

# **Building Blocks For Life**

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**Understanding Technology by Playing** 

#### THE BASIC BUILDING BLOCK, AN INGENIOUS IDEA

The fischertechnik basic building block is still the only building block today that can have attachments made to all six sides. This "manysided" block forms the basis for all

fischertechnik building sets, which

are put together individually according to age and capabilities of the pupils and students. These sets allow you to experience technology close-up and learn it by playing.

All of this taken together forms a logical concept

**PNEUMATICS** 

# >A close-up of knowledge + technology

#### PRESCHOOL/ ELEMENTARY SCHOOL



At the age of five, children get their first experience with technology and the way it works. The motto is learning by playing and designing with fast success. Initial basic knowledge in mechanics and statics are provided by the building set, Universal II. Comprehensive and easy to understand assembly instructions for 48 models allows the understanding and comprehension of technical functions.

Applications (A): Dump truck, cargo vehicle, tow truck, truck crane and portal crane

Applications (B): Fan, centrifuge, beam and scales, scales with sliding weight, kitchen appliance, sewing machine, clamp, lifting platform, crane, oil pump, lifting tackle, spindle press, die and planing machine.

# SCHOOL

SOLUTION CONTRIBUTION CONTRIBUTICON CONTRIBU

Applications: Vehicles, vehicles with steering, crank gear, gear box, planetary gear, bevel gear unit, toothed gearing, differential, lathe, barrier, beam and scales, fourbar chain and windshield wiper. Stability, struts and braces

Applications: Table, double ladder, high hunting seat, girder bridge, bridges with underbeam, bridges with upperbeam and crane. Make things move with air. Producing compressed air with a compressor. The relation between force, area and pressure, pneumatic cylinder and valves.

Applications: Compressor, lifting platform, catapult, sliding door, turntable with press, linear feed, excavator, pipe layer and front-end loader.



(A) Item No. 16 551



(B) Item No. 93 290



Item No. 93 291



Item No. 93 291



Item No. 77 791

where one fits with the other, building block for building block. Regardless of how complicated the models are, you can always use the components of the first fischertechnik set. Comprehensive and easily understandable assembly instructions help you design and discover the fascinating fischertechnik world. In addition, there are worksheets and instructional activity booklets with lots of background information, tasks and solutions.



Electrical circuits, electro-mechanical controls, controls with electronics, AND/OR circuit, series and parallel connection.

Applications: Continuity tester, elevator, turning signal, control of traffic lights, burglar alarm, parking garage barrier, punch press, hand dryer, flashlight, starwell lighting, refrigerator lights, building block dispenser, garage door and tower with warning blinking light.

Regenerative energy from wind, water and the sun. Storage and the use of electrical energy.

ENERGY

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ENEWABL

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Applications: Oil pump, solar cell tracking, solar vehicle, crane, rotating swing, wind power system, water turbine and hammer driver.

#### SCHOOL/VOCATIONAL SCHOOL/ UNIVERSITY/INDUSTRY





n No. 91 083



Item No. 57 485

# **Support + Systematics**

The learning building sets from fischertechnik are specially designed for use in technical instruction and in technical works for the basic and secondary level for the topics of mechanics, statics, electrical technology, regenerative energy and measurement, control and regulation (computer science and mechatronics). Supported by excellent instruc-

#### INSTRUCTIONAL MATERIAL

How does a gearbox work? What is a planetary gear? How is the movement of a windshield wiper produced? how do you design a stable bridge? These are questions which the instructional activity booklets illustrate and explain in a way that is easy to understand. This starts with elementary questions from the various subject areas such as mechanics, statics, electronics, computer science and progresses on to the practical implementation, which can be understood quickly, of everyday technical devices such as traffic lights, fans and a lifting tackle and then moves on to the technically refined and demanding solutions for robotics and computing.

The activity booklets are in black and white and thus they can be reproduced as desired for instruction without any loss of quality. Additional worksheets can be downloaded from the fischertechnik Web site and contain topicallyoriented questions and answers as an additional instrument to communicate the contents of the instruction in a simple and precise manner and to test the success of the learning.

# HANIC+STATIC



Instructional Book





#### **Booklet**



tional books and worksheets, which are prepared under the supervision of experienced teachers, these materials make it simpler for the teacher and the pupil to communicate and understand the contents of the instruction. In addition, there are intelligent storage systems that provide order and reliability for the everyday things at school.

