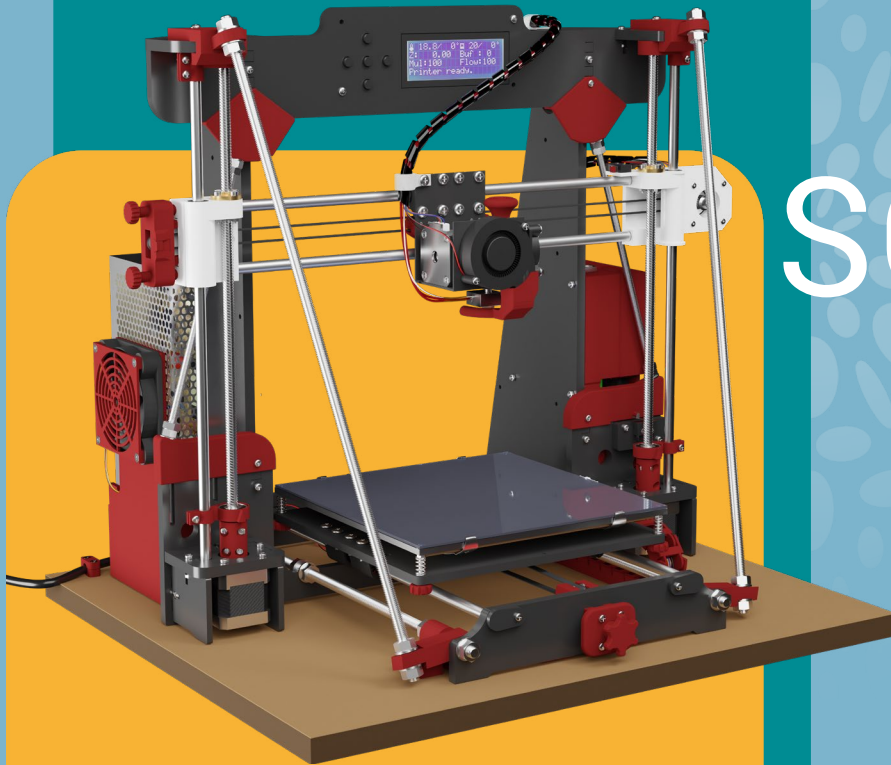


3D-PRINTING GOES SCHOOL!



A project by

TUTOLINO
EDUCATION NETWORK



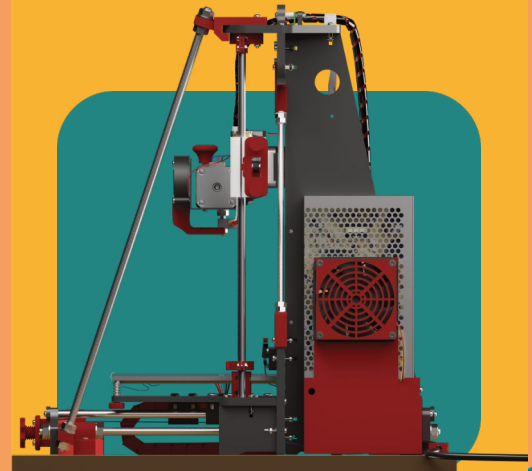
WHY 3D-PRINTING?

3D-printing is one of the most innovative and forward-looking technologies of the present and future.



The hereby possible additive manufacturing for the home sector is becoming more and more attractive and is, next to "Smart Home" and "Industry 4.0", the biggest progress of the last decade.

Many companies are converting parts of their production to 3D-printing or integrating additive manufacturing into their production flow nowadays. For example, in the form of small series or prototype construction.



