Project code:
2019-1-EL01-KA201-062914

Erasmus+ Call: 2019 - KA2 -
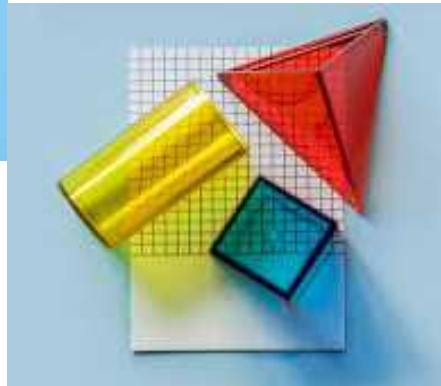
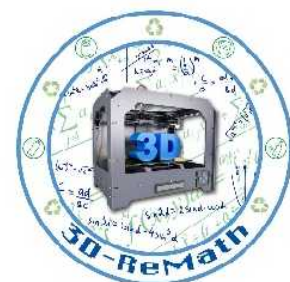# 3D printing technology aims students understanding maths and recycling procedure

Curricula 2: Digital Sketching "Making 2D Shapes / Line Tool"

Output 3 (O3) – 3D Printing and Maths

Description

In this lesson we learn how to draw basic 2D shapes in SketchUp. We learn how to use the line & shape tools by drawing lines, rectangles, circles and arcs.

Introduction

- While SketchUp is primarily used for creating 3D models, it can also be used as a quick and easy to way to draw floor plans, elevations and other two-dimensional elements. Google's SketchUp program is known for being exceptionally user-friendly and will give you the ability to create your 2D drawing in almost no time. Once you have created your 2D drawing in SketchUp, you can use that as a base for making a 3D model or you can simply use your 2D creation as is.

Introduction

- In order to get accustomed to SketchUp's interface and controls, we will learn how to draw simple 2D shapes using the line & shape tools.

- We can later turn these shapes into 3D in the following courses, using the push/pull tool.

