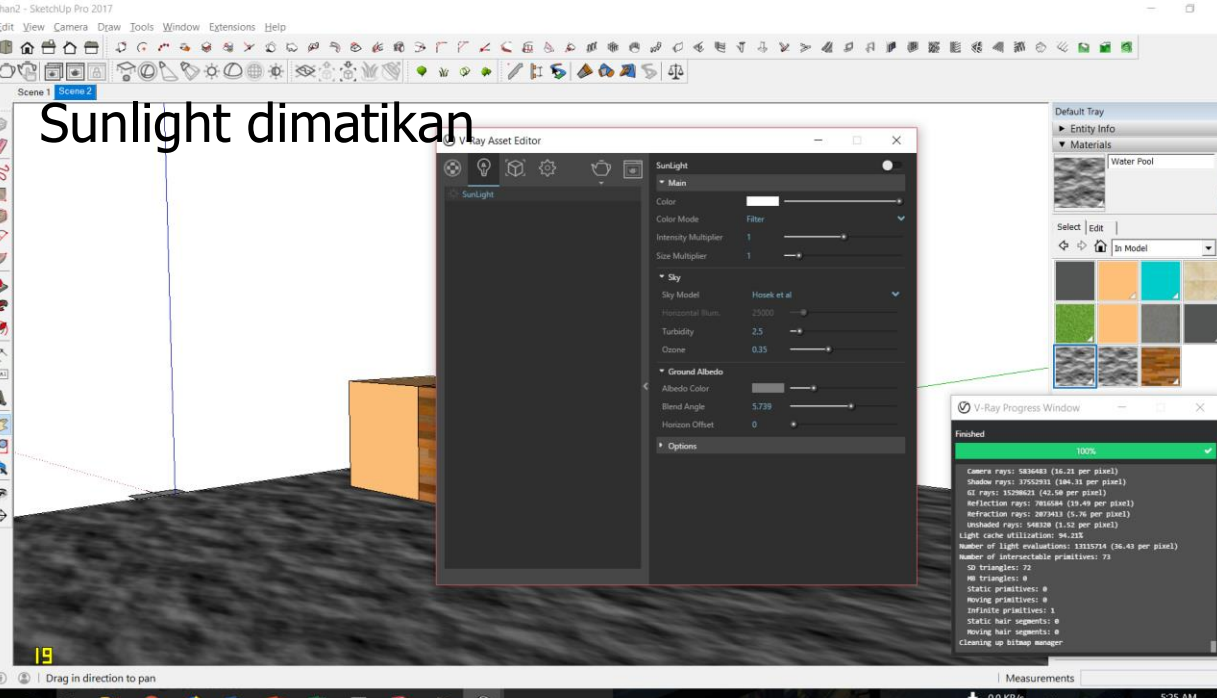
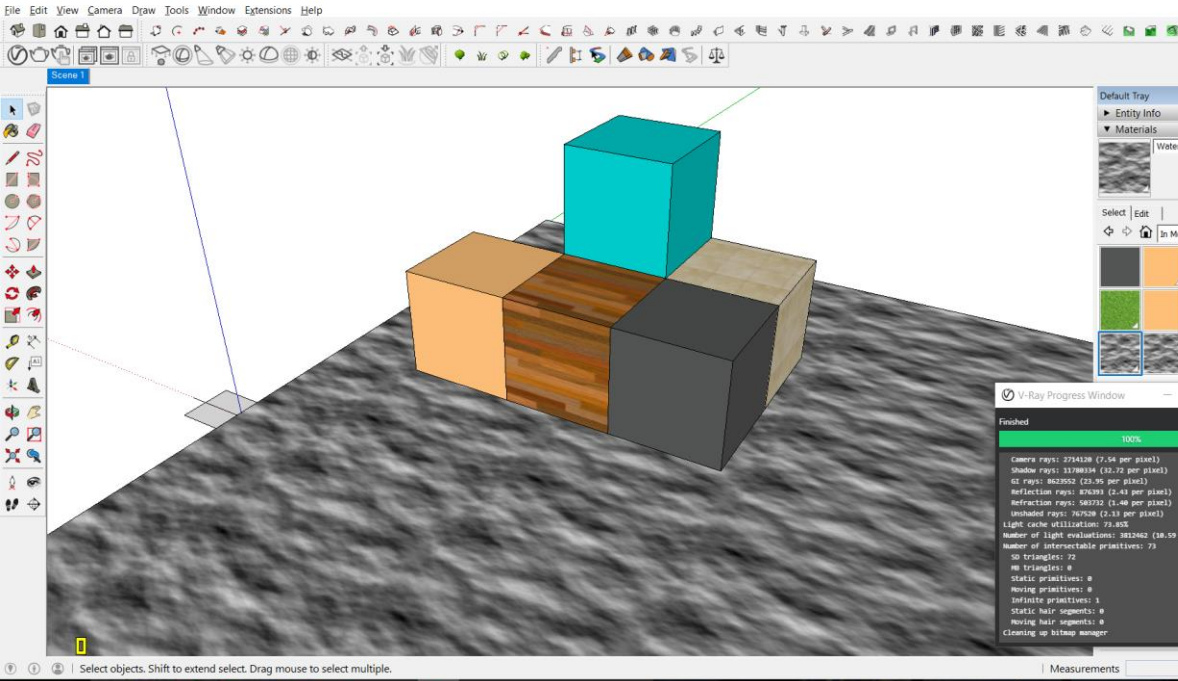




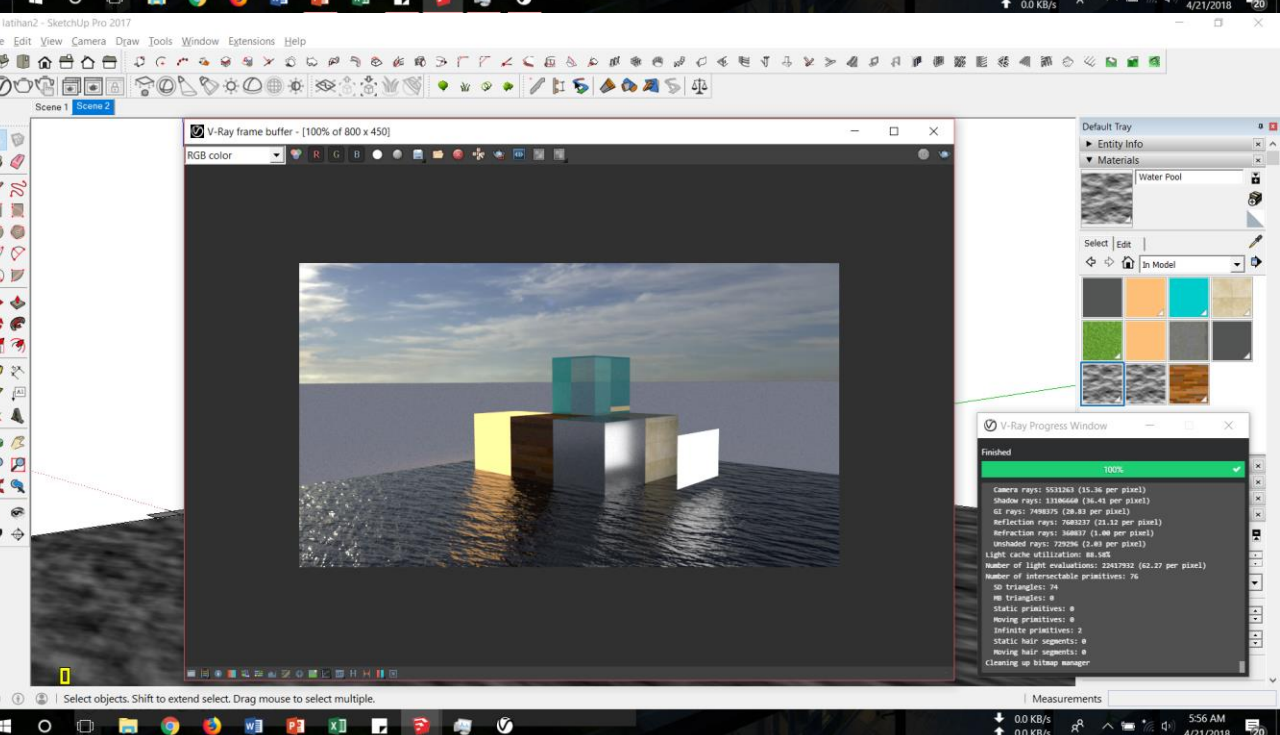
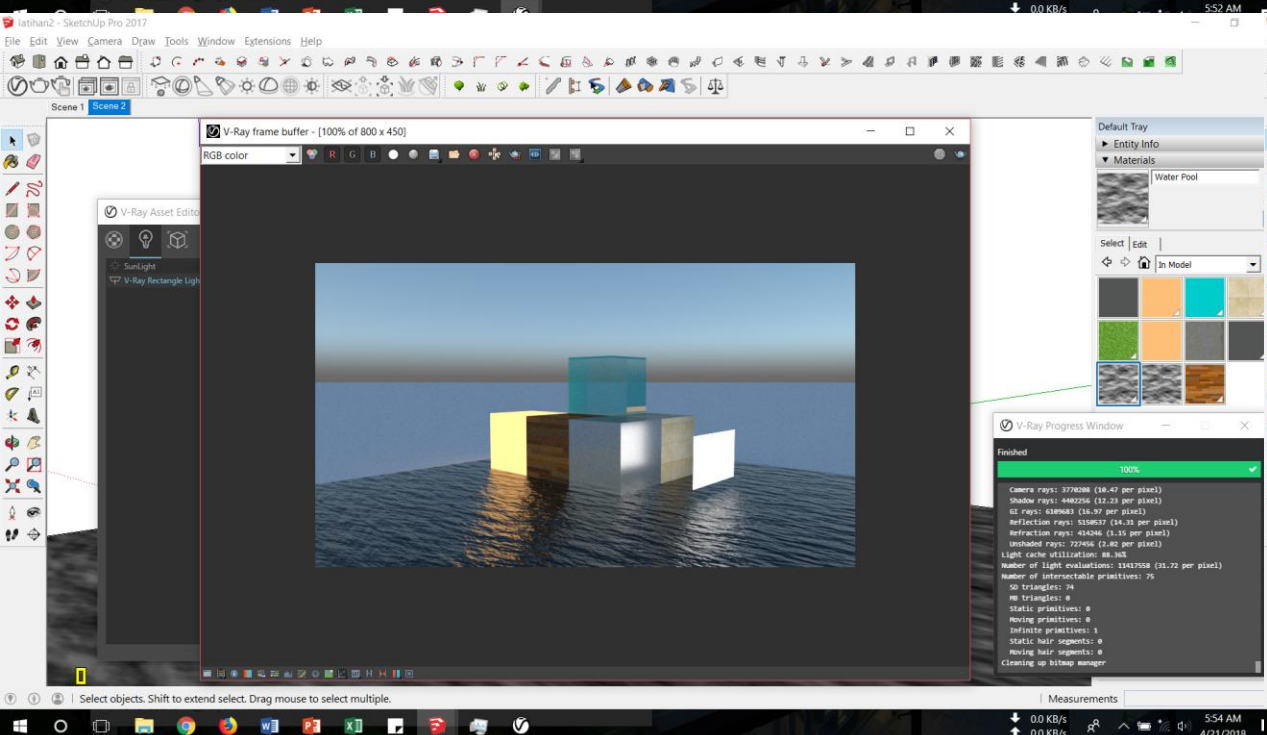
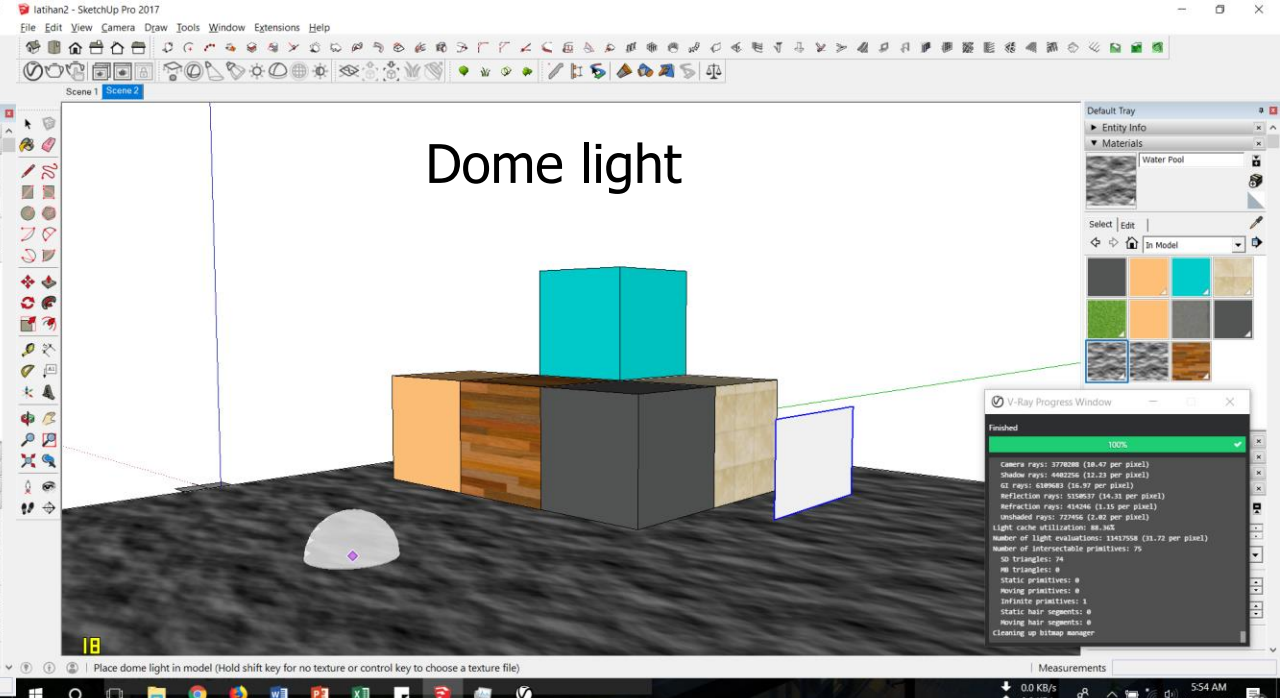
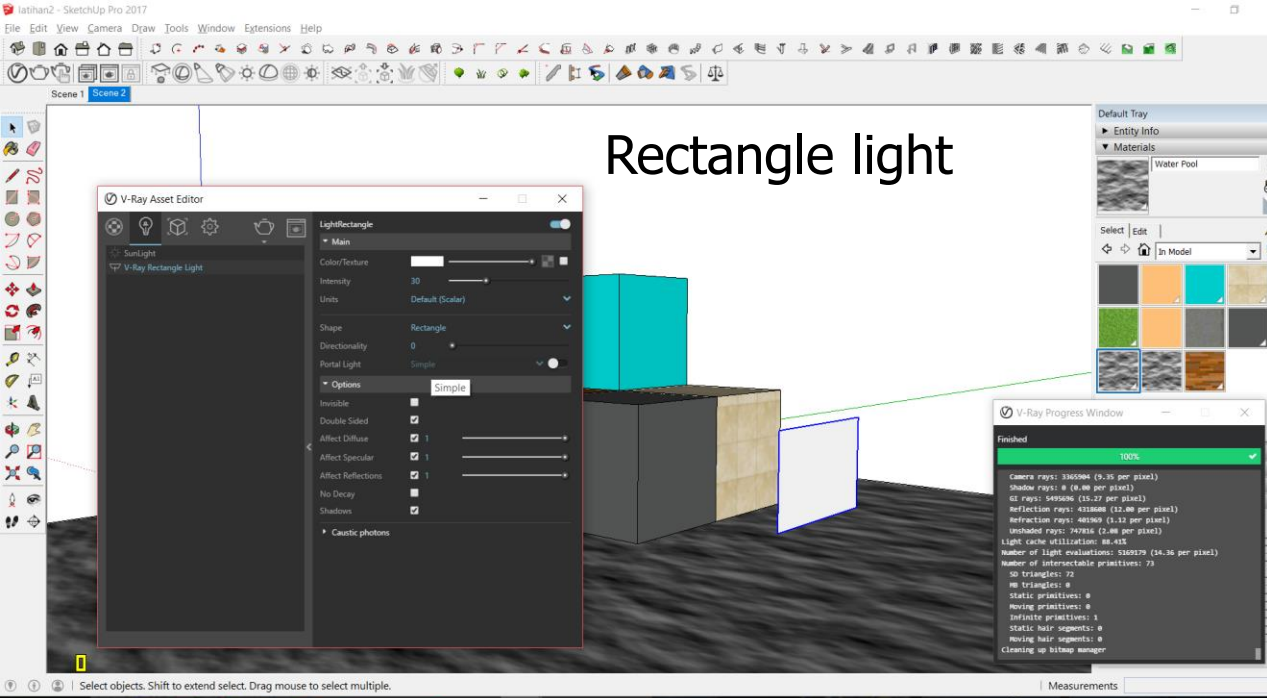




