

Challenges for AdventureBot

Challenge – Recipes for Robots

A program allows humans to give specific instructions to robots. Create a program in RoboScratch that uses the following elements:

- At least ten actions or movements
- A mix of “wait” and regular actions or sounds
- The robot must not remain in the same starting location
- The robot must take two different photos

Students will learn to...

- Program linear sequences
- Implement immediate commands
- Implement delayed commands
- Move the robot
- Reposition the robot
- Output audio
- Activate the camera

Recommended Lessons

The Robot Program Episode 071: History of Programming

The Robot Program Episode 020: Detect Face and Wave – RoboScratch

Challenge – Laughs and Limericks

Robots can be programmed to speak with a similar cadence and sound to humans. This allows for better quality interactions between humans and robots.

Program the robot to recite a family-friendly joke or poem. The chosen words should involve at least three lines of spoken text. Consider how a human would pause while reciting the text. For an advanced challenge, trigger the recitation using a speech command.

Students will learn to...

- Code linear, sequential programs using Blockly
- Analyze and predict speech patterns
- Trigger and time audio output
- Integrate pause commands where necessary in the code design
- Adjust speech recognition confidence intervals

Recommended Lessons

The Robot Program Episode 043: Create a Scene Using RoboScratch

The Robot Program Episode 044: Create a Scene Using Blockly

The Robot Program Episode 045: Control Robot with Speech Recognition

Challenge – Obstacle Mission

Robots can enter situations that might be too dangerous or difficult for humans. They can navigate over rough terrain and around obstacles.

Travel through an obstacle course or through a maze within a specified time limit first using speech recognition to control movement, and then by creating a Blockly program.

Tip: Remember to calculate how many seconds it takes the robot to complete a 90-degree turn to the right or left.

Tip: Make a note of how far the robot moves forward in a single second.

Students will learn to...

- Adjust speech recognition confidence intervals
- Trigger movement through audio input
- Calculate and analyze robot movements
- Build a series of movement commands
- Navigate turns and obstacles

Recommended Lessons

The Robot Program Episode 045: Control Robot with Speech Recognition

The Robot Program Episode 059: Navigating Using Blockly

Challenge – Secret Message Delivery

Robots can process complex information such as QR codes and react to the provided information.

Generate a secret message in a QR code and swap with someone else. Program your robot to decode the new message and then read it out loud, starting with the phrase “The secret code is...”

Students will learn to...

- Store information in a QR code
- Detect a QR code
- Read information from a variable
- Append text to a string
- Output audio

Recommended Lessons

The Robot Program Episode 052: Using QR Codes

Challenge – So You Think Your Robot Can Dance

Robotics are used in fine arts as a part of performance, animation, and theatrics.

Design a custom robot dance routine to a favorite piece of music. The choreography must be at least one minute in length and use a minimum of five different positions. For an advanced challenge, create one custom action that can be incorporated into the choreography.

Once your dance is complete, create and share a mobile interface that allows anyone to showcase the dance routine.

Tip: Search for free music using www.ninety9lives.com.

Tip: Start with an existing mobile interface to see how buttons can be used to execute routines.

Students will learn to...

- Synchronize servo movements to music
- Save a new routine in the Soundboard control
- Transition between servo positions
- Advanced: build actions through still frames
- Advanced: calculate servo angles and positioning
- Modify or build a mobile app interface
- Save and export a mobile app to the EZ-Cloud
- Access apps from the EZ-Cloud community

Recommended Lessons

The Robot Program Episode 034: Teaching JD Humanoid to Dance

The Robot Program Episode 037: Teaching JD Humanoid to Dab!

The Robot Program Episode 053: Creating a Mobile App