



Yr 7

3D PRINTING

An introduction to additive manufacturing, designing for 3D printing, and exploring the potential of new technologies



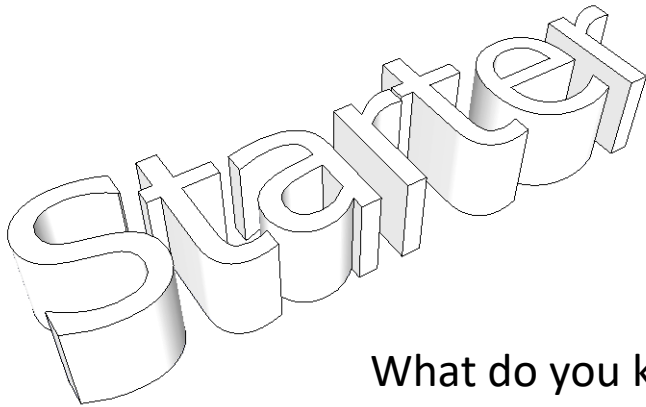
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LESSON 01

Objective: Understand the term additive manufacturing, and how 3D printing technology works, including its limitations.



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What do you know about 3D printing technology already?

At your tables, discuss and share what you know with your peers.

As a group we will then feedback what the group knows about this technology.



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What is additive manufacturing?

If we had to describe current and common making techniques, we would describe them as subtractive manufacturing. This is because we are taking material away from a larger piece of material to make a part or product.

Cutting, filing, sanding, drilling, are all common processes you can probably see equipment for in the workshop around you.

So if these are subtractive processes (subtracting materials) then additive manufacturing looks at processes that add materials.

Definition:

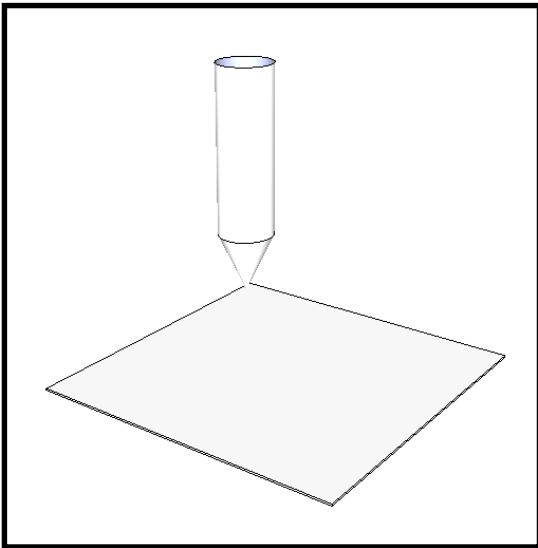
Additive manufacturing or 3D printing is the process of making a solid three dimensional object from a digital model. The final object is created by laying down successive layers of material until the final form is completed.



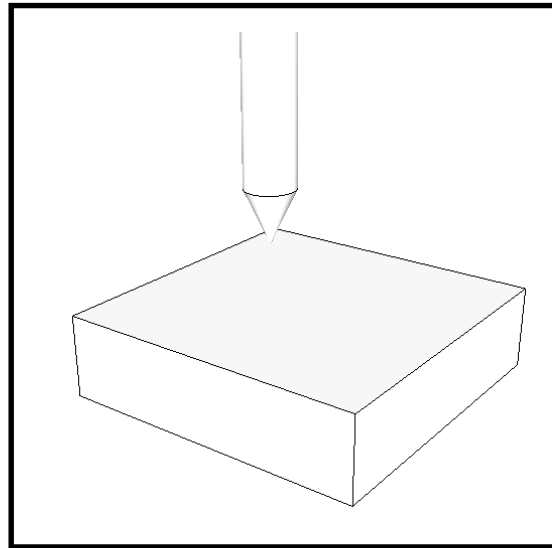
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What does additive manufacturing look like?

