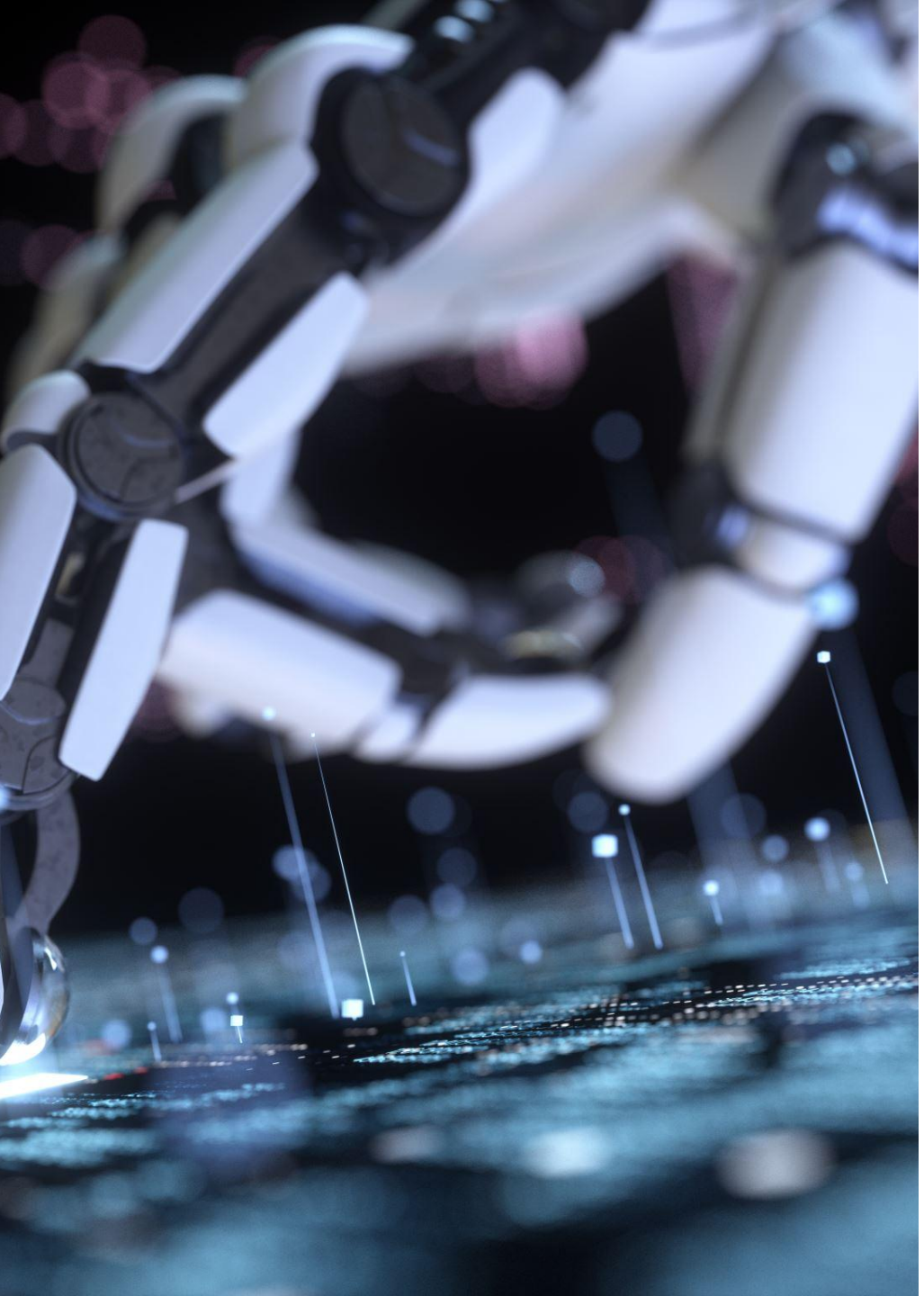


Reef Rescue: Coding for Coral Conservation

NANCY RUBIN AND TIFFANY MCCULLOUGH



Lesson Objectives

- Goal: Capture students' interest by introducing the exciting concept of programming a VR Ocean Cleaning Robot.
- **Main Objective: Use the VEXcode platform to code a VR Ocean Cleaning Robot**
- **Key Learning Outcomes:**
  - **Understand basic programming concepts,**
  - **Use of sensors,**
  - **The impact of automation on environmental conservation**

Career Connections



Research Mentor: **Dr. Ben Nye**, Director of Learning Sciences at USC-ICT. Dr. Nye's research interest is identifying best practices in advanced learning technology.



