



## Future Innovators

Season Challenge

Season 2023



# CONNECTING THE WORLD

## AGE GROUPS ELEMENTARY, JUNIOR AND SENIOR

Official Game Rules for the WRO International Final. Version: January 15th 2023

*(Note: Rules for local WRO events may vary!)*

WRO International Premium Partner



# Connecting the World

## INTRODUCTION

This WRO 2023 season Panama is Host Country of the International Final, and we focus on how robots can help connect the world in a sustainable way.

Ever since the Panama Canal was completed, Panama has been a central point for world-wide maritime logistics. 144 shipping routes cross through the Panama Canal connecting 160 countries. Around 14,000 big ships use the Canal each year. Panama is also becoming an important part of the world-wide internet cable network. Our daily use of digital technology depends heavily on infrastructure like cables under the oceans, data centres, satellites, and mobile connections. Sustainability is becoming increasingly important in both shipment and tech industry. Robots can help both shipping and digital technology infrastructure to work more safely and efficiently.

In 2023 teams will learn about the importance of logistics, the digital technology physical infrastructure and sustainability for our global connections in life and industry and about how robotics systems play a role in this.

### Your robot mission:

For the 2023 WRO Future Innovators category, **teams have the task to develop a robot model which helps with connecting people and places in a sustainable way.** Teams may choose one of the two areas (1, 2) to work on, but they can also choose to work on a project that focuses on a combination of the two areas.



### 1. Connecting over water

Seas, rivers and canals have been very important for transporting goods and people for thousands of years and they still play a very important role. This is a big reason why many cities are close to sea or a river. Many things you find in the shop\* have been transported over water.

Shipping over water is efficient, but there are still many things that can be improved. Ships are getting bigger, and accidents can have serious consequences. Ships can also accidentally break underwater cables or collide with offshore plants. Some ships are also still illegally dumping waste in the ocean or rivers, which is hard to track. Shipping routes or locks in rivers can also have a negative effect on underwater life. New technologies can help, and robots can play an important role in the future of shipping by doing tasks that are normally done by humans or by improving processes.

**We are looking for robotic solutions that help to make shipping over water more efficient, more safe, and more environmentally friendly.**

*\* The OECD states that 90% of traded goods have been transported over water.*



## 2. Connecting with Information Technology (IT)

In our modern life we use more and more digital technologies. We use our mobile phones for social media and for watching videos online. Shops use automated data to know what they have sold and what they should order. You can even track ships and airplanes online and see where they are in the world.

All this data we are sending and receiving needs to be transported worldwide. There is already a lot of infrastructure available. But this infrastructure needs constant maintenance and improvement. There are also questions related to the energy consumption of data centres and environmental impact. And there are areas where people do not have internet access yet.

**We are looking for robotic solutions that help to setup and maintain sustainable IT infrastructure around the world to make us able to connect and communicate.**

*For the sub-themes mentioned above (Connecting over Water and Connecting with Information Technology) you can find a connection and inspiration using the Sustainable Development Goals.*

*SDG#9 (Industry Innovation Infrastructure) and SDG#14 (Life under water) are most obviously related to the theme; however, there are multiple goals that support the theme, depending on your project idea: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>*