- More complex designs can be made from simple 2D shapes. These shapes form the basic layout of our design. For example, if we wanted to make a 3D house, we would start by drawing a 2D floor-plan.
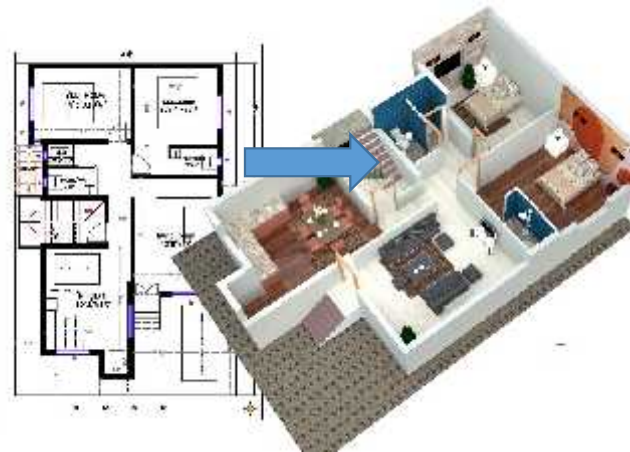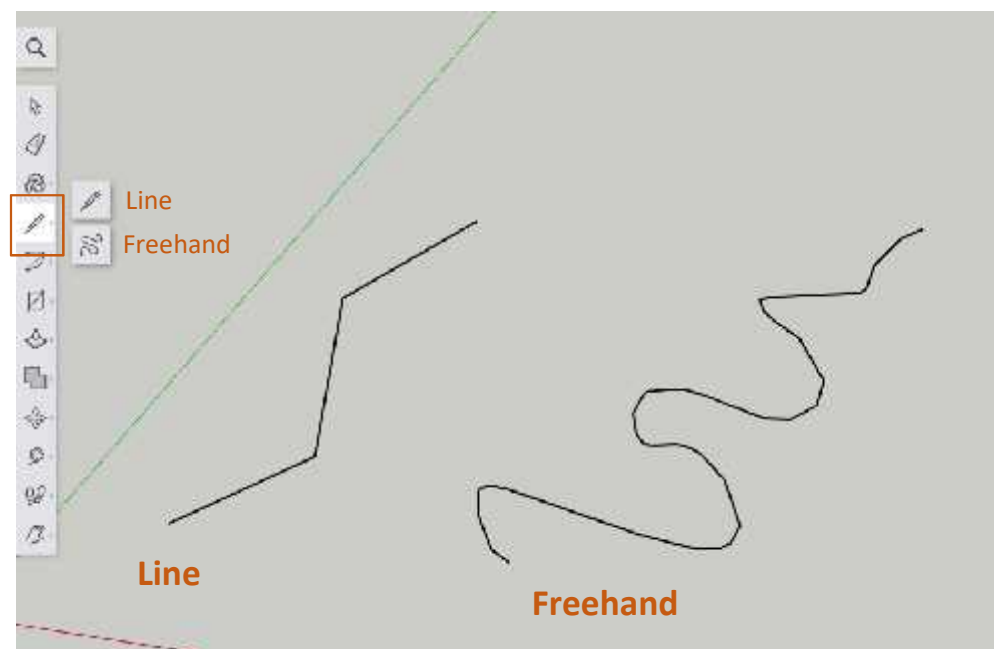
2D Sketch Tools
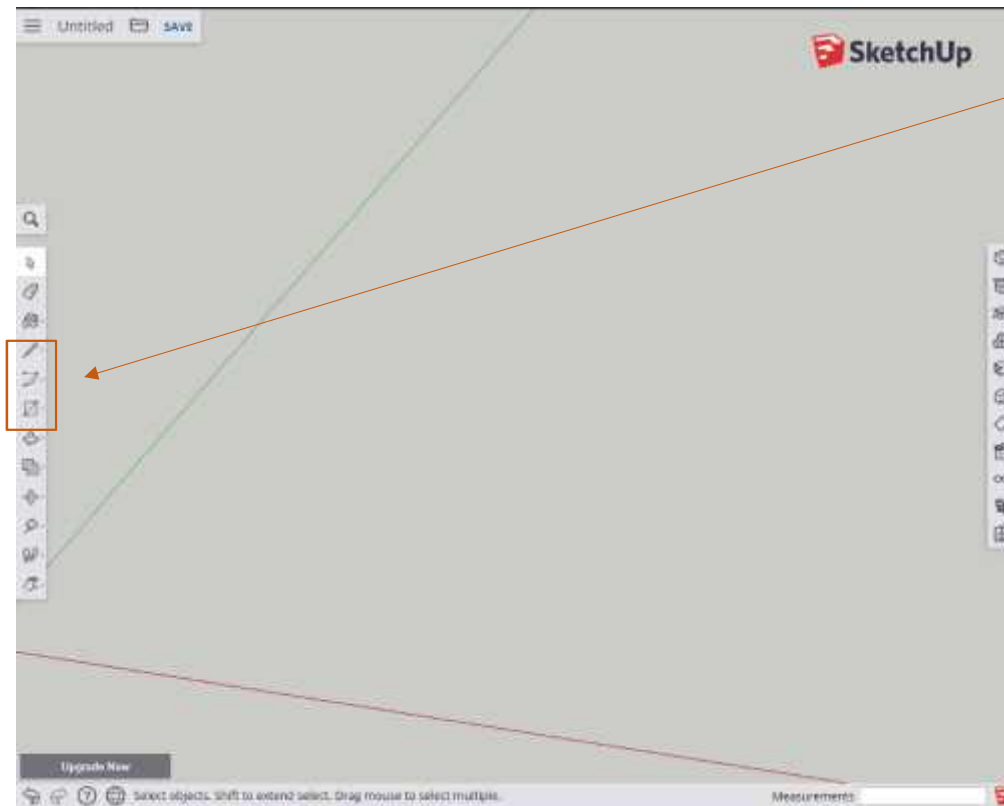
- On the left side toolbar, you can find the 2D sketch tools. Clicking each tool opens a submenu with more related options.
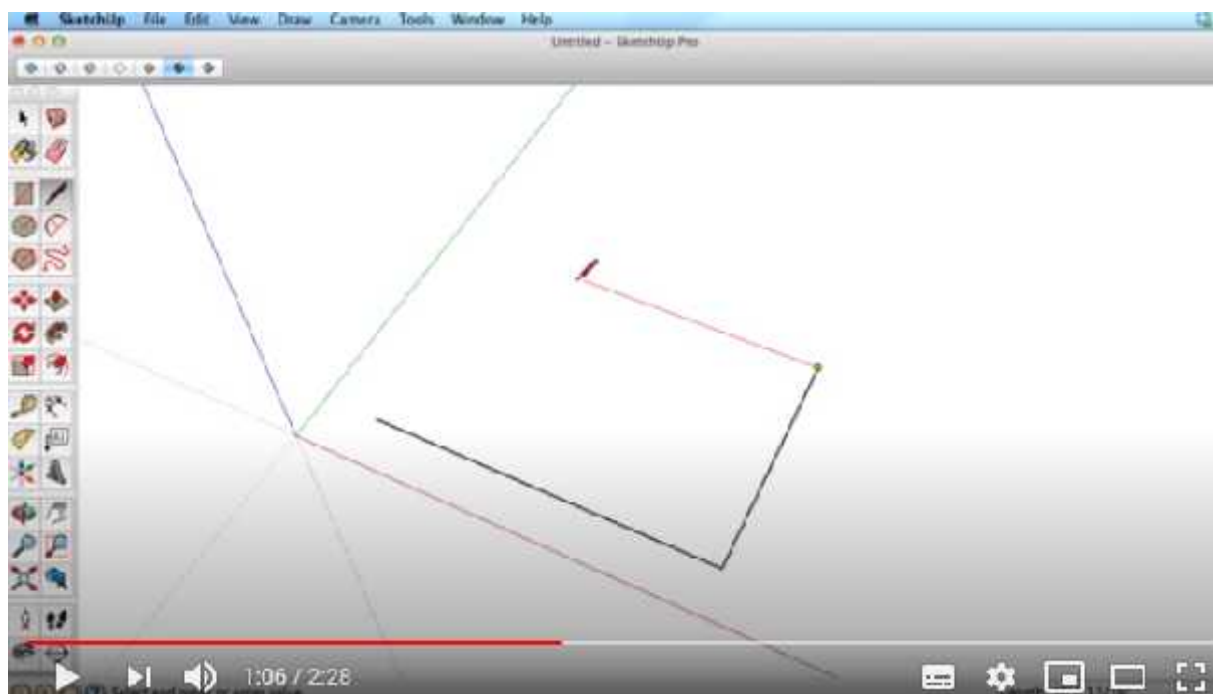
2D Sketch Tools - Line

