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Electronics
Programming
STEAM education



Part of the initiative



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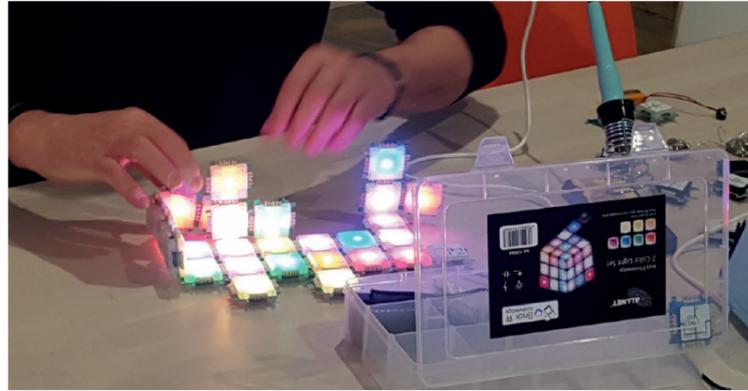
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Brick'R'knowledge - The modular electronics learning and experimental system for interdisciplinary STEAM teaching



Brick'R'knowledge gives you the opportunity to teach and learn the basics of electronics. Furthermore, it will let you immerse yourself in a wide range of applications. The system offers information far beyond the basics of electronics. Whether it is microcontroller programming, the workings of solar energy, or a dive into the Internet of Things. Learn about the easily comprehensible logic of a computer or the physics of a fuel cell and make interdisciplinary STEAM lessons an experience for students and teachers alike. Master the skills necessary for a new way of living and working.

The system is not limited for use in education but also provides an exciting option for anyone interested in learning about and experimenting with electronics, programming, light, alternative energies, logic etc. at home or with like-minded friends.

Teaching electronics can often pose a challenge because the handling and the visualization of electronic components is a complex task. Often plug-in-boards are used to demonstrate the workings of electronic circuits. These are difficult for beginners to master. The documentation of more complex circuits is an even greater challenge. In connection with the programming of microcontrollers this leads to a high expenditure of time in the classroom, which would be much better spent programming.

The advantages of the Brick'R'knowledge system for STEAM lessons are:

- A robust and stable connector system
- A clear circuit diagram style and easy documentation
- An uncomplicated exchange of components and easy modification of circuits by interlocking the bricks
- Compact switching due to mass return
- Measuring possibilities within the circuits with existing measuring devices or special measuring modules
- The combination of analog circuits with microcontrollers and digital components without system break
- Didactically informed manuals with circuits and applications that can easily be expanded in the classroom
- Application-related sets for interdisciplinary teaching in computer science, engineering, biology, physics and chemistry

In addition to the experiment sets presented here in the brochure, there are more than 500 different bricks available to complement and expand the sets. You can find them here:

<https://www.brickrknowledge.de/bricks/>

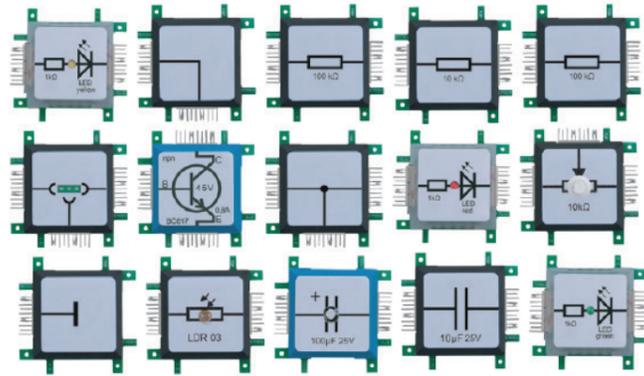
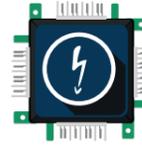
All presented sets can be combined with each other.