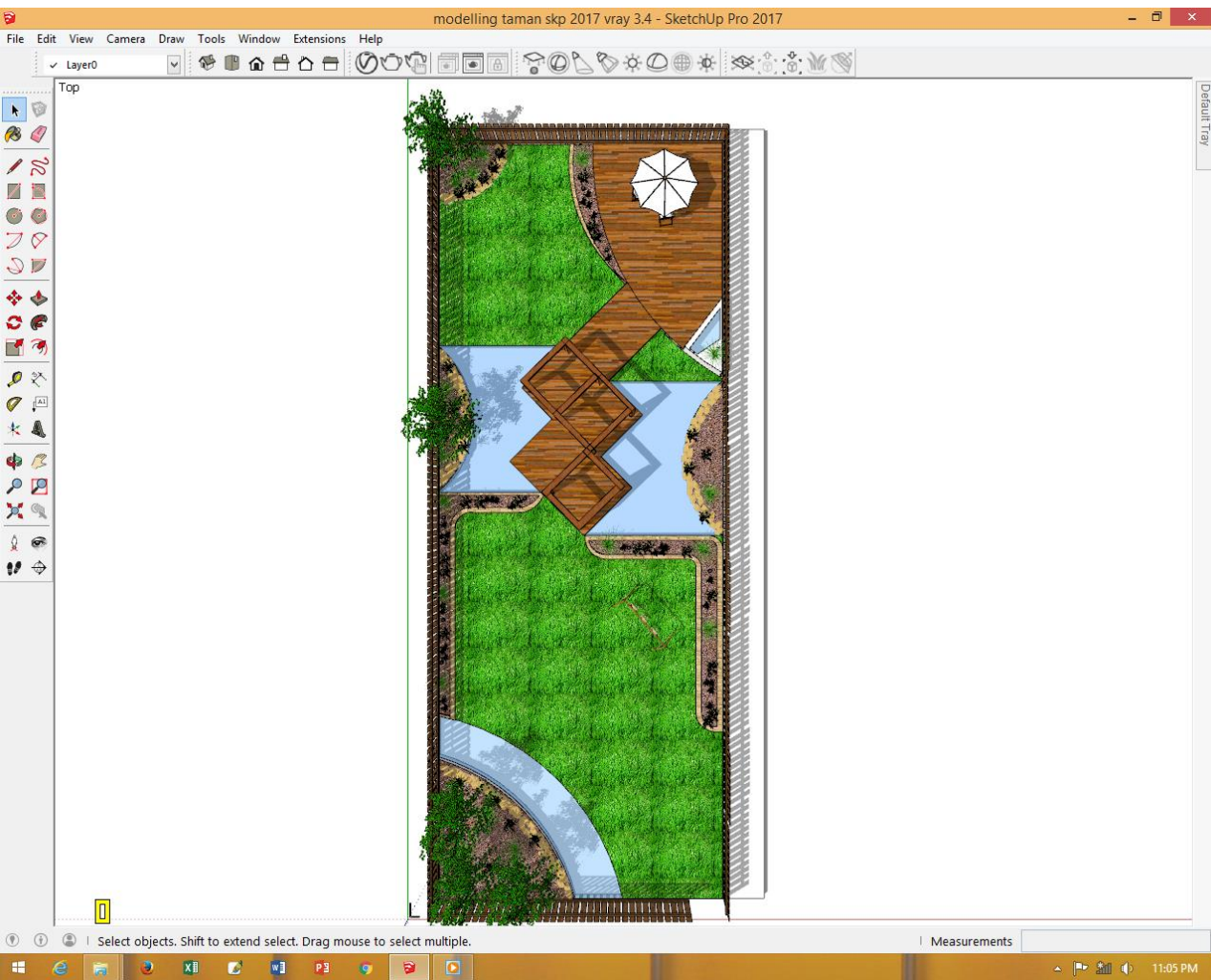




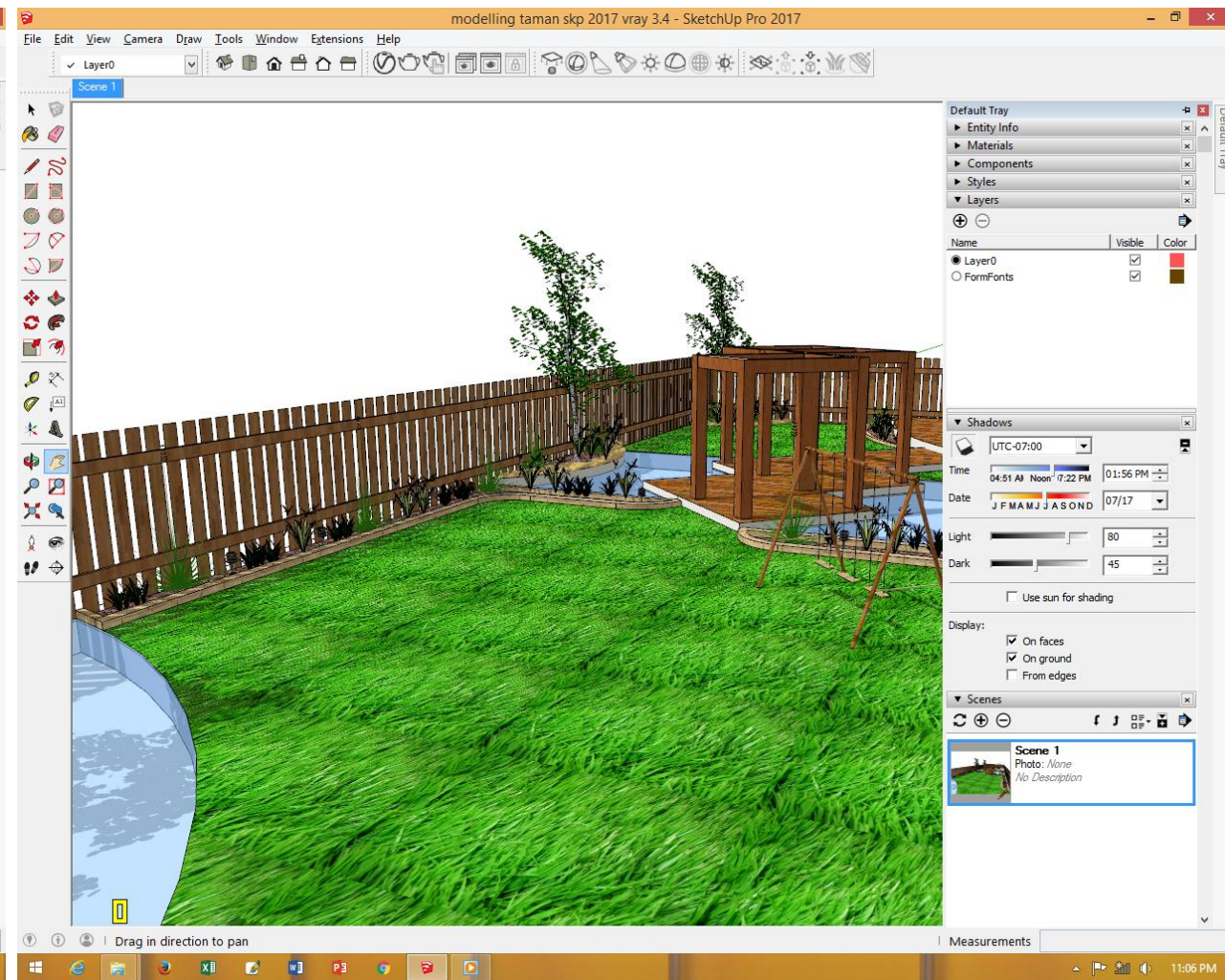






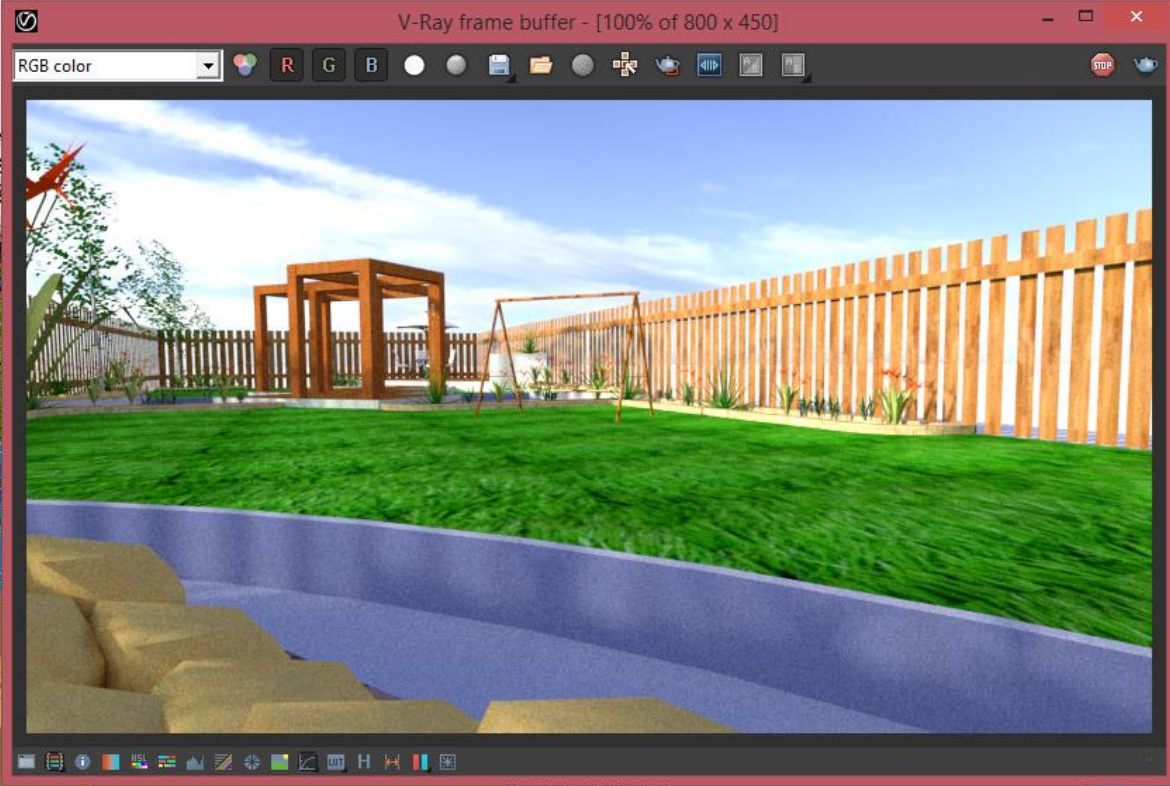
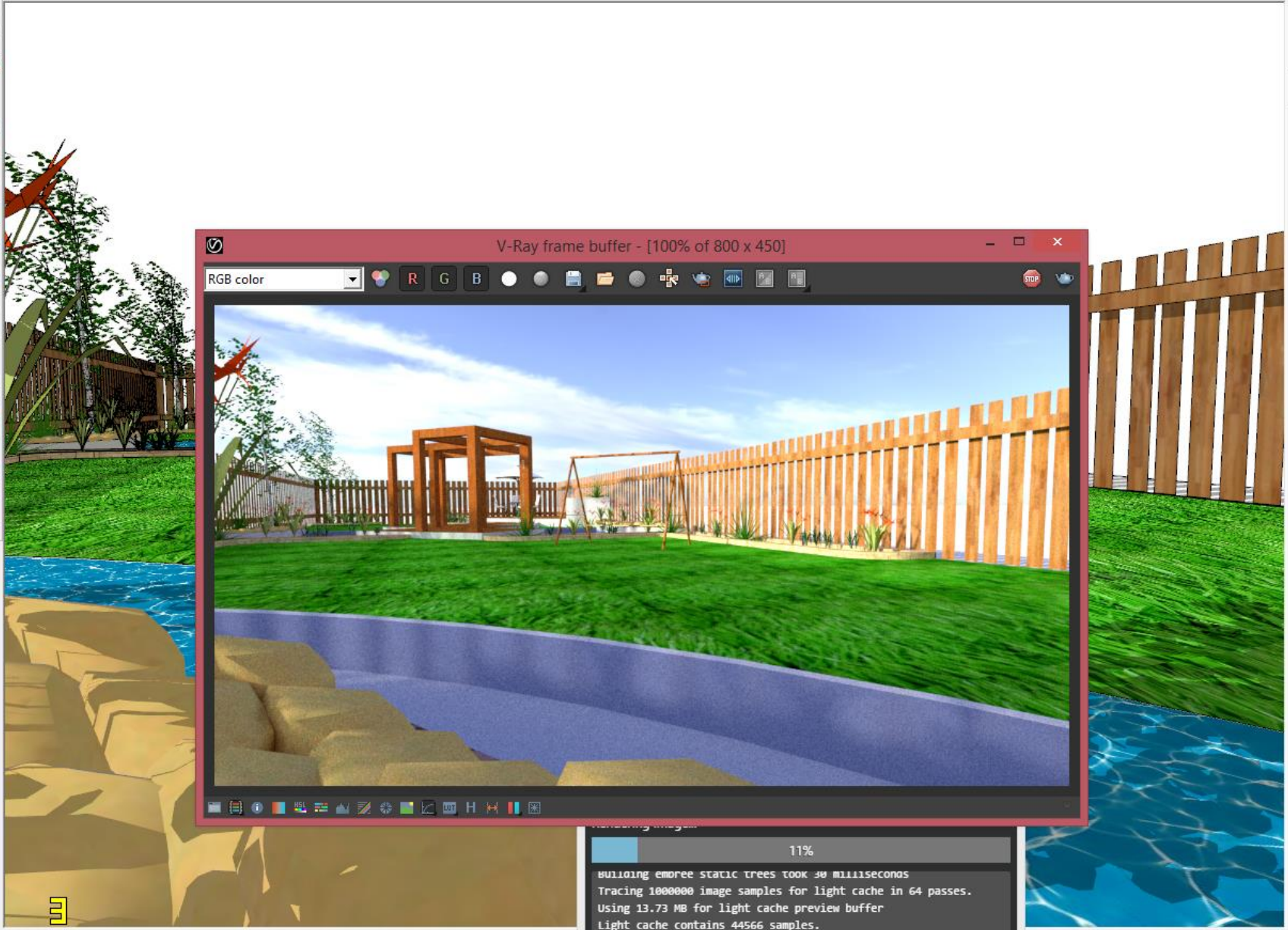


Cobalah dengan tugas taman anda



Cari view yang menarik





11%

Building embree static trees took 30 milliseconds

Tracing 1000000 image samples for light cache in 64 passes.

Using 13.73 MB for light cache preview buffer

Light cache contains 44566 samples.

Light cache takes 10.5 MB.

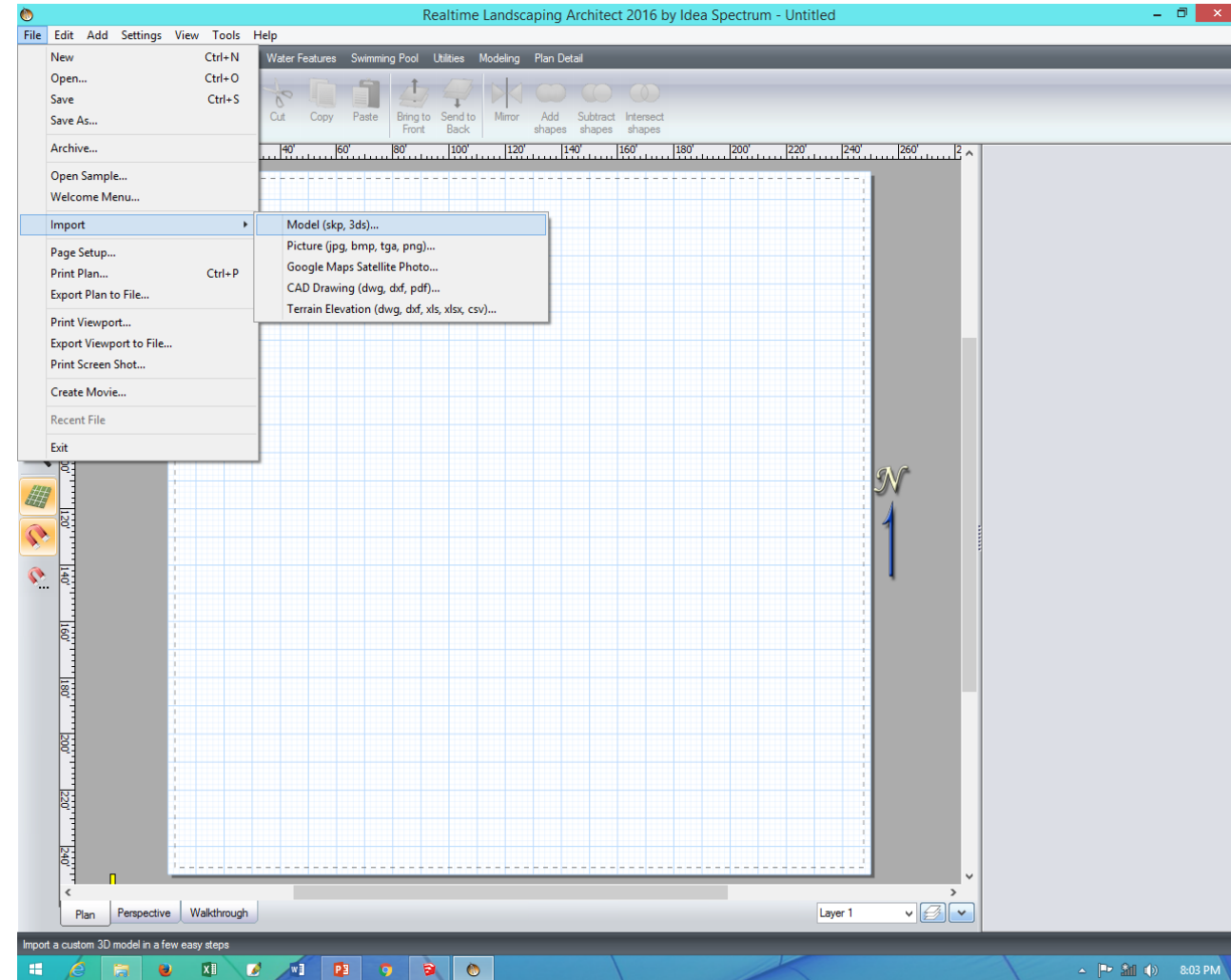
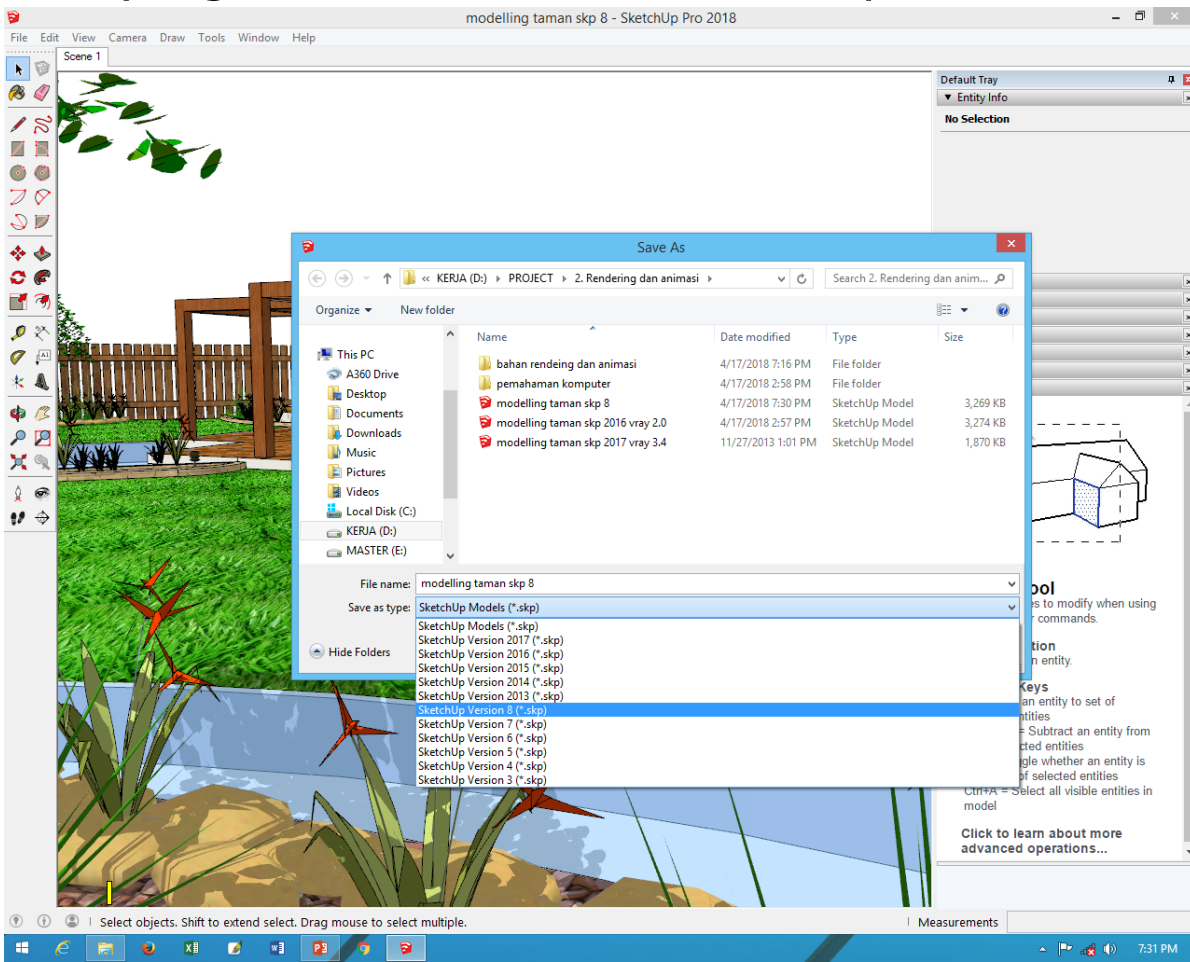
Average rays per light cache sample: 33.83 (min 1, max 3274)

Using pre-multiplied light cache.

