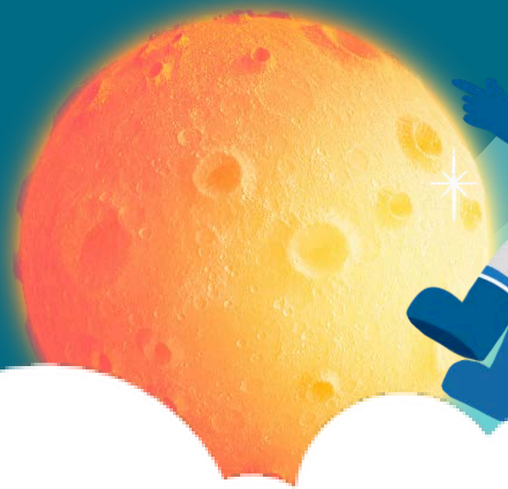
Model Rocket Laucher

Experiment Objectives

1. Learn how to assemble a model rocket.
2. Understand the principles and applications of rockets.
3. Stimulate children's interest in learning through scientific experiments and cultivate their scientific thinking.



Introduction

Think About It

What makes a rocket lift off?

Origin of Rockets

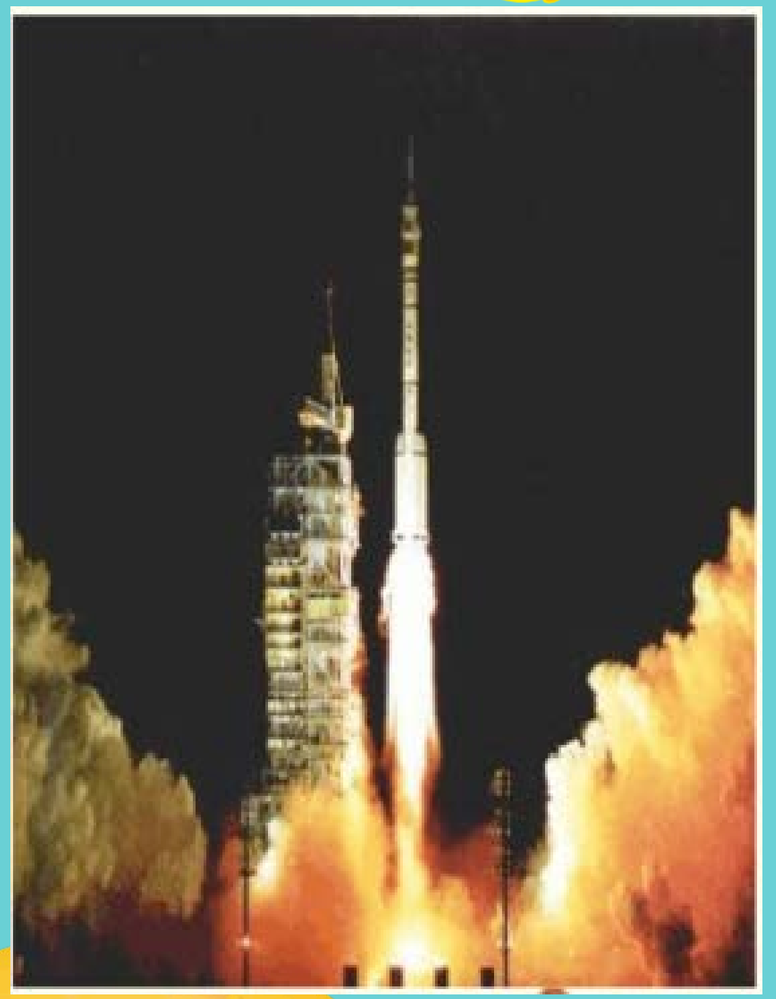
The origin of rockets is in China.
Rockets are one of the great inventions of ancient China, such as the "Fire Raven" from the Song Dynasty.

