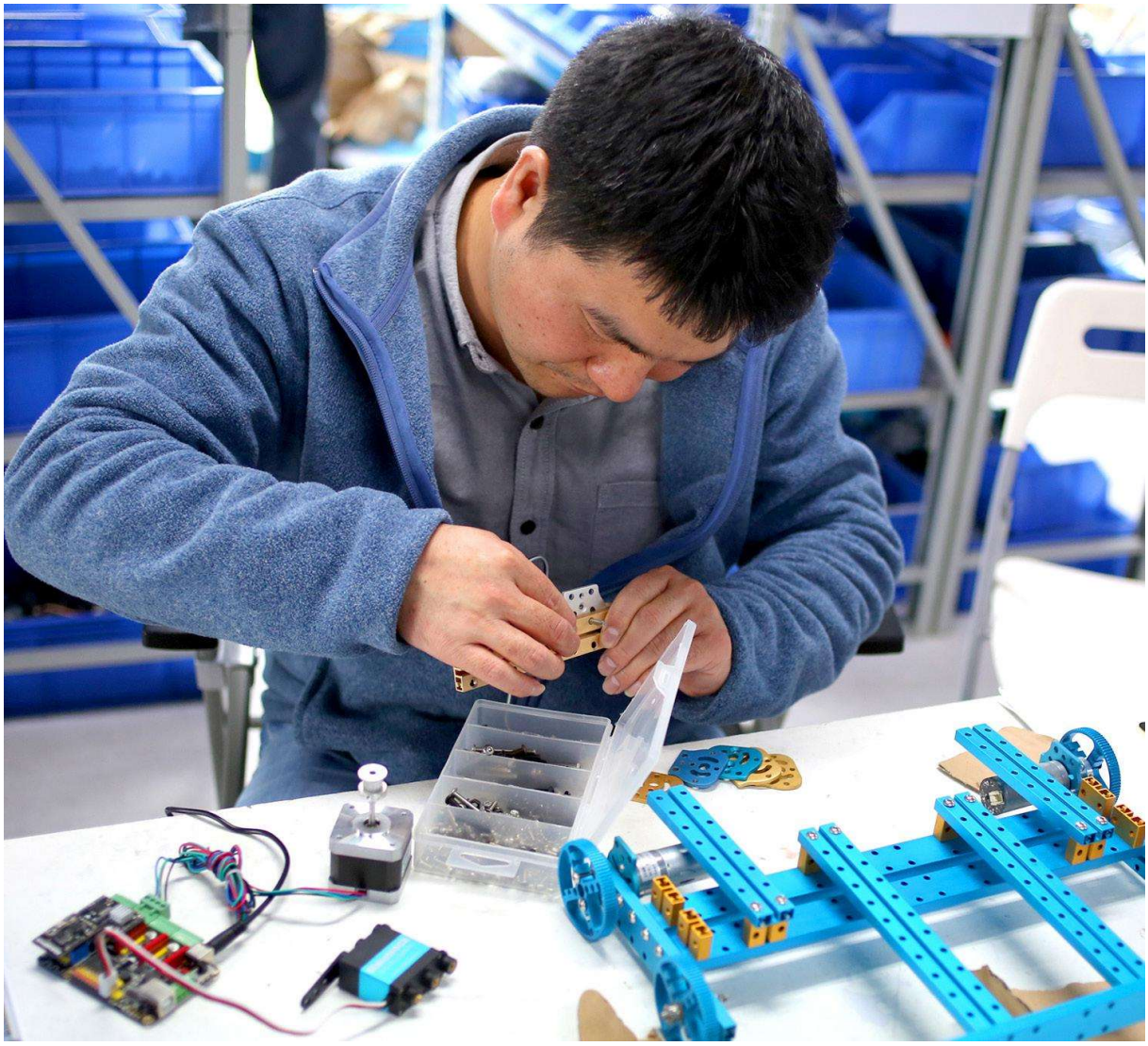
Encyclopedia of Terms

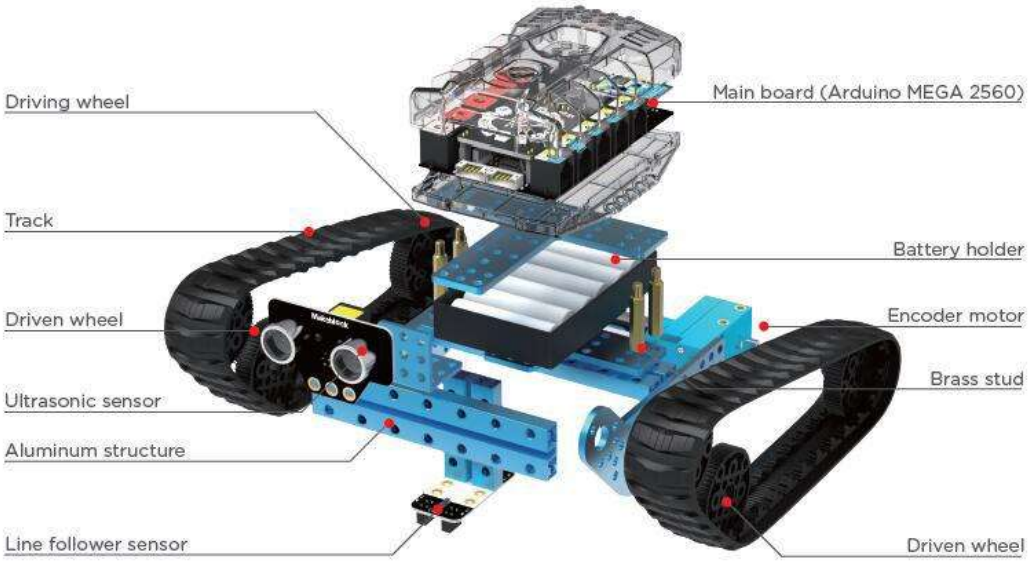


Makers are a group of people who love technology and practice, who have fun in sharing technology and discussing idea. MakerSpace (also referred to as Hackerspace) is a tie to link individual maker, as well as a platform for the makers to practice, create, exchange, and share. The popularization of MakerSpace is of great significance to develop the maker campaign.

Makers mainly focus on engineering field, such as electronics, machinery, robots, 3D printing, etc. They are familiar with the digital tools (e.g. CNC, laser engraver) and can even apply those techniques to the casting and handicraft works. They are good at developing new technologies, encouraging innovations and prototyping. Makers are turning their ideas into real works and are always keen to combine knowledge and practice.

