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Robotics in Middle School Age 10+

fischertechnik STEM Coding Max

Our Purpose

Prepare our **society** for the **future** by supporting **educators, professionals** and **learners** to teach and learn essential **STEM**, **social** and **emotional future skills**

Our Solution

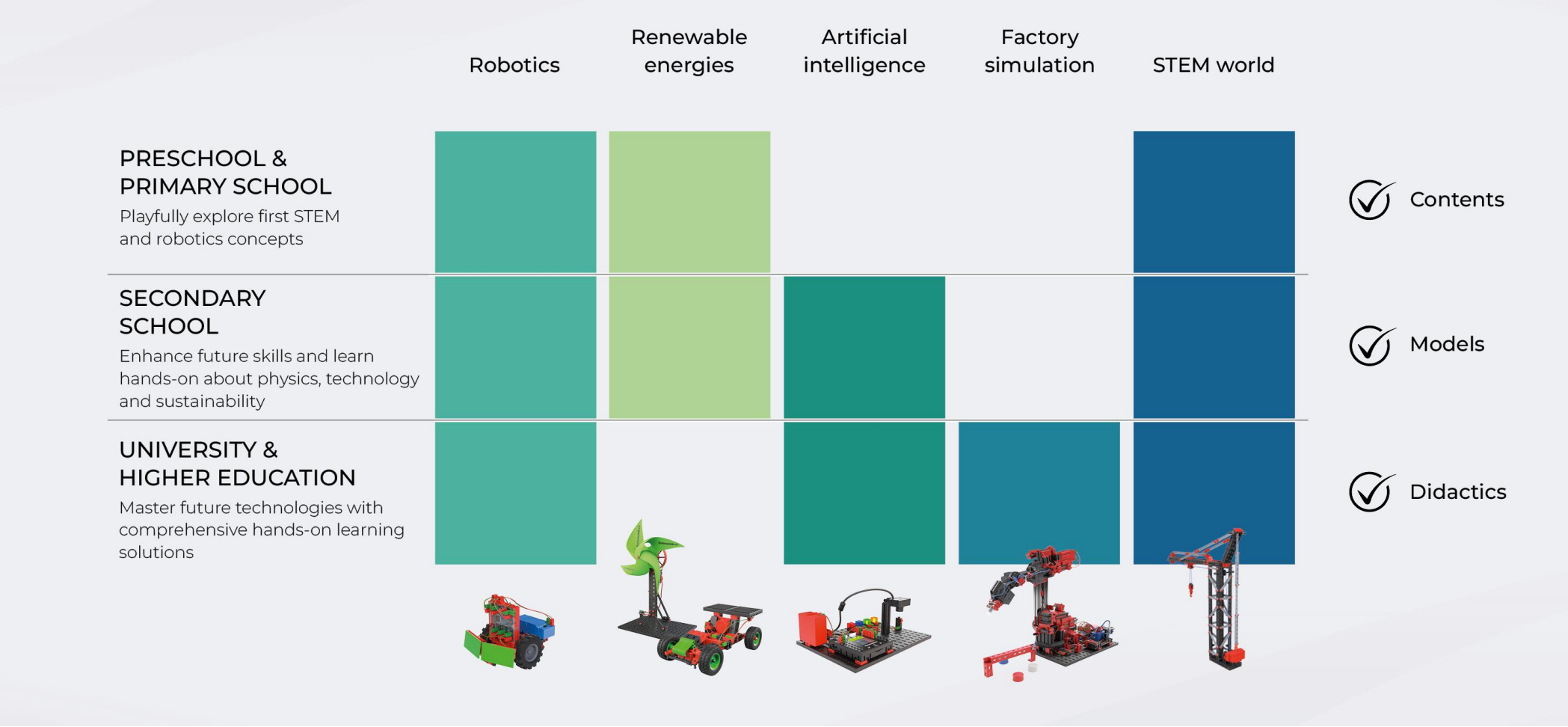
A **highly adaptable, fun,** and **hands-on STEM** and **robotics continuum** designed to **enable** learners from **preschool** throughout **K12** to **higher education** to acquire essential **future skills.**

through

#exciting **learning resources**
#fun and realistic **fischertechnik elements**
#easy to use **hard and software**
#engaging **teacher training & support**
innovative **simulation tools for IoT experts**

fischertechnik Learning Continuum

STEM and Robotics Learning Solutions from Primary to Higher Education



fischertechnik Robotics Continuum

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

Built on Blockly

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

Built on Blockly SCRATCH

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

OPEN ROBERTA

Built on Blockly SCRATCH

Starter Set Calliope / micro:bit

SECONDARY SCHOOL

LEARNING OBJECTIVES

- Understand and recreate everyday technology
- Build and expand computational thinking
- Playfully discover STEM and Future Skills
- Coding in Scratch, Blockly & Python

python

Built on Blockly SCRATCH

STEM Coding Max

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

SCRATCH python

TXT 4.0 + 6 Add Ons

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Hello!

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This is STEM Coding Max

2-4 students

243 parts incl. spare parts and easy re-sorting template

11+4 models with 42+ hours of learning

- RX Controller
- 2x motors
- 4x buttons
- 3x LED
- 1x Color/Gesture/Distance/Brightness sensor
- Reed contact
- 9V re-chargeable battery and USB-C port

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Hands-on and problem-based construction and programming in secondary school

Real-world Tasks & Engaging Storytelling

Step-by-Step Learning Approach

Detailed Instructions in Interactive App

python Blockly SCRATCH

Comprehensive Lesson Plans based on 4Cs

Content for Computer Science, Math, Physics and Future Skills

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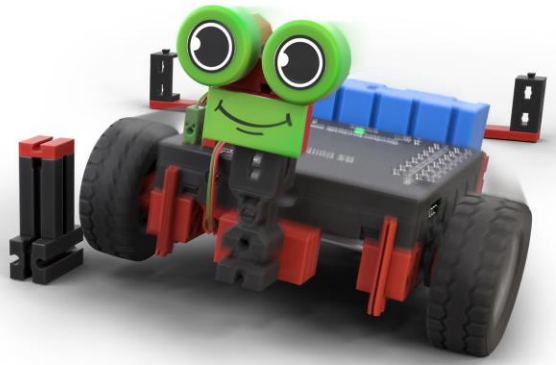
Driving Robot Roxy

I‘m on the right track!



“You are an **engineer of a racing team** preparing for a very special race:
the **Robo-Slalom Challenge.**

Your team has developed a robot that must navigate a slalom course with precisely placed obstacles. Your task is to **program the robot to complete the course as quickly as possible** without touching any obstacles. It will be an exciting **competition** against other teams, where **speed**, **precision**, and **technical skill** are decisive.

Your robot, your programming – ready, set, go!”

