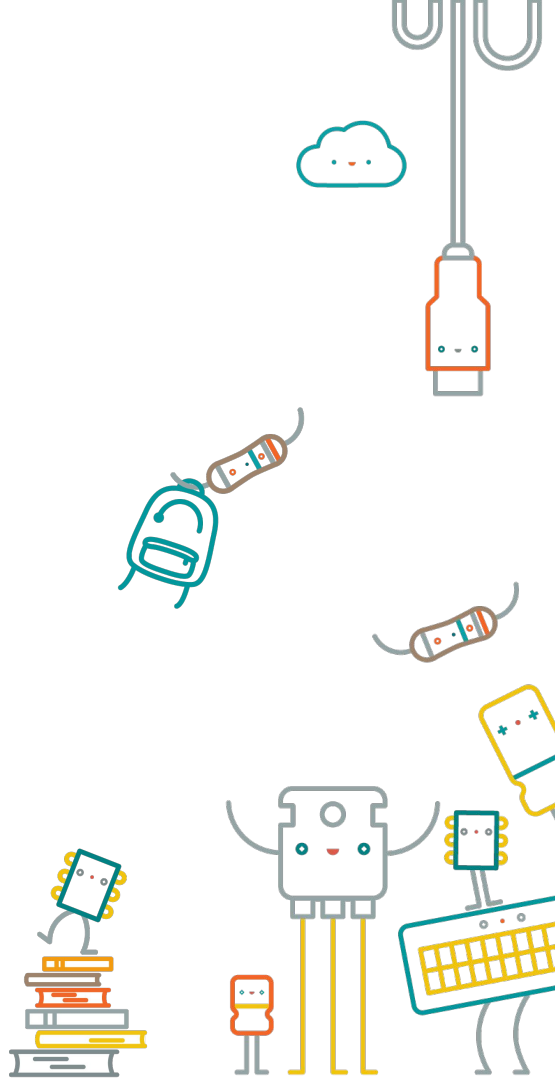
Welcome
Arduino Education

June 2023



Why do we exist?

- **Gap between education and the job market**, where technology, methodology and mindset for educating future talents are generally missing.

- Arduino Education strives to bring **cutting-edge, affordable and skill-oriented solutions** to bridge this gap and to become the game changer of STEM education.

Who are we serving?

- We serve teachers.
- Teachers are oriented to the benefits of students.
- Serving teachers will ultimately help students.
- Teachers are the key decision makers.

From top left: Massimo Banzi, David Cuartielles, Tom Igoe and David Mellis

Pic:www.requiredbrain.com/arduino-history-and-success-of-open-source-electronic-micro-controllers/

Arduino Education

Arduino started at the **Interaction Design Institute in Ivrea**, **Italy**, to make technology simple to use:

- **For design students**
  With non technical background, affordable
- **To make technology accessible & democratic**
  Open-source
- **To enable anyone to create & innovate**
  Build own projects & share them

ARDUINO® EDUCATION

Where do we act?

Middle schools & High schools

Higher education

Career tech education

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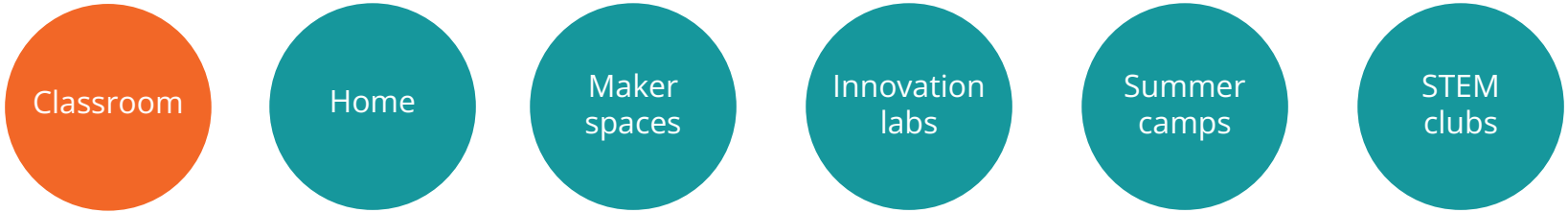
Where do we act?



Core values

Learning by doing

- Hands-on approach
- Touching, building, and using the hands enables students to find out why something works.
- Boosts engagement

Creativity

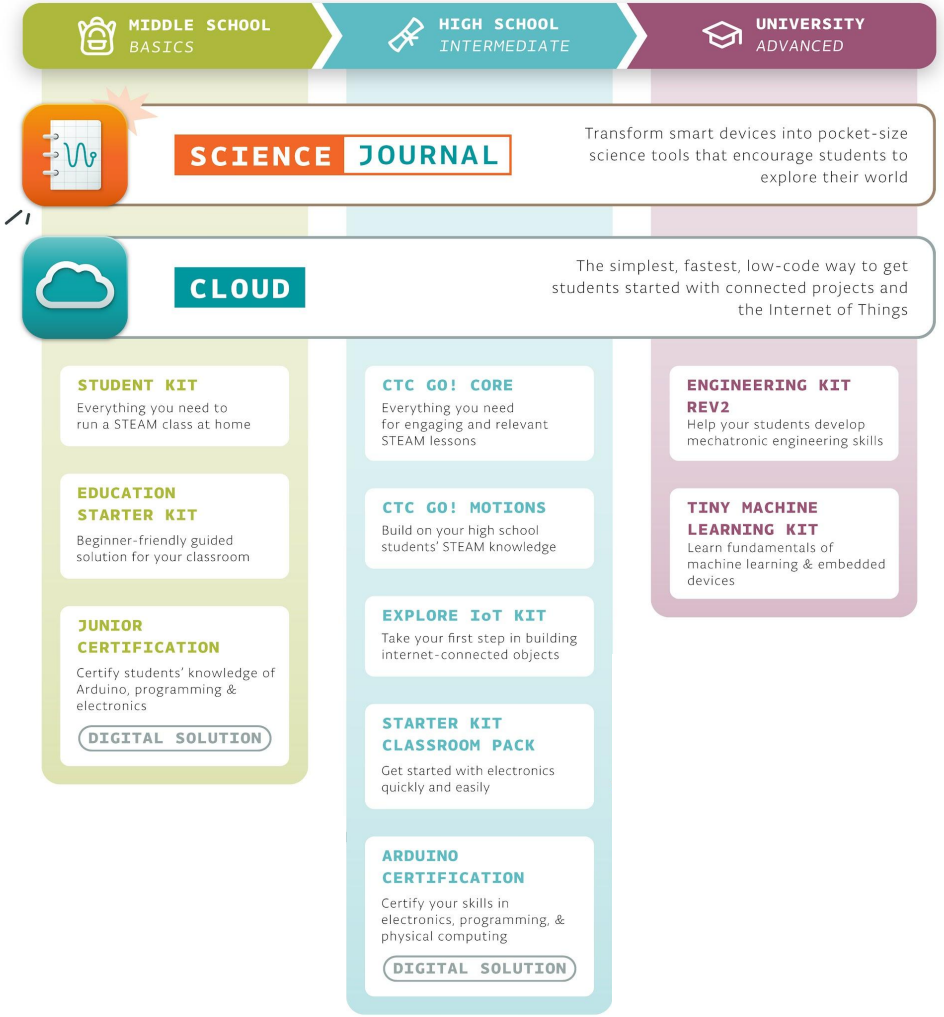
- We encourage the creative use of technology as a way of coming up with new ideas, solutions, and ways of doing things.
- Students aren't just learning how to use technology, they're using it as a tool to build, invent, and experiment.

Simplicity

- Teaching complex topics in a simple manner
- We enable children as young as 11 to truly understand the fundamentals of electronics, programming, and coding,
- and champion and support them as they take on more challenging tasks.

Arduino Education Learning Evolution

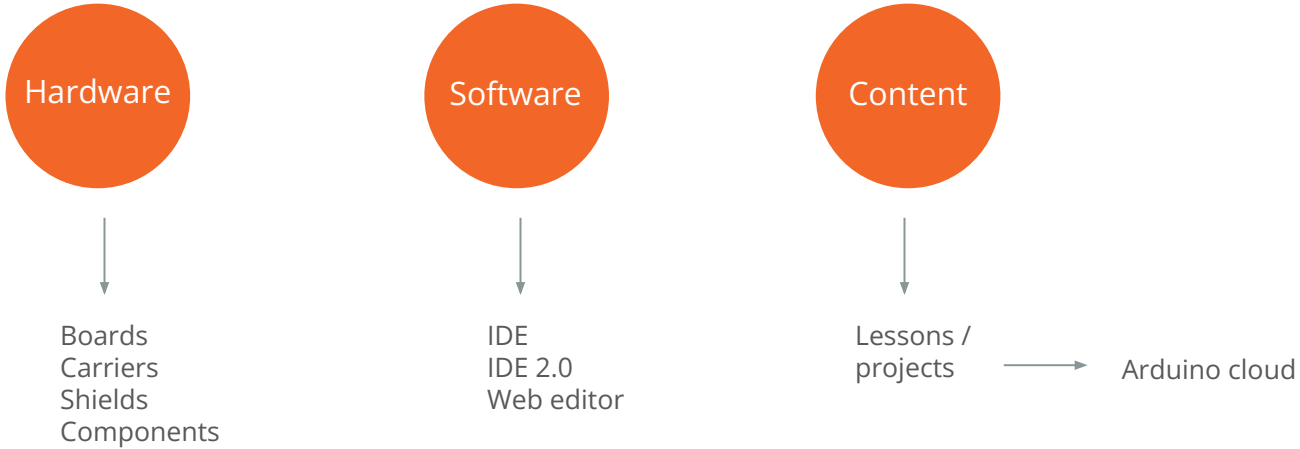
A solution for everyone



Arduino Education

- **Low Threshold, High Ceiling** Educational Solutions:
  From Beginner-Friendly Coding to industry-level expertise.

- Self-sufficient **hands- on lesson plans** with **open-ended projects,** that teachers can cover science, coding, electronics, and IoT subjects.