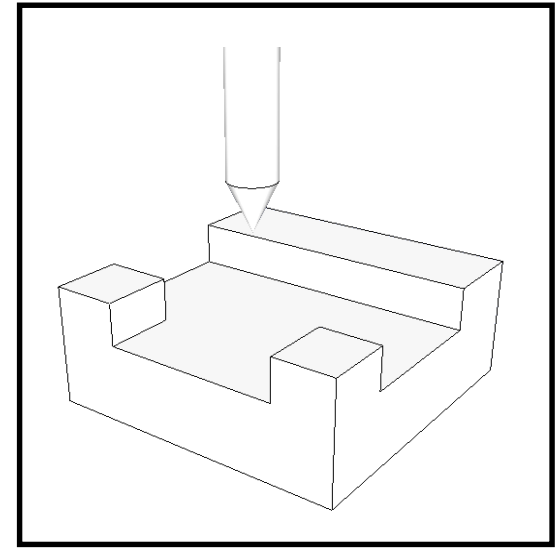
Here is a representation of additive manufacturing in a visual step by step explanation.



Step 1: The print head lays down the first layer of the model. Some printers will lay down a layer that will later be wasted, made from another material.



Step 2: The print head covers each layer with a new layer, building a 3D form from the bottom up.



Step 3: As the model builds towards completion, details are added to create an intricate form not possible with other processes.



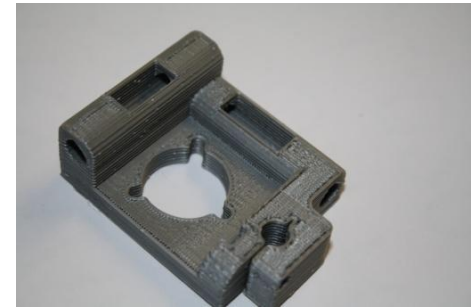
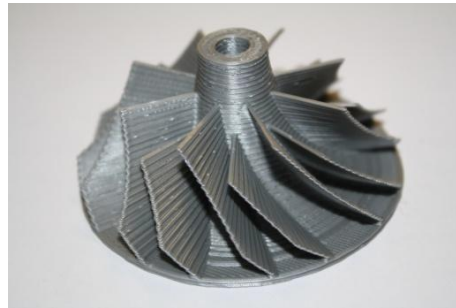
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Look at the handling collection of 3D printed objects

Task: Study each object and draw them onto a sheet.

Your task is to decide

- in which direction each was printed
- what features make them possible to print
- potentially what forms cannot then be 3D printed (the limitations)





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The Printer

Gather around the printer and have a look at its design.

All 3D printers effectively have the same features that make them work.

- Can you spot?**
1. The print head
 2. The print material
 3. The feed motor
 4. The print bed
 5. The X, Y and Z axis
 6. Sensors

What do each do?

In pairs, come up with a short description of what each part does.



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The Maxit printer

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3D printer

Watch the video showing you how a 3D printing works.

Using the following key words, write a description about how 3D printing technology works.

The print head

The print material

The feed motor

The print bed

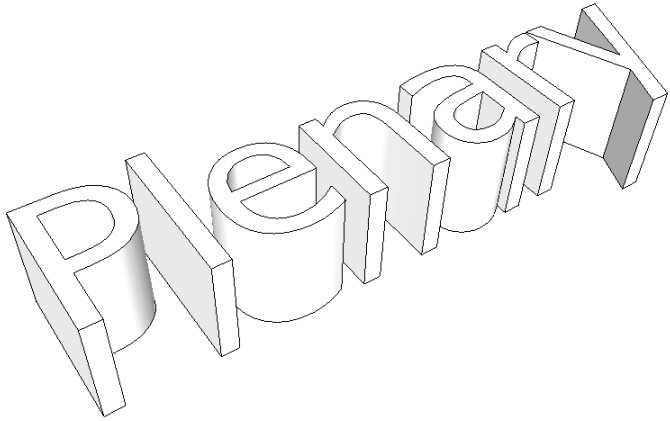
The X, Y and Z axis

Sensors

Video of 3D printing in action
printing a part



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What does additive manufacturing mean?

How does 3D printing work?

What can't you print using 3D printing?

What are the differences between additive and subtractive technologies?