

LEGO WeDo 2.0 - Fix & Code

Take your Lego robotics skills to the next level with our Lego WeDo 2.0 Fix & Code course! In this course, students will create more complex and sophisticated robots using the Lego WeDo 2.0 system. This course is beginner-friendly and is suitable for students who have no prior knowledge. They will learn advanced concepts in engineering and robotics, as well as more advanced programming techniques using the LEGO WeDo 2.0 visual drag-and-drop programming software.

Fix & Code



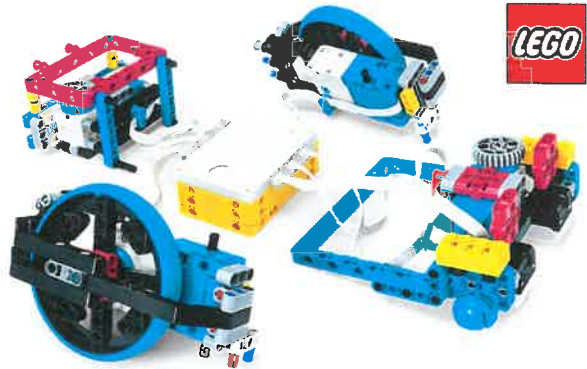
FitCat

Students will work on a variety of challenging projects and ideas, such as building rovers that can move and respond to their environment, machines such as cranes and windmills, and programming these robots to perform specific tasks. The course is also designed to help students develop important computational thinking skills, such as logical reasoning, pattern recognition, and simulation modelling. These skills are essential for success in today's world of technology, and they are highly valued by employers in a wide range of fields.



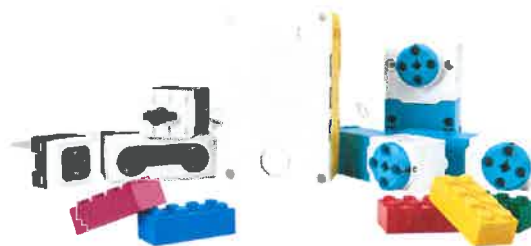
LEGO Spike Prime

The LEGO Spike Prime is an innovative program that uses robotics engineering to teach core computer programming logic and reasoning skills. The LEGO Spike kit utilizes a main controller, color sensor, motors, and distance sensor to allow students to program and build their own creations using the popular Scratch programming language. With LEGO Spike, students can learn about robotics and coding, as well as apply their critical thinking and problem-solving skills on projects such as:



1. Using the color sensor to detect different colors and then programming the robot to act based on the detected color. For example, the robot could be programmed to follow a line by detecting the contrasting color between the line and the ground.
2. Using the distance sensor to detect obstacles and then programming the robot to avoid them. This could be useful for creating a robot that can navigate a maze or avoid objects in its path.
3. Combining the sensors and motors to create a robot that can perform a specific task. For example, students could create a robot that can pick up and move objects, follow a specific path, or even play a game.

In the robot factory program, students will build several robots that help tackle issues in various fields such as: personal, medicine, manufacturing and automobile.



LEGO Spike Essentials – Amusement Park

The LEGO Spike Essentials Amusement Park is a fun and interactive way for kids to learn about engineering and technology while building and coding their own amusement park-themed LEGO projects. Students will learn about the steps involved in defining a problem, brainstorming solutions, and testing and refining prototypes to improve their ideas. They will also develop observation skills by

gathering information about a problem and modifying a solution to meet the needs of others. In this chapter, students will help a group of story characters spend a day at an amusement park and recount their experiences using relevant facts and descriptive details, helping them to develop their collaborative conversation skills.

The LEGO Spike Essential program combines the familiar and engaging LEGO building system with advanced robotics and coding tools. Students can build and customize their own robots using a wide range of LEGO bricks and other modular components, and then use the included coding software to program their robots to perform a variety of tasks, such as moving, sensing, and responding to stimuli. The

kit also includes a variety of sensors and other components that allow students to enhance their robots' functionality, including a controller, motors, color sensors, and an LED matrix. With the LEGO Spike Prime Amusement Park, students will have the opportunity to use these tools and components to create their own interactive and advanced amusement park-themed projects such as Carousel, Swings, Twirling Teacups, Ferris Wheels and more.



Lessons

Amazing Amusement Park (Lesson 1)



The Fast Lane

SPIKETM Essential

Help Leo enter the amusement park with the Fast Lane!

STEAM, Engineering

30-45 min. Beginner Grades 1-2

Amazing Amusement Park (Lesson 2)



Classic Carousel

SPIKETM Essential

Create a new spinning ride for Sofie to try!