Experimental sets

Sets

Basic Set Art.Nr.: 115589



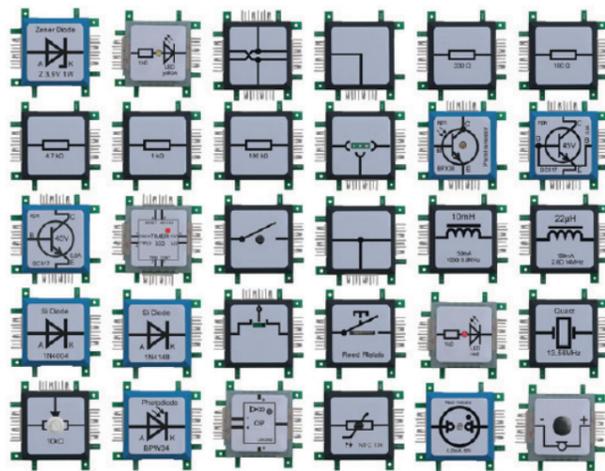
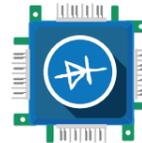
Fields of education:

- General studies
- Physics
- Technology
- Computer science

Content: 19 bricks, manual, exercise examples (online)

The Basic Set introduces the basics of electronics in an easy and comprehensible way. Topics from physics lessons such as Ohm's law or linear and parallel circuits are taught in a simple and clear way. Furthermore, the set introduces voltage dividers with either fixed or variable resistors. Additionally, the set offers experiments with capacitors and also features a transistor. Students will acquire skills in the use of a night-light-switch. The set is also ideal for all those interested in Arduino® programming in order to re-acquaint themselves with the subject of electronics.

Advanced Set Art.Nr.: 118704



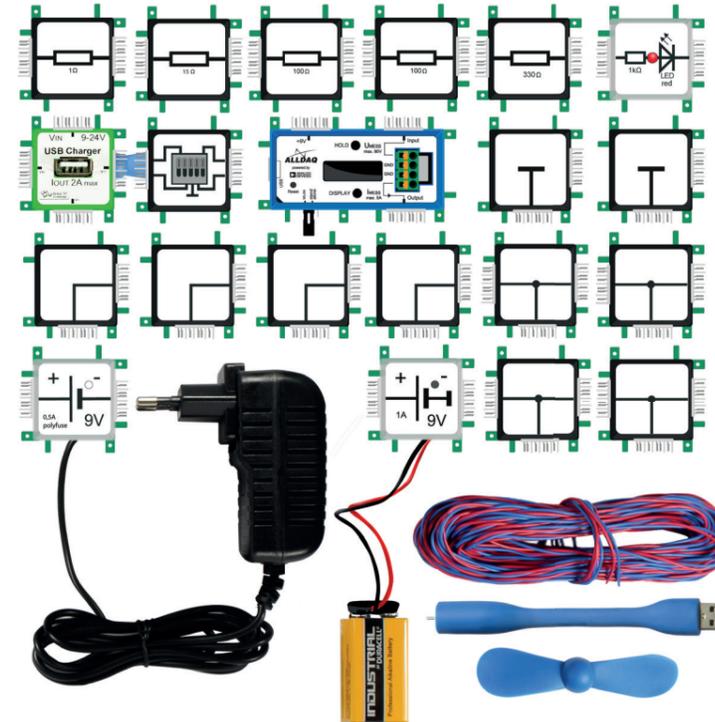
Fields of education:

- Physics
- Technology
- Computer science
- Trainee programs
- University education

Content: 111 bricks, manual

The Advanced Set is intended to give users the opportunity to reproduce basic circuits that are modern electronics and will further show means to develop them. It contains all the basic components of "traditional" analog electronics such as resistors and capacitors, coils, relays, piezos, loudspeakers, microphones etc. These are supplemented by basic components of the "modern" semiconductor electronics including various diodes, transistors, FET's, MOSFET's, timers etc. The set contains all the bricks of the Basic Set. It is aimed at school-children, but also trainees and university students, who want to acquire a deeper basic knowledge of electronics.