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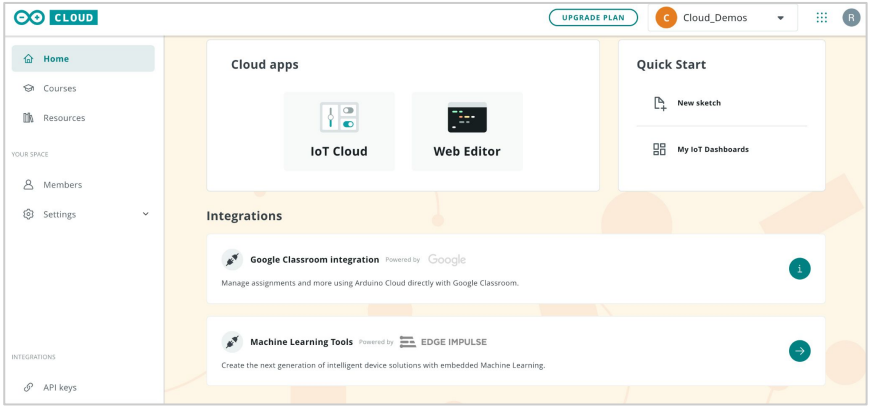
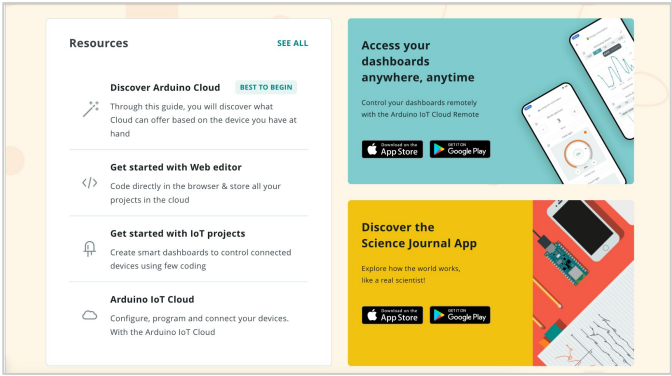
Arduino Cloud for Schools

Enrich learning with Cloud connectivity

An all in **one easy-to-use, secured** online platform that helps teachers to **implement coding, IoT, AI** and **STEM learning**.





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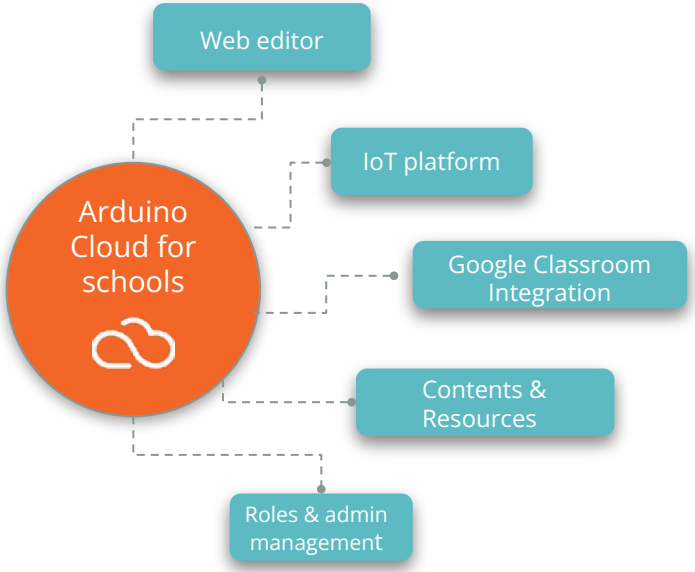
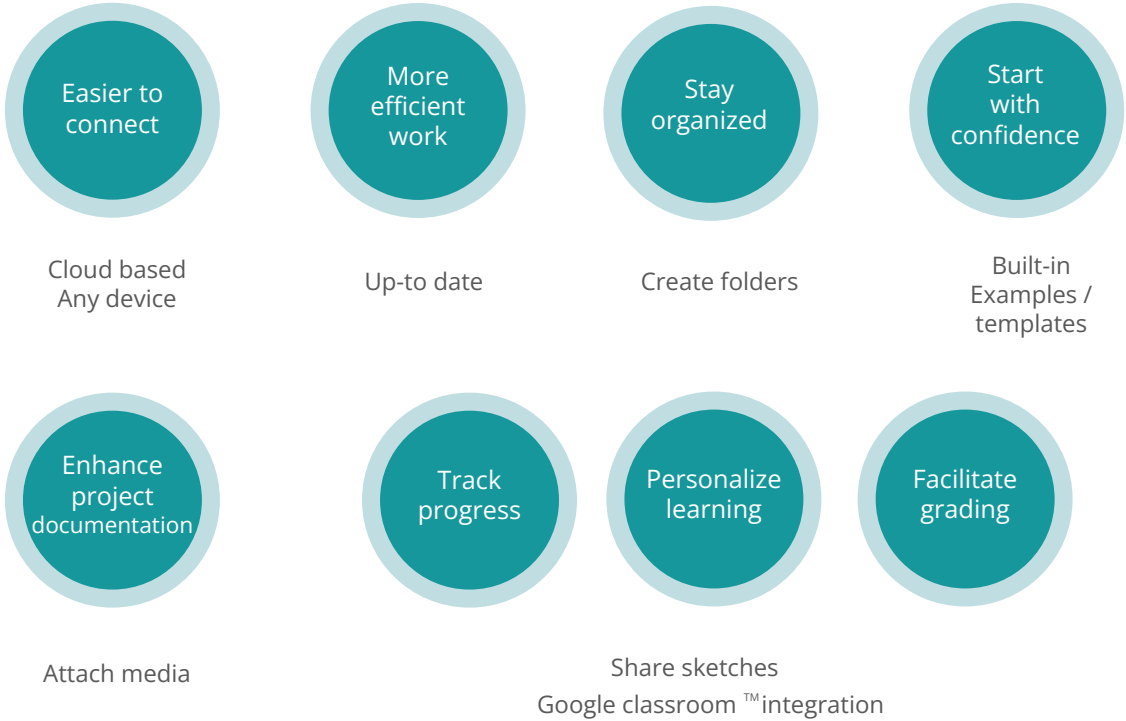
Arduino Cloud for schools

- Coding with hardware
- Creating IoT projects with hardware
- Connecting with Google classroom
- Compatible with Chromebooks
- Access to lessons and activities
- Students, teachers, and admins role assignment & management



How does the cloud help educators?



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Education Starter kit

Education Starter kit

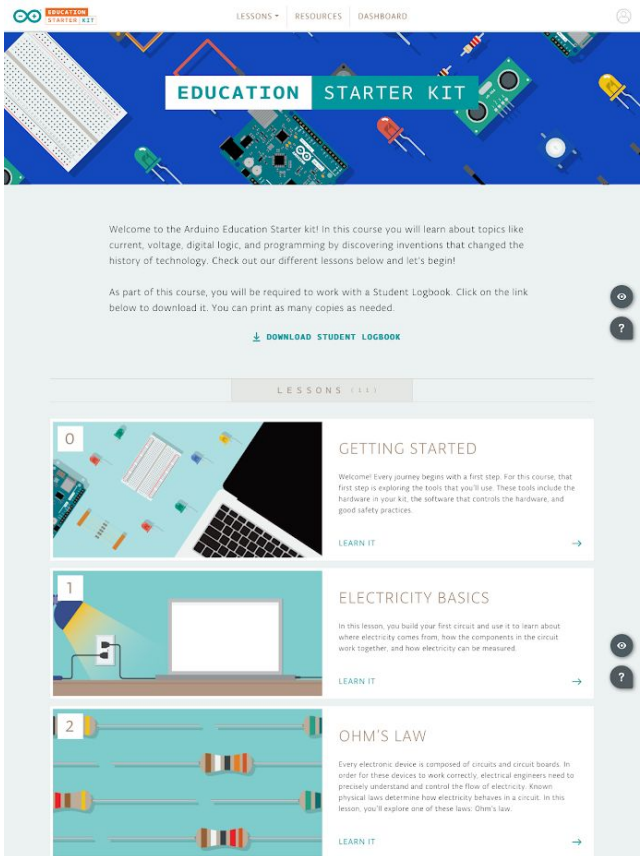
Age
- 11+

For
-The classroom

-8 students per kit (4 groups of 2)

Learning outcomes
- Learn electronics and programming step by step in a hands-on way

- No prior coding / electronics experience required.



Platform

Content

-Online platform: 9 lessons and 2 open projects
-Code
-Student logbook and Teacher guide
-Vocabulary
-Training
-Support

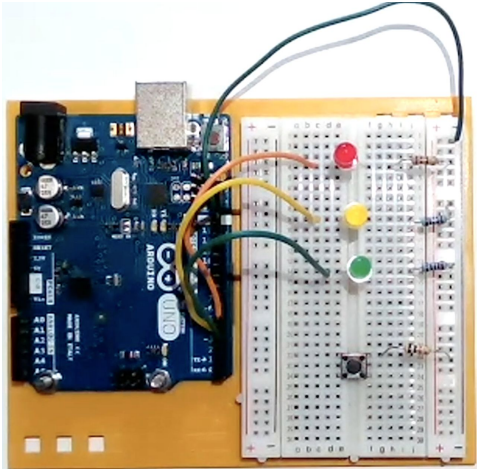
Hardware

-UNO REV 3 Board
-Collection of sensors and actuators: Servo motor, piezo, temperature sensor, LED, buttons, potentiometers, light sensors
-Multimeter

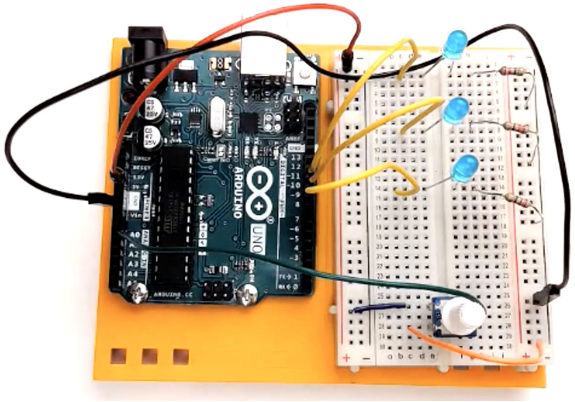
Software

-IDE Offline
-Online editor

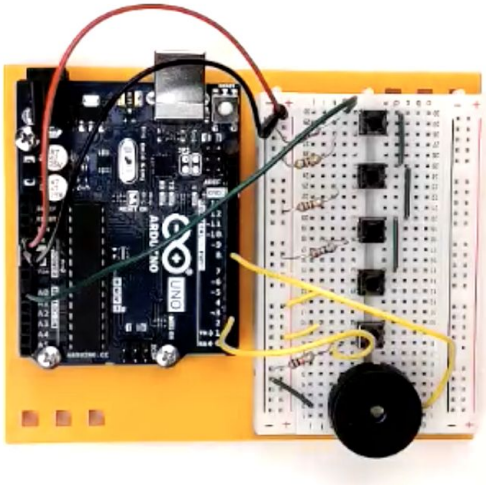
Projects



Lesson 3 -Traffic light



Lesson 4 - Dimmer switch



Lesson 8 - Keyboard

Student Kit

Age
- 11+

For
-Individual use

-Blended / hybrid learning & teaching

Learning outcomes
-Learn electronics and programming step by step in a hands-on way

- No prior coding / electronics experience required

- XXI century skills

Languages available:
-English, Spanish, Italian, German, Croatian

Arduino Student kit

11+ (individual usage)