STEAM, Engineering

30-45 min. Beginner Grades 1-2

Amazing Amusement Park (Lesson 3)



The Perfect Swing

SPIKETM Essential

Maria doesn't want a ride that goes too fast. Do you think the swing will be a perfect fit?

STEAM, Engineering

30-45 min. Beginner Grades 1-2

Amazing Amusement Park (Lesson 4)



Snack Stand

SPIKETM Essential

Oh, no! Daniel dropped his snack. Help him get a new one from the snack stand.

STEAM, Engineering

30-45 min. Beginner Grades 1-2

Amazing Amusement Park (Lesson 5)



Twirling Teacups

SPIKETM Essential

Round and round! Sofie and Leo are excited to try this new spinning ride today.

STEAM, Engineering

30-45 min. Beginner Grades 1-2

Amazing Amusement Park (Lesson 6)



The Spinning Ferris Wheel

SPIKETM Essential

The team wants to ride the Ferris Wheel together. How can you help them?

STEAM, Engineering

30-45 min. Beginner Grades 1-2

Amazing Amusement Park (Lesson 7)



The Most Amazing Amusement Park

SPIKETM Essential

It's time to create your very own amusement park ride!

STEAM, Engineering

45-90 min. Beginner Grades 1-2

Amazing Amusement Park (Lesson 8) Hybrid



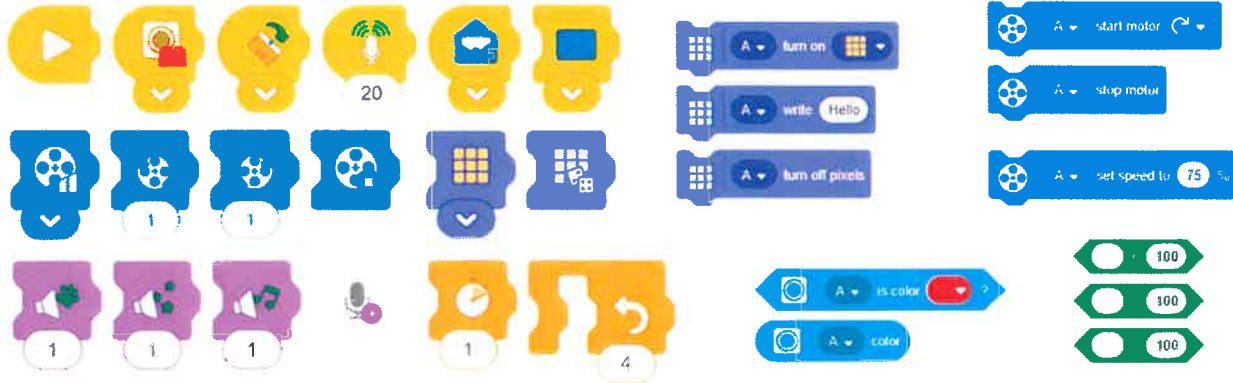
Remix the Ride

SPIKETM Essential

It's time to help get an unfinished ride ready for the amusement park!

STEAM, Engineering

30-45 min. Beginner Grades 1-2



Common coding blocks in Spike Essentials

LEGO Spike Essentials – Quirky Creations

The LEGO Spike Prime Quirky Creations chapter is a fun and interactive way for kids to learn about engineering and technology while building and coding their own unique LEGO projects. In this chapter, students will develop their engineering design skills as they investigate ways of defining problems, brainstorming solutions, and testing and refining prototypes. They will also refine their problem-solving skills as they create a solution to a problem that has constraints and improve on others' ideas, all while enhancing their ability to identify failure points and success criteria when comparing, modifying, and evaluating a solution.



Through building and interacting with various quirky creation-themed projects, such as a see-saw, soccer game, and trash monster machine, students will improve their communication skills as they engage in a range of collaborative discussions about their solutions.

The LEGO Spike Essential program combines the familiar and engaging LEGO building system with advanced robotics and coding tools. Students can build and customize their own robots using a wide range of LEGO bricks and other modular components, and then use the included coding software to program their robots to perform a variety of tasks, such as moving, sensing, and responding to stimuli. The kit also includes a variety of sensors and other components that allow students to enhance their robots' functionality, including a controller, motors, color sensors, and an LED matrix. With the LEGO Spike Prime Quirky Creations chapter, students will have the opportunity to use these tools and components to create their own unique and interactive LEGO projects

Lessons

Quirky Creations (Lesson 1)



Good Morning Machine

SPIKE™ Essential

Help Leo say "good morning" to his friends!

