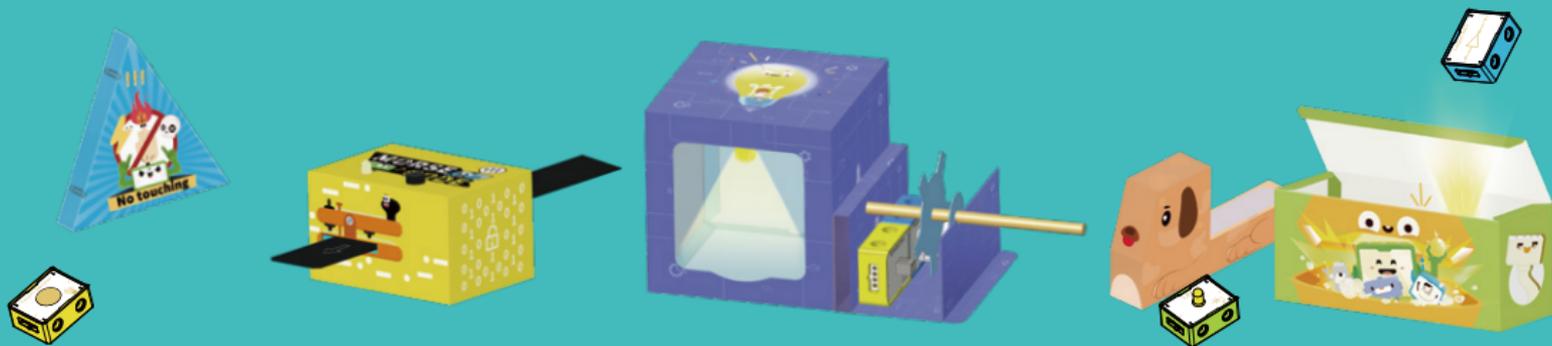


Hello Kit

A preferred kit for STEAM education to get started.



USER MANUAL

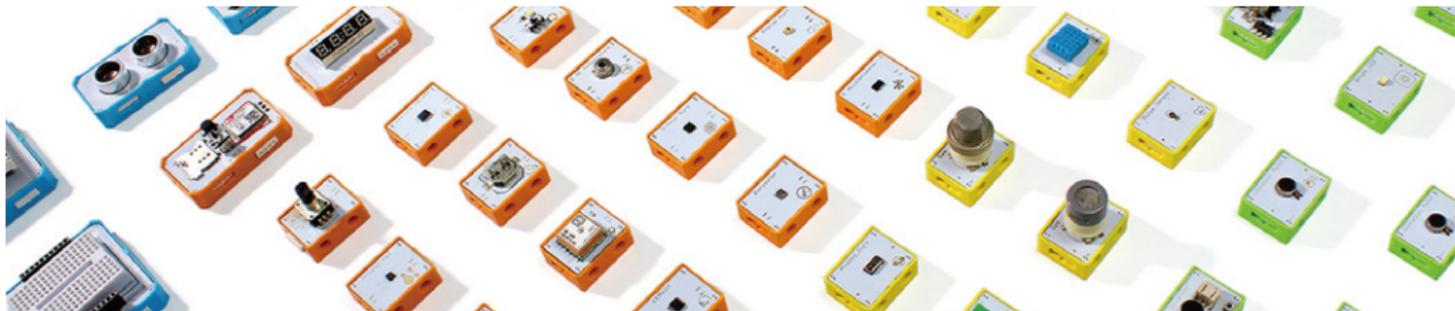
V1.1

Directory

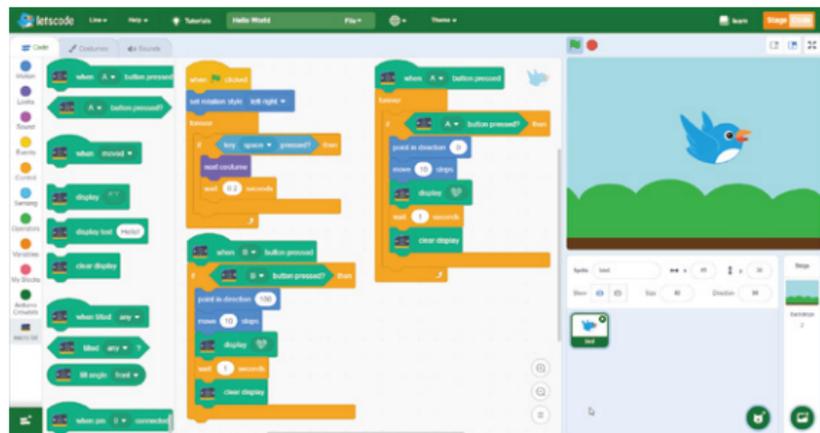
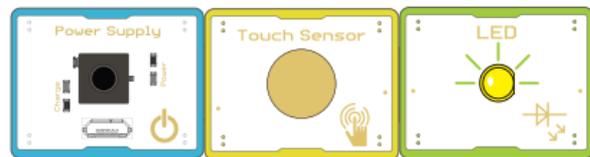
1. About Crowbits	2
2. Module list in the Hello Kit	5
3. Know the Crowbits module	5
4. Project tutorial	9
• 1 No touching	9
• 2 Flashing window light	15
• 3 Pandora's box	22
• 4 Cute little dog	28
• 5 Morse code machine	32
5. Common technical problems	37

1. About Crowbits

Crowbits is a new type of STEAM education tool, it integrates traditional circuit modules into a LEGO-compatible block, which means you can build creative projects with our Crowbits and LEGO bricks. Compared with some electronic kits on the market, Crowbits is definitely worthy of **“plug and play”**, for it doesn't require cables, tools or complex operations to connect them together. The magnetic snap on the side of these blocks allows you to connect these blocks together with the magnet. Learning through playing, Crowbits will transfer the way you learn into a more fun way. We have designed a series of modules for Crowbits, each module can be programmed. According to users' different needs, these modules form three series of kits, respectively no-programming kit, programming kit and application kit. According to the difficulty level, we define these kits as three stages to study electronic and programming.



The first stage-Crowbits no-coding kit includes more than 20 kinds of common sensors and modules, which means you can control all these modules without programming. When combined with carton papers or LEGO bricks, you can complete a creative project quickly. From these projects, kids can improve their hands-on ability, and meanwhile stimulate their imagination and creativity. Besides that, after knowing the logic of how these Crowbits blocks run, it's helpful enough for kids to step into the coding world.



The second stage-Crowbits coding kit contains the basic coding kit and advanced coding kit. These kits support multiple programming platforms, such as micro:bit, Arduino, Raspberry Pi and so on. And equipped with Elecrow's customized visual programming software-Letscode, you can program all Crowbits blocks through drag

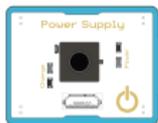
and drop. In addition, Letscode also supports other programming languages, like Python and Arduino IDE. Combining programming languages with various electronics, Crowbits provides a fun and effective way to learn code and electronics for students.

The third stage-Crowbits application kit is more productized. With the no-coding kit, you can learn the basic knowledge of electronics and stimulate your creativity; with the coding kit, you can further discover the joy of electronics and programming.

So based on the application kit, you can even assemble and build a product with complete functionality and appearance, for example game console, mobile phones, and etc. Through these products, you will experience the perfect combination of programming knowledge and complete products.



