

AI Bumper Bug

Warning! Not suitable for children under 36 months. Choking hazard. Only for use by children over 8 years old. To be used solely under the strict supervision of adults that have studied the precautions given in the experimental set. Hair entanglement may result if the child's head is too close to the motorized unit of this toy. This toy contains functional sharp point – on the component leads. Do not short-circuit the battery terminals and motors, which may cause overheating. Do not lock the motor or other moving parts, which may cause overheating. Use with care and only under supervision of adult.

Packaging materials are not toys. Please remove all packaging and packing tags/wires before giving this toy to your child.

CAUTION! Take extra care during unpacking and use.
Please take note: As an extra precaution, check this toy regularly for signs of wear or damage. Read the instructions carefully before use, then follow them and keep them for reference.

Warning! Do not short-circuit the battery terminals and motor, which may cause overheating. The wires are not to be inserted into socket outlets.

Batteries required: 3 x AAA (Not included)

IMPORTANT: Keep these instructions. DO NOT DISCARD.

1. Only adults should install and replace batteries.
2. Alkaline batteries are recommended.
3. If the device has not been used for a long time, remove the batteries.
4. Do not use rechargeable batteries.
5. Do not mix old and new batteries.
6. Do not mix alkaline, standard (carbon zinc) or rechargeable (nickel cadmium) batteries.
7. Exhausted batteries are to be removed from the toy.
8. Non-rechargeable batteries are not to be recharged.
9. The supply terminals are not to be short-circuited.
10. Only batteries of the same or equivalent type as recommended are to be used.
11. Batteries are to be inserted with the correct polarity.
12. Do not dispose of batteries in fire, batteries may explode or leak.
13. Batteries may explode or leak if misused.



If at any time in the future you should need to dispose of this product please note that Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or retailer for recycling advice.(Waste Electrical and Electronic Equipment Directive)

Introduction

Artificial Intelligence (A.I.) is a branch of *Science* which deals with helping machines find solutions to complex problems in a more human-like fashion. This generally involves borrowing characteristics from human intelligence, and applying them in a language the computer understands. Researchers are creating systems which can mimic human thought, understand speech, beat the best human chess player, and countless other feats never before possible.

The word "robot" originates from the Czech word *robota*, meaning drudgery. A robot is something that senses the world in some way, does some sort of computation, deciding what to do, and then acts on the world outside itself as a result. Basically a robot consists of:

- A mechanical device, such as a wheeled platform, arm, or other construction, capable of interacting with its environment
- Sensors on or around the device that are able to sense the environment and give useful feedback to the device
- Systems that process sensory input and instruct the device to perform actions in response to the situation

The science and technology that deals with robots is called robotics. These AI robot kits let you explore how robot sensors work to connect them to the outside world.

What does it do?

The AI Bumper Bug will move forward until it hits an obstacle. The bug detects this obstacle and back up to move in another direction.

How does it work?

Each of its antennas is a switch which closes when the antenna touches an obstacle. There is a micro-controller which continuous check the status of the switches. When one or both of the switches are closed, it will control the motors to move itself away from the obstacle and change direction.

Components:

- 1 Chassis x1
- 2 Transmission shaft x2
- 3 Short lever x4
- 4 Long lever x2
- 5 Circuit board x1
- 6 Leg x6
- 7 Long screw x6
- 8 Short screw x12
- 9 Battery box x1
- 10 Foot x6
- 11 Flag x1
- 12 Screwdriver x1

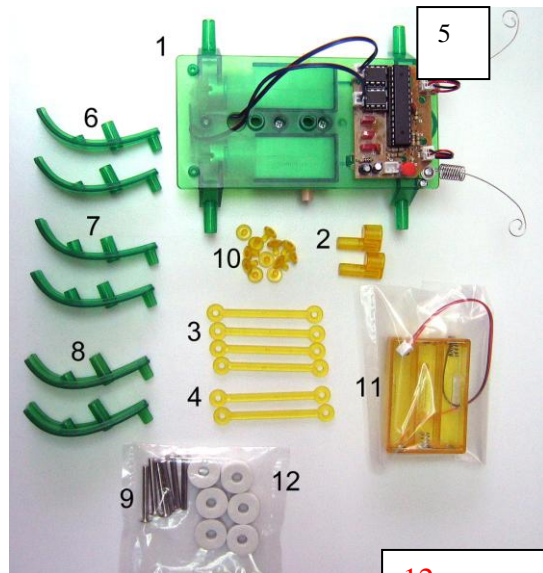


Fig. 1

Steps:

1. Attach the transmission shafts (2), the long lever (4) and short lever (3) to the leg (6) using the long screw (7) as shown in Fig. 2. Use the screwdriver (12) to help you. The screw should be tightly attached to the shaft but still allows the leg and the levers to rotate freely. Note that the long lever should be in between the transmission shaft and the short lever. Repeat by using another leg.

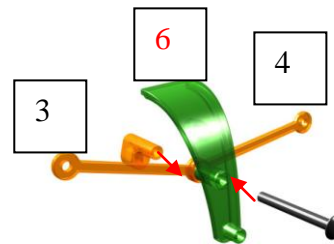


Fig. 2

2. Add a leg (6) to the short and long lever using the short screws (13), as shown in Fig. 3. Repeat to assemble the other set of legs.