- The Line tool submenu includes 2 options: **Line** *and Freehand*.

- **Line** is useful for drawing straight lines.

- **Freehand** is used for drawing freehand sketches.

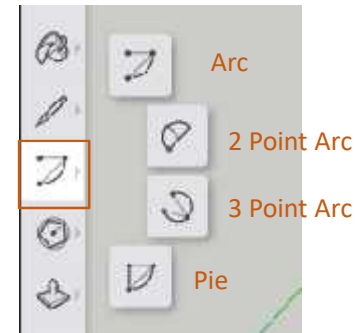# 2D Sketch Tools - Line

https://www.youtube.com/watch?v=hcyWodv5g_o
Youtube. SketchUp. "SketchUp Training Series: Line tool". 2014

2D Sketch Tools - Arc

- The Arc tool submenu includes 4 options: **Arc, 2-Point-Arc, 3-Point-Arc and Pie**.
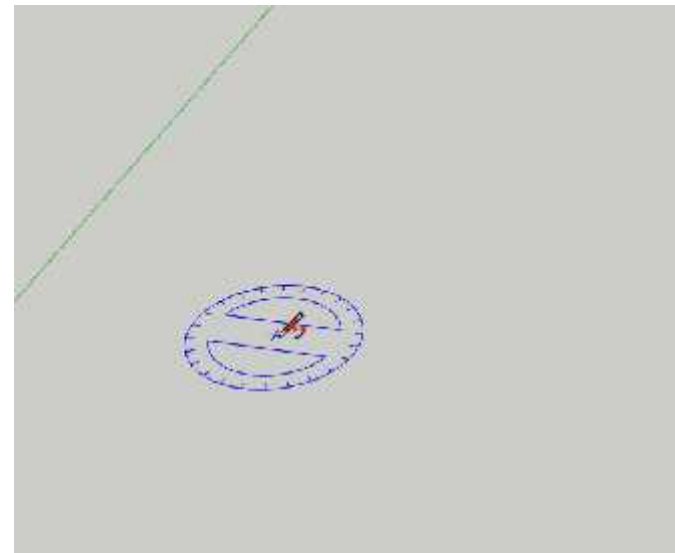
Arc