# Rendering animasi sederhana dengan Realtime Landscaping

## Architecture 2016

1. Sebelum membuka file di realtime pastikan sudah menyimpannya di format yang lebih lama, missal sketchup 8

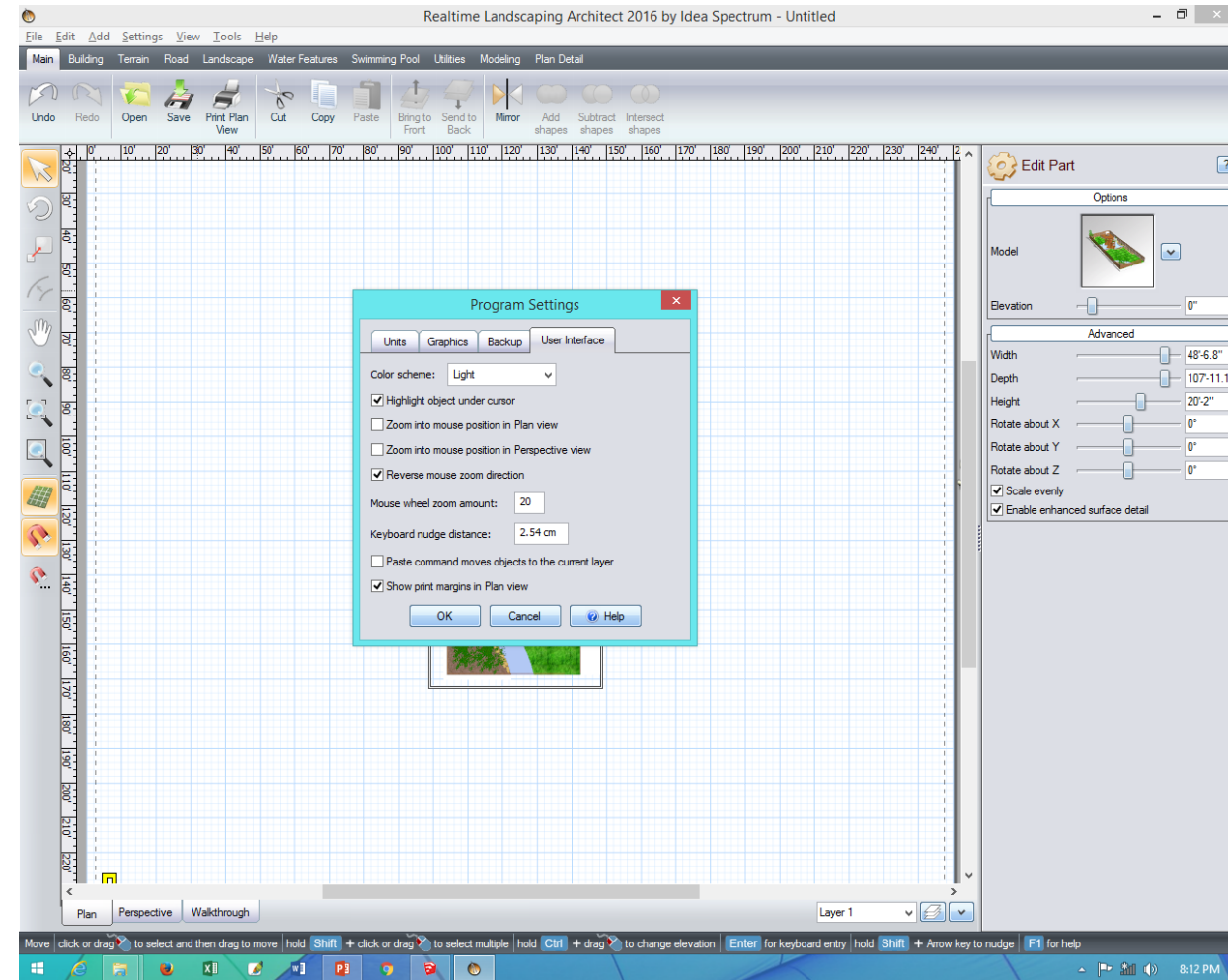
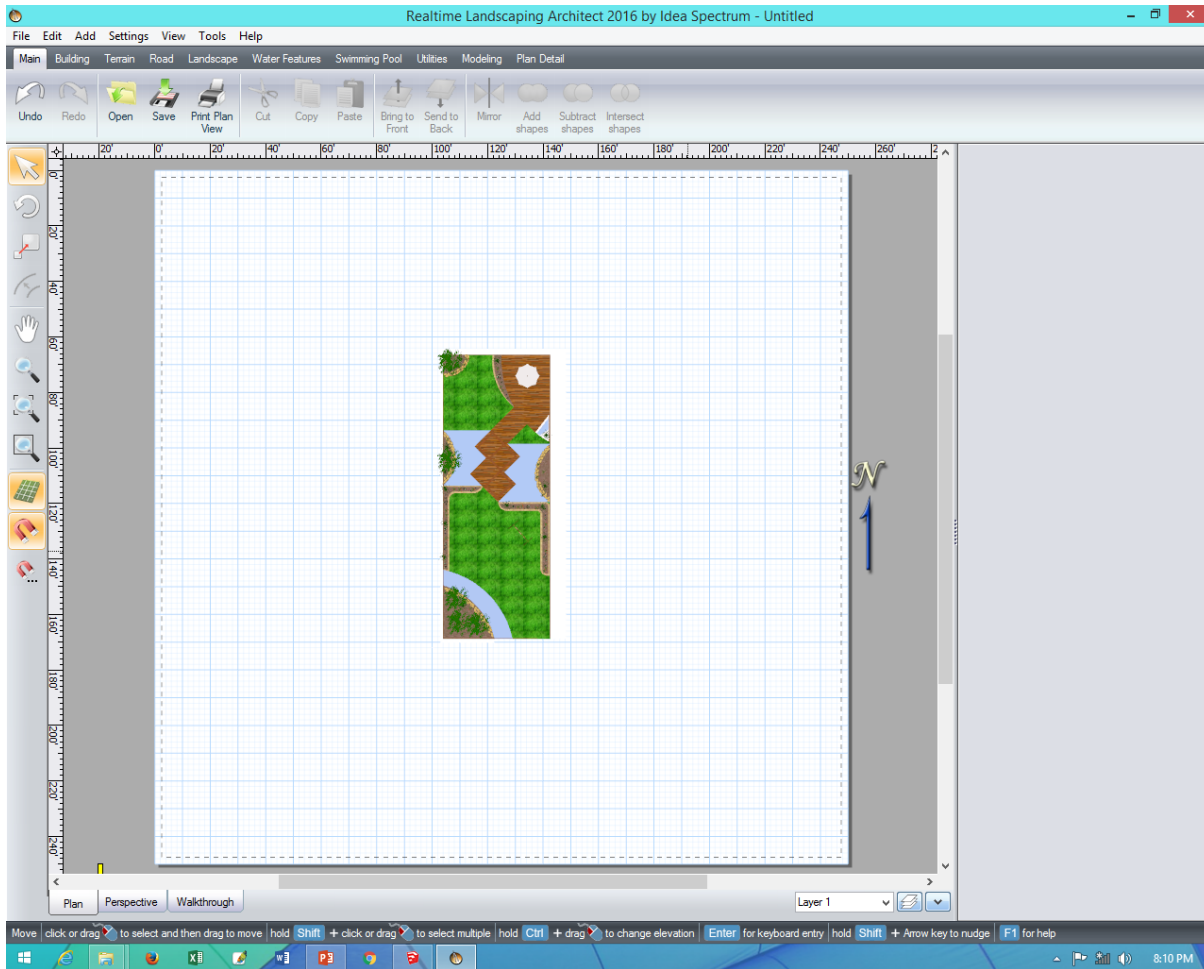


2. Silahkan import file skp anda

Software ini wajib dimiliki oleh landscaper karena ringan, tidak perlu komputer spek tinggi, dan database tanaman lengkap

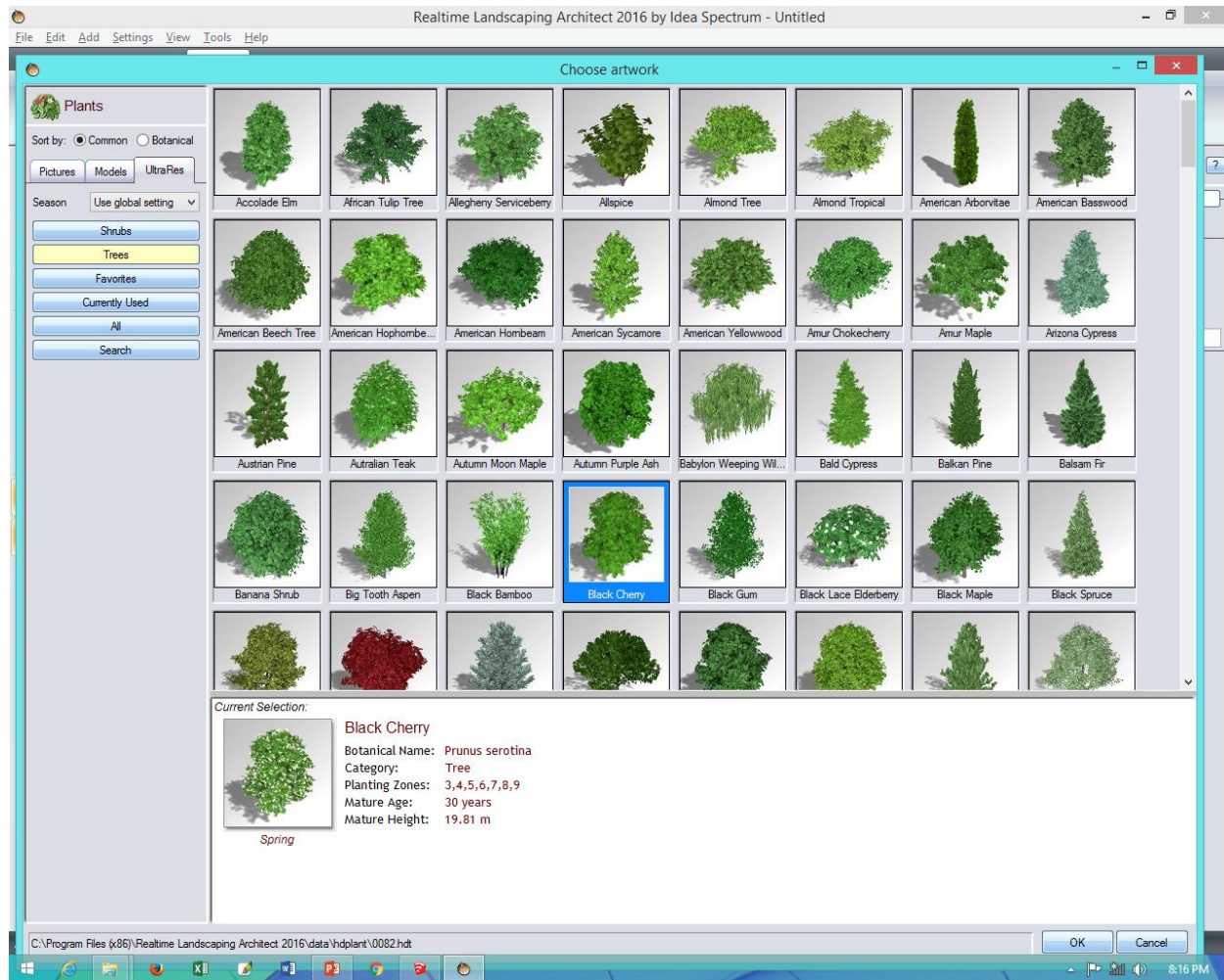


### 3. Import as part.



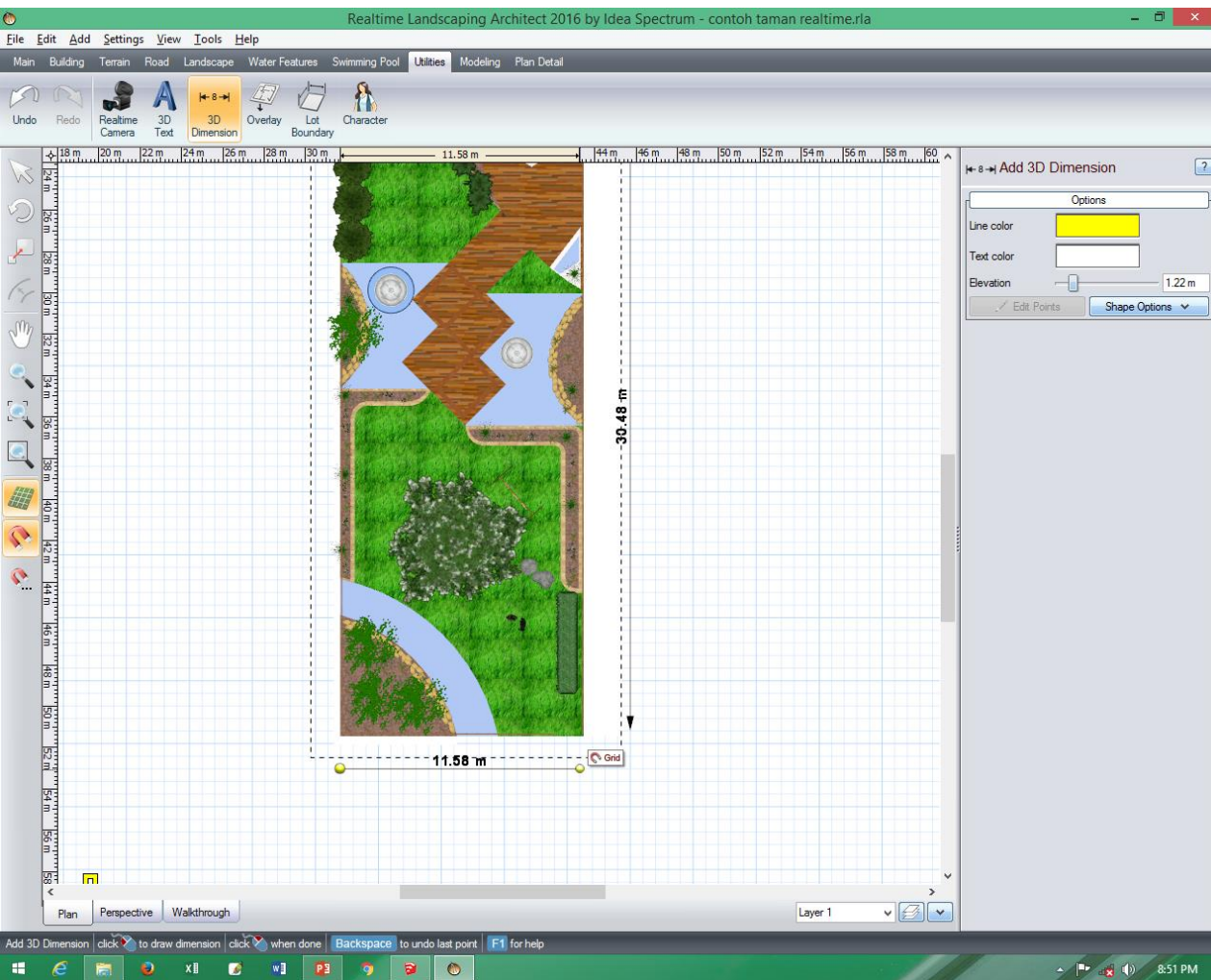
4. Sebelumnya buka setting/program setting, masukkan unit dalam metric, dan user interface klik reverse mouse zoom direction

## 5. Tambahkan komponen-komponen yang sesuai

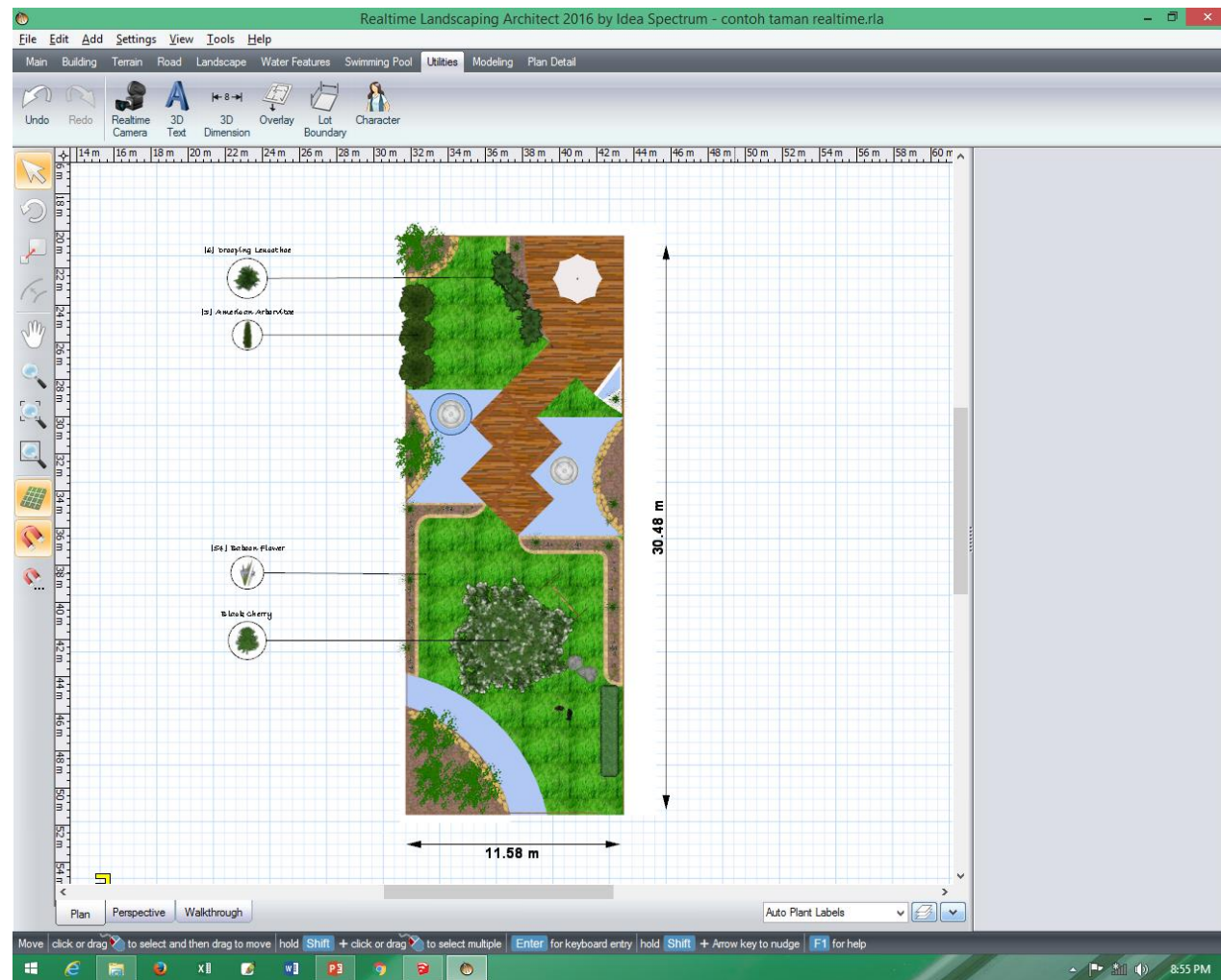


- Landscaping > tambahkan pohon, semak, perdu, yang sesuai dan atur jumlah dan umurnya
- Tambahkan water features untuk air mancur
- Tambahkan utilities > characters untuk menambahkan model manusia

