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WAYS TO EASILY TEACH ROBOTICS TO SCHOOLCHILDREN IN EXTRACURRICULAR ACTIVITIES.

Abstract. This article briefly discusses the orientation of school students to a number of science clubs for their extra knowledge in their spare time. The article details easy ways to teach robotics to kids and recommends several web apps to help teach robotics.

Key words: robotics, program, coding, programming, STEAM, circle, science, creativity, code.

Extracurricular science clubs can be a fantastic way to engage schoolchildren in hands-on learning and foster their interest in STEM (Science, Technology, Engineering, and Mathematics). Here are some types of science clubs that are often appropriate for schoolchildren:

Robotics Club:	Science Olympiad Team:	Young Engineers Club:
Focuses on building and programming robots. Provides a hands-on experience with electronics, sensors, and programming.	Participates in competitions covering various science disciplines. Encourages teamwork and problem-solving skills.	Involves hands-on engineering projects and challenges. Introduces basic engineering principles through creative activities.

Astronomy Club:	Coding Club:	Environmental Science Club:
Explores the wonders of space and astronomy. Includes stargazing sessions, planetarium visits, and discussions.	Teaches computer programming skills through fun projects. Encourages creativity in developing software applications and games.	Focuses on understanding and addressing environmental issues. Involves projects like community cleanups, planting trees, and studying ecosystems.

When establishing or joining a science club, it's essential to consider the age group and interests of the schoolchildren. Additionally, ensuring that the activities are hands-on, engaging, and aligned with the curriculum can enhance the learning experience. Collaborating with teachers, parents, or local STEM professionals can also provide valuable support and resources for the science club.

Teaching robotics to kids can be a fun and rewarding experience. Here are some easy and engaging ways to introduce robotics to kids:

Use Educational Kits:	Start with robotics kits designed for kids, such as LEGO Mindstorms, Ozobot, or Dash and Dot. These kits often come with building blocks and simple programming interfaces.
Storytelling with Robots:	Create stories or scenarios where robots play a role. Encourage kids to design robots that fit into these narratives, fostering creativity and imagination.
Hands-On Building:	Begin with simple robot builds using everyday materials like cardboard, paper cups, and craft supplies. This hands-on approach helps kids understand the basic mechanics of robots.
Introduce Basic Programming:	Use visual programming languages like Scratch or Blockly to teach kids the fundamentals of programming. Many educational robots have user-friendly interfaces that make coding accessible to young learners.

Robotics Challenges:	Pose challenges or tasks that require the use of robots. For example, create a maze for the robot to navigate or design a challenge where the robot must pick up objects.
Robot Art:	Combine robotics with art by creating drawing robots. Kids can build a robot that moves with markers to create unique artworks.
Interactive Games:	Develop games that involve robot interactions. For instance, create a game where robots respond to certain commands or navigate through obstacles to reach a goal.
Robot Dance Party:	Program robots to move and dance in sync with music. This activity combines coding, creativity, and movement.
Collaborative Projects:	Encourage teamwork by assigning group projects. Kids can work together to build and program robots, fostering collaboration and communication skills.
Field Trips and Guest Speakers:	Arrange visits to science centers, robotics labs, or invite guest speakers who work in the robotics field. Real-world exposure can inspire and motivate kids
Robot Storytime:	Read books or stories related to robots and then have discussions or activities that relate to the storyline. This can make learning about robotics more engaging.

Remember to adapt the complexity of the activities based on the age group and skill level of the children. The key is to make the learning experience enjoyable, hands-on, and interactive.

Several software and web apps are designed specifically to teach robotics to kids in a fun and interactive way. Here are some popular ones:

- Scratch: Scratch is a visual programming language developed by MIT. It's great for beginners and allows kids to create interactive stories, games, and animations. Many robotics platforms, like LEGO Mindstorms, have Scratch integration.

- Blockly: Blockly is a visual programming language that uses blocks to represent code. Blockly Games provides a series of educational games that teach programming concepts and can serve as an introduction to robotics programming.

- Tynker: Tynker is an educational platform that teaches coding through interactive games and activities. It offers courses on robotics, including programming robots like Sphero, Minecraft mods, and more.

- Robot Virtual Worlds: Robot Virtual Worlds offers simulated environments where students can program and test their robots virtually. It's a useful tool for learning and experimenting with programming before applying it to physical robots.

- Cognimates: Cognimates is a platform that integrates AI and machine learning into coding education. It allows kids to program and train their own AI models, offering a unique approach to understanding the intersection of robotics and AI.

- Ozobot Blockly: Ozobot Blockly is designed for use with Ozobot robots. Kids can drag and drop blocks to create programs and learn basic coding concepts. It's a good introduction to programming for younger children.

- EV3 Programming: LEGO Mindstorms EV3 robots have their own programming environment. It's suitable for older kids and provides a visual programming interface to control and program LEGO robots.

- MBlock: mBlock is a programming platform that supports both graphical and text-based programming. It's compatible with various robotics kits, including Makeblock's mBot.

- Code.org - CS Discoveries: Code.org offers various courses, including CS Discoveries, which introduces students to computer science concepts. The platform includes hands-on activities and coding challenges.

Before choosing a specific platform, consider the age group, the robotics kit or platform you're using, and the learning objectives. Many of these resources are designed to be user-friendly and engaging for kids, making the process of learning robotics enjoyable and educational.

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