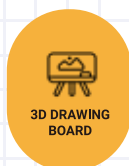


ELITRONS

8+

ELECTRONIC BLOCKS

CIRCUIT BUILDING BLOCKS



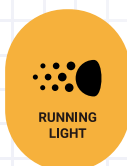
3D DRAWING
BOARD



LUMINOUS
SOLAR
SYSTEM



SOLAR
POWER



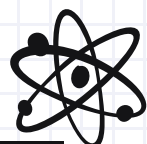
RUNNING
LIGHT



LEARNING CIRCUIT KNOWLEDGE

BUILD OVER

8899



PROJECTS

PROJEKTE | PROJEKTŮ

102

PCS | STK | KS



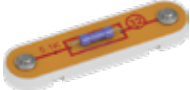
MANUAL
IN MULTIPLE LANGUAGES

HANDBUCH IN
MEHREREN SPRACHEN
MANUÁL
VE VÍCE JAZYCÍCH



eliPlay

PARTS LIST

NO	PART NAME	PART PICTURE
3	Wire 3 2x	
32	5.1 K Ω resistor	
49	Hand crank generator	
B2	Large solar cell	
M7	Electric torsion set	

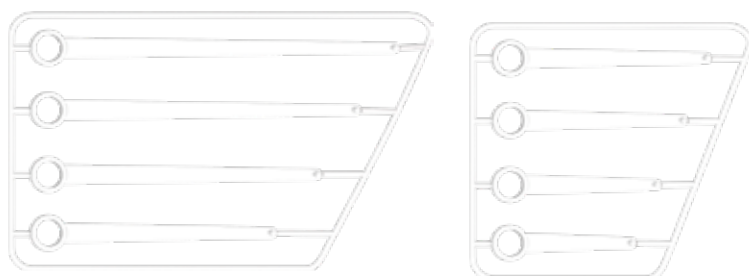
NO	PART NAME	PART PICTURE
U16	Running light	
U17	Reflective infrared sensor	
U18	Light base	
	Transparent drawing board	

NO	PART NAME	PART PICTURE
	3D glasses for light separation	
	3D pen with four colors	
	Flexible stand	
	Solar system set	See page P2

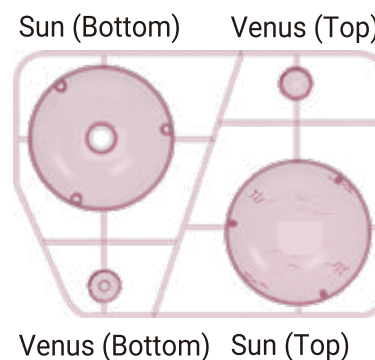
TABLE OF CONTENTS

Parts list	01		
Table of contents	01		
Unit 26: Solar system	02/05	Unit 29: Electric torsion	13/14
Unit 27: 3D drawing board	06/09	Unit 30: Infrared sensor	15/18
Unit 28: Running light	10/12	Unit 31: Hand crank circuit	19/22
		Unit 32: Solar cell circuit	23/26

SOLAR SYSTEM KIT LIST



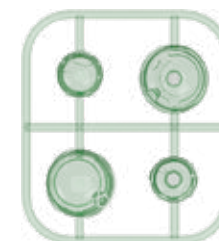
Planet Stand



Sun (Bottom) Venus (Top)

Venus (Bottom) Sun (Top)

Mercury (Top) Uranus (Bottom)



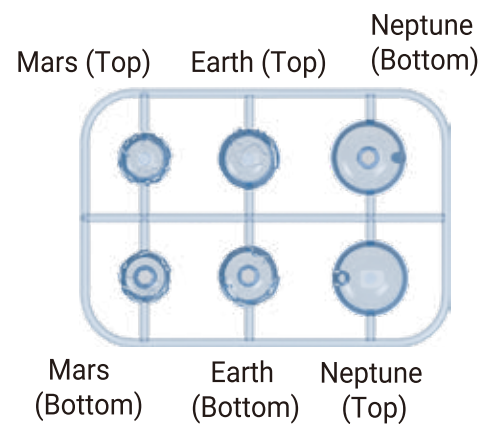
Uranus (Top) Mercury (Bottom)



Light Post

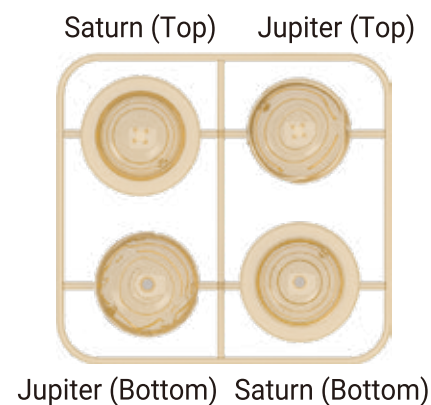
Solar System Motor

Planetary Sleeve



Mars (Top) Earth (Top) Neptune (Bottom)

Mars (Bottom) Earth (Bottom) Neptune (Top)



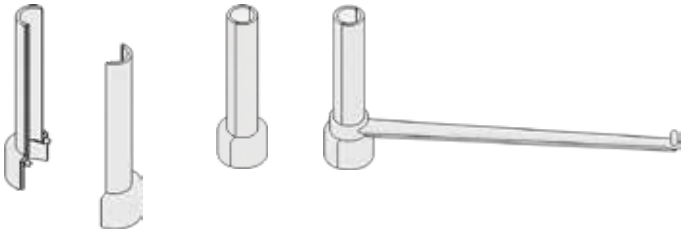
Saturn (Top) Jupiter (Top)

Jupiter (Bottom) Saturn (Bottom)



1. ASSEMBLE THE SOLAR SYSTEM

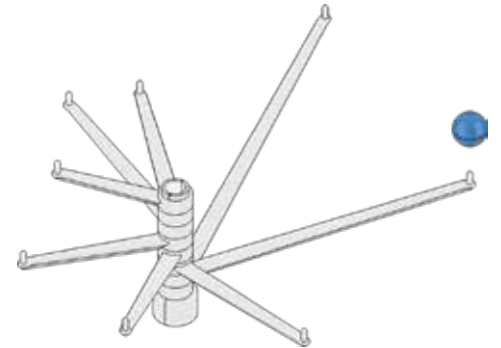
1



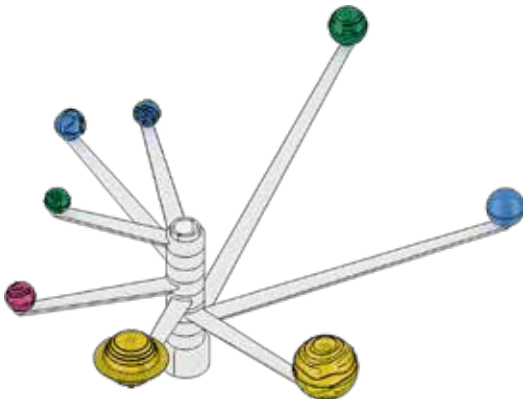
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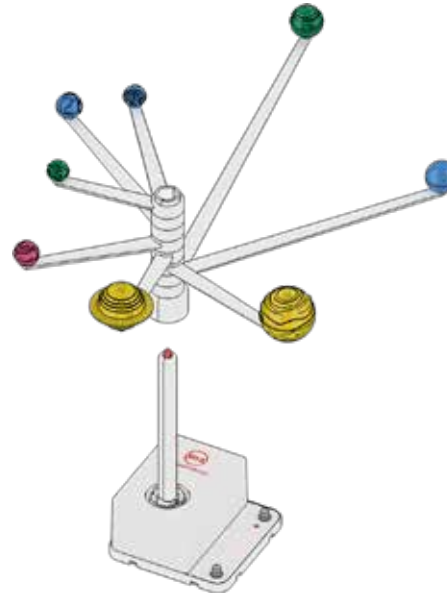
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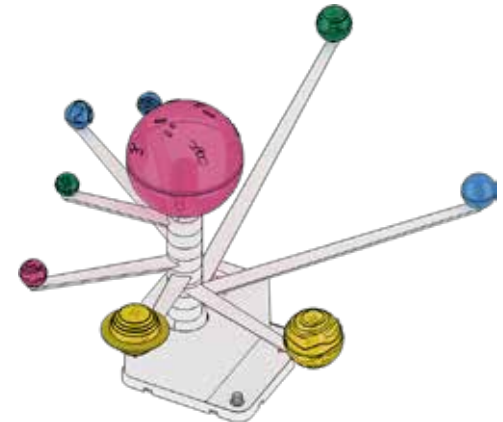
4



5



6

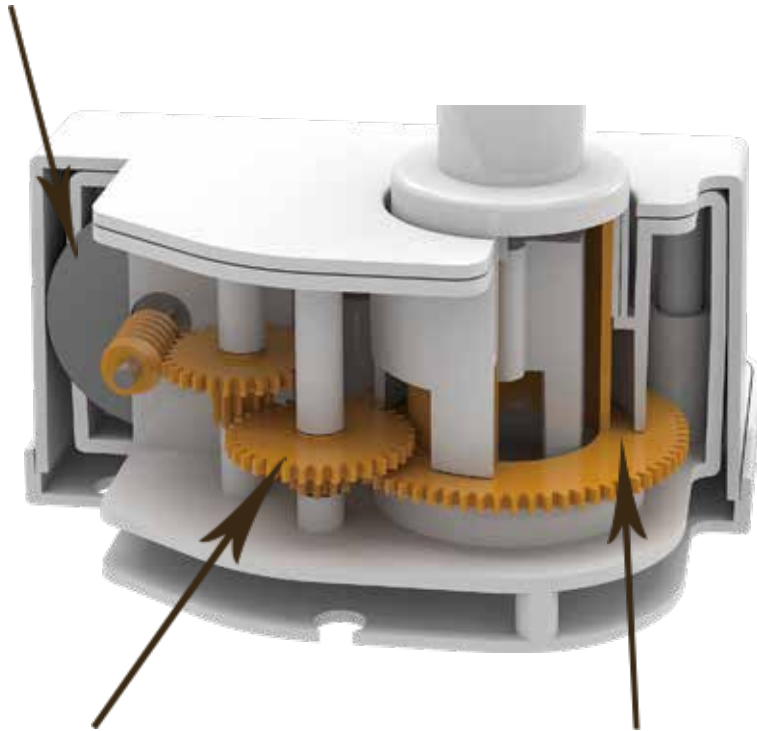


PART INTRODUCTION

Solar System Set, also known as "Solar System", is a model designed to demonstrate the motion of the solar system.

Motor

The motor converts electrical energy into mechanical energy, providing the power for the rotation of the solar system.



Gear System

It reduces the high-speed rotation of the motor to a low-speed rotation, thereby driving the slow movement of the eight planets.