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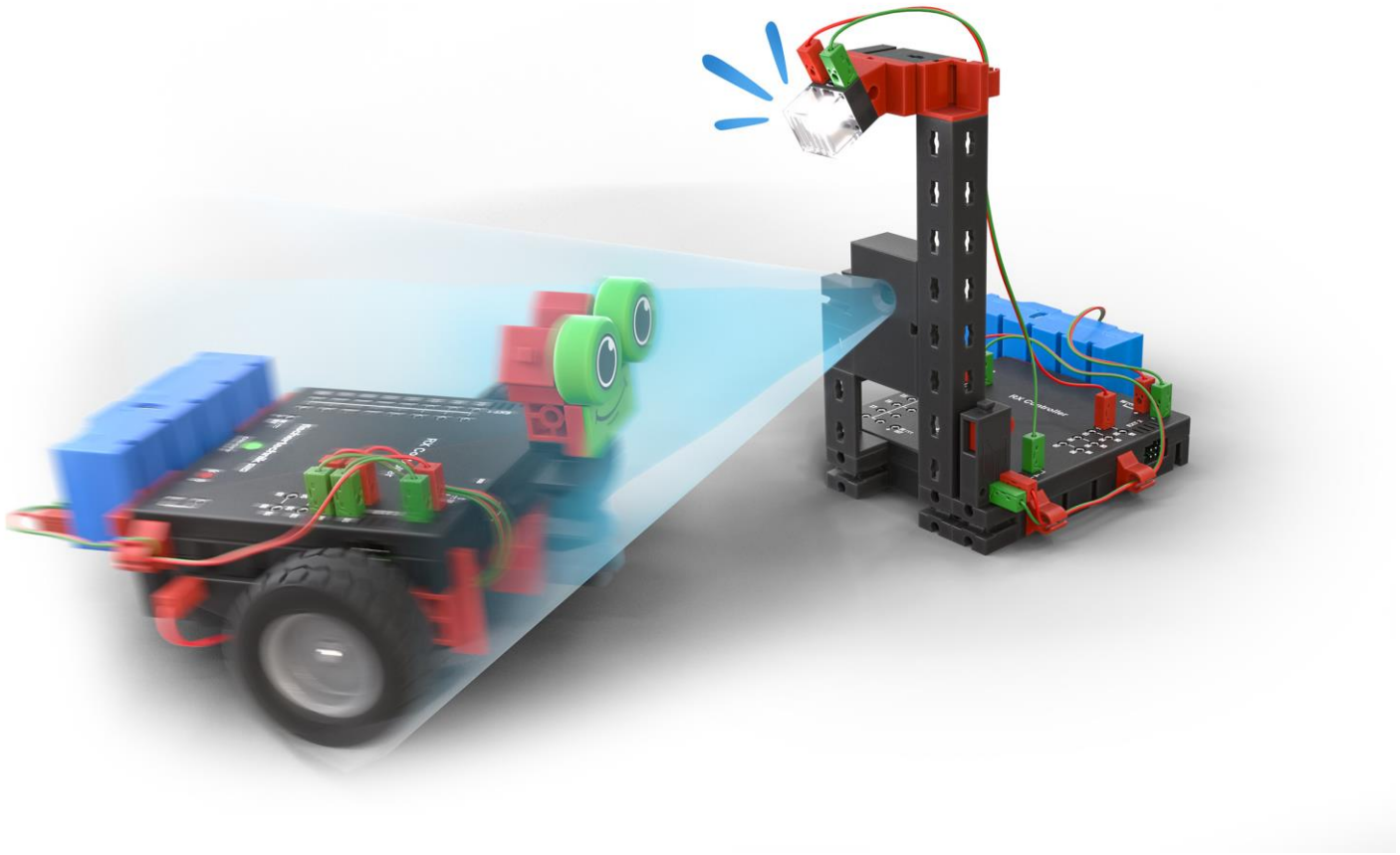
Outdoor Light

Brightness for dark corners



“You get to visit your English friend during the holidays.
His family lives in the countryside in an old house with a large backyard.
It might be haunted at night… you’re a bit uneasy about that. But you’re creative and, together with your friend, you build an **LED lighting system**.
Your parents might even use it as balcony lighting… a souvenir from the holidays.

Let’s get started…"

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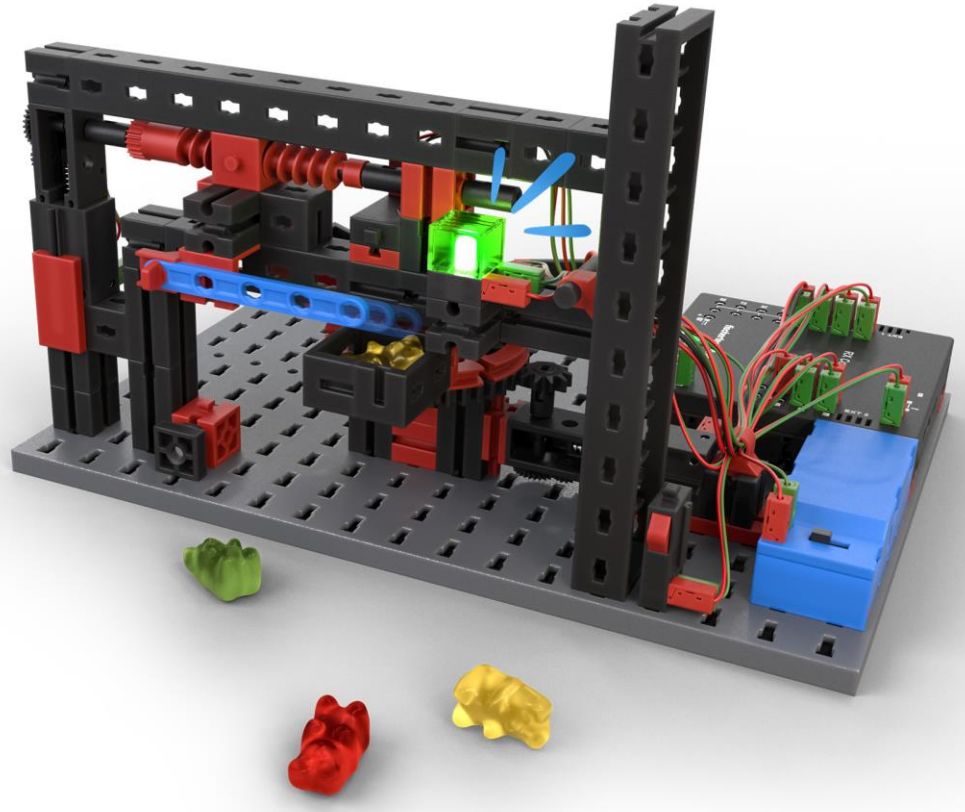
Candy Machine

Give me Sweets!

Two things are always scarce, you think: pocket money and sweets. And there's always a fight with your sister, the old sweet tooth, because she pilfers from your gummy bear stash.
So, you start thinking about **constructing a machine** that dispenses gummy bears only after you insert a coin.

'Wonderful!' exclaims your grandma when she hears about your project named PILLBOX, 'that would also be great for Grandpa's pills!'"



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11+4 Models, 42+h Hours of Learning

Getting Started Modules (6 units)

Model 1 
Mobile Robot RoXy
I‘m on the right track!

Model 2 
Action Timer
Always trouble with time!

Model 3 
Outdoor Light
Brightness for dark corners

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Distance Measurer
Of Measuring and surveying

Model 5 
Tablet Holder
Secured treasures

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Automatic Door
Out of the way!

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I write and draw your idea!

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I need music! Let me in!

