



fischertechnik 

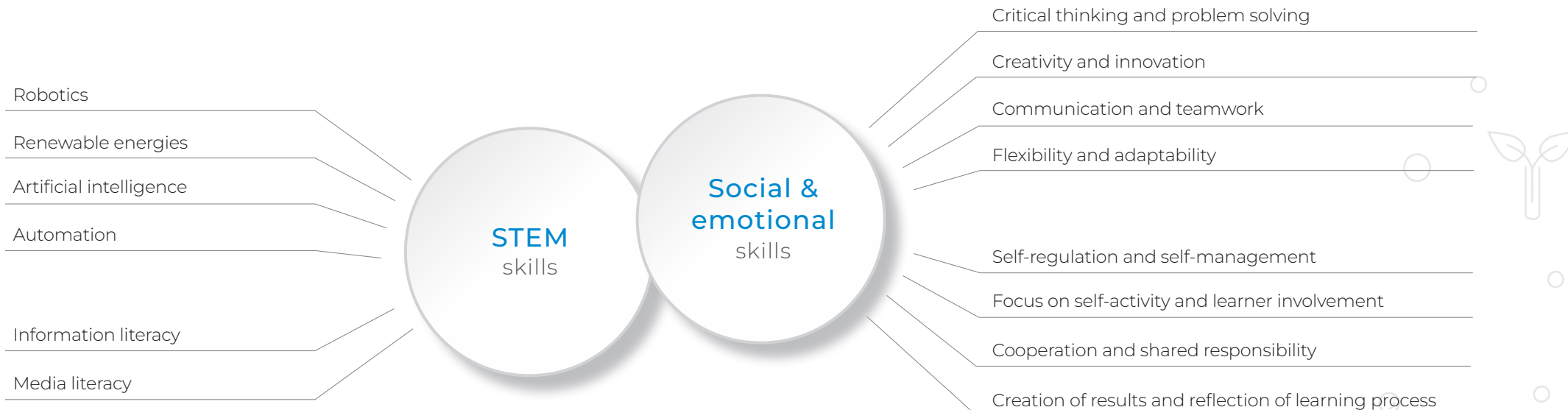
Develop future skills with hands-on learning solutions

STEM learning from primary school
to higher education

Navigating the future with hands-on learning

In our highly globalized and connected world, society is undergoing rapid technological development. According to a study by the World Economic Forum, more than half of the skills required for work will be different by 2025 than they are today. These future skills encompass STEM and digital skills, as well as robust social and emotional skills to navigate effectively in this rapidly changing world.

All fischertechnik learning concepts are based on the pedagogical principle of hands-on learning, enabling holistic development from hands to heart to mind.