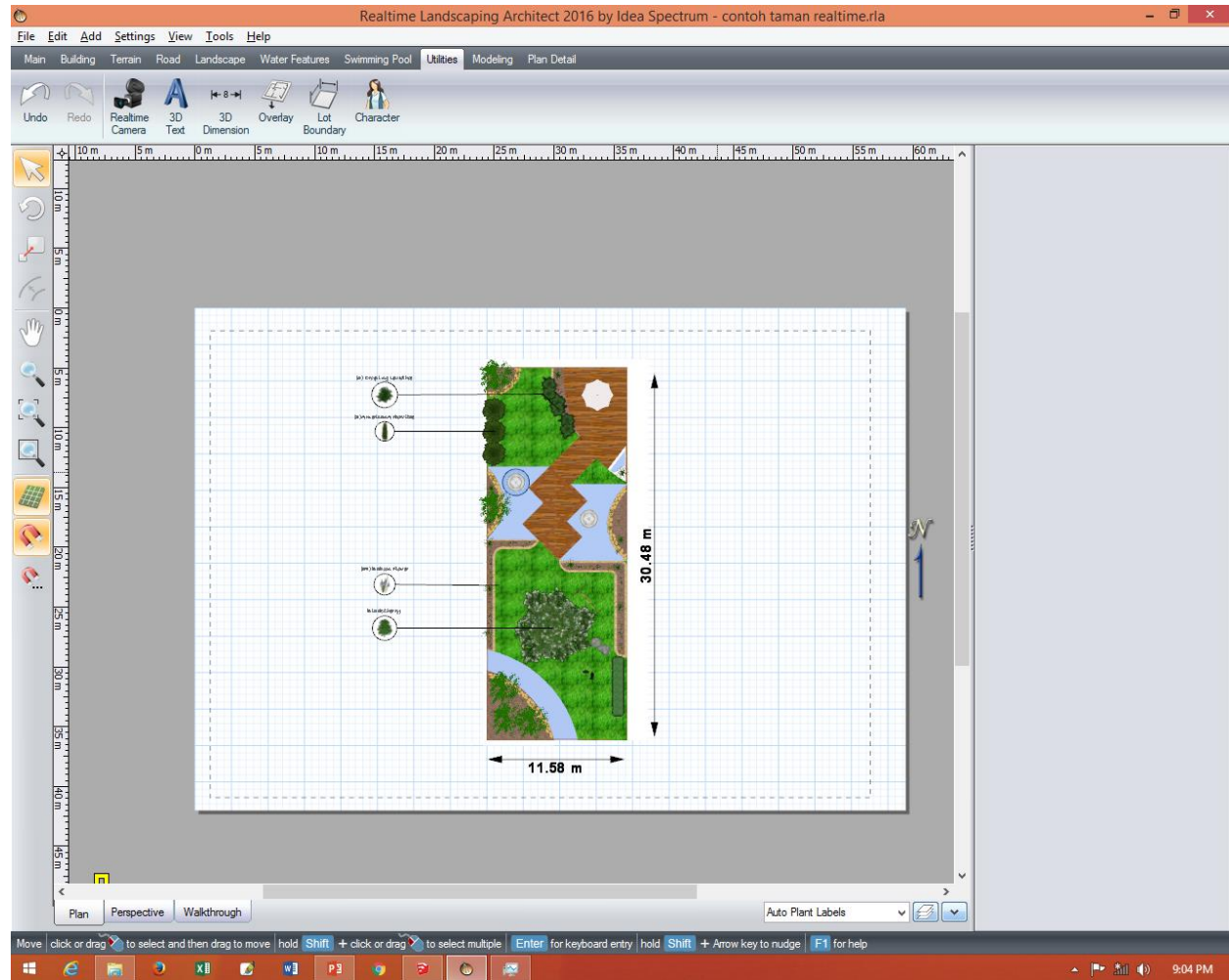
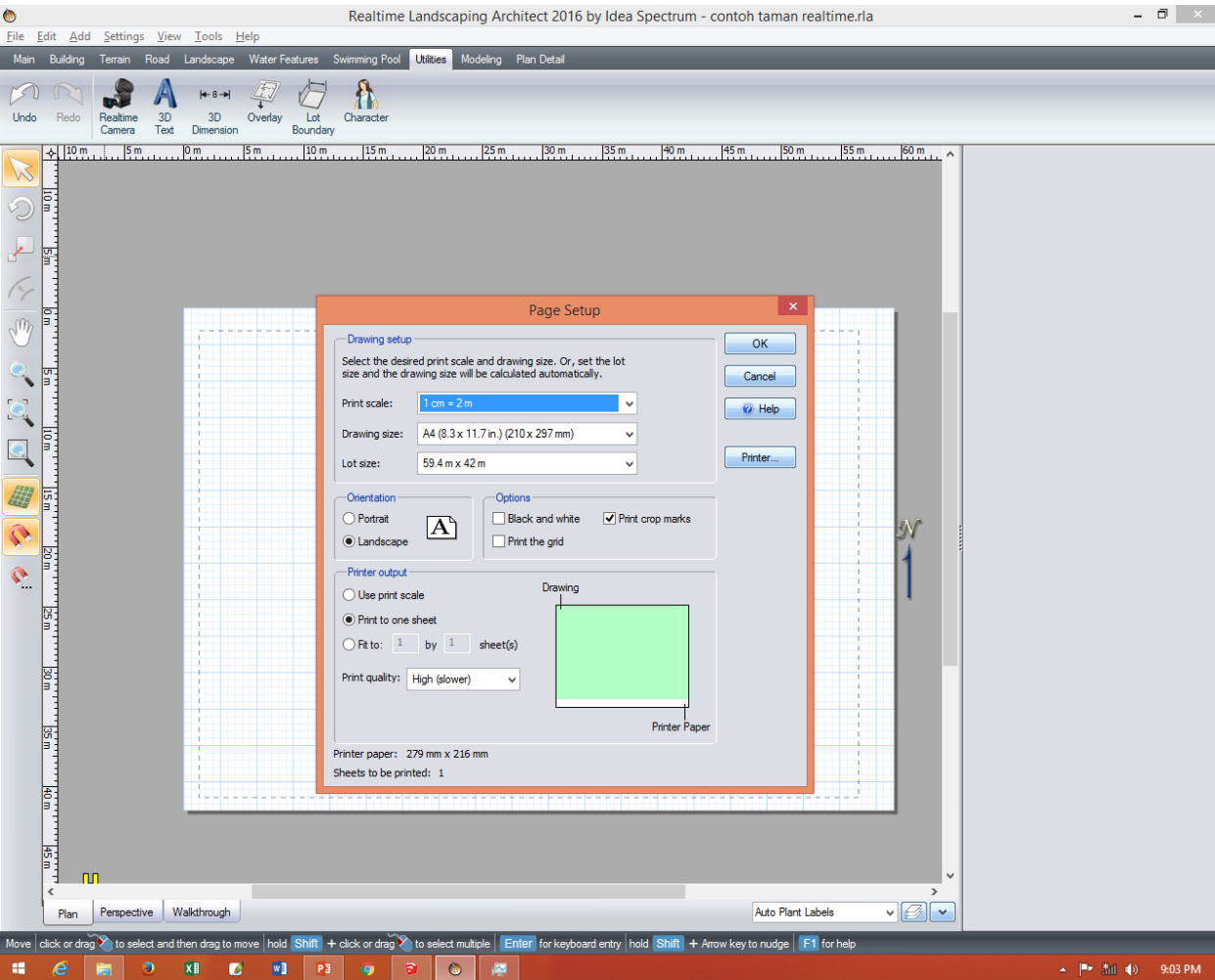