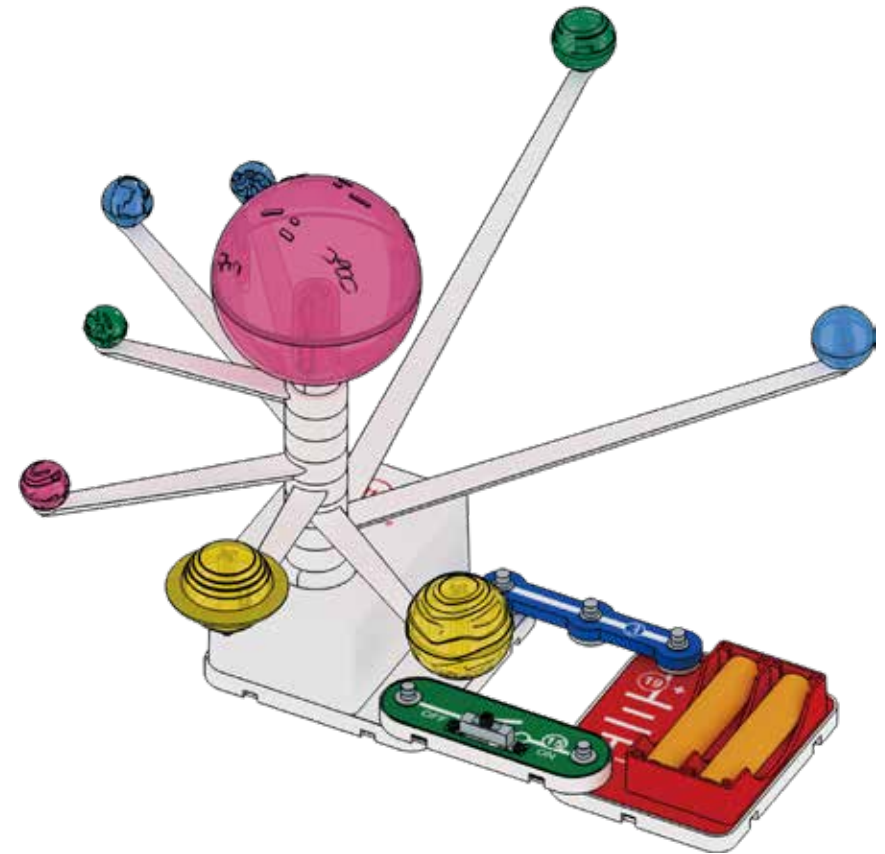
Planetary Gear Set Tube

One end is connected to the gear system, and the other end is attached to the planet stand, transferring the motor's movement to the planet stand, which in turn drives the rotation of the eight planets.



2. ELECTRIC SOLAR SYSTEM

- 1 Turn on the switch 15, and the sun emits a red glow, and the eight planets begin to rotate.



SOLAR SYSTEM FACTS

The order of the eight planets in the solar system from largest to smallest is:



sun



Jupiter



Saturn



Neptune



Uranus



Earth



Venus



Mars



Mercury

The order of the eight planets in the solar system from closest to the Sun is:



sun



Mercury



Venus



Earth



Mars



Jupiter



Saturn



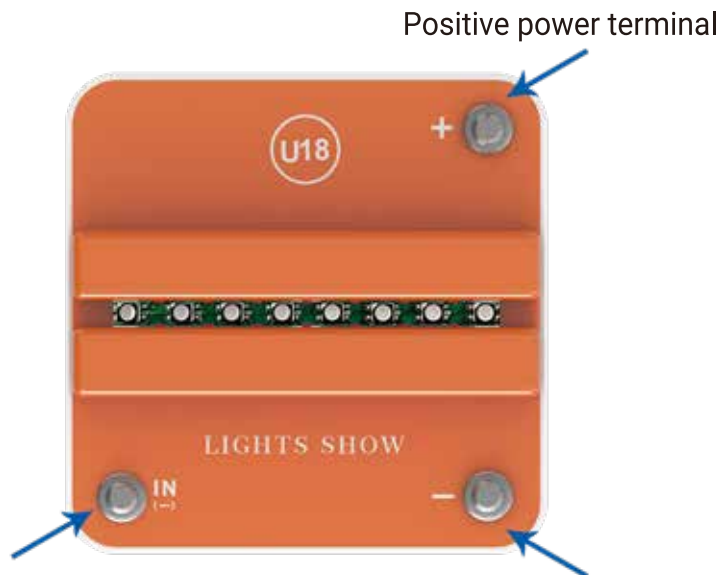
Uranus



Neptune

PART INTRODUCTION

The light drawing board base is composed of 8 RGB three-color LEDs, capable of emitting a variety of colors including red, green, and blue.



Light switch port:
connect the port to the
negative power terminal,
and each connection will change
the color of the lights once.

3D pen with
four colors



1. LIGHT DRAWING BOARD

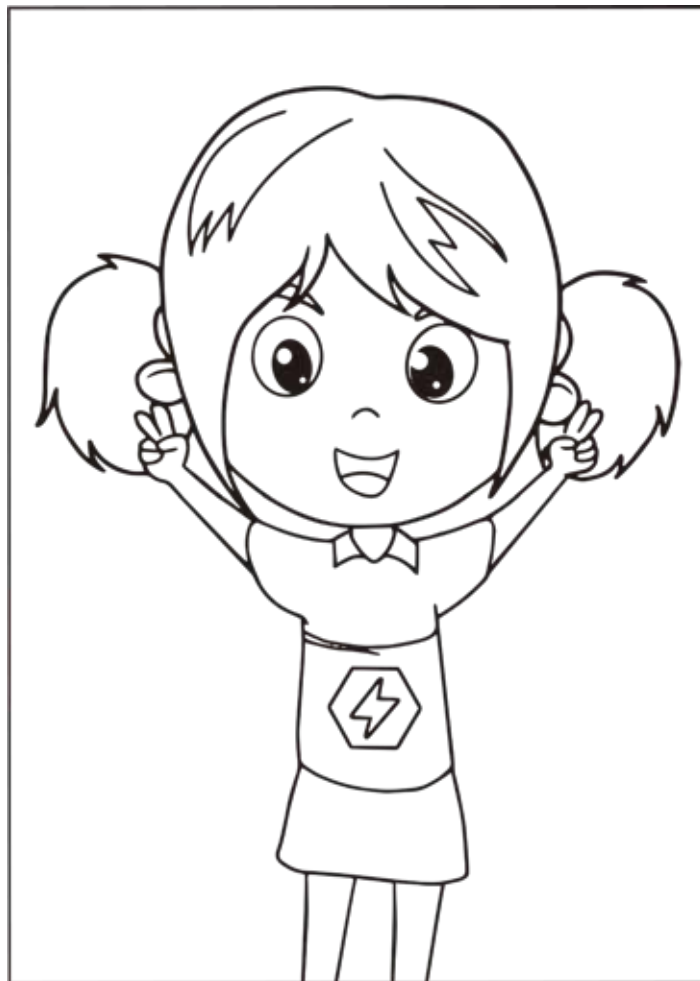
- 1 Draw patterns on the light board with a pen, then insert it into the base.
- 2 Turn on the switch 15, and press Tact switch 14 to change the color of the lights.



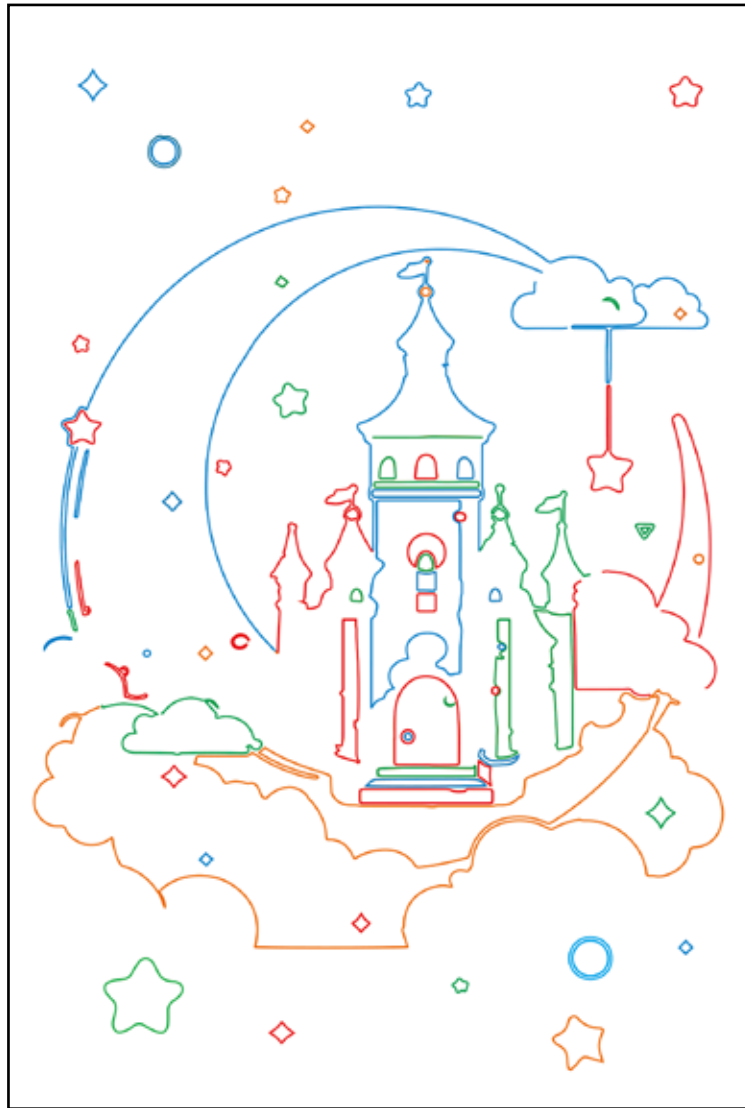
2. LIGHT DRAWING BOARD (6V POWER SUPPLY)

- 1 The operation is the same as above.