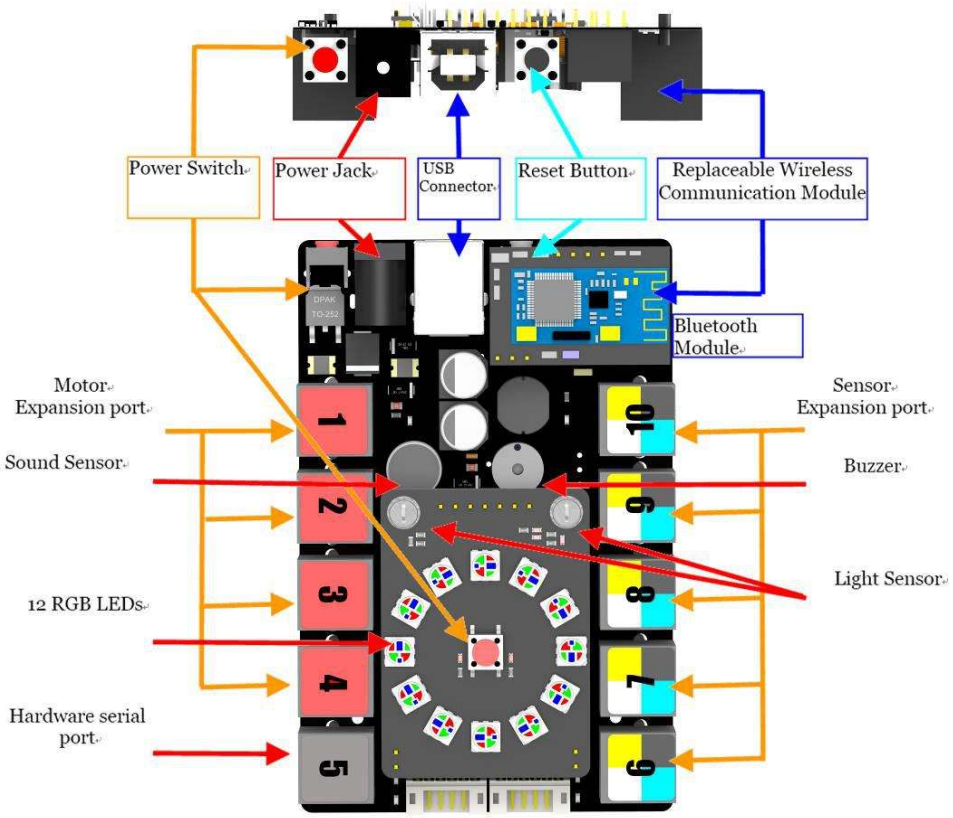
Getting Prepared

mBot Ranger Robot Kit



Learning Tasks

Learning Task 1 - Get to Know Me Auriga (the mainboard of mBot Ranger)



Based on Arduino Mega 2560, Me Auriga includes 10 easy-to-use RJ25 ports and 12 RGB LEDs. It integrates various sensors, such as gyro sensor, temperature sensor, light sensor and sound sensor.

mBot Ranger Robot Kit also comes with two additional sensors: an ultrasonic sensor and a line follower sensor. These two sensors can be connected to the expansion ports of Me Auriga via RJ25 port, allowing mBot Ranger to move freely in various scenes.

The Bluetooth module in this kit enables you to connect Ranger with smartphones, tablets or computers. You can also add a 2.4G module to realize wireless control over mBot Ranger, which is very suitable for teaching in classroom.

Power Switch: turn on/off the power supply

Power Jack: can be connected with an external 6-12V power supply

USB Connector: can be used for data communication with computer or downloading programs from computer

Reset Button: restart the program on mainboard

Wireless Communication Module: can be used for data communication with computer or be connected with smart devices e.g. smart phones, tablets

Motor Expansion Port: can be connected with all kinds of motors, e.g. stepper motor driver

Sensor Expansion Port: can be connected with various sensors, e.g. ultrasonic sensor

Sound Sensor: convert sound vibration to data of voltage variation through a microphone.

Light Sensor: convert light variation to data of voltage variation through a transistor.

Temperature Sensor: convert temperature variation to data of voltage variation through a thermistor

Ultrasonic Sensor: detect distance between the sensor and the objects in front of it

Line Follower Sensor: detect reflected infrared light from objects

Me 3-Axis Accelerometer and Gyro Sensor: measure the angular rate and the acceleration information

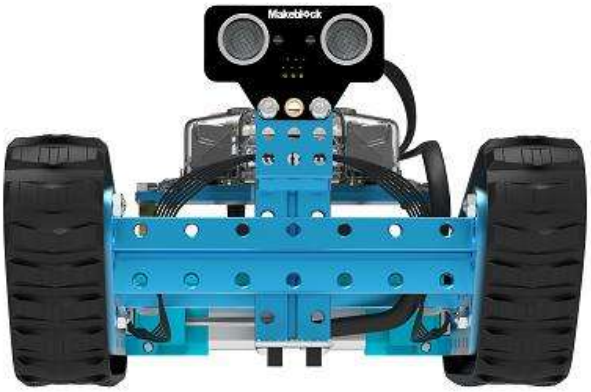
Buzzer: an electronic module that emits a sound via vibration produced by the varying voltage