6. Beri ukuran atau dimensi dengan klik tab utilities > 3D dimension

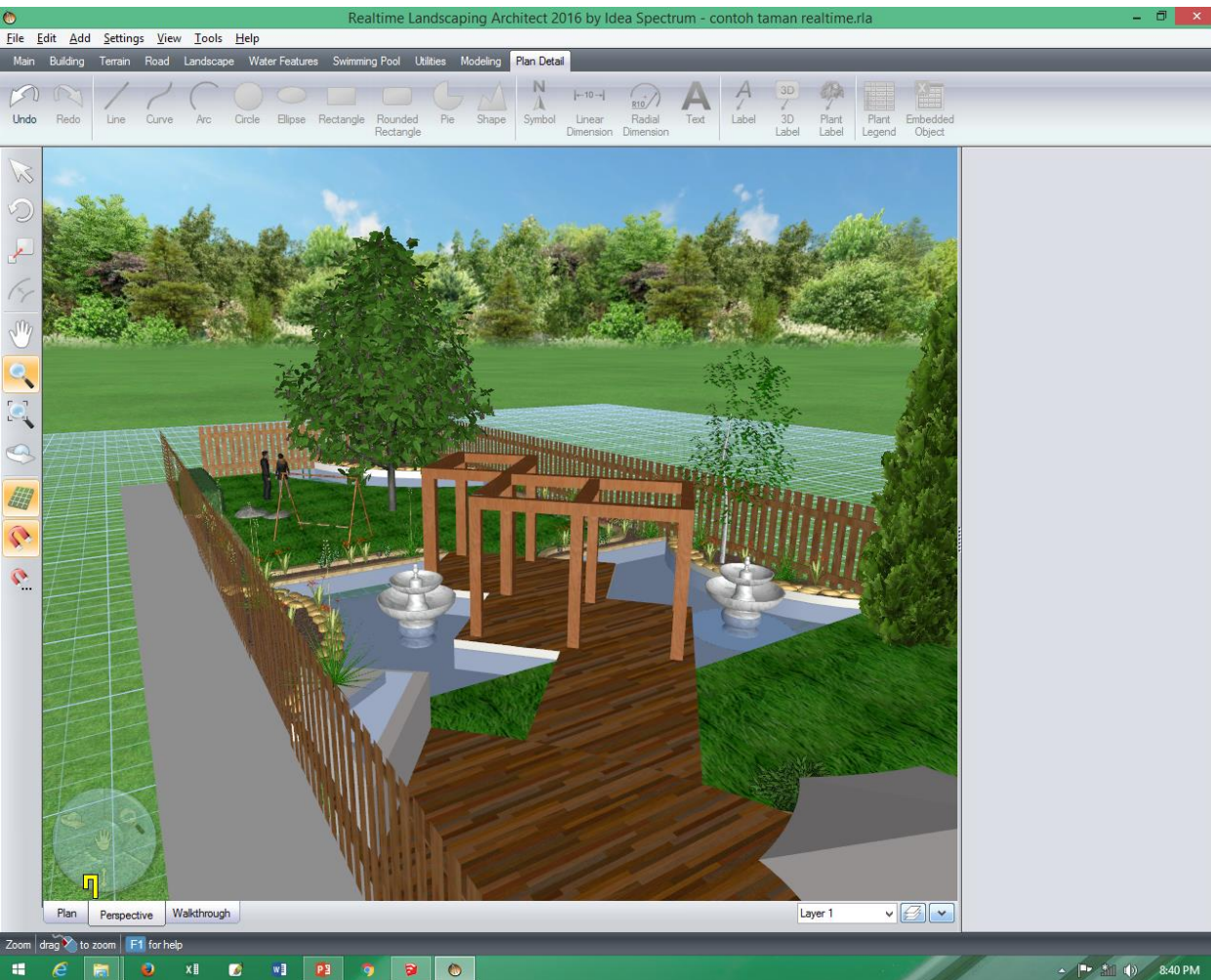


7. Klik tools kemudian plan lable wizard untuk memberi nama beragam jenis tanaman

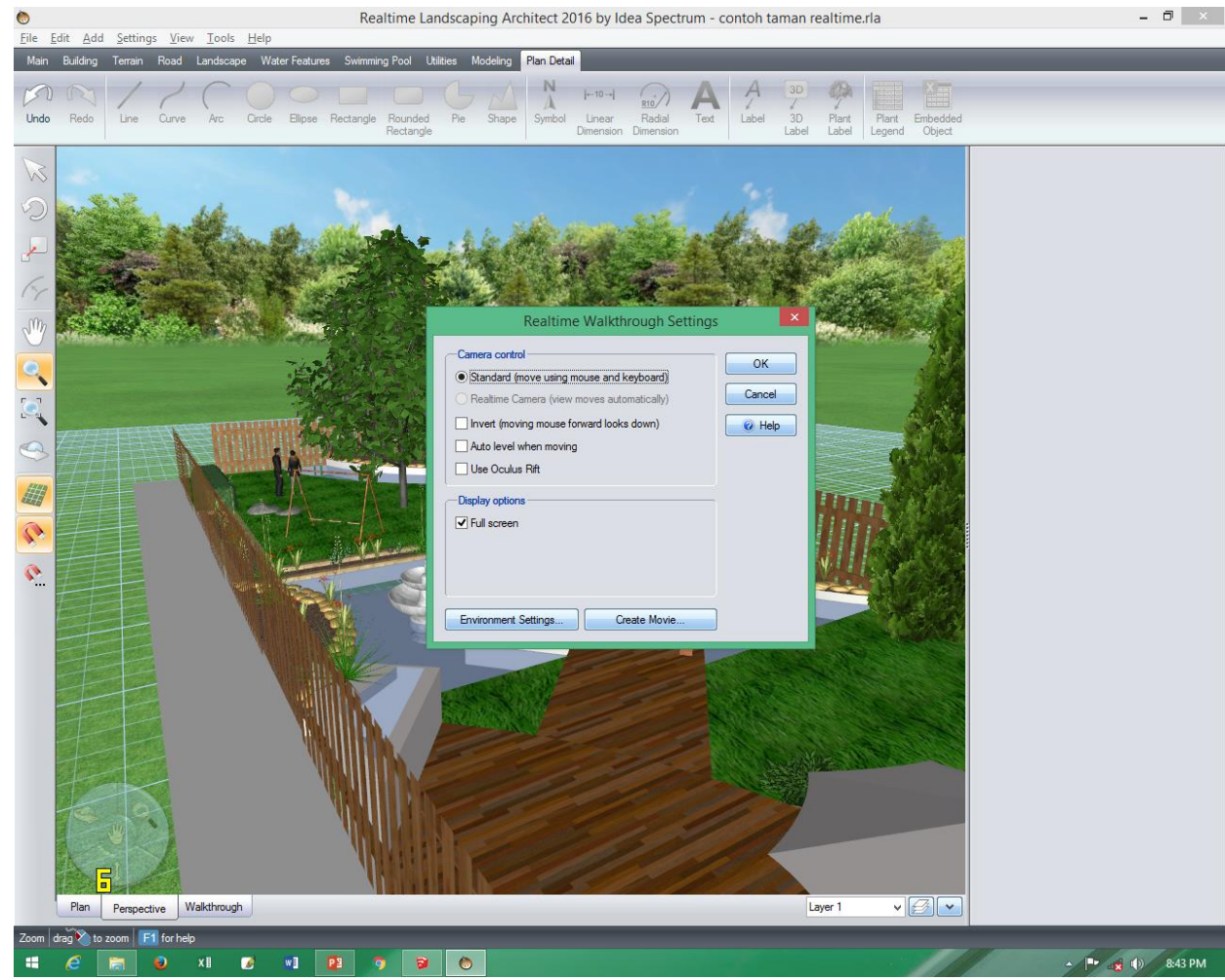


8. Jika ingin mencetak denah bisa mensetting pada page setup, agar ukuran sesuai. Misalkan memilih A4 dan 1cm=2m



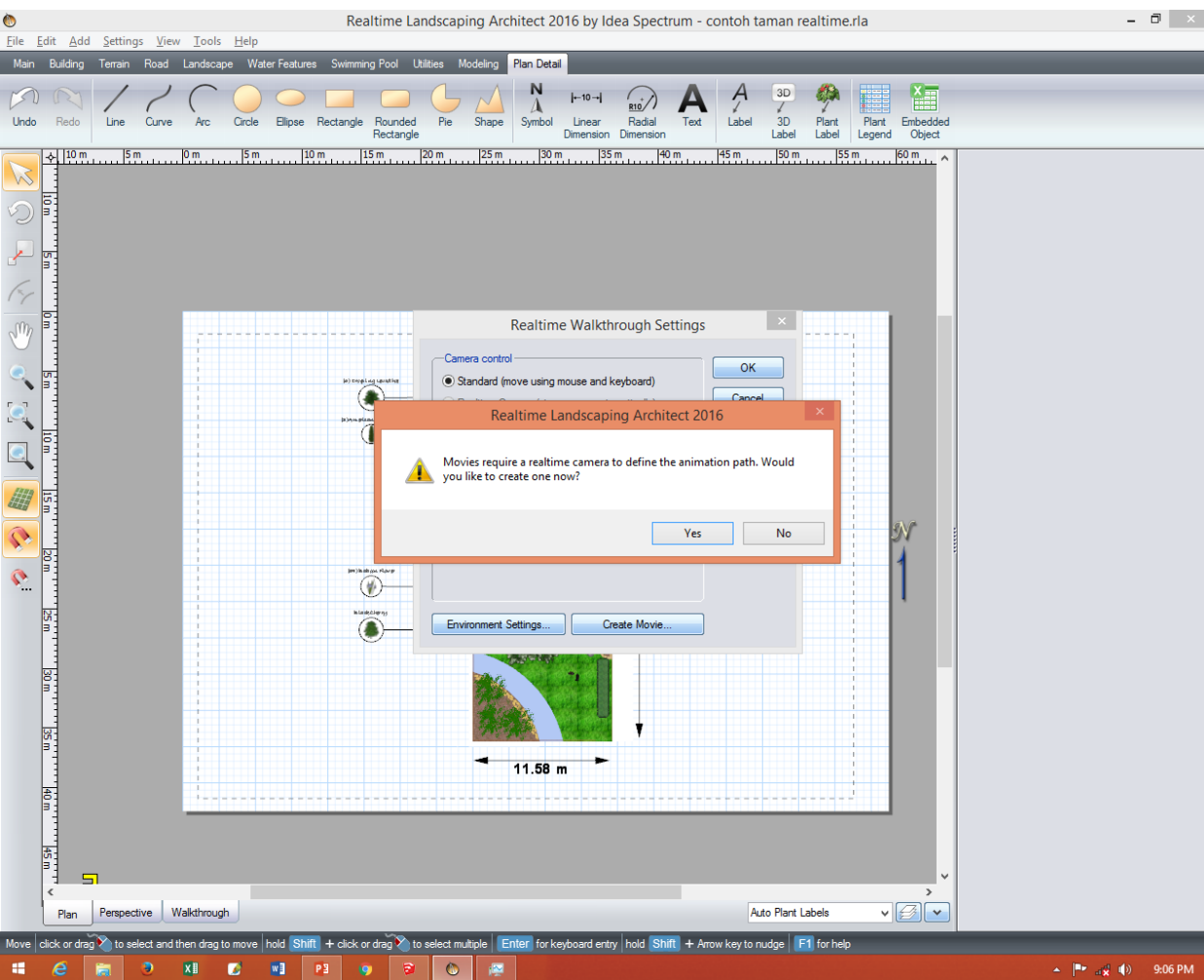


7. Tampilan perspektif

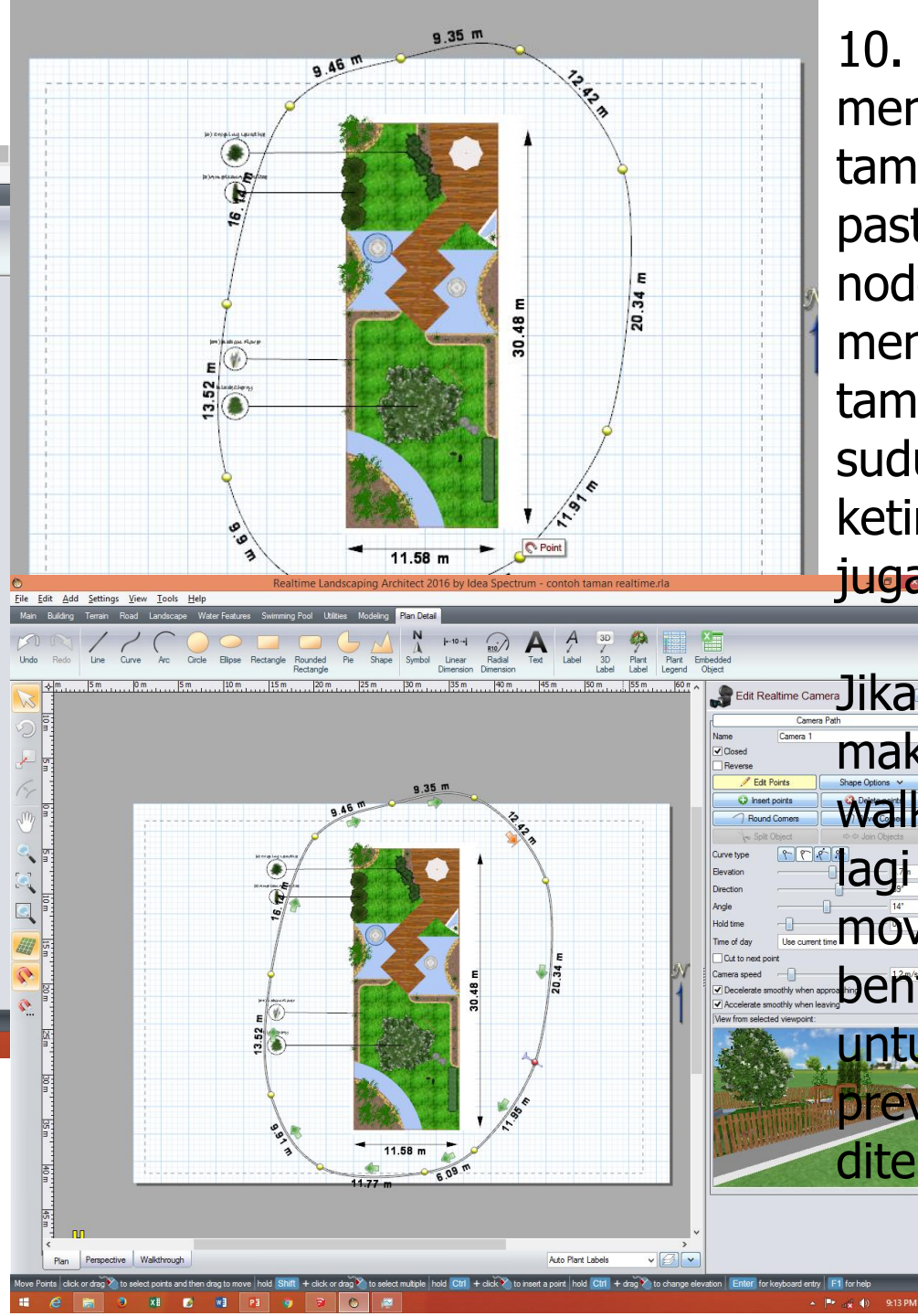


8. Pada walkthrough klik environment setting untuk merubah suasana, musim, waktu, bahkan tanaman juga mengikuti musim





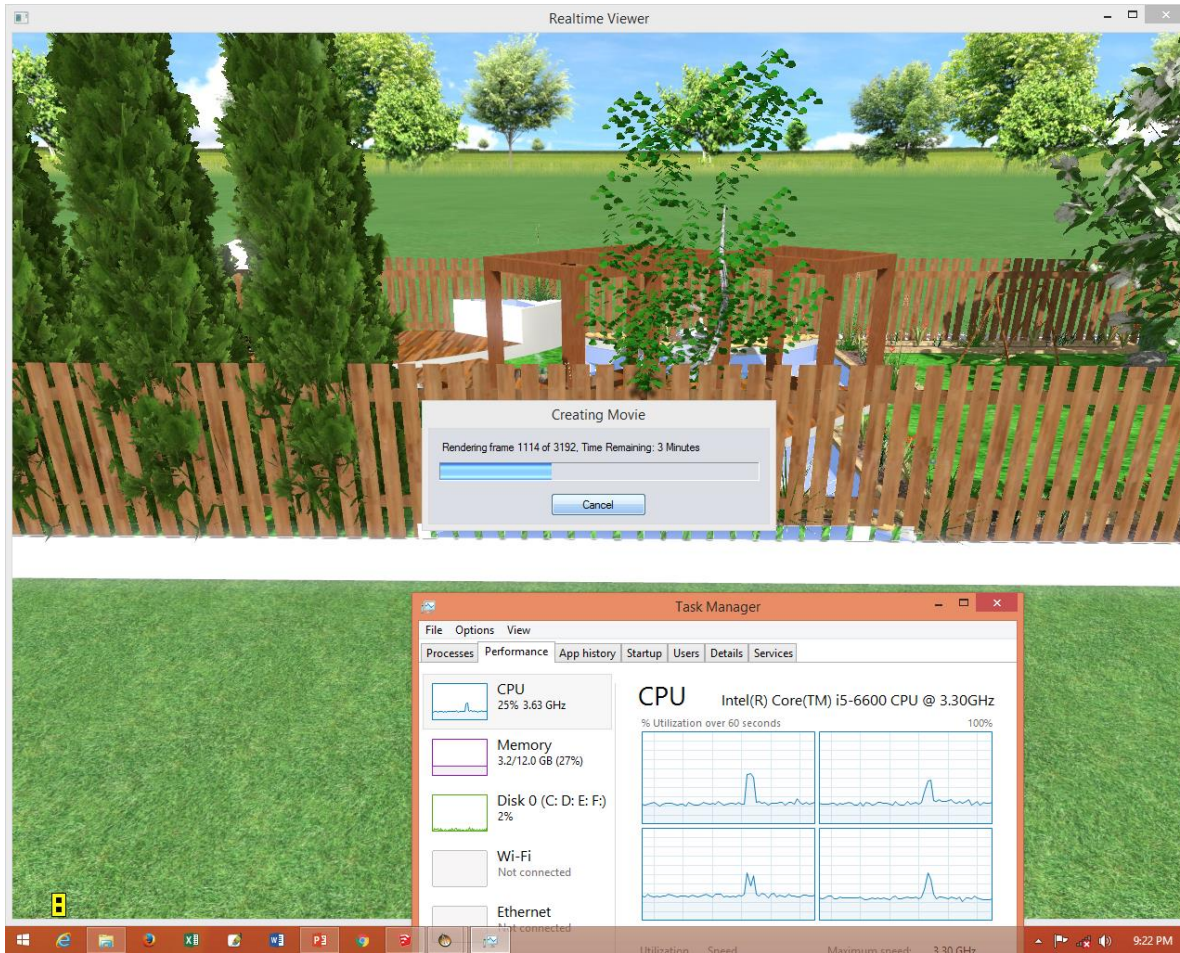
9. Jika sudah siap untuk membuat animasi, klik walkthrough lagi dan create movie. Anda akan diarahkan membuat path



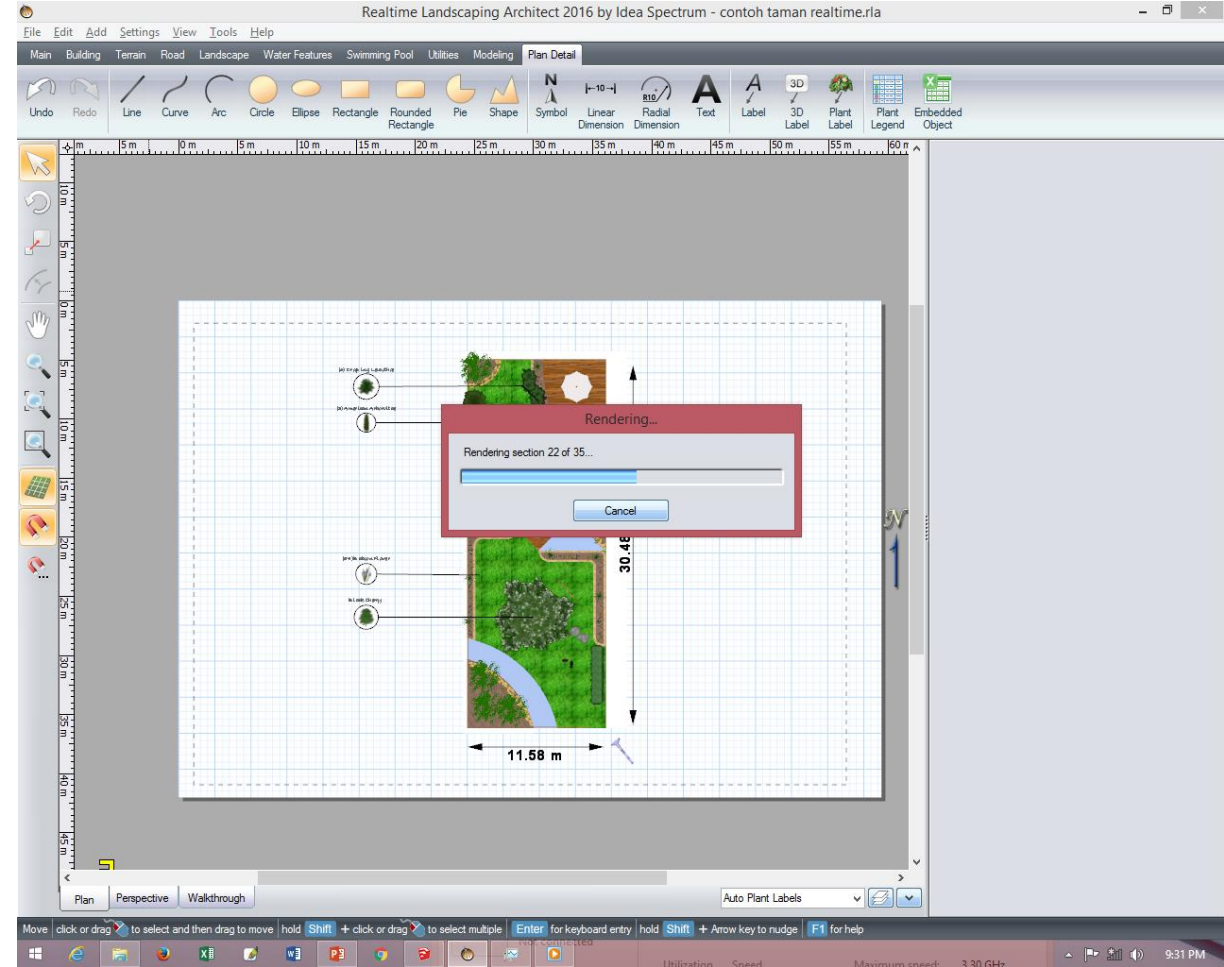
10. Path dibuat mengitari taman, pastikan saat node, kamera mengarah ke taman, arah sudut dan ketinggiannya juga diatur

Jika sudah maka klik walkthrough lagi dan create movie dalam bentuk wmv, untuk melihat previewnya ditekan ok





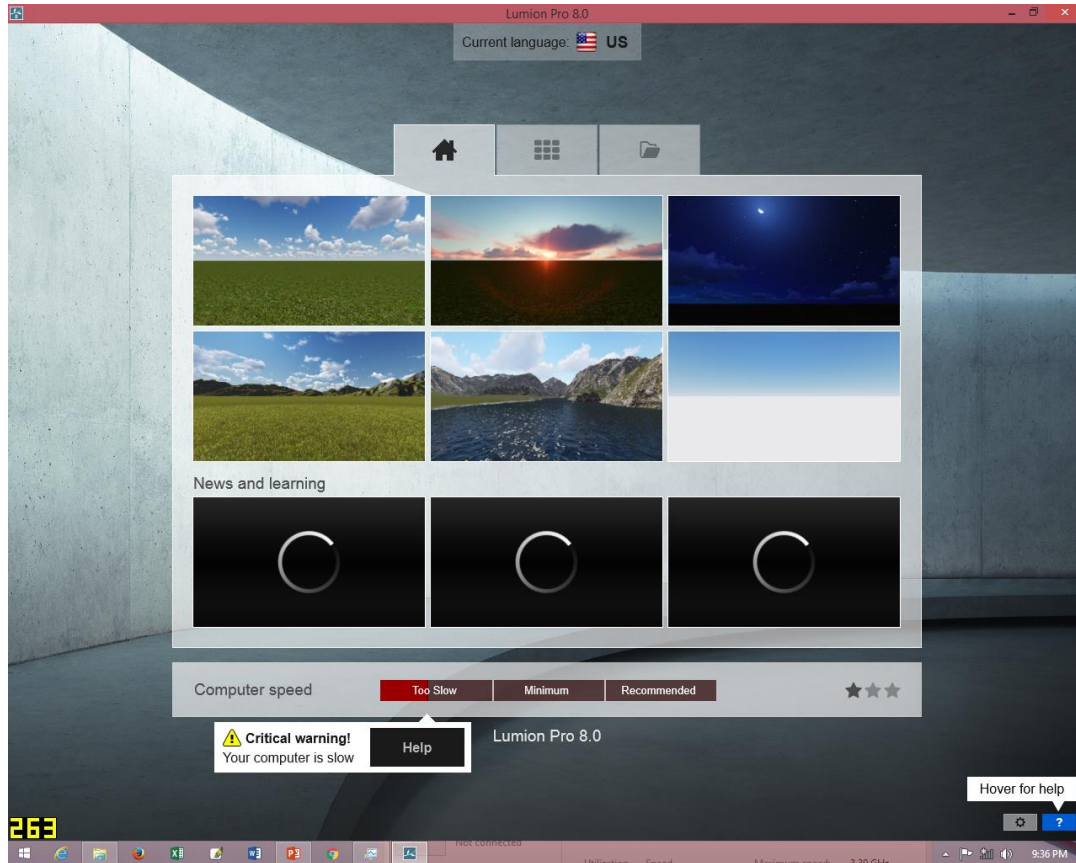
11. Proses rendering berjalan sesuai waktu yang ditunjukkan yaitu 5 menit untuk prosesor i5 6600, total waktu video 1menit 46 detik



12. Selain video, gambar tampak atas juga bisa disimpan dalam jpg atau pdf dengan cara file > export plan to file

# Rendering animasi sederhana dengan Lumion 8 Pro

Tampilan lumion 8 pro



Program yang wajib dimiliki, tetapi memiliki spesifikasi paling berat di antara software render yang lainnya

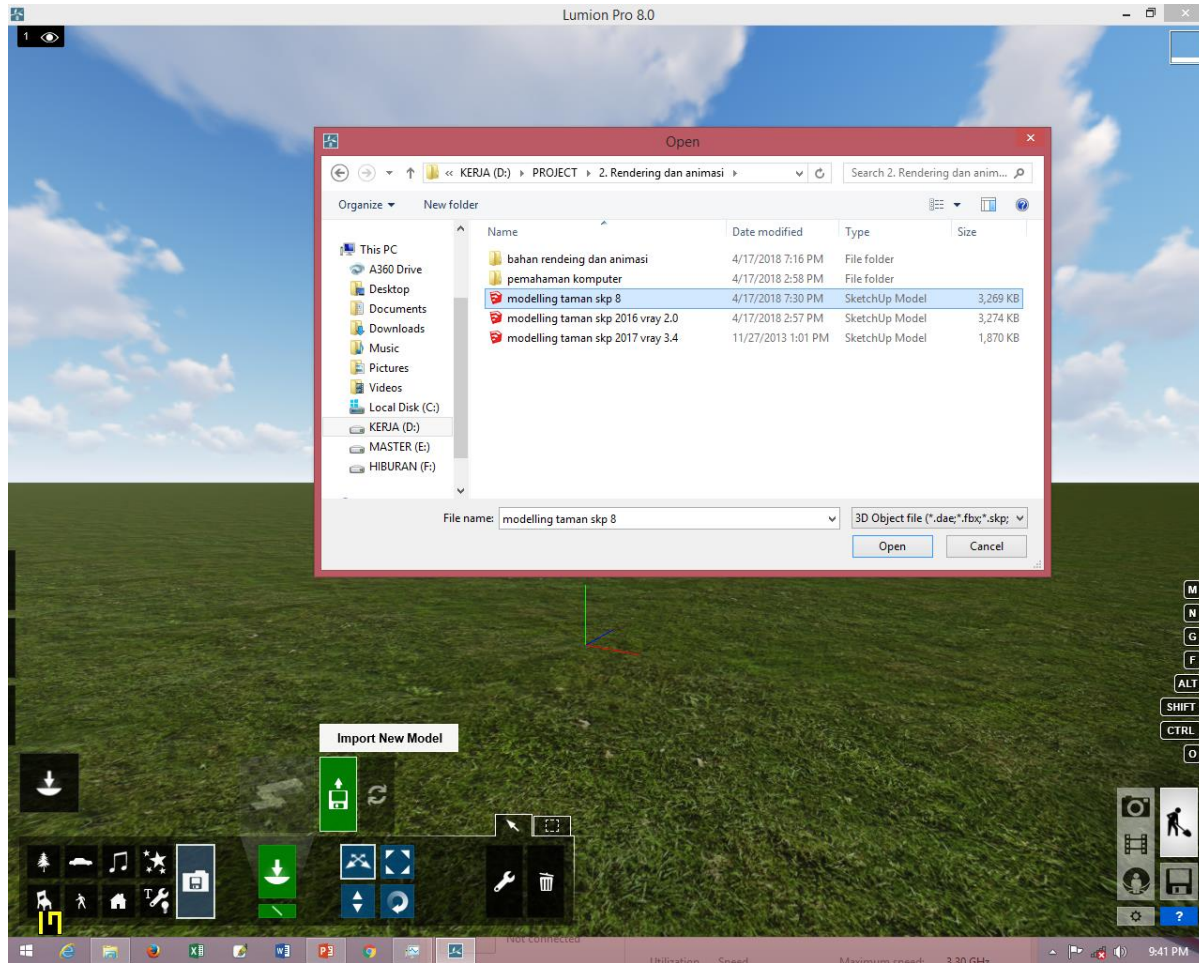


Testing dengan :  
Procie I5 6600  
Ram 12gb  
Vga gtx 745

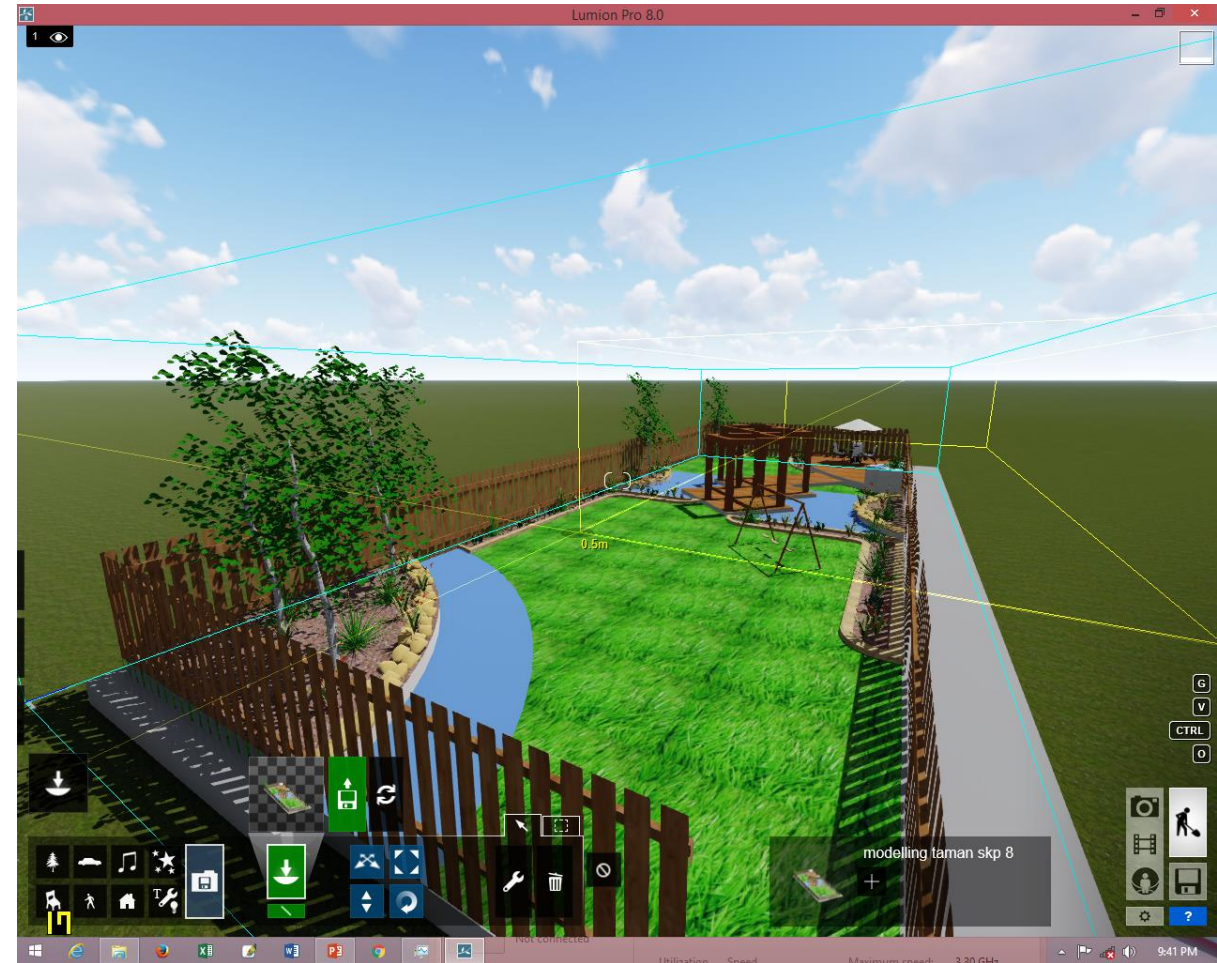
Testing dengan :  
Procie I5 7200u  
Ram 8gb  
Vga geforce 940mx