MOQ 34

Individual access to the platform

- Educational approach
- Physical materials for 1 student / teacher
- Work individually and safely
- The student or teacher register themselves on the platform

4x

Same content

Arduino Education Starter kit

11+ (classroom)

MOQ 5

Access to the platform: classroom management

- Educational approach
- Physical materials for 8 students (4 groups of 2)
- They share materials
- The teacher registers the students on the platform

Arduino Junior Certification

Junior Certification is an **online multiple-choice exam**

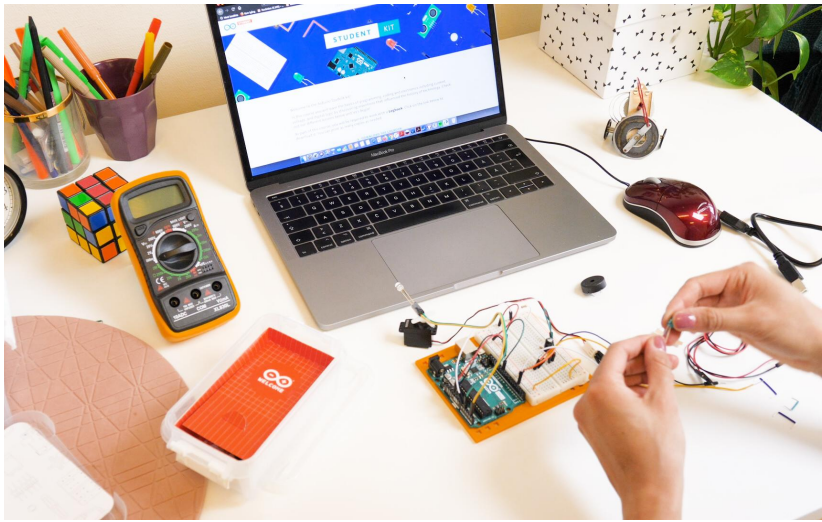
Provides official certification on knowledge of Arduino-related electronics and programming

Based on the **Student kit** content

Recommend age 14+

Junior Certification

Assess students' individual aptitude, **skills,** and what they've learned about programming, electronics, robotics, and Arduino concepts.



Benefits:

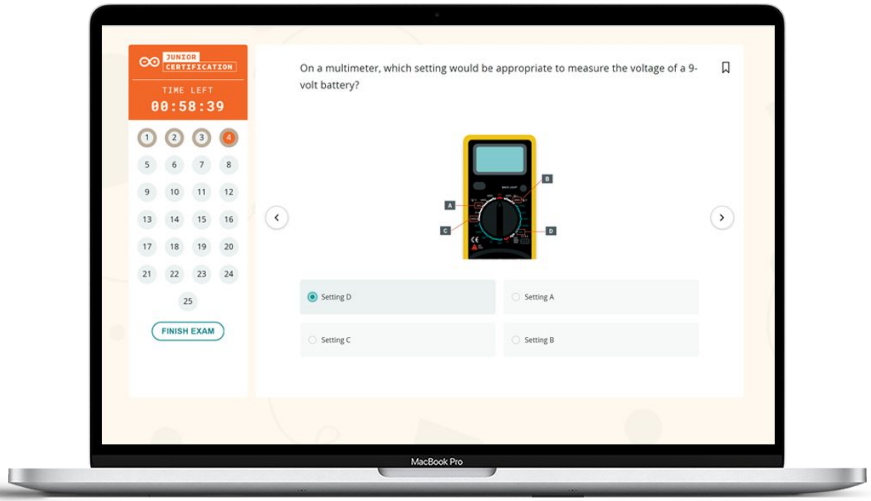
-A clear insight into each **student's own level.**

-Enables to **spot knowledge gaps** and **areas for improvement.**

-Helps students with **self-evaluation**

Junior Certification exam

- The online exam consists of **25 questions**
- **60-minute** time limit
- Available in English
- **Get results immediately** after submission, indicating whether students passed or failed
- Passing the exam will grant students the **downloadable Arduino Junior Certification certificate**



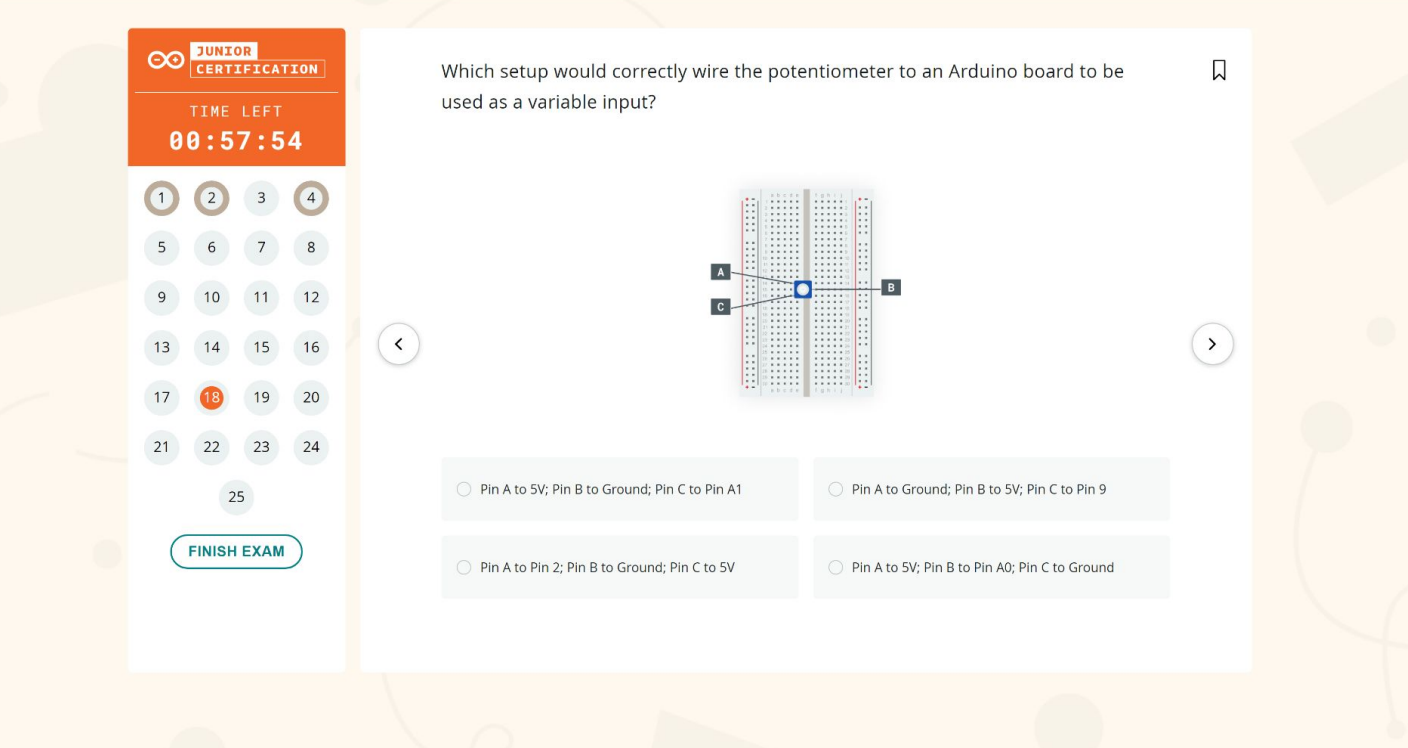
Exam only

- Recommended for users who **have completed the projects** in the Arduino Student Kit or Education Starter Kit.
- Each exam code allows **one person** to take the Arduino Junior Certification exam.
- **One** attempt
- Purchase **multiple codes and share them with your class.**
- After purchasing, exam code will be send by email. **Free to decide when to take it.**

Bundle: Kit & Exam

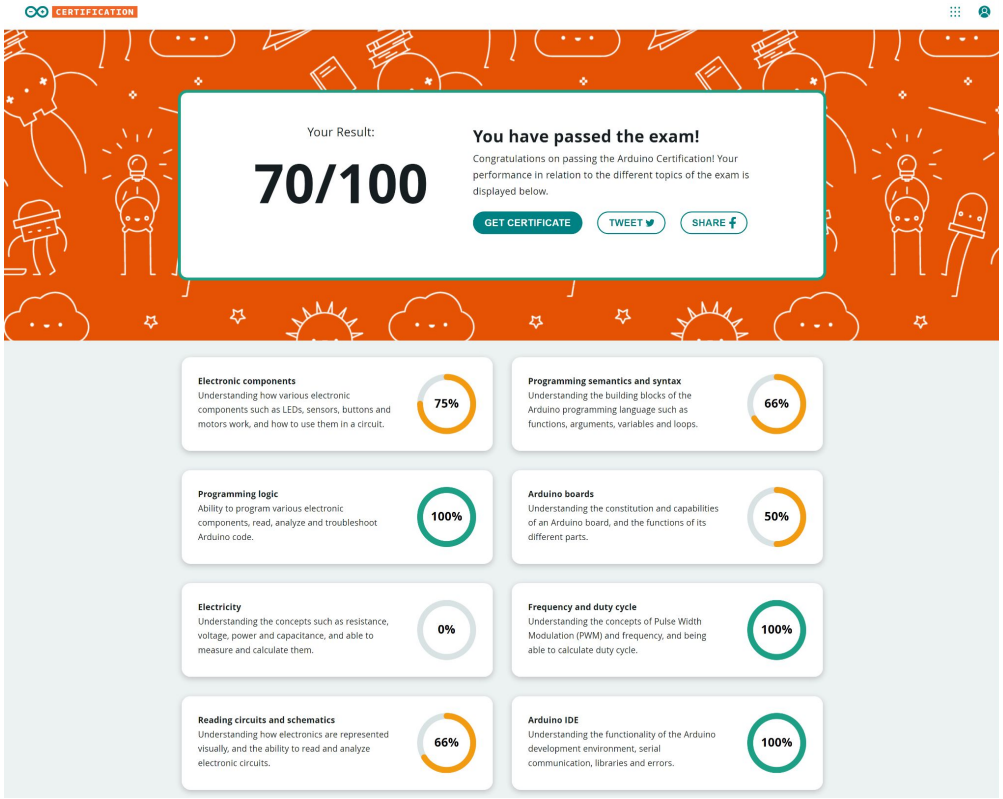
- **Arduino Student Kit** and an **activation code**, which can be used to unlock **one attempt** at the Arduino Junior Certification exam.
- **Includes hardware and learning content** with lessons and hands-on projects, covering the basics of programming, coding and electronics.
- It requires **no prior knowledge or experience** as the kit guides you through step by step.