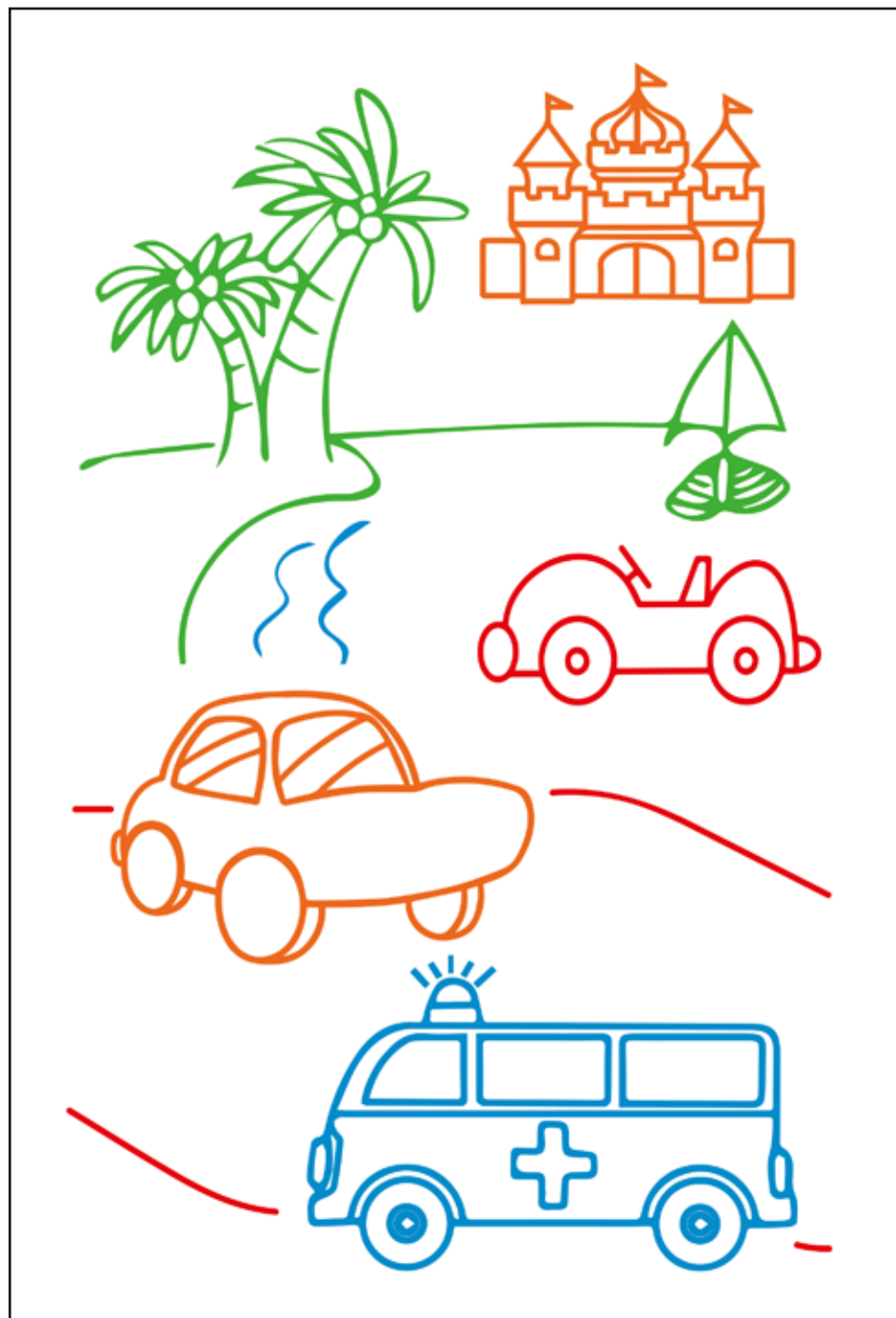




Align the transparent drawing board with the pattern, and use a 3D drawing pen to trace or create your own design. After completion, insert it into the light base and put on the 3D glasses to enjoy the three-dimensional visual effect. To redraw, simply clean the pattern with a damp tissue.



Place the drawing board over the pattern and trace it with a drawing pen.
You can also directly put on the 3D glasses to view the pattern on the paper.



PART INTRODUCTION

Running Light: A circular arrangement of 10 LEDs that, when activated, light up in a clockwise sequence, and finally illuminates one LED at random.

Positive Power Terminal



Positive Power Terminal: The positive terminal of the power supply.

Activation Port: Connected to the negative terminal of the power supply.

Negative Power Terminal



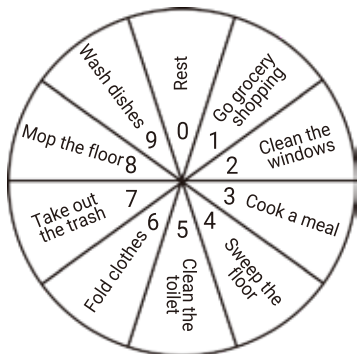
1. RUNNING LIGHT

- 1 Turn on the switch 15, and press Tact Switch 14.
- 2 The speaker emits a "beep beep beep" sound, the LED light circle runs in sequence, and finally lights up one LED at random.



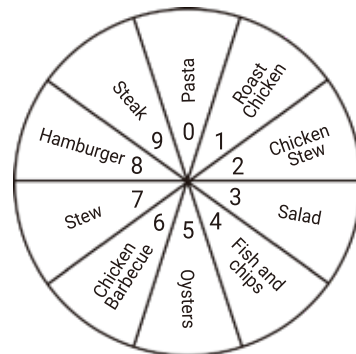
Housework carousel

Household Chore Spinner



Food carousel

Food Spinner



Family carousel

Family Spinning Wheel



You can write the corresponding activities for each number, start the Running Light, and let it help you make a choice! You can also invite your friends to join in the fun!





2. LIGHT AND SOUND RUNNING LIGHT

- 1 Turn on the switch 15, and press Tact Switch 14.
- 2 The buzzer H1 emits a "beep beep beep" sound, and the red LED also flashes.



3. LIGHT IN PARALLEL WITH RUNNING LIGHT

- 1 Turn on the switch 15, and press Tact Switch 14.
- 2 The buzzer H1 emits a "beep beep beep" sound, and two LEDs in series also flash.



4. LIGHT IN PARALLEL WITH RUNNING LIGHT 2

- 1 Turn on the switch 15, and press Tact Switch 14.
- 2 The buzzer H1 emits a "beep beep beep" sound, and the LEDs in series with the RGB LED also flash.



5. COLORFUL FAN WITH RUNNING LIGHT

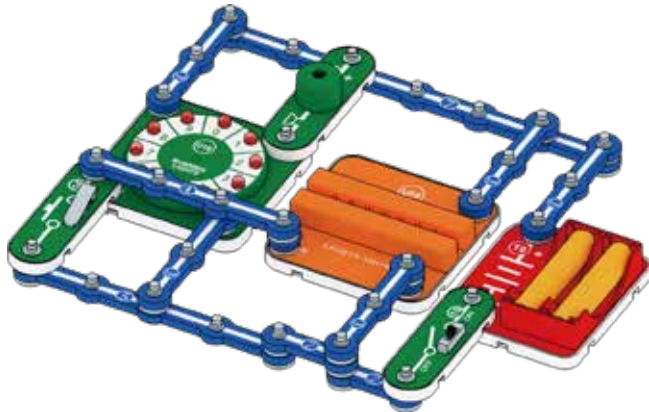
- 1 Turn on the switch 15, and press Tact Switch 14.
- 2 The colorful fan 71 starts up, the buzzer H1 emits a "beep beep beep" sound, and various color LEDs flash.





6. RUNNING LIGHT AND LIGHT DRAWING BOARD

- 1 Turn on the switch 15, press Tact Switch 14.
- 2 The running light starts, and the light drawing board changes colors.



7. TILT SWITCH CONTROL RUNNING LIGHT

- 1 Turn on the switch 15, connect wire 2 to terminal B, when tilted towards B, the running light starts.
- 2 Connect wire 2 to terminal C, when tilted towards C, the running light starts.



8. TOUCH-CONTROLLED SOUND AND LIGHT RUNNING LIGHT

- 1 Turn on the switch 15, and when you touch the touch chip U12 with your finger, the running light starts



Referring to the previous touch chip circuit unit, you will get more ways to play.



PART INTRODUCTION

The motor drives the torsion to rotate at high speed. Once the motor is disconnected, the torsion continues to spin for a while due to inertia.

Principle of Electric Torsion

Motor

Responsible for converting electrical energy into mechanical energy, driving the torsion to rotate at high speed.

Hook

Used to secure the torsion, allowing it to be driven by the motor.

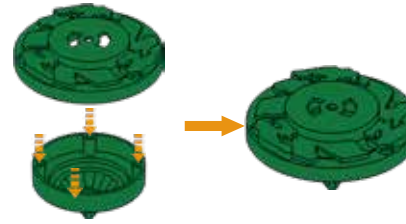
Torsion

Rotates at high speed under the motor's drive. When the motor's power is cut off, the torsion continues to spin for a period due to inertia and will detach from the hook, falling onto the circular plate to continue spinning.

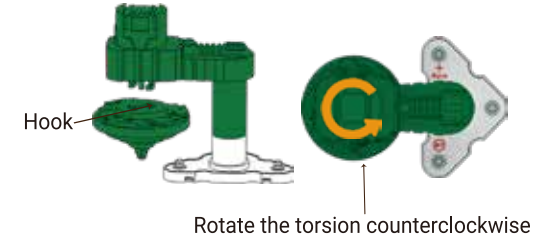
Circular Plate

Restricts the range of the torsion's rotation, preventing it from deviating from the intended area during rotation.

1 Assembling Torsion



2 Insert the torsion into the hook, then rotate the torsion counterclockwise until it is securely hooked.

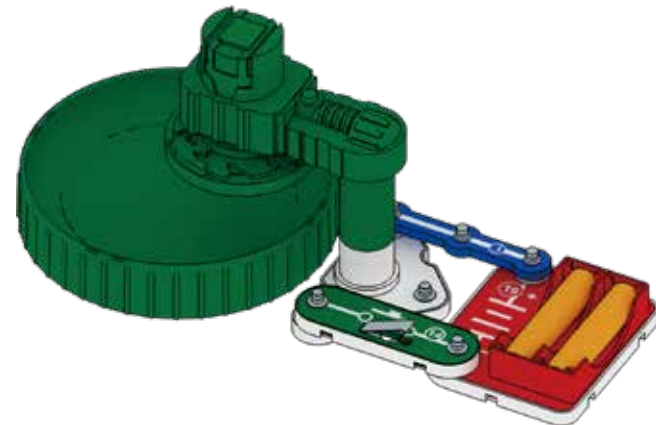


3 As shown in the diagram, press and hold down Tact Switch 14. When the torsion reaches its maximum rotation speed, release Tact Switch 14, and the torsion will fall onto the circular plate. Due to inertia, the torsion will continue to spin at high speed for a while before coming to a stop.



Warning

Do not touch the rotating parts, and avoid contact with the motor and torsion while they are in operation.



The motor converts electrical energy into mechanical energy, driving the torsion to rotate at high speed. Once the motor's power is disconnected, the motor stops rotating, and due to inertia, the torsion detaches from the hook and falls into the circular plate to continue spinning.

WHY DOES THE TORSION AUTOMATICALLY FALL OFF ONCE THE POWER IS CUT OFF?



