

AGES 8+

Discovery™

#MINDBLOWN



CIRCUIT SPACE STATION

GALACTIC EXPERIMENT SET



Requires 6 AA 1.5V batteries (not included). Colors and styles may vary. Adult supervision required.

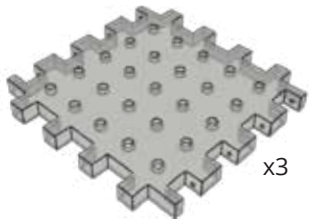
Discovery™

#MINDBLOWN

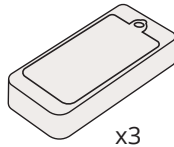
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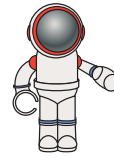
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Spring Connector



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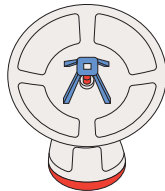
Particle Analyzer



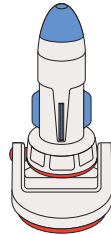
Analyzer/
Foam Asteroid



Antenna



Rocket & Rocket
Launch Base



Launch Button



GENERAL USE GUIDELINES

Check all wiring connections you have made before inserting batteries.

When finished with the experiment, switch off all components and remove all batteries before disconnecting any wires.

Do not block or hold the motor or other moving parts from functioning while they are powered. Do not turn motorized items by hand. Misuse can cause overheating and other damages to the parts.

Do not connect more than the number of batteries specified for a project.

The components for a given experiment may be packaged in different bags or located in different trays. Locate the required items before creating a circuit.

Only connect wires of the same color. Warm red wires should only connect to other warm red wires. Blue wires should only connect to other blue wires.

Always read the instructions and review the diagrams thoroughly before beginning assembly.

SAFETY WARNINGS

- Not intended to use for children under 8 years age.
- **CHOKING HAZARD!** Kit contains small parts which can pose a choking hazard. Keep out of reach of children 3 years and under.
- This kit may contain function sharp points on components.
- Do not use attachments of any kind.
- Only use this product for its intended purpose.
- Warning. Do not aid at eyes and face.
- Do not expose to extreme temperatures or moisture.
- Remove all batteries when not in use to avoid accidental operation.
- Keep hair, fingers and other body parts, along with loose clothing away from gears and other operating components.
- Thoroughly inspect products before every use. If the product appears worn, frayed/splintered, cracked, or broken in any manner, discontinue use and discard immediately.
- Short circuit the batteries or wrong connection of the wires, may cause overheating, always follow the assembly instructions.
- This toy is not to be connected to more than one power supply.
- Do not connect the battery compartment in parallel.
- The wires and connectors are not to be inserted into socket-outlets
- Read and follow all instructions in the manual before use.
- Retain this manual for future reference.

INSTRUCTIONS FOR PARENTS

- This kit is not intended for children under 8 years of age.
- Short circuit the batteries or wrong connection of the wires, may cause overheating, adult supervision required at all the times.
- Kit contains functional sharp points on components, always guide and observe in experiments.
- **CHOKING HAZARD!** Kit contains small pieces. Keep out of reach of children three years old and under.

BATTERY WARNINGS

- Do not mix old and new batteries.
- Do not mix alkaline, standard (carbon-zinc), or rechargeable batteries.
- Insert batteries using the correct polarity.
- Do not short-circuit the battery supply terminals.
- Remove batteries before storing.
- Recycle or dispose of batteries according to federal, state, and local laws.
- Do not dispose of batteries in fire, batteries may explode or leak.
- Always use, replace, and recharge (if applicable) batteries under adult supervision.
- Do not attempt to charge non-rechargeable batteries.
- Rechargeable batteries are to be removed from the toy before being charged.
- Rechargeable batteries are only to be charged under adult supervision.
- Exhausted batteries are to be removed from the toy.
- Alkaline batteries are recommended. Use only the specified voltage.
- Keep these instructions for future reference.

CAN ICE-3(B) / NMB-3(B)

WARNING: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

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Due to continuous product improvements, the pictures on this manual may differ slightly from the actual product.