Exam platform



5 question demo

Results & feedback



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Science Kit R3

Coming soon

September 2023

Science Kit R3

Students 13 +

Hardware

- Arduino RP2040
- Science Carrier REV 3
    - Silicon Stands
    - External temperature probe sensor
    - Ultrasonic Distance Sensor
    - USB-C© Cable
    - Crocodile Clips one end, banana plug the other
    - Speakers (x 2)

Software

- Science Journal app

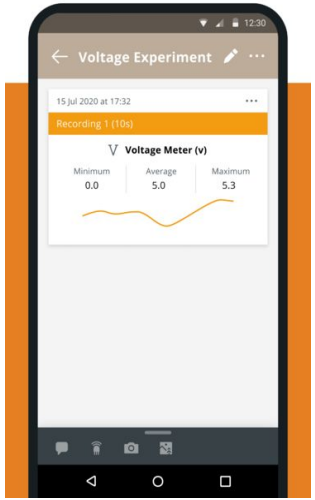
Transforms the smartphone or tablet into a cutting-edge multi sensor data logger.

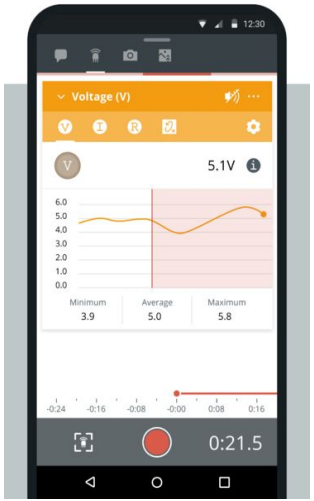
Software - Science Journal app

A ***free*** app that allows students to gather data by harnessing the sensors on the Arduino Science Kit R3 carrier.

The **app is needed to run the experiments** so students will need a tablet, smartphone or Chromebook to complete the investigations in each lesson.

The Arduino Science Journal app available for download from the main app stores: Play Store (Android) and iOS app store

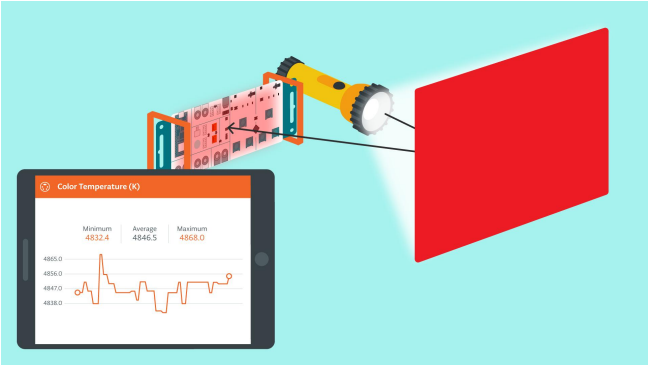




Science Kit REV 3

Lessons: 10 (60 mins)

- Linked to the real world
- Guide teachers on curriculum integration (Teachers professional development)



Investigate and explore:

- Speed
- Magnetic fields
- Mass-period
- Pendulum
- Motion & sound
- Kinetic energy
- Temperature / pressure
- Color & temperature
- Voltage
- Frequency

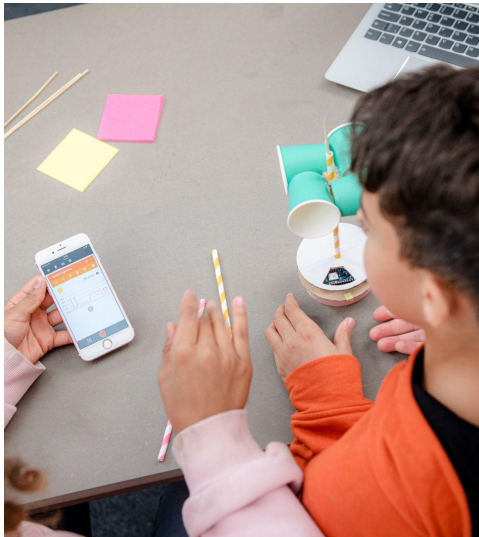
Science Kit R3

Product Benefits

- Out of the box, easy to use
- No coding experience required
- Self-paced investigations
- Personalized hands-on learning
- Applications in the real world with guided and open ended experiments
- Designed to match the science & physics curriculum from around the world.
- Developed in collaboration with physics teachers

Key Learning Values

- Boost future skills, such as problem-solving and collaboration
- Conduct and document science experiments, log real time data on the Arduino Science Journal app.
- Create assignments from students' experiments within their Google Classroom.



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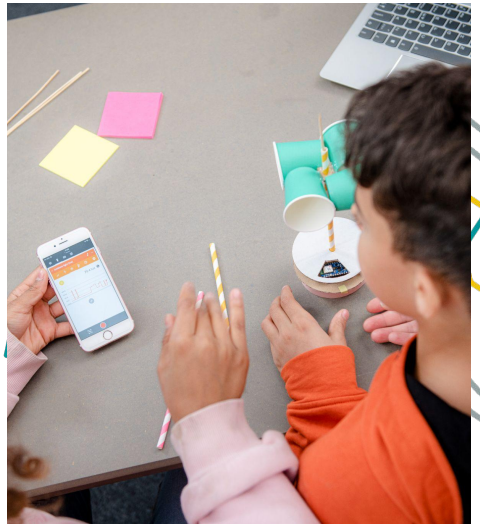
Science Journal app

Arduino Science Journal

- **Free** and **simple** to use
- Classroom & home-school friendly
- Safe for children to use (COPPA)
- **Easy recording of observations** in real-time
- **Teachers can create and receive assignments** and **collect experiments**
- Learn about topics like **physics**, **math**, **chemistry**, **biology**, **arts**, **music** and more



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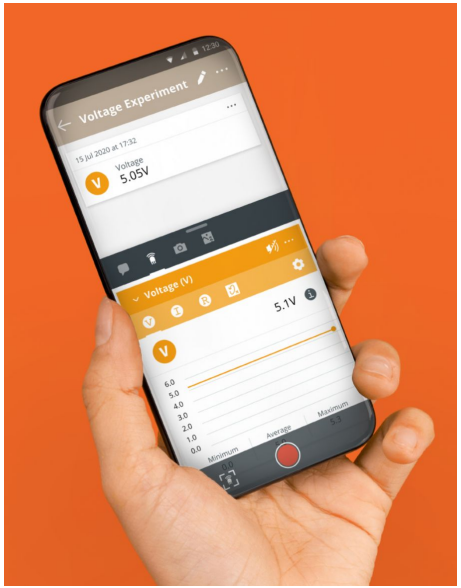
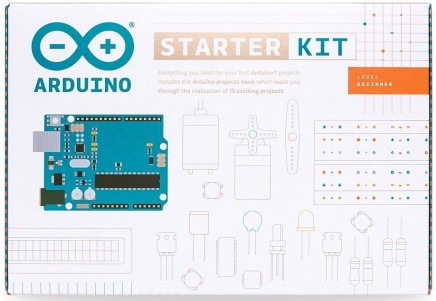
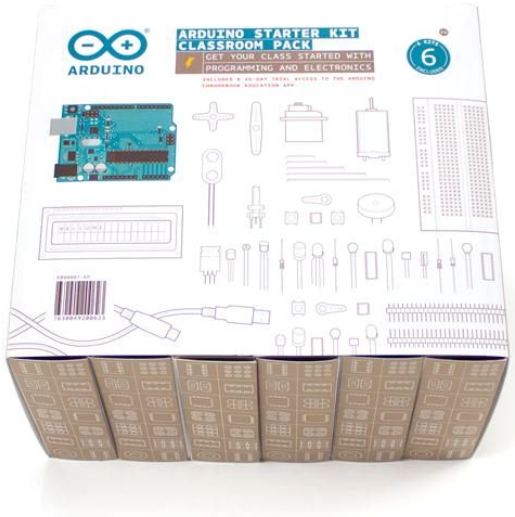
Science Journal app

- The Arduino Science Journal app is recommended for students from 10 to 18 years of age, and is available in 45 languages.
- It's compatible with Android, iOS, and Chromebook.
- Want to measure even more? Connect external sensors and hardware using bluetooth to unlock endless possibilities! The Science Journal is fully compatible with **Science Kit**, **Nano 33 BLE Sense board**.
- However, the app can just as easily be used on its own without any other technology.







Starter Kit - Classroom pack

Age
- 14+

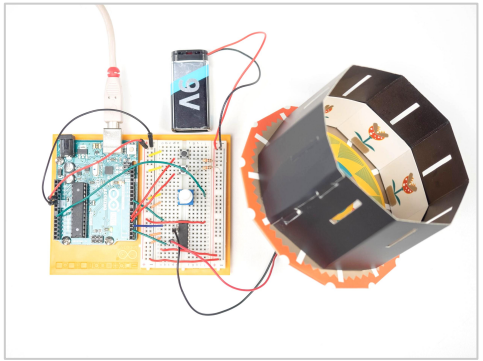
For
-Individual use and for the classroom (12 student)

-2 students per kit (6 groups of 2)

Learning outcomes
-Learn electronics and programming step by step in a hands-on way

- No prior coding / electronics experience required.