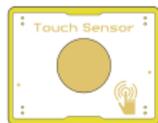
2. Module list in the Hello Kit



Crowbits-Power Supply



Crowbits-IR reflective sensor



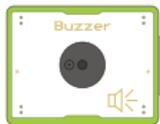
Crowbits- touch sensor



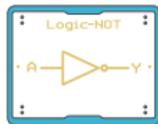
Crowbits-Light Sensor



Crowbits-LED(Y)



Crowbits-Buzzer



Crowbits-NOT

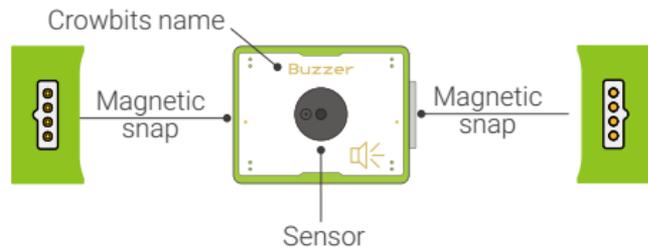


Magnetic Cable

3. Know the Crowbits module

• 1. Structure of Crowbits

TOP

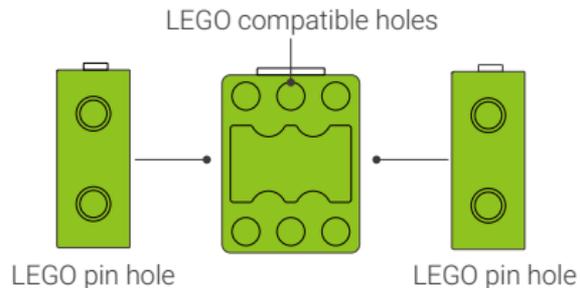


Crowbits name: Crowbits consists of many types of modules, so we marked the name for you to recognize easily.

Sensor: The main component of Crowbits is placed there.

Magnetic snap: It's a magical magnetic pogo-pin, the magnetic snap allows you to connect Crowbits together with magnet.

BACK

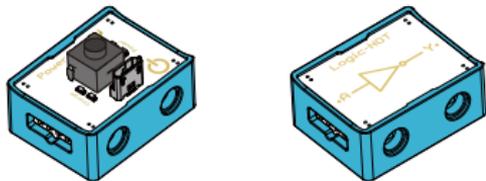


On the back of Crowbits, we have reserved 6 LEGO compatible holes, it's easy to build creative projects with Crowbits and LEGO bricks together. The LEGO pin hole reserved on the side of Crowbits allows you to fix the module by LEGO pin.

• 2. Color-coded by function

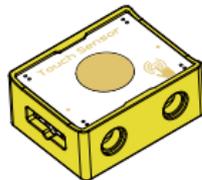
Crowbits modules are divided into four different types, they are color-coded by function.

Power and Logic module (Blue)



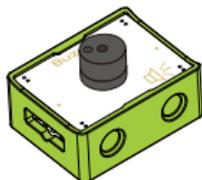
The power module is the power supply of all Crowbits modules, it can provide power supply for other modules. The logic module is used to do some basic logic operations.

Input module (Yellow)



The input module accepts an input from you or the environment and then sends signals to affect the output module.

Output module (Green)



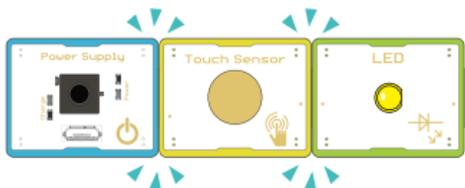
The output modules will do some operations, such as light up, vibrate when they receive a signal from input module.

• 3. Magnet connection

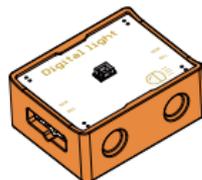
Connection mode

There are two ways for you to connect Crowbits together, it's easy to connect Crowbits together by snapping them by magnet. Or you could also connect them by magnetic cable.

Connect by magnetic snap



Special modules(Orange)



For some special modules (the interface is I2C or UART), we set the color to orange.

Connected by magnetic cable



Connection rules

A. A complete project must consist of power, input module and output module. The power supply module can be placed at will, whether on the left, on the right, or on the middle of input and output module. Make sure the name of module is facing up when connected.

Pair of power+input+single output



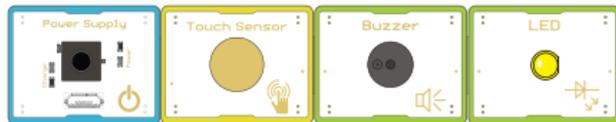
B. The sequence is important, Green is always on the right side of yellow, which means output modules must come after input modules.

C. Input module can affect single output module or multiple output modules at the same time.

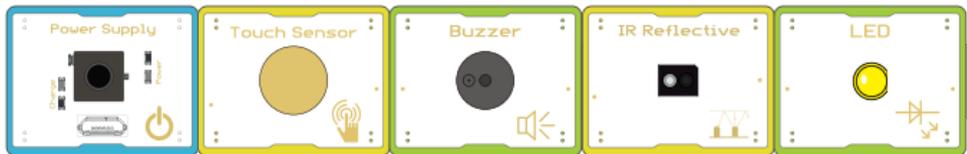
Input with single output



Input with multiple outputs



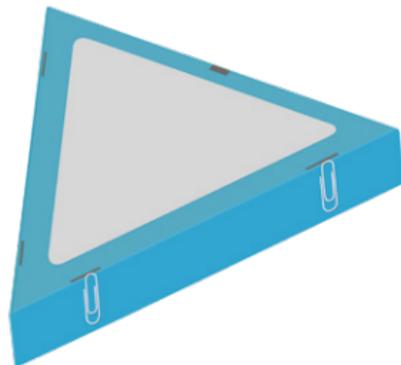
D. We can also connect these modules in a complex way, each input module individually controls a single output module. Remember that the output module is only controlled by the nearest input module on the left.



4. Project tutorial

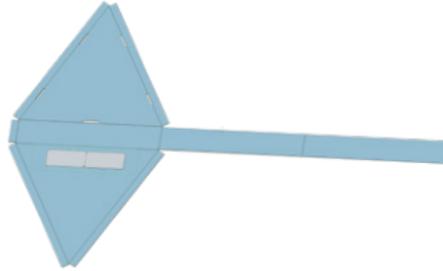
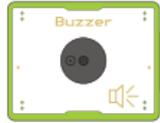
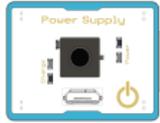
No touching

Project requirements: There are many place in life that are more dangerous, and children can not be brought into close contact, so we made an anti-touch warning device and placed it in a dangerous position. When the warning device is touched, an alarm is issued to remind children to stay away.



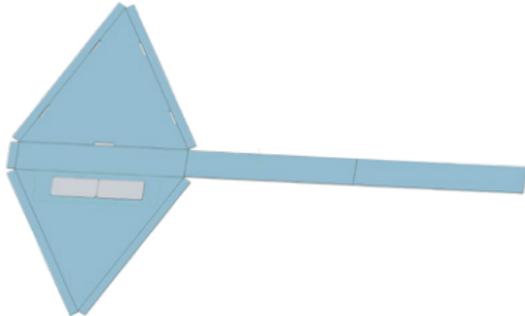
Modules and accessories:

Power Supply, Touch Sensor, Buzzer, carton paper plate, foil.

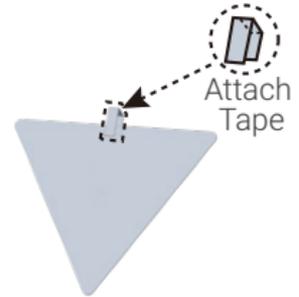
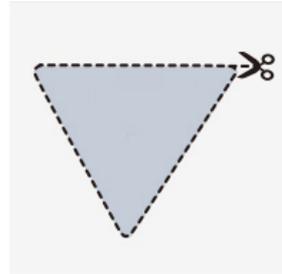


Installation Steps

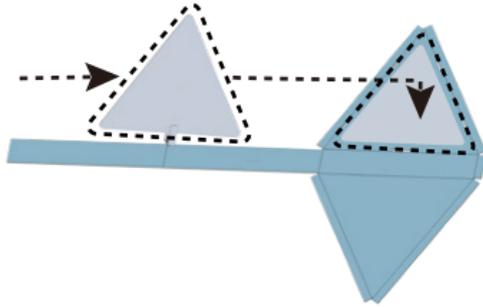
1. Unroll the paper mold that shows No touching



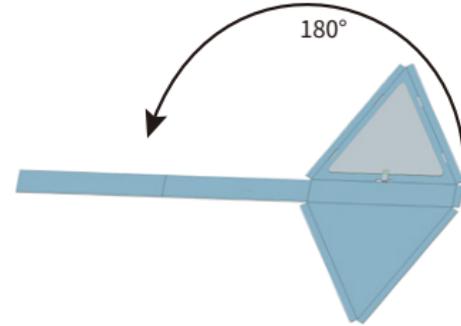
2. Cut the tin foil into triangles and paste on long pieces of tin foil