STEAM, Engineering

30-45 min. Beginner Grades 3-5

Quirky Creations (Lesson 2)



Big Little Helper

SPIKE™ Essential

Daniel's locker is overflowing. How can he get all his things home?

STEAM, Engineering

30-45 min. Beginner Grades 3-5

Quirky Creations (Lesson 3)



High-Tech Playground

SPIKE™ Essential

What do you think a high-tech playground would look like? Help Maria design something new for her friends!

STEAM, Engineering

30-45 min. Beginner Grades 3-5

Quirky Creations (Lesson 4)



Trash Monster Machine

SPIKE™ Essential

Help Sofie create a new way for her friends to throw out their trash.

STEAM, Engineering

30-45 min. Beginner Grades 3-5

Quirky Creations (Lesson 5)



Winning Goal

SPIKE™ Essential

How can Maria's soccer game be more like a computer game?

STEAM, Engineering

30-45 min. Beginner Grades 3-5

Quirky Creations (Lesson 6)



Literary Randomizer

SPIKE™ Essential

How can Daniel's literary randomizer make picking a book more exciting?

STEAM, Engineering

30-45 min. Beginner Grades 3-5

Quirky Creations (Lesson 7)



Your School Creation

SPIKE™ Essential

It's time to create your very own invention for the team's classroom!

STEAM, Engineering

45-90 min. Beginner Grades 3-5

Quirky Creations (Lesson 8)



Loads of Laundry

SPIKE™ Essential

Leo needs some help picking up his laundry. What could you build to help him?

STEAM, Engineering

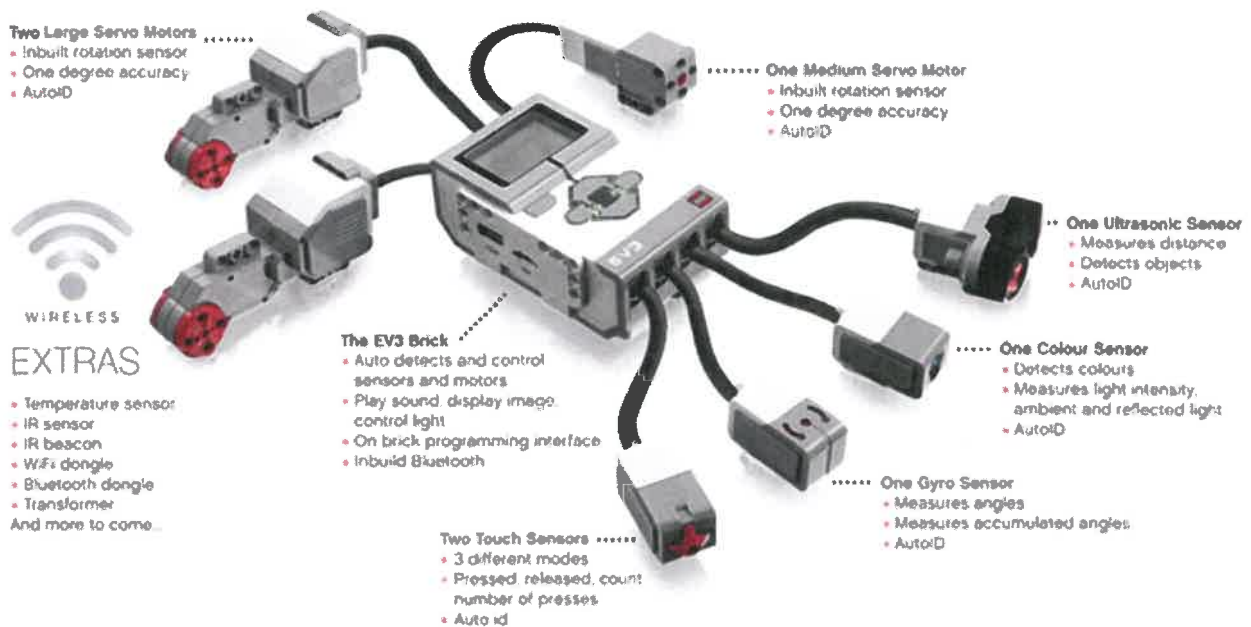
30-45 min. Beginner Grades 3-5

LEGO Mindstorms EV3

The LEGO Mindstorm EV3 course is a hands-on, learning experience that teaches students how to build and program robots using the LEGO Mindstorm EV3 platform. Designed for those with no prior programming experience, this course introduces students to concepts such as coding, looping, decision-making, and flow control as they utilize the visual drag and drop programming interface.



