

Product Specifications

LEGO® Education

Computer Science & AI

Kit 45521



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Product Specifications

LEGO® Education Computer Science & AI Kit 45521



Description

The LEGO Education Computer Science & AI Kit Year 4-6 contains 321 age-appropriate LEGO® bricks, building instructions, interactive hardware, and a USB charging cable.

The kit includes 30 hands-on computer science lessons grouped into six units, each including four lessons and a design challenge, accessible through the Teacher portal.

Key features

30 Unique Lessons

Ready-to-teach, curriculum-aligned computer science & AI lessons for year 4-6.

Bricks and more

Includes LEGO bricks, double motor, colour sensor, building instructions, and a USB charging cable.

Teacher portal

Classroom-ready lessons, presentations, and getting-started materials

Coding Canvas

Intuitive app with word-based coding to bring student creations to life

Hardware

45651 Double motor

45653 Colour sensor

Age mark

Suitable for year 4-6

Storage Box

H: 30.8 cm, L: 42.6 cm, W: 10.5 cm

Product Specifications

LEGO® Education

Double Motor

45651



Description

The LEGO® Education Double Motor can work alone, pair with other LEGO® Education interactive hardware, or connect to a laptop or tablet for coding tasks.

Key features

Wireless double-motor

Made for hands-on learning and straightforward, intuitive building of moving models.

2 motor outputs

Featuring our latest tech, the motor includes a built-in motion sensor for coding, a new precision drivetrain and absolute encoding for maximum control and flexibility.

Charging and communication

Easy USB-C charging and effective communication via Bluetooth Low Energy 4.2.

Age mark

Suitable for ages 5 and up.

Connection

Bluetooth Low Energy (BLE 4.2).

Battery Capacity

900 mAh (maximum charge rate: 1500mA).

Motor Performance

- No-load speed: 322-346 rpm
- Current consumption: 70-107mA
- Loaded speed (50mNm): 192-220 rpm
- Current consumption: 649-753mA
- Stall torque: 148.1-173.1mNm

All performances are measured at 4.2 V (fully charged battery)

Sensor inputs

- 3-axis Accelerometer
- 3-axis Gyroscope
- Absolute encoding on both motor outputs

*Not all features may be fully operational at the time of launch

Product Specifications

LEGO® Education

Colour Sensor

45653



Description

The LEGO® Education Colour Sensor can detect and react to 6 LEGO® colours straight out of the box, with more detailed detection available when used with the supplementary app. It can be paired with motors or connected to a laptop or tablet for coding activities.

Key features

Colour sensor

An ultra-compact sensor with robust performance, ideal for efficient, hands-on learning in the classroom.

Detects LEGO® colours

Senses and reacts to 6 LEGO colours straight out of the box at a distance of 4–16 mm.

Versatile use

Pair with motors for hands-on learning or connect to a laptop or tablet for coding activities.

Charging and communication

Easy USB-C charging and effective communication via Bluetooth Low Energy 4.2.

Age mark

Suitable for ages 5 and up

Connection

Bluetooth Low Energy (BLE 4.2).

Battery Capacity

135 mAh (maximum charge rate: 270mA)

Sensor inputs

Colour sensor with 6 LEGO colours

*Not all features may be fully operational at the time of launch

Product Specifications

LEGO® Education Connection Cards 45657



Description

With the LEGO® Education Connection Card packs, each student team gets its own unique colour card, and when the connection card is scanned in front of a device, the matching colour lights up on the component. Each pack includes 8 cards to enable connection. Just tap a card over a motor, controller, or sensor to connect.

Key features

Size/format

ID-1 (also known as CR-80)
85.6 × 53.98 mm / 3.370 × 2.125 inches

RFID antenna/chip

Not user programmable
ISO 14443A/B compatible (proximity/short range)

Reading range

The card is readable in a distance of 0-6 cm from the HW elements (tolerance +/- 1 cm)

Adaptable

These connection cards are compatible with LEGO® Education Science Kits.

Age mark

Suitable for ages 5 and up



Product Specifications

LEGO® Education

Multi-Charger (LEI)

45624



Description The LEGO® Education Multi-charger connects to up to 8 elements. Works with the AC Cable (45656).

Key features **8-port USB-C docking station**
Charge 8 devices simultaneously.

Age mark
The multi-charger is considered IT equipment and should only be used by children under adult supervision.

Connection Input: AC power (110-230v).
Output: 8x USB-C charging ports.

Performance

- Maximum power consumption: 66W
- Standby consumption: <1.15W
- Maximum total charge rate: 5A @5v
- Charge rate per port: 0.5-1.5A @5v

LEGO® Education Coding Canvas



Key features

When LEGO® Education Coding Canvas is used with LEGO Education hardware (Science or Computer Science & AI), the pupils can:

- get a first encounter with a playful, experimental and safe AI experience
- bring their builds to life in a playful and interactive environment
- learn computational thinking and computer science concepts through block-based coding
- tinker, tweak, debug and experiment with LEGO Education HW and LEGO Education models
- grow with their experience, as the app caters for year 1-3 (icon blocks) and 4-6 (word blocks) with toolboxes suitable for learners on all levels.

Language

The LEGO® Education Coding Canvas is available in 21 languages: English (US), English (UK), English (AU), Chinese (simplified), Japanese, German, Dutch, Swedish, Norwegian, Danish, French, Italian, Korean, Portuguese (BR), Spanish (MX), Polish, Turkish, Vietnamese, Arabic, and Finnish.

Open-Source

No. But an API will be publicly available.

Supported platforms

Native iOS app for iPad
Web app (developed for Chromium browsers, e.g., Google Chrome)*
*WebBLE is a requirement, as connecting to the hardware requires bluetooth

System Requirements

Bluetooth
Camera (e.g., built-in web camera)

Programming Languages

Icon and Word blocks (Blockly-based, similar to Scratch)

There is no text-based coding in the app, but LEGO Education will make the API (Application Programming Interface) publicly available with a Python installation package, meaning that users will be able to use their favourite text-based programming tool to interact with LEGO Education Hardware

LEGO® Education

Coding Canvas



Units & Lessons

Units and lessons are facilitated from the Teacher Portal, and not within the Coding Canvas itself. When the pupils need to engage with a specific lesson the Teacher Presentation will display a Lesson PIN. This PIN is then entered in the Coding Canvas by the pupils, which loads a pre-populated canvas that holds the Lesson Starter Code (the initial code snippet that can bring a model to life), and a curated block palette, reducing the complexity for the pupils.

This means that Coding Canvas is much more lightweight than the LEGO Education SPIKE app, since there is no heavy content to download on the pupils' devices.

Software Distribution

Web App

The Web App is freely available online at code.legoeducation.com

iPad App

The iPad app can be installed through the Apple App Store on iPads or Apple School Manager.

There is no user login required to engage with the experience on either platform.

Data Privacy

The Coding Canvas does not require account creation or user login. In compliance with GDPR the Coding Canvas does not collect personally identifiable information or health information from users, although reading IP addresses is necessary for the Coding Canvas to function. Images used for training AI or for AI functionality are never stored or collected, and all processing of AI-related data is done locally on the pupils' devices.

Coding Canvas might not support all hardware features and functionalities.