

Robotics Challenge Manual

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What is the challenge? What are the required project specifications?

Teams must have at least four (4) student members, and individual schools are limited to three (3) teams maximum. Teams must design, build, and test a prototype device that addresses the challenge prompt for the current year and meets the required specifications below.

2023 Challenge Prompt: “COMBAT THE EFFECTS OF CLIMATE CHANGE”

All projects must meet the following specifications to be eligible for awards:

- All projects must utilize, at minimum, **one microcontroller, one sensor, and one output**. *These are included in the kit provided by the MOST. The use of additional components is permitted, but not required.*
- All projects must be accompanied by a **poster or fair board** that demonstrates how teams used the Engineering Design Process to design, build, and test their projects. *Fair boards can be provided by the MOST upon request to eventcoordinator@most.org.*

How are projects evaluated and prizes awarded?

Four awards (1st, 2nd, 3rd, and 4th Place) will be given in two divisions (Junior, Grades 4-8 and Senior, Grades 9-12), determined by the **highest average subjective judging score**. Judges will evaluate projects in a science-fair style judging session on three metrics: **technical proficiency, design creativity/process, and student comprehension of STEM concepts**.

An additional award will also be given in each of the following categories:

- ‘Fan Favorite’ Project
- Best Team Spirit/Enthusiasm

What is included in the provided kit?

Kits for up to 40 teams (30 Junior, 10 Senior) are available for pick-up on a first-registered, first-served basis by arrangement with eventcoordinator@most.org. Teams must have at least four (4) student members, and individual schools are limited to three (3) teams maximum. The use of additional components **is** permitted, but is not required.

JUNIOR LEVEL KIT (30 AVAILABLE)	SENIOR LEVEL KIT (10 AVAILABLE)
Stepper Motor	Mega 2560 Controller Board
Servo Motor	LCD1602 Module (w/pin header)
IR Receiver Module	RFID Module
5V Relay	RC522
Uno R3 Controller Boars	Prototype Expansion Module
LCD 1602 Module (w/pin header)	Power Supply Module
Stepper Motor Driver	GY-521 Module
Power Supply Module	Servo Motor
Prototype Expansion Module	Stepper Motor Driver Module

<p>4 digit 7 Segment Display 1 digit 7 Segment Display Tilt Ball Switch Fan Blade and 3-6V DC Motor (w/wire) Joystick Module Temp and Humidity Module Ultrasonic Sensor Button (5) Potentiometer Passive Buzzer Active Buzzer 9V Battery w/snap-on Connector Remote USB Cable Female to Male Dupont Wire (10) Breadboard Jumper Wire (65) Shift Register IC 16-pin Motor Driver IC 830 Tie-Points Breadboard Thermistor Diode Rectifier (2) LED (25) Photoresistor (Photocell) (2) Resistor (120) RGB (2) NPN Transistor (2) AWG Wire</p>	<p>Remote Control MAX7219 Module 1 Digit 7 Segment Display 4 digit 7 Segment Display 16-pin Motor Driver IC Shift Register IC Active Buzzwe Passive Buzzer Potentiometer 10k (2) PIR Motion Sensor Module Sound Sensor Module Water Level Detection Module Ultrasonic Sensor RTC Module Rotary Encoder Module Temp and Humidity Module IR Receiver Module Joystick Module 5V Relay Fan Blade and 3-6V Motor Membrane Switch Module 830 Tie-Points Breadboard 9V Battery w/snap-on Connector Clip 9V1A Adapter Breadboard Jumper Wire (65) Female to Male Dupont Wire (20) USB Cable Resistor (120) Thermistor Diode Rectifier (5) 100uF Electrotytic Capacitor (2) 10uF Electrotytic Capacitor (2) NPN Transistor (5) NPN Transistor (5) Tilt Ball Switch Button (5) Red LED (5) Yellow LED (5) Blue LED (5) Green LED (5) White LED (5) RGB LED (2) 104pF Ceramic Capacitor (5) 22pF Ceramic Capacitor (5) Photoresistor (Photocell) (2) AWG Wire</p>
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Tips for Robotics Project Construction

Be sure you understand the challenge rules when designing your prototype. Revisit the earlier sections of this manual that define the challenge prompt and judging criteria for the project.

[Learning Resources by Topic are Available Here](#)