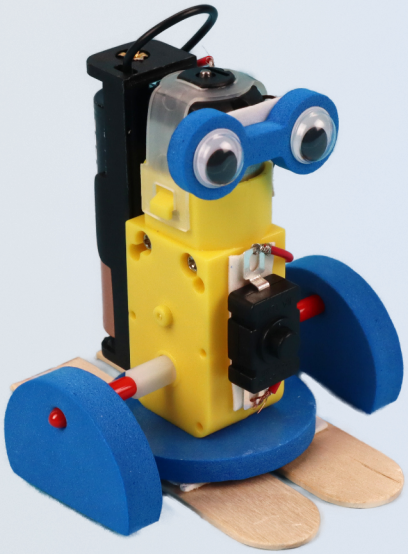
My First Robot
Big Foot Bot

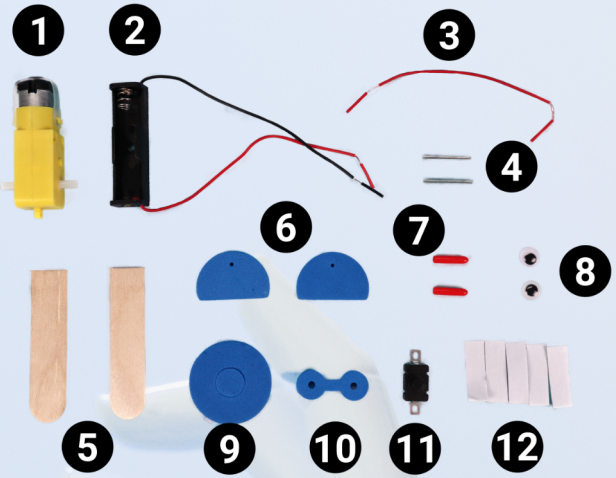
Scan QR code to watch video instruction, or visit:
xworkbox.com/pages/my-first-robot

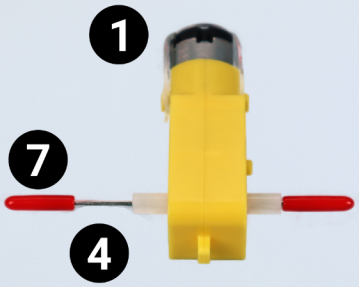


A robot is a machine that does tasks without the help of a person. Many people think of robots as machines that look and act like people. However, most robots do not look like people.

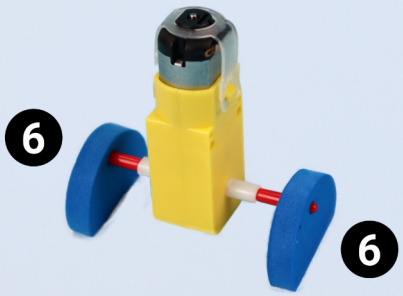
Most robots are computer-controlled devices with many parts. An industrial robot, for example, is an armlike machine that can turn at several joints. It has a handlike part to grasp and hold things. Motors move the parts in a robot.

In this box, we will make two little robots that have a small yellow motor to drive their movements.

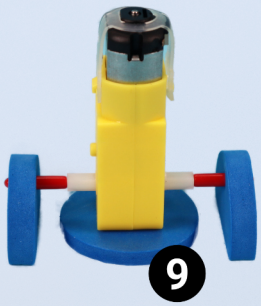




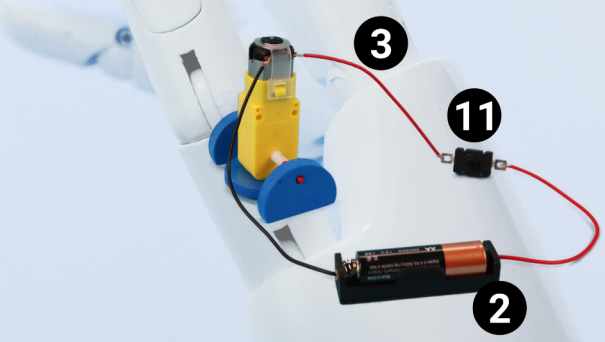
1 Insert steel rods (4) into motor shafts (1). Then insert rubber tubes (7) on rods to make robot legs.



2 Insert semicircle foam pads (6) on legs.



3 Stick base foam pad (9) on the bottom of the motor using double sided tape.



4 Connect the motor, battery holder (2) and switch (11).

⚠WARNING:
CHOKING HAZARD - Small parts
Not for children under 3 years.

