fischertechnik

The construction kit for all ages

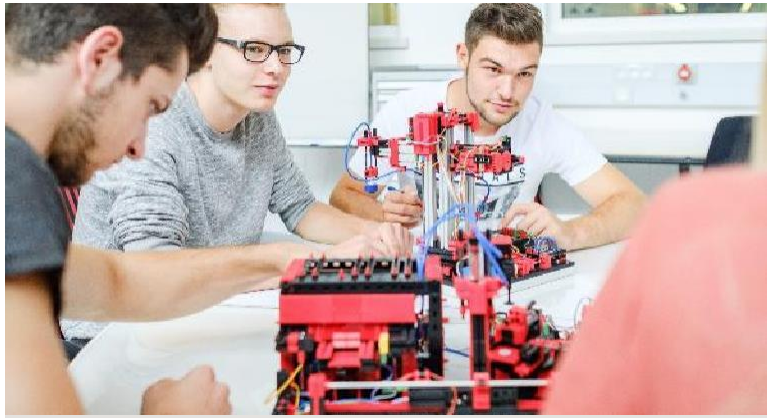
fischertechnik
More than just toys

Play

A playful introduction to the world of technology, getting to grips with it and gaining a long-term understanding – this is our approach to letting children discover their passion for technology from an early age

Teach

fischertechnik can be used to teach topics relevant to the curriculum in primary and secondary schools, degree courses and vocational schools



Simulate

Complex processes can be realistically simulated with fischertechnik's training models.
The Training Factory 4.0 demonstrates the implementation of digitalisation in a real factory environment

- 1965
  fischertechnik is developed as a Christmas gift for customers of the fastening sector

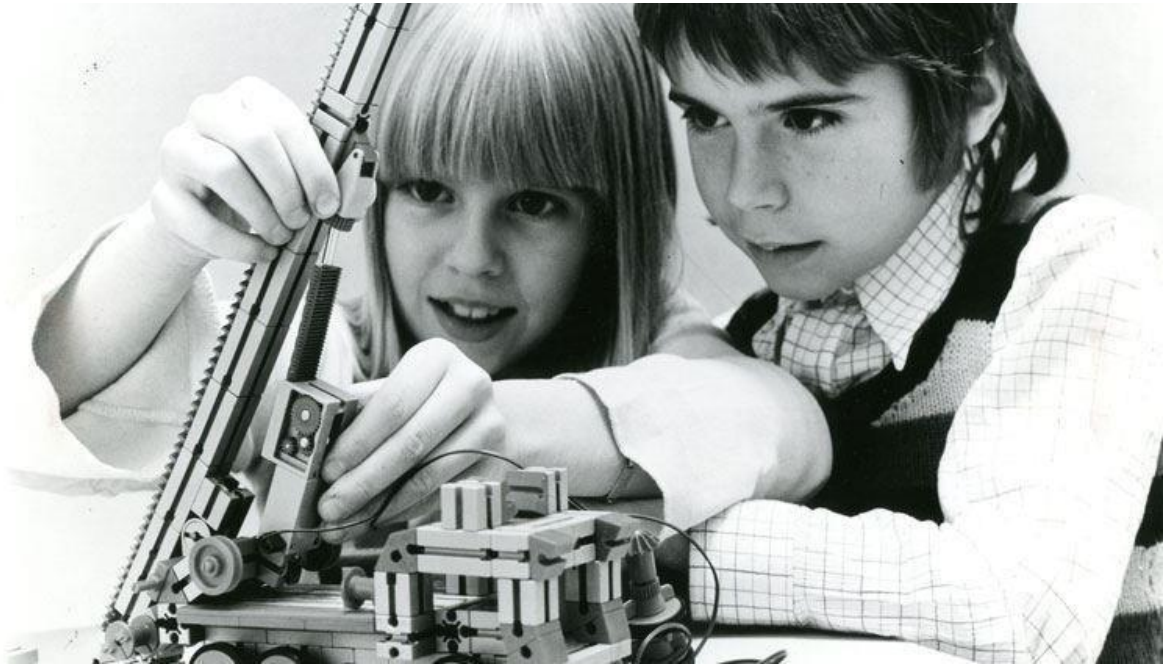
- 1966
  First presentation at the International Toy Fair, Nuremberg, Germany

- 1970
  Expansion of the program through learning kits (teaching technology series)

- 1982
  Introduction of the first simulation models

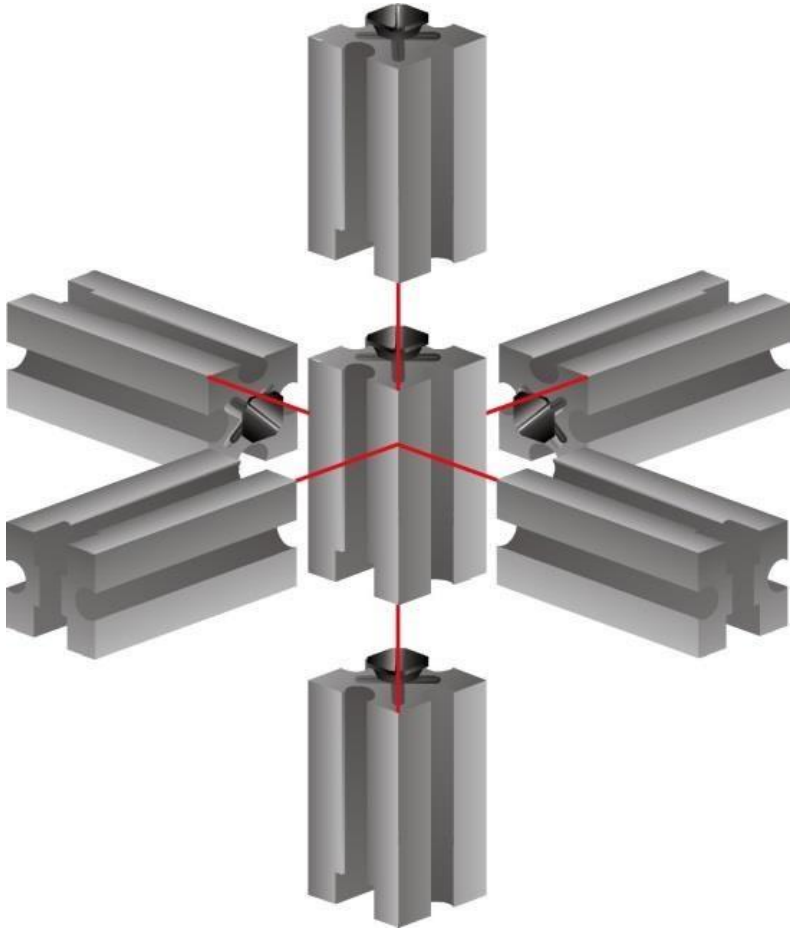
fischertechnik - History

- 1985
  Entry into computer technology (Robotics)
- 1996
  Launch of first product with solar technology
- 2009
  Launch of first kit with Fuel Cell (Hydrogen)
- 2015
  fischertechnik celebrates 50th anniversary
- 2019
  Launch of Training Factory Industry 4.0