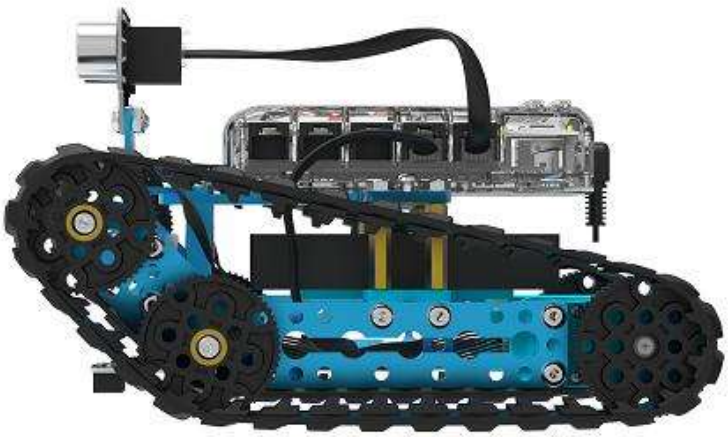
RGB LED: every RGB LED can be programmed to combine three colors (red, green and blue) to produce various colors of light

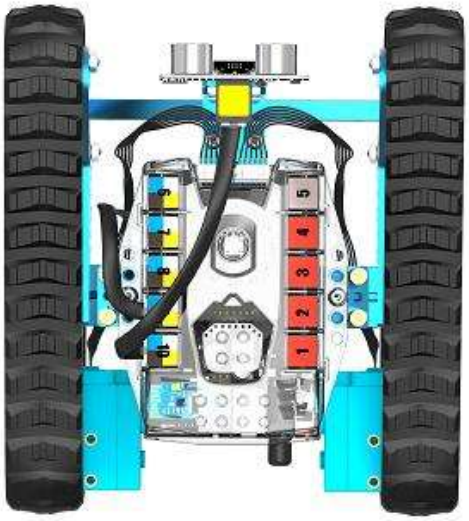
Hardware Serial Port: can be connected with Bluetooth module or 2.4G module