Structure of the Hook



When the hook rotates clockwise, it will grip the torsion

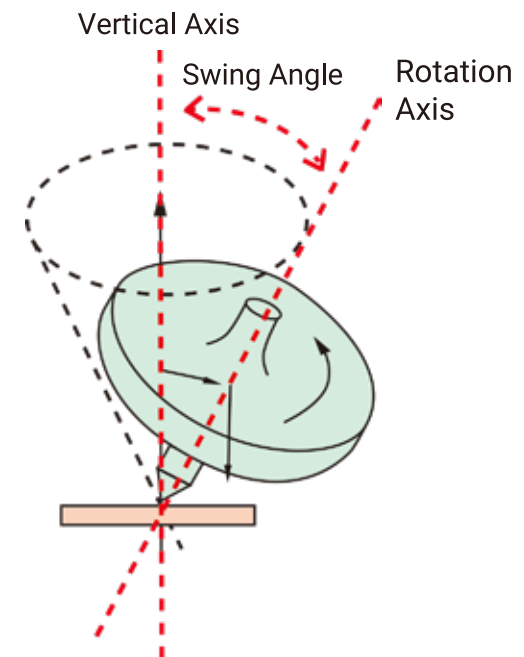
- 1 When powered, the hook grips the torsion and rotates clockwise with it.



- 2 After the power is disconnected, the hook stops rotating, but due to inertia, the torsion continues to move forward. At this point, the torsion detaches from the hook and automatically falls off.

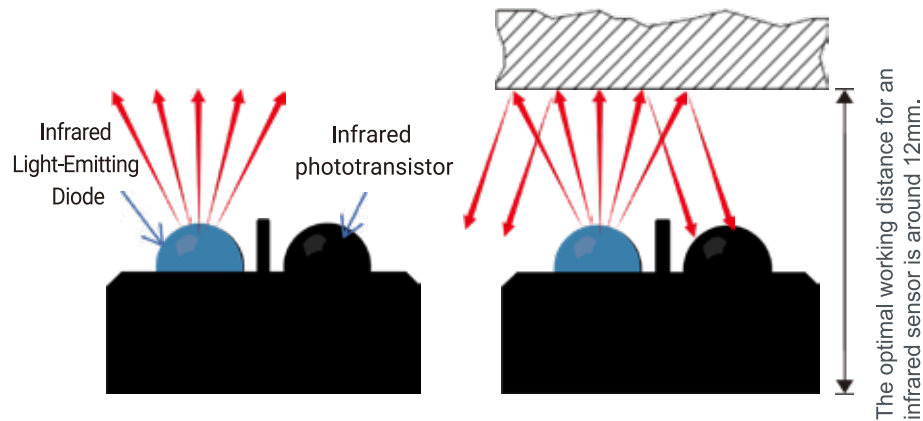
WHY CAN THE TORSION CONTINUE TO SPIN?

While the torsion is spinning, it not only rotates around its own axis (rotation axis) but also performs a conical motion around a vertical axis. The speed of the "self-rotation" around its own axis is slower, which determines the size of the torsion's swinging angle. The slower the torsion spins, the larger the angle of swing: the less stable it is, the shorter the spinning time. Conversely, the faster the torsion spins, the smaller the angle of swing, thus the better its stability, and the longer the spinning time. A torsion spinning at high speed may even appear to be completely stationary.



PART INTRODUCTION

Reflective infrared sensor, also known as an infrared sensor, contains an infrared light-emitting diode and an infrared phototransistor.



When there is no object above

When the infrared emitted by the infrared light-emitting diode is not reflected back or is reflected back but with insufficient intensity, the infrared phototransistor remains in an off state.

When there is an object above

When the infrared emitted by the infrared light-emitting diode is reflected back with sufficient intensity, the infrared phototransistor is in a conductive state.



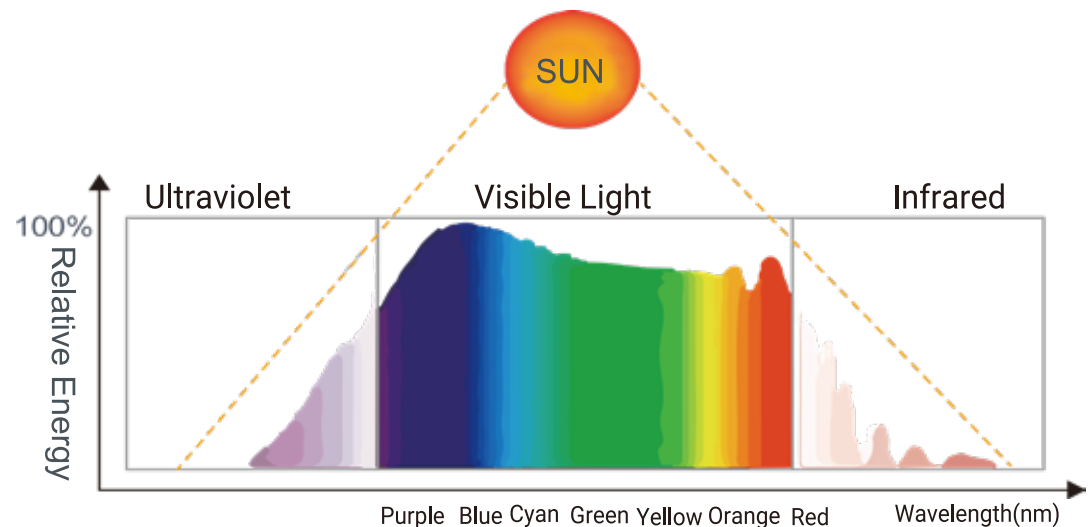
Reflective Infrared Sensor Circuit Diagram

WHY DO REFLECTIVE INFRARED SENSORS NEED TO WORK IN PLACES WITH DIM SUNLIGHT?



This is because sunlight contains infrared rays. If infrared sensors work in bright sunlight, they will be affected, leading to false triggering.

The light waves beyond red light are known as infrared rays. The light waves beyond violet light are known as ultraviolet rays.



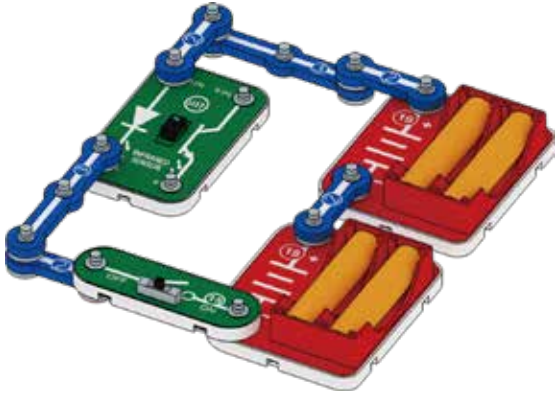
In addition to the visible light that is visible to the human eye in sunlight, there are also ultraviolet and infrared rays that are invisible to our eyes.

Many other organisms can see a different range of light waves than humans. For example, some insects, including bees, can see the ultraviolet band, which is very helpful in finding nectar.



1. INFRARED EMITTING DIODE

- 1 Turn on the switch 15, and the infrared emitting diode inside the infrared sensor U17 emits infrared rays.



Infrared rays are invisible to the naked eye and require a smartphone camera to be seen.



4. REMOTE CONTROL LED (2)

- 1 With the addition of a transistor for current amplification, the operation is the same as above.



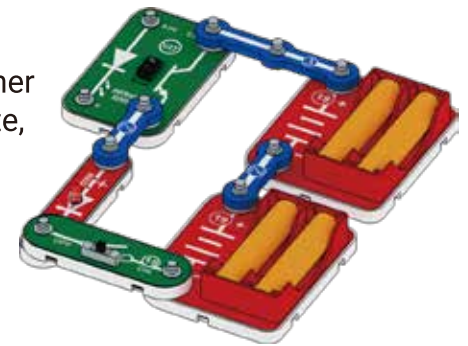
2. SUNLIGHT INFRARED CONTROL LED

- 1 Turn on the switch 15, place the device in sunlight, and the red LED lights up.



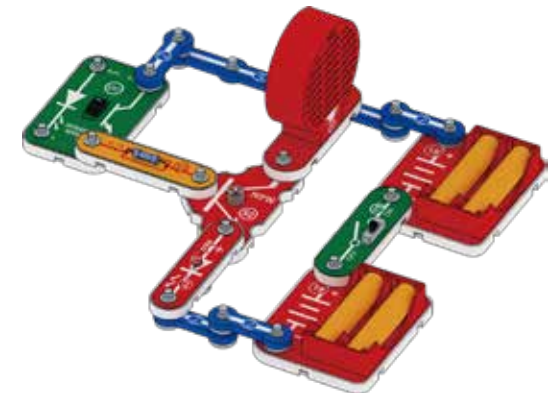
3. REMOTE CONTROL LED

- 1 Move the device to a dark indoor area where the LED is off.
- 2 Point any infrared remote control from home appliances like a TV or air conditioner at U17 and press any button on the remote, and the LED will flash once.



5. REMOTE CONTROL SPEAKER

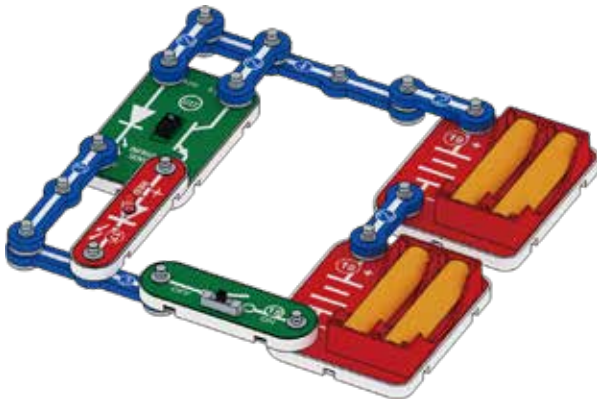
- 1 Turn on the switch 15.
- 2 Point any infrared remote control from home appliances at U17 and press any button on the remote, the LED will flash and the speaker will emit a "beep" sound.





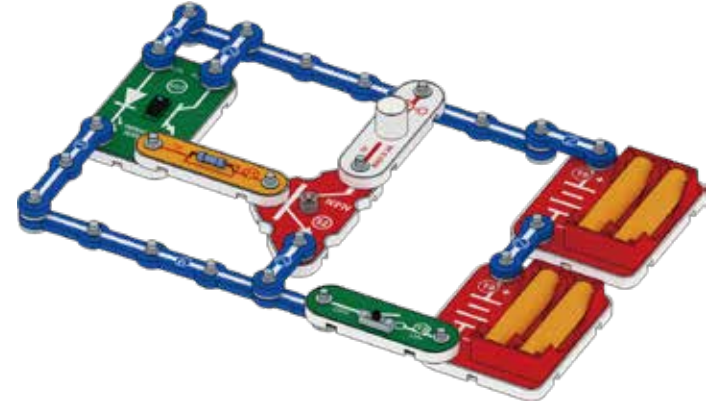
6. INFRARED SENSOR CONTROL LED

- 1 Turn on the switch 15.
- 2 As you move your palm from above down towards the infrared sensor U17, the red LED will gradually light up.