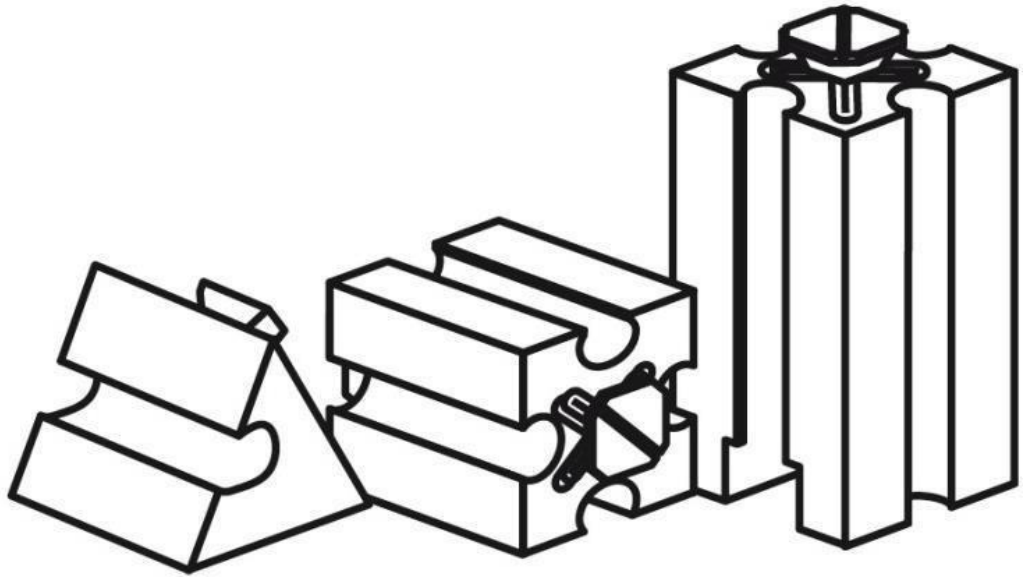
fischertechnik‘s USP: The building block

- Attachment possibility on all six sides
- Made of three specially selected materials
- Enables maximum stability and flexibility
- Basis for the continuous grid size of 15x30 mm
- Opens infinite variety of possible combinations



The aim

- To develop Hands-On skills
- “Learning by doing“ – encourage familiarity with technical principals
- To stimulate an interest in STEM (Science, Technology, Engineering, Math)
- To learn all about ROBOTICS
- To encourage creativity



The 3 product lines and its target groups

Playing

Playful learning of basic technical knowledge in the children's room

Teaching

Tools for imparting knowledge in schools, universities and further training in companies

Simulating

Technical function models for the simulation of complex industrial plants

Education Line

Advantages

- Over 55 years of experience as a manufacturer of educational kits for the classroom
- High-quality, durable and reliable products "Made in Germany”
- Freely accessible, comprehensive didactic concept for all products including lesson plans with reference to educational plans
- Continuous combinability of the individual parts from 1965 to today
- Functional models that focus on learning content
- Systematic expansion options with add-on boxes

Philosophy

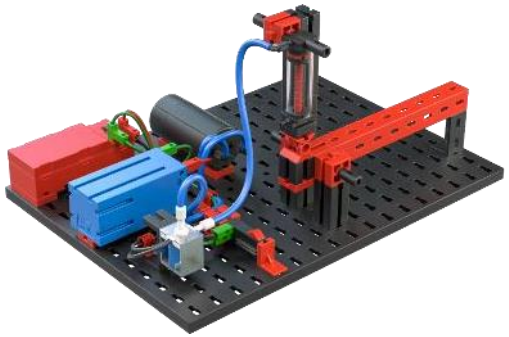
Set and assembly guides

Storage box optimized for school

- ✓ Clear division of the storage box for quick sorting of the components
- ✓ The assembly guides are printed and enclosed and promotes spatial thinking

Functional models

- ✓ The models are optimized for functionality
- ✓ Fast to build models allow optimal use in regular classes



Didactic concept

- ✓ All teaching material is freely accessible online
- ✓ Extensive topic introduction to the product theme
- ✓ The educational plan reference, the learning objectives and the time required are shown
- ✓ Lesson plans incl. assignment sheets and solutionswith reference to the educational plan

eLearning Portal

Philosophy

Class sets for primary level

- ✓ **16 units of identical single sets**.
- ✓ Each individual set is stored in a separate tray.
- ✓ Each tray contains sorting inserts and is clearly divided.
- ✓ Optimal for group work from two students, ideal for a school class up to 30 students and one teacher.

Philosophy

Project-oriented STEM sets for secondary schools

- ✓ **A set of parts with which you can build different models.**
- ✓ Design for project-oriented work: 2-4 students per kit
- ✓ Conception for both regular lessons and project work.

Topic Overview

fischertechnik offers a comprehensive product range for STEM education:

Our innovative teaching material conveys basic technical understanding and optimally prepares students for technical professions. The fischertechnik learning construction sets are used all over the world to explore the following topics:

- ***Mechanics***
- ***Statics***
- ***Hydraulics***
- ***Pneumatics***
- ***Renewable energies***
- ***Fuel cell***
- ***Optics & Light***
- ***Electronics***
- ***Robotics***
- ***Mechatronics***
- ***Automation***
- ***Measurement value acquisition***
- ***Industry 4.0***
- ***IoT (Internet of Things)***