#### WELL-THOUGHT-OUT STORAGE

There is an optimal answer to the frequently asked question about the simple, but well-thought-out and structured storage of the fischertechnik builiding blocks: the fischertechnik storage boxes for professional use in schools and training. Stable plastic boxes with variable inserts can be used for general purposes and are indisbensable for special uses in school. Every building set can be optimally stored with these boxes. A sorting plan for the storage with illustrations of the parts and the number of parts ends the quessing and the often futile search for the small parts. Every block has its place. Teachers can easily and quickly check to see if everything is complete and has been returned.

There is an additional practical advantage: the top box can be securely closed with the versatile fischertechnik base plate, 285 x 186 mm.

Here in the catalogue, the number at the bottom shows you the number of storage boxes necessary for each building set to organize the complete building set. When you order your new work materials, please think about these because they pay off guickly.



Sortina Box Item No. 94 828

Base Plate 258x186 mm Item No. 32 985





# >Play+Success – Fun+Creativity

# JUNIOR STARTER JUMBO PACK

Item No. 16 551

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PRESCHO

14 models and of these four can be built at the same time. This is optimal for kindergarten and day homes for children. > 135 components > 14 models

Dump truck, cargo vehicle, low-bed trailer, tow truck, truck crane, portal crane, simple airplane, douple decker, sailplane and train with two train cars.

## UNIVERSAL II

Item No. 93 290 Vice, lifting platform with car, sewing machine and an entire recreation park. Up to five models can be built at the same time. Here, the technology in everyday life is easy to grasp mentally and physically. > 400 components > 48 models

> ideal additions:

EMENTARY SCHOOL

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ANY-SIDE

s instruction RI book for 48 models

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Mini Motor Set · Power Motor Set · Energy Set

UNIVERS

Fan centrifuge, beam and scales, scales with sliding weight, kitchen appliance, sewing machine, clamp, lifting platform, crane, oil pump, lifting tackle, spindle press, die and planing machine.



# PROFI

How do pneumatics work? What is a differential gear, planetary gear, universal joint and a compressor? How does an electrical circuit and a solar celll work? What is a phototransistor? Experience pure technology up close and learn it while playing. The instructional activity booklets provide support for this and contain a lot of background information, sample tasks and solutions.



# MECHANICS +STATICS

#### Item No. 93 291

SCHOOL

How does a gearbox work? What is a planetary gear? How is the movement of a windshield wiper produced? How do you design a stable bridge? The answers to these and other elementary questions form the subject areas of mechanics and statics are found in this building set with 30 different models.

> incl. the activity booklet: »mechanic+static«

- > incl. »mini motor«, switch, battery holder.
- > 500 components > 30 models.

## PNEUMATICS II

Item No. 77 791

SCHOOL

The **Profi Pneumatics II** provides playful learning of the basics of this "airy" technology and shows, using numerous application examples, the way that pneumatic valves and cylinders work in connection with a compressor and an air cell. It contains four doubleacting prneumatic cylinders,

- three 4/3-way hand valves and one electrically operated compressor with air cell.
- > incl. the activity booklet:
- »Pneumatics Produce Movement with Compressed Air«
- > incl. compressor with »mini motor«, switch, battery holder.
- > 350 components > 8 models

PNEUMATIC ECHANIC+STA **Instructional Book Instructional Book Booklet Booklet** Worksheets Worksheets

recommended storage: 4 x Item No. 94 828



recommended storage: 4 x Item No. 94 828



- Pneumatic cylinder: the air is fed into this through hoses
- Valve: when you open the valve, air flows into the cylinder and makes the piston move.
- O This lifts the excavator arm or the pipe is grasped and lifted



## E-TECH

# SCHOOL

#### Item No. 91 083

Electric circuits, electromechanics and electronic controls. The pupils learn the principle of series connection and parallel connection step-by-step with the function models or they can control a traffic light with a controller drum. In addition, there is the e-tech module with eight fixed programs that control, for example, a burglar alarm with a buzzer, a hand dryer with a light barrier and a garage door with a magnetic sensor and these devices are through three inputs for digital sensors such as a sensing device phototransistor and reed contact and an output for a motor or two indicator lights.

> incl. the activity booklet: »Electrical Technology«

Q'8

- > incl. »mini motor«, e-tech module, sensing device, light barrier, magnetic sensor
- > 250 components > 12 models

# ECO POWER

Item No. 57 485

Renewable energy is becoming our most important energy supplier. Generation, storage and use of energy from natural energy sources such as water, wind and the sun are illustrated using eight models

- SCHOOL and numerous experiments.
  - > incl. the activity booklet: »Renewable Energy« > incl. solar motor, 2 solar cells, »Gold Cap«-energy
  - storage unit.
  - > 150 components > 8 models.