Powermeter Set Art.Nr.: 155536



Fields of education:

- Physics
- Mathematics
- Technology
- Computer science
- Trainee programs

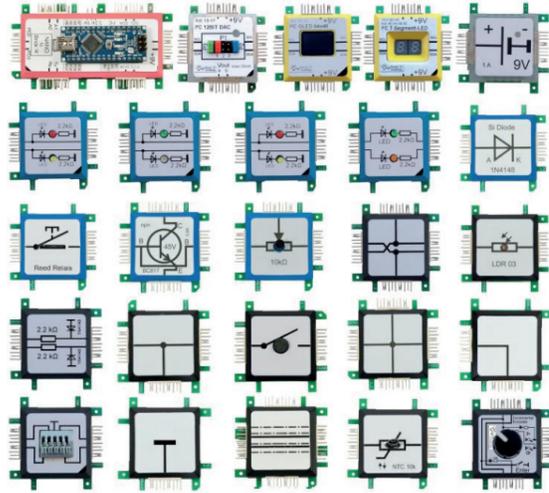
Content: 19 bricks, manual, exercise examples (online)

The Powermeter Set was developed for people who wish to delve deeper into the topic of current and voltage measurement in electronics. Accordingly, the set conveys the basic understanding of current and voltage measuring instruments. The included measurement equipment does not only cover simple series and parallel connections but also resistance networks. Students will also learn to mathematically understand and measure the star-delta transformation of bridge circuits. The set is easily combined with the Advanced Set.

Manuals available for download as pdf
www.brickrknowledge.de/downloads

Sets

Arduino® Coding Set Art.Nr.: 125697



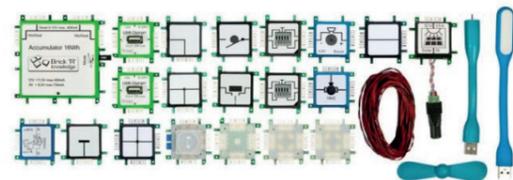
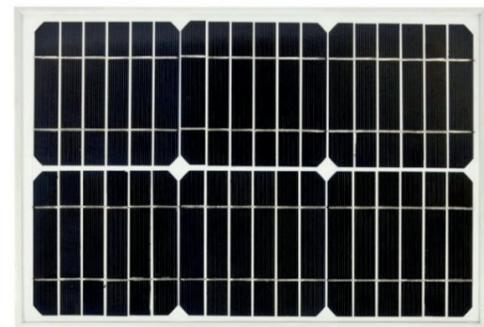
Fields of education:

- Computer science
- Physics
- Technology
- Trainee programs
- University education

Content: 45 bricks, 1 Arduino Nano, manual (online)

Physical Computing made easy - with the Coding Set, you can get started with Arduino® programming without the time-consuming and error-prone method of plug-in boards. This set allows you to illustrate the peripherals for Arduino® applications with both I/O and analog pins. It will also let you demonstrate the use of buses in programming. The corresponding necessary analog and digital bricks as well as an Arduino® Nano Brick are included in the set. Comprehensive circuit and programming examples are supplied with the set, which can then be expanded as required in class.

Solar Set Art.Nr.: 133574

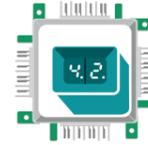


Fields of education:

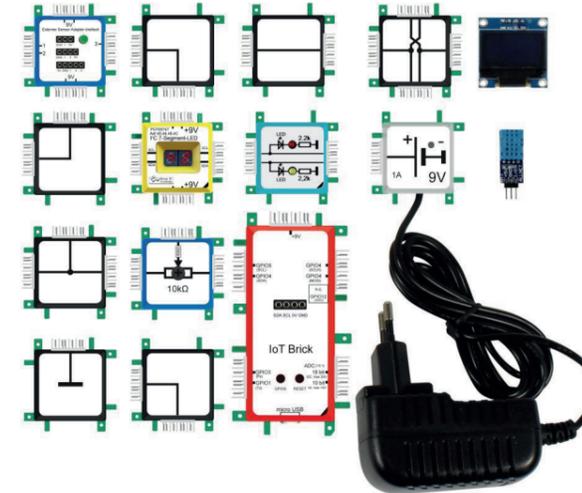
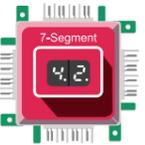
- General studies
- Nature studies
- Physics
- Technology
- Trainee programs
- University education