Product Highlights Primary Level

Robotics First Coding

NEW 2022

Class Set Statics

NEW 2022

Class Set Simple Machines

Class Set Gears

Class Set Optics

Class Set Solar Energy

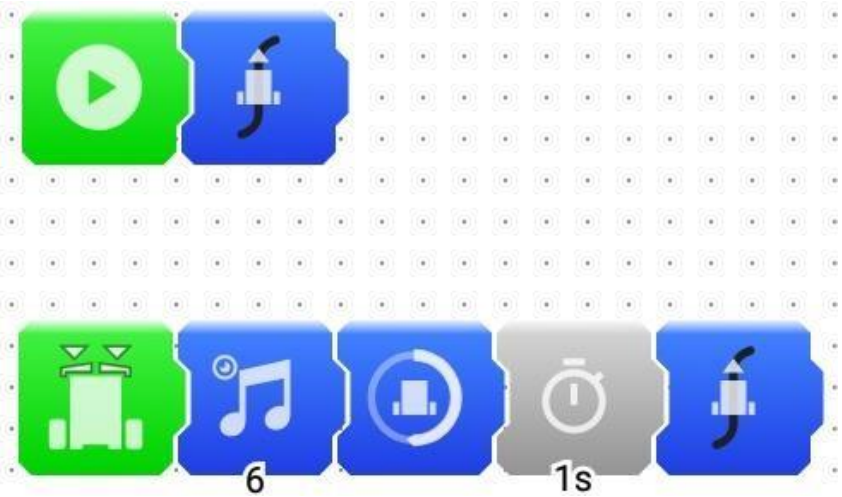
Class Set Electrical Control

NEW 2022 - Robotics First Coding

- 5 Experiments

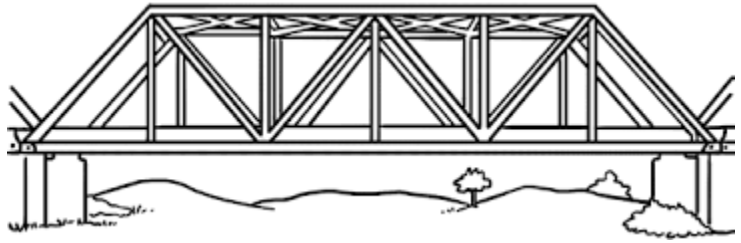
- 3 Driving robots

  ✓ Actuators, sensors and controls integrated into the chassis
  ✓ Quick to assemble
  ✓ Track sensor, 2x pushbuttons and distance sensor included
  ✓ Battery compartment for 3x AAA batteries included
  ✓ Child-friendly programming via smartphone/tablet
  ✓ Bluetooth 4.0 Interface



NEW 2022 - Class Set Statics

- 8 Experiments



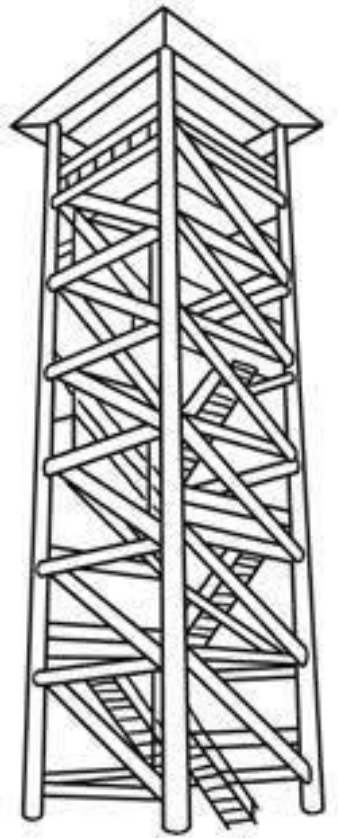
- Main topics:

✓ Designing buildings, structures experimentally

✓ Stability and strength in technical constructions

✓ Discover relationships between load-bearing capacity and connection of structural elements

✓ Functional characteristics of structures



NEW 2022 - Class Set Simple Machines

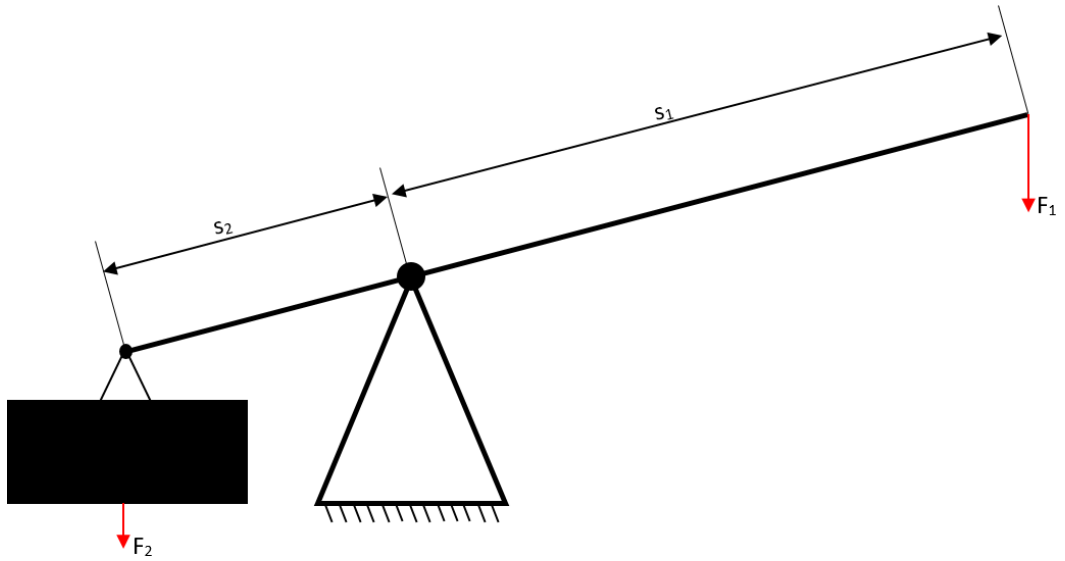
- 6 Experiments

- Main topics:

  ✓ Learn basic technical knowledge

  ✓ Keywords: construction, transport, lever

  ✓ Explore drive, gear design, gear ratios



Class Set Gears

- 12 Experiments
- 15 simple gearbox models, e.g.:
  - ✓ Belt drive
  - ✓ Worm gear
  - ✓ Gear transmission
  - ✓ Bevel gearbox
  - ✓ Rack and pinion gearbox

Class Set Optics

- 6 Experiments

- 6 Models:

  - ✓ Magnifier with illumination
  - ✓ Penumbra and umbra
  - ✓ Beam path
  - ✓ Circle
  - ✓ Sundial
  - ✓ Tablet / smartphone magnifier

Class Set Solar Energy

- 10 Experiments
- 3 Solar models

✓ Simple functional models

Class Set Electrical Control

- 25 Experiments

- 9 simple models on the topic of electric circuits, e.g.:

  ✓ Series connection
  ✓ Parallel connection
  ✓ Alternating circuit

Product Highlights Secondary Level

NEW 2022

NEW 2022

STEM Statics Advanced

STEM Simple Machines Advanced

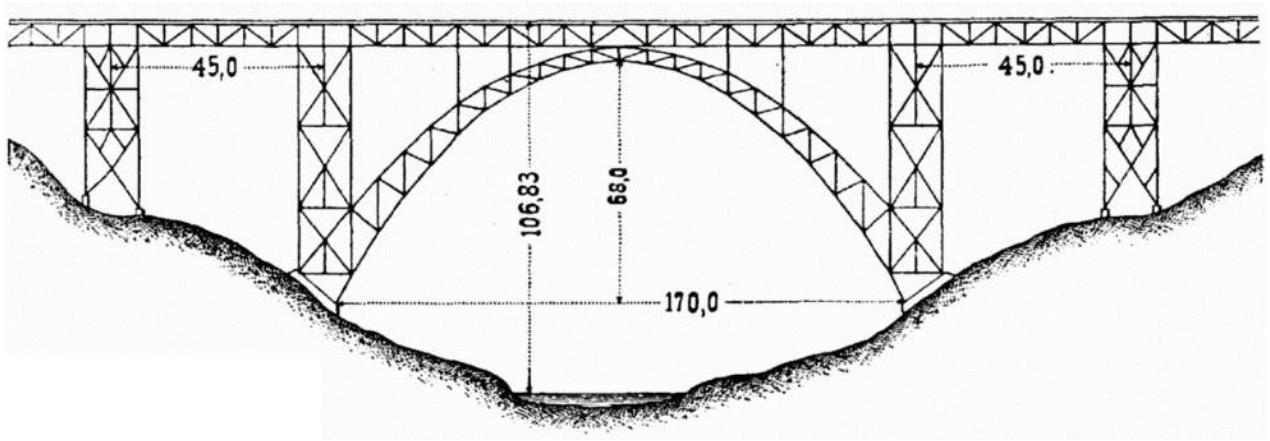
STEM Pneumatics

STEM Renewable Energies

STEM Gear Tech

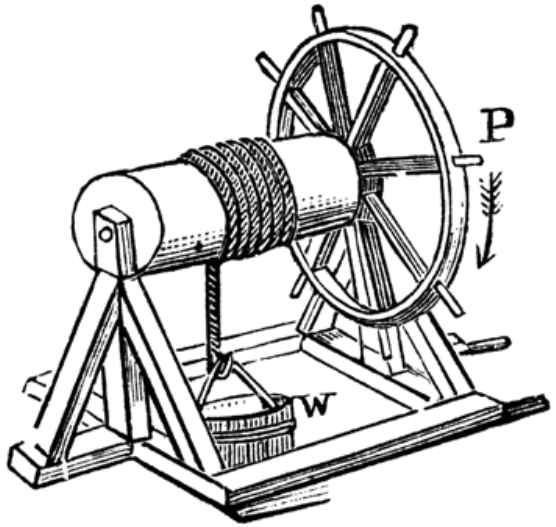
STEM Electronics

NEW 2022 - STEM Statics Advanced

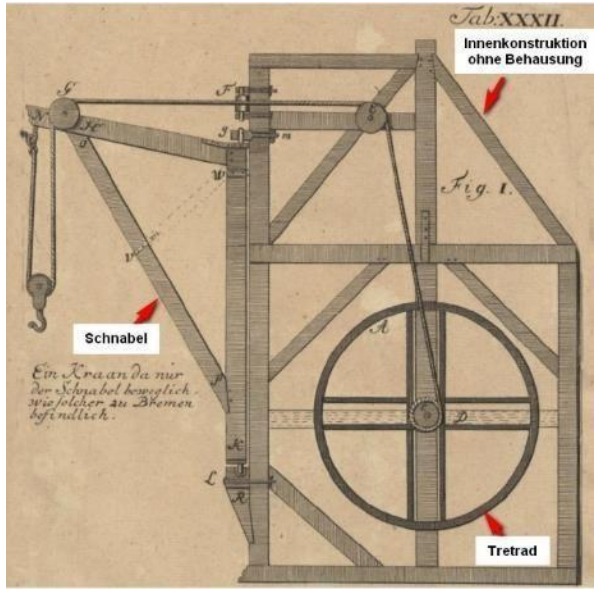


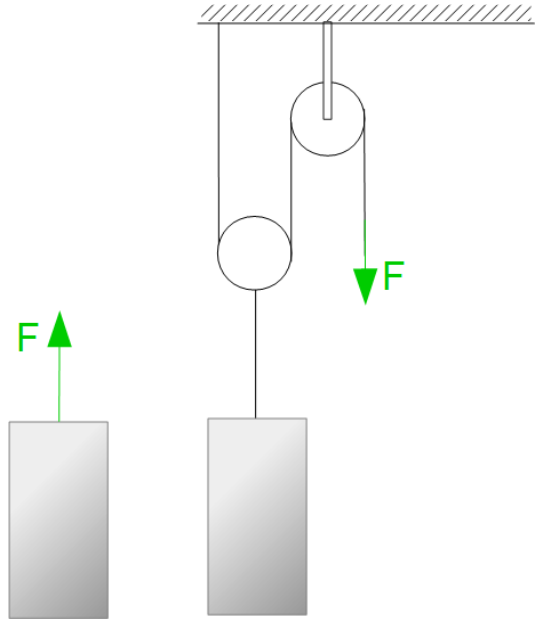
- 8 Experiments
- Main topics:
  - ✓ Implementation of static principles of on the example of bridges and house constructions
  - ✓ Apply physical ways of thinking and working
  - ✓ Determine tensile and compressive forces two-dimensionally
  - ✓ Analyze the static structure of natural and technical systems
  - ✓ Forces in balance

NEW 2022 - STEM Simple Machines Advanced

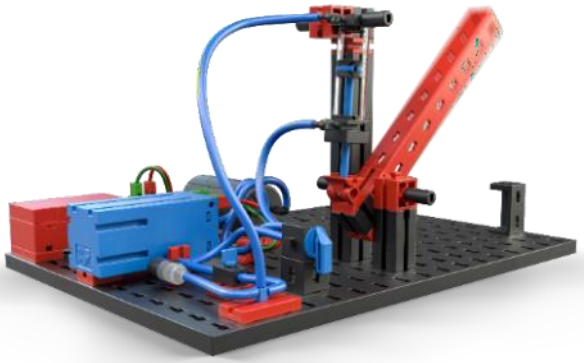


- 8 Experiments
- Main topics:
  - ✓ Lever, pulley, shaft wheel
  - ✓ Pedal wheel crane
  - ✓ Water loops
  - ✓ Clock gearbox
  - ✓ Leonardo da Vinci file hair machine
  - ✓ Sextant (angle measuring instrument for astronomy)



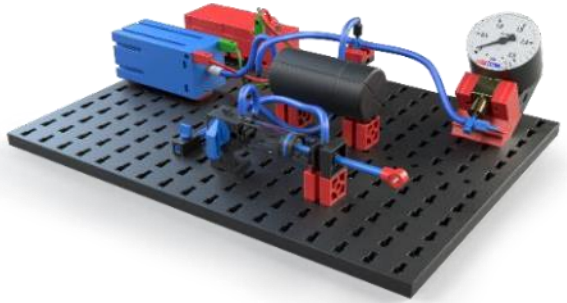


STEM Pneumatics



- 29 Experiments

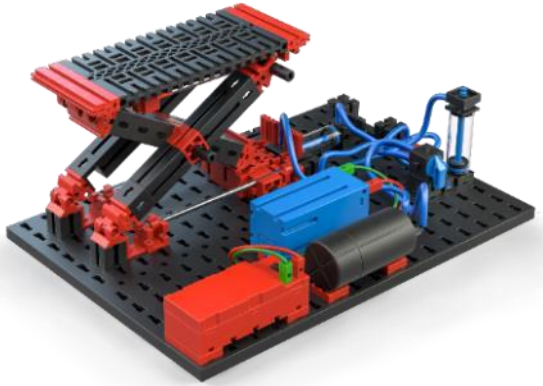
- 8 Models, e.g.:



  ✓ Functional model with compressor, cylinder and valve

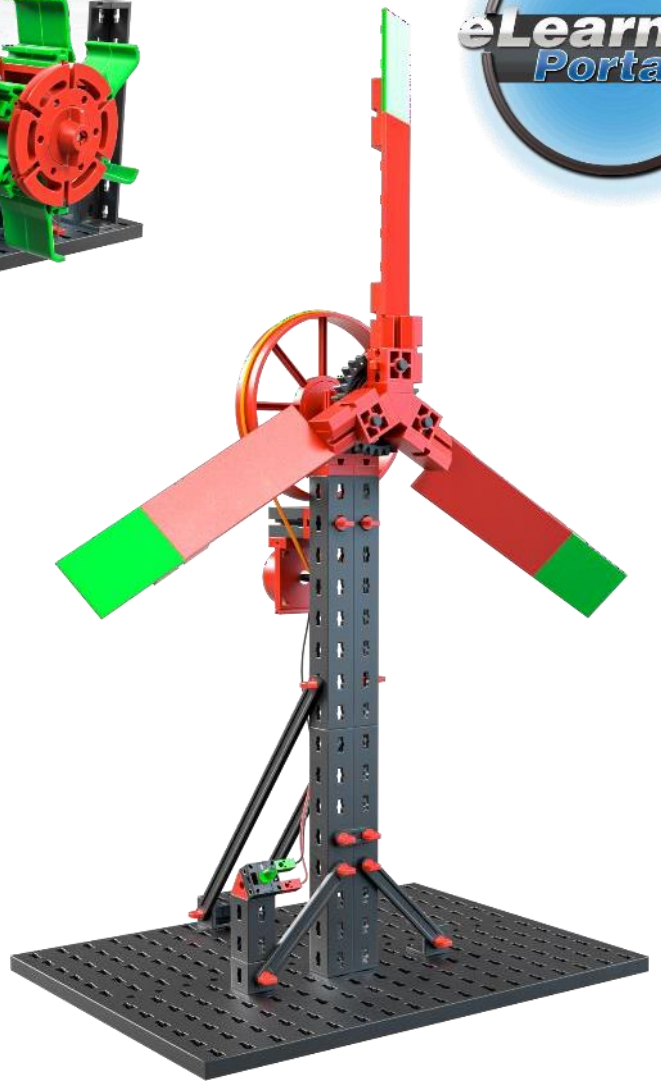
  ✓ Barrier with single-acting cylinder

  ✓ Barrier with double acting cylinder

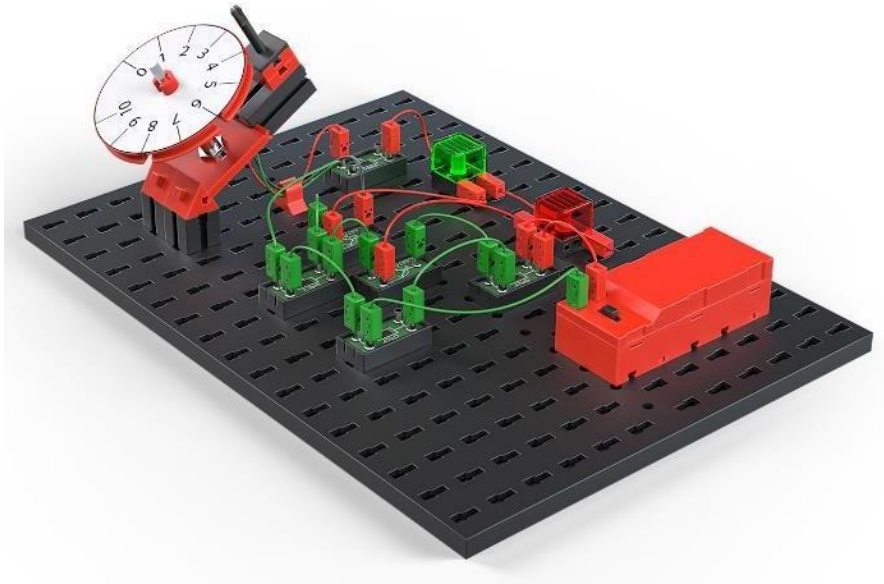


STEM Renewable Energies

- 28 Experiments
- 8 Models, e.g.:
  - ✓ Hand-held generator
  - ✓ Wind turbine
  - ✓ Vertical wind turbine
  - ✓ Water turbine
  - ✓ Electric car with fuel cell
  - ✓ Electric vehicle with gold cap capacitor



STEM Electronics



Differential amplifier

- 20 Experiments
- 10 Models, e.g.:
  - ✓ Electrical circuits
  - ✓ Principle of electric motor
  - ✓ Measurement of voltage and current
  - ✓ Functionality and application of semiconductors (diode, resistor, transistor, etc.)

STEM Gear Tech

- 26 Experiments
- 17 Models, e.g.:

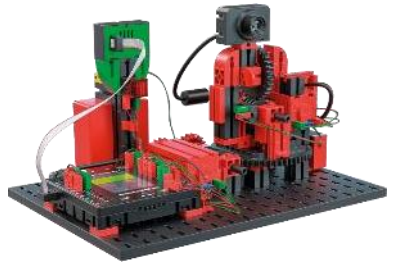
✓ Pulley block
✓ Three-speed manual transmission with reverse gear
✓ Bevel planetary gearbox
✓ Windshield wiper
✓ Planetary gear with fixed ring gear
✓ Differential gear

Product Highlights ROBOTICS Secondary Level

Robotics TXT 4.0 Base Set

Add On:
Omniwheels

Add On:
Autonomous Driving



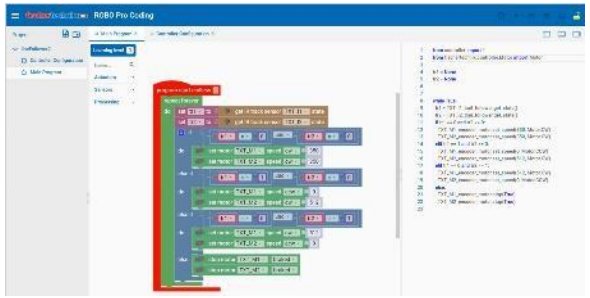
Add On:
IoT

Add On:
Competition

559888 Robotics TXT 4.0 Base Set

- 25 Experiments
- Set includes:
  - Robotics TXT 4.0 Controller
  - ROBO Pro Coding Software
  - Accu Set
  - 2x Encoder Motor
  - USB Camera
  - IR Track Sensor
  - 2x Limit Switch
  - 2x LED
  - Phototransistor
  - Ultrasonic Distance Sensor

- 12 Models:
  - Temperature measurement
  - Kink barrier in three variants
  - Pedestrian traffic light
  - Barcode Reader
  - Morse Key
  - Base Model “Buggy“
  - Obstacle Recognizer
  - Target finder
  - Painting robot
  - Analogue track follower
  - Digital track follower
  - Digital lane follower with distance and color recognition