STEM Careers related to this project include:

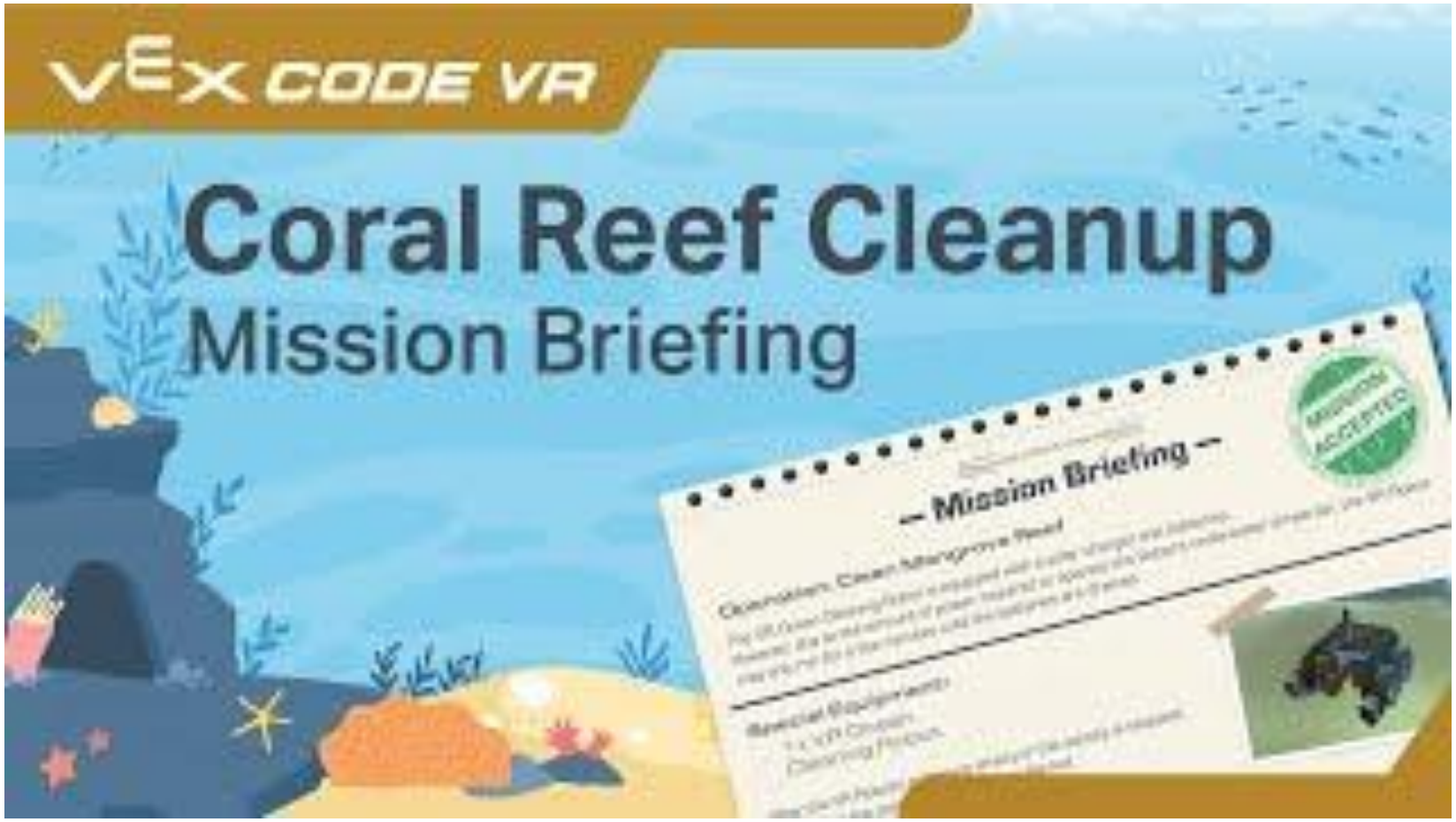
- Robotics Engineer
- Marine Biologist
- Environmental Engineer
- Oceanographer

Engagement

Introduce	**Introduce mission: Code a VR Ocean Cleaning Robot** **Students will step into the shoes of an environmental hero, learning essential programming concepts and the power of sensors, all while making a positive impact on our planet.**
Show	**Show videos about coral reefs and pollution**
Discuss	**Discuss the importance of cleaning coral reefs and technology's role**