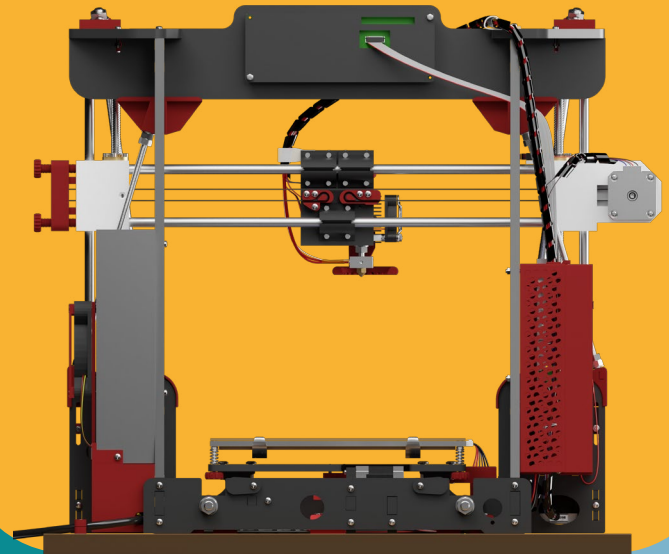
This requires an ever-increasing number of skilled workers.

Of course, the search for interest already begins in school and forms one of the foundations for the later choice of profession.



CURRICULUM

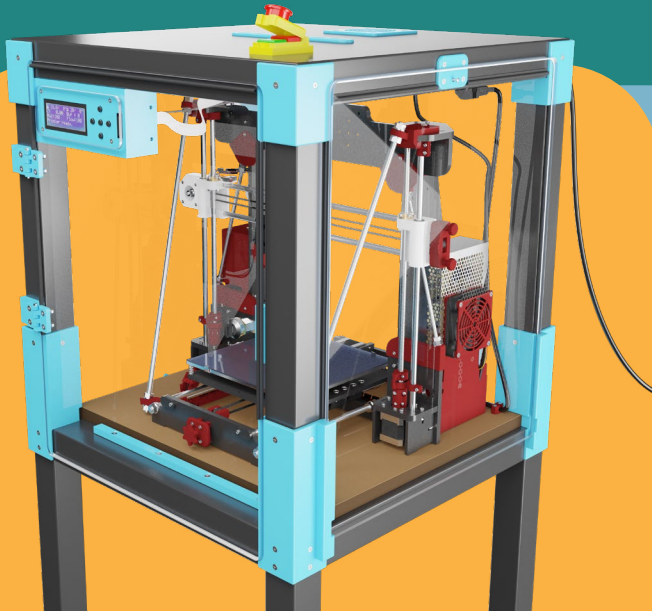
- Assembling the 3D-Printer
- 3D-Construction
- Slicing of the 3D-Model into a code, readable by the 3D-Printer





THE KIT

The schools receive the Anet A8 3D-printer as a kit, as well as various 3D-printed and mechanical add-on parts that greatly improve the function and handling of the printer.



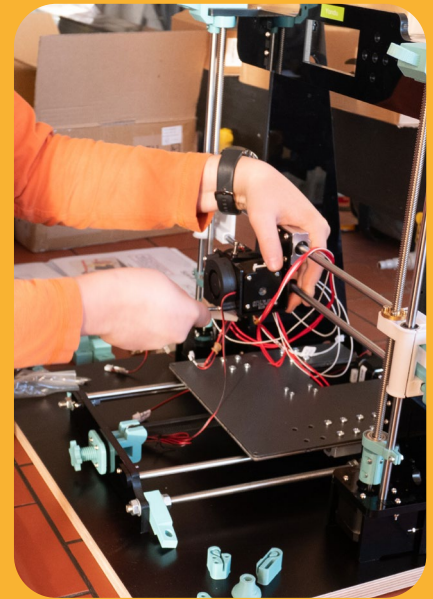
The complete set, first published by the editors of "Make:" magazine (issues 1 and 2 of 2018) and later developed with 3dk.berlin, contains far more than 200 individual parts and should be assembled with patience and conscientiousness. Even the lockable housing comes in individual parts and is assembled independently. Students not only have fun building a 3D-printer, but also significantly expand their technical understanding. They learn to carry out a complex task as independently as possible from start to finish.

The reward: a self-built, fully functional 3D-printer, which is ready for immediate use.



THE ASSEMBLY

There is quite a lot going on in the classroom and there is no room for boredom. Everyone has something to do, the instructors are on hand to help the students and can also answer many detailed questions during assembly.



In addition to the lecturers, the children are also provided with detailed assembly instructions for setting up the printer. In these instructions, each step is explained individually and supported by informative illustrations.