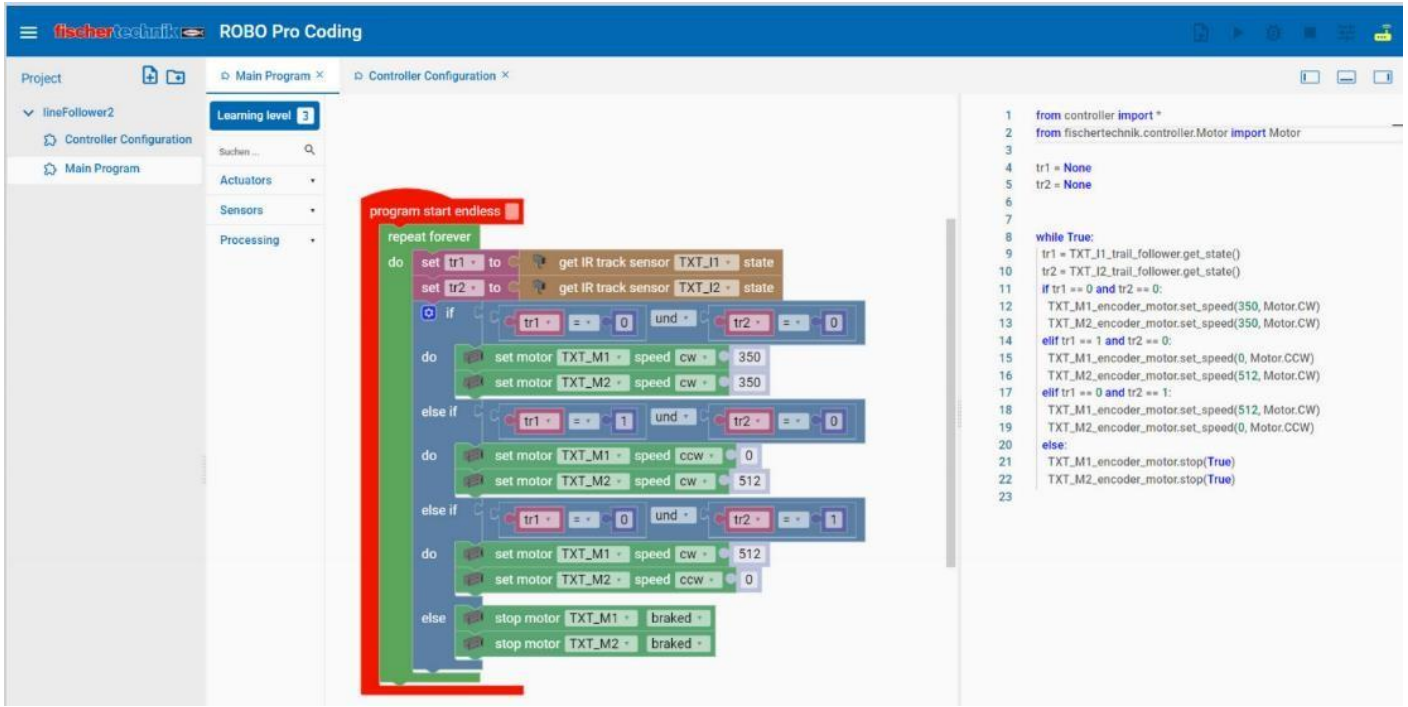


560166 Robotics TXT 4.0 Controller

- **New features vs recent TXT:**
  - 3 Servo Outputs
  - More capacity: 512MB RAM, 4GB eMMC (2 GB operational)
  - 1 Master plus 8 possible extensions
  - Capacitive Touch Display suppporting swiping mode
  - Updated WLAN / Bluetooth Modul (2,4+5.0 GHz, BT 5.0)
  - 3.3V and 5V power connectivity for third party sensores (Arduino, Raspberry Pi)
  - Automatical firmware udating via Cloud as well as via SD card or USB Stick

Robotics ROBO Pro Coding

- Free of charge download from App Stores
- Graphical programing as well as text based programing with Python
- Runs on Windows, Linux or MacOS platforms as well as on mobile devices (Android and iOS)



559898 Robotics Add On: Omniwheels

- 12 Experiments / 4 Tasks
  - 4x Mecanum Omniwheels
  - 1x Servo
  - 2x Gearbox Motor
  - Speech Control
- 4 Models:
  - Base Model with sensors
  - Ball Shooter
  - Painting Robot
  - Soccer Robot

559896 Robotics Add On: Autonomous Driving

- 12 Experiments / 4 Tasks

- Lane Keeping Assist
- Automatic parking system
- Automatic light control
- Cruise control
- Speedometer
- Includes:
  - Chassis (differential, wheels)
  - Servo
  - LED
  - Steering

- 1 model: vehicle with drive motor, differential and servo

559897 Robotics Add On: IoT

- 6 Experiments / 2 Tasks
- Includes:
  - Environmental sensor
  - Brightness sensor
  - Cloud connection
  - Moving camera
- 1 Model: IoT Station

560842 Robotics Add On: Competition

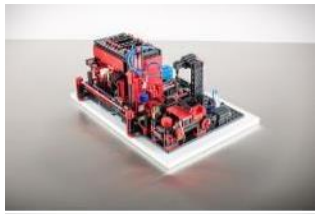
- Parts Set

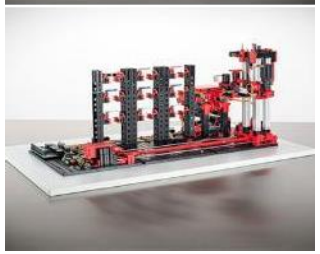
  - RGB six-direction guesture sensor with:
    - Color recognition
    - Ambient brightness
    - Proximity detection up to 15cm
  - Ultrasonic distance sensor
  - Combi sensor (gyroscope, acceleration and compass)
  - Stronger motors
  - Crawler pads + track links for crawler vehicle

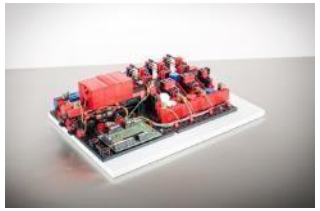
  - **Ideal for the improvement or extensions of the models used at the common international Robotics competitions**