Printed in China

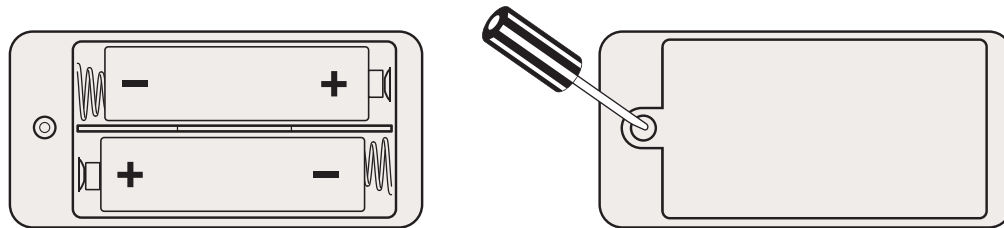
CIRCUIT SPACE STATION

GALACTIC EXPERIMENT SET

BATTERIES

Each battery compartment requires 2 X AA (LR6) batteries.

- 1) Use a screwdriver (not included) to remove the battery cover (turn screw left).
- 2) Insert batteries according to the +/- polarity markings in the battery compartment.
- 3) Replace the battery cover (turn screw right).



GLOSSARY

Battery – A device for storing energy. Batteries have external connectors (terminals) to allow them to provide power to circuits. Electrons move from the negative terminal (anode) through the circuit to the positive terminal (cathode).

Breadboard – In electronics, a breadboard is a construction base for building circuits without soldering.

Circuit – A series of electrical components in a closed loop that gives a return path for the electrical current.

Conductor – An object or material that allows the flow of electric current. Metal is a good conductor.

Current – The flow of electric charge. In the electric circuits in this kit, the charge is carried by moving electrons through the wires and connected devices. These moving charged particles create magnetic fields which turn motors.

Electron – A negatively charged subatomic particle. They play an important part in electricity, magnetism and chemistry. Each atom has at least one electron orbiting its nucleus.

Insulator – A material that does not allow electric charges to flow freely.

LED – Light Emitting Diode. Various forms are used in everything from digital clocks and infrared remotes to camera flashes and medical devices.

Motor – A machine that converts one form of energy to mechanical energy. In this kit, the motors use electrical energy to blow air, move a robot, launch a rocket and more.

Neutron – Like the electron, above, it is a subatomic particle. Unlike the electron, it has no charge. It forms the nucleus of an atom along with the proton.

Negative – A pole in circuitry and magnetism, represented by “-“. Electrons start from the negative pole in a circuit.

Positive – A pole in circuitry and magnetism, represented by “+“. Electrons move towards the positive pole in a circuit.

Power – The force or strength of energy that is mechanically generated.

Proton – A third subatomic particle, like the electron and neutron. It has a positive charge. Neutrons and protons are bigger than electrons and together form the nucleus of an atom.

Switch – Circuits only function when they are “closed” so that the electricity can run from the negative pole to the positive pole. Flipping a switch to “on” closes the circuit, allowing electrons to flow uninterrupted. Turning the switch “off” opens it, breaking the flow.

Wire – A conductor (usually copper wrapped in a plastic insulator) used to carry electrical current.

CREATING A BASIC CIRCUIT

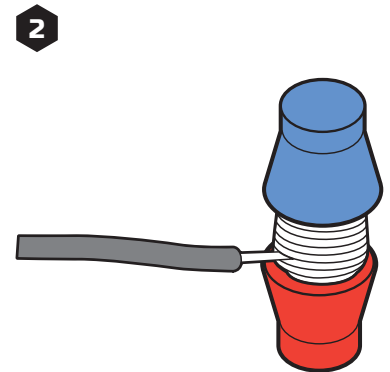
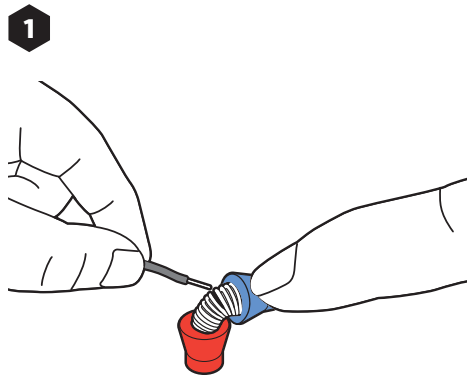
There are 3 experimental circuits in this kit: **Particle Analyzer**, **Spinning Antenna**, and **Rocket Launch**. While they all perform different actions, they all share common methods in their assembly.

To practice proper techniques, you will first assemble a basic circuit. This will give you practical experience that will help when you build the more complex circuits.