Principle of Rockets

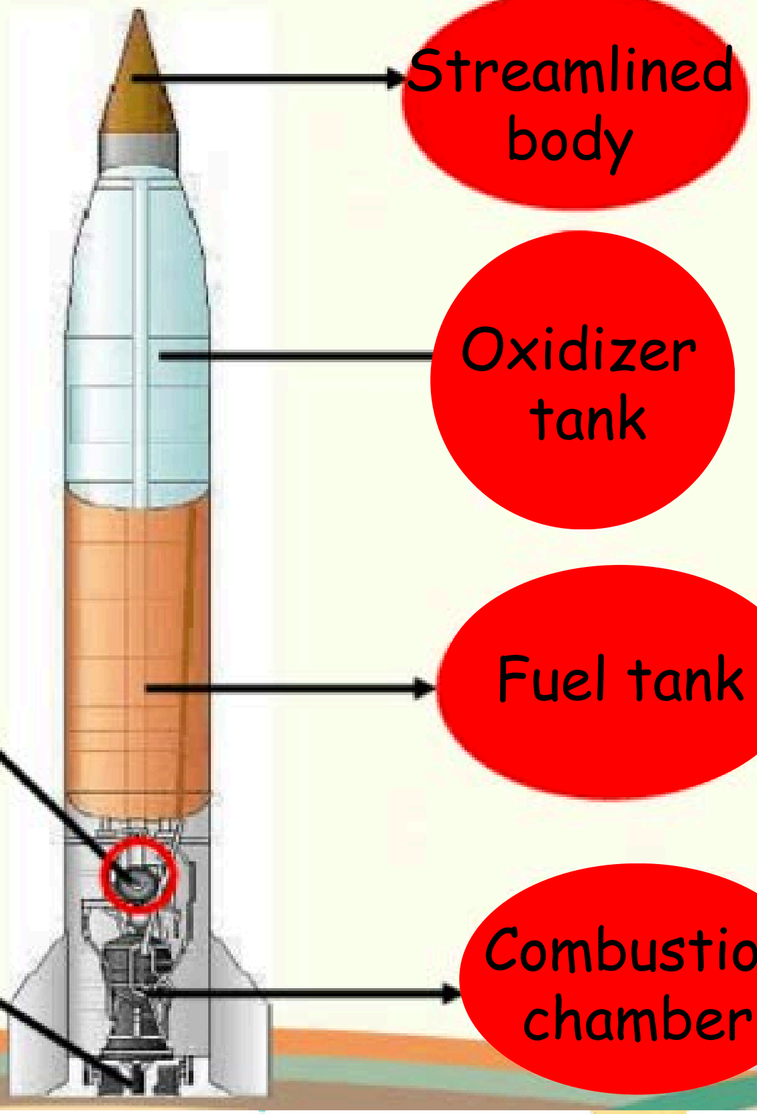
The principle of modern rockets is the same as that of ancient rockets.

When the fuel burns, it produces high-temperature and high-pressure gas. The gas is ejected at high speed from the rocket's tail, generating a strong reaction force that propels the rocket forward.

Energy transformation in rocket operation:
Chemical energy of the fuel → Internal energy of the gas → Mechanical energy of the rocket.



Structure of a Rocket



Streamlined body

Oxidizer tank

Fuel tank

Combustion chamber

Delivery System

Nozzle

Modern rockets often use multi-stage rockets.
Each stage is discarded after completing its task, and the next stage ignites.

Rockets are currently the only tools capable of overcoming Earth's gravity and entering space.

Rocket Launch Process:

1. Rocket lifts off and begins programmed turning.
2. Rocket continues flying and jettisons the escape tower.
3. Discards boosters.
4. First and second stages separate; fairing separates.
5. Solar panels unfold; spacecraft orbits Earth as planned.
6. Second-stage engine shuts down; spacecraft separates from rocket.
7. Orbital module separates from reentry module.
8. Propulsion module separates from reentry module.