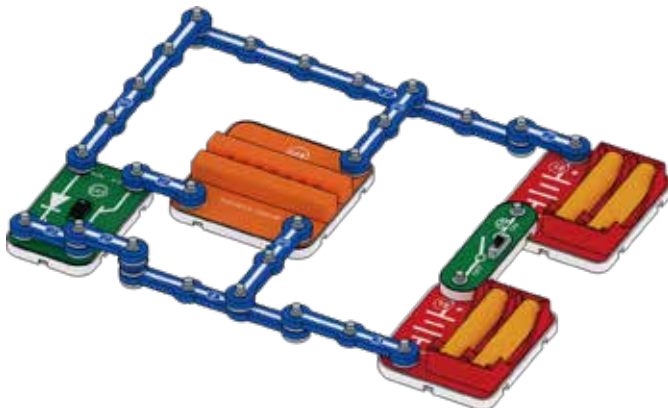
7. INFRARED SENSOR CONTROL LIGHT BULB

- 1 Turn on the switch 15.
- 2 As you move your palm from above down towards the infrared sensor U17, the light bulb 27 will gradually light up.
- 3 You can replace bulb 27 with 17, 18, 24, 71, 87.



8. INFRARED SENSOR CONTROL LIGHT BASE

- 1 Turn on the switch 15.
- 2 As you move your palm from above down towards the infrared sensor U17, you can switch the color of the light.



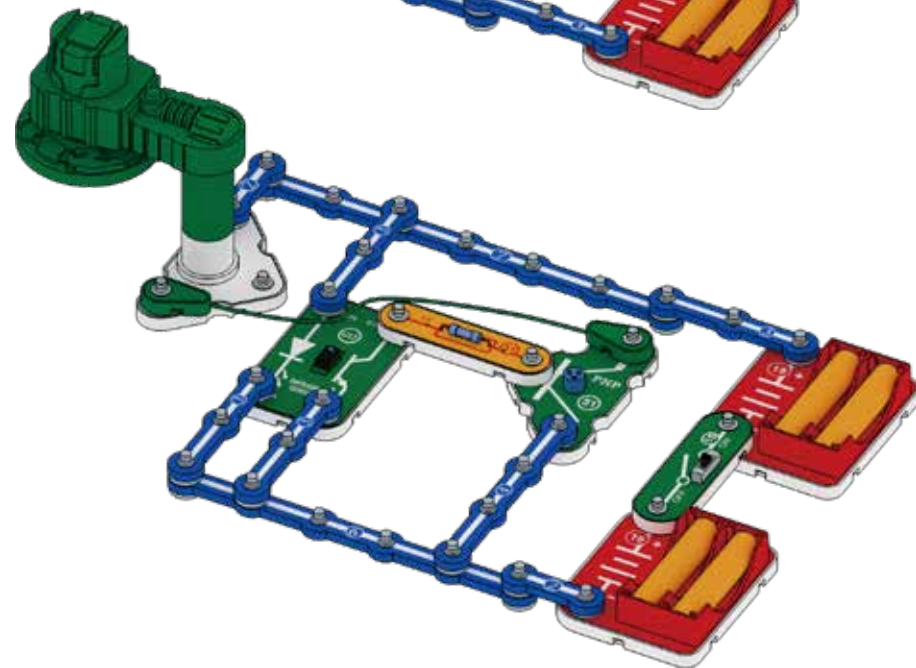
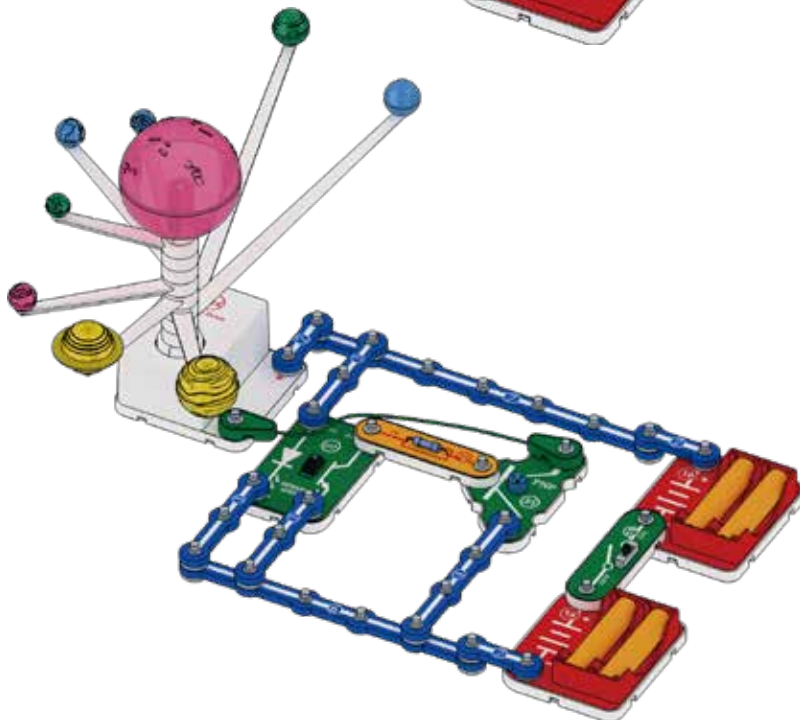
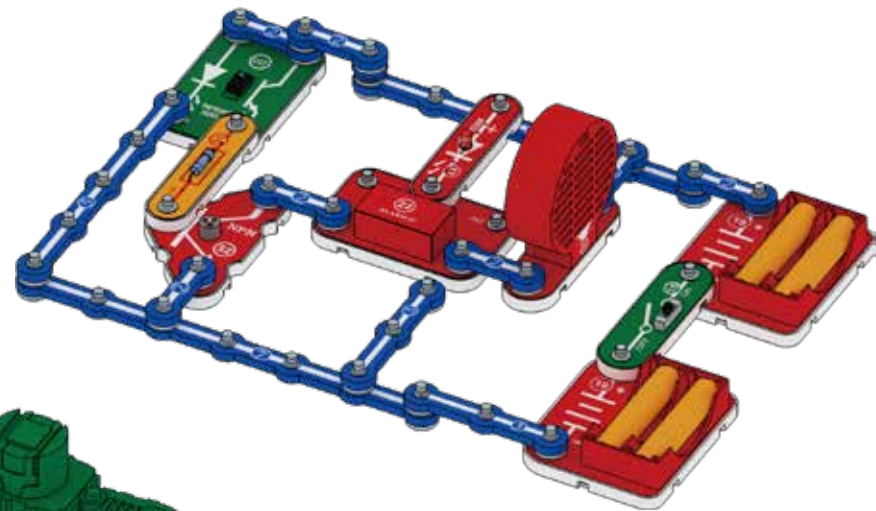
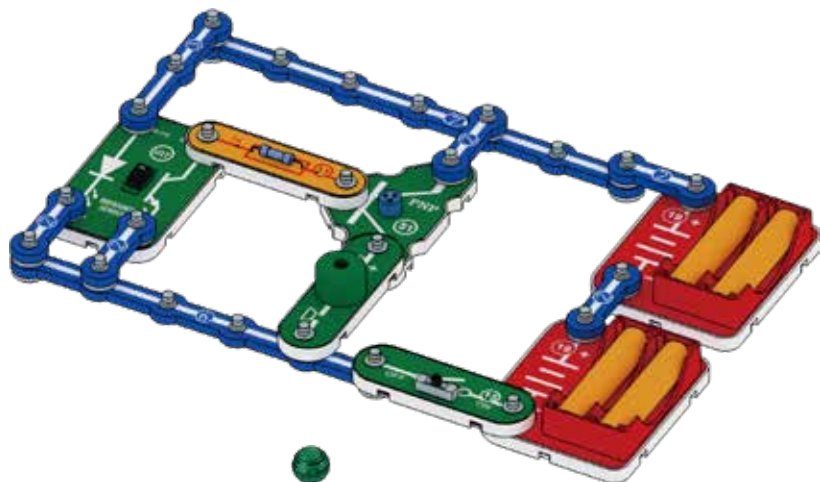
9. INFRARED SENSOR CONTROL RUNNING LIGHT

- 1 Turn on the switch 15.
- 2 As you move your palm from above down towards the infrared sensor U17, you can activate the running light.





10. MORE WAYS TO PLAY WITH INFRARED SENSOR

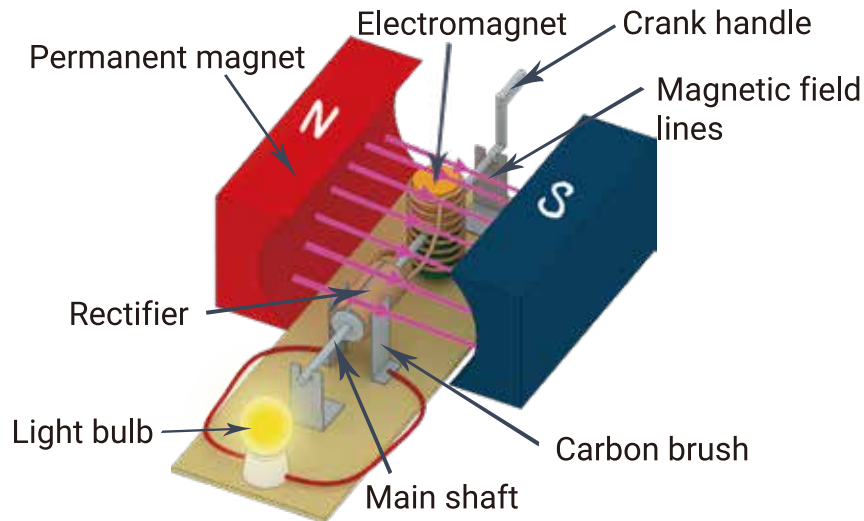


For more ways to play,
refer to the previous transistor unit.



PART INTRODUCTION

The hand-crank generator uses the principle of electromagnetic induction to convert mechanical energy into electrical energy.



