

Arduino Explore IoT Kit Rev2

PRODUCT TEXT

One-liner

Create, collaborate, impact: teach students how to use IoT technologies and design thinking to solve real-world challenges.

Short product text

Advanced high school and college students can now create their own connected devices - known as the Internet of Things - quickly and easily. They'll learn how to build internet-connected objects with easy-access getting started activities and 10 sustainability projects, supported by technical and theoretical lessons. Each of these projects allows students to investigate and solve a real-world challenge linked to one of the UN's Sustainable Development Goals. Students learn design thinking methods that help them develop their own unique solutions to challenges such as urban farming, health monitoring, and water and waste conservation.

Empower your students with future technologies, design methodologies, and an in-depth understanding of real-world issues to build a sustainable future with the Arduino Explore IoT Kit Rev2.

Long product text

The Internet of Things (IoT) is a giant network of connected devices that can collect and share data from all over the world, and it's changing the way we live, work and study. Learning about the IoT requires students to understand and use a combination of hardware, software, and programming languages.

With the Arduino Explore IoT Kit, advanced high school and college students can now create their own connected devices quickly and easily. They'll learn how to build internet-connected objects with an onboarding guide and easy-access getting started activities, including sensor activities, technical lessons, and theoretical lessons.

This is followed by 10 sustainability projects which allow students to investigate and solve a real-world challenge linked to one of the UN's Sustainable Development Goals. These projects equip students with scientific and design thinking methodologies to study a sustainability issue using data analysis, and build solutions using advanced IoT systems. At the end of each project, students will have the opportunity to build a valuable application and share it with their community.

All the projects adopt a learning-by-doing approach. Students construct fully functional solutions, including experiments, challenges and building meaningful applications, such as energy efficiency devices, accessible education facilities, and smart irrigation systems.

Teach students to innovate, investigate, and explore with connected devices that use sensors, automation, protocols, and graphing to collect data they can analyze and learn from. Students will also learn to control objects remotely using a digital dashboard, called Arduino IoT Cloud, which stores and displays real-time data through an intuitive plug-and-play connection that simplifies their projects.

Create connections, make a complex subject simple, allow students to innovate, and enhance their understanding of real-world technology with Arduino Explore IoT Kit.

What is the Arduino Explore IoT Kit Rev2?

The Arduino Explore IoT Kit Rev2 is the gateway to the digital world of connected objects and people, and helps you get advanced high school and college students started with the fundamental concepts of the Internet of Things quickly and easily.

Students will learn to harness the power of the Arduino IoT Cloud to gather data, understand how devices communicate with each other, and which tools to use to facilitate communication. They'll also learn about data management, analysis, and computational thinking - serious technology made simple as it's based on open hardware and plug-and-play connections. And they'll learn to use this technology while finding creative solutions to global sustainability challenges, as each project is linked to the UN's Sustainable Development Goals (SDGs).

Each kit contains an Arduino board (MKR Wi-Fi 1010), a MKR IoT Carrier Rev2 developed specially for this kit, a collection of sensors and actuators, and a comprehensive getting started introduction to the IoT and related activities, included in kit's basic content.

For a more complete learning experience and access to the full content, educators can subscribe to the Arduino Cloud for Education School Plan. This plan provides a comprehensive educational journey into the Internet of Things. Here's what you get with the School Plan:

- Unlimited storage and compilation time for all your students' sketches
- Dashboards that visualize without any restrictions
- Enhanced collaboration and easy troubleshooting with Google Classroom integration
- Deeper student knowledge with exclusive guides on using the hardware and help with coding
- Boost students' creativity and innovation with more lessons and projects
- Stay organized with easy management and student enrolment

Using the Explore IoT Kit with the School Plan allows you to unlock 10 times more content, including projects, hardware guides, and foundational content that supports students in learning coding, electronics, and how to use Arduino components. It also improves the teacher experience by making everything simpler, shareable, and collaborative.

What's the MKR IoT Carrier?

The MKR IoT Carrier helps you focus more on software and testing by making it easier to build your circuits. The MKR IoT Carrier is an extension of your board and makes wiring and troubleshooting easier, so you can focus on prototyping your ideas and programming. Just connect your device to the computer and you're ready to go!