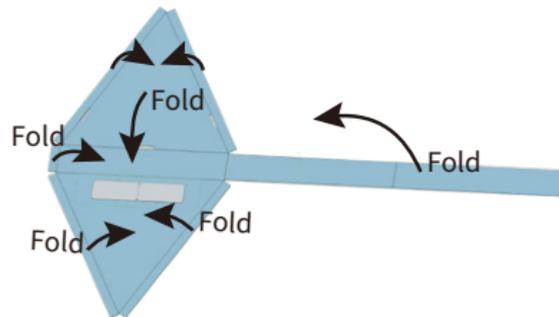
3. Glue the tin foil to the triangle area of the paper mold.
The long piece of tin foil passes through the fine hole



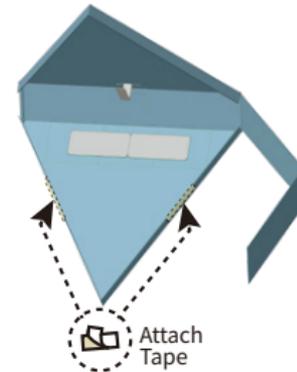
4. Turn the paper mold 180 degrees



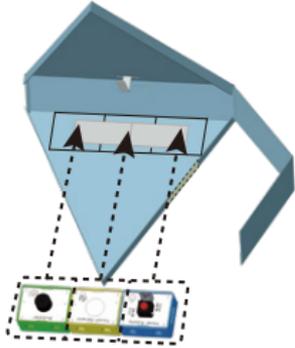
5. The paper die folds in the direction of folding



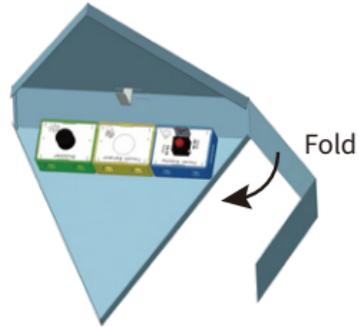
6. Double-sided adhesive tape on both sides



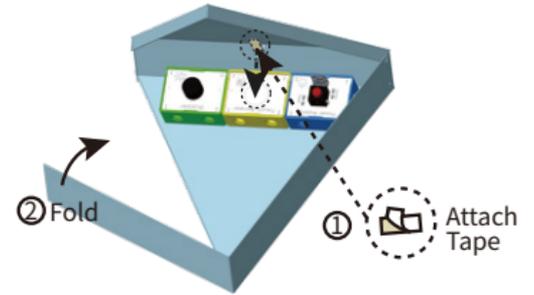
7. Place the module in the carton



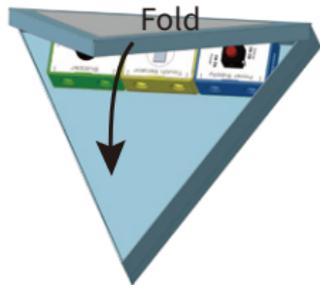
8. Close the note



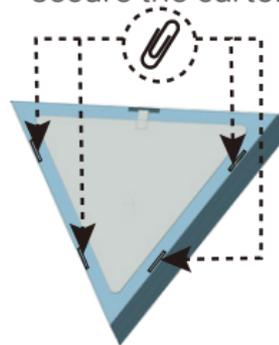
9. Paste the tin foil onto the Touch module



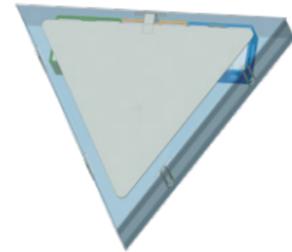
10. Close the carton



11. Use paper clips to secure the carton

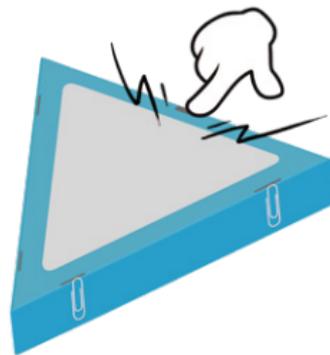


12. Finished!



Test:

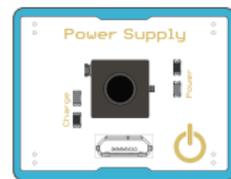
1. When the hand touches the box, an alarm is issued;
2. Place the box in a place where you do not want others to touch. When someone touches, an alarm is issued to remind you.



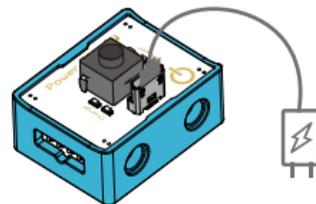
Introduction of required modules:

In this project, the power module, Buzzer and Touch sensor module are used.

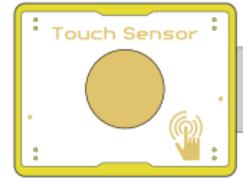
The power module is the core part of the entire Crowbits module, and it can provide power to other modules. No matter what the project is, it needs the participation of the power module.



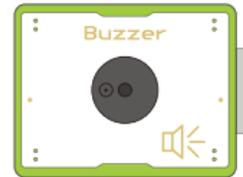
When the power supply module is used up or not used for a long time, it needs to be charged in time to use it. It can be charged by using a micro USB cable.



Touch module is a digital input module that can be used as a touch switch. When it is touched, the switch is turned on. The core part is a touch detection chip. When it is touched, it will output a logic high level. When it is not touched, it will only output a logic low level.



The buzzer module is a digital output module. When receiving the input signal, it will make a sound. The buzzer is often used to prompt or alarm. The core part of the module is an electromagnetic buzzer, which can be controlled by the input module. When the input signal of logic high level is received, due to the internal structure of the electromagnetic buzzer, magnetic field is generated inside the buzzer when the current passes through, and the vibration diaphragm periodically vibrates under the effect of magnetic field to sound.



Applications in life

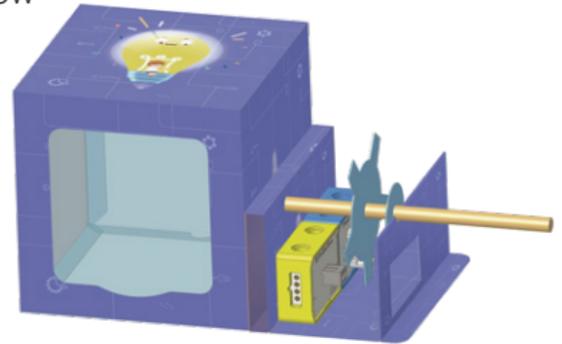
Touch sensor has a very wide range of useage in our daily life, such as the electrical appliances we used, many operation buttons are used touch sensor. For example, the touch switch.



Buzzer is widely used in computer, printer, copier, alarm, electronic toy, automobile electronic equipment, telephone, timer and other electronic products as a sound device. Piezoelectric buzzers are used in musical greeting cards, electronic doorbells and electronic toys.