Simulation Models

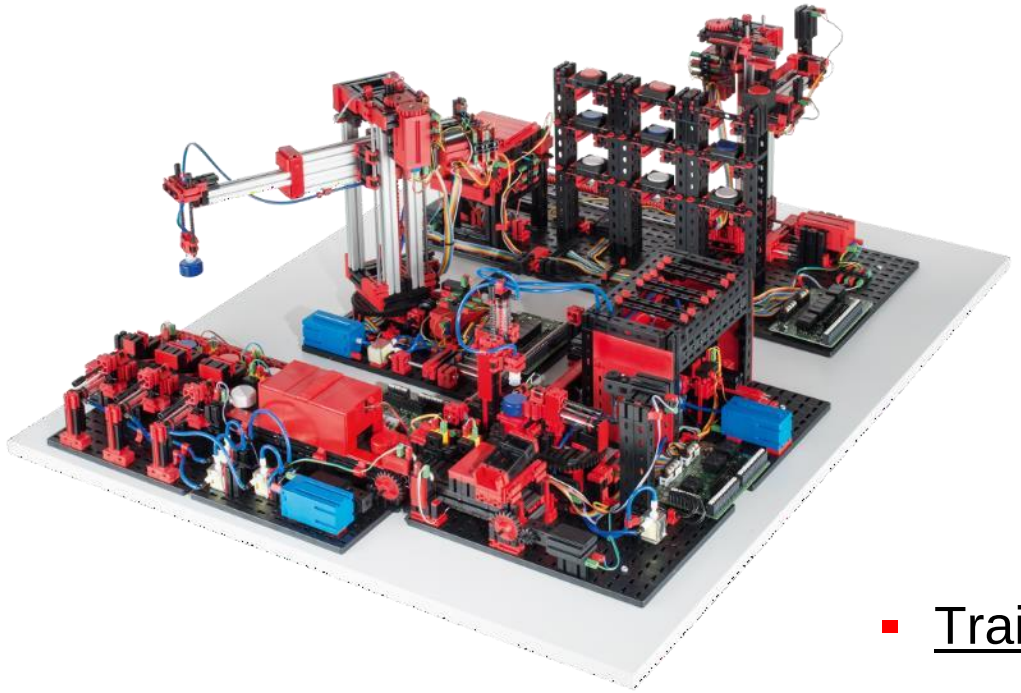
Simulating - Pre-assembled Training Models for Technical Vocational Training (TVT), Higher Education and Industry







- 9v version equipped with TXT 4.0 Controller and ROBO Pro Coding program
- 24v version connectable with any PLC brand
- Focus on Programming & Controlling of Industrial Applications
- For Technical Vocational Training (TVT), esp. Mechatronics & Automation Control

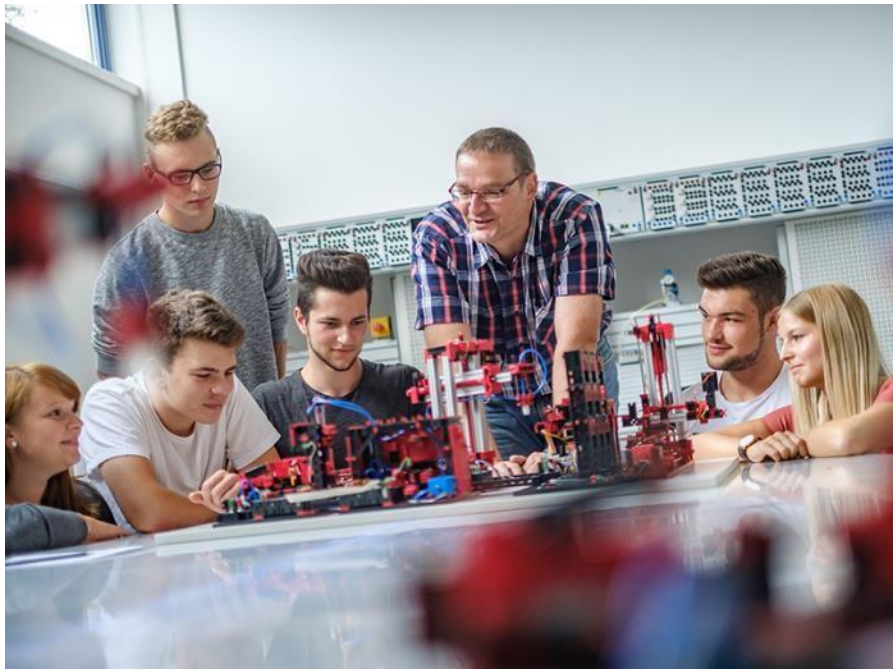


- Training Factory Industry 4.0

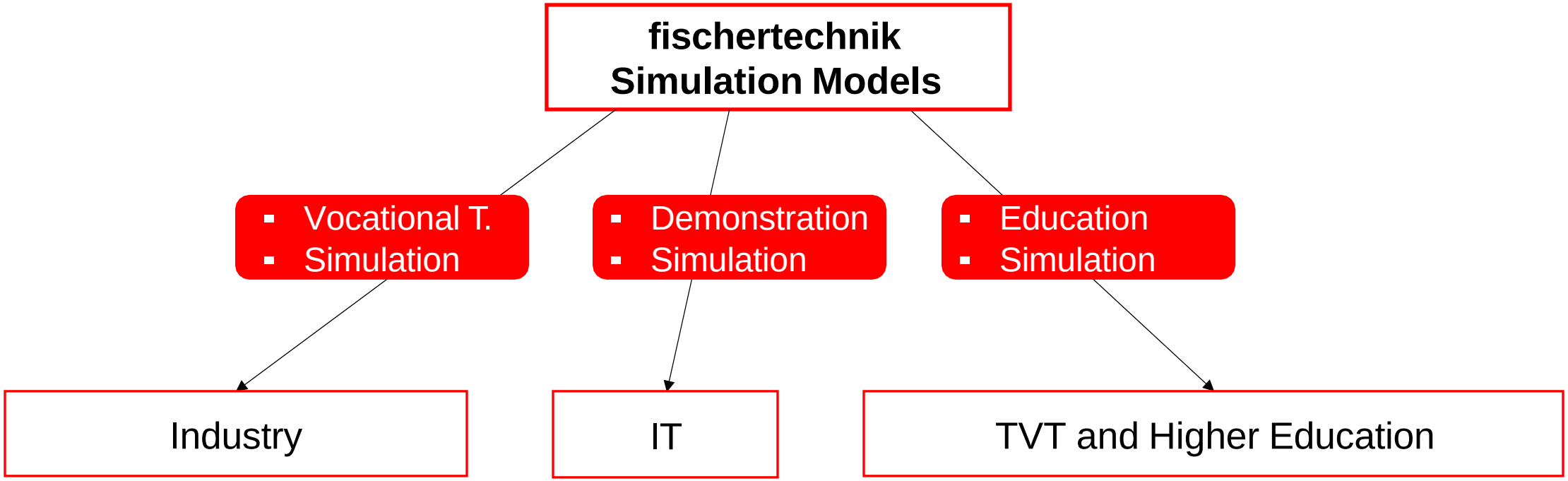
Learning subjects

fischertechnik simulation models are the ideal learning platform for

- Industry-oriented PLC programming
- Understanding Industry 4.0
- Use and operation of dashboards
- Data usage via cloud
- Automated production processes
- In-depth learning through haptic grasping
- Optical and sensory applications
- Logistics systems (high-bay warehouse, First in First out)