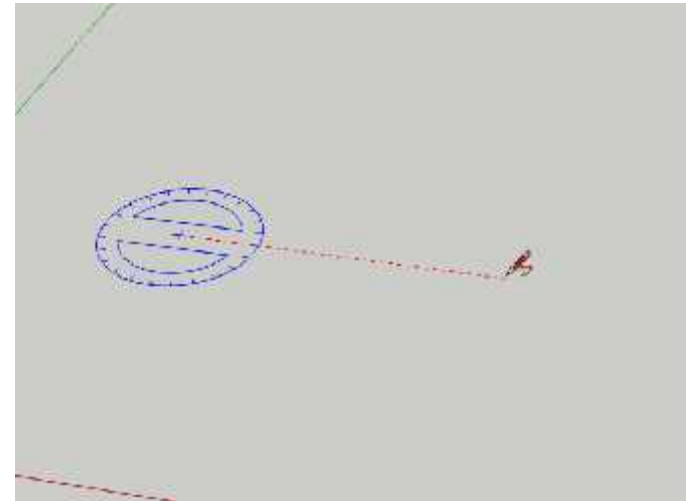2 Point Arc

3 Point Arc

Pie

2D Sketch Tools – Arc (1/3)

- The **Arc** tool can be used to create simple arcs.
- To use it, first we select the tool and click to set the starting point:
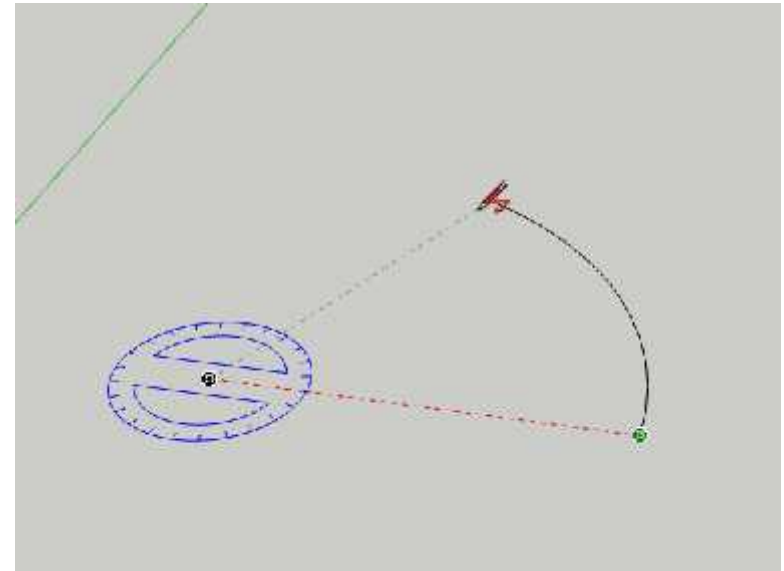
2D Sketch Tools – Arc (2/3)

- Then we move the cursor away, without clicking, to set the length:
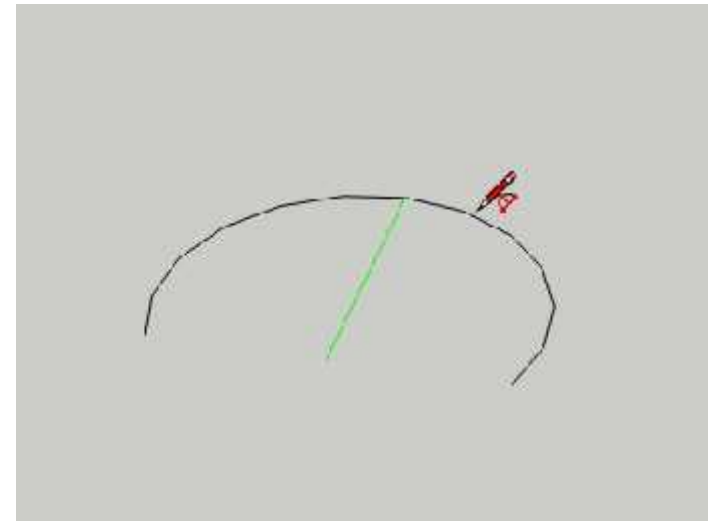
2D Sketch Tools – Arc (3/3)