THE FIRST PRINTS

In this section of the learning phase, the children are taught the basic functions and initial setup of the printer. They are instructed to the point where they can independently start a print on the 3D-printer they have set up themselves and easily correct simple errors.

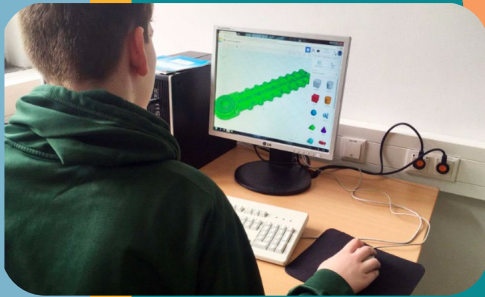
The 3D-printing system presented here is designed to print objects reliably and without danger over a longer period of time. At least within the maximum possible duration of a school day. The students can also create small projects completely independently and use them in class, if the respective school supports this.

Of course, it takes several weeks from screwing together the first parts of the printer to the finished machine with its own protective housing. But once this work is complete, the tests can begin and the children print the first parts on their self-built 3D-printer.



3D-CONSTRUCTION

Besides building 3D-printers, 3D-design is of course also part of the curriculum for the students. Here they learn the functions of the 3D model design program "Tinkercad". The program is free and browser-based. Here they create their first 3D-projects, which can be printed out in the following lessons.



SLICING

Slicing is one of the most important steps in 3D printing. The software required for this is a computer software, in most cases free of charge, which converts the previously designed 3D object into a code readable by 3D printers, the so-called GCODE. Here, the children learn about the connections between the various setting options of the software and the resulting outcomes during the actual printing process.





SENSE OF ACHIEVEMENT

The sense of achievement is immense. The children experience how an object that they have imagined themselves is created layer by layer by a device that they have assembled, maintained, cared for and brought into its function by themselves. They realize all the little connections of why an object is better constructed one way or another. Independently exploring the limits of this very special technology, they can give free rein to their imagination. Suddenly everything becomes possible. Suddenly you can shape, design, even create things yourself.

Some of the first objects designed and printed out by the students themselves here in Berlin, for example, were key chains.





PARTNER SCHOOL

The Carl-Friedrich-von-Siemens Gymnasium in Berlin Spandau, under the direction of its principal Claudia Kremer, was the first Berlin school to participate very successfully in the project.

The school's wish for its own 3D-printing lab was realized by finding a sponsor who covered 50% of the equipment costs, while the school provided the remaining sum from its own funds.



Since 2018, a total of 5 kits have been purchased and assembled by students between the ages of 12 and 14 as part of a school club, each within a school semester.



Carl-Friedrich-
von-Siemens-
Gymnasium



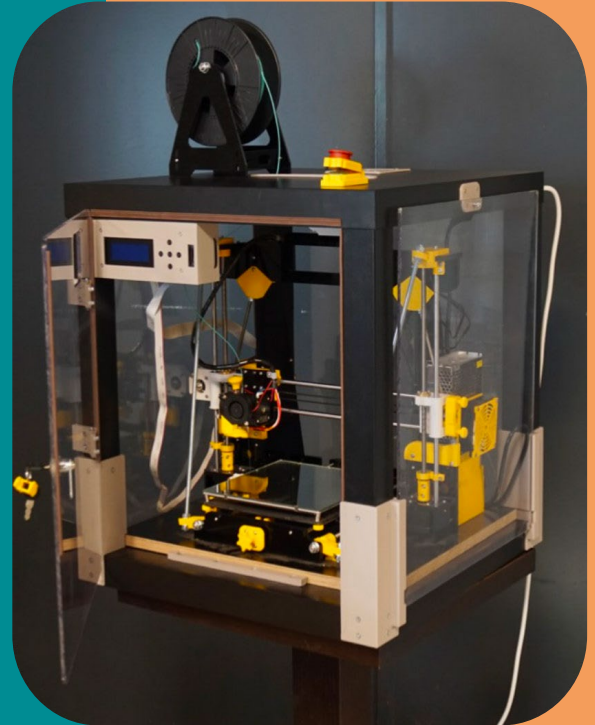
Currently, the printers are being used independently by the now firmly established 3D printing club and are even being used for specific purposes, for example to print items for the Christmas bazaar.