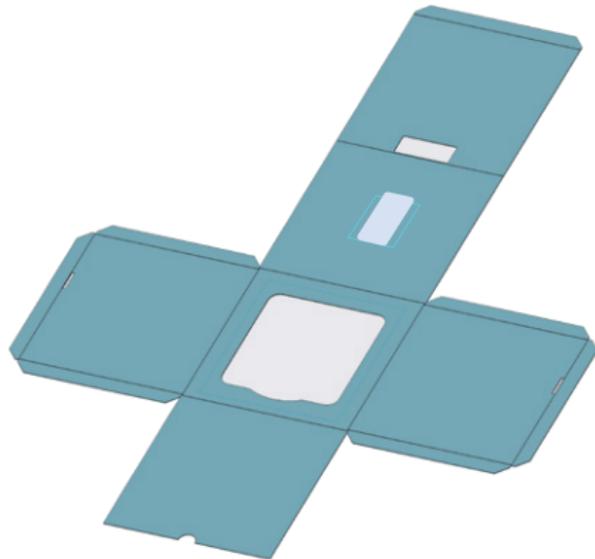
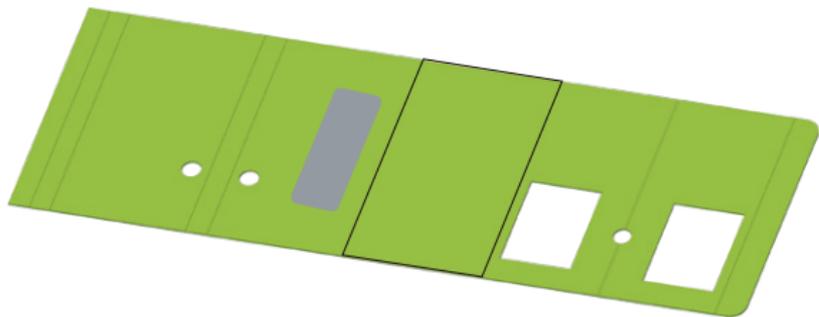
Flashing window light

Project requirements: Make a display window, the lights in the window can flicker incessantly. Using the characteristic of the IR reflective sensor, the high and low level can make the light on and off. Put the disc with a gap at the position of the IR reflective sensor. When rotating the disc, the sensor sends high and low levels in a cycle and controls the light to go on and off. Different speed determines the speed of high and low levels switch, which can make the window lights flash according to your rhythm.



Required modules and materials:

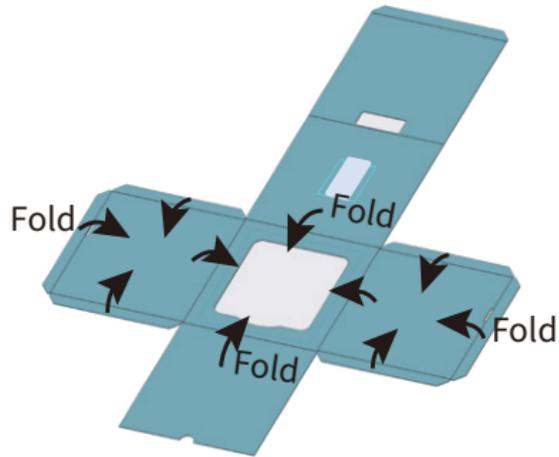
Power Supply, IR Reflective sensor, LED(Y), paper box, magnetic cable.



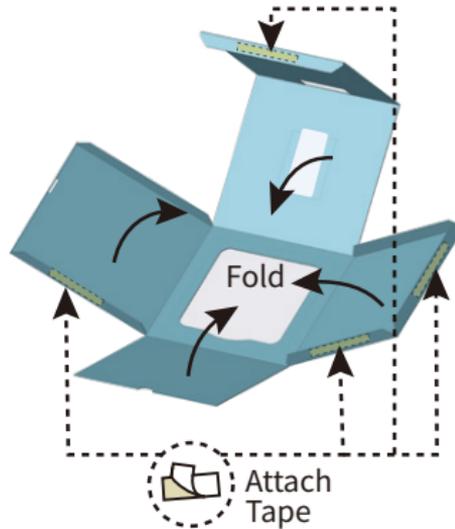
Installation Steps

Step 1: Fold the window.

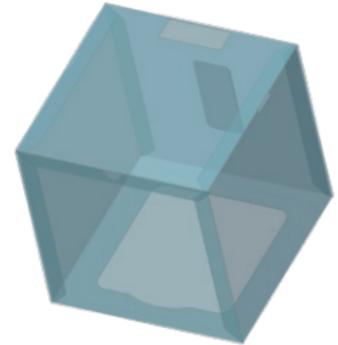
1-1. Lay the carton flat



1-2. Attach double-sided adhesive tape and fold the joint

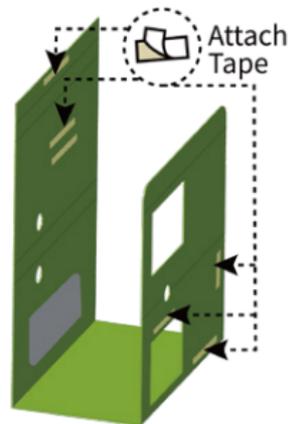
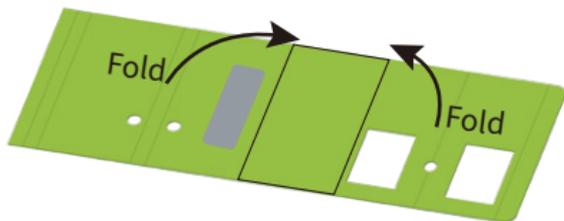


1-3. Fold the carton and assemble it into shape



Step 2: Fold the bracket and rotating shaft.

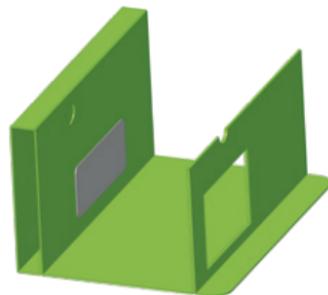
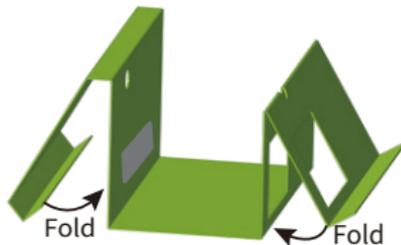
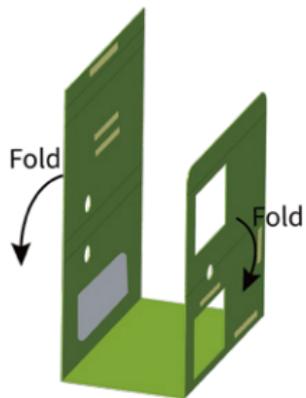
2-1. Spread out the paper mold of the bracket and attach double-sided adhesive tape to the corresponding position



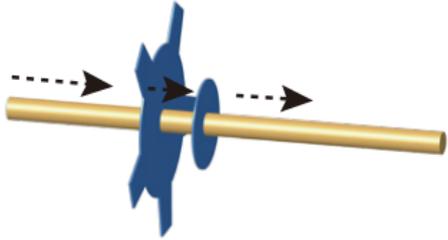
2-2. Fold the paper die as shown

2-3. Fold into the above shape

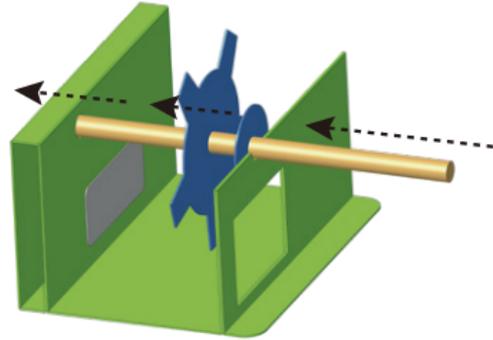
2-4. To complete the folding



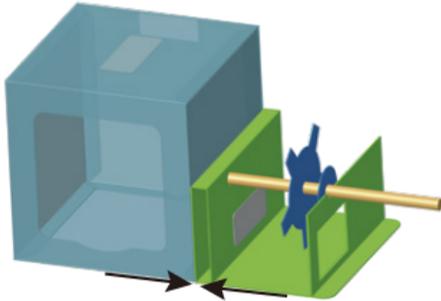
2-5. Put the gear and the clip wheel on the stick