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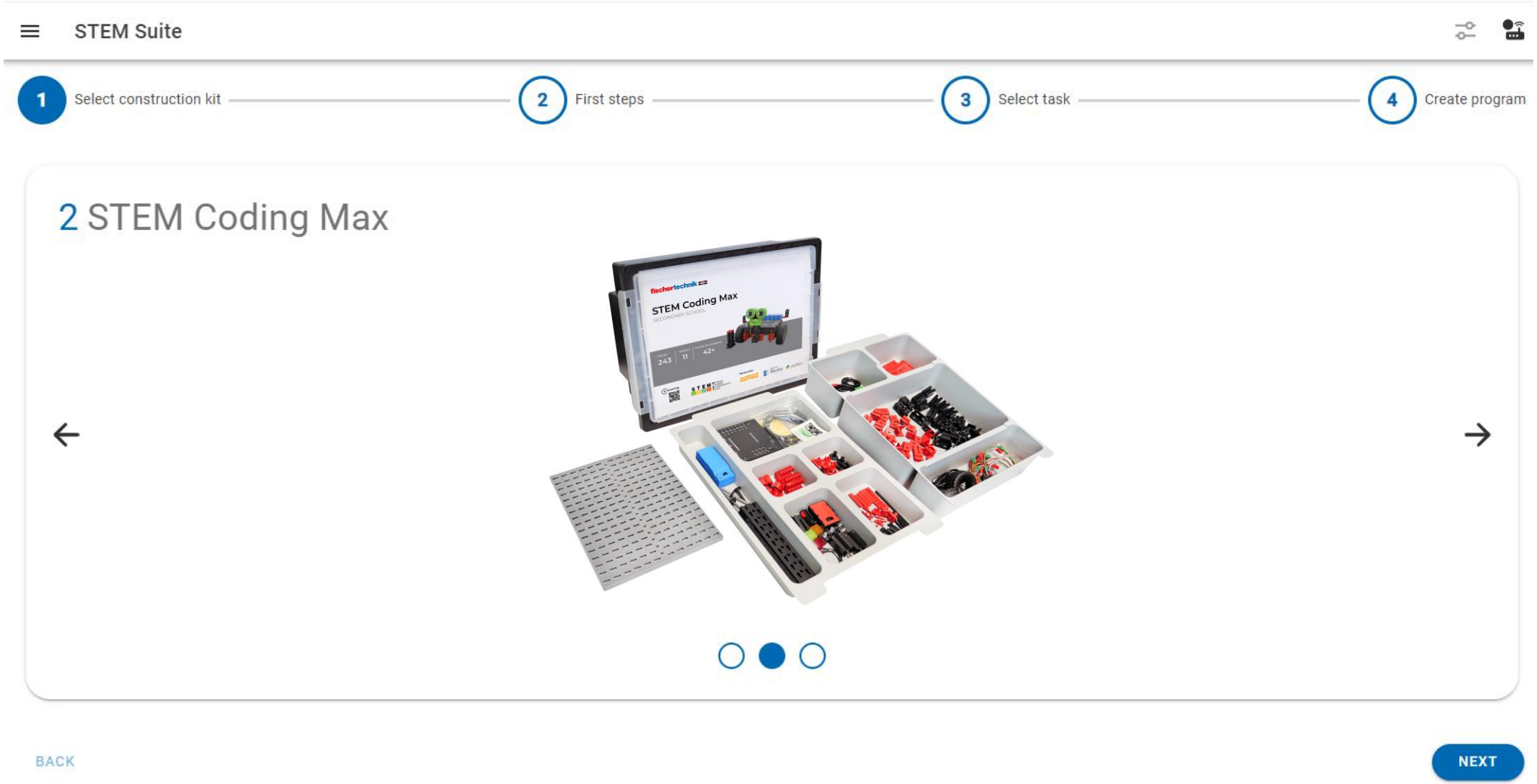
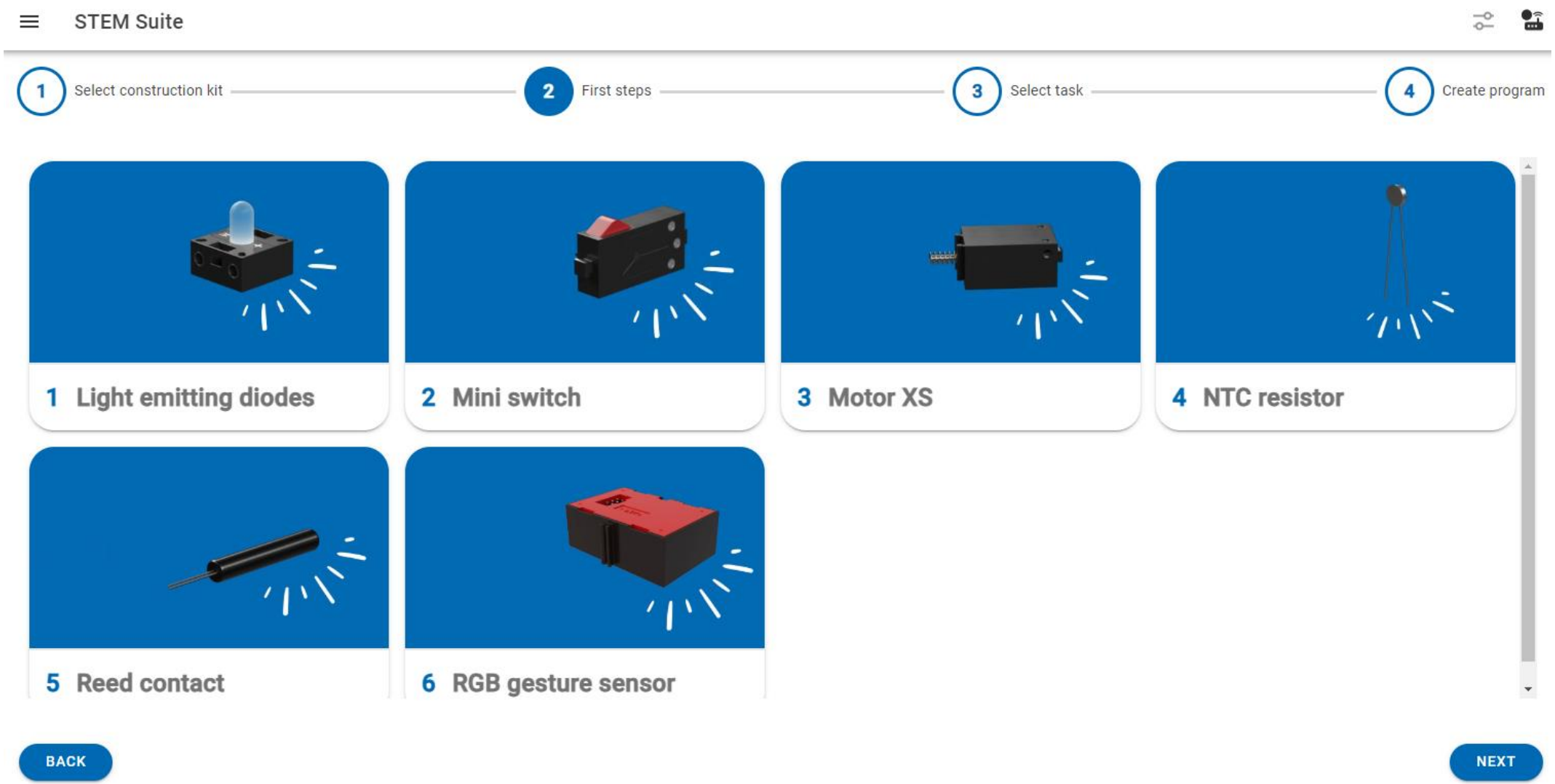
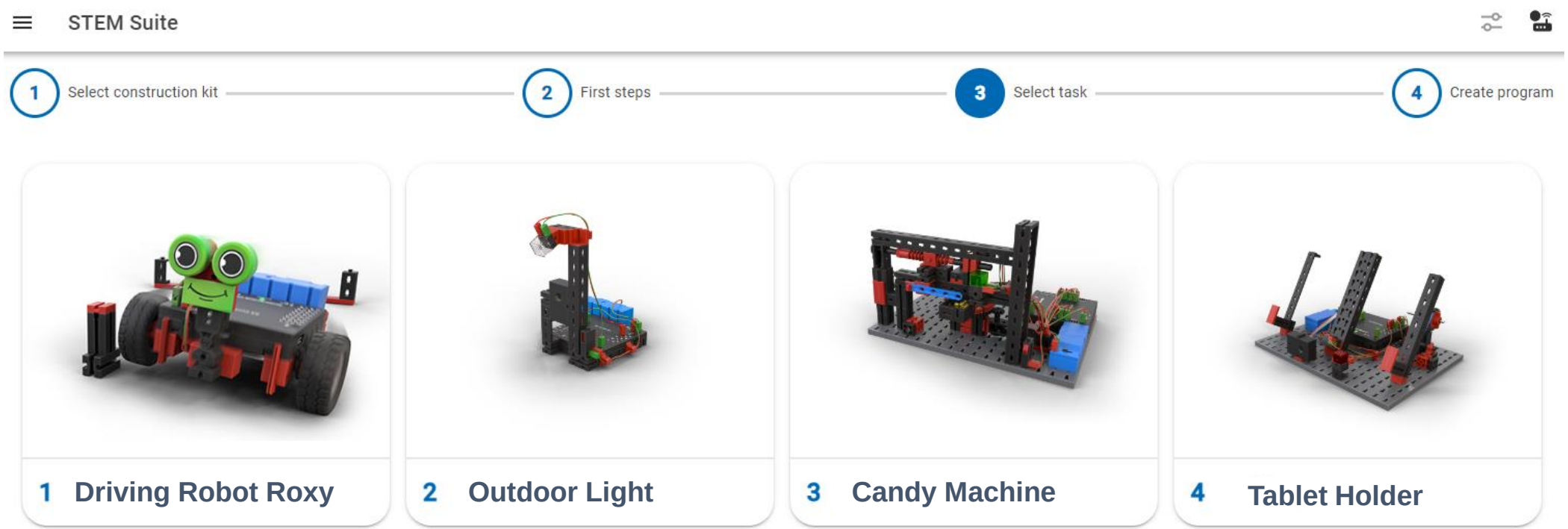
Step 1 : Select Kit