fischertechnik learning continuum

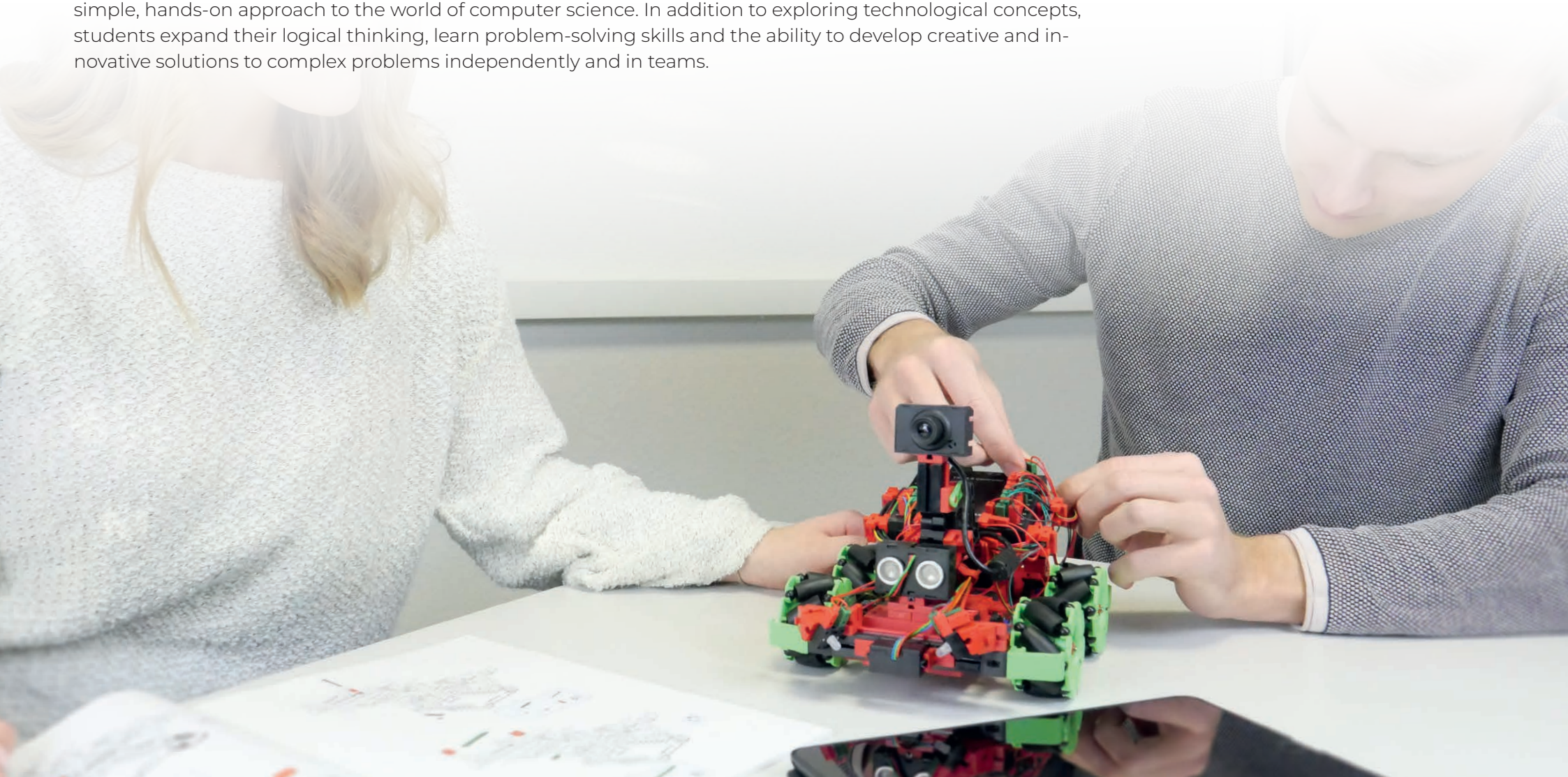
Innovative STEM learning concepts for all skill levels and combinations thanks to the versatile and flexible fischertechnik building block

	Robotics Page 4-5	Renewable energies Page 6-7	Artificial intelligence Page 8-9	Factory simulation Page 10-11	STEM world Page 12-13	
PRESCHOOL & PRIMARY SCHOOL Playfully explore first STEM and robotics concepts						✓ Contents
SECONDARY SCHOOL Enhance future skills and learn hands-on about physics, technology and sustainability						✓ Models
UNIVERSITY & HIGHER EDUCATION Master future technologies with comprehensive hands-on learning solutions						✓ Didactics
						

Robotics

Digital and coding skills will shape the workplace of tomorrow

Basic digital and computer science skills, especially „computational thinking“, will play a growing role in general education and should be taught as early as possible in the classroom. Robotics in the classroom offers a simple, hands-on approach to the world of computer science. In addition to exploring technological concepts, students expand their logical thinking, learn problem-solving skills and the ability to develop creative and innovative solutions to complex problems independently and in teams.



fischertechnik robotic continuum

The perfect programming solution for every skill level

PRESCHOOL & PRIMARY SCHOOL

LEARNING OBJECTIVES

- Entry into the world of information technology and robotics
- First graphic programming with pre-built programming blocks
- Getting to know motors and sensors
- Quick setup with minimal components for an easy start