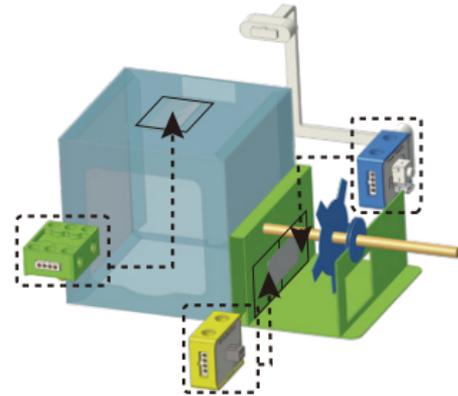
2-6. Place the stick on the bracket



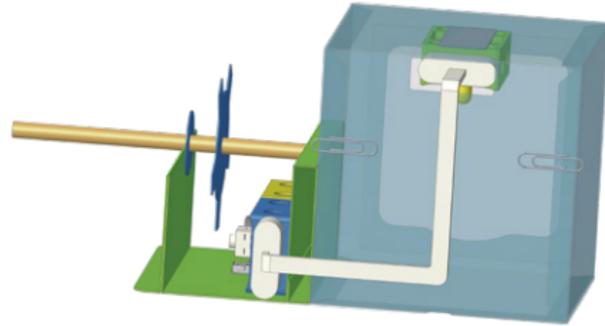
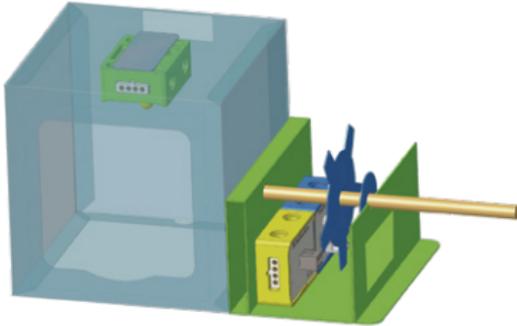
2-7. Attach the bracket to the window



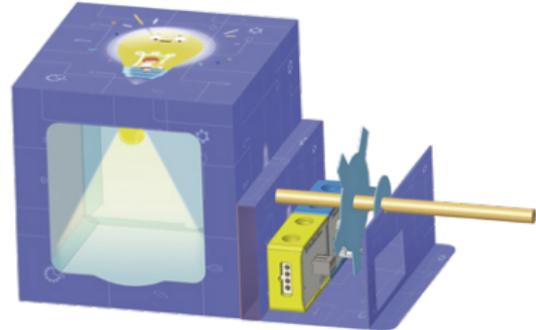
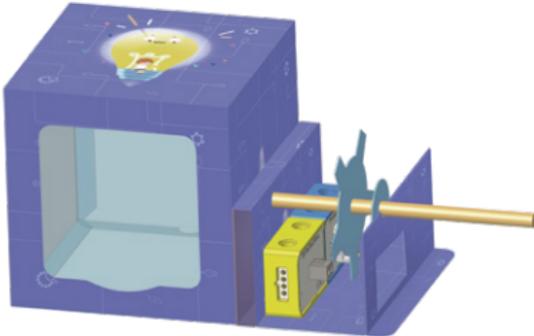
2-8. Install the three modules in the appropriate locations



2-9. Complete production



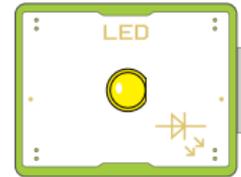
Test: Rotate the stick, the lights flashes, then your window lamp model is successful, try to change the speed of rotating the stick, see the different effect.



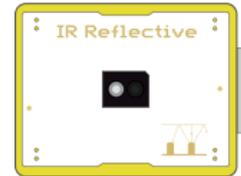
Description of required modules:

In this project, in addition to using the previous power module, two new modules are used here, respectively are LED and IR reflective modules.

LED module is a module with LED light, it is controlled by the input module, according to the change of input signal to realize the LED light on and off. When a logic high level signal is input to the LED module, the light will be on. When a logic low-level signal is input to the LED module, the light will light off.



IR Reflective module is a digital input module, it acts like a pair of eyes, detecting and responding to objects directly in front of it. IR reflective sensors are usually used in vehicle tracking devices to avoid obstacles. The IR reflective sensor is composed of an infrared transmitting head and a receiving head. When the infrared light emitted by the infrared transmitting head is reflected by the reflective surface (not black) and then received by the receiving head, the receiving head will conduct and then output a logic high level signal. When no non-black obstacle is detected, the output of the sensor outputs a logic low-level signal.



Applications in life

Our common coffee machine, when the cup is placed in the water out, it can sense the existence of the cup, then open the coffee machine, the coffee comes into the cup automatically, do not need to manually control, is this convenient?



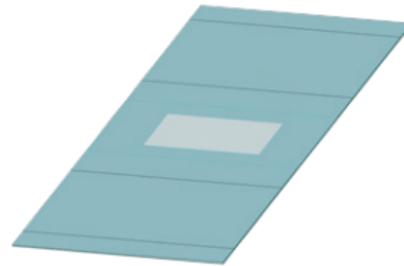
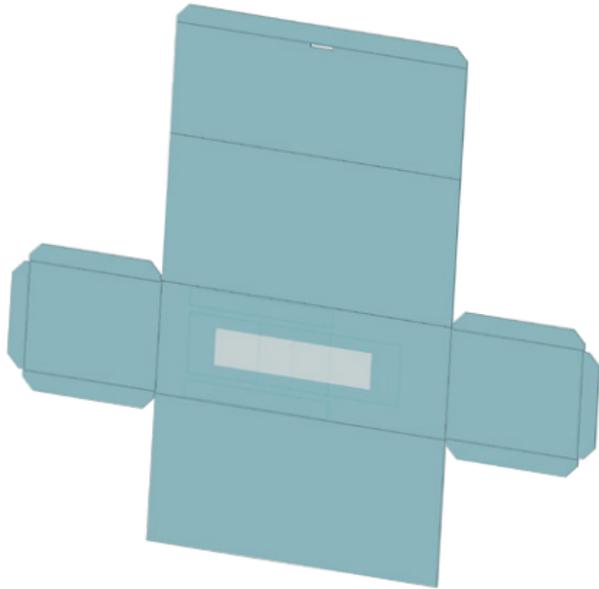
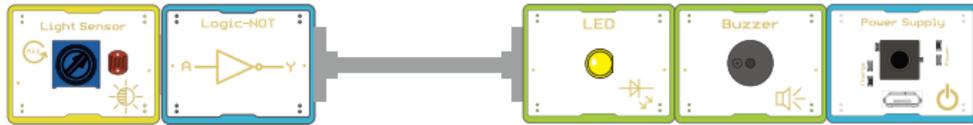
Pandora's box

Project requirements: make a magic Pandora's box. When the box is opened, it will turn on the light and the buzzer will beep. When the box is closed, the lights go out and the beeping stops.



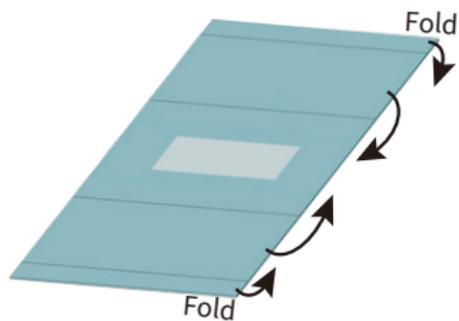
Required modules and materials:

Power Supply, Light sensor, LED (Y), logic NOT, cardboard, magnetic cable.

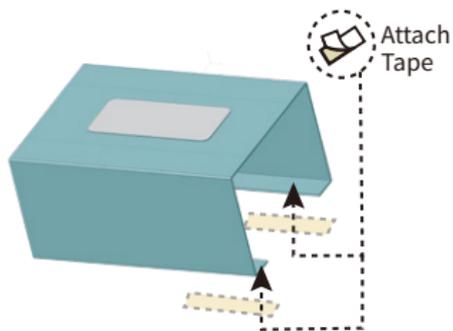


Installation method:

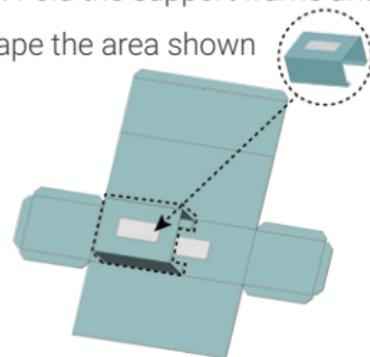
1. Spread out the Pandora's box



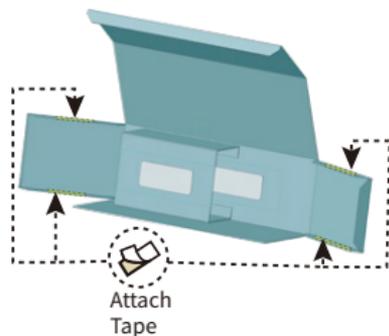
2. The shell of a support frame



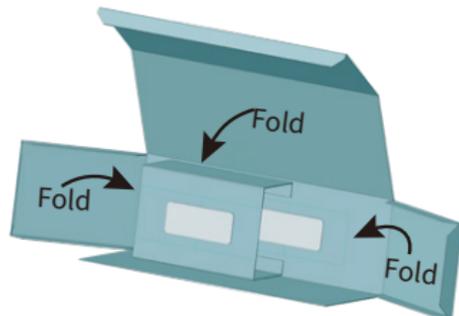
3. Fold the support frame and tape the area shown