1. Dengan cara yang sama, file sketchup disimpan dalam versi yang lama supaya lebih aman dan diimpor ke dalam lumion



2. Tampilan model yang telah diimpor

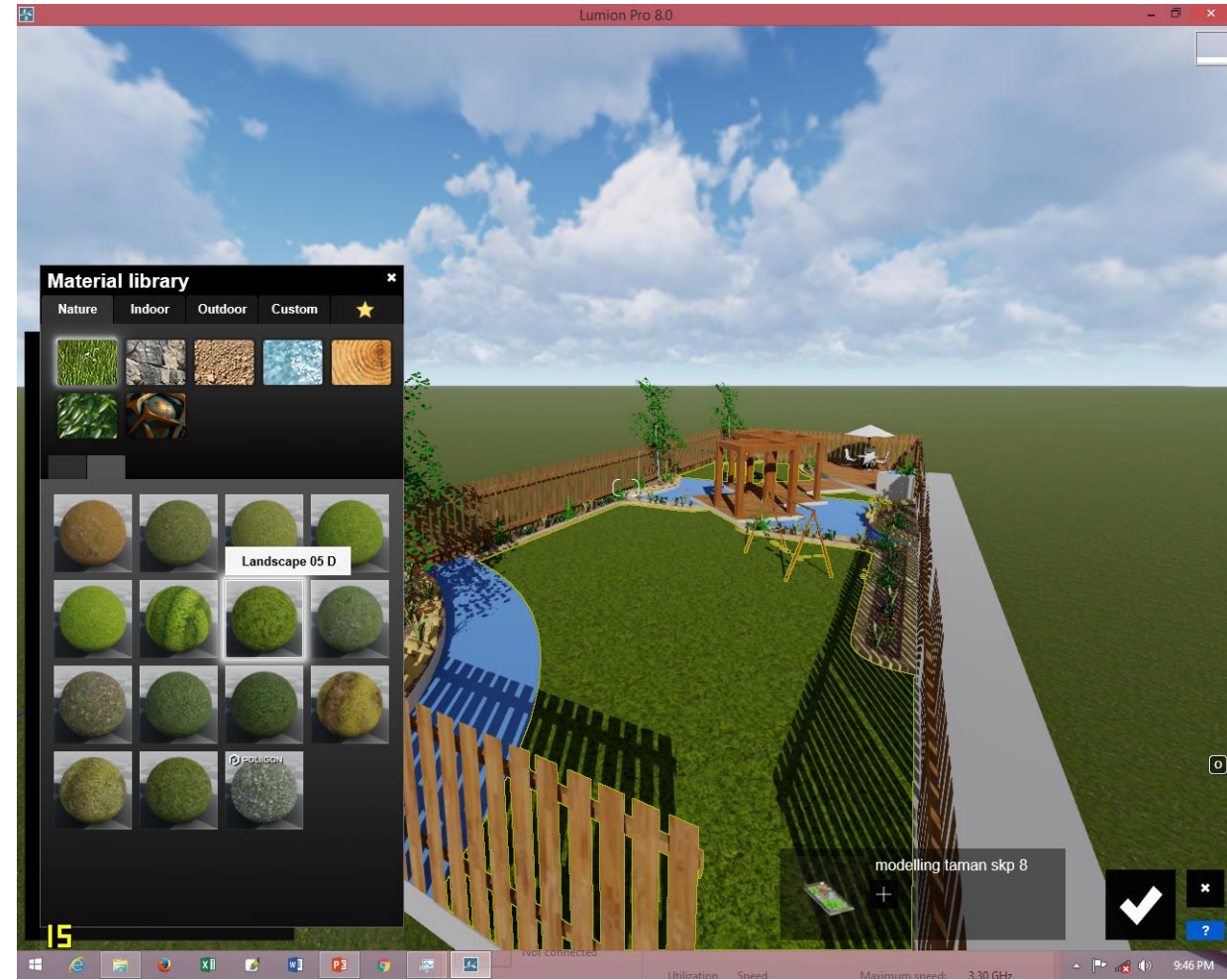




### 3. Setting weather

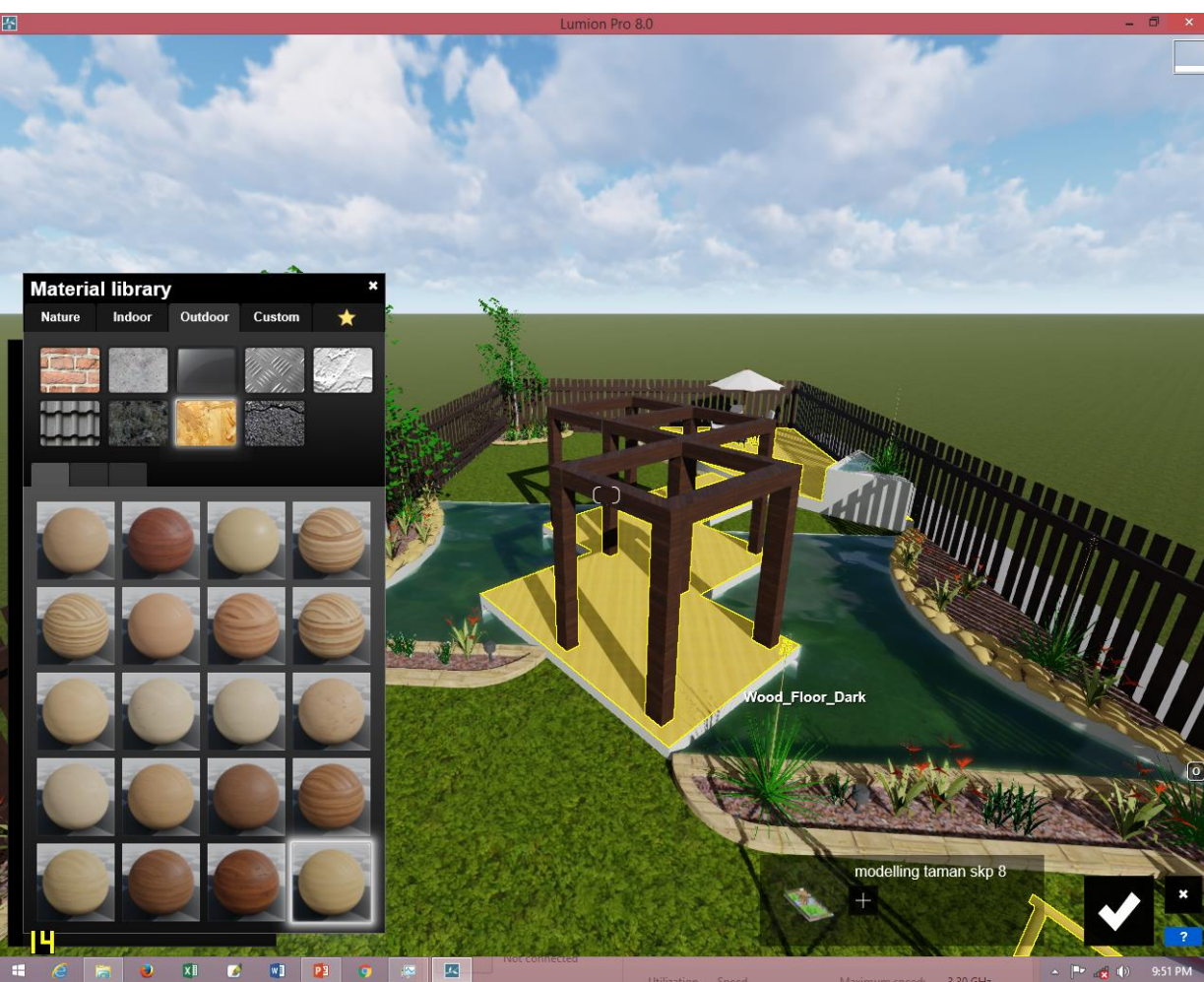


### 4. Setting material



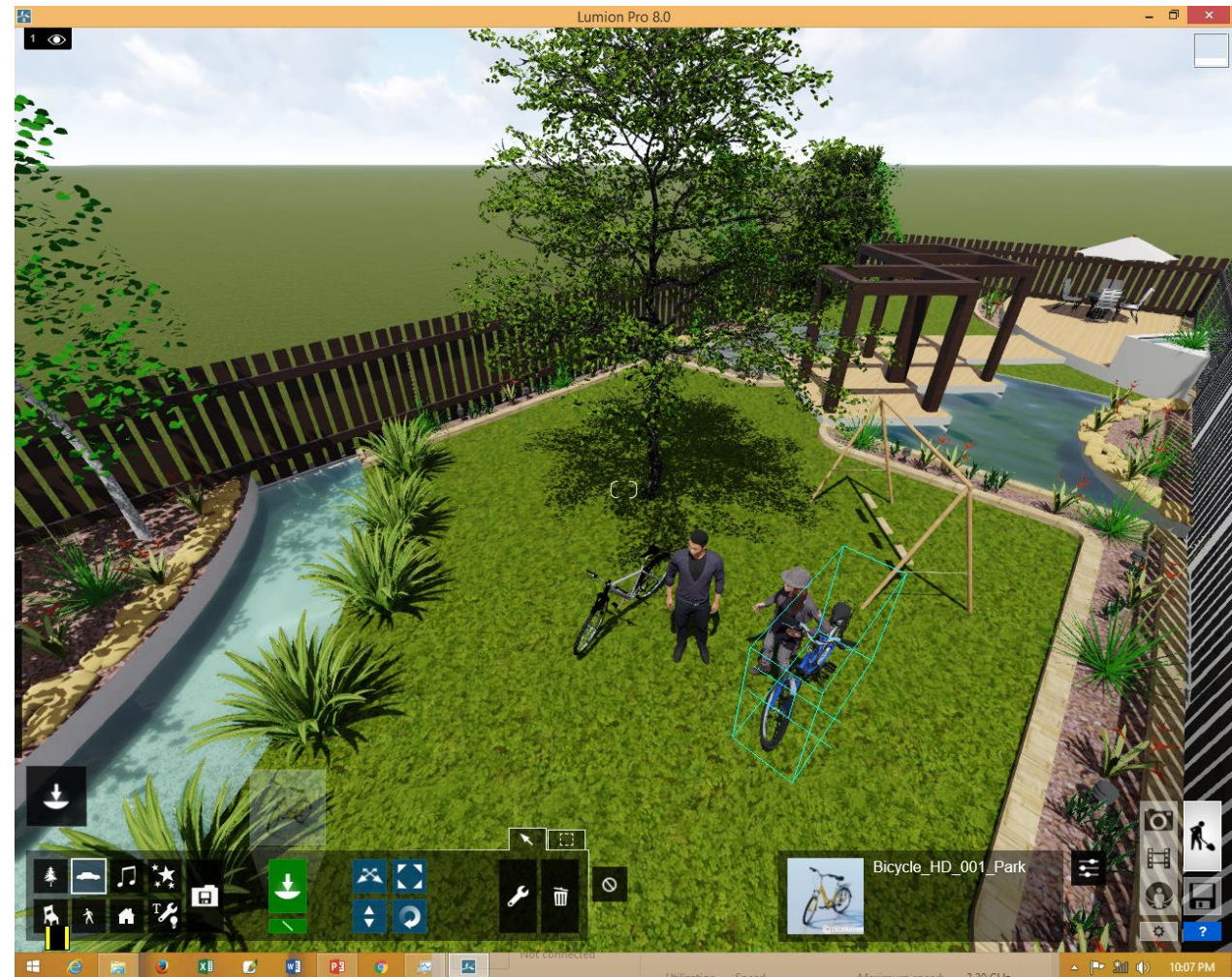
Perhatikan material yang memiliki refleksi atau refraksi