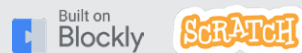


First Coding

PRIMARY SCHOOL

LEARNING OBJECTIVES

- Create small programs
- Learn the basics of robotics
- Understand the meaning and function of sensors and actuators
- Explore topics such as control, measurement and regulation
- Collaborate in groups and assume roles
- Present and reflect on results



STEM Coding Pro

PRIMARY SCHOOL

LEARNING OBJECTIVES

- Learn the basics of programming
- Understand sensors and actuators
- Develop problem-solving skills
- Encourage creative thinking
- Construct and engage in logical thinking



Starter Set Calliope / micro:bit

SECONDARY SCHOOL

LEARNING OBJECTIVES

- Graphical and text-based programming of complex robotics models including autonomous / artificially intelligent robots
- Control and evaluation of analog and digital sensors
- Data transmission techniques
- Coding and decoding processes
- Image processing



TXT 4.0 + 6 Add Ons

UNIVERSITY & HIGHER EDUCATION

LEARNING OBJECTIVES OF AUTOMATION

- Training and simulation on a realistic production image
- Learn PLC programming and automation
- Simulate agile production
- Understand Industry 4.0
- Making artificial intelligence usable in the production environment



PLC programming



Training Factory Industry 4.0

All robotics learning concepts contain skill-appropriate construction kits, suitable software and hardware, as well as extensive support for teachers on the fischertechnik website.



Renewable energies

The most important energy sources of our future

Regenerative or renewable energy refers to the provision of energy from sustainable sources such as sun, wind, water, geothermal energy or biomass. They are available in almost inexhaustible quantities. In contrast, the supply of fossil fuels such as coal, oil, natural gas and conventional nuclear fuels is continuously decreasing as consumption continues. These fossil fuels belong to the non-renewable energy sources. Once they have been burned in a power or heating plant, they are no longer available. They do not regenerate, they are devalued.

However, the growing world population and the advancing technological development of mankind are leading to an enormous demand for energy, which is constantly increasing. It is also known that emissions of the greenhouse gas carbon dioxide (CO_2) from the combustion of oil, natural gas and coal are very high and, according to current knowledge, are the cause of global warming.

The transition from fossil and nuclear fuels to renewable energies is already in full swing. In addition to the increased expansion of renewable energies, reducing our energy consumption and increasing energy efficiency through technological progress are key issues and current challenges at the same time. In everyday life, we encounter the energy transition in electromobility in transport, when buying energy-efficient household appliances or when renovating buildings to make them more energy-efficient.



Renewable energies

The power of water, wind, sun and hydrogen

PRIMARY SCHOOL

LEARNING OBJECTIVES

- Introduction to the topic of energy generation from renewable energies
- Learn about solar energy and its use
- Understand series-parallel connections

incl. 2x solar module and 1x solar motor per set

Available in class sets, consisting of 16 individual sets



Class Set
Solar Energy

SECONDARY SCHOOL

LEARNING OBJECTIVES

- Explore and understand different renewable energy sources: Water, wind, sun and hydrogen
- Work with a fuel cell to produce hydrogen
- Measurement of current and voltage
- Generation, storage and use of electricity

incl. multimeter for measuring current and voltage

Available in individual sets for 2 - 4 students each



STEM
Renewable Energies

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Immerse yourself in the world of renewable energies using the fischertechnik construction kits. These experiment kits offer my students a delightful introduction to sustainability. As they engage with the kits, students discover the ease of generating hydropower, harnessing wind and solar energy, and creating fuel cell energy. This hands-on experience empowers them to actively contribute to a more sustainable and promising future.

Tim Scott,
Teacher in USA



In addition to a relevant selection of building blocks, the STEM sets contain all the important technical components for a sustainable understanding of the energy forms of the future. Teachers find free lesson support material on the fischertechnik website.

Artificial intelligence

Haptic visualization of an abstract topic

Artificial intelligence forms the basis of numerous innovations and is becoming an integral part of the world of work. According to a study by McKinsey, around 30 percent of the global workforce will need advanced AI skills by 2030. Incorporating AI into the curriculum promotes digital skills, critical thinking and interdisciplinary learning, giving students the opportunity to develop their own skills.