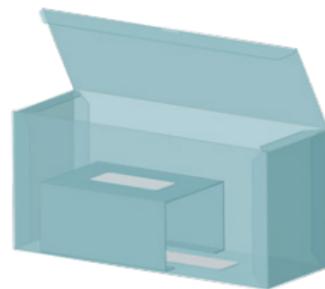
4. Post the support rack inside the carton



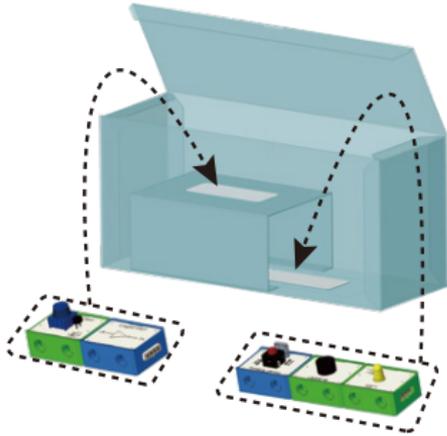
5. Folding carton



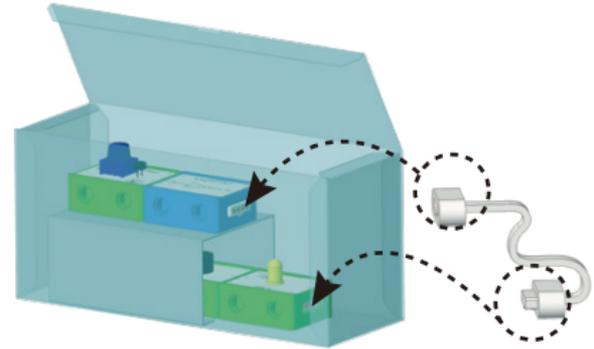
6. Fold into the shape shown on the diagram



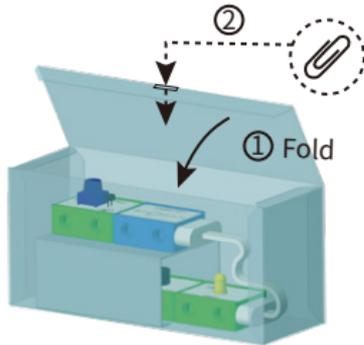
7. Place each module in the appropriate location



8. Connect the module with magnetic cable



9. Fold the lid of the box and fix it with a paper clip



10. The finished product



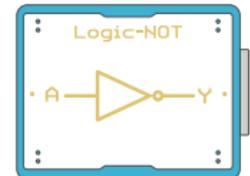
Test:

turn on the power, when you open the cover of the **Pandora** box, the **Pandora** box makes a sound and light turns on. When the lid is closed, the sound stops and the light turns off.

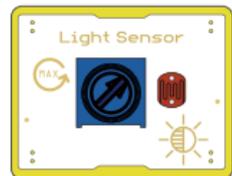


Description of required modules: In this project, in addition to the previous modules, **logical NOT module** and **Light sensor module** are also used.

A logical NOT module is based on a logical not-gate, which performs an inverse operation on the input, the output and input states are always opposite. With this module we can change the level of the input signal and do some interesting projects.



The main component of the **light sensor module** is a photoresistor, which is a resistance changing with the light value, and its resistance value will decrease with the increase of the light intensity. It is an analog input module, which can control the output module or even the whole circuit according to the light intensity.

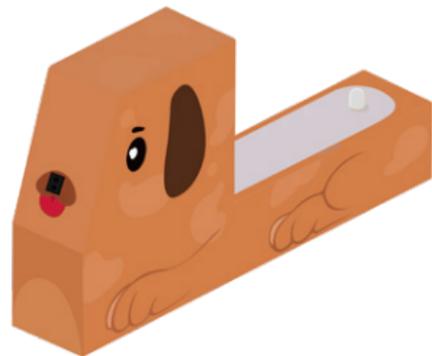


Application scenarios

The photoresistor is widely used in camera daylight control, photoelectric automatic control, photoelectric coupling, photoelectric automatic detection, electronic light-controlled toy, automatic light switch and various optical band photoelectric control measurement occasions.

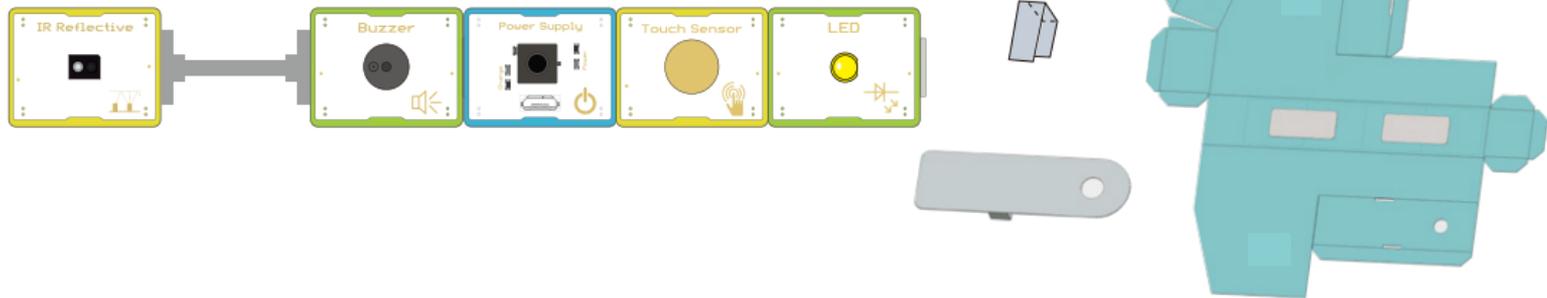
Cute little dog

Requirements: Make a cute puppy that can interact and play with you and light up when you stroke its back. When you touch its head, it gives a buzzer warning. Finish this fun project and let your dog interact with you.



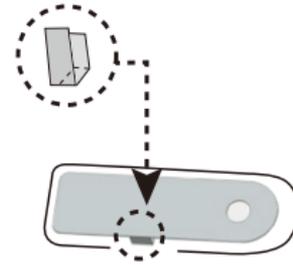
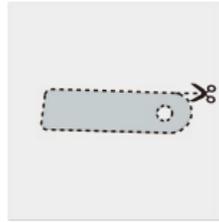
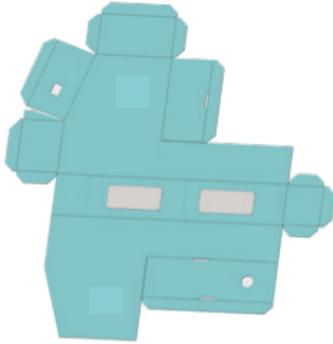
Required modules and materials:

Power Supply, Touch sensor, LED (Y), Buzzer, IR reflective sensor, cardboard, magnetic cable, tin foil.