PROFI : Oeco Power





**Instructional Book** 









recommended storage: 3 x Item No. 94 828











**Instructional Book** 



**Booklet** 



#### Worksheets



recommended storage: 2 x Item No. 94 828





## COMPUTING

Design machines and robot models, program the control software on the PC and put the entire thing in motion. What sounds so complicated and technical becomes a fascination and creative game with computing and this doesn't apply only to technical fans.

# ROBO MOBILE SET THE COMPLETE PACKAGE

#### Item No. 93 292

The complete computing package! It consists of 450 components for the building of eight mobile robot models, the ROBO interface and the ROBO Pro software. The assembly instructions show seven mobile robots with all-round edge recognition or obstacle recognition and a mobile robot on six legs. A light detector constantly follows a light source, which travels in front of it, and the track detector follows a black line. In addition, the light detector can be combinded with obstacle recognition. The mobile robot moves like an insect and can move forwards, backwards as well as right and left.

- > incl. the activity booklet: »Programming and Control of fischertechnik Robots with the PC«
- > incl. «two power motors«, four sensing devices, two phototransistors and one lens tip bulb.
- > 450 components > 8 models
  - Accu Set required.





8 mobile Robots + ROBO Interface + ROBO Pro Software

**Instructional Book** 



SCHOOL/VOCATIONAL SCHOOL/UNIVERSITY



**Booklet** 





recommended storage: 4 x Item No. 94 828



incl. ROBO Interface and **ROBO Pro Software** 

The ROBO Mobile Set is also available as a building set without interface and without software: item No. 94 828.





## **INDUSTRY ROBOTS**

Art. No. 96 782

3 realistic, fully functional, detailed industrial robots: two 3-axis industrial robots and a welding robot.

- Plus a CD with relevant example programs
   incl. the "Programming and controlling fischertechnik robots with a PC" accompanying manual.
   incl. 1 "Power Motor", 3 "Mini Motors", 8 switches,1 bulb lamp
- >available from fall on 400 components > 3 Models >
- Required\*: ROBO Interface + Software ROBO Pro + Energy set or Accu Set >

\* As an alternative: intelligent interface (Item No. 30 402) + software LLWin (Item No. 30 407)



SCHOOL/VOCATIONAL SCHOOL/UNIVERSITY





recommended storage: 4 x Item No. 94 828

## COMPUTING



#### PNEUMATIC ROBOTS



*recommended storage: 4 x Item No. 94 828* 



Item No. 93 293 > Microprocessor: 16 bit, type M30245, 16MHz > storage: 128kByte RAM, 128 kByte flash, two programs in flash, one program can be stored in RAM. > Interfaces: USB 1.1/2.0 compatible 12Mbit/s and serial RS 232 38400 Bit/s., incl. cable > Inputs: 8 digital 9 V DC, 2 analog 0-5.5 kW, 2 analog 0-10V, 2 analog for distance sensors

> 4 motor outputs 9 V DC,
 250 mA, short-circuit proof,
 speed controllable with eight
 levels, can also be used as
 eight individual outputs for
 example, for indicator lights.
 > Programmable with fischer technik software, ROBO Pro
 (Windows, Linux) or C compiler
 (neither one is provided).

Includes 26-pin strip for the connection of a model using a ribbon cable.
 Integrated IR receiver for hand transmitter from IR

Control Set (Item No. 30 344). > Expansion plug for ROBO I/O Extension (item No. 93 294) up to three can be connected and functional interface, ROBO RF Data Link (Item No. 93 295) > Power supply 9 V DC, 100 mA (Energy Set, Item No. 30 182 or Accu Set, Item No. 34 969) required additionally.



#### ROBO I/O EXTENSION

#### Item No. 93 294

Expansion module for the ROBO interface. Connection using a 10-pin ribbon cable. USB interface for online operation directly on the PC. Connection for additional ROBO I/O Extension with up to three in a series.

- > 4 regulatable motor outputs 9 V, 250 mA
- > 8 digital inputs
- > 1 analog input for resistances 0-5 k $\Omega$

> Power Supply 9 V DC, 1000 mA (Energy Set, item No. 30182 or Accu Set, item No. 34969) required additionally.