Content: 20 bricks, 1 solar module 15 W, 1 LED light, 1 fan, manual, practice examples (online)

The Solar Set lets you understand the use of solar energy in everyday life. The set offers the possibility to conduct electronic experiments directly with electricity from the solar module. In addition, an understanding of the energy turnaround using solar energy can also be developed using a battery brick. The topic of energy storage is addressed as well as the subject of energy transformation. The set was designed to playfully explore alternative energy concepts by means of practical experiments. The enclosed handbook also serves this purpose and encourages experimentation and the development of new ideas.



Internet of Things (IoT) Set Art.Nr.: 138090



Fields of education:

- Computer science
- Physics
- Chemistry
- Environmental technology
- Technology
- Trainee programs
- University education

Content: 45 bricks, 1 Arduino Nano, manual (online)

The Internet of Things Set allows you to learn about the principles of the Internet of Things and shows various ways of creating your own applications to develop it further. The set does not only show how the bricks can be used to record, evaluate and forward sensor data via the Internet to an app. The set also gives you the opportunity to trigger actions in the brick circuits from your own app. The students learn how home automation can be implemented and take the first steps towards a school networked in the understanding of the Internet of Things. The core component of the set is the IoT brick based on an ESP. Comprehensive circuit and programming examples are supplied with the set, which can then be expanded as required in class.

Manuals available for download as pdf
www.brickrknowledge.de/downloads

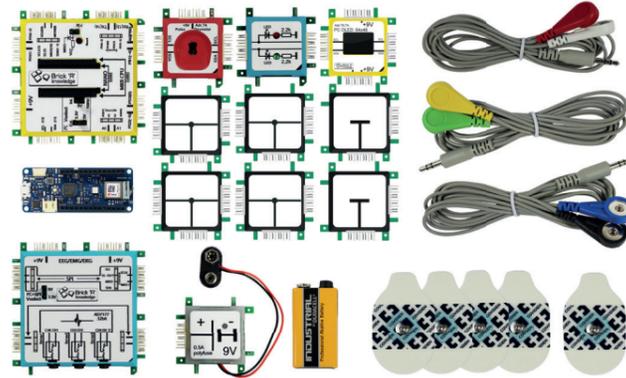
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Sets

Bio Feedback Set Art.Nr.: 168071

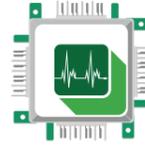


Fields of education:

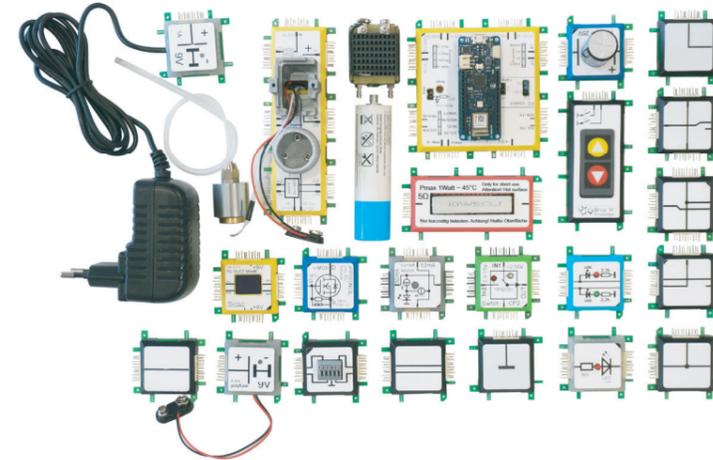
- Biology
- Computer science
- Physical education
- Physics
- Technology
- Trainee programs
- University education