Schematic diagram of the generator principle

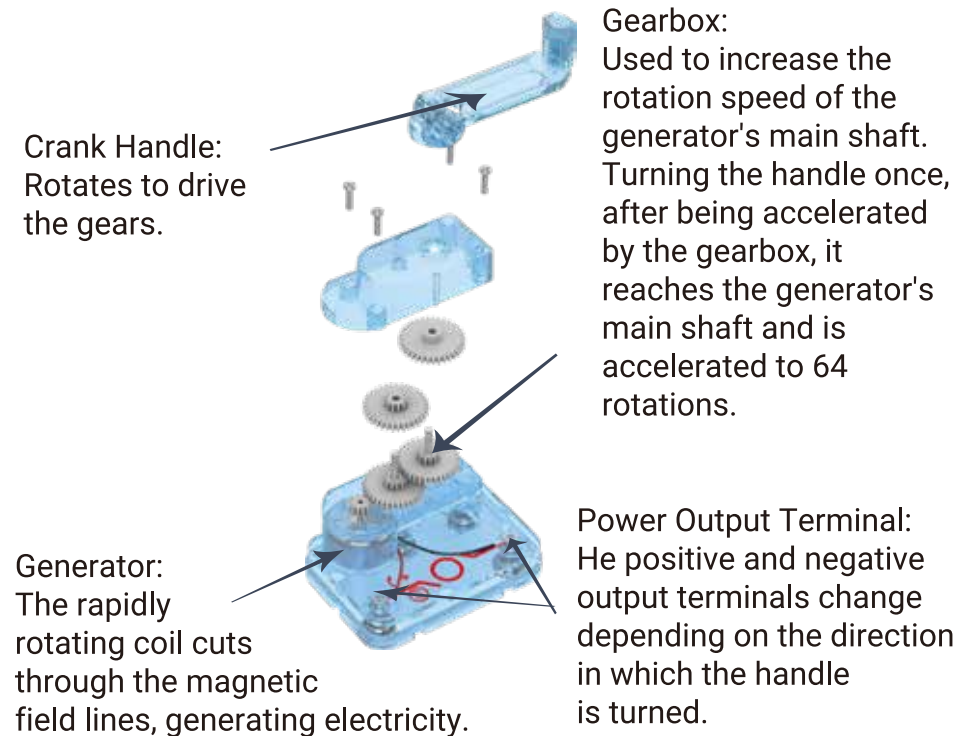
Principle of direct current generator

When the crank of the generator is turned, the main shaft, along with the electromagnet, rotates at high speed. The electromagnet cuts through the magnetic field lines of the permanent magnet, inducing an electric current in the coil of the electromagnet. This current is then drawn out through the commutator and brushes, producing direct current that lights up the bulb. The rated voltage of the hand crank generator is 3V, with a current of 0.3A.

In this set of building blocks, all circuits that use battery box 19 can be replaced with a hand crank generator 49, which can double the number of ways to play!



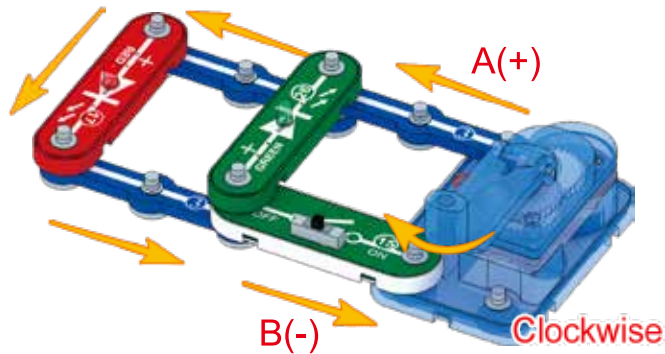
Structure of Hand Crank Generator





1. CLOCKWISE POWER GENERATION

- 1 Turn on the switch 15, and rotate the generator clockwise (49).
- 2 Terminal A is positive, and terminal B is negative. The current starts from point A, passes through and lights up the red LED, then returns to terminal B, the negative pole.

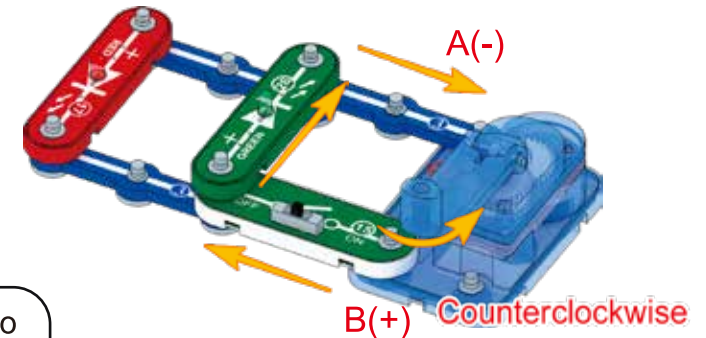


Do you know why two LEDs do not light up at the same time?



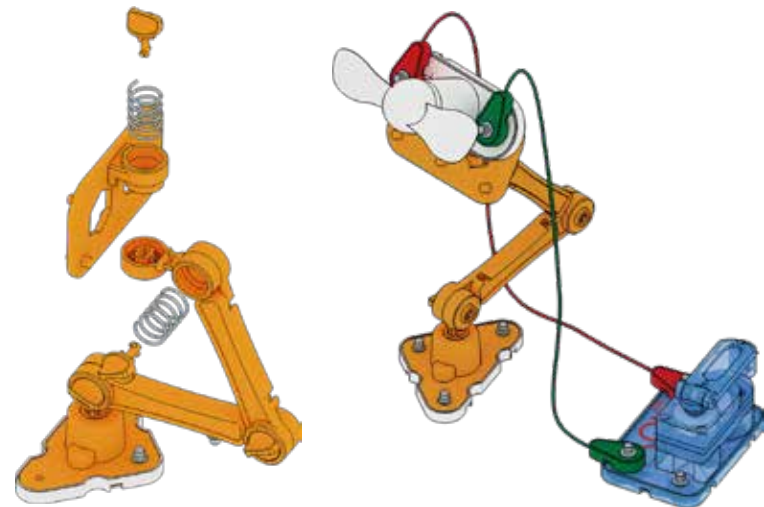
2. COUNTERCLOCKWISE POWER GENERATION

- 1 Turn on the switch 15, and rotate the generator counterclockwise (49).
- 2 Terminal B is positive, and terminal A is negative. The current starts from point B, passes through and lights up the green LED, then returns to terminal A, the negative pole.



3. HAND CRANK COLORFUL FAN

- 1 Replace the lamp head of the directional lamp with a rotating connection board, and install the solar panel, LED, colorful fan, etc, on top to create a directional stand.
- 2 Rotate the generator clockwise, and the colorful fan will light up and spin. Rotate the generator counterclockwise, and the colorful fan will spin but will not light up.

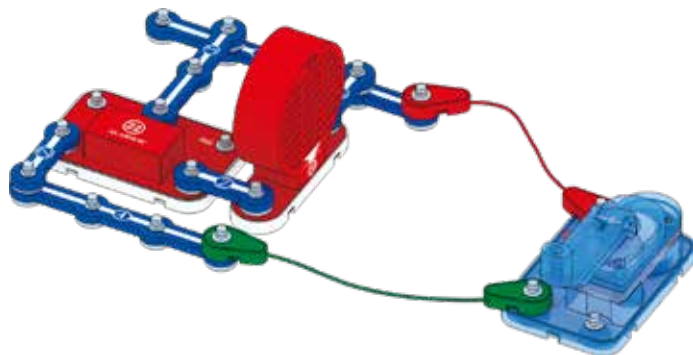




4. HAND CRANK GENERATOR ALARM CIRCUIT

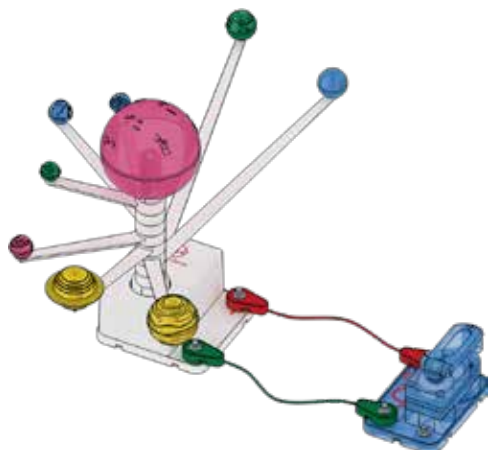
- 1 Crank the generator 49 clockwise at a steady and slow pace to sound the police car alarm.

For more combinations, please refer to the previous alarm circuit unit.



6. HAND CRANK SOLAR SYSTEM

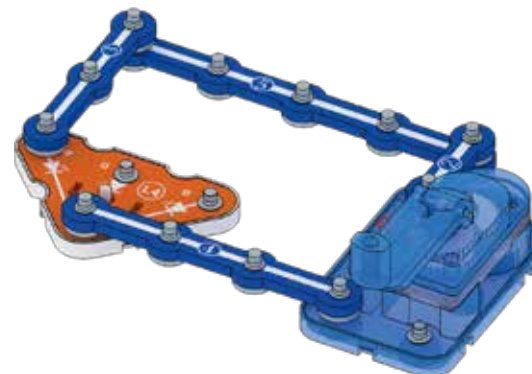
- 1 Crank the generator clockwise to light up and rotate the solar system.
- 2 Crank counterclockwise, and the solar system will rotate but not light up.



5. HAND CRANK RGB LED

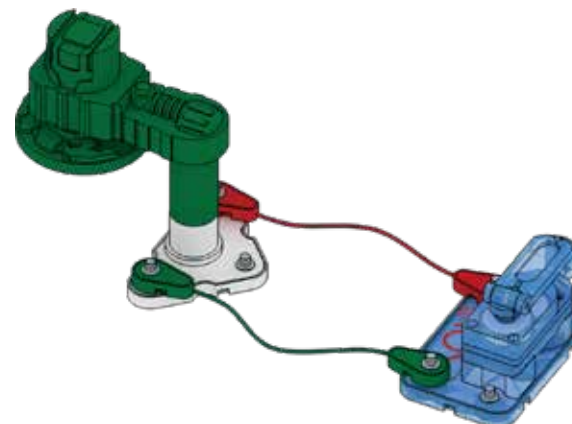
- 1 Crank the generator 49 clockwise to power the RGB three-color LED.

For more combinations, please refer to the previous RGB LED unit.



