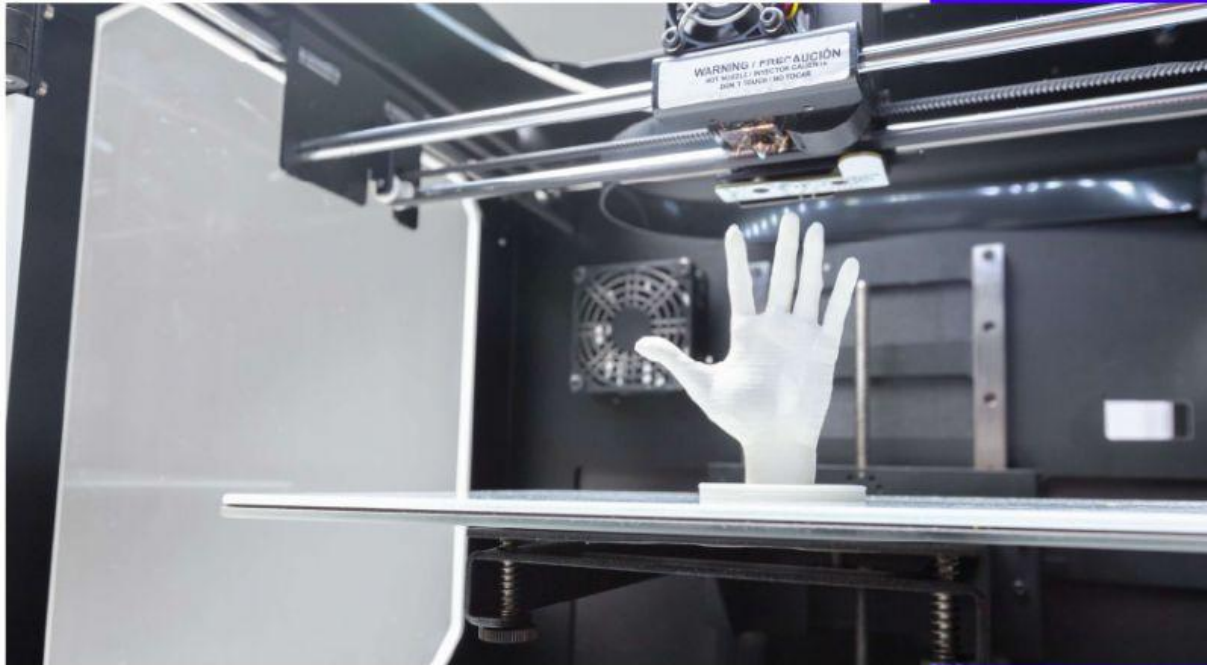


TECHNOLOGICAL DEVICES

Reading 2



3D PRINTER

Traditionally, the process of making physical products was a tough one. It was often hard for designers and manufacturers to build and test their ideas. By the time a good product was in the market, tons of hard moments had taken place. However, in the 1980s, an idea called rapid prototyping (RP) emerged as a solution. This means developing models through automated methods in hours or days rather than weeks. 3D printing is an extension of this idea as designers make their own prototypes in hours, using sophisticated machines similar to inkjet printers.

This machine works like regular printers. Instructions are sent to the printer from a computer, and it turns these into physical objects. Thus, 3D printers can build complex shapes and even objects with moving parts.