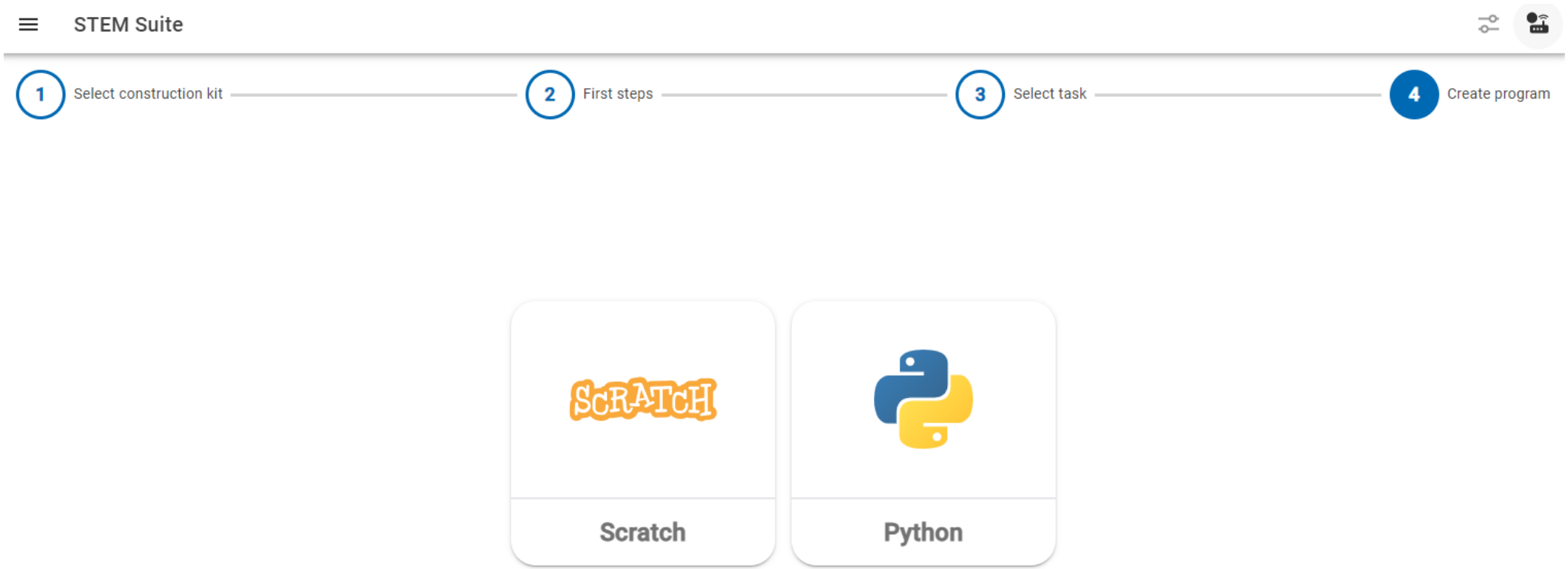
Step 2 : Getting Started Tutorials



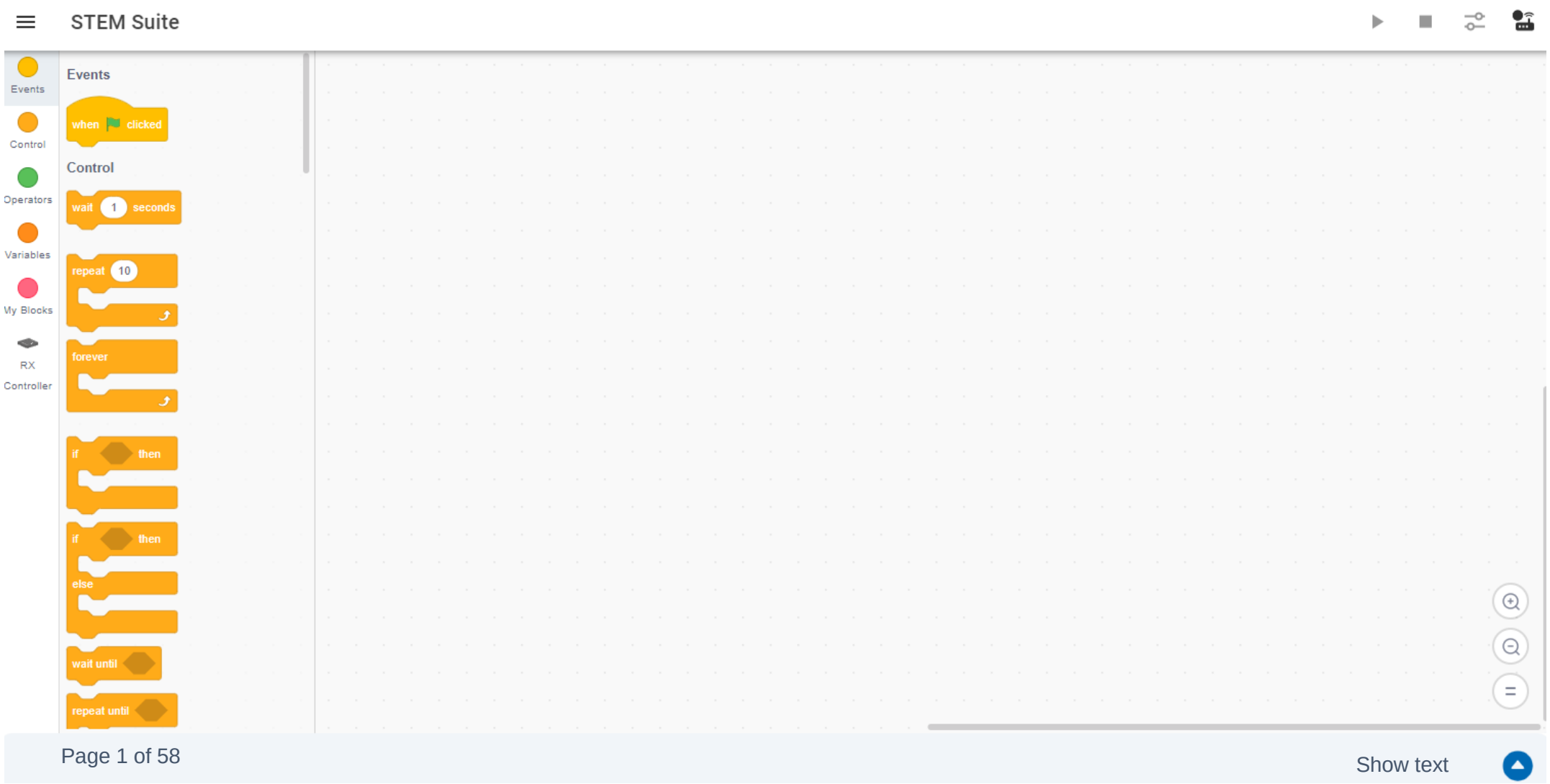
