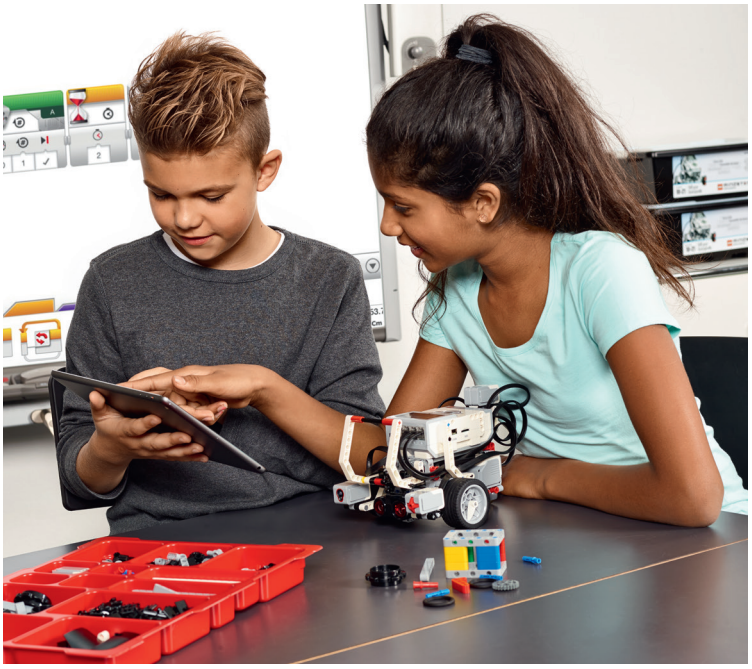
EV3

Use the following information when requesting grants for manipulatives used to teach computer science concepts and real-life robotics technology for Grades 6 and up.



Need Statement

The issue in my classroom is **(select an area of issue below)**.

Issue 1: underperforming students.

Issue 2: students are not engaged in learning.

Issue 3: students with an extreme diversity of abilities.

Issue 4: not enough real-life or project-based learning opportunities.

Project Description

My proposed solution is to engage students in a cross-curricular, hands-on learning environment using LEGO MINDSTORMS® Education EV3 robotics.

EV3 curriculum, including Design Engineering Projects, Space Challenge, and Middle School Science, is based on constructivism. This educational theory states that children learn best when they experience things firsthand and within a meaningful context.

The curriculum, which is aligned to national standards, engages students to become more independent learners. The 21st-century skills they will develop include collaboration, communication, creativity, critical thinking, and problem solving.

It creates a learning environment that addresses the challenges associated with **(area of issue)**.

(Add statements as needed to show how you will address the area of issue utilizing the EV3 curriculum.)

Through this curriculum, **(number)** students will design, build, program, and test robots to do a variety of tasks. They learn to control motors and collect data using of a variety of sensors and log the results of experiments at up to 1,000 samples per second.

The curriculum's classroom instruction includes open-ended problem-solving activities designed to make learning science, technology, engineering, and mathematics through real-life robotics engaging and fun.

Students will demonstrate an increased ability to solve problems and communicate more effectively by applying their science, technology, engineering, and mathematics skills to address challenges they encounter through the lessons. Additionally, these experiences will help students better comprehend and apply scientific and technical language.

Skills assessment will take place through student presentations and ongoing observation.

Curriculum Information

Select relevant description option:

Option 1: EV3 Design Engineering Projects

EV3 Design Engineering Projects is a curriculum package with 30 hours of classroom instruction. The curriculum features three main sections: Make It Move, Make It Smarter, and Make a System. Each section includes five design projects.

Option 2: EV3 Space Activity Pack and Challenge Set

The EV3 Space Challenge Set includes three 2' x 3' learning mats, one 4' x 6' challenge mat, and a large number of LEGO elements for building the challenge models. When the challenge set is combined with the EV3 Space Activity Pack, you can teach 30+ hours of activities in the following categories: Basics of Gears, Learning Missions, Challenge Missions, and Research Projects.

Option 3: EV3 Science Activity Pack

The EV3 Science Activity Pack is the result of a close collaboration with science teachers and Fraunhofer, a global application-oriented research organization. It consists of 14 physical science experiments that utilize the data-logging capabilities of the LEGO MINDSTORMS Education EV3 hardware and software, as well as the LEGO Education Renewable Energy Set and the MINDSTORMS Temperature Sensor (each sold separately).

The experiments focus on:

- renewable energy (energy production and consumption)
- thermal physics (boiling/melting points and heat transmission)
- mechanics (force and motion)
- light (light intensity)

Each experiment fits within a 45- to 90-minute science lesson with small, engaging LEGO models that students can build and program in a short amount of time.

Professional Development

This hands-on workshop is six hours of intense communication, reflection, and application that is tailored to meet the needs of the participants.

The workshop lets participants experience being both a student and a teacher as they learn about EV3 programming, discover how STEM fits the curriculum and subject area they teach, and practice differentiated instruction.

Participating in the workshop leads to a greater understanding of how LEGO Education creates an environment where all students can share their ideas and knowledge. It also provides the tools necessary to engage students throughout the year by connecting the possibilities of EV3 with the required curriculum.

Learning theory

- Apply the 4Cs in the classroom.
- Awaken students' interests in given subjects.

Hands on

- Learn how to get started and how to take a simple concept and make it complex through a series of intermediate steps.
- Develop confidence in leading students through building and programming a robot.

Tools for planning

- Apply EV3 to curricula programs.
- Share ideas with other participants and leverage the knowledge of best practices from the facilitator to get the most from professional development.

Materials management

- Organize and label the materials and do periodic inventory.
- Keep the sets organized and ready for student use.

LEGO education