ROBO I/O-EXTENSIO



#### ROBO PRO SOFTWARE

Item No. 93 296 individual license (Windows 98, ME, NT, 2000, XP) Item No. 93 298 school license (Windows) Item No. 93 297 individual license (Linux)

> Simple start for beginners using proven programming form flow charts consisting of various activate building blocks. The aver

of various software building blocks. The exchange of the data between the software building blocks and the subprograms can be done through variable and graphical connections as well. This allows the illustration of the program funtions in an understandable manner. The graphic programming language, ROBO Pro, also offers all important elements of modern programming languages for pros such as arrays, functions, recursion, objects, asynchronous events and almost parallel processing. The programs are translated directily into the machine language so that even very complex programs can be executed very efficiently. This is also optimally suited for advanced and experienced programmers. There are no problems with the preparation of teach-in programs or simple data exchange with other Windows software. In the online mode several ROBO interfaces can be controlled parallel for large models and can be prepared for the activation of individual control panels with switches, regulators and display elements.

> System requirements: a minimum of Pentium II 500 MHz, 64 MB RAM, 20 MB free space on the hard drive. A minimum of 1024 x 768 high color 16 bit. One free USB or serial interface.

#### ROBO RF DATA LINK

#### Item No. 93 295

Radio interface for the ROBO Interface. Connection to the PC at the USB interface. Connection to the interface as an additional printed circuit board, which is plugged into the interface printed circuit board. Range is about 10 m. Eight adjustable frequencies for simultaneous operations of eight devices in one room. Direct communications between two ROBO Interfaces with the same frequency is possible.

- > Frequency: 2.4 GHz
- > No additional power supply is needed.



# TRAINING MODELS

Compact function models, which are ready assembled, provide ideal training and demonstration models for training and in-service training and industrial automation. Available in the 9 V standard voltage and in the worldwide 24 V industrial standard.

#### **PUNCHING MACHINE** with Conveyor Belt

Item No. 51 663

Conveyor Belt with one workpiece

#### > incl. 2 DC motors, 2 limit switches, potential-free,

2 light barriers, consisting of a phototransistor and a lens light bulb.

#### Scope of Delivery:

Without control, interface: one ribbon cable, 14-pin and color coded with 14-pin pin strip.

- Carton packaging
- > Model is mounted on a fischertechnik base plate. Model measurements: about 280x215x185 mm (LxWxH).
- > Model is available with 9 V DC and as 24 V DC.
- > See the price list for additional accessories.
- > Model can be ideally combined with the 3-D robot.

#### **3-D-ROBOT**

#### Item No. 16 286

3-Axis-Robot with grabber claw.

> incl. 4 DC motors, 4 limit switches, 4 pulse sensing devices for measuring distances and all sensing devices are potential-free.

Degree of freedom: axis 1 rotation of  $180^{\circ}$ , axis 2 forwards and return 1000 mm, axis 3 raising and lowering 160 mm **Scope of Delivery:** 

Without control interface: one ribbon cable, 24-pin and color coded with 26-pin pin strip.

- > Model is mounted on al stable wooden board.
- > Packed in a wooden crate.
- Model measurements: about 385x270x350 mm (LxWxH).
- > Model is available with 9 V DC and as 24 V DC.
- > See the price list for additional acessories.
- > Model can be ideally combined with the punching machine and the Indexed Line with two Machining Stations.





#### **INDEXED LINE** with two Machining Stations

#### Item No. 51 664

Conveyor Belt, arranged in a U shape, for cycled transport > incl. 2 machining stations, 4 conveyor belt, 8 DC motors, four limit switches, potential-free, and five light barriers consisting of a phototransistor and a lens light bulb.

#### **Scope of Delivery:**

Without control, interface: two ribbon cables, each with 18-pin and color coded with 18-pin pin strip.

- > Model is mouted on a stable wooden board. Model measurements: 450x410x190 mm (LxWxH).
- > Model is available with 9 V DC and as 24 V DC.
- See the price list for additional accessories.



#### PNEUMATIC PROCESSING CENTER

#### Item No. 77 577

**Processing Center** with bin for workpieces, turntable, machining station, conveyor belt for the transport of workpieces and model compressor.

> incl. 2 double-acting and one single-acting pneumatic cylinder, five 3/2-way magnetic valves, two direct current motors, four sensing devices, potentialfree, four light barriers consisting for phototransistor and lens light bulb.

#### **Scope of Delivery:**

Without control, interface; two ribbon cables, 16 pin and color coded with 16-pin strip.

- > Model is mounted on a stable wooden board
- > Packed in a wooden crate.
  - Model measurements: about 450x410x190 mm (LxWxH).
- > Model is available with 9 V DC and as 24 V DC.
- > See the price list for additional accessories.

## **PLAN+SIMULATION**

The function models form fischertechnik, plan + simulation, are a proven and inexpensive means to plan and develop industrial controls with the associated software and to test processes. They are used throughout the world in the areas of training, development and presentations.