Content: 14 bricks, 1 Arduino MKR WiFi 1010 and 30 EEG/EKG/EMG Pads, manual

The Bio Feedback Set offers an ideal combination for application-oriented computer sciences and biology lessons. With the set you can easily perform biological measurements on humans or other living things. In addition to measuring the pulse and oxygen content of the blood, you can also use the set to measure and display heart activity (ECG), muscle activity (EMG) and brain activity (EEG) in varying stress scenarios. An Arduino® MKR WiFi 1010 brick serves as the core of the set. All necessary programs are supplied in detail and can then be further developed and adapted as required. The data is either displayed on the OLED display or forwarded to a self-programmed evaluation-app via WiFi. In addition to the understanding of human biology, the set also shows the possibility of triggering actions (switching of an LED) via brain waves.



Fuel Cell Set – Hydrogen fuel cell Art.Nr.: 180230

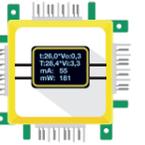


Fields of education:

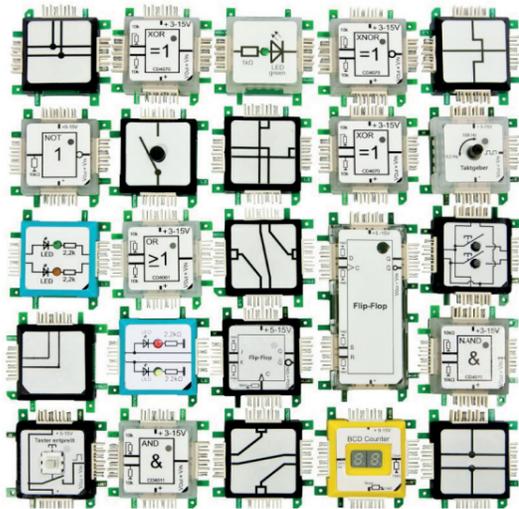
- Nature studies
- Physics
- Chemistry
- Technology
- Trainee programs
- University education

Content: 30 bricks, 1 fuel cell, 1 Arduino MKR WiFi 1010, 1 hydrogen storage with accessories, manual

The Fuel Cell Set makes it possible to learn in detail about an alternative technology for power generation in the light of the energy turnaround or the search for new alternative drive concepts in transportation. The fuel cell is integrated into the brick system in such a way that electronic experiments can be conducted with it, and the physics of the fuel cell can be experienced and measured. In addition, the topic of uninterruptible power supply is also taught. The set offers the possibility to develop and understand own concepts of the energy turnaround by including further brick sets (e.g. Solar Set). All programs for the Arduino necessary to operate the set are included. These can then be developed further, e.g. to monitor and control the system via the Internet.



Logic Set Art.Nr.: 135006

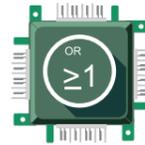


Fields of education:

- Mathematics
- Computer science
- Physics
- Technology
- Trainee programs
- University education

Content: 93 bricks, manual, practice examples (online)

The Logic Set offers the possibility to learn Boolean algebra not only theoretically, but also practically by way of physical circuits. Thus the set is very well applicable in mathematics lessons. But the set goes far beyond Boolean algebra with logic gates. Students are shown how a modern computer calculates based on binary numbers. Half and full adders can be built and their behavior studied. In addition to the logic gates, the set contains various flip-flops to build and investigate up-and-down-counters or shift-registers. The set also introduces specific topics of digital electronics, like the debouncing of switches, for example.