7. HAND CRANK ELECTRIC TORSION

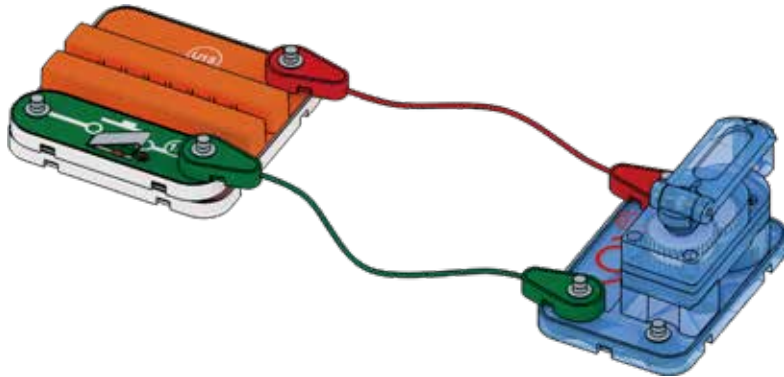
- 1 After hanging the torsion, crank the generator clockwise, and the torsion will start to rotate.
- 2 When the torsion reaches a relatively high speed, stop cranking, and the torsion will fall off and continue to spin.





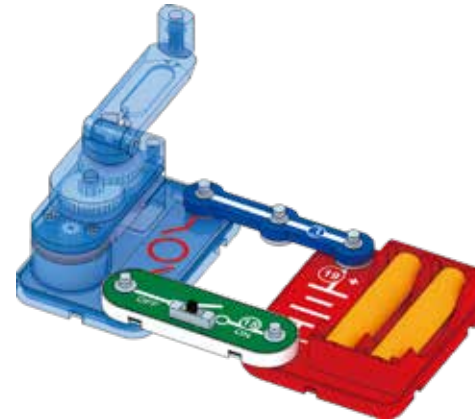
8. HAND CRANK LIGHT DRAWING BOARD

- 1 Crank the generator clockwise while pressing the button to start the light drawing board.



9. HAND CRANK MOTOR

- 1 Turn on the switch 15, and the hand crank generator will act as a motor and start to rotate.

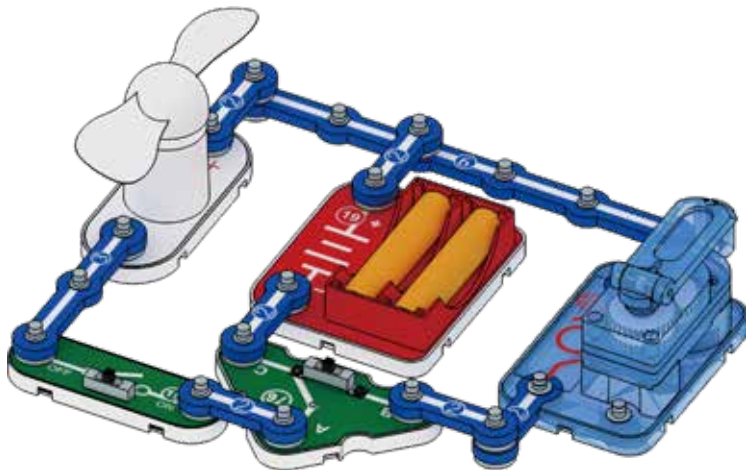


Actually, a generator and a motor can be interchanged. When you crank the generator, it can produce electricity; when you apply electricity to the hand crank generator, it will rotate like a motor.



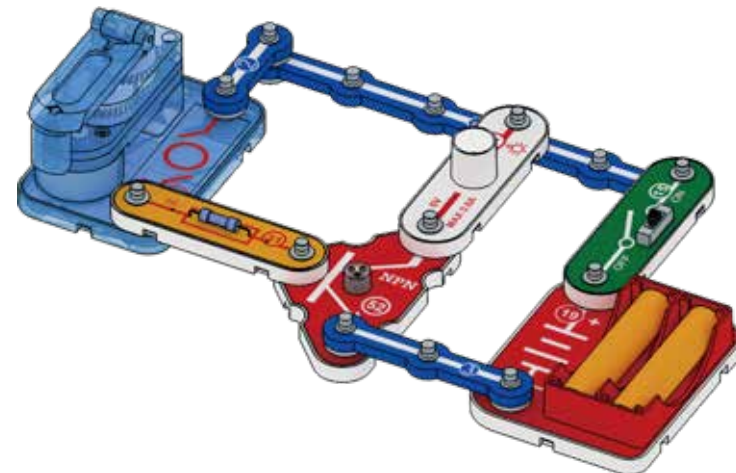
10. SWITCHING POWER SUPPLY MODE

- 1 Turn on the switch 15, and then use a single pole, double throw switch to toggle the power supply mode for the colorful fan.



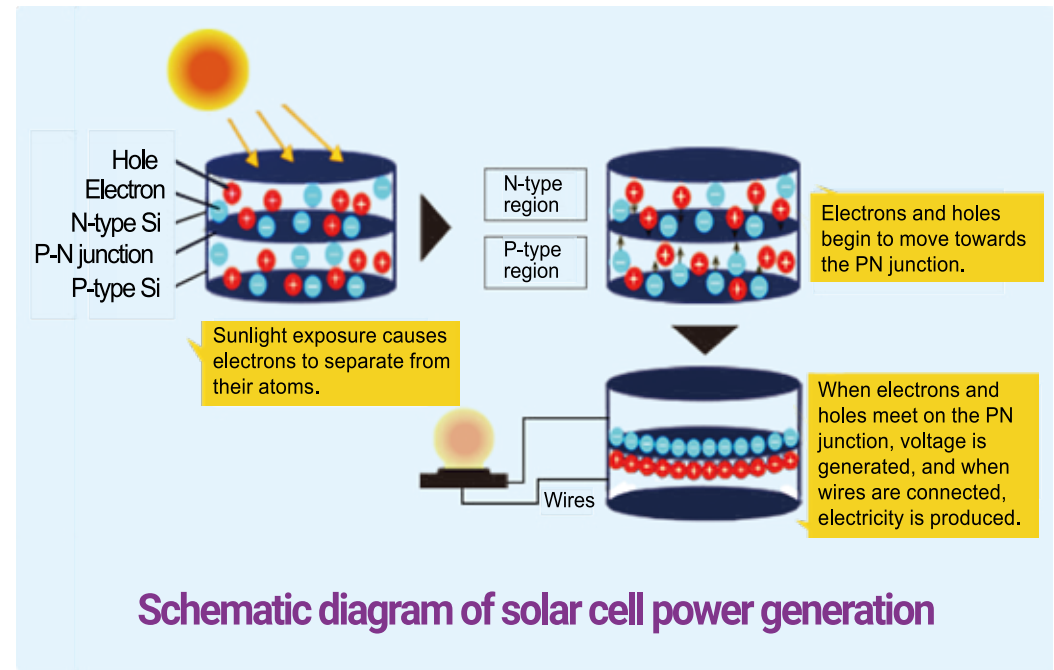
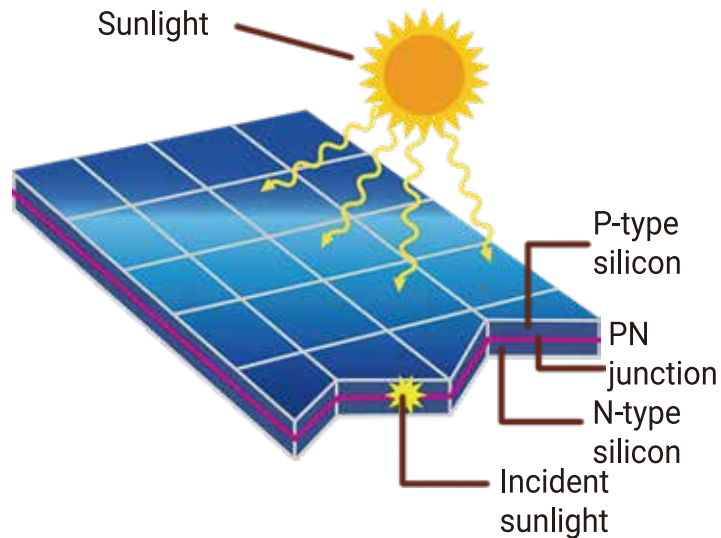
11. HAND CRANK GENERATOR CONTROLLING NPN TRANSISTOR

- 1 Turn on the switch 15, and crank the generator 49 clockwise to light up bulb 18.



PART INTRODUCTION

Solar cells utilize the photovoltaic effect of semiconductor materials to convert solar energy into electrical energy.



Characteristics of solar cells

- 1** Optimal Conditions for Solar Cells
Solar cells need to be under sunlight or incandescent lights of more than 50W to perform at their best.
- 2** Energy Storage of Solar Cells
Solar cells themselves cannot store electrical energy and must be continuously placed under a light source to generate electricity.
- 3** Output Current of Solar Cells
The current output by solar cells is small, only sufficient to power low-current devices such as buzzers and LEDs, but not enough to light up bulbs.



In this set of building blocks, all circuits that use battery box 19 can be attempted to be modified to use a solar battery B2, which can increase the number of combinations by at least a thousand.



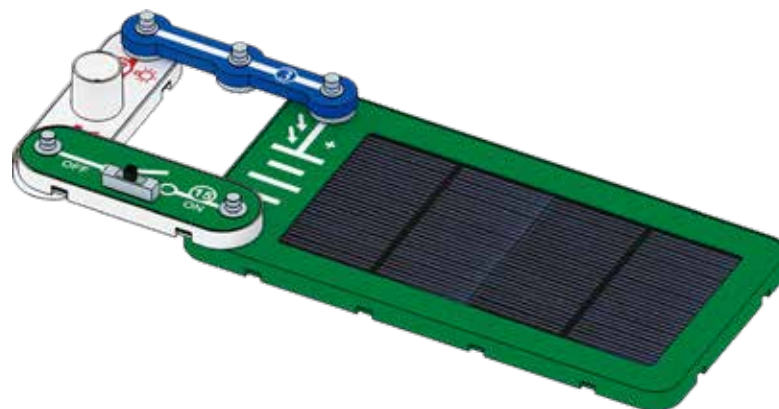
1. SOLAR LED

- 1 Turn on the switch 15, place the solar battery in the sunlight, and the red LED lights up..
- 2 You can replace 17 with 9, 26, 87.



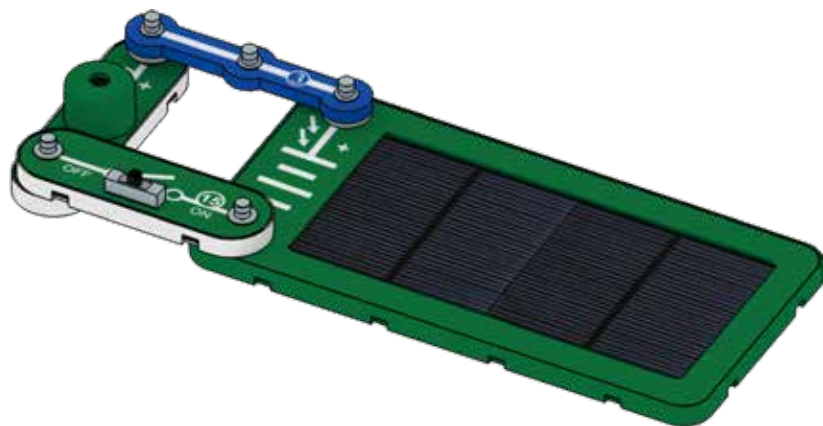
2. SOLAR BULB

- 1 Turn on the switch 15, and place the solar battery under strong sunlight for the light bulb 18 to light up.