Here, the specially designed, food safe PLA filament from 3dk.berlin is used. PLA is an organic polymer based on corn starch



SAFETY

Printing with a 3D-printer should not only be fun, but also as safe as possible. For that reason, after the printer is built, it is given a special enclosure that includes various functions.





Lockable Building Space



Multi-layered Filter



Modified Add-ons



Emergency Switch



External Control Panel



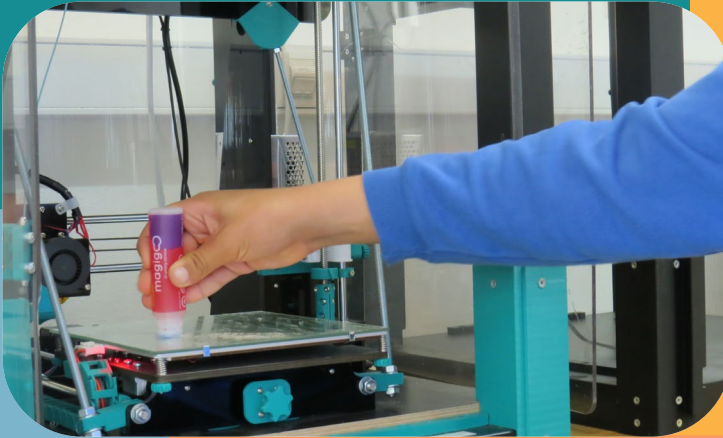
Testing according to DGUV V3
possible



EXTRAS

Each kit comes with several tools that provide an easy introduction to 3D-printing, so one can get started right after assembly!

In addition to practical aids, such as the Magigoo print bed adhesive and a roll of PLA filament from the company 3dk.berlin, these also include the so-called AM Field-Guide Compact, which was created by Reutlingen University together with the trade fair "formnext" to provide an insight into the complex technologies of additive manufacturing.





NETWORK & PRINT-TIME-DONORS

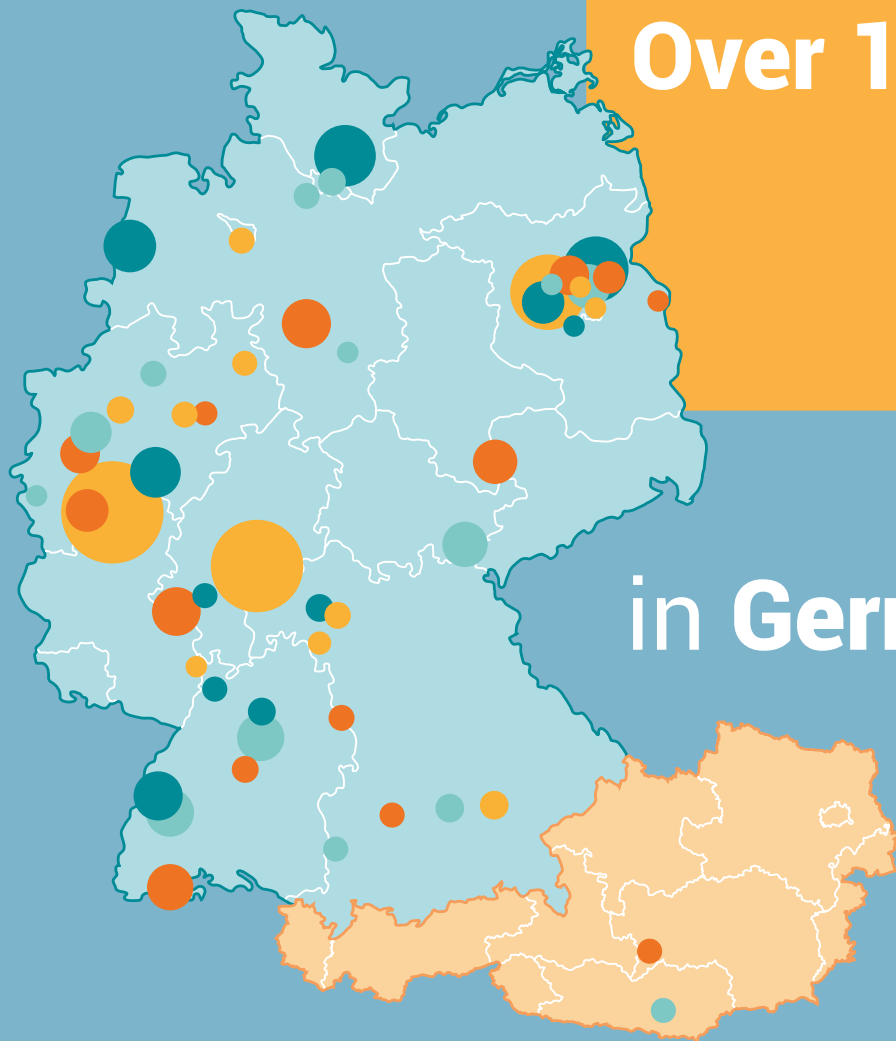
Anyone using the „3D-PRINTING GOES SCHOOL“ printer not only owns a safe, reliable and powerful printer, but also benefits from the wide and competent network that has formed around the project over the years.