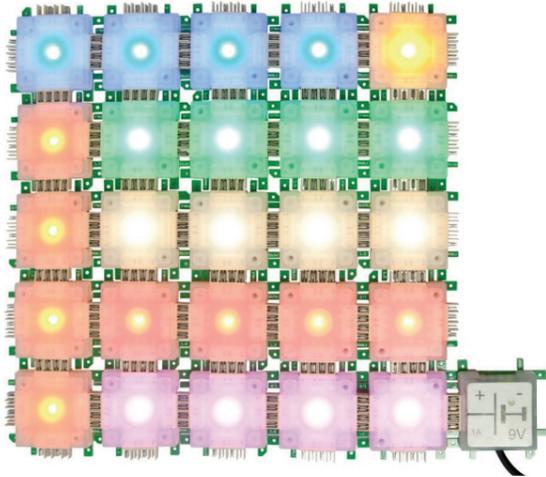


Manuals available for download as pdf
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Sets

7 Color Light Set

Art.Nr.: 124344



Fields of education:

- Art education
- General studies
- Technology

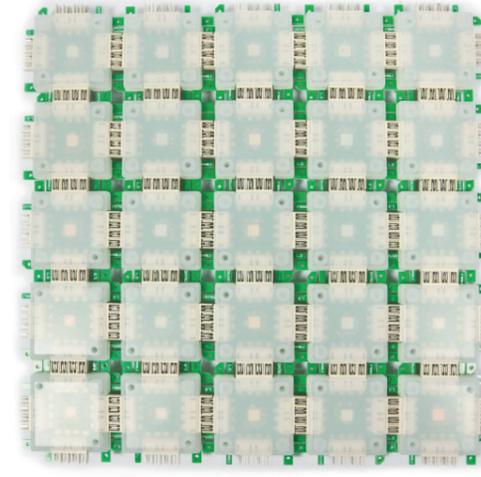
Content: 29 bricks

The creative employment and application of electronics is the theme of the 7 Color Light Set. As soon as children are old enough to go to kindergarten they are old enough to use this set to learn about colors. Colorful two- and three-dimensional objects can be created and made to glow. Specialized LED projects and first experiences with electronics make this set an ideal start for STEAM lessons.



Programmable LED Set

Art.Nr.: 133358

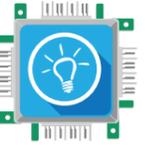


Fields of education:

- Art education
- Computer science
- Technology
- Trainee programs
- University education

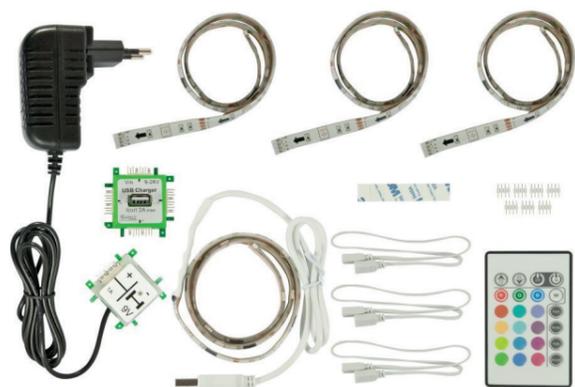
Content: 51 bricks

With the Programmable LED Set you can develop and test dynamic light installations. The addressable LED bricks, which can be arranged in different geometrical patterns, are controlled by an Arduino® Nano. The set can also be used to build a large-format display (7x7 pixels) to visualize sensor data or to output simple messages or simple "emojis". Interactive art installations with changing color gradients or similar projects can easily be realized. By extending the set with 8 additional programmable LED bricks, you can turn it into a 24-hour word clock with 5-minute display by simply replacing the standard tops with 3D printed ones, controlled by the Arduino®.



RGB Color Light Set

Art.Nr.: 133907

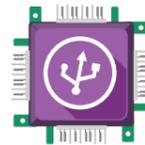


Fields of education:

- Physics
- Computer science
- Technology
- Trainee programs
- University education
- HAM radio education

Content: 6 bricks

The RGB Color Light Set offers the possibility to create more flexible lighting installations that can be operated via a remote control. In addition to discovering colored light as a creative design element, the electronic background of artistic lighting creations can also be demonstrated.