This kit uses spring connectors to make electrical connections instead of solder (soldering requires melting metal onto electrical contacts to complete a circuit.) The advantage of using spring connectors here is that you can take your circuit apart once you're done with it!

To Connect Wires:

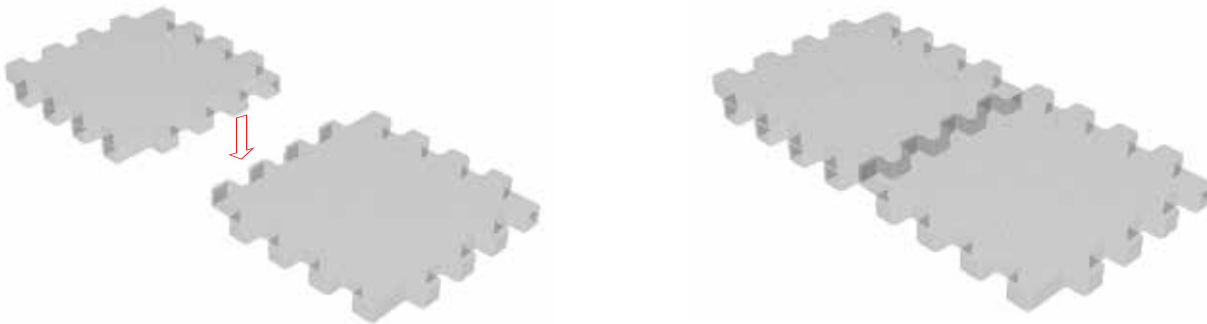
1. Insert the spring plastic cap into the bread board securely.
2. Bend the spring over to make a gap.
3. Insert the bare end of the wire into the gap and gently let the spring back.



IF NOTHING HAPPENS: CHECK YOUR CONNECTIONS

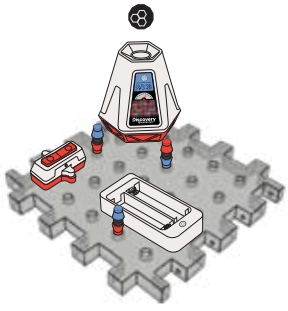
- Is the bare end of the metal wire in contact with the metal of the spring? If the coils of the spring are only touching insulation, the current can't flow. Insulators resist electric current flowing through them.
- Make sure that the wires are the same color. **Warm red to warm red** and **blue to blue**.

CONNECTING THE BREAD BOARDS

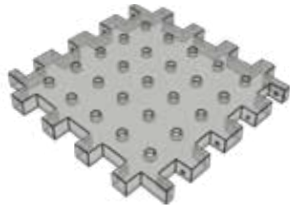


Place one breadboard on a flat surface. Take another breadboard and align the grooves, then press down so they connect.

PARTICLE ANALYZER PARTS LIST



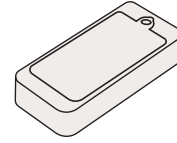
01 Breadboard



02 Particle Analyzer



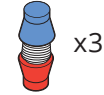
03 Battery Compartment



04 ON/OFF Switch



05 Spring Connector

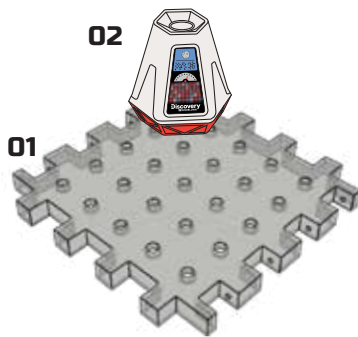


06 Analyzer/
Foam Asteroid

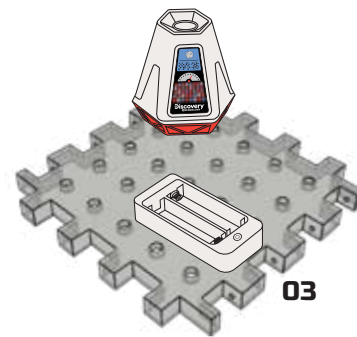


BASIC ASSEMBLY

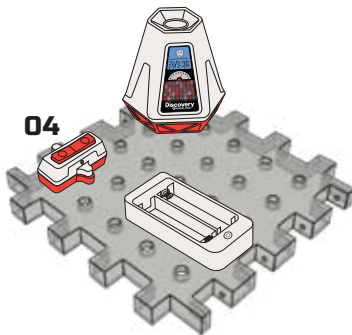
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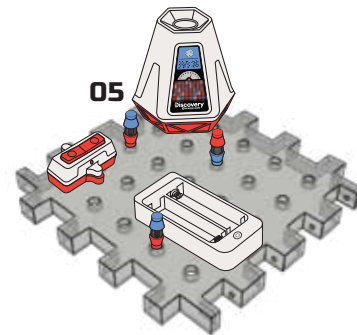
2