Pastikan semua material sudah disesuaikan

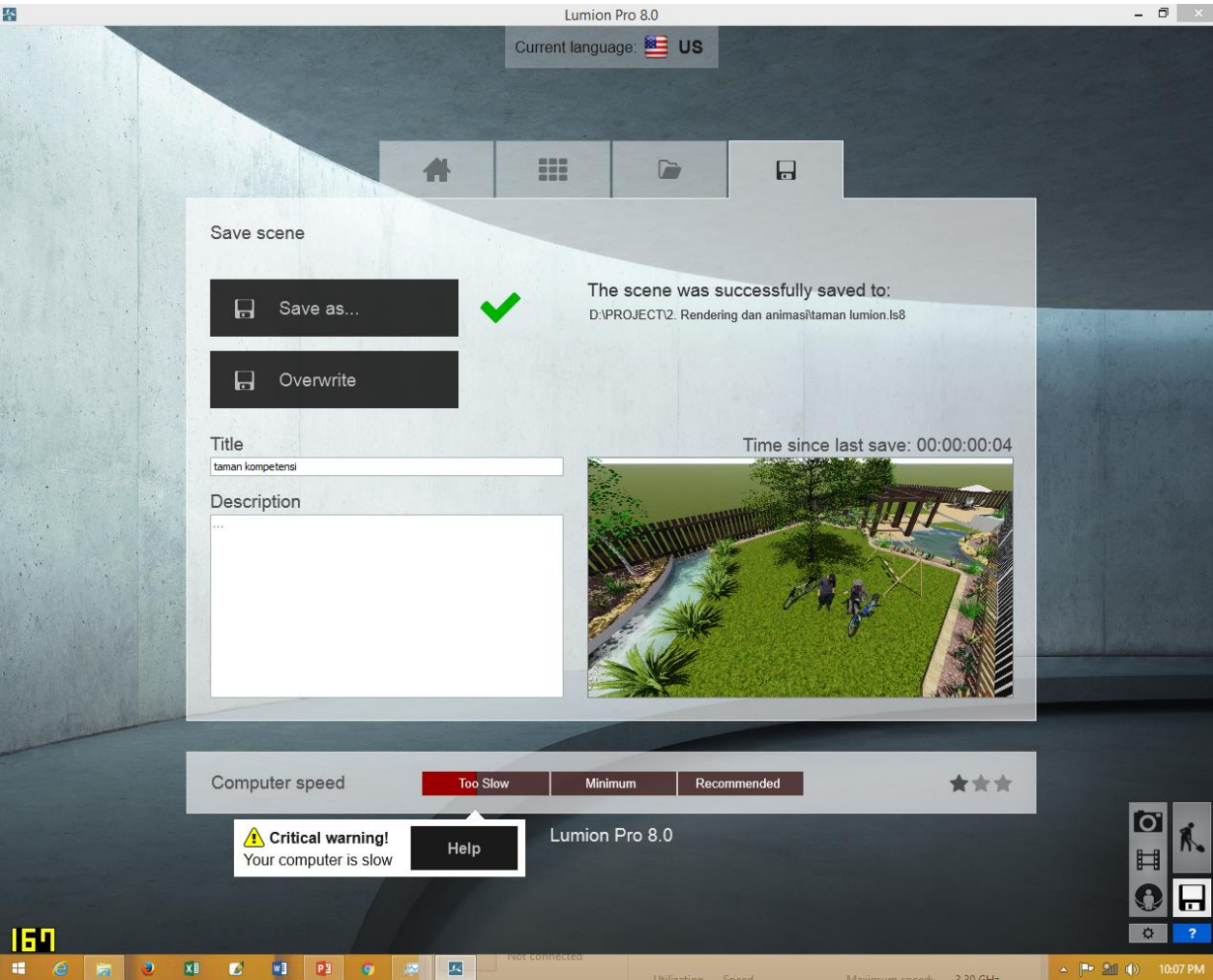
## 5. Tambahkan objek



Objek berupa tanaman, kendaraan, manusia dan lainnya



## 6. Simpan file dengan menekan logo diskfloppy

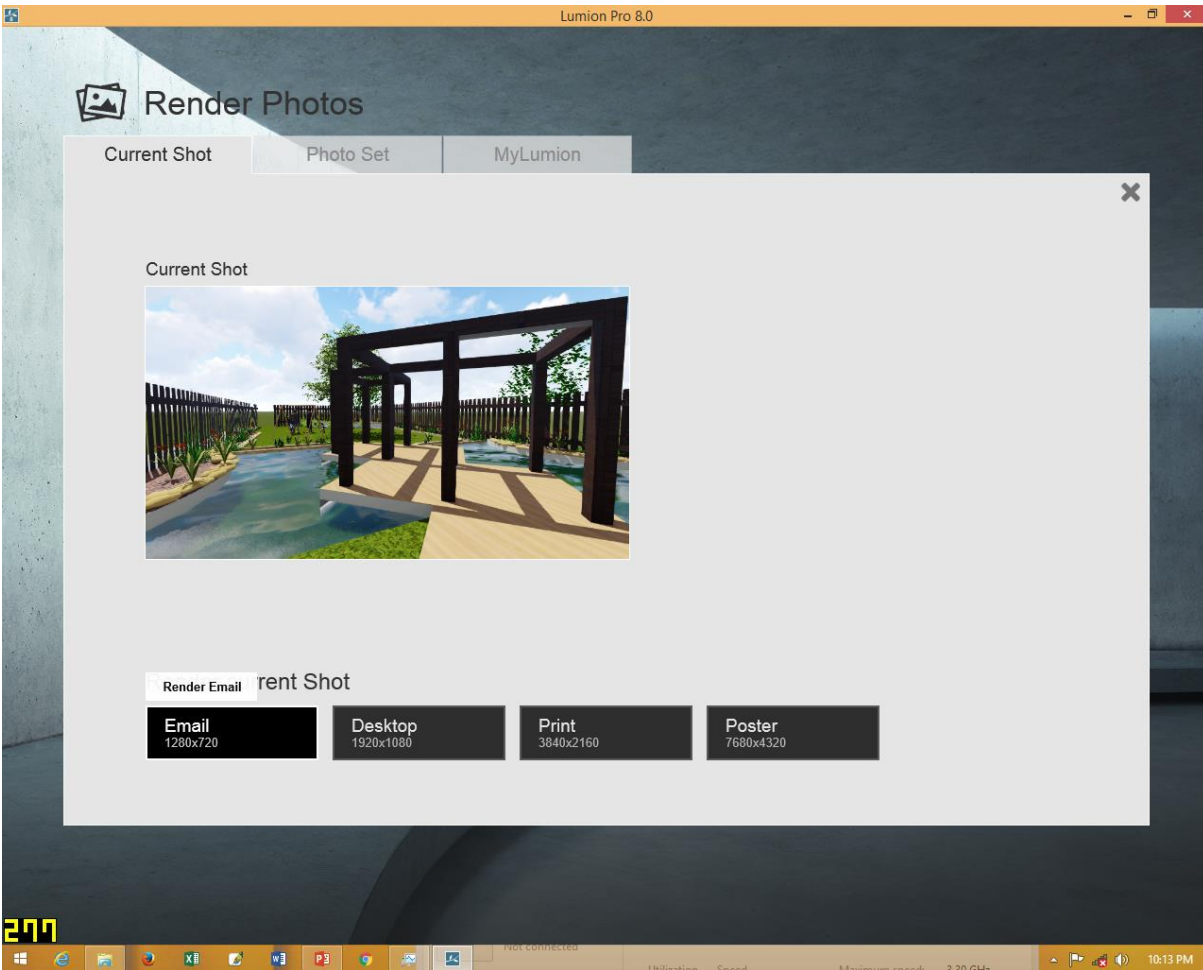


## 7. Merender gambar, dengan menekan logo kamera/photo





8. Cari sudut gambar terbaik, dengan komposisi fotografi



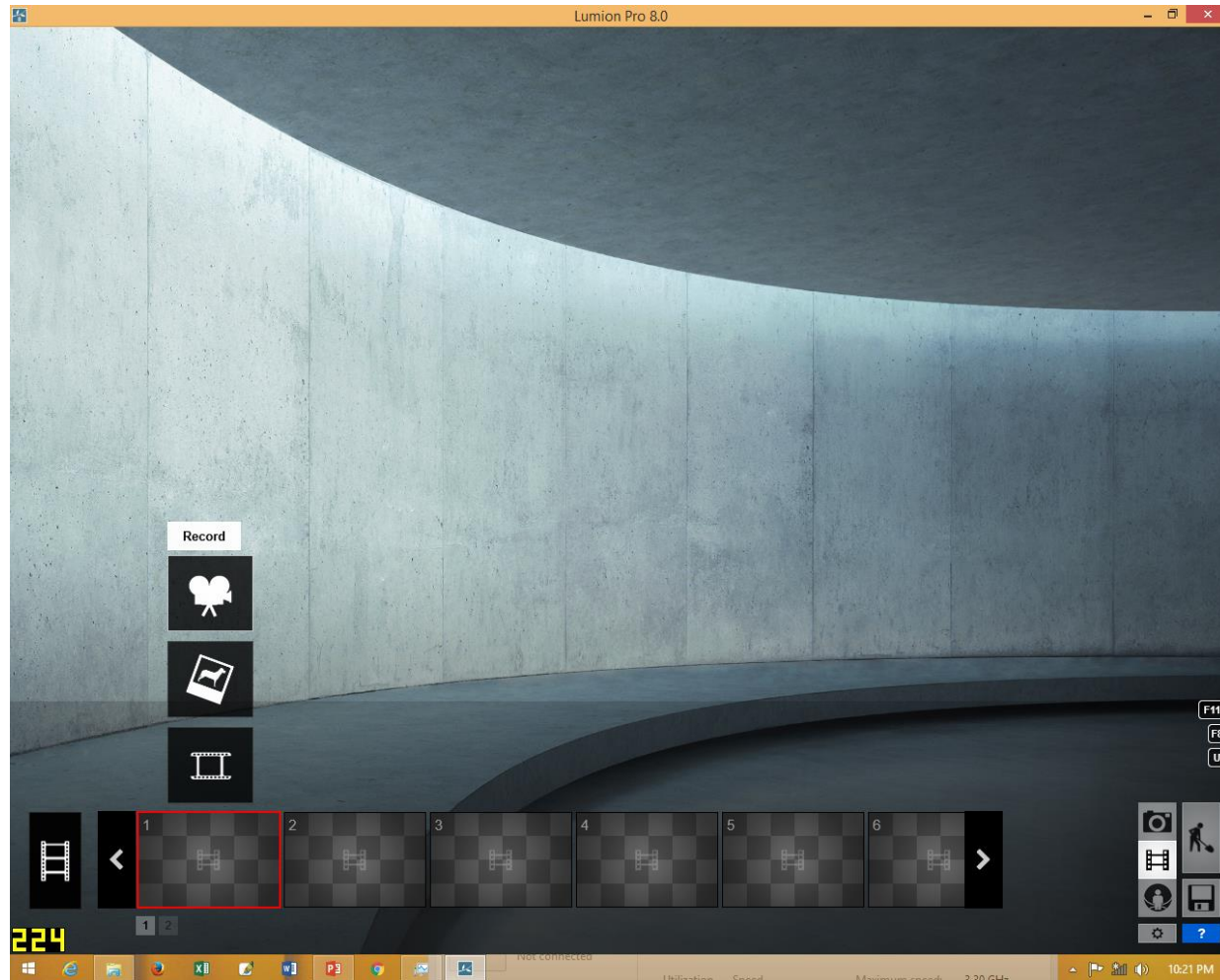
Pada custom style pilih **realistic** untuk tampilah yang lebih nyata, Klik render email untuk ukuran kecil /desktop untuk ukuran menengah

9. Hasil rendering image dengan lumion

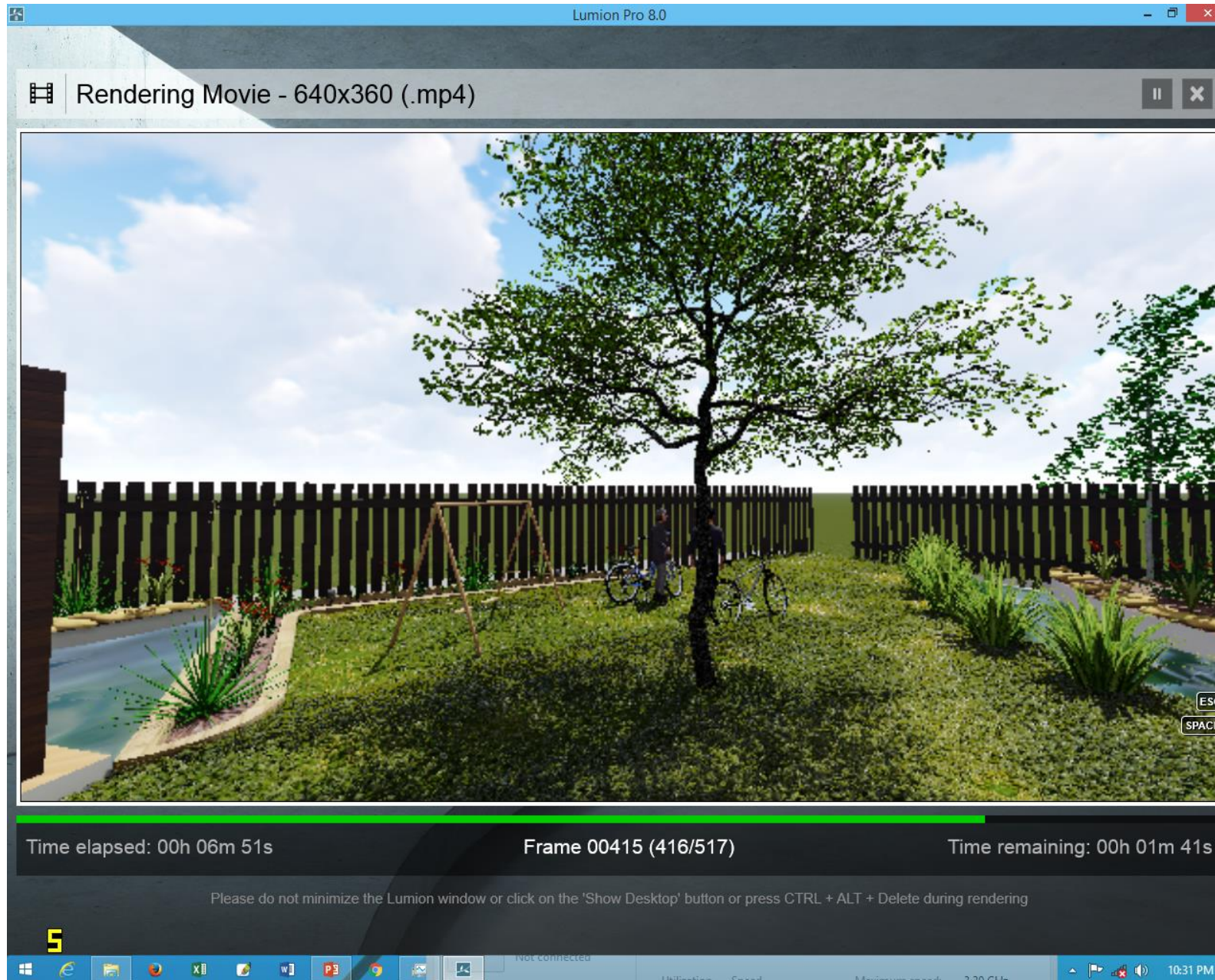


10. Klik movie > record, untuk membuat animasi  
Klik take photo secukupnya dan back

11. Klik render movie,  
Simpan dalam mp4







Proses rendering berjalan tunggu sampai selesai

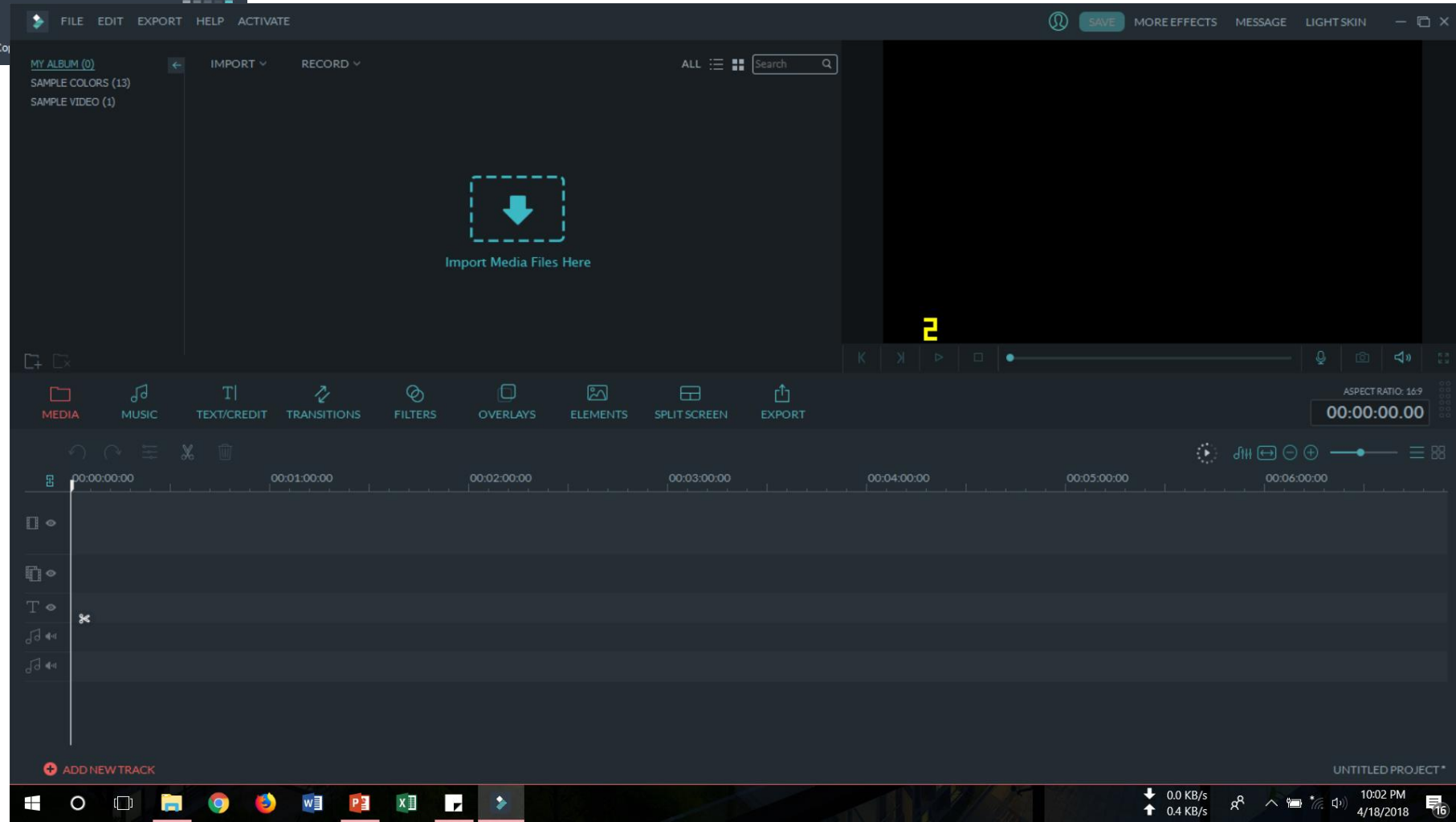
# Menggabungkan Video dengan Video Editor secara sederhana



Software  
wondershare  
filmora

Pastikan file animasi dari realtime  
landscaping atau lumion telah  
tersimpan dengan baik

Sebenarnya ada  
banyak software  
video editor seperti :  
adobe premier,  
movavi, corelvideo  
studio, ulead, namun  
pada prinsipnya  
semuanya sama



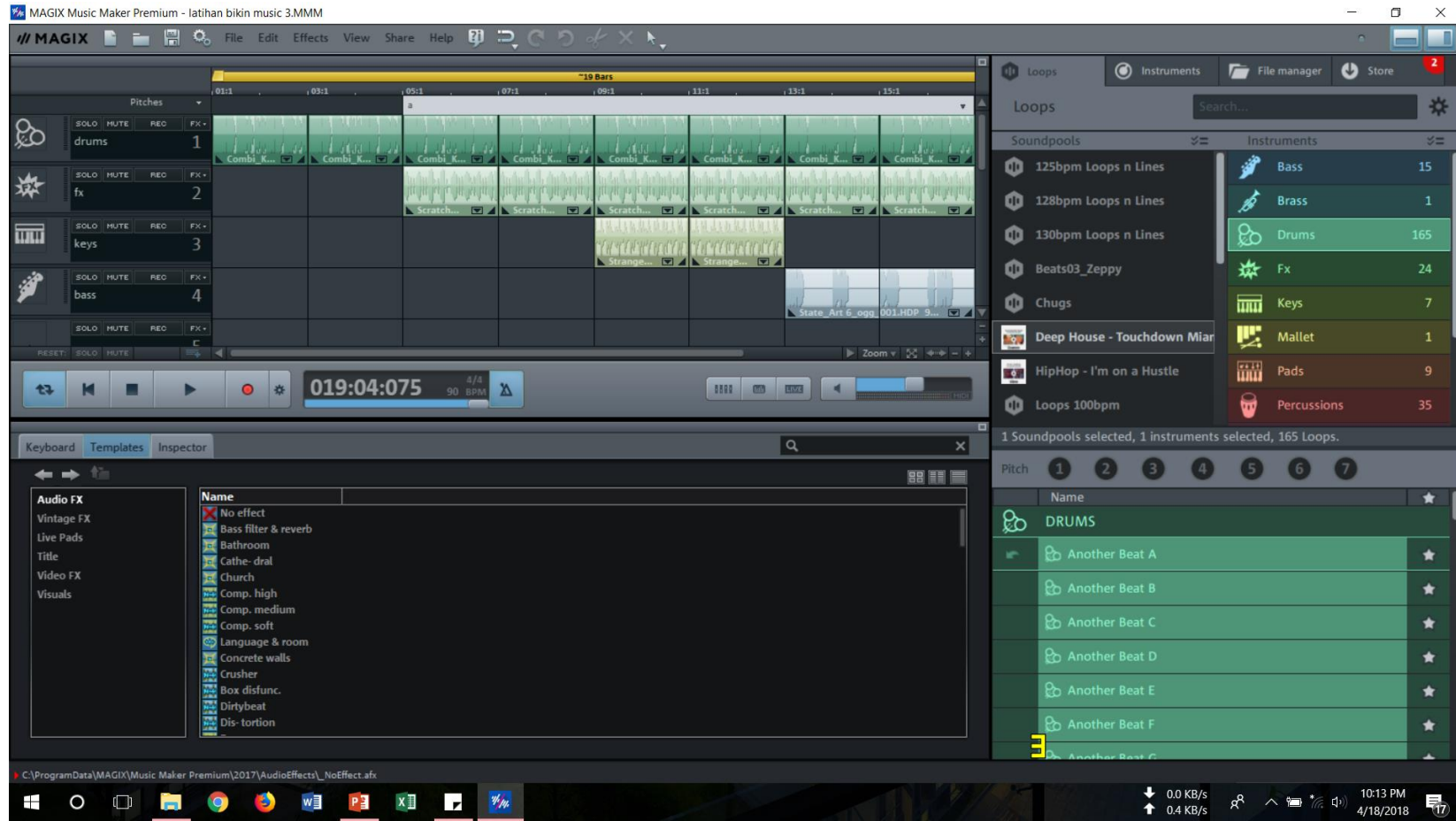


Persiapkan :

1. Animasi
2. Gambar image pendukung (logo, foto, dsb)
3. Lagu (terkadang, lagu yang didapatkan akan ditolak oleh youtube karena terhitung pelagiasi, sehingga beberapa kasus akan **buat lagu sendiri**)