13 Starter Kit: Touchy-Feely Lamp



Starter kit

Content

-Projects Book
-15 projects

Hardware

-UNO board
-Collection of sensors and actuators

Software

-IDE offline
-Web editor

Languages available

-English, Chinese, Spanish, German,French, Italian, Korean, Portuguese, Arabic

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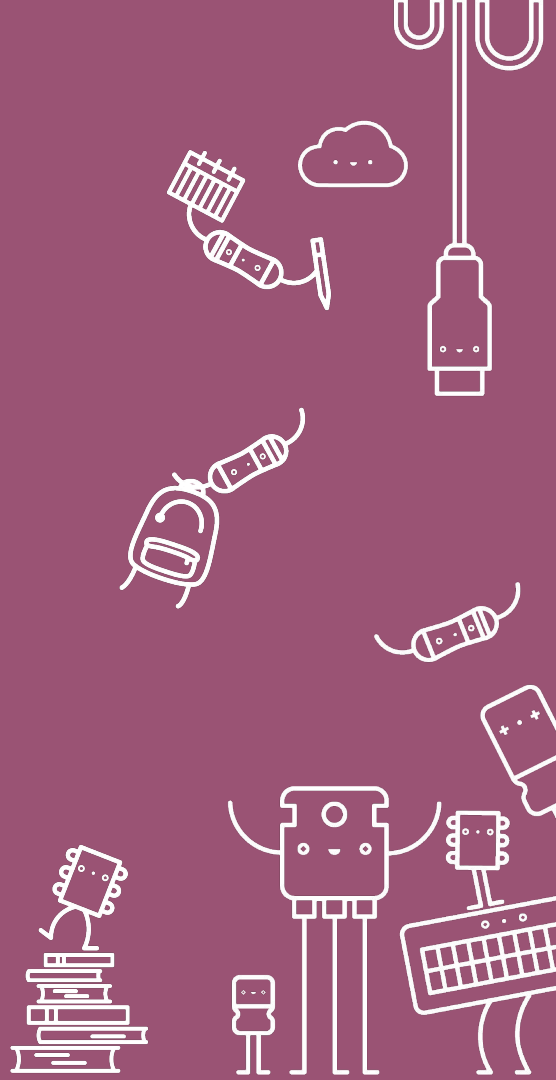
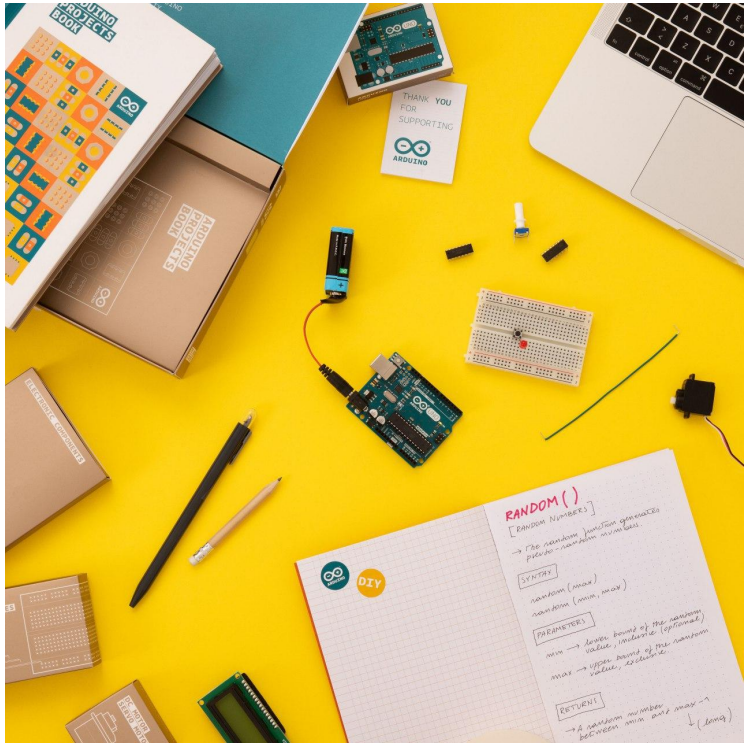
Arduino Certification





Fundamentals certification

Age
- 16+

For
-Individual use

-Learning & teaching remotely

Benefits
- Official Arduino Certification in programming, electronics and physical computing.

Languages
-English, Spanish , Italian, Greek, German, Chinese, Bangla

Demo

Fundamentals certification

Content

-Based on the Starter Kit projects book concepts
-Online exam: 36 questions / 75 minutes
-Score: 70 / 100 points

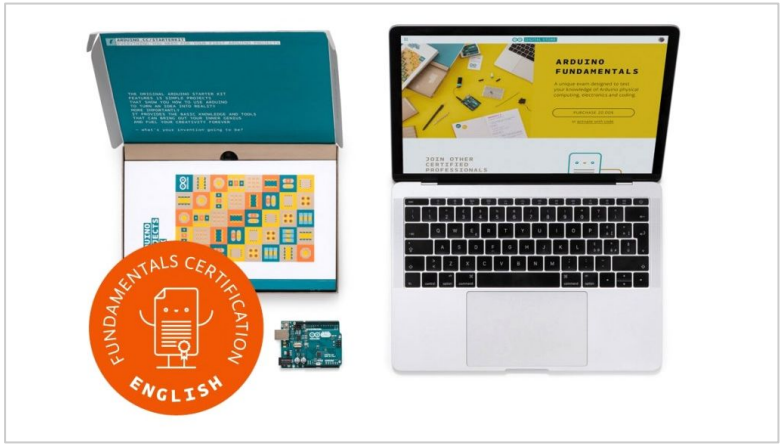
-3 main areas: **Theory** and **introduction to, electronics**, **code and programming with Arduino**

-8 categories: Electricity, Reading schematics and circuits, Arduino IDE , Arduino boards, Frequency and duty cycle, Electronic components, programming logic, programming language and syntax

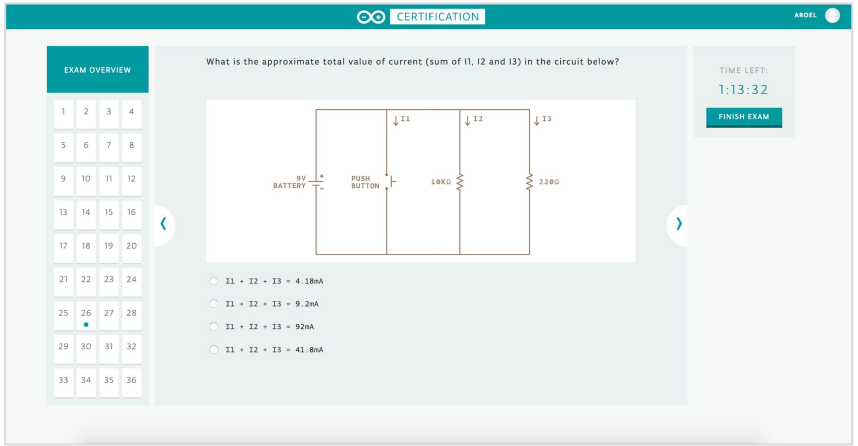
Modalities

- Exam alone
- Fundamentals Bundle

Fundamentals Bundle & Fundamentals exam

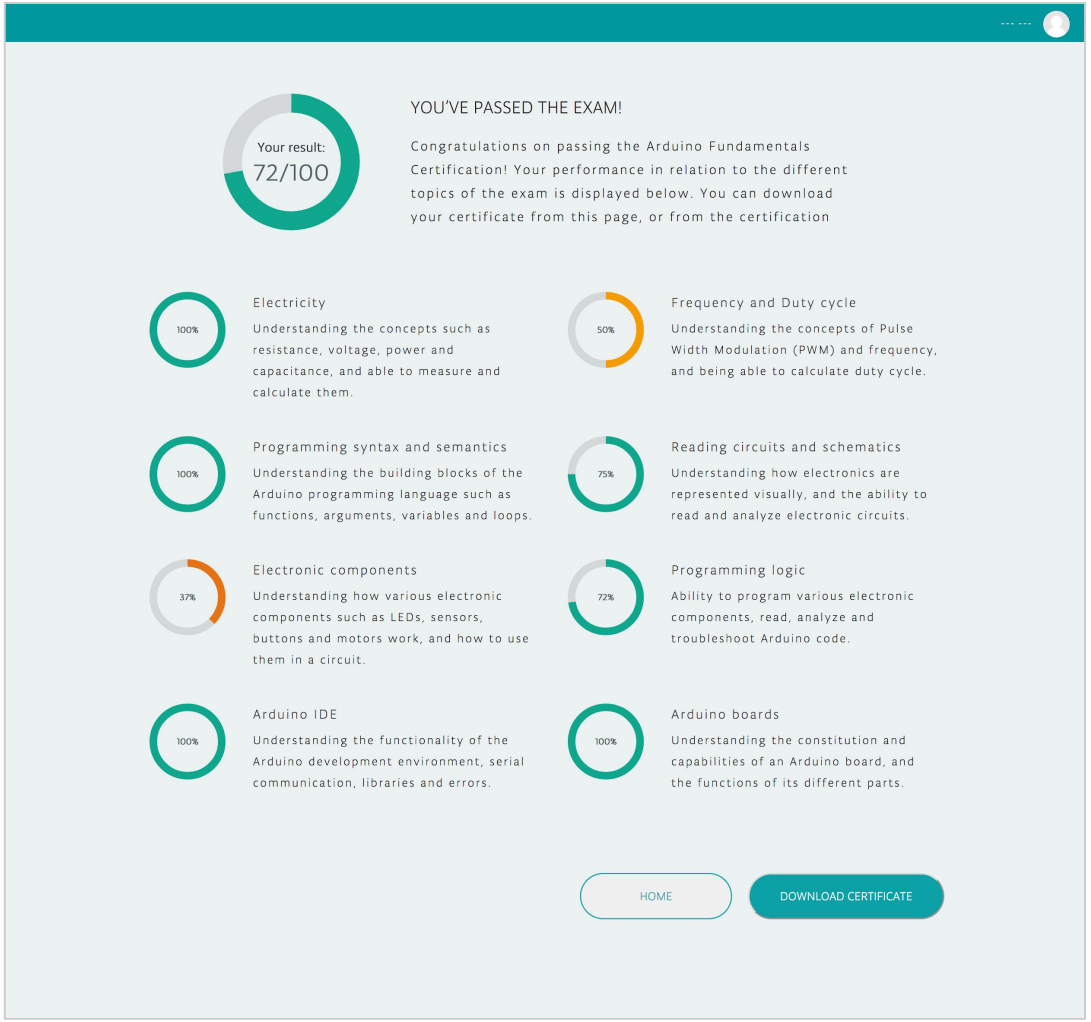


Training
Student kit + 1(one) attempt at the exam



Exam alone
1(one) attempt

Exam results



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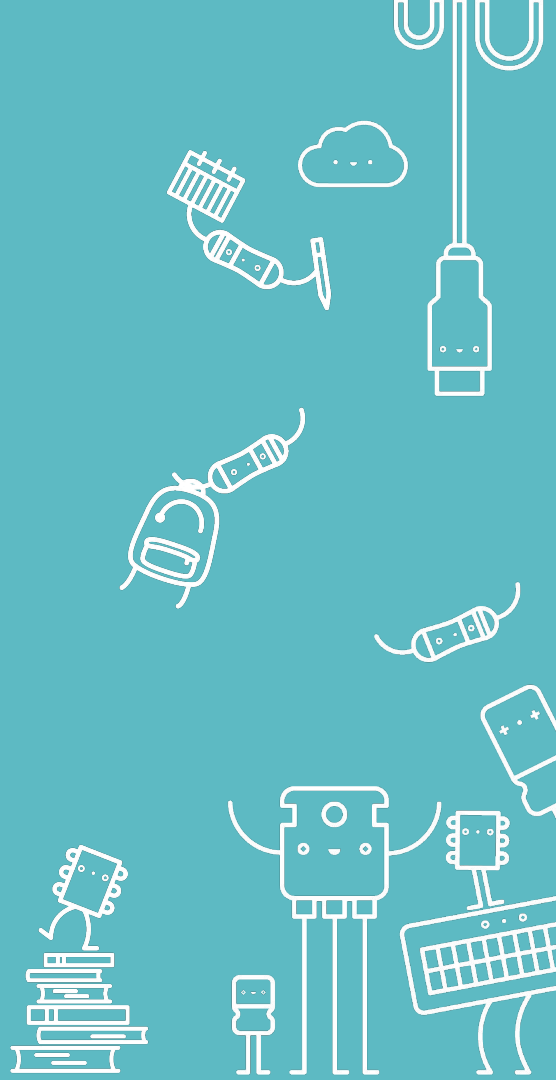
CTC Go! Family