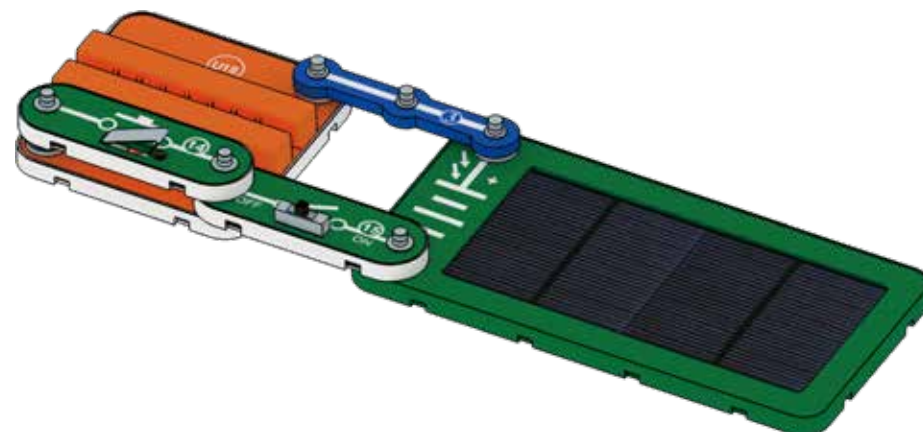
3. SOLAR BUZZER

- 1 Operate as above.



4. SOLAR LIGHT DRAWING BOARD

- 1 Turn on the switch 15, place the solar battery in the sunlight, and press the button to start the light drawing board.





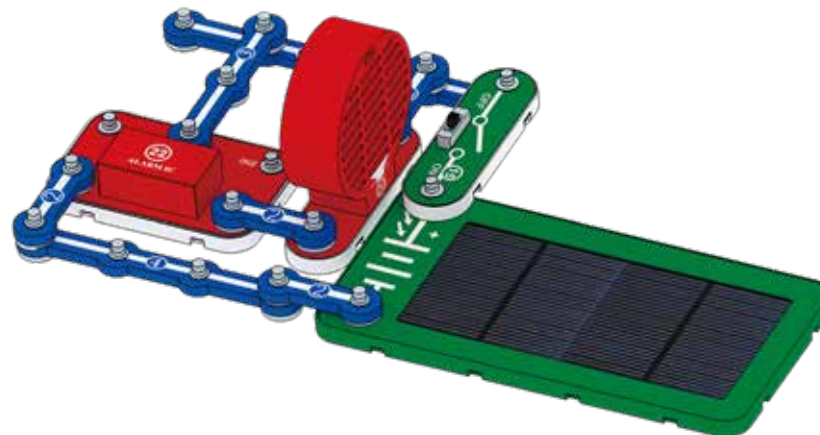
5. SOLAR RUNNING LIGHT

1 Operate as above.



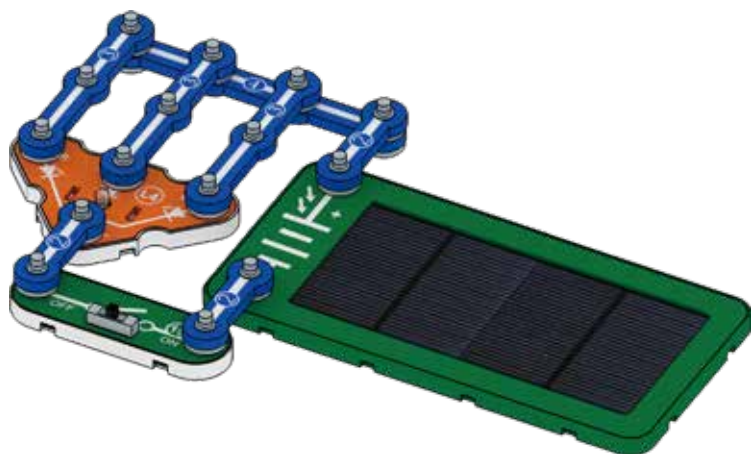
6. SOLAR ALARM SOUND

1 Operate as above.



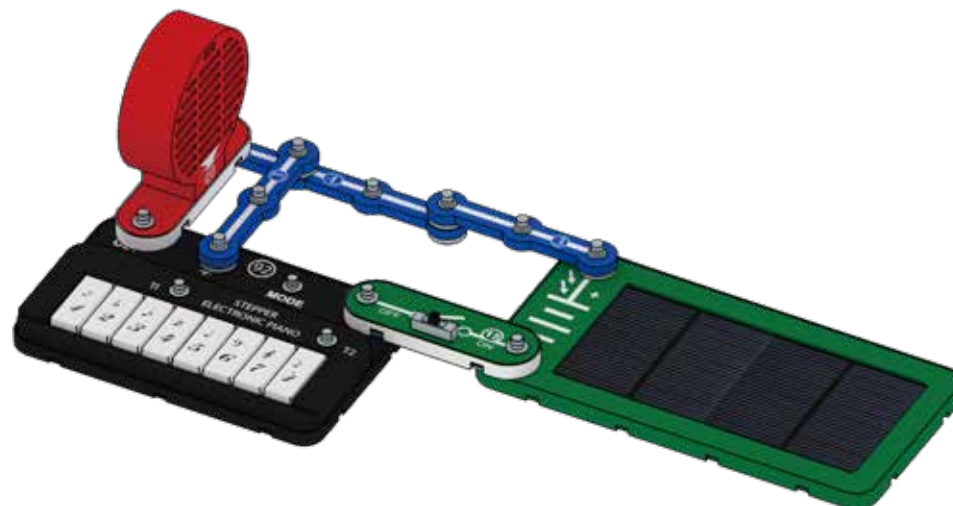
7. SOLAR RGB LED

1 Operate as above.



8. SOLAR STEP SEQUENCER ELECTRONIC KEYBOARD

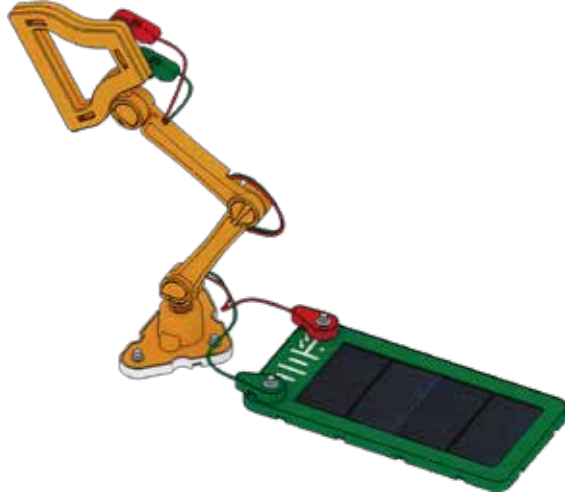
1 Operate as above.





9. SOLAR FLEXIBLE DESK LAMP

- 1 Operate as above.



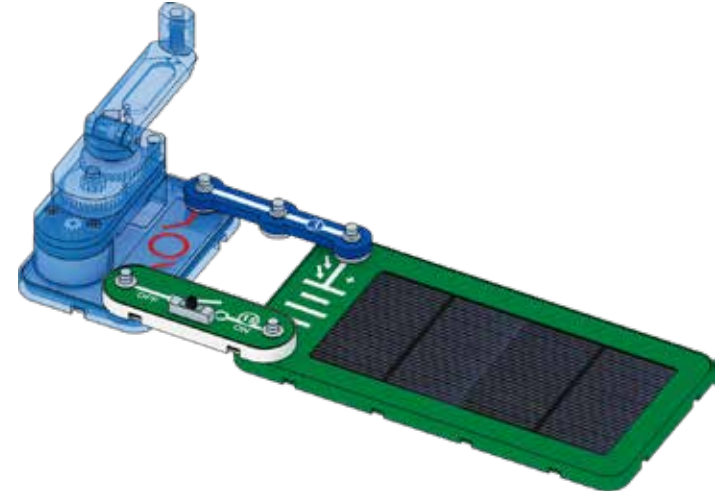
11. SOLAR CONTROL NPN TRANSISTOR CIRCUIT

- 1 Turn on the switch 15, slowly move the solar battery towards a place with plenty of sunlight, and the red LED 17 will light up first, followed by the light bulb 18.



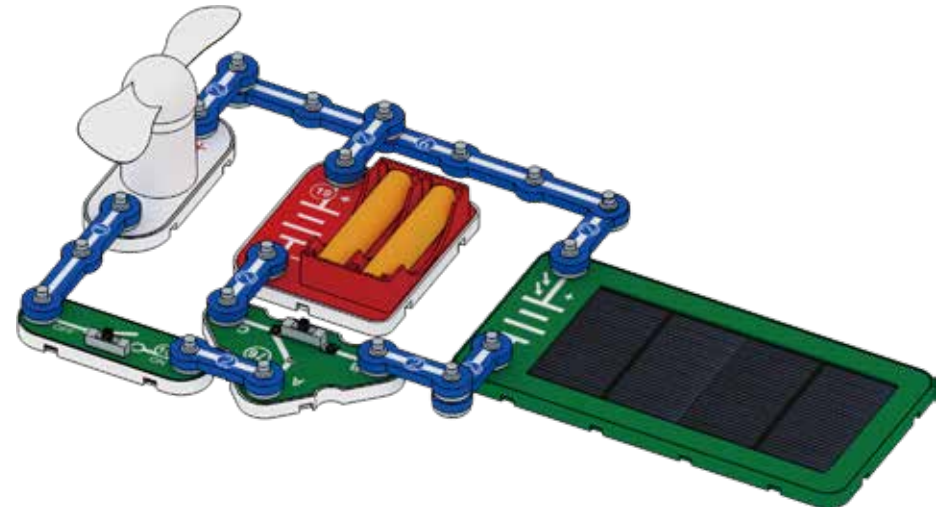
10. SOLAR MOTOR

- 1 Operate as above.



12. SWITCHING POWER SUPPLY MODE

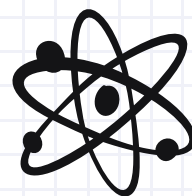
- 1 Turn on the switch 15, and then use a single pole, double throw switch to toggle the power supply mode.



PARTS LOCATION COMPARSION CHART



PLAYING WITH ELECTRONICS



LEARNING CIRCUIT KNOWLEDGE