3



4



5

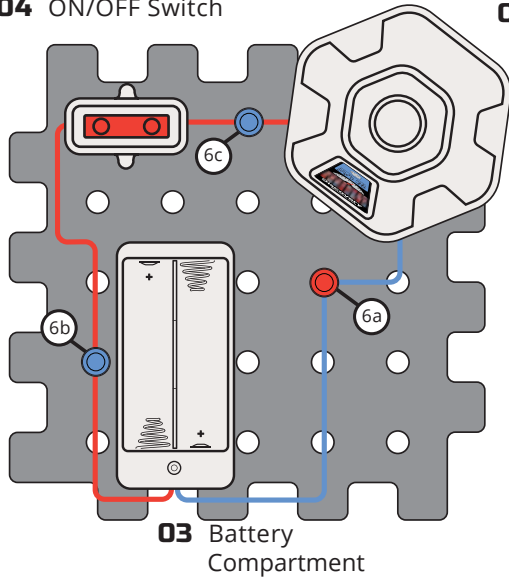


PARTICLE ANALYZER BASIC WIRING DIAGRAM

04 ON/OFF Switch

02 Particle Analyzer

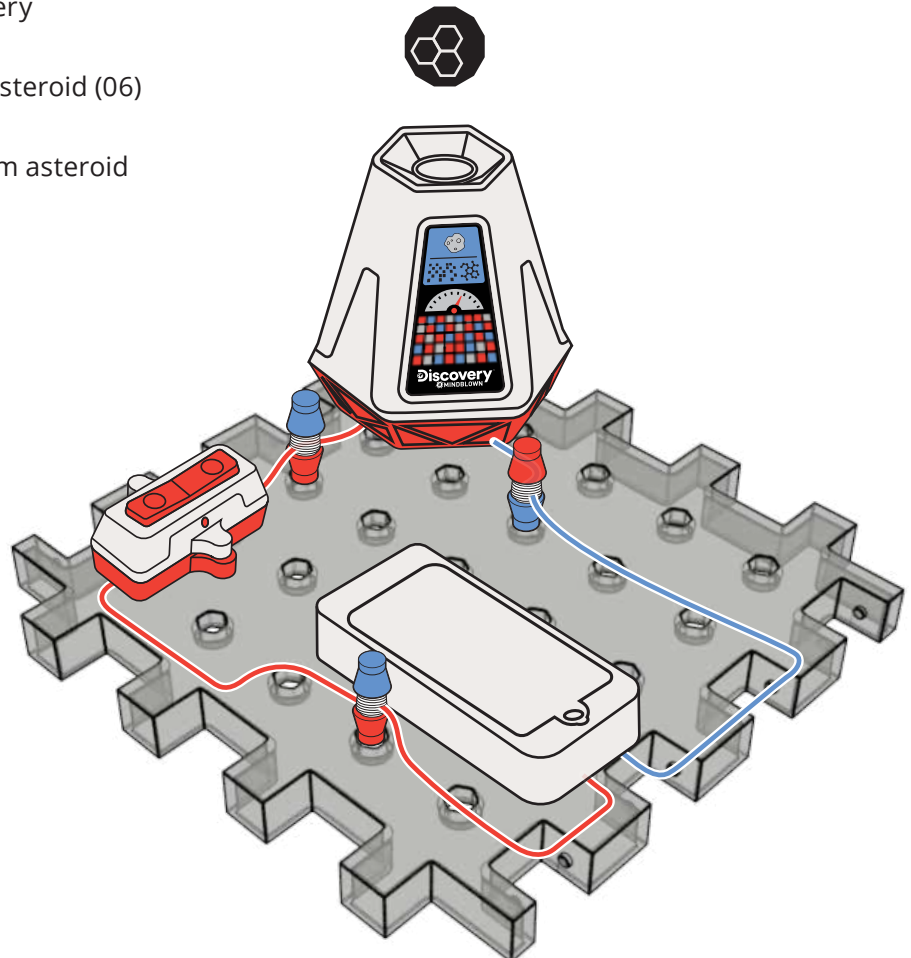
| Wiring Connections | Spring (6a) | Spring (6b) | Spring (6c) |
|--------------------------|-------------|-------------|-------------|
| Battery Compartment (03) | Blue | Warm red | |
| ON/OFF Switch (04) | | Warm red | Warm red |
| Particle Analyzer (02) | Blue | | Warm red |