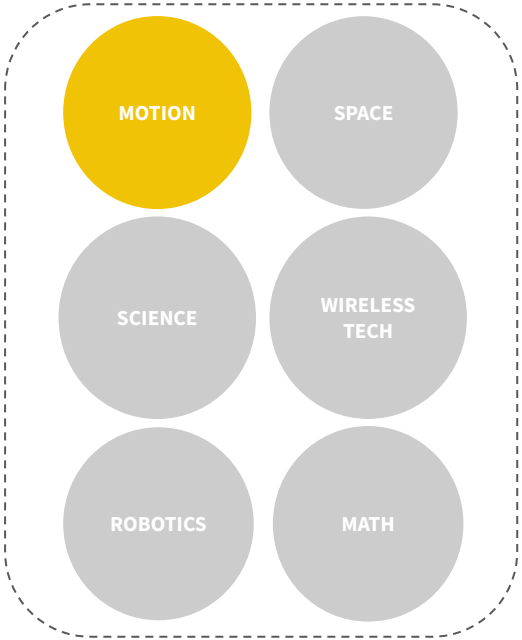
Core module &
motions expansion



CTC GO! (Creative Technologies in the classroom)

Core Module

+



Expansion packs

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DESIGN AND IMPLEMENT YOUR OWN STEAM PATH

CTC GO! Core Module

Age
-14-17

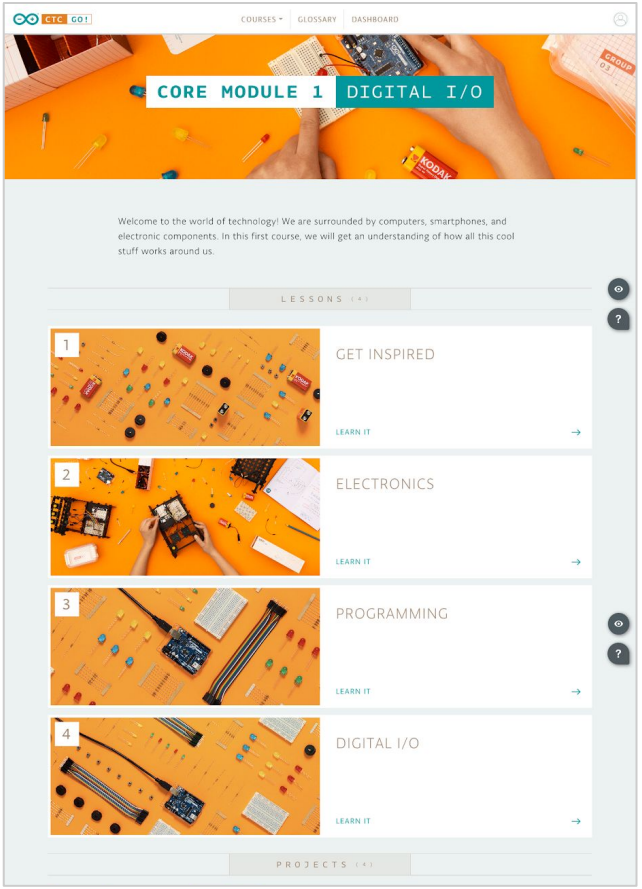
For
-The classroom
-24 students and 3 educators per kit
-8 groups of 3

Learning outcomes
-Customizable STEAM program

-Learn foundations of electronics and programming

-XX1 skills

Languages available
English, Spanish, French



Platform

Content

-Online platform: 8 lessons and 8 projects
-Code
-Teacher's tips
-Training
-Support

Hardware

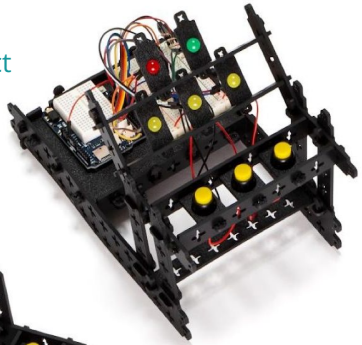
-Powered by UNO WiFi REV 2
-Education shield
-Electronic components
-Modular pieces

Software

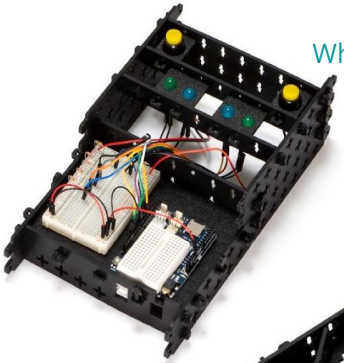
-IDE offline
-IDE online

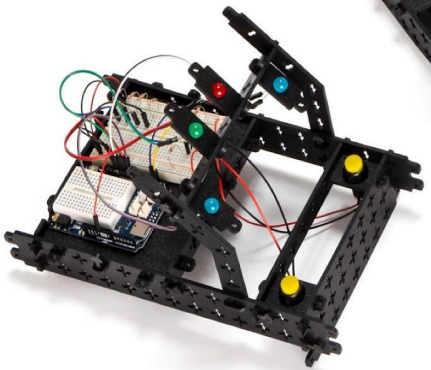
Projects

React

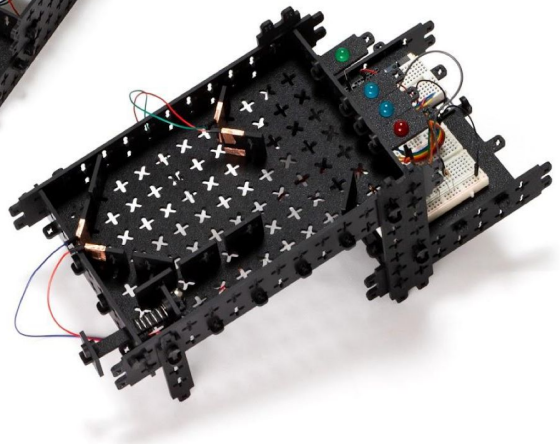


Whack-a-mole





Finger race



Pinball

CTC GO! Motions Expansion

Age
-14-17

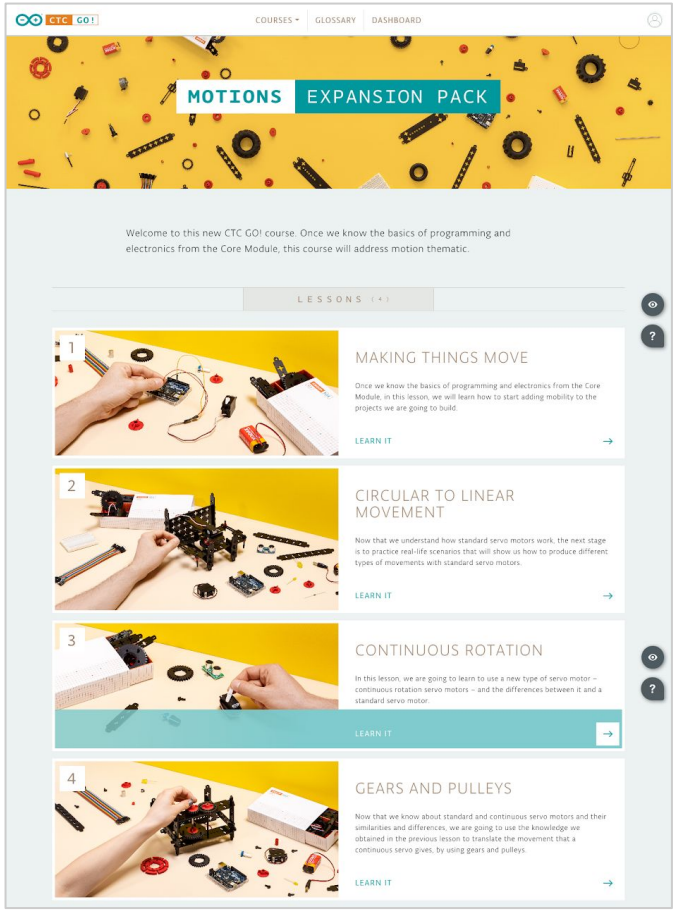
For
-The classroom
-24 students and 3 educators per kit
-8 groups of 3

Learning outcomes
-Add mobility to the projects

-Learn about motors

-XXI skills

Languages available
English, Spanish, French



Platform

Content

-Online platform: 4 lessons and 4 projects
-Code
-Teacher's tips
-Training
-Support

Hardware

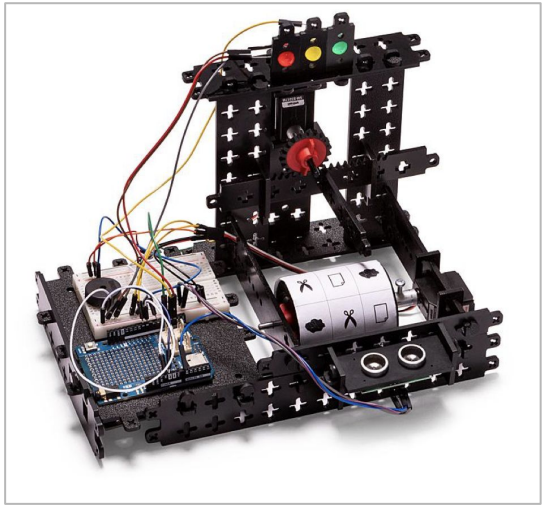
-Powered by UNO WiFi REV 2*
-Education shield*
-Electronic components
-Modular pieces

Software

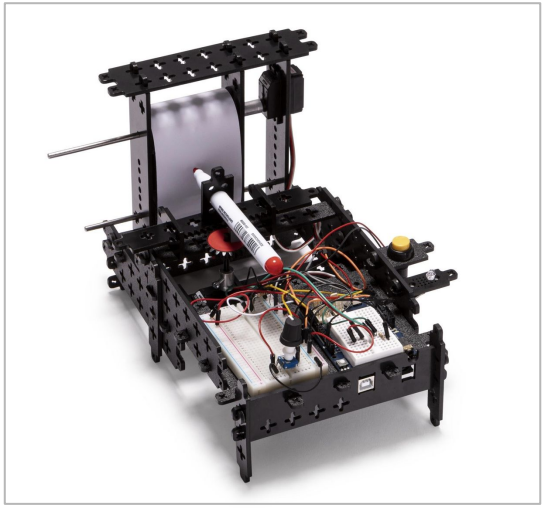
-IDE offline
-IDE online

*(not included. Available in the Core module)