Benefits of the Arduino Explore IoT Kit Rev2

- Get started quickly and easily with the Internet of Things
- Make a complex subject simple and accessible
- Enhance students' understanding of real-world technology and its applications
- Learn critical future skills for 21st century careers
- Be an innovator - learn how to use technology to make an impact on society
- Build functional prototypes inspired by real-world applications

- Gain confidence in designing and making your own connected projects
- Combine your knowledge with actual industry innovations

Feature highlights of the Arduino Explore IoT Kit

- A comprehensive lesson plan and structured projects for educators, enabling you to spend more time on teaching and supporting your students
- Access to the basic content which includes a complete getting started experience and activities. For a more comprehensive educational journey into the Internet of Things, access to the full content, and to connect with Google Classroom, educators can subscribe to the Arduino Cloud for Education School Plan
- The exclusive MKR IoT Carrier Rev2 allows you to focus on prototyping and programming instead of wiring and troubleshooting your board. Just connect the device to your computer and you're ready to go!

What's included?

- The kit includes:
 - Arduino MKR1010
 - MKR IoT Carrier designed for this kit, includes
 - Two 24 V relays
 - SD card holder
 - Five Tactile buttons
 - Plug and play Grove connectors for different external sensors
 - Temperature sensor
 - Humidity sensor
 - Pressure sensor
 - Gas sensor (VOC)
 - Ambient light sensor
 - RGB color sensor
 - Gesture sensor
 - Accelerometer
 - RGB 1.20" rounded display
 - 18650 Li-Ion rechargeable battery holder
 - Five RGB LEDs
 - Buzzer
 - Micro USB cable
 - Moisture sensor
 - PIR sensor
 - Plug-and-play cables for the external sensors
 - Plastic enclosure to attach and protect the hardware
- Access to the basic content, which includes a complete IoT getting started experience and three introductory activities and lessons.
- For a more comprehensive educational journey into the Internet of Things, access to 10 more step-by-step, hands-on projects, each linked to the UN's Sustainable Development Goals and covering the fundamentals of IoT, and to connect with Google Classroom, educators can subscribe to the Arduino Cloud for Education School Plan.
 - Each of the 10 projects takes between 15-25 hours to complete, and can be completed over the course of a couple of weeks or a whole term or year.

- Each project contains five modules which can be completed in an order that makes sense for your classroom.
- To complete a project, students ideally need good programming skills and to have worked with sensor technologies.
- However, if your students are at more of a basic level, the kit also includes additional technical activities and lessons for beginners.

Learning outcomes

The Arduino Explore IoT Kit Rev2 has been created to provide a comprehensive understanding of the Internet of Things, as well as to encourage students to think about solving global sustainability challenges, according to the UN's Sustainable Development Goals.

After looking into current academic and industrial standards, we have identified important concepts this kit should touch upon for students to learn how devices communicate and the tools used to facilitate communication, data management, analysis, and computational thinking by using real-world sensors to capture meaningful data from the environment and modify it by remotely controlling actuators such as LEDs, buzzers, displays, through the Cloud.

Key learning values

- Using Arduino IoT Cloud and connected devices
 - Control physical objects, such as a displays or lights, remotely with Arduino IoT Cloud
- Collecting, processing, and storing data
 - Store data locally, wirelessly and remotely for analysis and backup
- Graphing and visualizing data and understanding its meaning
 - Use different tools and techniques to graph data and interpret the information collected
- Sustainability & global challenges
 - Researching environmental problems and creating prototype solutions
 - Learning multiple design thinking techniques and using them to create solutions
 - Carrying out scientific investigation, formulating research questions, and working with dependent, independent, and controlled variables
 - Researching and understanding the UN's SDGs and collaboratively developing solutions to tackle sustainability issues using IoT technology
- Network security considerations
 - Understand how software developers protect devices and information from unauthorized access
- Different sensors and how to use them
 - Investigate the environment using temperature, humidity, and light sensors
 - Collect data about movement using an accelerometer, pressure, CO₂ and motion sensors
 - Take care of your plants by following the data from moisture and UV light sensors
- Actuators and how to use them
 - Use lights, sound, display and relays, and electronic components used to activate high power devices, to visualize data and control external devices