Students will design and build programmable robots using high-quality motors, sensors, gears, wheels, axles, and other technical components. By using hands-on robotics, students will better understand how the technology works in real-world applications and develop a deeper understanding of concepts in science, technology, engineering, and math (STEM). Along the way, they will develop critical thinking, problem-solving, and communication skills. By the end of the course, students will have a solid foundation in robotics and programming, and they will be well-prepared to explore more advanced topics in STEM.

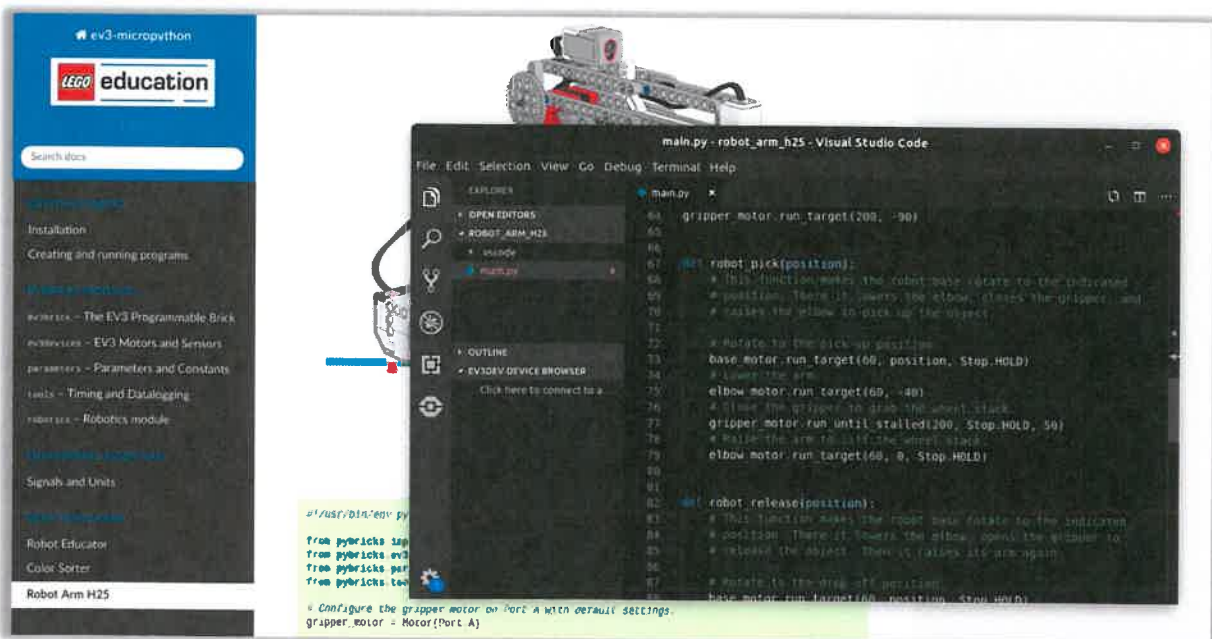


LEGO Mindstorms EV3 – Programming with microPython

The EV3 has a Linux computer at its heart and can be programmed using several other programming systems, such as Python, C++, Java, or EV3 Basic. Running these more advanced programming languages allows students to get their EV3 robot to do things that would not be possible with the standard EV3 programming system, such as making a drawing robot that uses EV3 Python.

In addition to empowering students to write programs that can do things that cannot be achieved with the standard icon-based EV3 programming system, another great reason to learn EV3 Python is that it is a textual programming language, the kind that professional programmers use. Learning a textual programming language (especially Python) can boost career prospects enormously.

By the end of the course, students will have a strong foundation in robotics and will be equipped with professional programming skills, and they will be well-prepared to continue exploring the exciting field of STEM.



Minecraft Education: Programming with Code Builder

Minecraft Education Edition is a course designed to introduce students to the fundamentals of computer programming through the popular game Minecraft. Using block-based coding, students will create and customize their own Minecraft worlds. The Code Builder is a tool in Minecraft that integrates with familiar learn-to-code platforms like Tynker and Microsoft MakeCode, allowing students to easily apply their coding skills to create unique and interactive experiences in Minecraft.



Throughout the course, students will be challenged to think creatively and problem-solve as they design and build their own structures, create interactive games, and program their own Minecraft mods. They will also learn about key computer science concepts such as loops, variables, and conditional statements. Students will have the opportunity to work on real-world coding projects and see the immediate results of their work in their Minecraft worlds. This hands-on approach to coding will not only help students develop their coding skills, but also encourage them to explore their own interests and passions within the world of computer science.