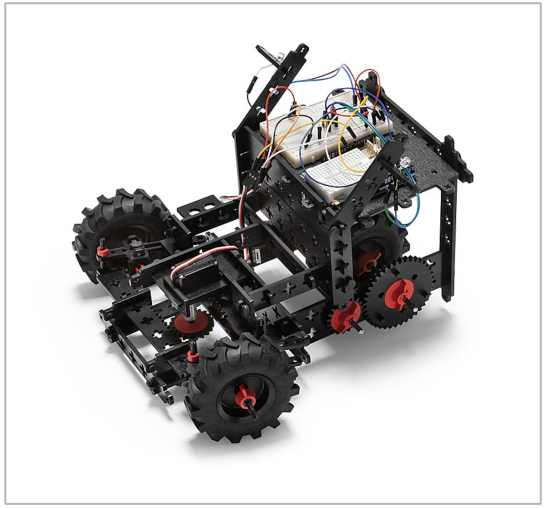
Projects



Rock, paper, scissors



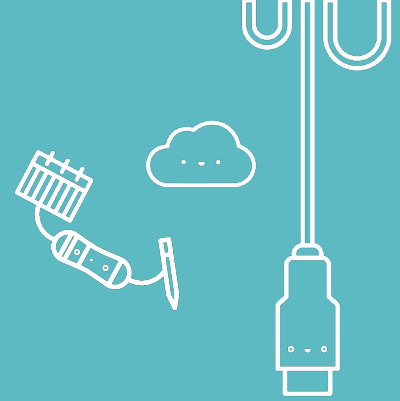
Wave generator

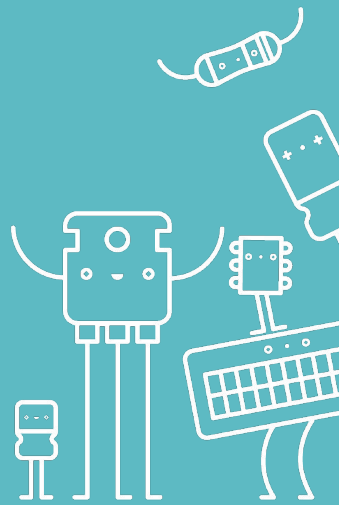


Wiggler

Explore IoT Kit Rev2

IoT technology presents exciting opportunities for students to innovate and create new solutions to real-world problems





Explore IoT kit Rev2

Age
-16+

For
-Classroom / remote

-2 students

Learning outcomes
Get started quickly and easily with the Internet of Things
Enhance students' understanding of real-world, technology and its applications.

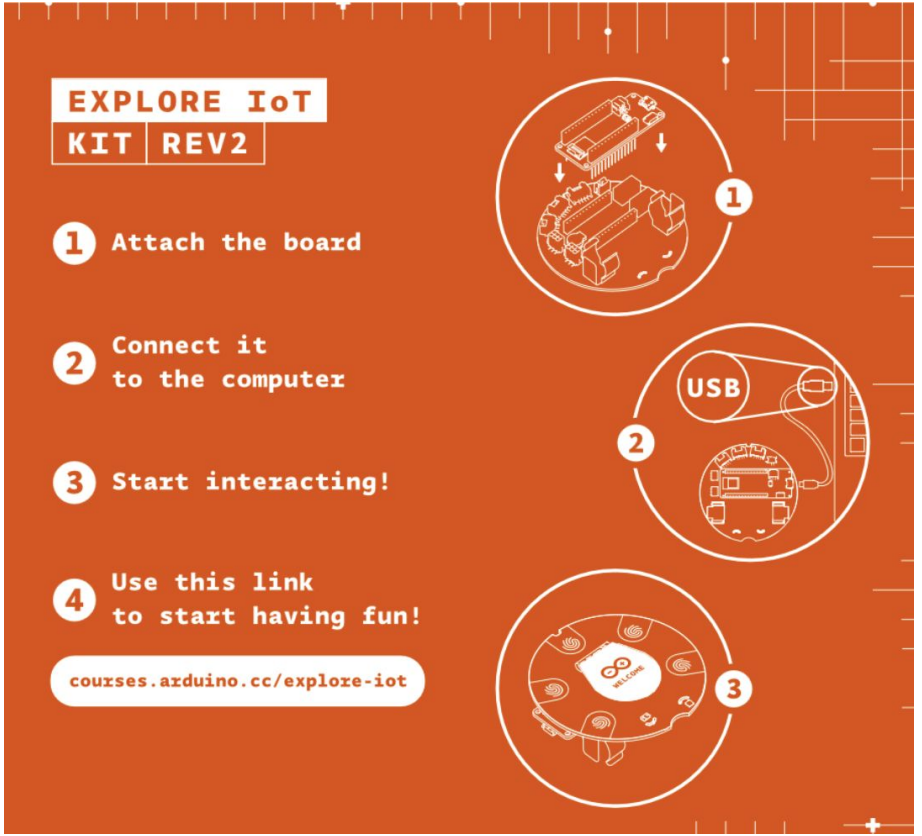
Requirements
-Previous experience in programming
-School Plan

Languages available
English, Italian

Explore IoT REV2

Pre-flashed activity:

- Out of the box experience
- No-code
- Start with confidence
- Interactive first experience



Key Learning Values

Using Arduino IoT Cloud and connected devices

Collecting, processing, and storing data

Graphing and visualizing data and understanding its meaning

Collaboratively developing solutions to tackle sustainability issues using IoT technology

Learning multiple design thinking techniques and using them to create solutions

Network security considerations

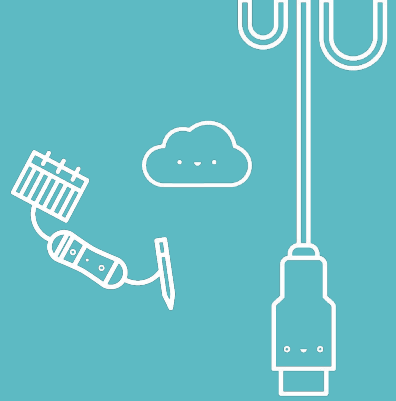
Content

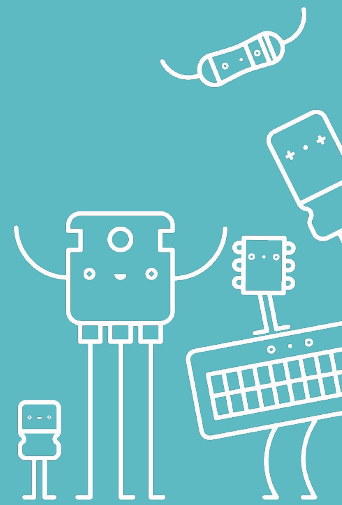
- Investigate and solve a real-world challenge linked to one of the UN's Sustainable Development Goals.
- Design methodologies
- In-depth understanding of real-world issues to build a sustainable future.
- Develop their own unique solutions to challenges such as:
  - -Urban farming
  - -Health monitoring
  - -Water and waste conservation

-Foundational knowledge & sensor activities
-10 real world activities

Greenhouse kit

For partners only





Greenhouse kit

Developed in collaboration with Campustore

- Use innovative technology to boost sustainability by creating an automated greenhouse.

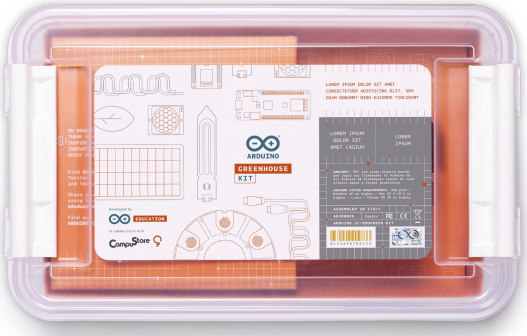
- A progressive way to start learning farming concepts with IoT for Middle School and High School students

Key selling points

A greenhouse is a controlled environment that allows plants to receive specific climatic conditions that they need for stimulated growth.

- Experiential learning
- IoT for real world application
- Students of all backgrounds can benefit from agricultural knowledge.
- Research purposes
- Easily create connected devices
- Real-world data, students develop better critical thinking and problem-solving skills
- Create connections and allow students to innovate, and enhance their understanding of real-world technology.

What does it include?



Hardware:

- Arduino MKR WiFi 1010
- MRK IoT Carrier REV2
- Growth LED strip
- Fan
- Water pump w/speed controller
- 2 moisture sensors
- VOC sensor
- CO2 sensor
- Temperature & humidity sensors
- Pressure sensor

Content:

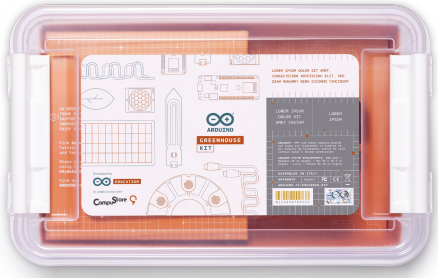
-Middle School and High School
-5 guided projects
-1 open project

Covers basic technical and agricultural learning points to the greenhouse effect

Software:

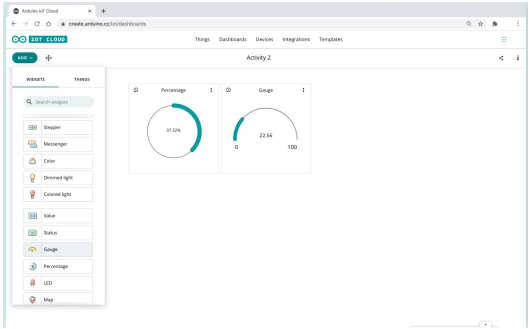
-IoT platform
-Web editor
-Remote IoT app

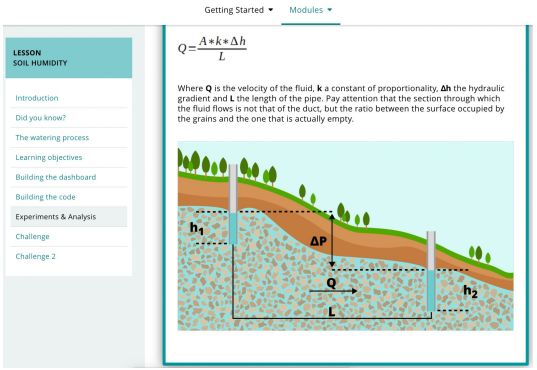
What is needed?