Students are better prepared for the challenges and opportunities of modern society. It is not just about understanding AI, but also about raising a generation that can deal creatively with this transformative technology.



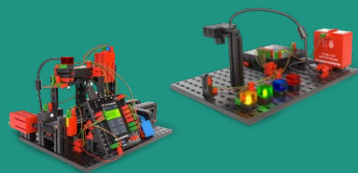
Artificial intelligence and machine learning

Understanding supervised learning haptically

SECONDARY SCHOOL

LEARNING OBJECTIVES

- Understand processes related to AI
- Conduct simple object recognition
- Express and recognize the quality of a classifier
- Recognize the importance of the right training data
- Realistic application



Add On for TXT 4.0 Base Set
Artificial Intelligence

UNIVERSITY & HIGHER EDUCATION

LEARNING OBJECTIVES

- Training and simulation using realistic production images
- Develop an understanding of machine learning
- Build your own AI model for object recognition
- Implement supervised learning



Quality Control
with AI

UNIVERSITY & HIGHER EDUCATION

LEARNING OBJECTIVES

- Modular production
- Digitality in the production environment
- Industry 4.0
- Quality assurance with artificial intelligence
- Automated guided vehicles
- Digital twin
- Automation and PLC programming



PLC programming



Agile Production
Simulation



The AI learning concepts consist of fischertechnik building blocks, relevant hardware and software as well as free access to lesson plans and training materials on the fischertechnik website.



Industry 4.0

The production of tomorrow is the subject of research, industry and academia

Industry 4.0 is a term that describes the fourth industrial revolution and refers to the progressive integration of digital technology into industrial production and manufacturing. It is a paradigm shift in the way products are manufactured and business processes are designed. Industry 4.0 encompasses a range of technologies and concepts such as the Internet of Things (IoT), artificial intelligence (AI) and machine learning, big data and data analysis or cloud computing.

The goals of Industry 4.0 are increased efficiency, flexibility and productivity in industrial production. By integrating these technologies, companies can optimize their processes, reduce production costs, improve quality and mass-produce individual products (batch size 1).



Factory simulations

Basis for sustainable learning experiences in an activity-oriented environment

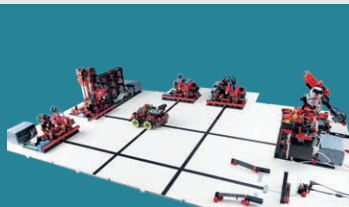
UNIVERSITY &
HIGHER EDUCATION

LEARNING OBJECTIVES

- Modular production
- Digitality in the production environment
- Industry 4.0
- Quality assurance with artificial intelligence
- Automated guided vehicles
- Digital twin
- Automation and PLC programming



PLC programming



Agile Production
Simulation

UNIVERSITY &
HIGHER EDUCATION

LEARNING OBJECTIVES

- Assembly line production
- Digitality in the production environment
- Quality assurance with color recognition
- Multi-axis robots
- Automation and PLC programming
- Industry 4.0



PLC programming



Training Factory
Industry 4.0

UNIVERSITY &
HIGHER EDUCATION

LEARNING OBJECTIVES

- Digital learning platform
- Learning modules on future topics in production
- Didactic concept incl. learning success control
- Digital image of the haptic simulation model



Digital twin



Fit for the factory of the future with fischertechnik.