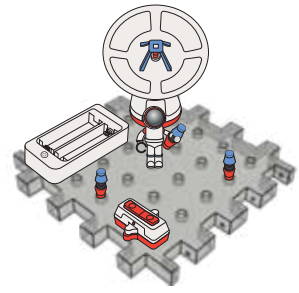
05 Spring Connectors

OPERATION

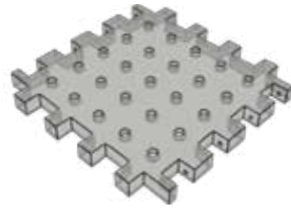
1. Insert 2 AA 1.5V batteries into the battery compartment.
2. Turn the switch on and put the Foam Asteroid (06) above the particle analyzer's nozzle.
3. The particle analyzer will make the foam asteroid hover in midair!



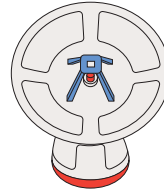
SPINNING ANTENNA PARTS LIST



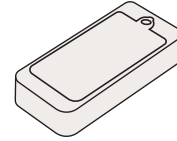
01 Breadboard



02 Antenna



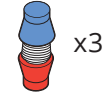
03 Battery Compartment



04 ON/OFF Switch

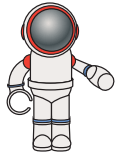


05 Spring Connector



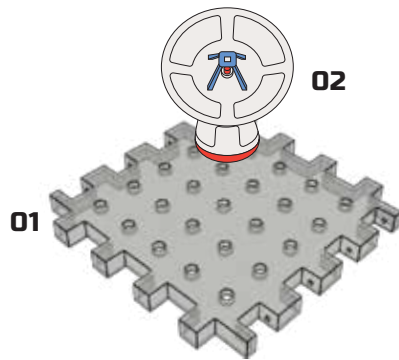
x3

06 Astronaut

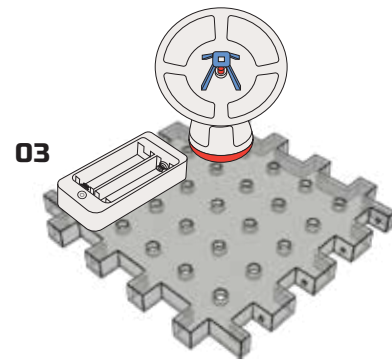


BASIC ASSEMBLY

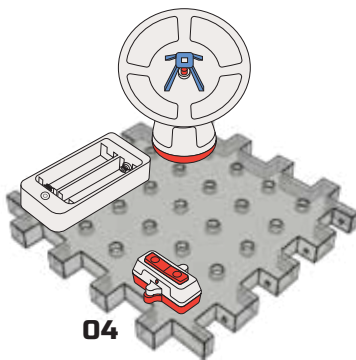
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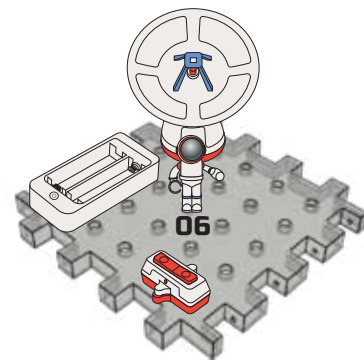
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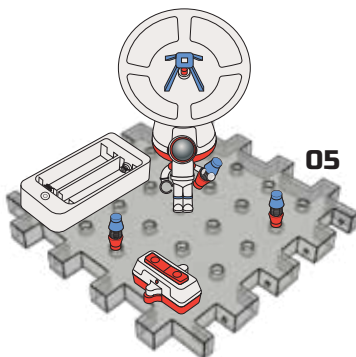
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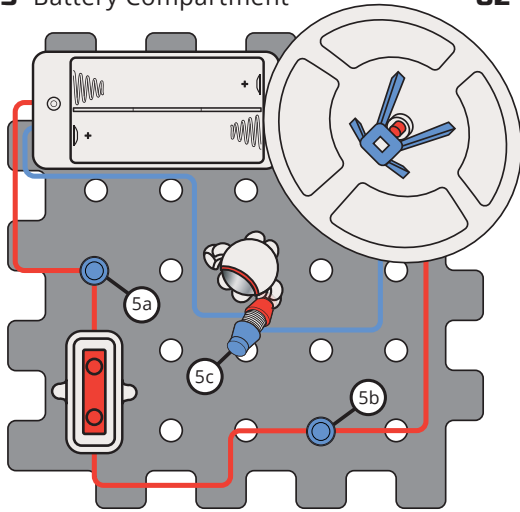
5