Highpower LED Set 50

Art.Nr.: 124449



Fields of education:

- Art education
- Technology
- Trainee programs

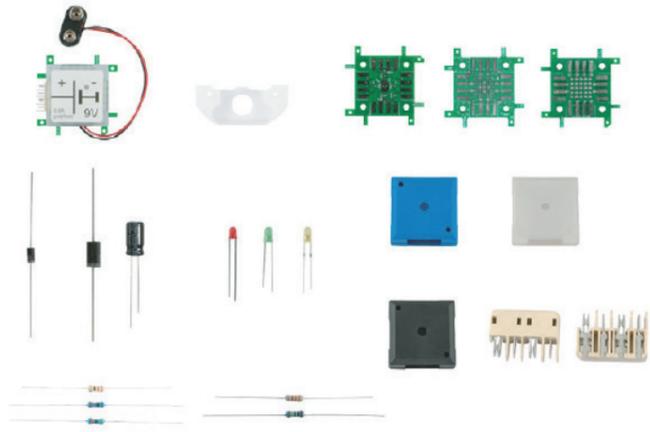
Content: 51 bricks

With the Highpower LED Set 50 you can design and assemble various lighting variations for everyday use can be designed and created. No matter whether direct or indirect lighting concepts in combination with switches or motion detectors are detected and should be tried out. The 1 watt high-power LED bricks provide enough light to realize your projects.



Sets

DIY Set Art.Nr.: 124343

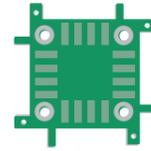


Fields of education:

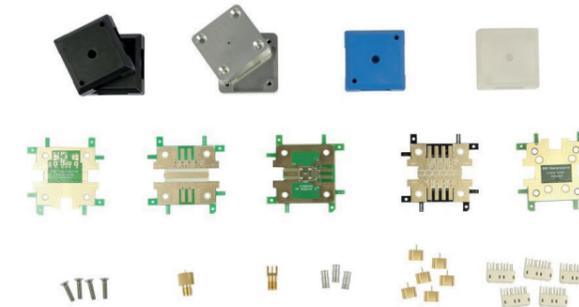
- Technology
- Physics
- Computer science
- Trainee programs
- University education
- HAM radio education

Content: 25 experiment boards (3 different types), 60 plugs, 60 plastic cases, solder gauge, various electronic components

The DIY Set opens up the possibility to develop bricks according to your own ideas and requirements and to supplement and expand existing sets with it. The set also offers the possibility to easily repair bricks on site.



GHz DIY Set Art.Nr.: 130193



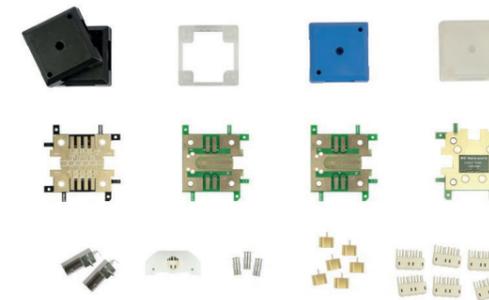
Fields of education:

- University education
- Trainee programs
- Technology
- Physics
- HAM radio education

Content: 4 experiment boards (4 different types), 6 P SMP plugs, 3 P SMP connectors, 6 brick plugs, 1 GHz aluminium cases, 4 plastic cases, solder gauge, instructions

With the GHz DIY Set, the brick system can be extended into the GHz range. Filters, splitters, combiners, attenuators, MMIC amplifiers etc. can be built and used in combination with the existing bricks for experiments in the high frequency (GHz) range.