- We click once to set the length, then we move the cursor away to set the angle.
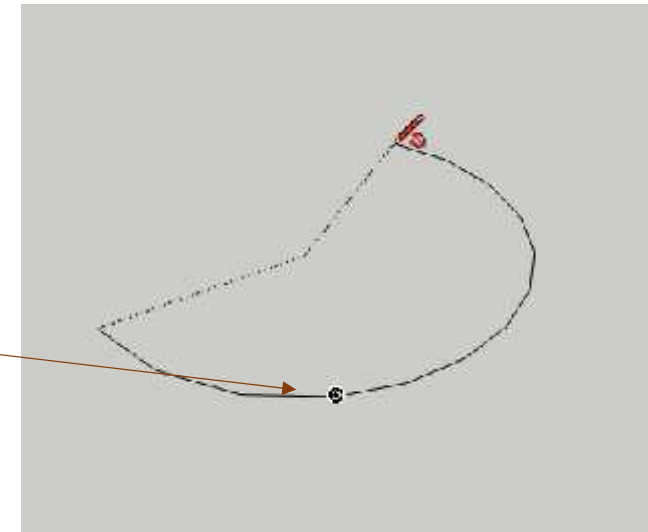- Finally we click again to finish the arc.

2D Sketch Tools – 2 Point Arc

- The **2 Point Arc** tool works similarly, but instead of setting the angle in the final step, we set the Bulge *(Green Line).*

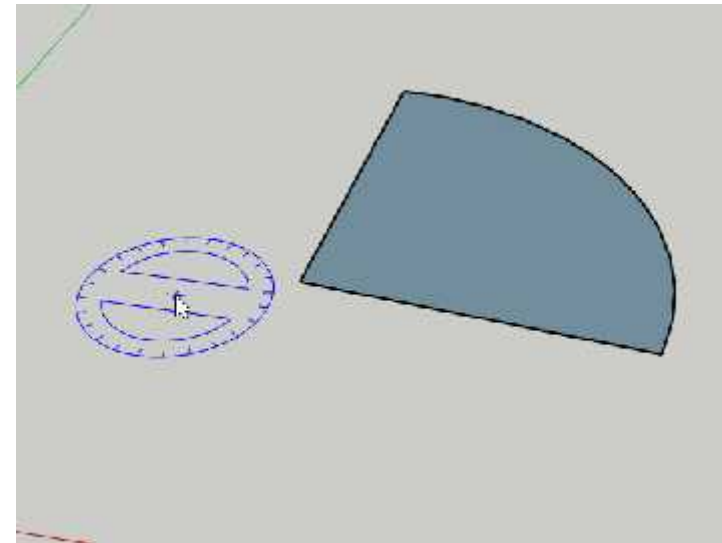# 2D Sketch Tools – 3 Point Arc

- The **3 Point Arc** is also similar, but allows us to *pin* the arc to an intermediate Point.