1. Hardware

+





2. IoT Platform / online content
School Plan

+

3. Greenhouse structure

ARDUINO
EDUCATION

Engineering Kit REV 2

AEK REV 2

Engineering Kit REV 2

Age
-17+

FOR:
-The classroom / remote

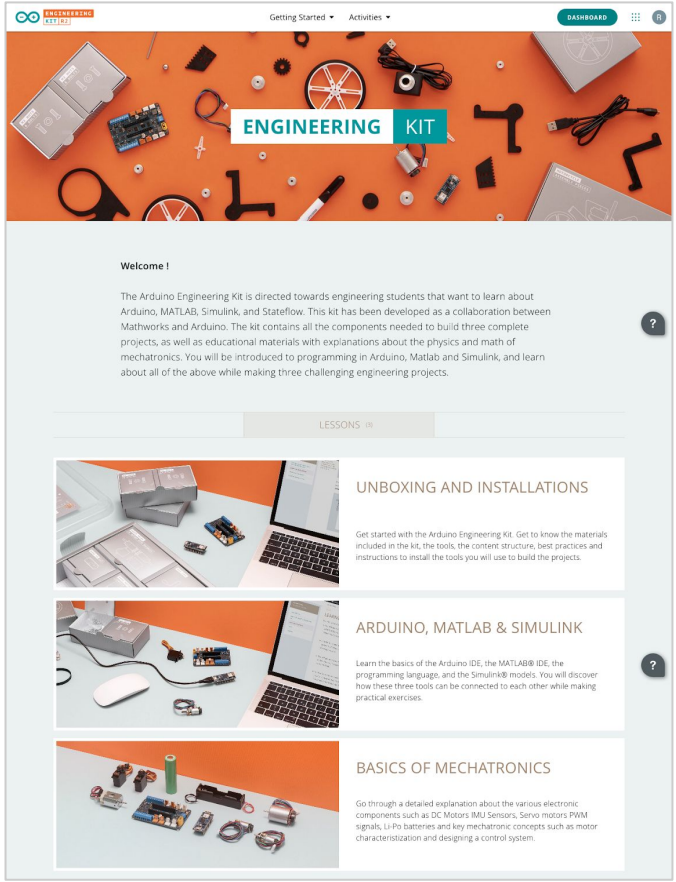
-3 students & 1 student per kit

Learning outcomes
-Key engineering and mechatronic concepts.
-Knowledge of robotics, image and video processing

-Matlab & Simulink

-XXI century skills

Languages available
English, Spanish



Platform

Content

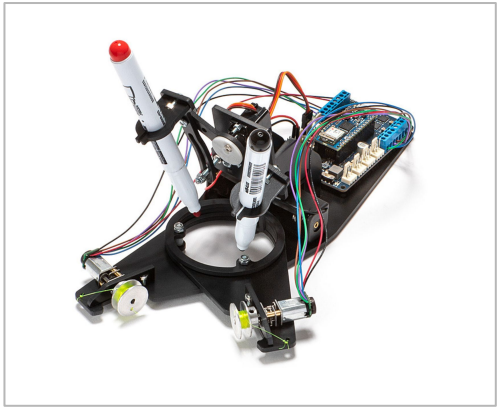
-Online Platform: 3 lessons and 3 projects
-Training
-Support

Hardware

-NANO IoT 33 board
-Nano Motor carrier
-Electric components
-Assembly pieces

Software

-Mathlabs
-Simulink
-Arduino IDE

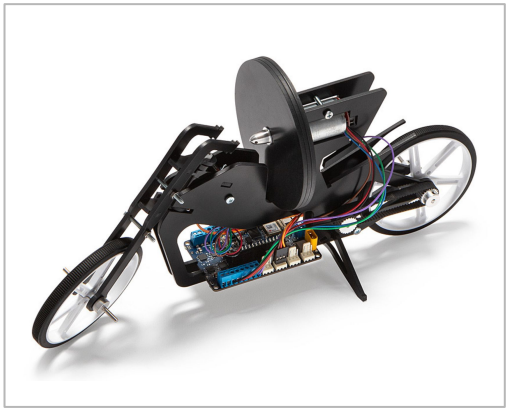


Drawing robot

- **Image processing** of pictures to take from them the traces to replicate it in a white board
- **Trigonometric concepts** that allow knowing the position of the robot on the whiteboard
- **Mathematical movement concepts** to transform the pixels that make up the images in meters that the robot has to move

Web camera controlled rover

- **PID Control concepts** in diferencial platforms
- **Real time image processing** to locate the robot position on the arena
- Real time image processing to detect obstacles

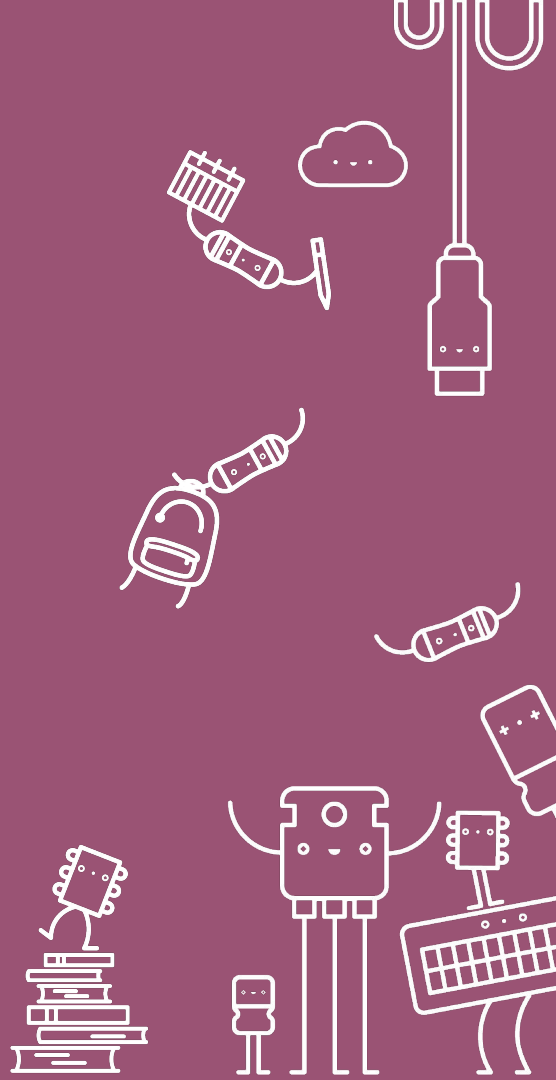


Self balancing motorcycle

- Apply the **mathematical theory** in the simulink model
- PID control modeling based on IMU sensor data

ARDUINO
EDUCATION

Tiny ML Kit



TINY Machine Learning KIT

COURSE 1

- Understand what machine learning (ML) Is
- Deep learning and embedded machine learning
- Understand neural networks
- Background responsibilities and Real Examples

COURSE 2

- Train your device using your own datasets
- Using external training models for your project
- Basics of AI, real user cases and scenarios
- Know and play with some of the most used technics
- Real world industry applications

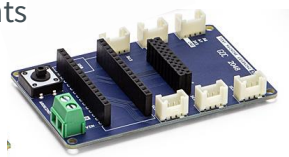
COURSE 3

- Hardware basics
- Code your own projects with TinyML
- Train your TinyML device
- Deploy, test, and correct your TinyML projects

Arduino Nano 33 BLE Sense

- Senses: movement, acceleration, rotation, temperature, humidity, barometric pressure, sounds, gestures, proximity, color, and light intensity.

Custom Arduino shield to attach your components



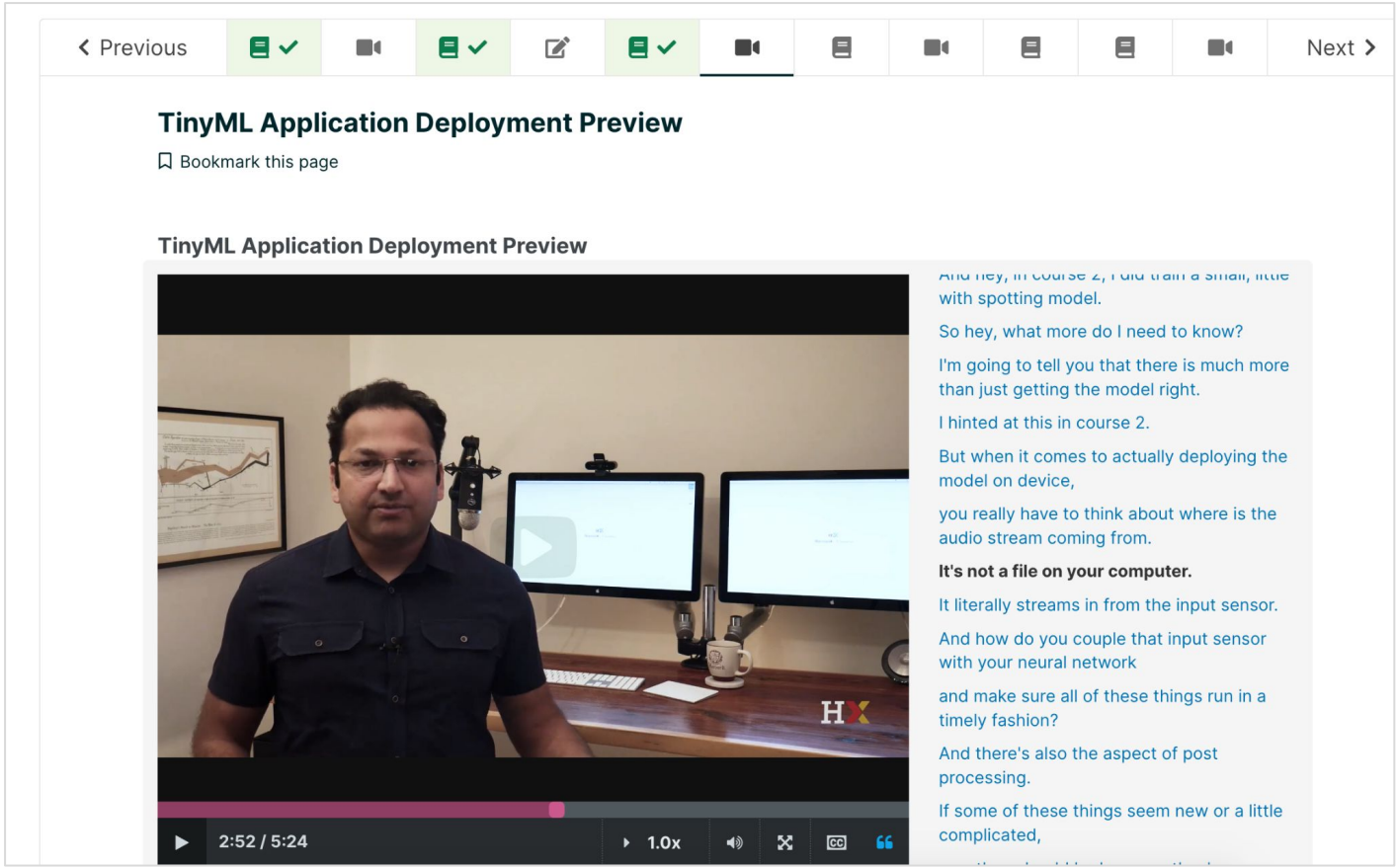
Camera module (OV7675)

External content:

- There is **NO Arduino content** for this kit
- Use the freely available content & courses from **Harvard University at EdX**

Arduino IDE
Tensor Flow
Google Colab

edX: Tiny machine learning course



That’s a wrap
Thank you!