MHz DIY Set Art.Nr.: 130192



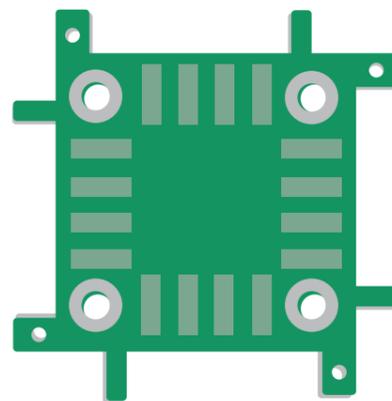
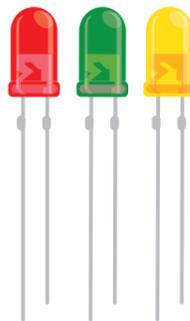
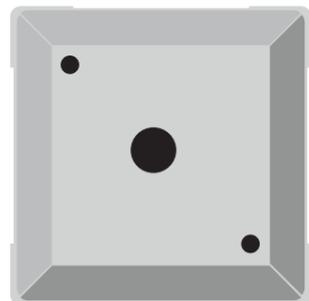
Fields of education:

- University education
- Trainee programs
- Technology
- Physics
- HAM radio education

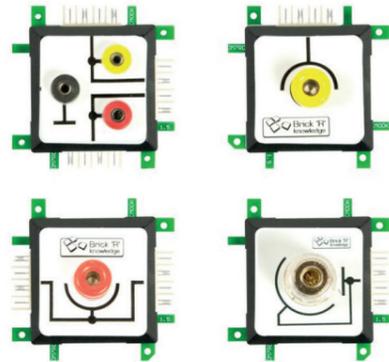
Content: 4 experiment boards (3 different types), 6 P SMP plugs, 3 P SMP connectors, 5 brick plugs, 2 SMA connectors, 4 plastic cases, solder gauge, instructions

The MHz DIY Set offers the equipment which allows you to extend the brick sets so that they are compatible with circuits and experiments in the MHz range.

With the special experimental boards included in the set and the corresponding MHz-capable plugs and connectors, you have the possibility to build MHz-capable bricks and thus extend the experimental spectrum of the other sets.



Measurement Set One Art.Nr.: 136818



Fields of education:

- Physics
- Computer science
- Technology
- Trainee programs
- University education
- HAM radio education

Content: 4 bricks

The Measurement Set One offers the possibility of using standard measuring instruments in brick'R'knowledge circuits. Voltage, current and other measured variables are easily determined. The bricks offer connection possibilities for both 2 mm and 4 mm measuring adapters in various configurations.

Measurement Set Two Art.Nr.: 136820



Fields of education:

- Physics
- Computer science
- Technology
- Trainee programs
- University education
- HAM radio education

Content: 6 bricks

The Measurement Set Two offers the possibility of using standard measuring instruments in brick'R'knowledge circuits. Voltage, current and other measured variables can be easily determined. The bricks offer connection possibilities for 4 mm measuring adapters in different configurations.

Maker Store Berlin



What products can be found at the Maker Store?

In the Maker Store of Allknow GmbH you will find all available Brick'R'knowledge Sets and everything that makes need with regard to Arduino® microcontrollers. Beginners of all ages in robotics or 3D printing will not only find the products but also the necessary accessories, advice and suggestions.

In short: We have everything the maker's, DIY's, artist's, tekkie's and child's heart desires: the imagination knows no limits. Also, gift vouchers for all products are available! And what you can't find at the shop you can purchase at our online store.

<https://shop.maker-store.de>

We also offer workshops to make it easier to get started with the topics.

Which workshops do we offer?

Electronics

Here you will learn about the circuit and the basics of electronics with a lot of information and above all, fun.

Robotics

Assemble your own robot and program it with graphical software.

Programming

The wonderful world of Arduino® programming awaits: basics, sensors, displays, and more.

3D printing or laser cutting

Have you always wanted to enter the world of 3D printing and laser cutting? Then this workshop is just what you need.

Soldering

Turn on your soldering irons, ready your boards and grab your tin – let us teach you the important craft of soldering.

And if you would like to discover a new perspective on digital change in your company then our robotics team event is just what you need. Let us host a stimulating, team-building event away from your daily routines for you. With us or with you, no problem.

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