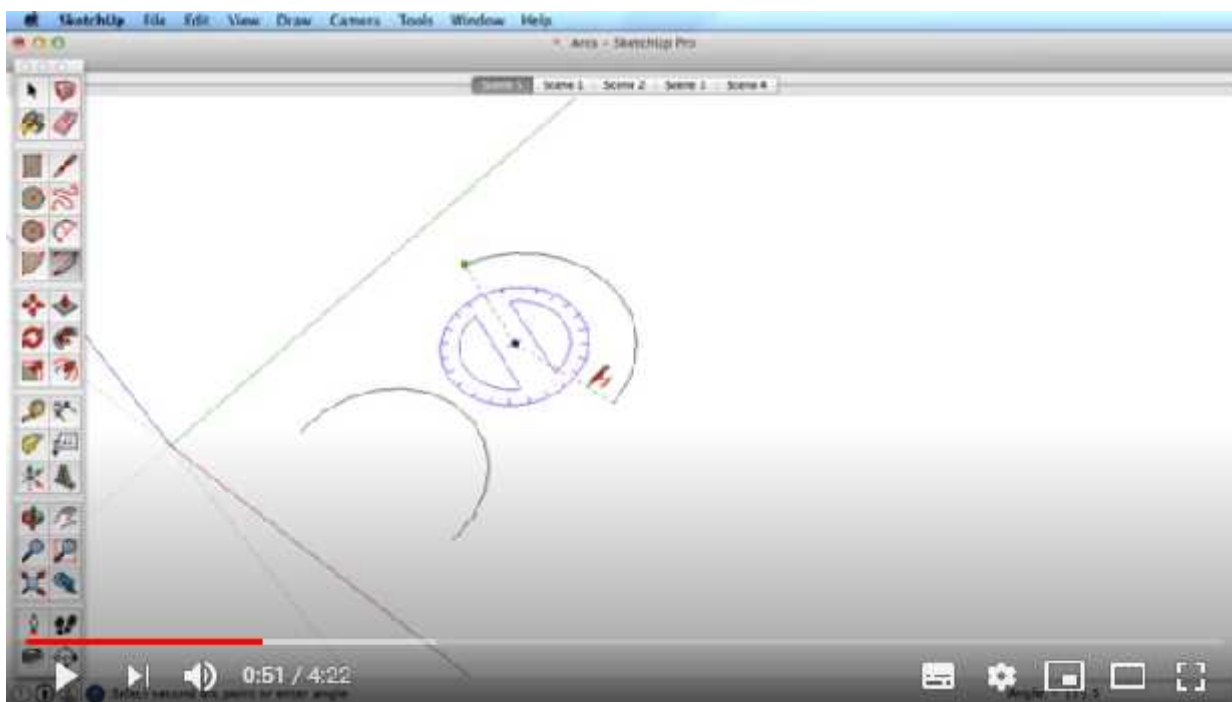- The resulting Arc will always pass through that Point.

2D Sketch Tools – Pie (Arc)

- Finally, the **Pie** Arc tool allows us to easily create pie shapes.
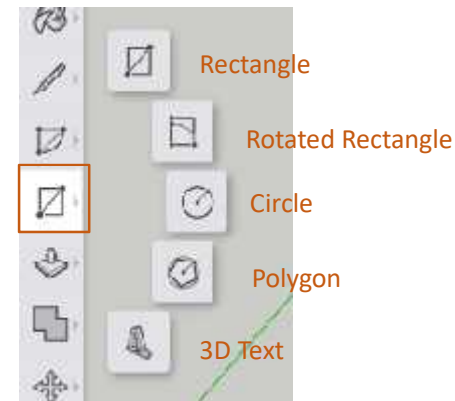
2D Sketch Tools - Arc

2D Sketch Tools - Shapes

- The Shape tool submenu includes 5 options: **Rectangle, Rotated Rectangle, Circle, Polygon and 3D Text**.

- We will not focus on **Rotated Rectangle** and **3D Text** for the moment, as they move into 3D space and are subject for another lesson.

Rectangle

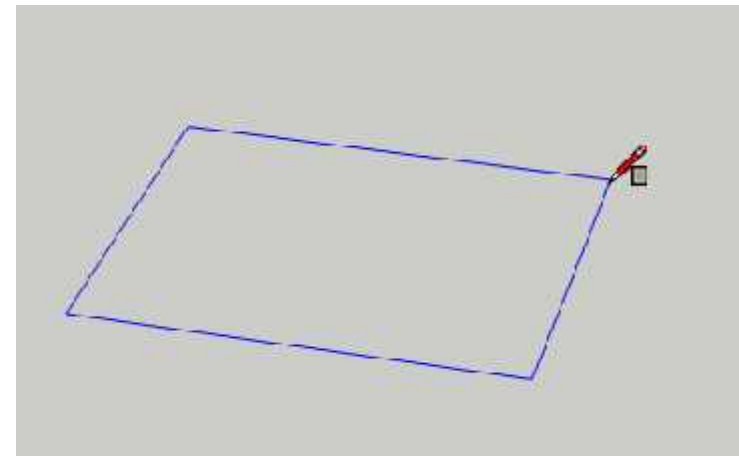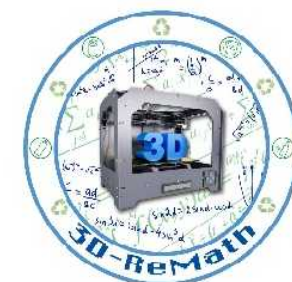Rotated Rectangle