SPINNING ANTENNA BASIC WIRING DIAGRAM

03 Battery Compartment

02 Antenna



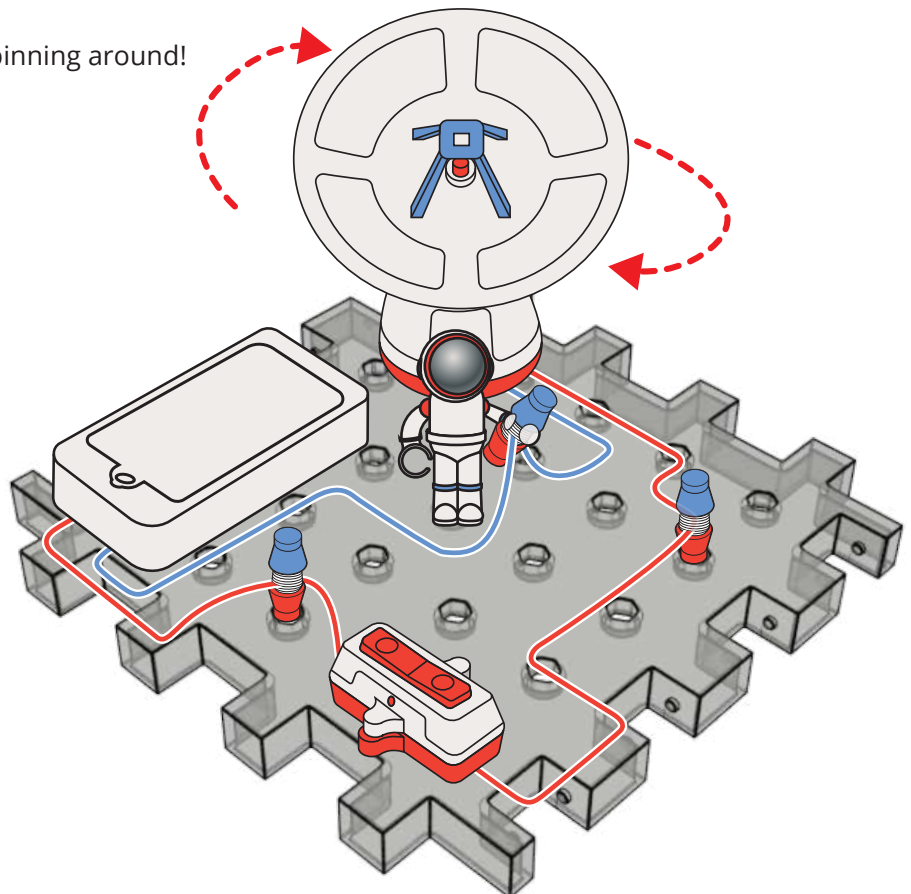
| Wiring Connections | Spring (5a) | Spring (5b) | Spring (5c) |
|--------------------------|-------------|-------------|-------------|
| Battery Compartment (03) | Warm red | | Blue |
| ON/OFF Switch (04) | Warm red | Warm red | |
| Antenna (02) | | Warm red | Blue |

04 ON/OFF Switch

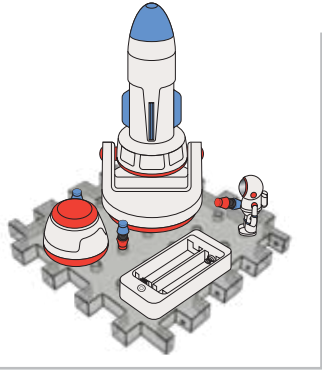
05 Spring Connectors

OPERATION

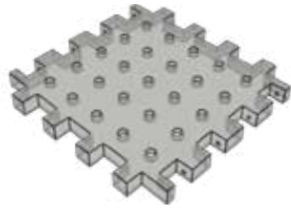
1. Insert 2 AA 1.5V batteries into the battery compartment.
2. Turn the switch on.
3. Watch the antenna light up and start spinning around!