Learning Task 2 - Get to Know mBot Ranger Robot Kit

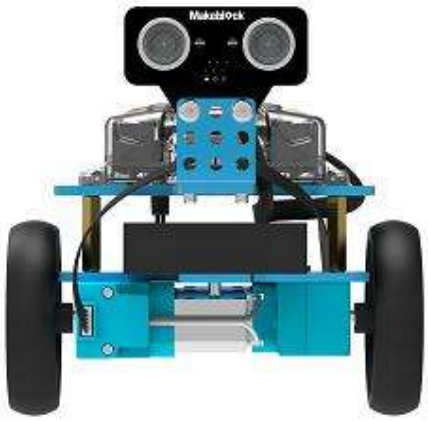
Building Form I: Land Raider

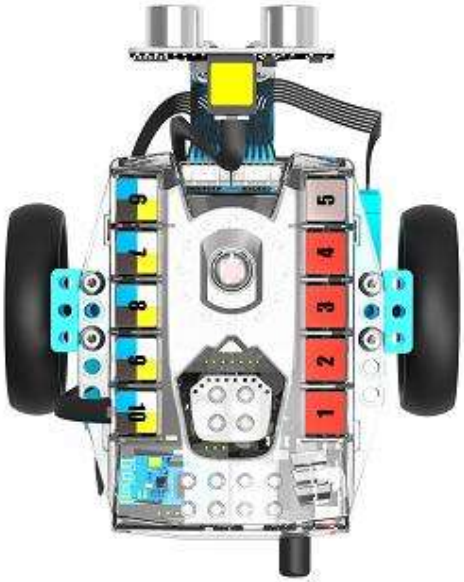




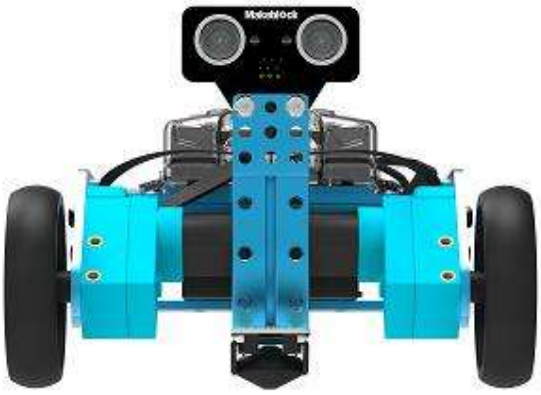


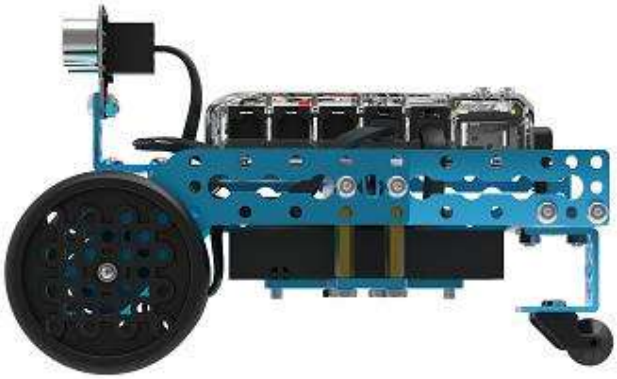
Building Form II: Rocking Bird