Circle

Polygon

3D Text

2D Sketch Tools – Rectangle

- As the name suggests, the **Rectangle** tool allows us to draw simple rectangles by clicking on two points.
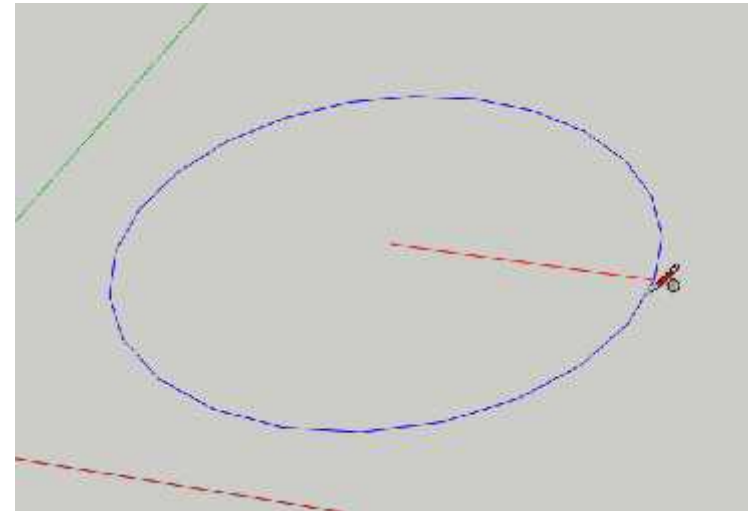
2D Sketch Tools - Rectangle

https://www.youtube.com/watch?v=WtF8YtX-Tf8
Youtube. SketchUp. "SketchUp Training Series: Rectangle tool". 2014

2D Sketch Tools – Circle

- The **Circle** tool allows us to draw circles by first clicking on a centre-point and then setting the radius *(Red Line)*.
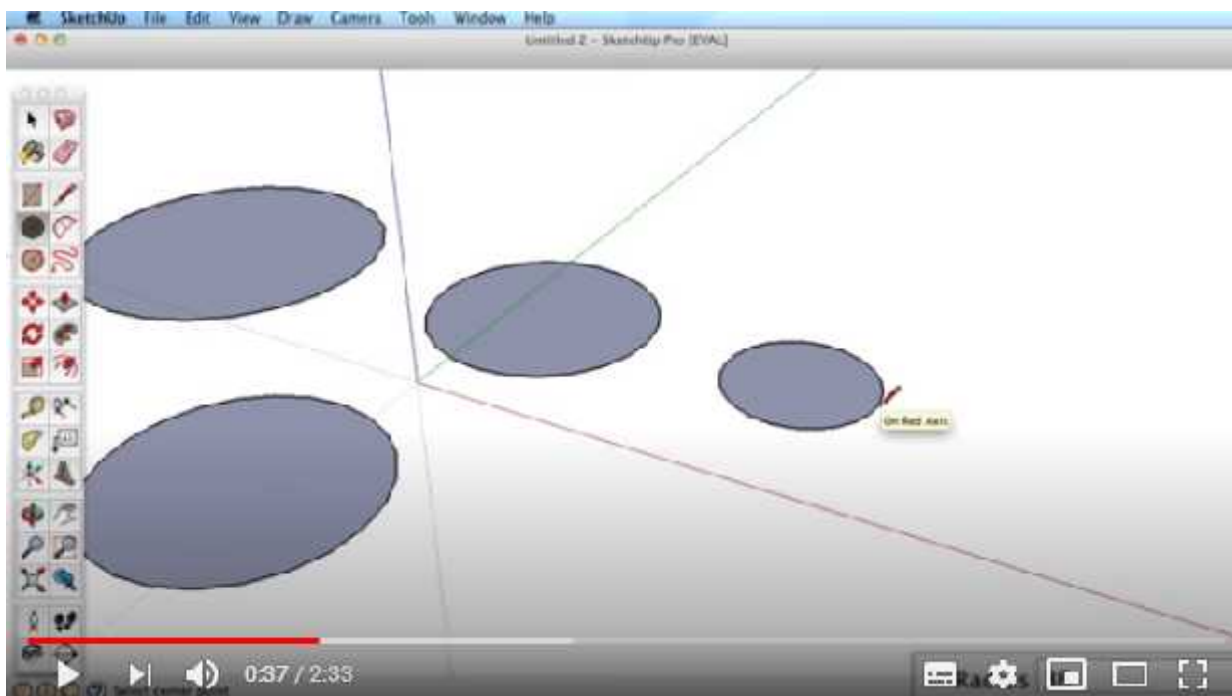
2D Sketch Tools – Polygon

