

STREAM@SREES Solutions

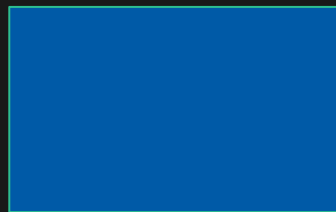
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# What is the difference of 3d vs 2d?



3D

An object with three dimensions and has length, width, and height.



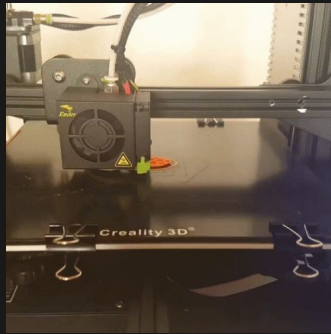
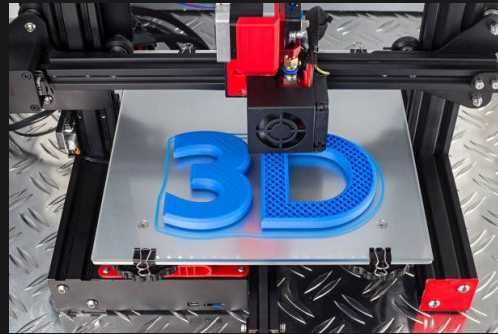
2D

A flat item with two dimensions of length and width, but does not account for thickness or height.

vs

# What is 3D Printing?

- An additive manufacturing process that uses a machine to create a three-dimensional object
- 3D printing is done by building up an object layer by layer



# How does 3D Printing Work?

- Laying down thin layers of melted or powdered plastic(filament) and then fusing the layers together in accordance to the design uploaded
  - Other materials such as metal and cement can also be used.
- A UV-laser beam is exposed to a layer of photosensitive liquid resin, which hardens in the desired shape and occurs layer by layer until the product is complete.

# Parts of a 3D Printer

Build Plate (Heated Bed): Where the model/item is created layer by layer (Comes to life)

Print Head: Releases melted filament through the nozzle onto the heated bed

Filament Tube: Inserting the filament through one end takes it to the print head and eventually through the nozzle

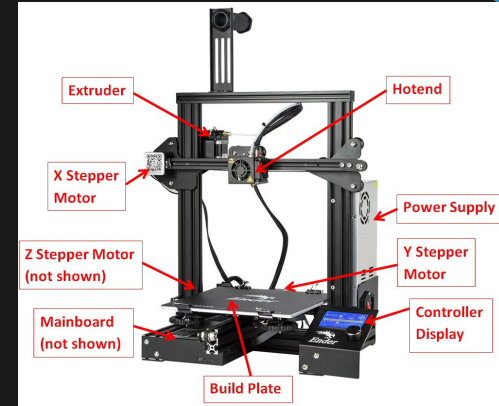
Filament Holder: Holds the filament wheel

Controller Display: Control center for printer activities such as temperature, speed, etc.

Stepper Motors (X,Y,Z): Controls movement for designated axis

Cooling Fan: Cools the filament to an appropriate temperature

Note: Various printers may have different parts



# 3D Printing Process

- Step 1: Create or Find a Design
- Step 2: Export the STL File
- Step 3: Choose Your Materials
  - Color, filament, etc.
- Step 4: Choose Your Parameters
- Step 5: Create the Gcode/Slicing
- Step 6: Print
- Step 7: Post-printing (cool down phase)



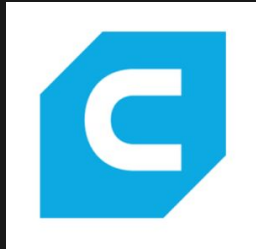
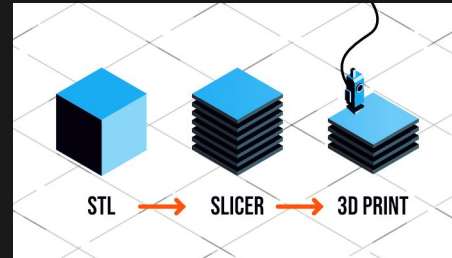
# Modeling Applications

- Tinkercad
- Onshape
- Fusion 360
- There are many options to design and produce your creations!



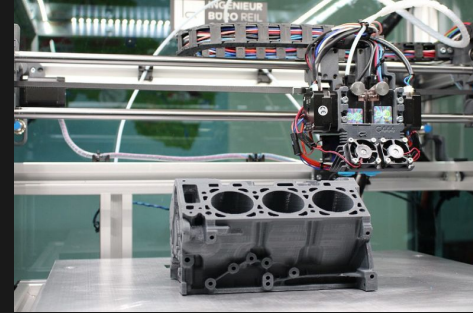
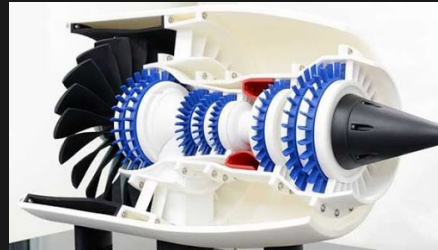
# What is Slicing?

- Converting the 3D model file into a machine language that can be recognized by the printer
  - Only can be printed if the printer recognizes the language
- Provides set of instructions and preview of the item will be built
  - “Slices” 3D model into thin layers as instructions for the machine
- Converts designs in other languages into a g-code file
- Ultimaker Cura, Prusa Slicer, etc.



# 3D Printing Real-World Applications

- Manufacturing
- Medical
- Automotive
- Aerospace
- Construction
- Many more!



The background is a dark navy blue. It is decorated with several abstract geometric shapes. In the top left, there is a small cube with orange, blue, and grey faces. To its right is a larger orange cube. In the top right, there is a purple and blue shape resembling a stylized flower or a set of three petals. Below that is a large orange triangle. In the bottom left, there is a cluster of several cubes in orange, blue, and grey. In the bottom center, there is a semi-circle with an orange-to-yellow gradient. To its right is a circle divided into four quadrants of orange, blue, grey, and blue. In the bottom right, there are several overlapping triangles in shades of blue, teal, and purple.

# Thanks for listening!

Feel free to grab a sample design!