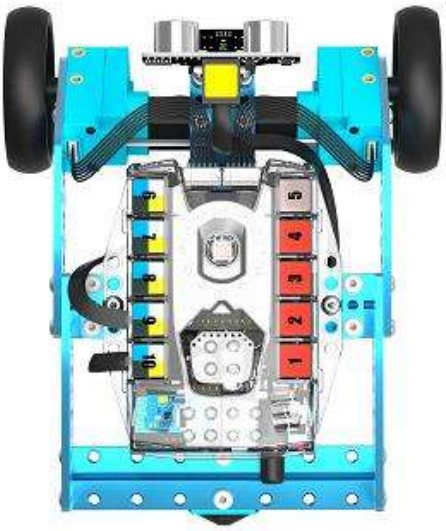




Building Form III: Dashing Raptor



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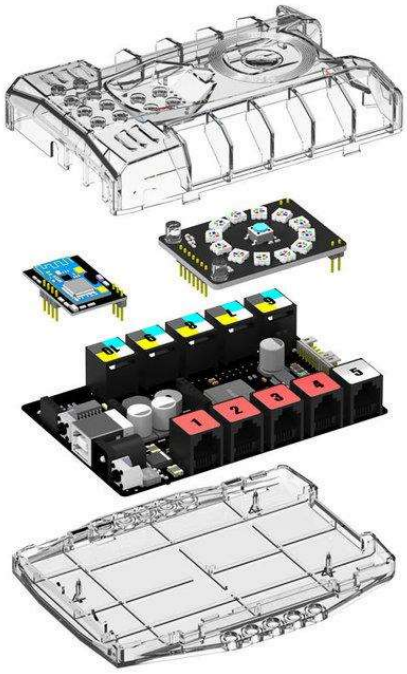
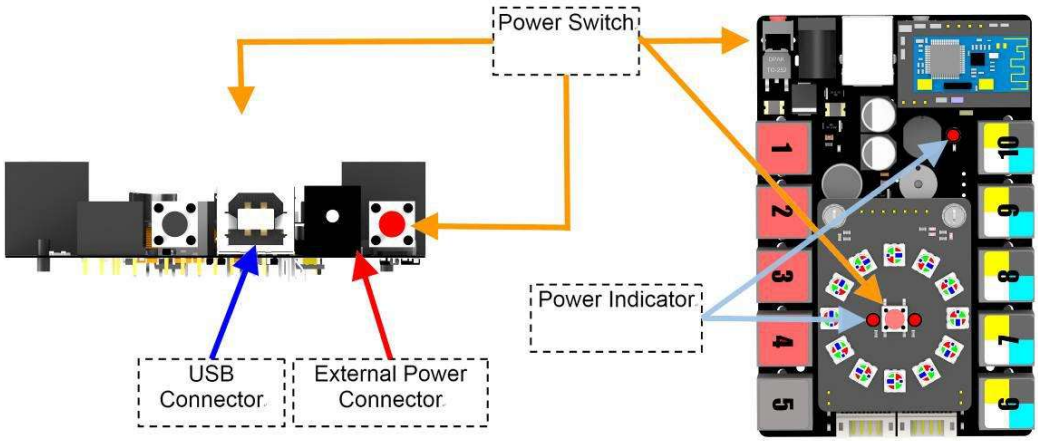
Task 1 - Turn on/off the Power Supply of Me Auriga