Step 3 : Select Module/Task



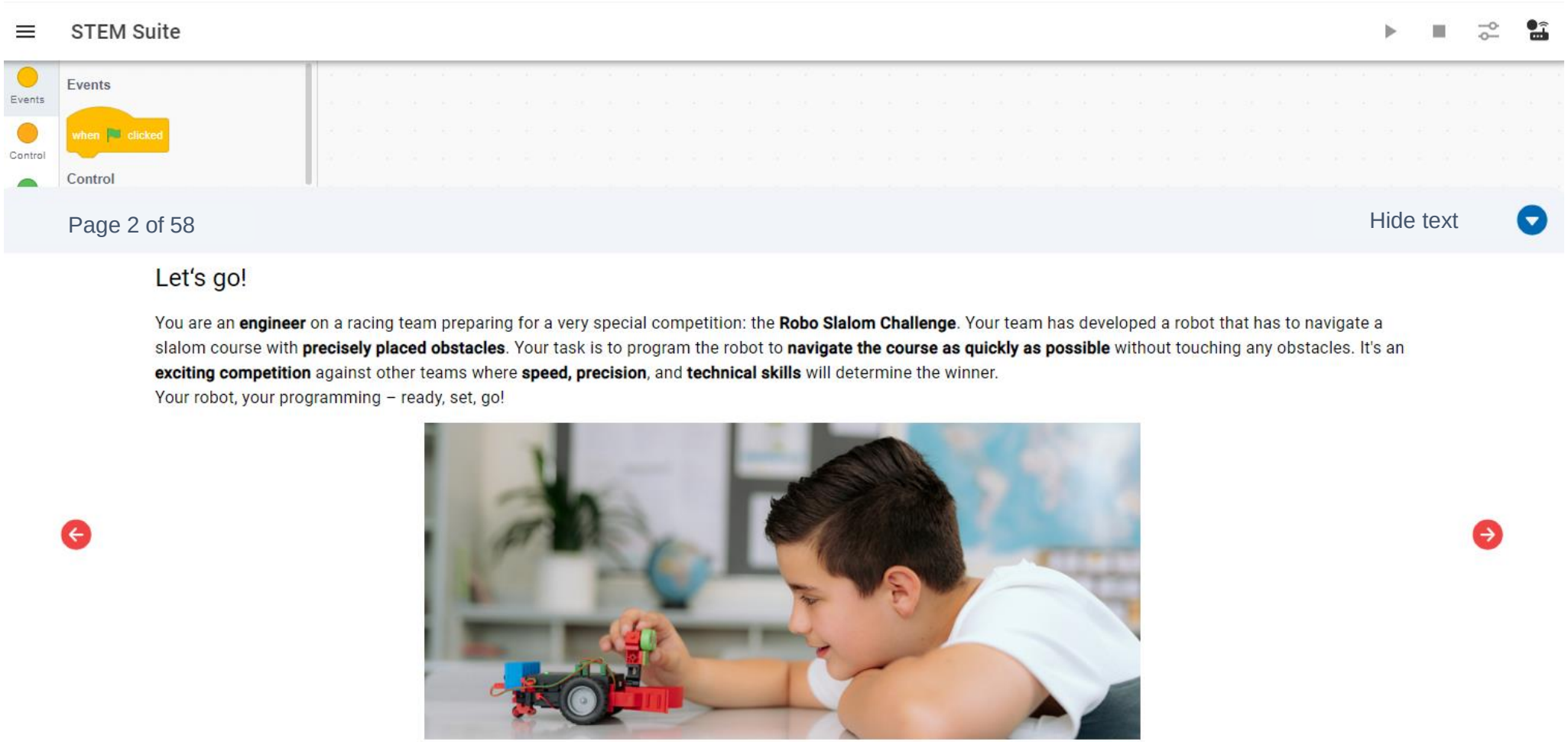
Step 4 : Create program – Choose programming language



