

CNY Robotics Challenge Manual & Instructions

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A. Introduction to the Challenge

The CNY Robotics Challenge is an annual competition open to Junior Level (Grades 4-8) and Senior Level (Grades 9-12) teams. 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. Teams will share and demonstrate their completed projects on event day to compete for awards from our community judges.

2025 Challenge Prompt: “DESIGN A DEVICE THAT CAN HELP ON A FARM”

B. Getting Started

Registration and Kit Collection: Register your team to receive a free Robotics Kit. Schedule your pickup by reaching out to eventcoordinator@most.org.

C. Robotics Kit Contents

Each registered team can request a free Robotics Kit containing the following materials:

JUNIOR LEVEL KIT (30 AVAILABLE)



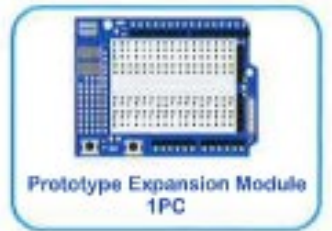
**UNO R3 Controller Board
1PC**



**LCD1602 Module
(with pin header)
1PC**



**RC522 RFID Module
1PC**



**Prototype Expansion Module
1PC**



**HC-SR501 PIR Motion
Sensor Module
1PC**



**Sound Sensor Module
1PC**



**Water Level Detection
Sensor Module
1PC**



**Ultrasonic Sensor
1PC**



**Remote Control
1PC**



**MAX7219 Module
1PC**



**1 Digit 7-Segment Display
1PC**



**4 Digit 7-Segment Display
1PC**



**5V Relay
1PC**



**Fan Blade and 3-6V Motor
1PC**



**Membrane Switch Module
1PC**



**830 Tie-Points Breadboard
1PC**



**Resistor
120PCS**



**Thermistor
1PC**



**Diode Rectifier
5PCS**



**100uF Electrolytic Capacitor
2PCS**



**Red LED
5PCS**



**Yellow LED
5PCS**



**Blue LED
5PCS**



**Green LED
5PCS**



Power Supply Module
1PC



GY-521 Module
1PC



Servo Motor SG90
1PC



Stepper Motor
1PC



ULN2003 Stepper Motor
Driver Module
1PC



DS1307 RTC Module
1PC



Rotary Encoder Module
1PC



DHT11 Temperature and
Humidity Module
1PC



IR Receiver Module
1PC



Joystick Module
1PC



L293D
1PC



74HC595 IC
1PC



Active Buzzer
1PC



Passive Buzzer
1PC



Potentiometer 10K
2PCS



9V Battery with Snap-on
Connector Clip
1PC



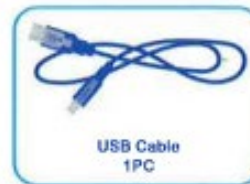
9V1A Adapter
1PC



Breadboard Jumper Wire
65PCS



Female-to-Male Dupont Wire
20PCS



USB Cable
1PC



10uF Electrolytic Capacitor
2PCS



NPN Transistor PN2222
5PCS



NPN Transistor S8050
5PCS



Tilt Ball Switch
1PC



Button
5PCS



White LED
5PCS



RGB LED
2PCS



104pF Ceramic Capacitor
5PCS



22pF Ceramic Capacitor
5PCS



Photoresistor(Photocell)
2PCS

SENIOR LEVEL KIT (10 AVAILABLE)



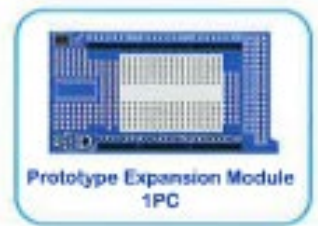
**MEGA Controller Board
1PC**



**LCD1602 Module
(with pin header)
1PC**



**RC522 RFID Module
1PC**



**Prototype Expansion Module
1PC**



**HC-SR501 PIR Motion
Sensor Module
1PC**



**Sound Sensor Module
1PC**



**Water Level Detection
Sensor Module
1PC**



**Ultrasonic Sensor
1PC**



**Remote Control
1PC**



**MAX7219 Module
1PC**



**1 Digit 7-Segment Display
1PC**



**4 Digit 7-Segment Display
1PC**



**5V Relay
1PC**



**Fan Blade and 3-6V Motor
1PC**



**Membrane Switch Module
1PC**



**830 Tie-Points Breadboard
1PC**



**Resistor
120PCS**



**Thermistor
1PC**



**Diode Rectifier
5PCS**



**100uF Electrolytic Capacitor
2PCS**



**Red LED
5PCS**



**Yellow LED
5PCS**



**Blue LED
5PCS**



**Green LED
5PCS**



D. Robot Specifications and Construction

Note: Robots that do not follow these specifications can still be tested but are not eligible for awards.

D1. Design Constraints

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.

D2. Equipment & Installation Guides

- Junior Kit: [Elegoo Super Starter Kit for UNO](#)
- Senior Kit: [The Most Complete Starter Kit for MEGA](#)

E. Testing and Evaluation Procedures

E1. Evaluation Criteria

Judges will evaluate projects in a science-fair style judging session on three metrics:

1. Technical Proficiency
2. Design Creativity/Process
3. Student Comprehension of STEM Concepts

F. Awards and Recognition

F1. Awards

The following prizes will be awarded at the conclusion of the event:

- Top Overall Score, 1st – 4th Place (Senior Division)
- Top Overall Score, 1st – 4th Place (Junior Division)
- “Fan Favorite” Project (Senior Division)
- “Fan Favorite” Project (Junior Division)
- Team Spirit

G. Resources and Information

G1. For Students

<https://projecthub.arduino.cc/>

<https://learn.adafruit.com/>

G2. For Teachers

<https://www.arduino.cc/education/>

H. Vocabulary List

- **Capacitor: Device that stores electrical energy**
- **Resistor: Device that adds electrical resistance to the flow of current through a circuit**
- **Thermistor: Type of resistor where the resistance varies with temperature**
- **Transistor: Three terminal electrical component that controls voltage and current like a switch**
- **Photoresistor: Type of resistor where the resistance varies with light intensity**
- **Ultrasonic: Frequencies greater than 20 kHz**
- **Potentiometer: A variable resistor with three connection points where the resistance can be manually adjusted via a knob or slider.**
- **Motor: Device that converts electrical energy into mechanical energy usually in the form of motion**
- **RFID: Radio Frequency Identification**
- **RTC: Real Time Clock**
- **LED: Light emitting diode**