#### THE STEP TO REALITY

#### Less is more

The flexibility and the modularity of the fischertechnik system in connection with the industrially adapted sensors and actuators as well as the controls from leading manufacturers open up almost unlimited possibilities for hardware simulation. Compared to the conventional construction of models, fischertechnik models provide the advantages of using inexpensive finished parts, fast assembly and recycling of the material. For the design and the optimization of technical production processes, modules were developed that allow quick and efficient construction of the simulation system. The control software for a real system can be completely developed and tested without risk through the connection of the models to modern industrial control systems or stored-program controls and field bus systems.

#### **Standards for Success**

The functional models offer a high learning effect for trainees in the commercial technical area and for prospective technicians and engineers through the simulation of real operations. For industrial projects, the elimination of errors in the planning phase reduces the total costs for a project significantly so that the procurement of a model always remains profitable. Due to the high degree of abstraction of the models, complicated technical systems are shown in a clear and understandable manner. In particular, the project participants from the commercial area can get a precise picture so that they can make appropriate decisions concerning investments.

Contact us directly at the address given on the back of the catalogue for more detailed documents concerning the assortment available form fischertechnik plan + simulation.





Everything to make fischertechnik complete. The fischertechnik supplemental sets provide light, movement and additional functions for every model.



Item No. 91 082 More than 700 components from the current fischertechnik assortment. Packed in BOX 1000 with base plate, 390 x 270 mm as cover. > 700 components

> 8 sorting spacers

Figure shows the construction »PROFI MECHANICS + STATICS« in four sorting boxes, item No. 94 828 and a base plate, Item No. 32 985. SORTING BOX Item No. 94 828

Practical storage box with four sorting partitions without contents and base plate.

#### **BASE PLATE**

Item No. 32 985 258 x 186 mm

#### **BOX 1000** Item No. 30 383

Practical storage box with eight sorting spacers and 32 sorting partitions. The cover also serves as the big fischertechnik base plate, 390 x 270 mm.

> Eight sorting spacers > Large base plate



#### POWER MOTOR SET

Item No. 34 965

The powerful gear unit motor with gear wheels, worm, differential, pole-reversing switch, cable and plug.

> Performance data: voltage 9 V -  $\infty$ , max. output 2.4 W at 340 RPM, gear reduction of 8:1 35 components

> 35 components

> Additionaly required: power supply form Energy Set or Accu Set



**ENERGY SET** Item No. 30 182 The power supply from the electrical socket for all fischertechnik models. > Output: 9V :::/1000mA

> Power unit + automatic control unit



 MINI MOTOR SET

 Item No. 30 342

 The universal motor set with S motor, 9 V battery holder and many gear unit parts: gear wheels, bevel gear, differential, universal joints

 > Performance data: Voltage 9 V ... max. output 1.1 W at 5000 RPM

 > 50 components



LIGHTS Item No. 34 970 The lighting set consists of four bulbs, colored luminious caps, cable, plug and blink electronics for up to eight bulbs. Short-circuit and overload proof. For blinking and continous light. > 35 components



**ACCU SET** Item No. 34 969 Mobile power supply from the battery pack [NiCad 8.4 V/940 mAh] and specially adapted microcontroller charging device, turbo charge, that charges the battery pack completely in only 1.8 hours.

With ∆U safety charging monitoring > Charger + battery set



#### IR CONTROL SET Item No. 30 344

Performance characteristics: 10 m range, three independent motor outputs and of these two can be controlled at the same time, two speed levels. Transmitter can communicate with up to six motors (with IR receiver II).

#### > Transmitter + IR-receiver I

required power supply: for the transmitter two batteries, LR03/1.5 V AAA For the receiver Energy Set or Accu Set

#### www.fischertechnik.de

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# WHAT DO THE TEACHERS GET FROM THIS?

Instructional material that helps their pupils to submerge themselves in the world of technology to recognize this world and to learn about it. The design of the fischertechnik models promotes logical thinking and creativity. Thus, you are supporting the natural talent of your pupils in learning about technology in the truest sense of the world. The fischertechnik world knows no limits because all building sets and all components always fit together ideally and complement each other.

#### WHAT DO THE PUPILS GET FROM THIS?

This is quite simple: they learn about technology while playing.

Assembly is creative and concentrated, the teamwork is friendly and supportive and curiosity and discovery are part of the experimentation and research.



- · A high quality product, made in Germany.
- High acceptance by parents, teachers and engineers.
- All building sets and components can be combined with each other in an ideal way.
- Awards received:



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