Step 5 : Create program



Step 6 : Work through a project



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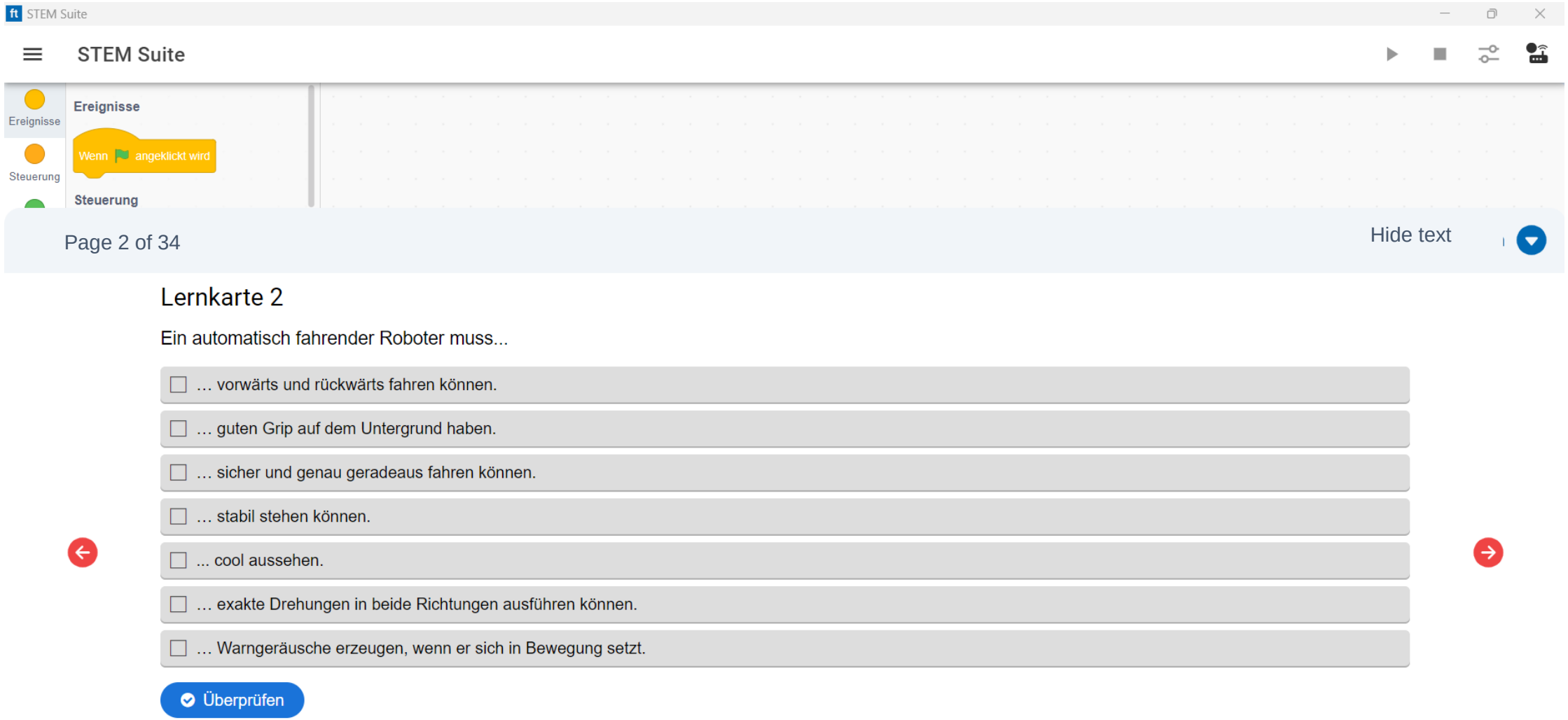
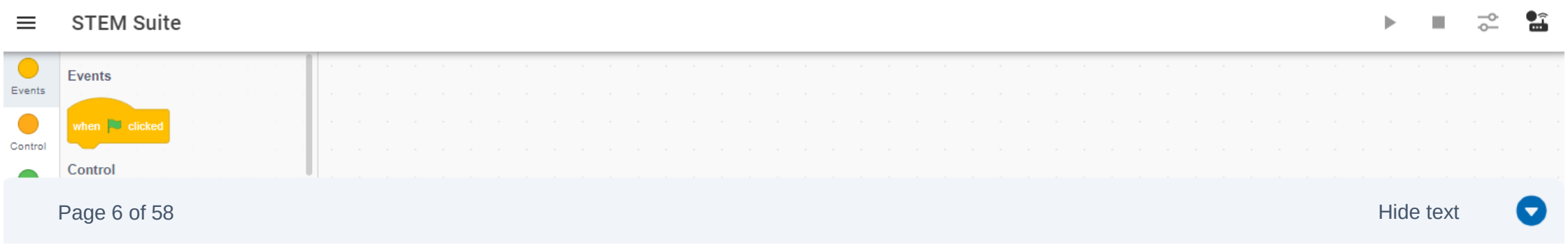
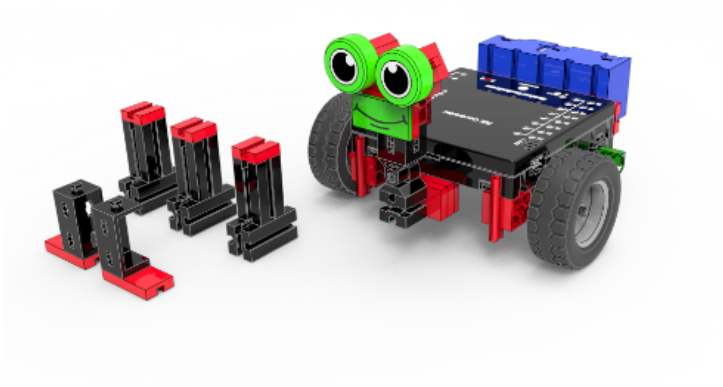


Step 6 : Work through a project



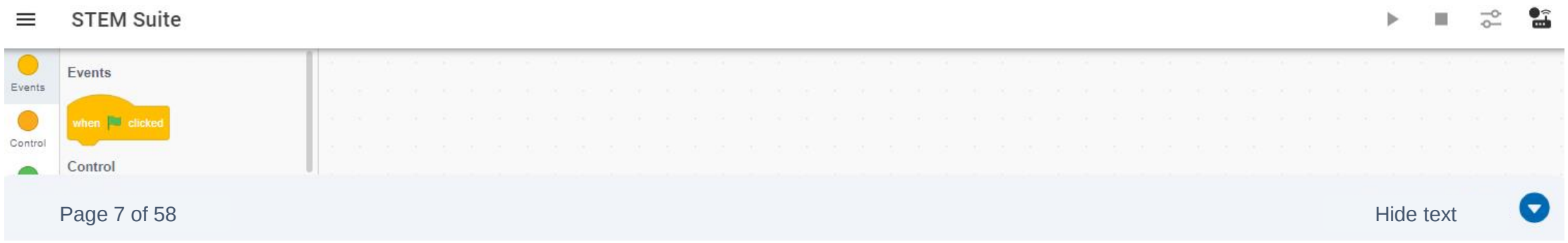
Construction phase

Take a look at the picture of the mobile robot RoXy to be built.