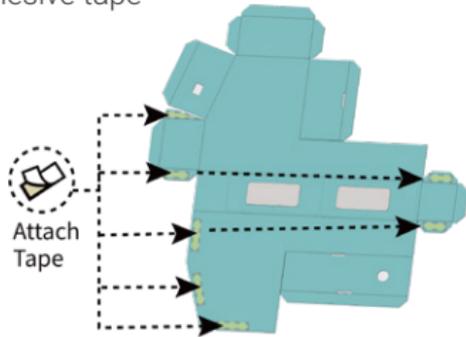


Installation method:

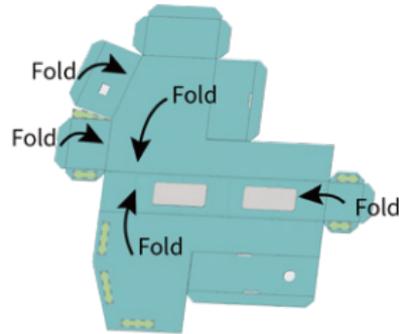
1. Spread out the paper, cut out the tin foil to the size of the paper mold, and stick a long strip of tin foil for later use



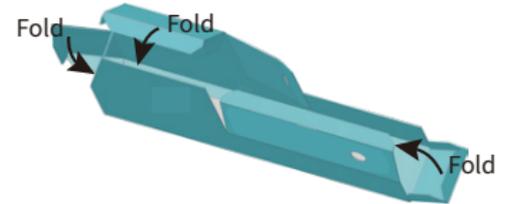
2. Corresponding position paste double - sided adhesive tape



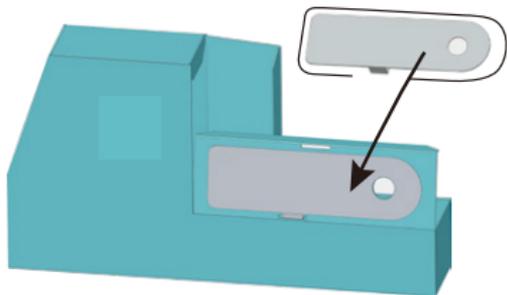
3. Folding carton



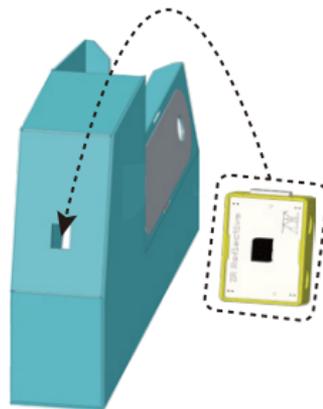
4. Connect the carton to secure



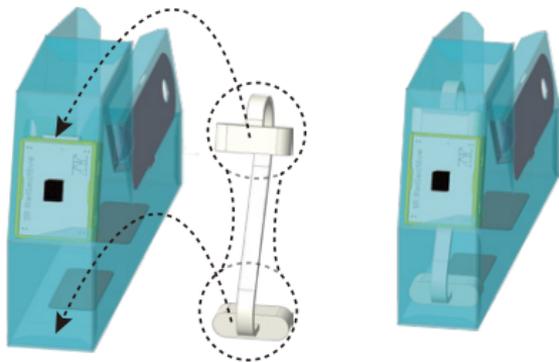
5. Paste the tin foil on your back



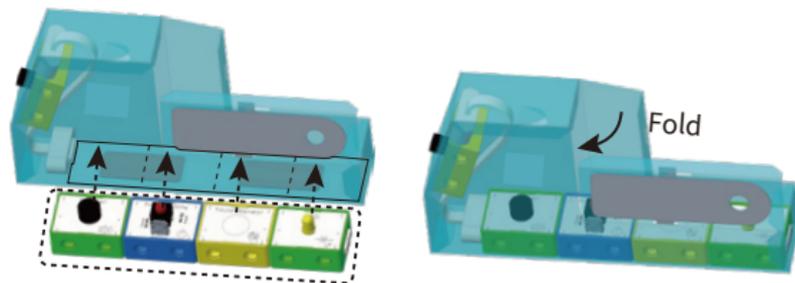
6. Put the infrared reflection sensor module in the head



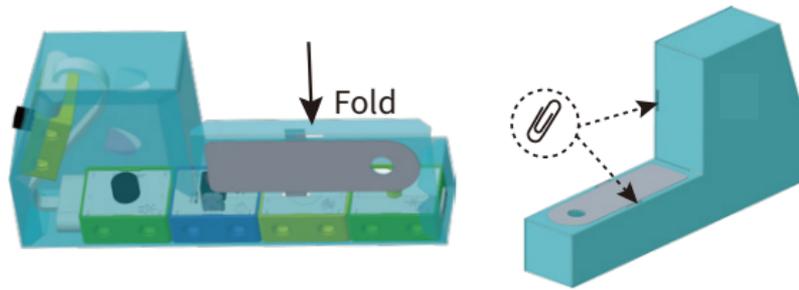
7. Connect the modules with magnetic cable



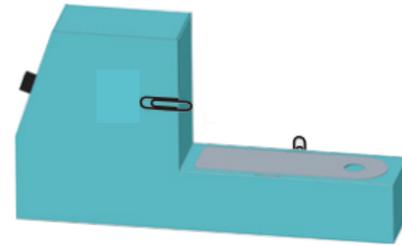
8. Place the module in the appropriate location



9. Close the back cover and secure the paper clip

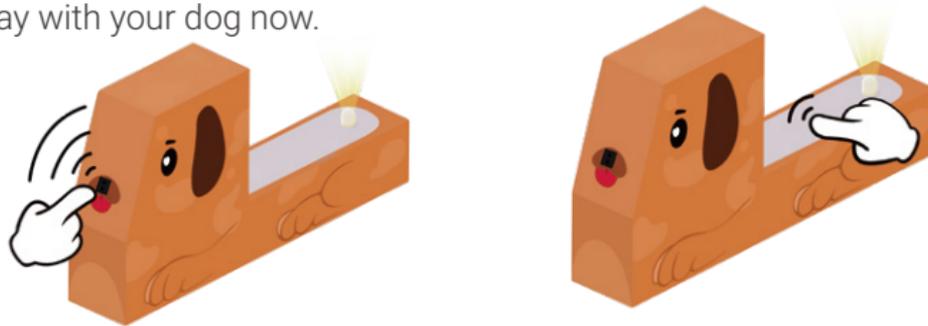


10. Finish assembly



Test:

Put your hand on the dog's head, the dog makes a noise. When the hand touches the dog's back, the tail light comes on. Play with your dog now.



Description of required modules: In this project, all the previous modules are reused, no more introduction will be made.

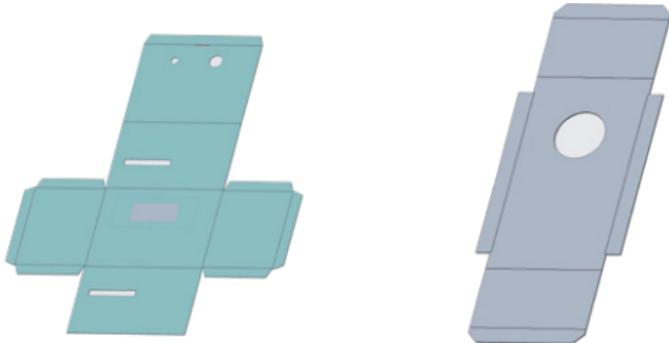
Morse code machine

Project requirements: Morse code, is a kind of on-and-off signal code that expresses different English letters, numbers and punctuation marks in different order. Here we will build a Morse code translator to translate the contents of the paper with Morse code signals. Listen carefully and see if you can make sense of these Morse codes.



Required modules and materials:

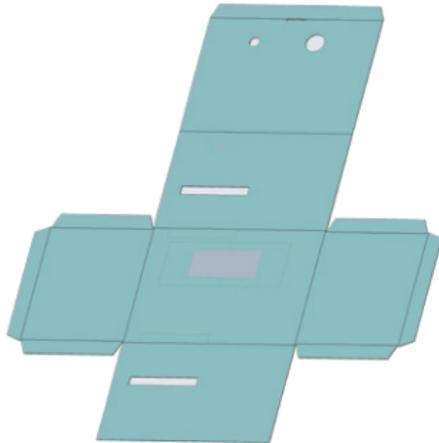
Power Supply, Touch sensor, LED (Y), Buzzer, IR reflective sensor, cardboard, magnetic cable, tin foil.