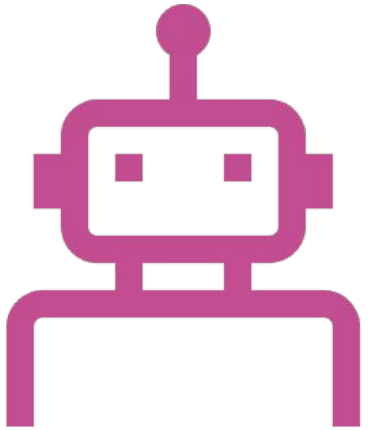


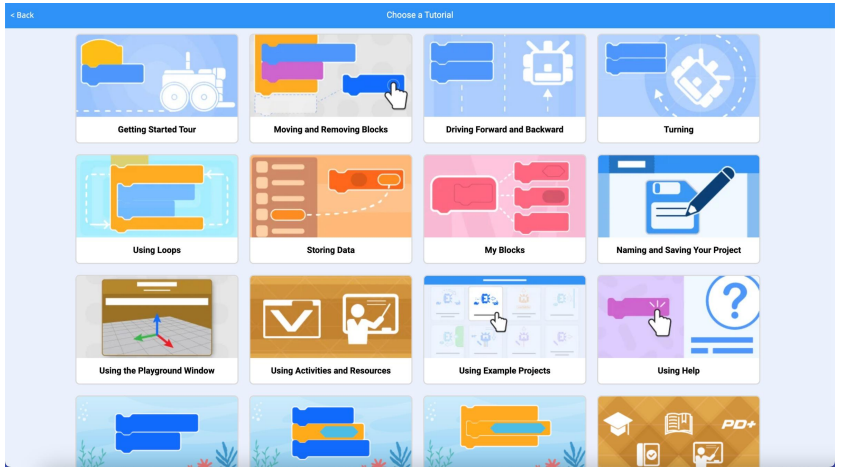
Mission Briefing for VEXcode VR Coral Reef Cleanup by VEX Robotics



Exploration

- **Exploring VEXcode VR Platform**
  - Dive into the VEXcode VR platform
  - Navigate intuitive interfaces and discover basic programming
  - See how simple commands bring your robot to life
    - Getting Started: Moving and Removing Blocks
    - Driving Forward and Backward
    - Turning

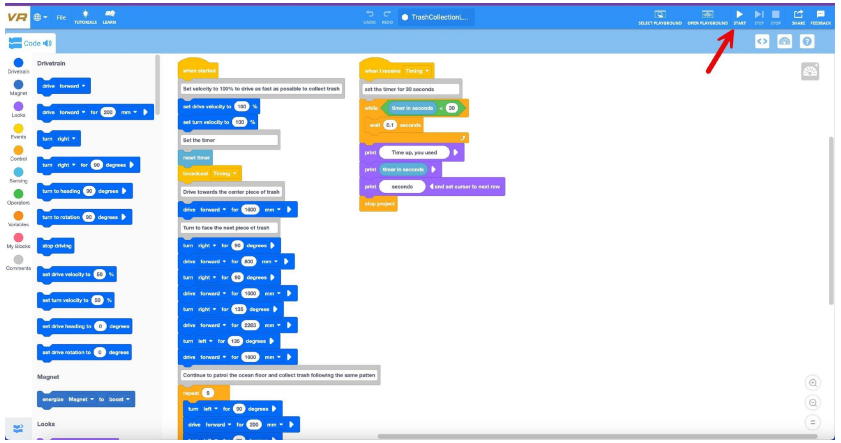




Elaborate



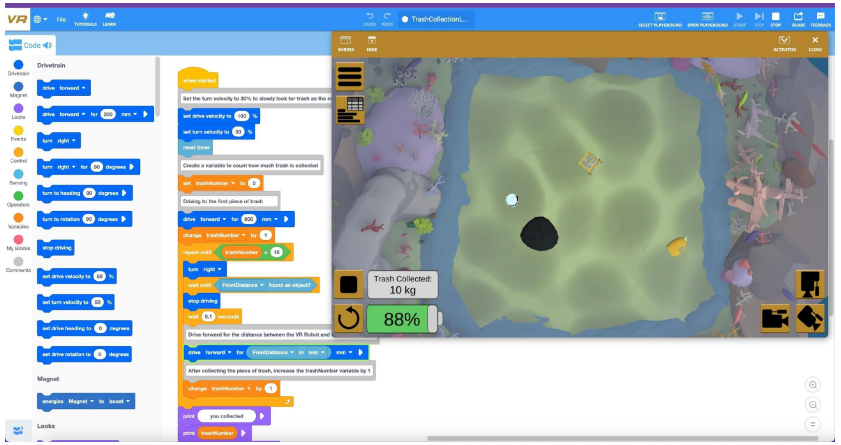
- **Complete the Coral Reef Cleanup Level 1 Tutorial.**
  - Use drive forward, turning, and stopping blocks to maximize trash collection before the battery drains or time runs out.
    - Create an algorithm to collect as much trash as possible in 30 seconds.
    - Sequence behaviors to drive the VR Robot for optimal trash collection.
    - Utilize the timer and a conditional loop to control the robot's actions for 30 seconds.



Elaborate



- **Complete the Coral Reef Cleanup Level 2 Tutorial, which uses sensors and control blocks.**
  - Create an algorithm to collect approximately 15 pieces of trash as quickly as possible.
  - Use the Front Distance Sensor to navigate the robot.
  - Create a variable to store the number of pieces of trash collected.
  - Use the variable and a conditional loop to control the robot to collect approximately 15 pieces of trash.



Evaluation

- Evaluate students based on their robot's performance (how much trash they collect and how quickly they collect it),
- AND their ability to explain their code
- Wrap Up
  - Students should reflect on what they learned about coding, the use of sensors, and the impact of their work on environmental conservation.

