

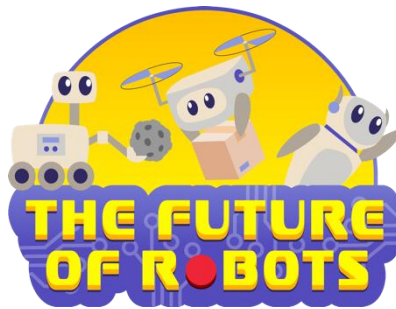


WORLD ROBOT OLYMPIAD™

Future Innovators

Season Challenge

Season 2025



The Future of Robots

AGE GROUPS ELEMENTARY, JUNIOR AND SENIOR

Official Game Rules for the WRO International Final. Version: December 1st 2024
(Note: Rules for local WRO events may vary!)

WRO International Premium Partner



WRO International Gold Partners



The Future of Robots

INTRODUCTION

The WRO Future Innovators category challenges your team to imagine and create the robotic solutions that will shape the world of tomorrow. This year's theme, "The Future of Robots," invites you to explore the way robotics can help solve global challenges and improve our lives.

Diving into The Future of Robots is a journey into the unknown, where innovation meets the challenges of tomorrow. From robots reshaping our future cities, to robots driving the expansion of life across the universe and to AI-enabled robots improving all aspects of our life. The possibilities are endless. Through The Future of Robots, we can shape a future that holds solutions, drives progress, and brings a better tomorrow for mankind.

This document outlines three broad areas within the main theme of "The Future of Robots." It provides examples of possible solutions. Your team is encouraged to explore innovative robotics solutions within any of these areas. But you can also propose entirely original ideas that align with the theme.

Your Robot's Mission:

In 2025 your Future Innovators team has the task to come up with a robotic solution which helps in designing future cities, with life in space, or that combines AI with robotics to improve our lives. Once you've found a problem to solve, you need to design a robot that can help. This means thinking about what your **robotic solution** will look like, what it will do, and how it will work.

Your team will need to present your innovative robotic solution in a compelling manner. You will need to demonstrate your robot's capabilities and explain its potential impact. This document gives you a description of each sub-theme and some ideas. To spark your creativity, we give a few examples for each sub-theme. But you can also come with a different idea for a robotic solution for the future or even combine sub-themes.

More info about requirements in the General Rules:

Don't forget to study the general rules for the specifics about this category. Make sure your robotic solution is:

"A robotic device that has several mechanisms, sensors and actuators and is operated with one or more controller(s). A robotic device should do more than a machine that is only repeating a certain workflow and should make autonomous decisions." (5.1.1 General Rules.)

Area 1. Robots Organizing Future Cities

As cities grow faster, innovative robotic solutions are needed to manage complex environments of the future. In this sub-theme you will research, design, and develop robotic solutions capable of optimizing various aspects of city life.

- **Robots in Urban Transportation**

Cities are getting bigger and more crowded, and traffic is becoming a big problem. We need new ways to get around that are safe and don't harm the environment. We already have self-driving cars, buses, and even flying drones that deliver packages. Your robotic solutions can go one step further by improving existing systems. You can also create entirely new solutions by improving public transportation or guiding autonomous vehicle navigation, all aimed at reducing traffic and increasing transportation efficiency.

- **Robots Helping to Save Resources**

Robots can bring new ideas to help cities use their resources better. Imagine robots that check how much energy buildings use, find leaks in water pipes, or make sure buildings stay safe. Your robot solution could help cities save energy and protect the environment. By automating tasks, looking at data, and giving quick updates, robots can help cities manage resources more wisely and create a cleaner, healthier future.

Area 2. Robots Supporting Life in Space

Humans aim to explore space, and robots will be important for helping us live and work beyond Earth. If you choose this sub-theme, you can explore how robots can do different jobs in the challenging environment of space.

- **Robots building Habitats & Finding Resources**

Robots could help build and maintain structures on the moon or other planets. Or help to maintain space objects. Your robotic system could help create a safe and habitable environment for humans. Robots could also help with mining resources, making materials, and producing energy that can support life in space. This will mean that space explorers will not rely on supplies from Earth so much.

- **Robots Supporting Interstellar Travel**

Robots will play a crucial role in handling navigation, spacecraft maintenance, and life support in long journeys through space. They can repair systems, monitor crew health, and harvest energy from space. Your robotic system can help humans to focus on exploration or take time to enjoy some entertainment.

Area 3. AI Enabling Robots to Improve Life

Combining Artificial Intelligence (AI) and robotics gives us amazing chances to improve human life in many ways. If you choose this sub-theme you should keep in mind that your project should focus on building a robotic system that can physically interact with the world around it, it's not just about creating software.

- **AI Enabled Robots in Manufacturing & Industry**

AI-driven robots could adapt to workers in real-time, adjusting tasks based on their workflow, skill level, or even mood. They could also help analysing data to suggest innovative solutions or improvements. Mood-responsive cobots might step in during stressful moments, offering support or handling challenging tasks. By focusing on improving life for workers, your AI-powered robotics system will make things safer, more interesting, and help things run faster and better.

- **AI in Daily Living**

AI-powered robots could seamlessly blend into everyday life, adapting to personal needs and preferences. Imagine AI learning buddies that turn homework into interactive games, making learning more engaging and fun. Virtual pets could evolve based on your personality. Your robotics system could focus on making daily life more enjoyable, personalized, and creative.

The Future Innovators category gives you the chance to be a part of shaping tomorrow. By working on real-world problems and coming up with creative robotic solutions, you will learn important skills and help make the world a better place.

Remember, WRO encourages you to also think about the UN Sustainable Development Goals your robotic solution could support. This way, your robot can have an even bigger impact, helping people and the planet. You can check out all the United Nations (UN) Sustainable Development Goals (SDGs) at the following link:

<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>