Start Me Auriga



USB power supply:

We can connect the mainboard with the computer via USB when the mainboard is not driving motors. After connecting with computer, the 5V LED indicator on the mainboard will light up.

External power supply:

If you want the robot working on its own (without connecting with computer), or you want to use motors or 1~4 ports in the operation, please make sure you use an external power supply. After connecting with external power supply, press the power switch (the one in the middle of the RGB LED ring or the one next to the power jack). At this time, the Power LED Indicator on the mainboard will light up.

Turn off the power supply of Me Auriga (Mainboard)

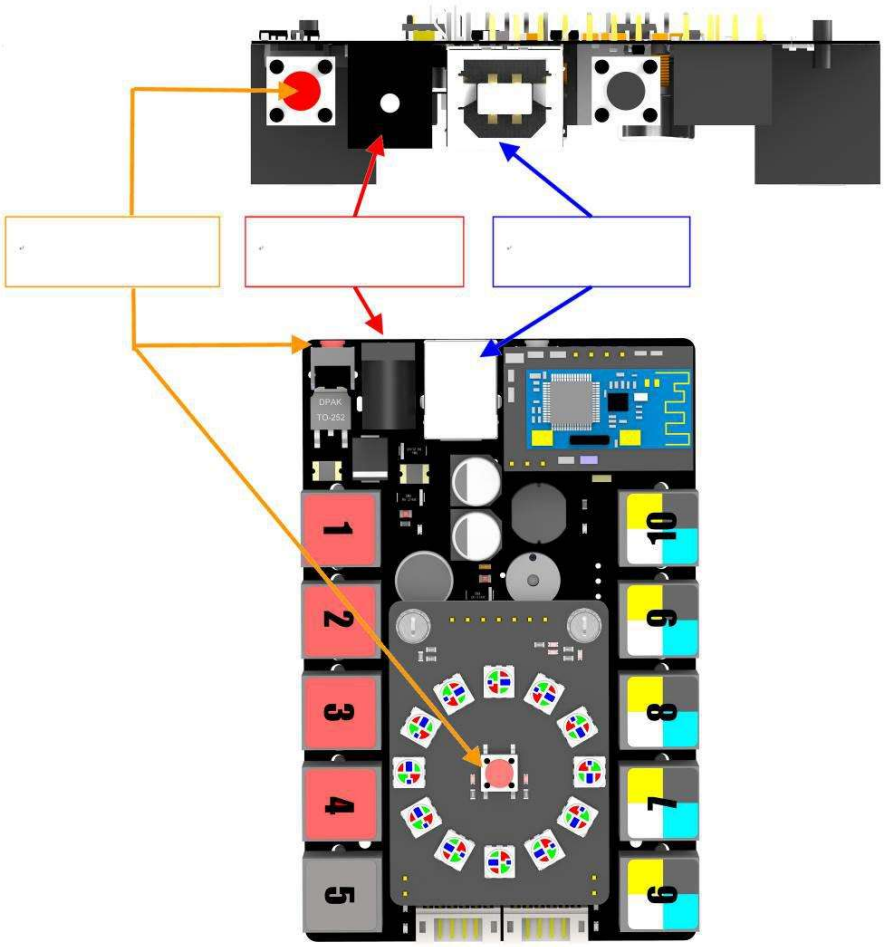
You can press the power switch for 3~8 seconds to turn off the power supply. If the mainboard is still connected with the computer, turning off the power supply will stop the operation of motors and 1~4 ports, but the program in the mainboard will continue working.