- The **Polygon** tool allows us to draw n-sided polygons.
- We can set the number of segments by using Ctrl+ to increase and Ctrl- to decrease the number, while drawing the polygon.
- The number of sides can be set between 3 (Triangle) to 999.
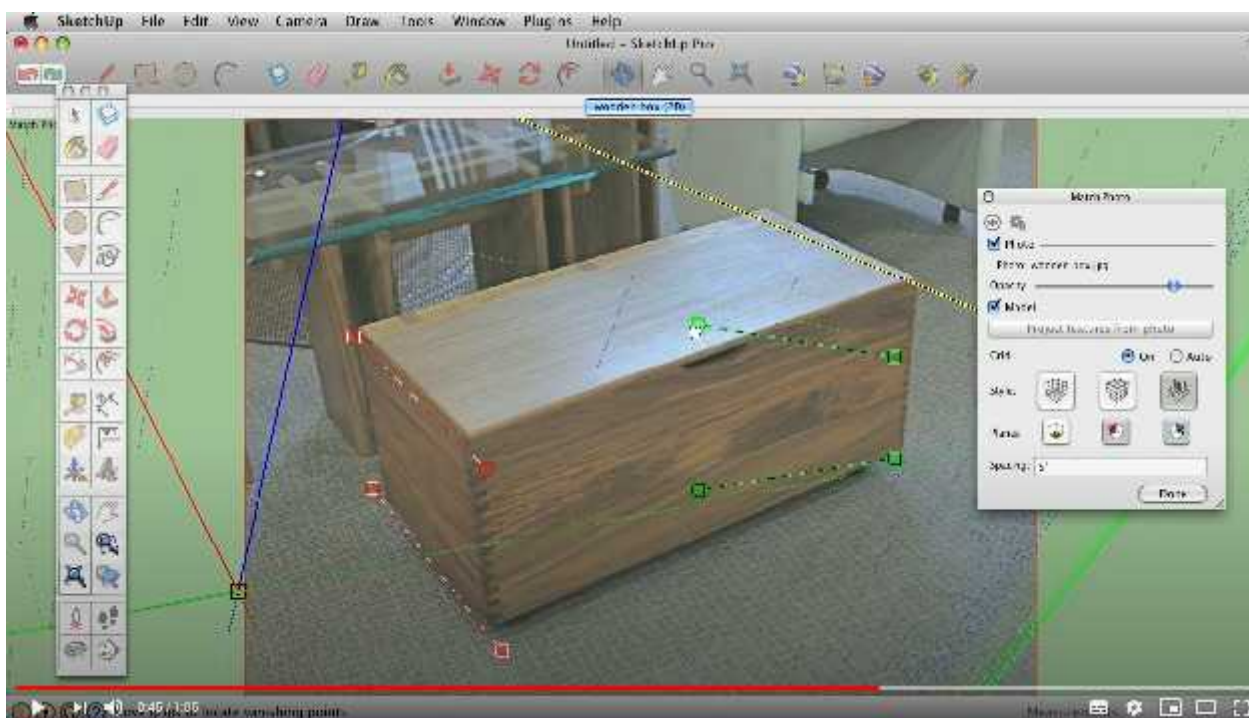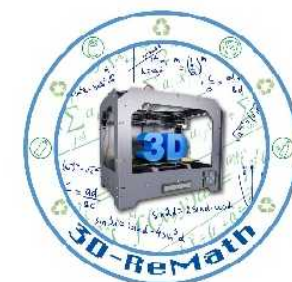
2D Sketch Tools – Circle & Polygon

https://www.youtube.com/watch?v=RHnid50KLIA
Youtube. SketchUp. "SketchUp Training Series: Circle and Polygon tools". 2014

2D Sketch Tools – Drawing over an Image

https://www.youtube.com/watch?v=gOB7fBrEjwY

Youtube. Concept3D. "SketchUp Tips and Tricks: Image, Texture, Matched Photo Import Options". 2009

Thank you!!

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