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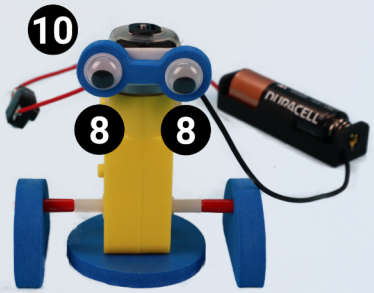
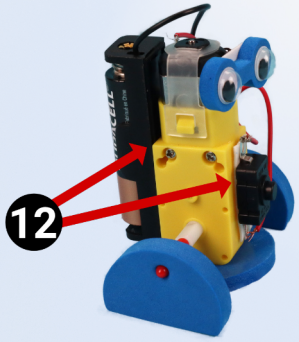


5 Stick eyes (8) on the small foam pad (10).

Switch on and observe the direction of rotation.

Use double sided tape to stick the eye foam pad on the forward side of the motor.

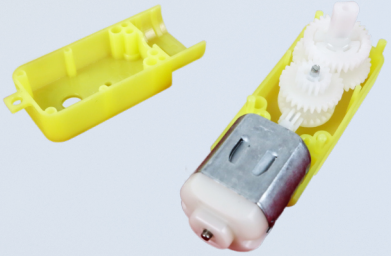


6 Use double sided tape (12) to stick the battery holder and switch onto the motor.

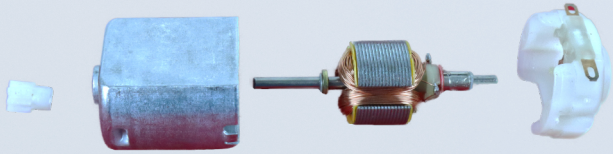
7 Use double sided tape to stick two wood strips (5) on the bottom.

Taking Things Apart

What's inside the yellow motor?



1 Removed the two side screws and split the gearbox. There are a collection of gears attached to the motor shaft which drives robot's movements.



2 Remove the motor's pinion gear, pry the tabs open and remove the end cap.

Field Magnet
Two curved magnets

A motor uses magnets to create motion. The fundamental law of all magnets: Opposites attract and likes repel. Inside an electric motor, these attracting and repelling forces caused by Field Magnet and Electromagnet create rotational motion.

Electromagnet

When an electronic current flow through a wire, it generates a magnetic field. This is an important concept in electricity. The magnetic field can be increased by coiling the wire.

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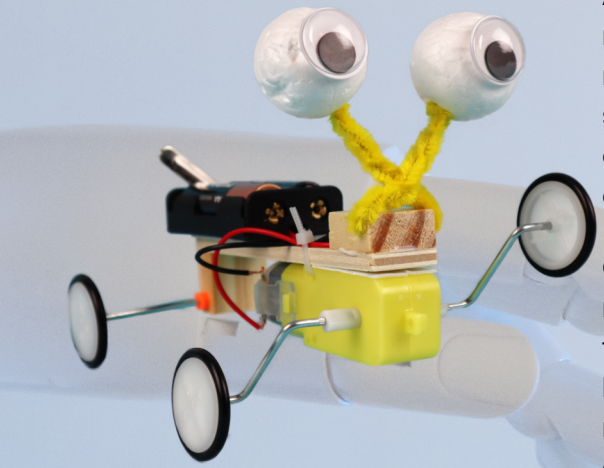
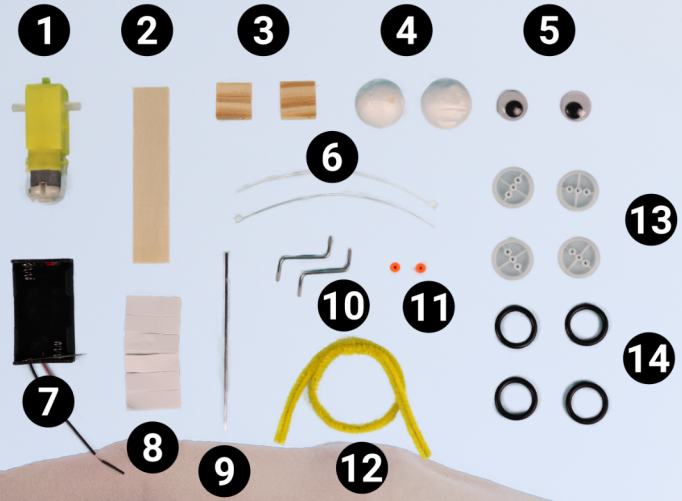
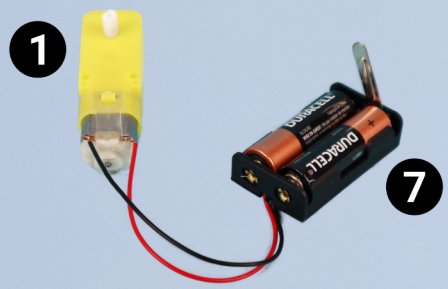
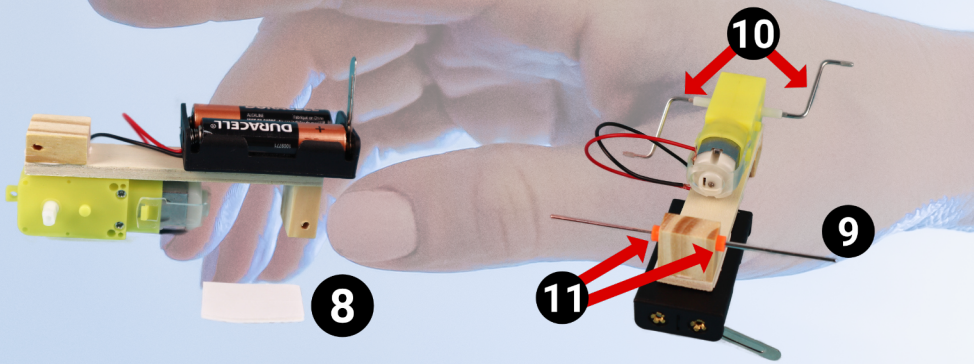