Challenging Task

Challenging Task 1 - What is the mainboard of mBot Ranger Robot Kit?

The Name of the mainboard: ( )

Do you remember the names and functions of the objects indicated by arrows?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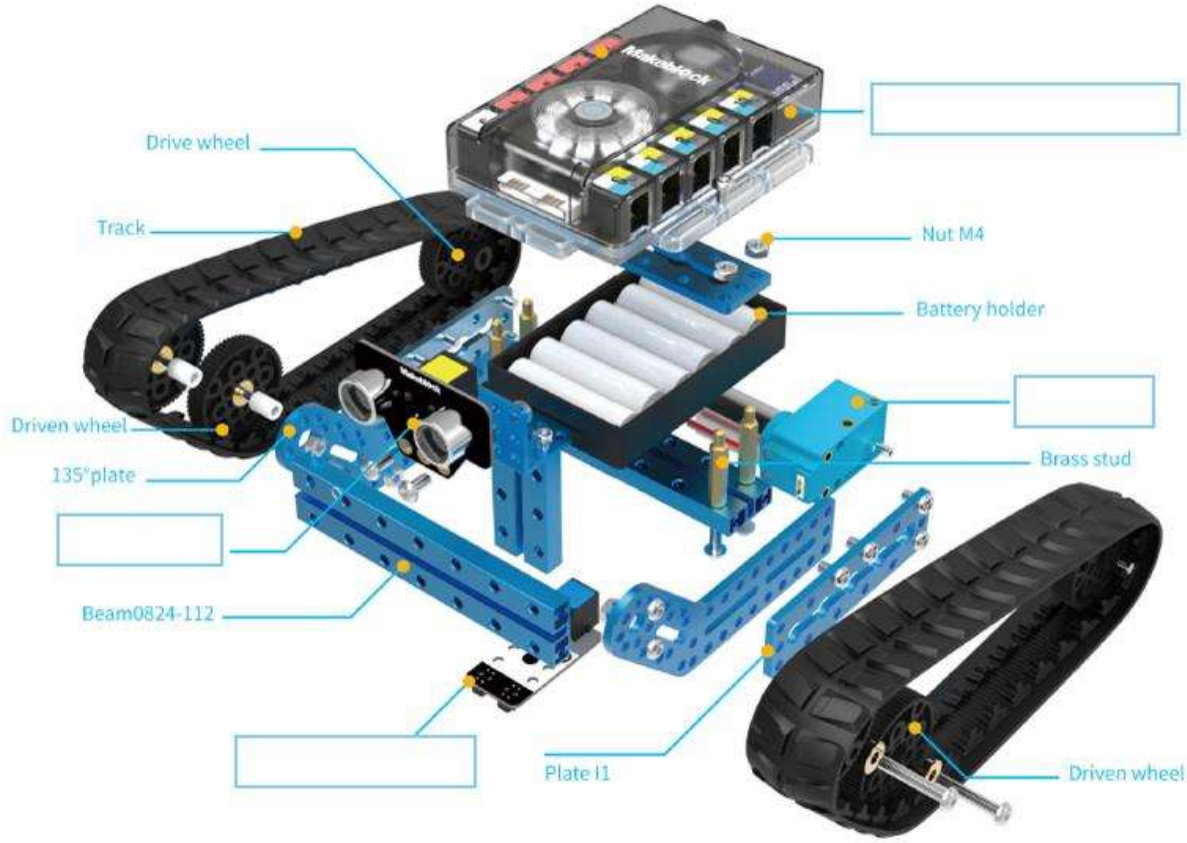
Challenging Task 2 - Name the Mechanical Parts of mBot Ranger Robot Kit

Do you remember the names and functions of the objects in boxes?



Conclusion of this chapter

Do you have more idea on the three building forms of mBot Ranger? What are the functions of the sensors on the mainboard? Mark will explore more in mBot Ranger Robot Kit together with you in the next chapter!