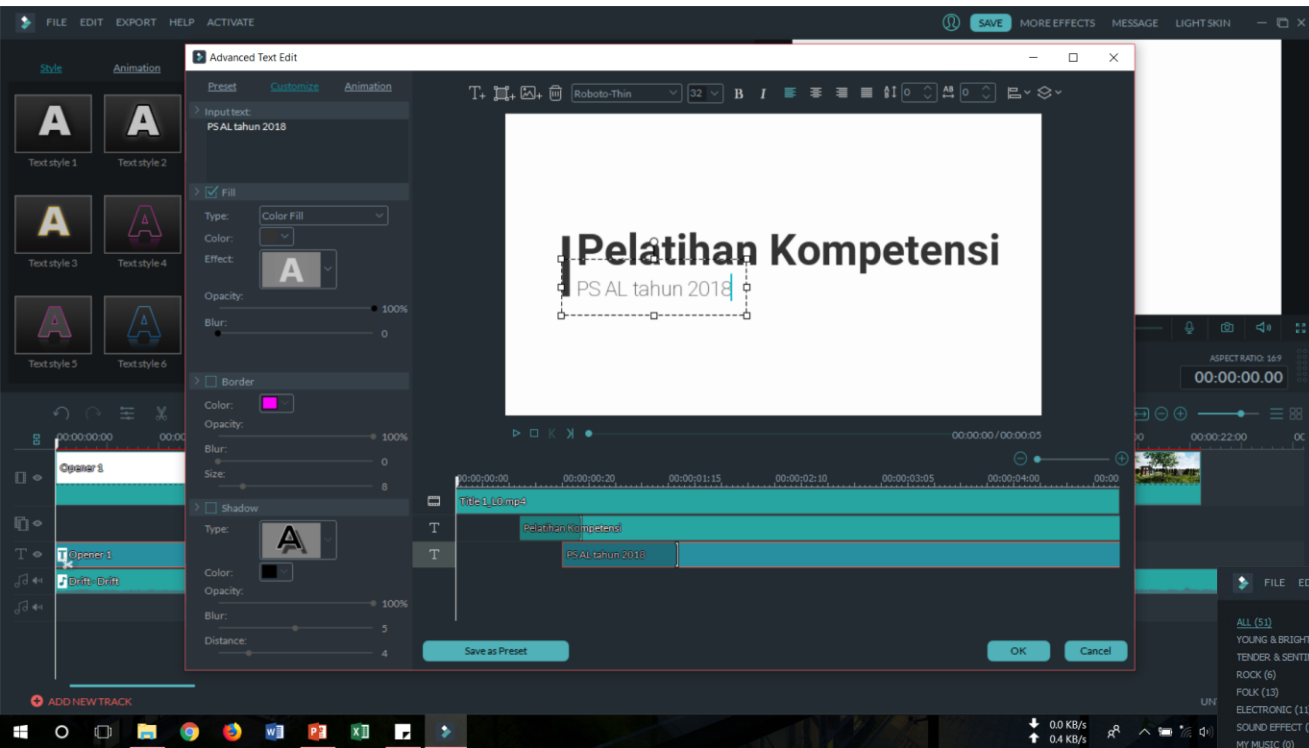


Software magix music maker premium

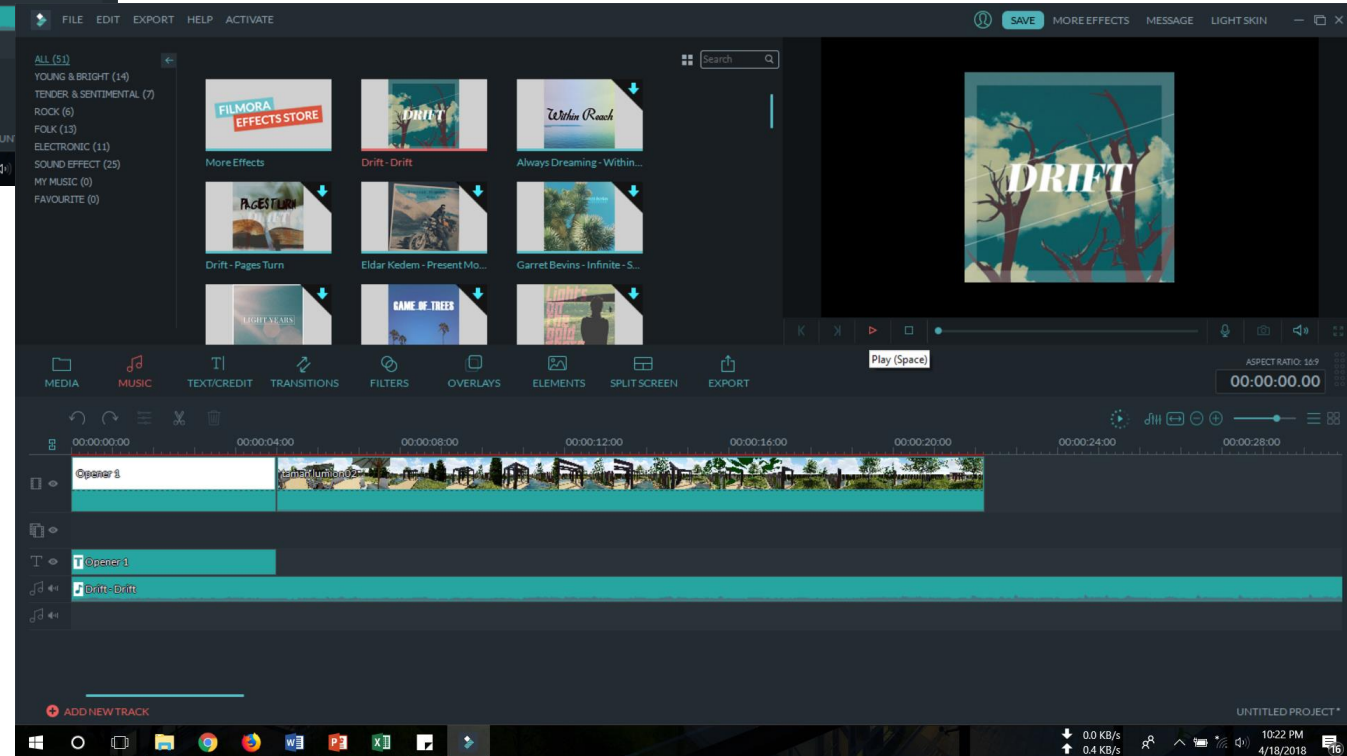


Susunlah aransemen music sehingga enak didengar, dan sudah pasti bukan pelagiasi

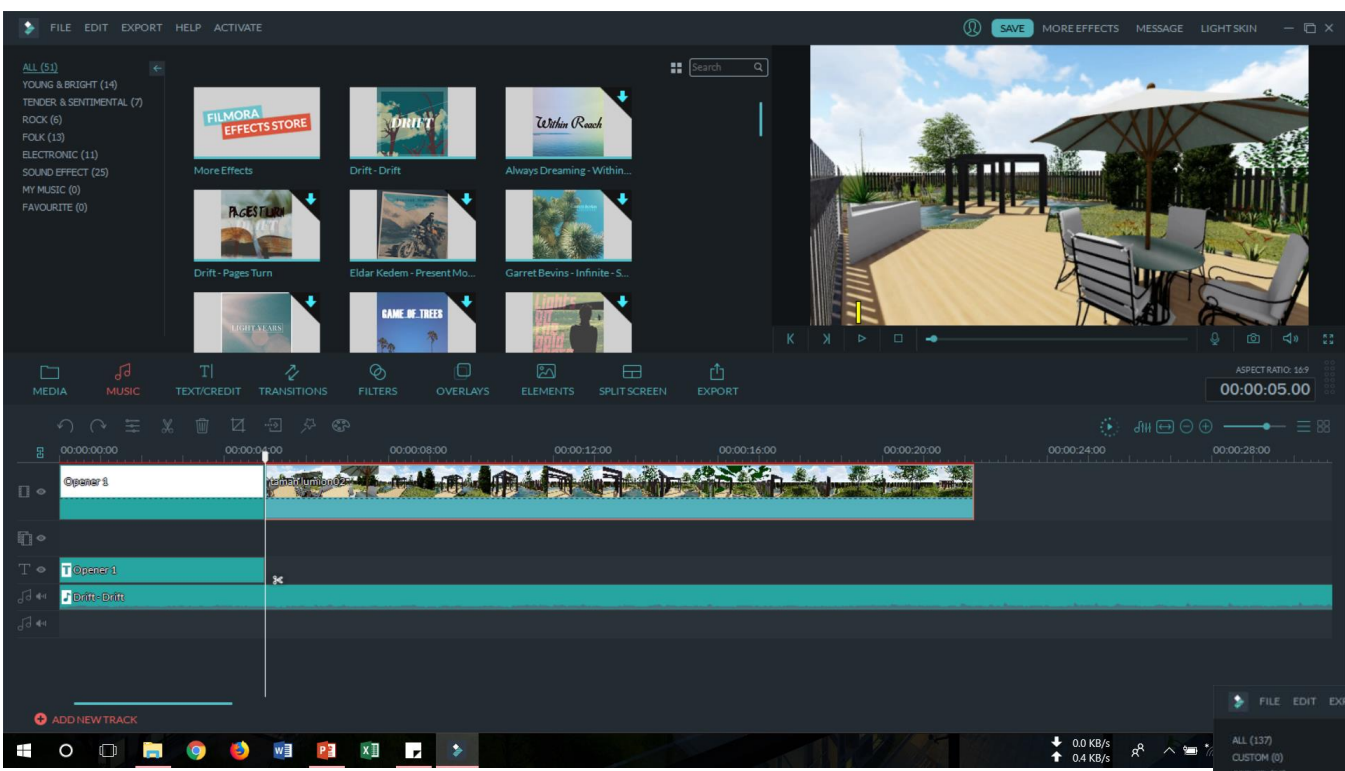
Music disimpan dalam format mp3 dengan file>export>audio mp3



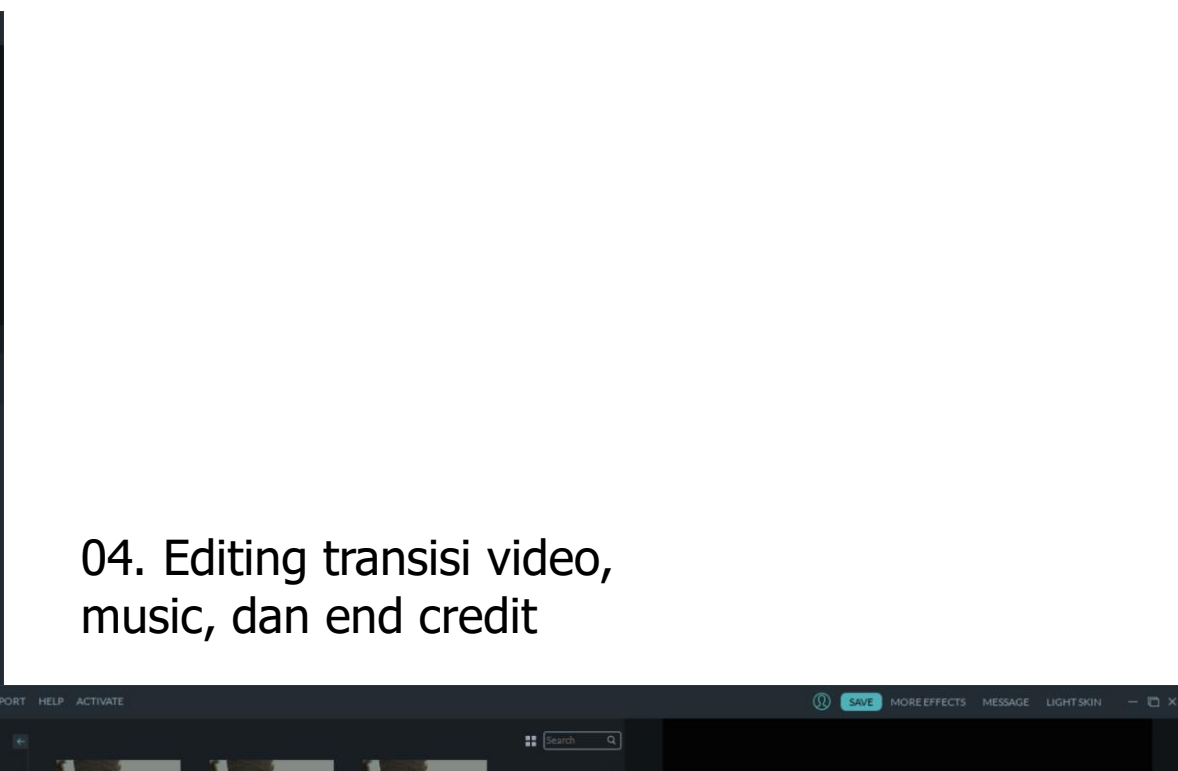
02. Memilih music dari library atau hasil music buatan sendiri



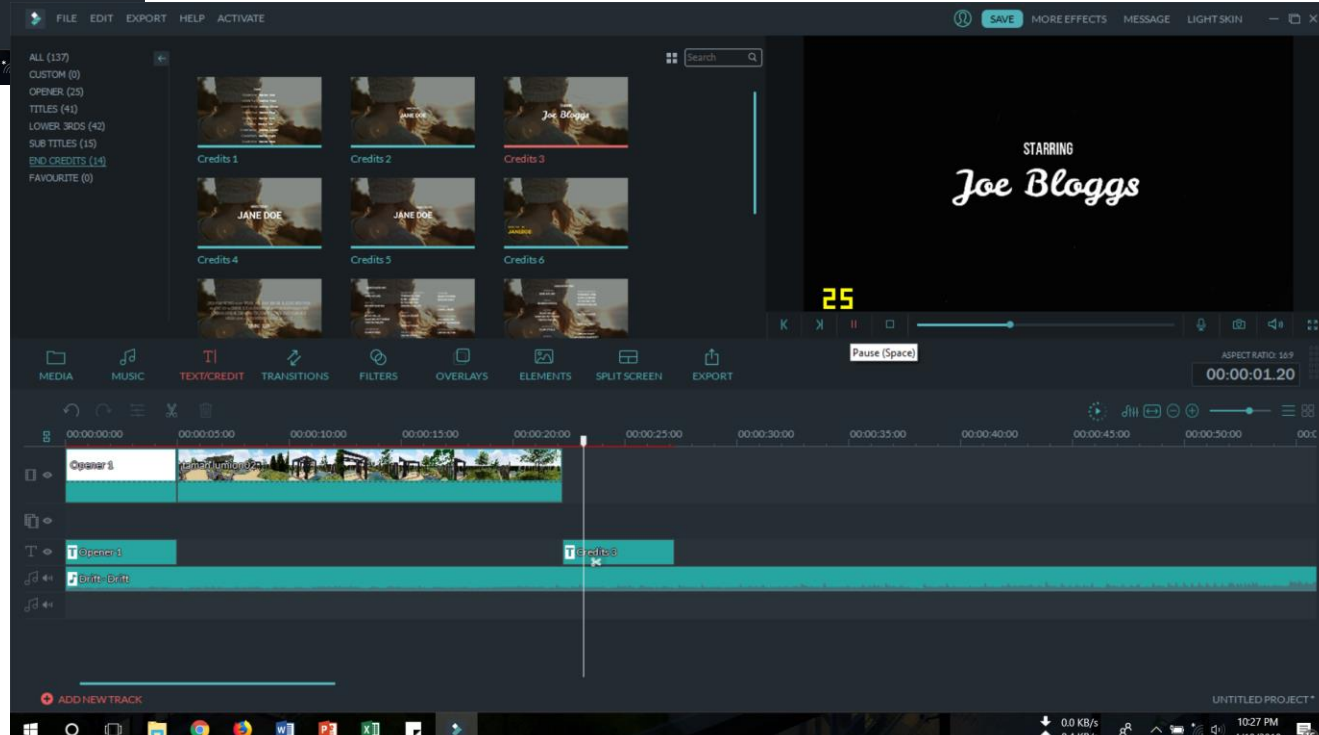


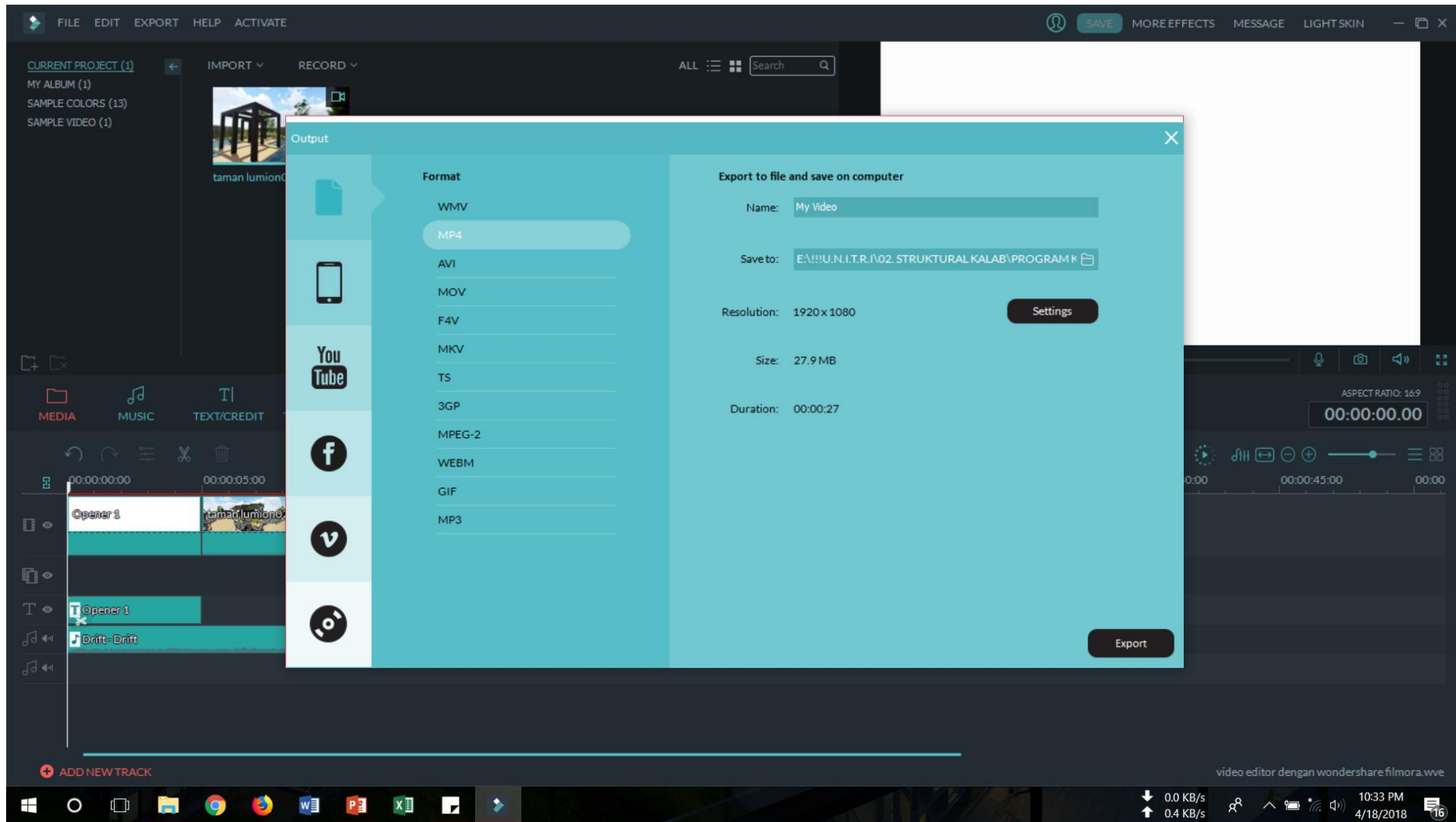


03. Memasukkan video animasi hasil render dari lumion atau realtime



04. Editing transisi video, music, dan end credit





05. Ekspor dalam bentuk mp4



## **Tugas pertemuan II :**

- 1. Bukalah sketchup taman**
- 2. Render image dengan vray 3.4 pada sketchup 2017**
- 3. Buatlah animasi dengan realtime atau lumion**
- 4. Gabungkan animasi dan gambar dengan music pendukung dengan software video editor**
- 5. Kumpulkan tugas dalam bentuk file sketchup, render jpg, rla/lr8, animasi mp4**