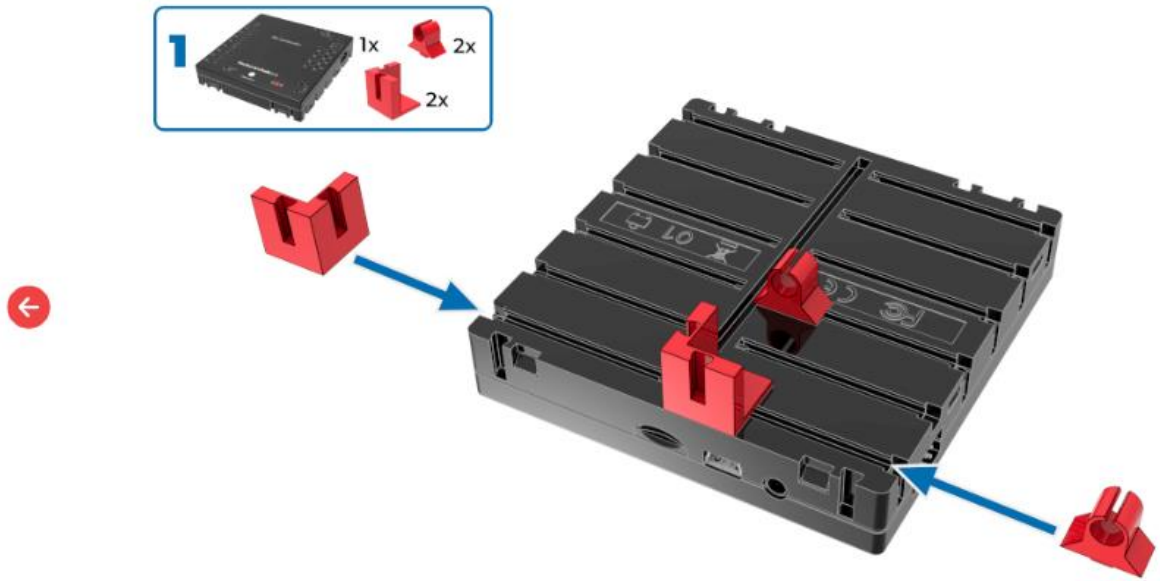


Now build your mobile robot RoXy using the following steps.

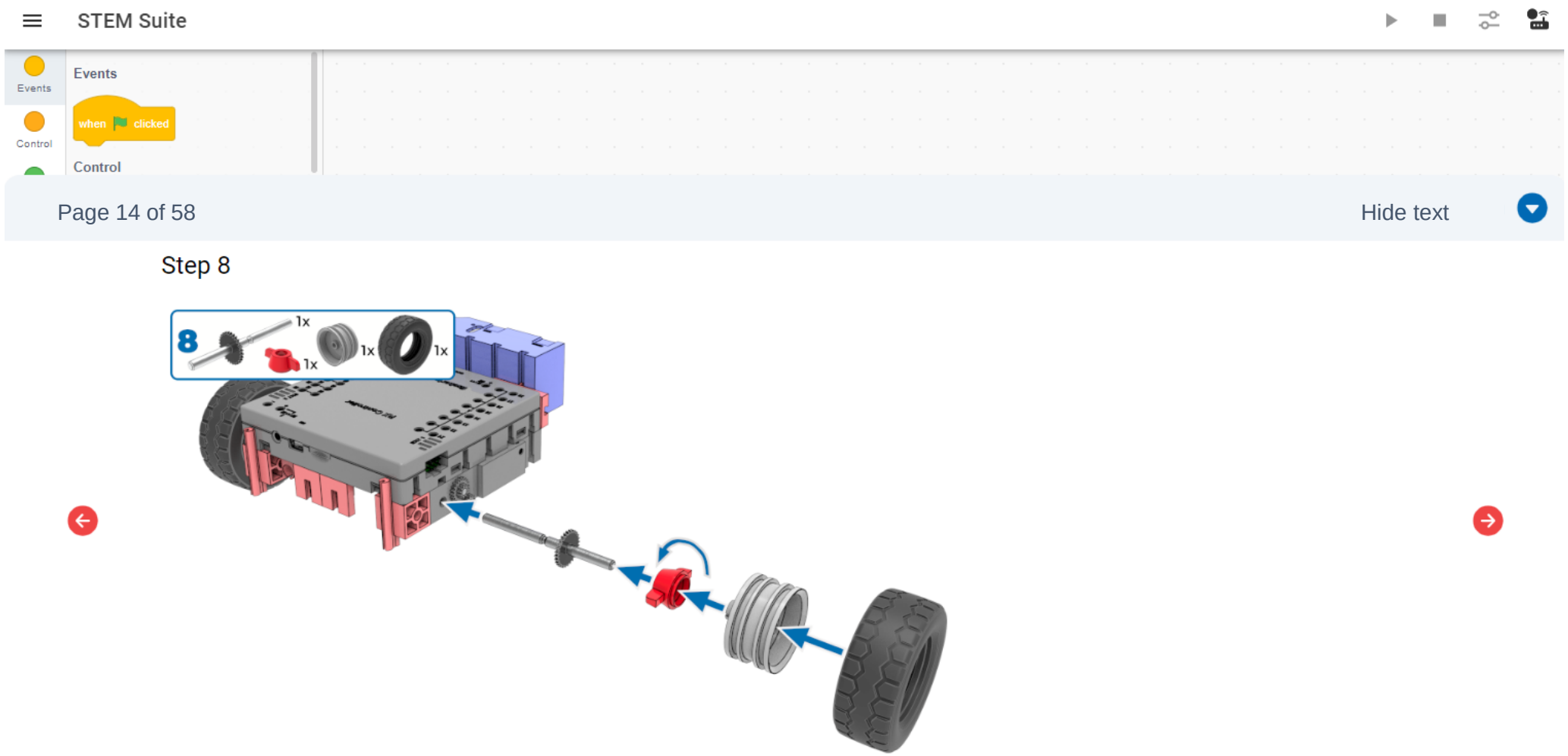
Step 6 : Work through a project



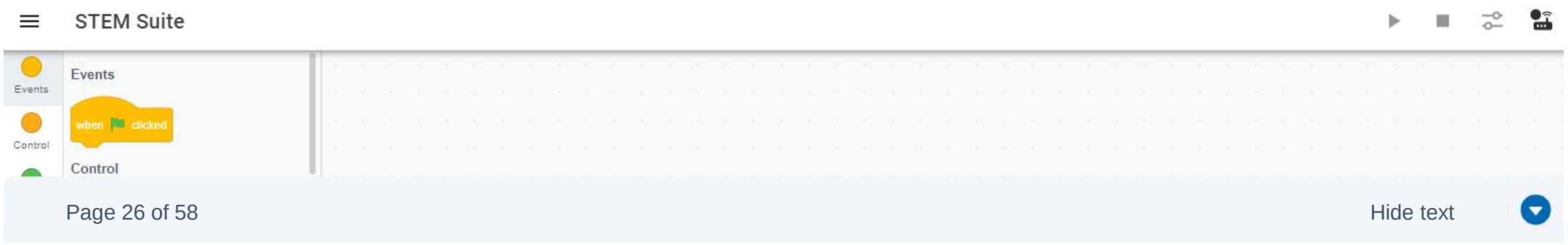
Step 1



Step 6 : Work through a project



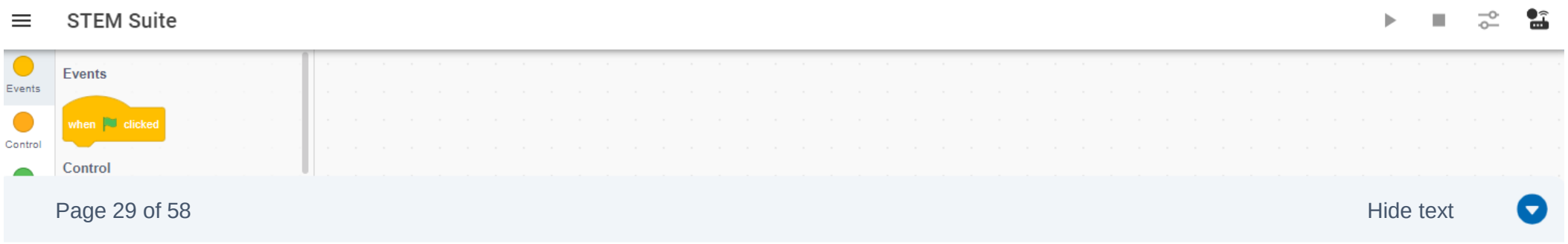
Step 6 : Work through a project



Programming phase

Great! You are now ready to program your mobile robot RoXy. To put the mobile robot RoXy into operation, the software must be transferred to the **RX Controller**.
Select either the **wired** or **wireless** connection type and transfer the program.