Fig. 3

3. Attach another short lever (3) to the middle leg using a short screw, as shown in Fig. 4. Repeat for the other side.

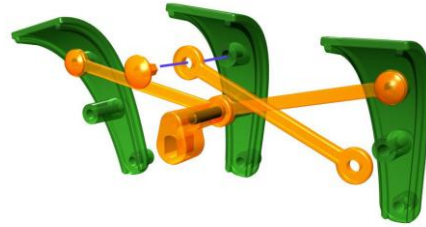


Fig. 4

4. Install the legs assembled in the previous step to the chassis (1) using the long screws (7) and screwdriver as shown in Fig. 5. **Make sure the screws are firmly secured to the chassis but still allow the legs to move freely.**

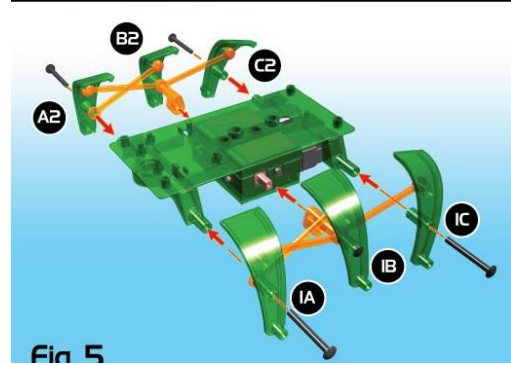


Fig. 5

Fig. 5

5. Install the battery box (9) on the chassis. See Fig 6.

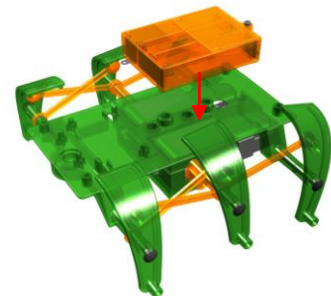


Fig. 6

6. **Use the screwdriver (12) to loosen the screw of the battery cover and install 3 AAA size batteries into the battery box according to the polarity mark. Replace the battery cover and tighten the screw.** (Fig 7)

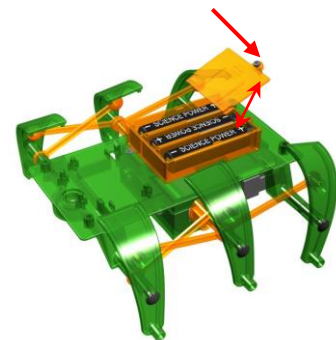


Fig. 7

7. Insert the flag (11) as shown in Fig. 8.



Fig. 8

8. Attach the feet to the legs using the remaining short screws as shown in fig. 9.

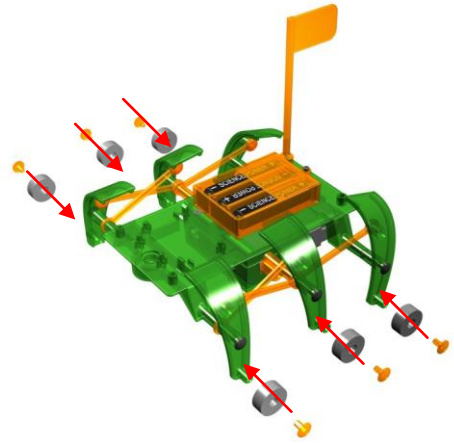


Fig. 9

9. Insert the circuit board on the chassis. (Fig. 10)

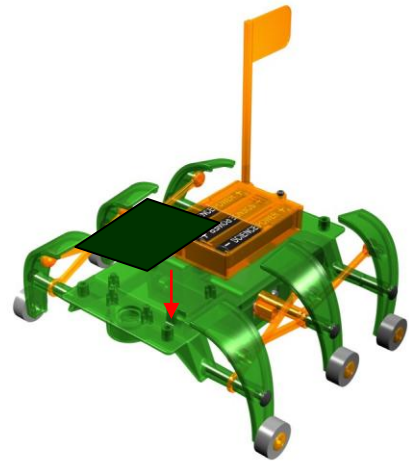


Fig. 10

10. Connect the different plugs to the circuit board (Fig. 11):
- i. Battery - socket “3V” (A)
 - ii. Right motor - socket “Right” (R)
 - iii. Left motor – socket “Left” (L)
- Done!

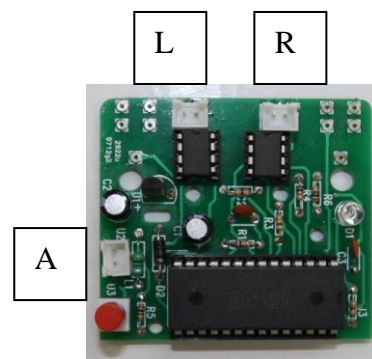


Fig. 11

How to Play:

Press the red button on the circuit board to start! Try blocking it at the front and see it hitting the obstacle, backing up and move around!

Battery Installation:

The unit uses three AAA/LR03 (1.5V X 3) batteries (not included)

1. Refer to Step 6 above to install batteries.
2. Replace with new batteries when the movement becomes slow or it does not respond.
3. Insert new batteries according to the polarity marks.