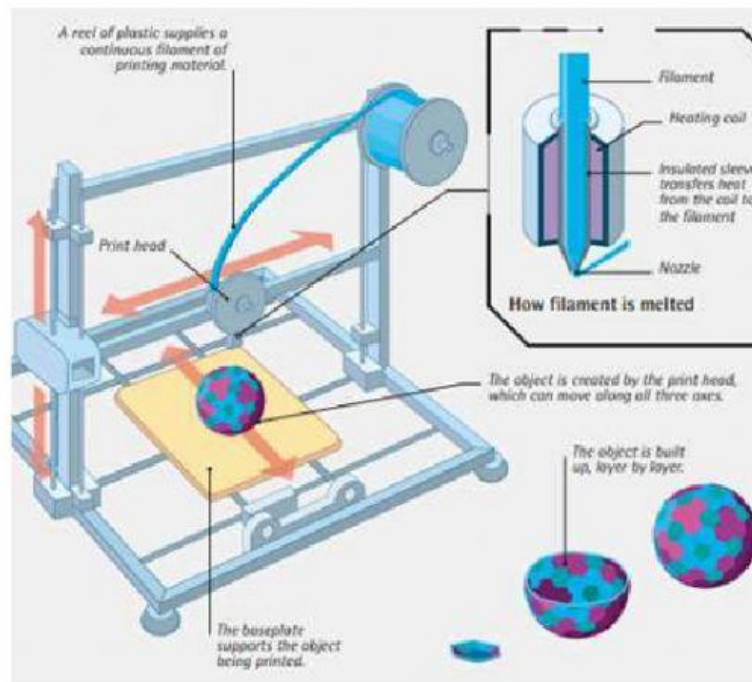
Skills:

- Details
- Make inferences
- Vocabulary in context

Getting started

What kind of processes have been benefited by new technological advances?

How the printer works isn't a mystery. The printer melts a continuous filament of solid material and squeezes the liquid out of the print head through a fine nozzle onto a baseplate. The baseplate or the nozzle move according to the instructions to control where the liquid goes. When the first layer has been laid down, another layer is squeezed out on top of it. Then, more layers are laid down gradually building up the shape of a 3D object.



3D printing in space

The days when astronauts had to wait ages for a tool or a replacement part to be sent up from Earth may be over. In November 2014, the crew of the International Space Station (ISS) was able to make a wrench there in space. They had received a 3D printer some weeks before, which enabled the astronauts to make objects they needed.

**Adapted from How Super Cool Tech Works. DK Publishing.*

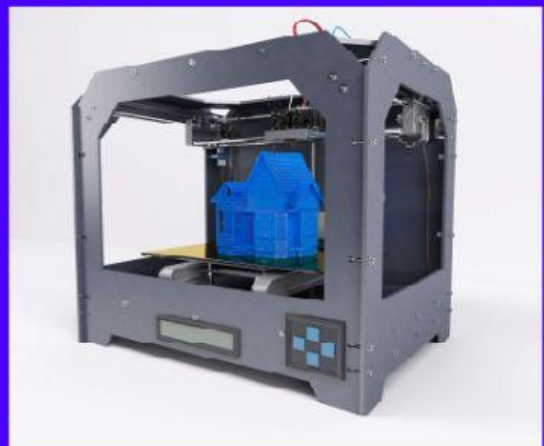


Read the following definitions and match them with words from the text.

1. Having or causing problems or difficulties: _____
2. Instead of somebody or something: _____
3. To become or make something become liquid as a result of heating:

4. A quantity or sheet of something that lies over a surface or between surfaces:

5. To get liquid out of something by pressing or twisting it hard: _____
6. All the people working on a ship, plane, etc.: _____
7. A metal tool with an end with a special shape for holding and turning nuts and bolts (= small metal rings and pins that hold things together): _____



Language Note – Past Perfect

- By the time a good product was in the market, tons of hard moments **had taken** place.
- They **had received** a 3D printer some weeks before.

We use the past perfect to express events that happened before other past actions.

- When I arrived at the airport, I realized I **had forgotten** my passport.
- As I tried to open the door, I realized someone **had broken** in our office the previous night.

Structure: had + past participle

- By the time she won her first Oscar, she **had already made** 32 movies.

The past perfect continuous (had + been + verb -ing) is used to emphasize the duration of an action.

- They **had been walking** for three hours before they realized they were lost.

What do you think?

If you could use a 3D printer right now, what object would you make?