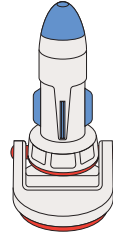
ROCKET LAUNCH PARTS LIST



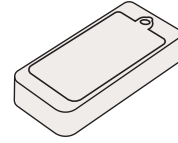
01 Breadboard



02 Rocket & Rocket Launch Base



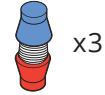
03 Battery Compartment



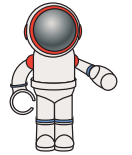
04 Launch Button



05 Spring Connector

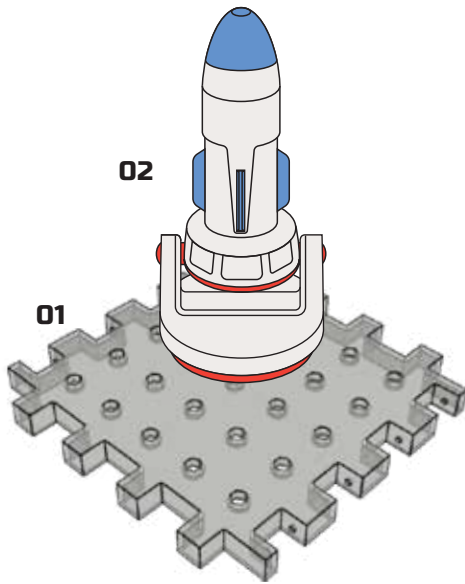


06 Astronaut

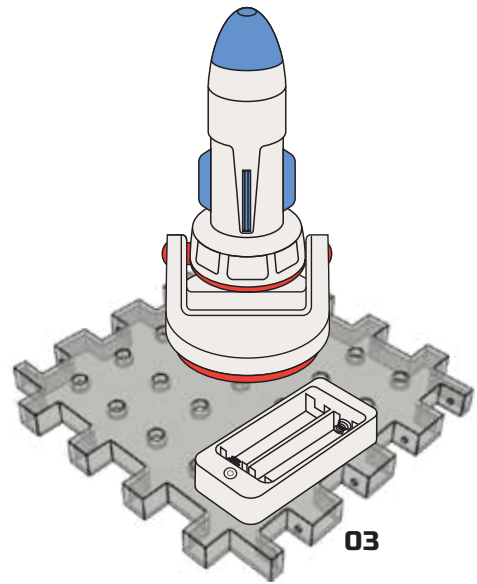


BASIC ASSEMBLY

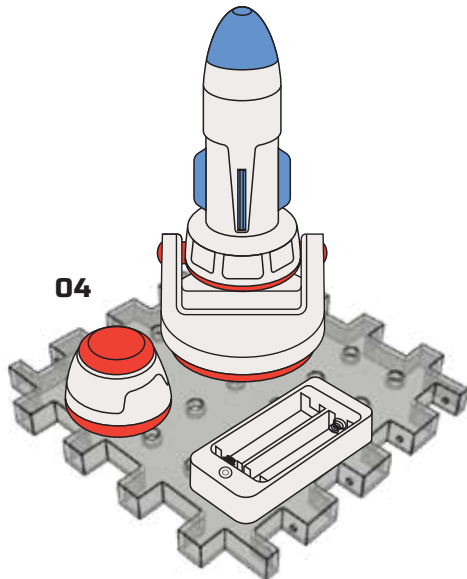
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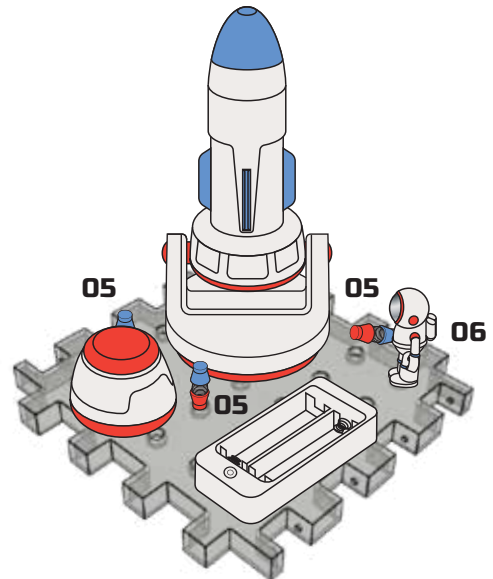
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3