Be it Print-Time-Donors who donate time and effort to complete the kit with their printed parts or industry partners who support with resources and expertise.

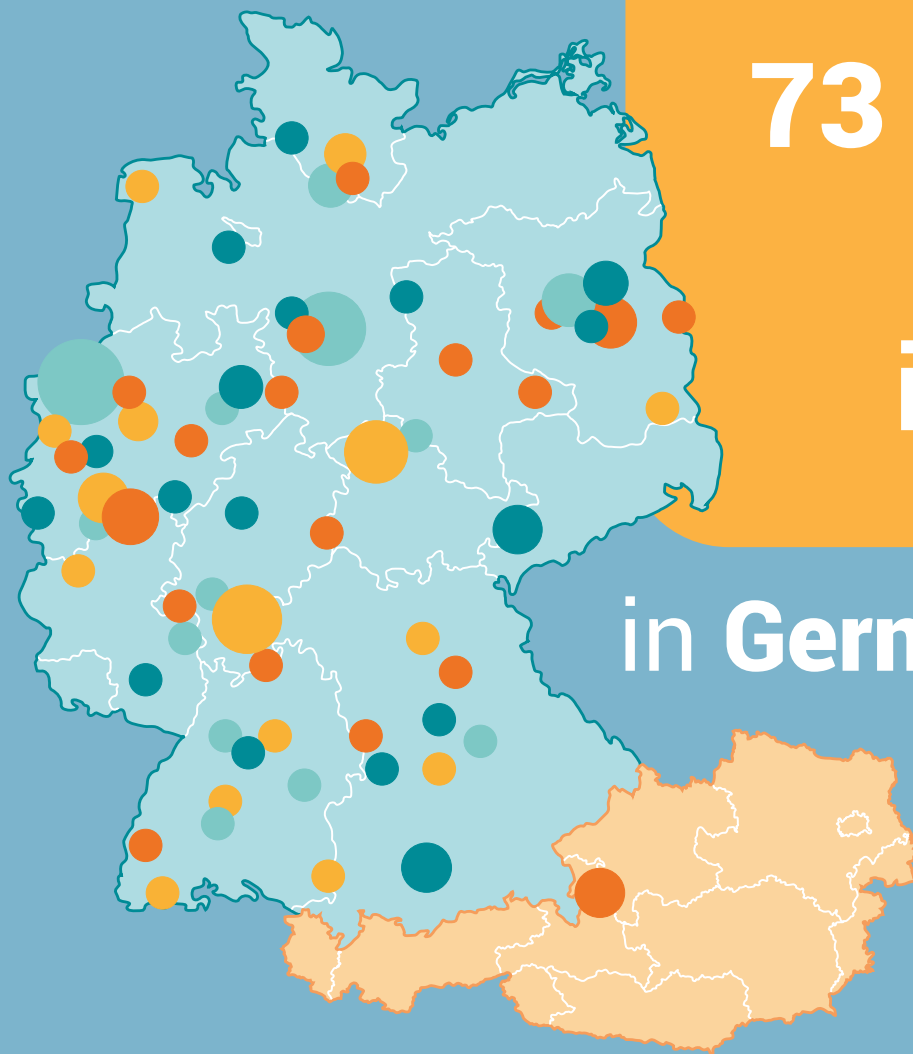
The „3D-PRINTING GOES SCHOOL“ printer is increasingly establishing itself as the leading teaching method for 3D printing in the classroom. Like at the Siebengebirgsschule in Bonn, which already operates 9 systems, as of 2022!