Discover the big fischertechnik STEM world

Understanding the basics of Science, Technology, Engineering and Math in a hands-on way



Hands-on learning concepts for a range of STEM topics aligned to curriculum standards

PRIMARY SCHOOL

MAIN TOPICS

- Statics
- Optics
- Simple machines
- Electronics
- Gears

Available in class sets, consisting of 16 individual sets



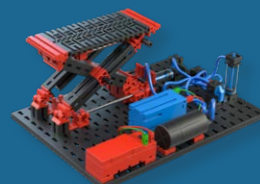
Class Set Gears

SECONDARY SCHOOL

MAIN TOPICS

- Statics
- Physics
- Optics
- Simple machines
- Electronics
- Pneumatics
- Gears
- Mechanics

Available in individual sets for 2 - 4 students each



STEM Pneumatics

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The hands-on approach with fischertechnik allows students to learn through direct experience. While constructing the models, the functionality of pneumatics becomes evident. After a brief introduction, my class independently built the models and engaged with the corresponding task sheets. Testing the finished models reveals the practical applications of compressed air in everyday life, unveiling new realms of technology and establishing clear connections.

Tobias Hannich,
Teacher in Germany



All STEM learning concepts consist of a construction kit, relevant technical components and free access to extensive teacher support materials and lesson plans on the fischertechnik website.



Extensive support for teachers

How to integrate fischertechnik into your lessons

All fischertechnik learning concepts are developed in close cooperation with teachers and industry experts. They are tailored to specific school types, grade levels, and aligned with the curriculum.



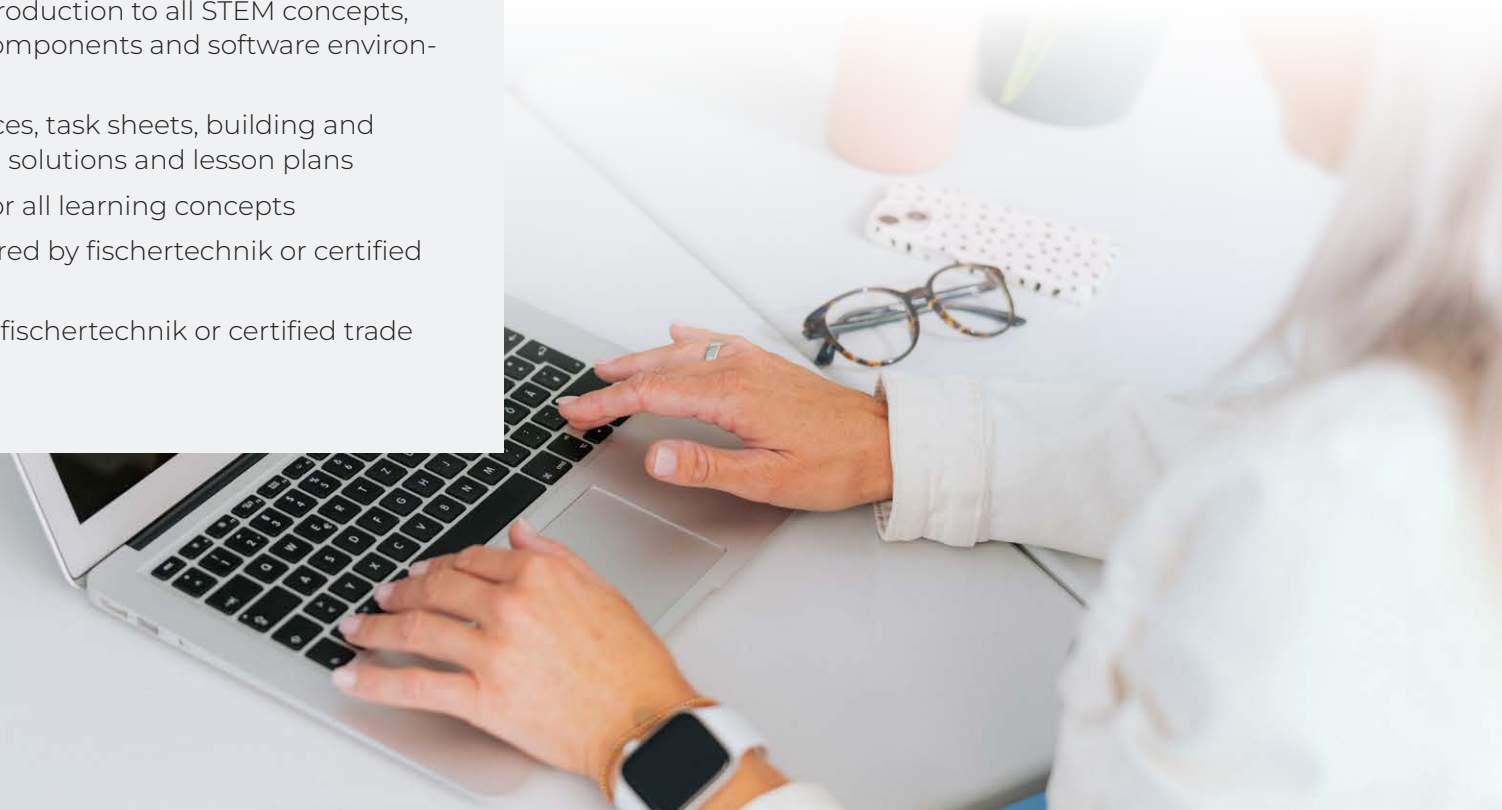
The right support for your teaching projects