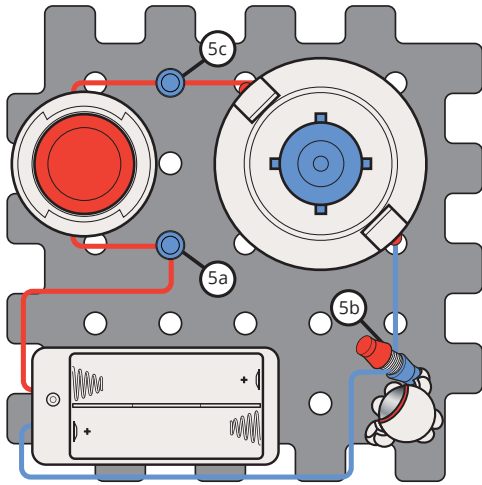
4



ROCKET LAUNCH BASIC WIRING DIAGRAM

04 Launch Button

02 Rocket



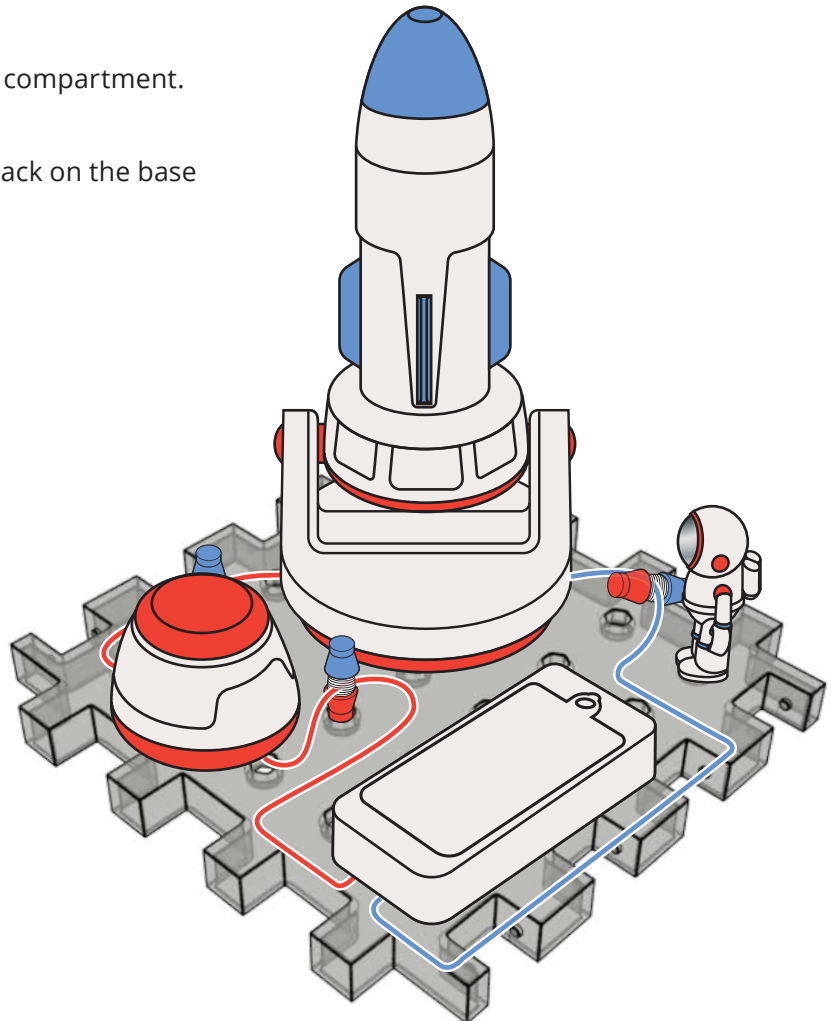
03 Battery Compartment

05 Spring Connectors

| Wiring Connections | Spring (5a) | Spring (5b) | Spring (5c) |
|--------------------------|-------------|-------------|-------------|
| Battery Compartment (03) | Warm red | Blue | |
| Rocket (02) | | Blue | Warm red |
| Launch Button (04) | Warm red | | Warm red |

OPERATION

1. Insert 2 AA 1.5V batteries into the battery compartment.
2. Press the launch button.
3. Watch the rocket fly up! Place the rocket back on the base to launch again.





CIRCUIT SPACE STATION

GALACTIC EXPERIMENT SET