



DISCOVER ROBOTICS & PROGRAMMING I LABCARDS

Grades: 4+

Students: 1-3 per Kit

Contact Hours: 20+

Recommended Settings:

- Traditional classrooms
- Makerspaces
- After-school programs
- Home learning

Pricing Options:

- Single Kit: \$379
- Club Pack (5 Kits): \$1895
- Classroom Set (16 Kits, stored in a high-quality hardwood furniture unit with rolling casters): \$6595

Materials:

- Computer science curriculum, printed on no-tear polymer
 - Discover Robotics & Programming I LABCards (20-card set)
 - Step-by-step building instructions for motor testing station and RiQ robot
 - Brain and Cortex User Guide
 - Expanding file folder for easy access and storage of all curriculum pages
- Specialized PCS Robotic Controller, The Brain™
- Bluetooth Dongle (Available in BLE for iPads or Classic for all computers and Android-based tablets)
- USB Cable
- Advanced Sensor Pack including 1 ultrasonic, 1 light, 2 touch, 2 infrared, 2 LEDs, and 5 sensor cables
- 2 9V DC motors and 2 motor cables
- Rechargeable 11.1V LiPo battery and DC wall adapter
- Advanced engineering manipulatives from fischertechnik™
- Compartmentalized Gratnell storage bin with lid

Mastery-based Assessment:

- Students track progress towards mastery with LABCard point system.
- Each card includes Check for Understanding questions that instructors can use for discussion, reflection, formative assessment and deepening student understanding while serving as facilitators and guides.

Curriculum Content:

YELLOW

Level 1: Intro to Motor Commands

- Intro to Cortex
- Motor Testing Station Build
- Turn Motors ON and OFF
- REVERSE Direction and SET POWER

ORANGE

Level 2: Advanced Motor Commands

- RiQ Robot Build
- Local and Global Commands
- Motor Polarity: THIS WAY and THAT WAY
- Combine Commands

PURPLE

Level 3: Lights and Sounds

- REPEAT Commands
- NOTEs and BEEPs
- WAIT Commands
- Turn LED's ON and OFF

BLUE

Level 4: Intro to Sensors and Logic

- Logical LOOPS
- CALL a PROCEDURE
- Touch Sensors
- IF Statements

Technical Requirements:

- One device per kit with Windows, OS X, iOS or Android operating system. *Cortex is currently not compatible with Google Chromebooks.*
- All tablets require Internet connection to enable wireless communication

Training:

- Purchases of \$500+ come with 30 minutes of free webinar training
- Purchases of \$1000+ come with 1 hour of free webinar training
- *Additional training available for purchase*

Alignments & Standards

To meet the needs of a variety of learning environments, LABCards are aligned to 21st Century Skills and Habits of Mind as well as national standards for math, language arts, science, engineering, and technology.

21st Century Skills:

A set of widely-applicable abilities essential for success in the information age.

- Communication and Collaboration
- Creativity and Innovation
- Critical Thinking and Problem Solving
- Information, Media and Technology Literacy
- Initiative and Self-Direction
- Productivity and Accountability

Habits of Mind:

16 “thinking habits” developed by Art Costa and Bena Kallick to empower students to succeed in a 21st century learning environment.

- Applying Past Knowledge to New Situations
- Managing Impulsivity
- Persisting
- Remaining Open to Continuous Learning
- Striving for Accuracy
- Thinking about Thinking (Metacognition)
- Thinking Flexibly

Common Core State Standards for Language Arts

- CCSS.ELA-LITERACY.RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- CCSS.ELA-LITERACY.RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
- CCSS.ELA-LITERACY.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Common Core State Standards for Math

- CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them.
- CCSS.Math.Practice.MP5 Use appropriate tools strategically.
- CCSS.Math.Practice.MP7 Look for and make use of structures.
- CCSS.MATH.CONTENT.7.G.A.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions.

Next Generation Science Standards

- MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
- MS-ETS1-3 Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.
- MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

