Design Engineering Projects

Product number:	2005544
Product name:	LEGO® MINDSTORMS® Education EV3 Design Engineering Projects
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Theme:	LEGO® MINDSTORMS® Education
Related products:	45500, 45501, 45502, 45503, 45504, 45505, 45507, 45508, 45509, 45514, 45515, 45516, 45544, 45560, 2000045, 2000046,
Product text:	New from LEGO® Education for the EV3 platform is Design Engineering Projects, a curriculum package with 30 hours of classroom instruction and open-ended problem-solving activities that make learning of science, technology, engineering and mathematics through real-life robotics engaging and fun for students. The curriculum features three main sections with five design projects per section for a total of 15 projects:

• Make it Move: Students are challenged to design, build and program robots that move using motors with rotation sensors. In five projects students apply mathematics and science knowledge to create robots that measure distance, measure speed, move without using wheels, maximize power to move up an incline, and move and turn to create regular polygons. Students will also apply their knowledge of simple and complex machines and use ratios to describe proportional relationships.

• Make it Smarter: Students are challenged to add sensors to their robots to control behavior and to measure, graph and analyze sensor data. In five projects, students develop robots that use sensors that measure ambient and reflected light, distinguish specific colors, measure distance from an object, recognize a touch sensor state (pressed or not pressed, or pressed and released), and measure angular displacement or rate of change.

• Make a System: Students are challenged to design, build, and program robotics systems built from subsystems. In five projects, students develop systems that move a ball, pick and place objects, simulate manufacturing, sort colors, and communicate their location. Students test their system, gather data, and use that evidence to engineer system optimizations and improvements.

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Product text:

The structure of the activities in the Design Engineering Projects curriculum mimics the engineering design process used by scientists and engineers in many industries. Each project starts with a design brief explaining the challenge, uses videos of robots in action to make real-world connections, and culminates in a final project that can be shared and presented. Throughout the process students gain and use knowledge of science, technology and mathematics as they engineer a solution. This structure is designed to help students develop the 21st-century creative thinking, problem solving, teamwork, and communication skills required for success in school and beyond. The curriculum is digitally-delivered and installs directly into the LEGO MINDSTORMS® Education Ev3 programming software lobby.

The in-built content editor enables teachers to customize the curriculum and create their own lessons. It enables students to capture their work directly inside the content creating their own digital workbook, making classroom management and assessment easier. The Design Engineering Projects curriculum was written to match national curriculum. For full curriculum grid including correlation to standards and activity examples please visit legoeducation.com/MINDSTORMS

Learning Values

• Learn and use engineering design process skills
• Understand and use mathematical skills and concepts, such as proportions and ratios, graphing data and multi-digit computation
• Apply knowledge of science concepts, such as speed and power, motion and stability, and forces and interactions
• Understand cross-cutting concepts, such as systems, patterns, structure and function, and logical thinking
• Understand the core concepts of technology
• Understand the role of troubleshooting, invention and innovation, and experimentation in problem solving
• Plan and manage activities to develop a solution or complete a project
• Demonstrate creative thinking and construct knowledge using technology
• Use digital media and environments to communicate and work collaboratively