All around the world, engineers are developing robots for many applications. This involves building machines that can solve certain problems: fly or swim from point A to B, grasp and manipulate a soft object, or travel a distance with a limited amount of energy.

Over millions of years, nature has already solved many of these problems. To make biomimetic robots, the engineers study the animal kingdom, figure out how their skeletal structures and muscles work. The results are robots that are inspired from nature and are particularly efficient at what they do.







1 Connect motor (1) and battery holder (7). Insert two AA batteries. Close knife switch to test the motor.

2 Attach two small wood blocks (3) on the long wood block (2) using glue. Beware of the hole positions.

3 Stick motor and battery holder with double sided tapes on the robot's main body.

4 Insert two S shape bars (10) into the motor shaft. Insert the long rod (9) through the backend hole with two shaft sleeves (11) on two sides.

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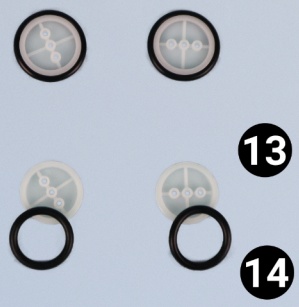
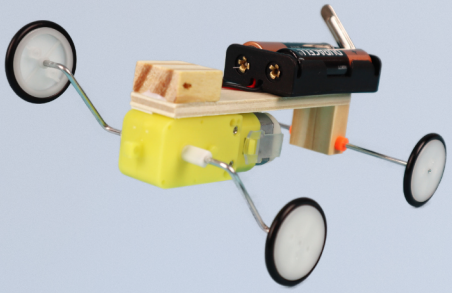
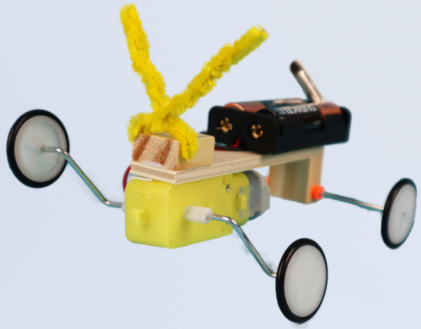


5 Make four wheels by attaching tires (14) around wheels (13).

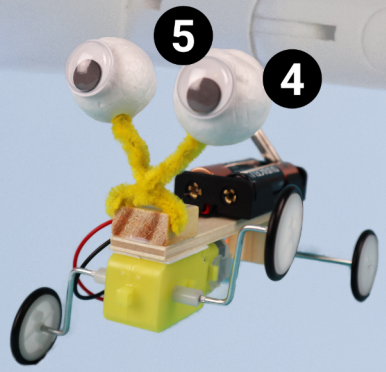


6 Install the four wheels on the robot's legs.

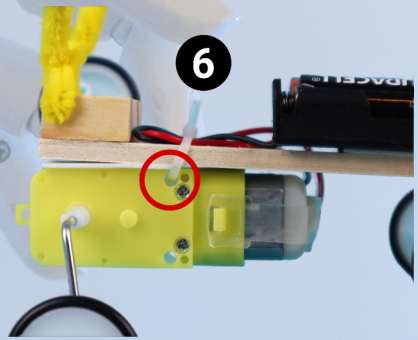
7 Fold pipe cleaner (12) in half and twist it.



8 Insert folded pipe cleaner through the hole and twist.



9 Peel off stickers behind eyes (5) and attach them on the two foam balls (4). Stick the pipe cleaners into the balls.



10 Insert zip tie (6) through the motor's holes to lock the motor tightly onto the body.

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