Step 6 : Work through a project



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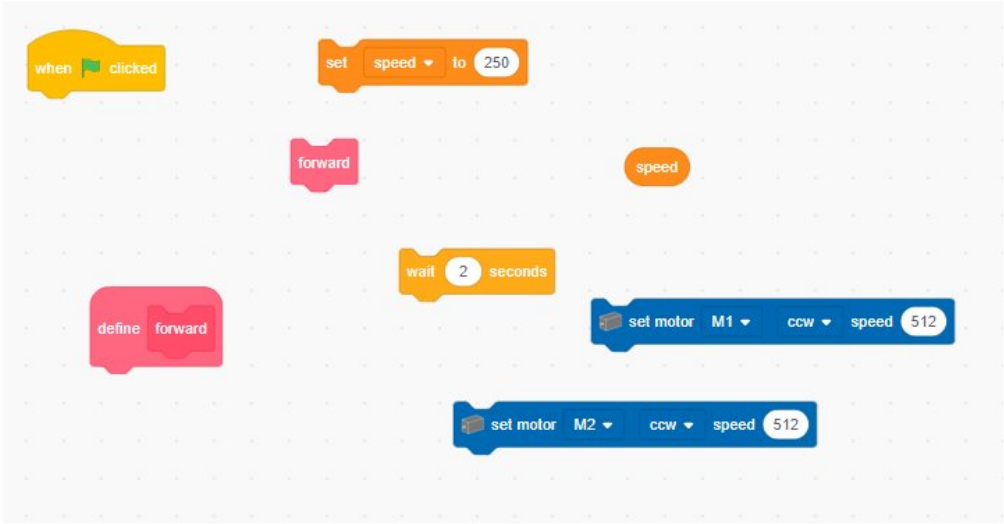
Full speed ahead! When the programme is started on...

Full speed ahead! When the programme is started on the RX Controller, the RoXy should drive straight ahead for 2 seconds.



Put the programme together and test it. Does everything work?

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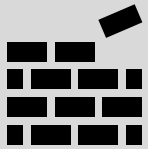

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Structured Lesson Plans based on 4Cs

- Guiding Questions
- Lesson Idea at a Glance
- Model Description/Task
- Everyday Relevance
- Subject Relevance
- Lesson Plan incl. 6 Phases

- Motivational Aspects
- Programming Skills
- Additional Materials
- Functions of the Model and Technical Solutions
- List of Materials

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Structured Lesson Plans based on 4Cs

Prof. Dr. Stefan Kruse, Klaus Trimborn, Claas Niehues

STEM Coding Max

Handlungsorientiert Programmieren lernen

Klett MEX

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MODELL 1

Ich krieg die Kurve!

LEITFRAGEN:

- **Wo ist ein automatisch fahrender Roboter im Alltag einsetzbar?** ***(Kommunikation)***
- **Welche Funktionen muss der Roboter sinnvollerweise erfüllen?** ***(Kollaboration)***
- **Unter welchen Bedingungen soll das System an- bzw. ausschalten?** ***(kritisches Denken)***
- **Was ist zu berücksichtigen, damit der Roboter an verschiedenen Standorten genutzt werden kann und das System möglichst robust funktioniert?** ***(Kreativität)***

DIE UNTERRICHTSIDEE AUF EINEN BLICK

Klassenstufe:	5–7
Zeitaufwand:	1 Doppelstunde (erweiterbar bis zu 8 DS)
Schwierigkeitsgrad:	Modell Programmierung bis
Modellart:	Mobiles Gerät, individuell positionierbar und für Transporte/Bewegung einsetzbar

MODELLBESCHREIBUNG / AUFGABE

Die Schülerinnen und Schüler (SuS) planen und realisieren einen Fahrroboter, der einen Hindernisparcours abfahren kann. Der Roboter schaltet bei einem Tastendruck auf den On/Off Taster ein und startet sein Fahrprogramm. Über denselben Taster kann die Fahrt gestoppt werden.

Planungsphase	
Unterrichtsgespräch	• Die Vorgehensweise zum Bau des Modells und die zu erzielende Funktion werden gemeinsam erarbeitet. • Abfolgeschritte der App werden vorgegeben bzw. besprochen.
Partner- oder Einzelarbeit	• Die SuS machen sich mit der App bekannt und laden die entsprechende Aufgabe. • Die SuS definieren sinnvolle Funktionen eines automatisch fahrenden Roboters. • Die SuS erstellen mittels App die Anforderungsliste für den zu bauenden Roboter.
Optional: Partner- oder Gruppenarbeit	• Optional skizzieren die SuS die möglichen Roboter. • Die SuS diskutieren die Ergebnisse in der Gruppe und legen sich auf ein Design fest.
Konstruktionsphase	
Partner- oder Einzelarbeit	• Die SuS nutzen die App zum Bau des Fahrroboters. Die App führt kleinschrittig durchs Programm.
Programmierphase	
Partner- oder Gruppenarbeit	• Die SuS schreiben das Programm für den Fahrroboter (2 × Motor, On/Off Taster). Die App führt hier kleinschrittig durchs Programm. • Hilfe wird in der App angeboten. • Das Programm wird auf den RX Controller übertragen.
Experimentier- und Testphase	
Partner- oder Gruppenarbeit	• Der Fahrroboter wird in Betrieb genommen. • Erste Fahrten werden mit dem Roboter durchgeführt. • Mögliche Störungen im Funktionsablauf müssen gefunden und eliminiert werden. • Eventuelle Fehlersuche ist mittels Vorschläge in der App möglich. • Eventuelle Optimierungen bei der Hardware (z. B. Befestigung der Räder, Drehrolle) und der Programmierung können vorgenommen werden.
Abschlussphase	
Diskussion im Plenum	• Nachbesprechung des Projekts im Klassenverbund. • Klärung von zukünftigen Einsatzmöglichkeiten im Alltag (Übertragung der Thematik auf den Alltag), z. B. Staubsauger-roboter, Rasenmähroboter, Automobile, Drohnen.

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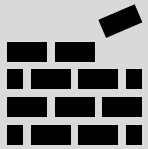

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Sales Enablement

IMAGE/VIDEO

Images:
Models
Components
Packaging/box
Lifestyle imagery

Videos:
Product video DE|EN|ES
Tutorial video DE|EN|ES

MASTER DATA

Listing data DE|EN|ES
Texts DE|EN|ES
Messaging DE|EN|ES
Price list DE|EN

ASSETS

Fact sheet PDF DE|EN|ES
Sales pitch deck PPT DE|EN|ES

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July 16 – August 31, 2024

Average School Price:
420€

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THANK
YOU!