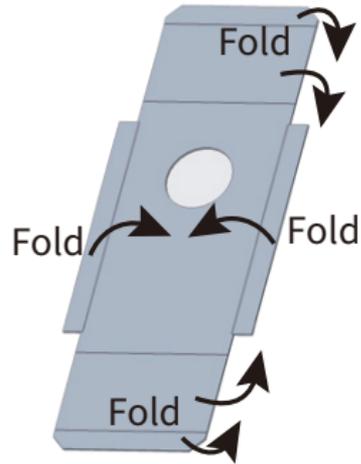


Installation method:

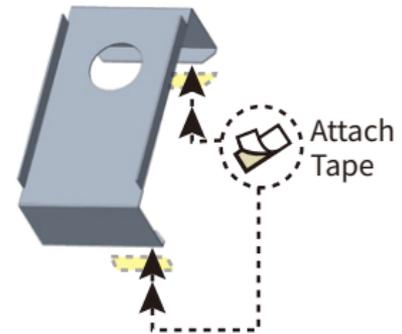
1. Spread out the carton



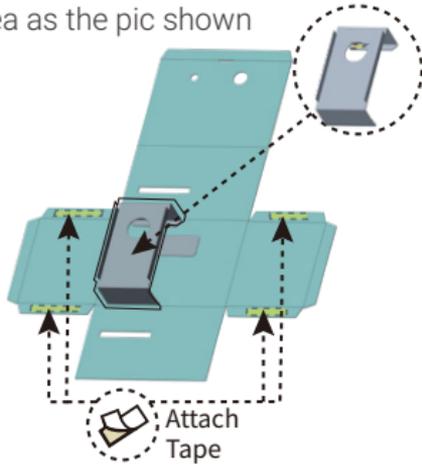
2. Folding bracket



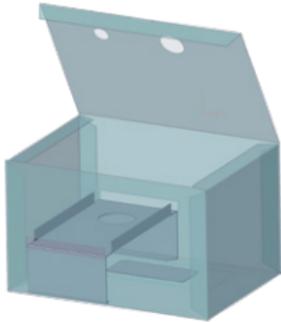
3. Paste double-sided tape in the area shown



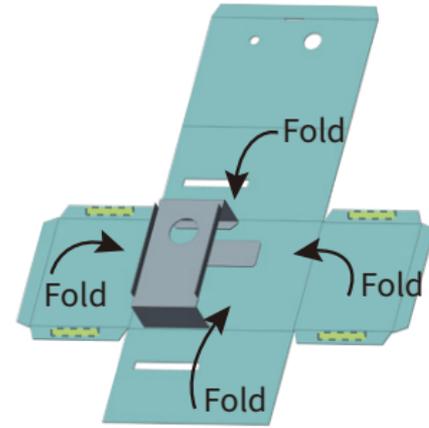
4. Install the bracket and paste the double-sided tape on the area as the pic shown



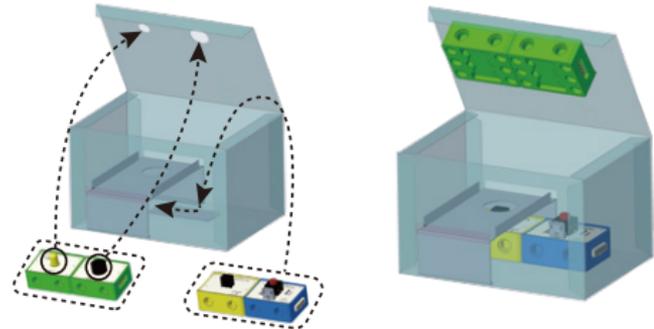
6. Fold into the shape shown above



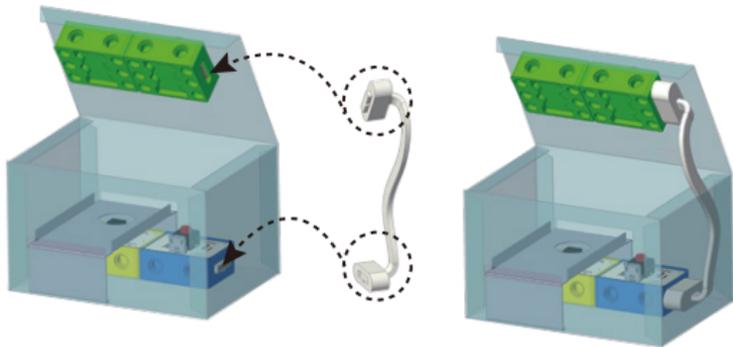
5. Folding carton



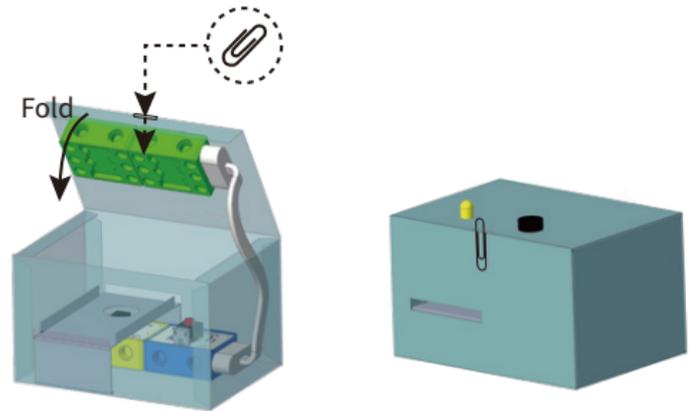
7. Place the module in the appropriate location



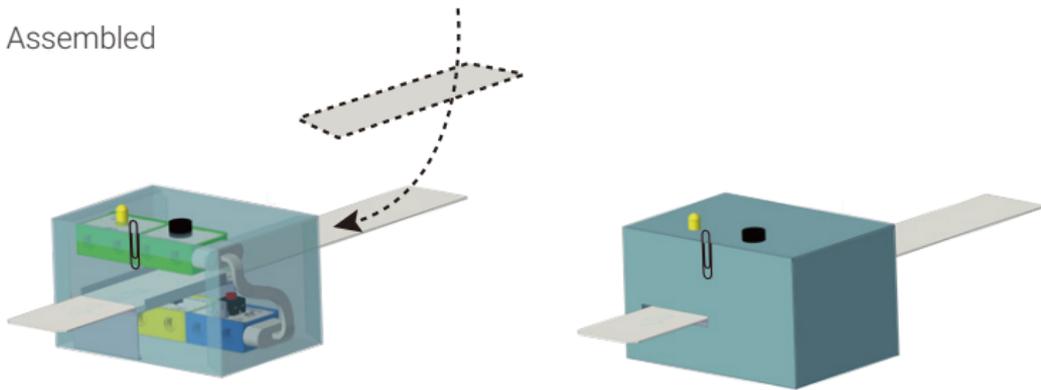
8. Connect modules with magnetic cable



9. Fold the cover in place

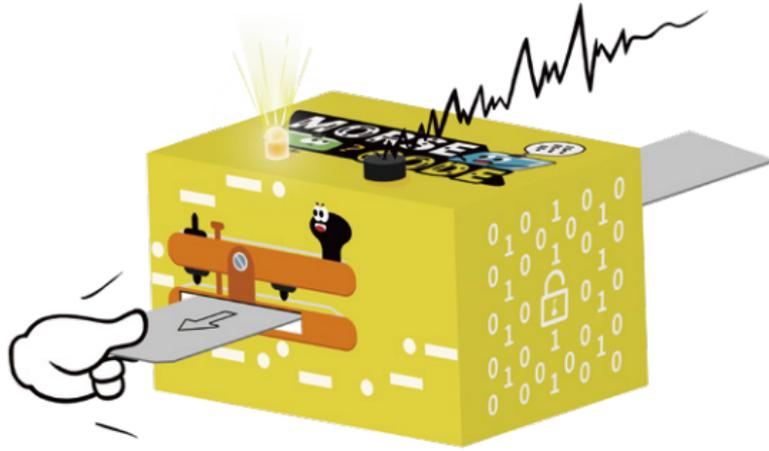


10. Assembled



Test:

Place the code strip at the entrance of the machine, pull it out from the other end at a constant speed, and the Morse code machine makes a point and a continuous sound. Check the Morse code table and translate the signal to sentences.



Description of required modules:

In this Morse code machine project, all the previous modules are reused, and no more introductions will be made.

5. Common technical problems

1. When the power module is switched on, the indicator light is not on.

- Use USB or A power adapter to charge the power module.

2. What if the module does not respond?

• Check whether the input module is on the left side of the output module, and connect the module correctly according to the connection diagram of the module.

• Adjust the position of the power module and check whether one side of the power module has bad contact.

• Replace the input and output modules with normal input and output modules to confirm whether there is a problem in one of the modules.