- First steps instructions
- Introduction to the fischertechnik building block and videos for an easy start
- Comprehensive content including topic introduction to all STEM concepts, hands-on learning, future skills, technical components and software environment for all relevant platforms
- Teaching materials incl. curriculum references, task sheets, building and programming instructions (also in the app), solutions and lesson plans
- Suitable packaging and storage solutions for all learning concepts
- Competent advice and further training offered by fischertechnik or certified trade partners
- Easy reordering of individual parts through fischertechnik or certified trade partners



The kits come with detailed teacher support materials, allowing teachers to quickly familiarize themselves with a new subject area. All documents are easily accessible on the fischertechnik homepage and can, therefore, be adapted to your own lessons. The materials are also aligned with the curricula and include both group and individual tasks with sample solutions.

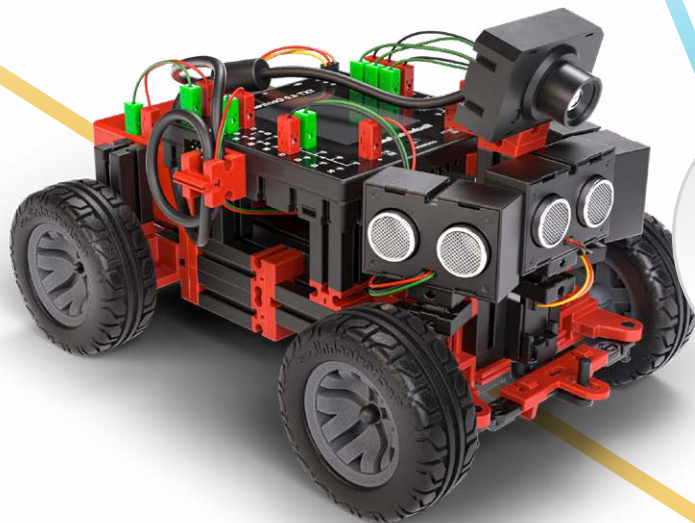
Lola Gomez,
Teacher in Spain



Robotics in competition

fischertechnik is an international partner of WRO seasons 2024 and 2025

Competitions provide an exciting opportunity for children and young people to develop their skills. School teams, aged 8 - 19, from over 90 countries participate in the World Robot Olympiad robotics competitions held worldwide. Teams choose one of the four competition categories, collaborate on a robotics / STEM task for the respective season, and then compete against other teams at local, national, and international events. In addition to STEM skills, children and young people develop essential emotional and social skills while overcoming exciting challenges together as a team.



STEM Coding Competition

designed for

WORLD ROBOT OLYMPIAD™
**FUTURE
ENGINEERS**



” STEM Coding Competition is specially designed for robotics competitions. The focus is on the independent development, construction and programming of an autonomous robotic vehicle.

Jonathan Auer,
Product Designer fischertechnik

FUTURE ENGINEERS
FUTURE INNOVATORS

Official partners:



Future
Classroom Lab
by European Schoolnet

fischertechnik 

Discover more learning concepts
online at www.fischertechnik.de/en
and at our retail partners!

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