**Over 100 Systems in
55 Schools in
47 Cities**



**in Germany
& Austria**

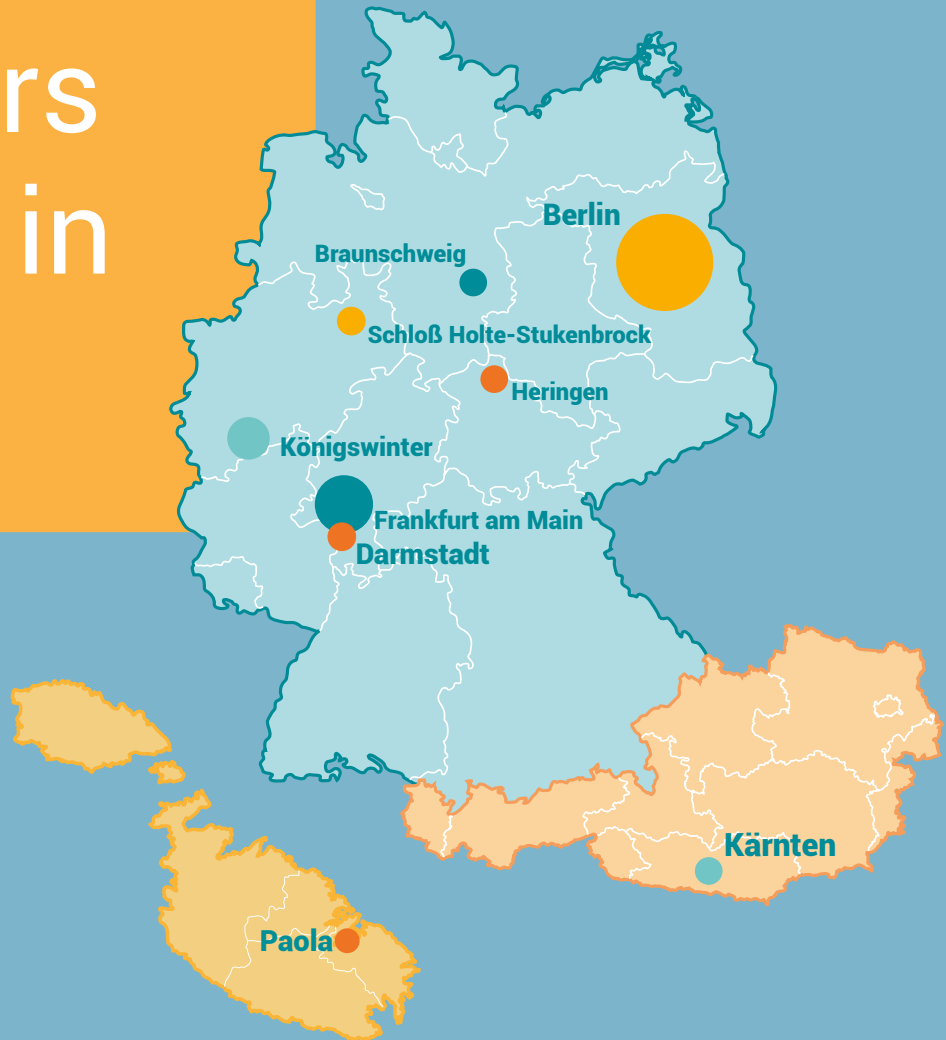
**73 Print-Time
Donors
in 67 Cities**



**in Germany
& Austria**

17 Sponsors & Partners in 9 Cities

in Germany,
Austria
& Malta





PARTNERS

A big thank you to all
sponsors and partners
who support the
**3D-PRINTING GOES
SCHOOL** project!

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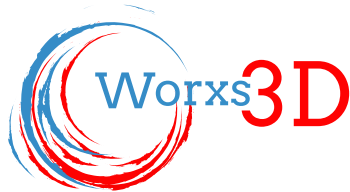


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