Target groups



International School Projects

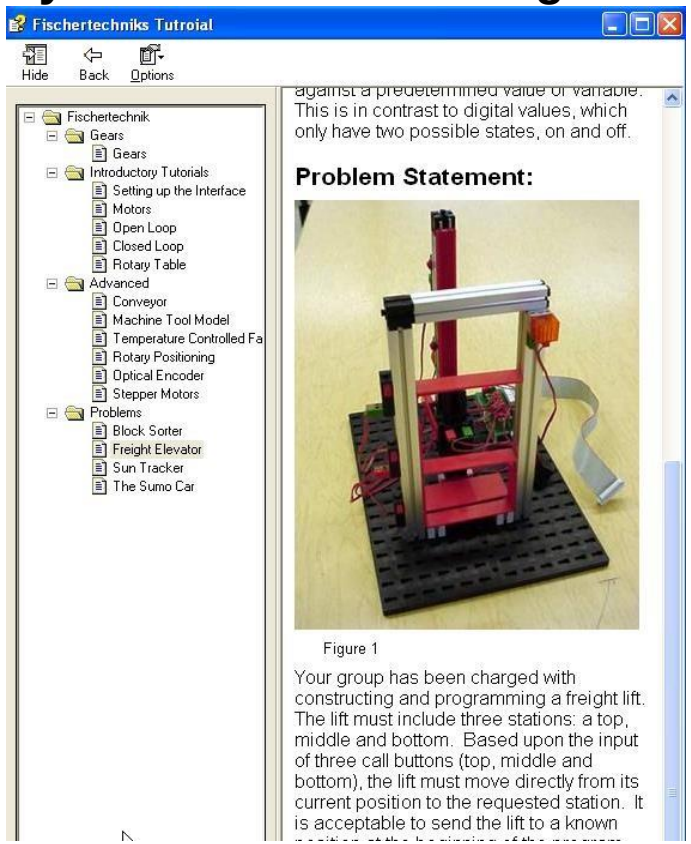
“Future Lab“ Poland 2021/2022 (EU funded)

- Budget: 150 Mio. EUR for STEM & Robotics products for all 15,000 public primary schools
- Selection of 12 different fischertechnik STEM & Robotics Sets
- To be continued at secondary level in 2023 and in 1,500 private schools from July 2022

STEM

Problem Solving

Problems are designed to challenge students to aply programming principles already learned and to synthesize new learning.



"The fischertechnik factory"

Students are assigned to build elements of a factory

Teams must communicate with each other about positioning

Teams assemble the elements to create an assembly line

project lead the way

STEM Education

since 1998

- 5000 Middle and High Schools have been using the kits
- 10,000 STEM teachers have been trained so far
- 500,000 students have been using the STEM kits per year

Science · Technology STEM Engineering · Math

fischertechnik at MOE Bangkok City (BMA)

- fischertechnik has been chosen as THE STEM material supplier for all 500 public K-12 schools since 2011.
- Has been used in all grades from grade 4 up to grade 12 to teach currently Mechanics, Electronics, Pneumatics, Green Energies, Robotics

Worlddidac Asia 2013, Bangkok

Her Highness, Princess Maha Chakri Sirindhorn of Thaiand at the fischertechnik stand

October 10, 2013

Integration of Robotics into “Plan Ceibal“, Uruguay

Plan Ceibal

- OLPC – Initiative (“One Laptop per Child“); established by Uruguay‘s government back in 2007
- Aim: All students should have access to the virtual world despite of their social status and income
- Now: About 570,000 students and teachers have their own laptop
- Since 2011, bundling of OLPC with Robotics kits
- Aim: Stimulation of STEM Education in basic and vocational education; to get more students started in Engineering Careers
- Since 2012: fischertechnik as the key provider for Robotics kits for Elementary level (ROBO LT Beginner Set)

Launch of Robotics at MOE, Panama, 2013 / First RoboCup Competition Panama, April 7-9, 2014

- Sponsored and organized by MEDUCA (Ministry of Education), Panama
- For Students from Elementary (9 to 14 y.) and Seconday (14 to 18 y.) to participate in "Dance", "Rescue" or "Soccer“ category
- Aim: Stimulation of STEM Education in basic and vocational education; to get more students started in Engineering Careers
- More than 180 teams from public and private schools from all of the 9 provinces
- 85% of the teams had fischertechnik (from tender 2013)
- 7 out of 9 winning teams were fischertechnik teams
- Winning teams were invited to particpate at RoboCup World Cup Joao Pessoa, Curitiba, Brazil, July 9 – 25, 2014

State of Paraíba, Brazil, 2013+2014: Introduction of fischertechnik STEM kits to Ministry of Education,

- ❑ Equipping of 300 Secondary Schools
- ❑ Each school got 10 kits to cater each of the 10 given technology topcis (electronics, robotics, pneumatics, optics, etc.), hence 100 fischertechnik kits per school
- ❑ Package included also teacher training for approx. 1,400 teachers

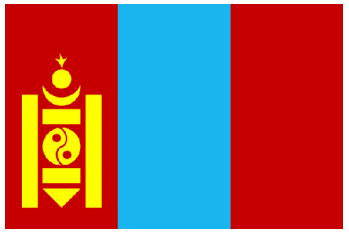
State of Paraíba:
Surface: 56.439 km²
Total pop: 4 Mio.

from Mathematics, Physics, and Technology classes

Official launch of fischertechnik STEM Labs through MOE City of Kayseri, Turkey on May 7, 2014

STEM

Launch of STEM kits at MOE, Mongolia 2017



- 4000 STEM kits Mechanics 2.0 for 400 public schools
- Intensive Teacher's Training was conducted through distributor STEM Brainy Tech
- Project to be continued for more schools by end 2019

STEM

MOE Israel 2017: „Robotics & Coding“

- Robotics Kits for grade 4 in 400 public schools
- 133 schools haven choosen ft Robotics (190 Lego, 57 Abilix)
- **1.825 Robotics Competition Sets supplied (= 700,000 USD)**
- Continuation for more schools in 2019/2020

STEM

Kuwait 2017: fischertechnik in Technical Vocational Education (TVE)

- 2016: Launch of fischertechnik Robotics kits, Training Models and large customized Industrial Models in 2 TVE Schools (40 TEUR Umsatz) through govenrnent entity SACGC (Education Initiative Emir of Kuwait)
- 2017: 3 more TVE Schools were fully equipped
- 2017: Launch “ft Robotics for Middle Schools” in 20 public pilote schools under patronage of MOE Kuwait

National RoboCup Junior Competition Taiwan

- Taiwan has always been a very strong Robotics Competition market
- Most of the participating teams at Robo Cup Junior Rescue Taiwan are using fischertechnik Robotics now (since 2010)
- Numerous winning teams have been awarded to participate at RoboCup World Cup‘s since 2010

Competitions

"National University Competition China"

- Since 2002, bi annually, for Students of Engineering faculties
- Sponsored by MOE China, conducted by Cedutech, Beijing, China
- Aim: To strenghten the skills in innovative, constructive and problem solving thinking of tomorrow‘s Chinese Engineers

China

8th National fischertechnik University Competition China
April 15-17, 2016, Beijing Institute of Graphic Communication

China

- Two subjects to choose: “Coin & Note Dispensing Machine“ or “Logistic System for the Mining Industry“
- 309 Teams from 123 Technical Colleges / Universities
- 1200 Students, 350 Teachers / mentors (Professors, Professor‘s assistance)
- 25 Jurors from the most prestigious Universities (Deans, Principals)
- 3 Tasks to accomplish: Construction of the model – Business Plan - Interview