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THE FUTURE IS NOW

Course Outline

Robotics and Coding II

Age : 9-14, 10-14 years old

Introduction

\"The STEAM Robotic and Coding II Lessons have been developed to engage and motivate children in the early making, piquing their interest in learning design, technology, and engineering. LEGO elements with intuitive block-based coding and standards-aligned lesson plans that make STEAM learning fun and accessible. LEGO bricks, sensors, and motors help students of all levels develop concrete and tangible understanding of abstract concepts .\n\nThe lesson plans are designed to build The students' confidence to define problems, ask questions, and design their solutions. The lessons come in a range of challenge levels and cover science, engineering, maker, and computational thinking. students to practice their STEAM and robotics skills in a 'near real-world' environment. Easily adaptable to fit any learning environment.\n\nThe teacher's role in these lessons is to provide children with the tools and necessary freedom to connect with and define a problem, make a solution, and share what they have made. Use your creativity to adapt these activities to suit the needs of your children plus giving challenges that supposed to be given to them.\"

Seq	Lesson	Objective
1	Prevent Flooding	- Explore various ways that precipitation can change over seasons and how water can cause damage if it is not controlled. - Create and program a floodgate to control the water level of a river.
2	Drop and Rescue	- Explore different weather-related hazards that can influence the survival of a population in your region. - Create and program a device to relocate people and animals in a safe, easy-to-use, and respectful way or efficiently drop materials into an area.

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Seq	Lesson	Objective
3	Sort to Recycle	- Explore how better sorting methods for recycling can aid in cutting back the amount of waste that is discarded. - Create and program a device that will sort recyclables according to their size and shape.
4	Predator and Prey	- Explore the different strategies animals use to catch their prey or to escape from their predators. - Create and program a predator or prey in order to explore the relationship between them.
5	Animal Expression	- Explore different ways that animals communicate, including the unique methods of animals and insects that light up in the dark. - Create and program an animal or insect to illustrate how it socially interacts with others of its species.
6	Extreme Habitats	- Explore different environments around the globe and across time, and describe what they might tell us about the lifestyle and success of a species. - Create and program an animal or reptile that could have lived in a particular habitat.
7	Space Exploration	- Explore actual missions of rovers an imagine future possibilities. - Create and program a space rover to achieve a specific task, such as: move in and out of a crater, collect a rock sample, drill a hole in the ground.

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8	Hazard Alarm	- Explore different weather-related hazards that everyone needs to be aware of, like tsunamis, and hurricanes, and the warning systems. - Create and program a device that could warn people to take action because dangerous weather is coming.
9	Cleaning the Ocean	- Explore why it is important to take care of the oceans and keep them clean of plastic debris. - Create and program a device that can help physically collect plastics of certain types and sizes from the ocean.
10	Wildlife Crossing	- Explore the effect of road construction on animals and plants and imagine possibilities to reduce its impact. - Create and program a device to allow animals to cross hazardous areas.
11	Moving Materials	- Explore different ways material is transported and assembled. - Create and program a device that will help you carry and/or assemble differently sized objects, considering safety, efficiency, and storage.
12	Moon Base	- Explore why and how we could set up a base on the moon. - Create and program a robot to move on the surface of the moon. - Test your code to assemble the moon base at a specific location
13	Grabbing Objects	- Explore how prosthetic designs help people with disabilities. - Create and program a prosthetic hand to move objects around. - Test your program to make the hand as functional as possible

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14	Send Messages	- Explore how messages can be transferred from one place to another. - Create and program a joystick that will allow you to send messages by using codes
15	Volcano Alert	- Explore the different ways that scientists monitor volcanic activity. - Create and program an alarm to indicate the different stages of volcanic activity - Test your program and how well it indicates these different stages.
16	Inspection	- Explore how robots can be used to inspect narrow spaces. - Create and program a robot to move on a surface and avoid obstacles. - Test your program to make sure that it can detect walls, holes, a cave, and objects
17	Emotional Design	- Explore how robots can create positive emotions in everyday situations. - Build and program a robot that interacts with people in order to create positive emotions
18	City Safety	- Explore the different safety rules that are linked to city transportation and describe how some of them can be improved - Create and program a device to improve city safety. - Test your program and show how safety has been improved with your device