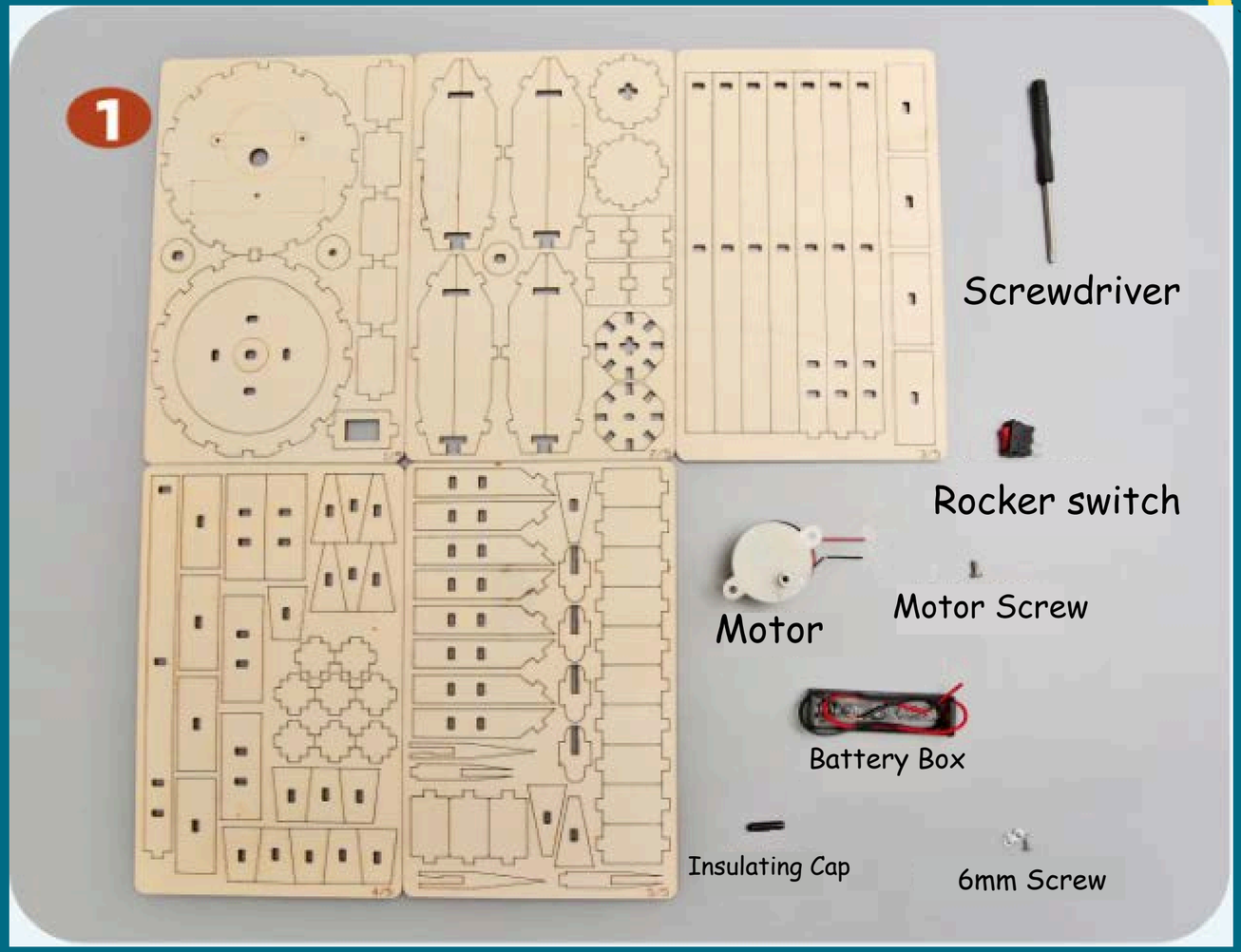
Let's make an interesting "rocket" together !

Experiment Steps

Let's begin!

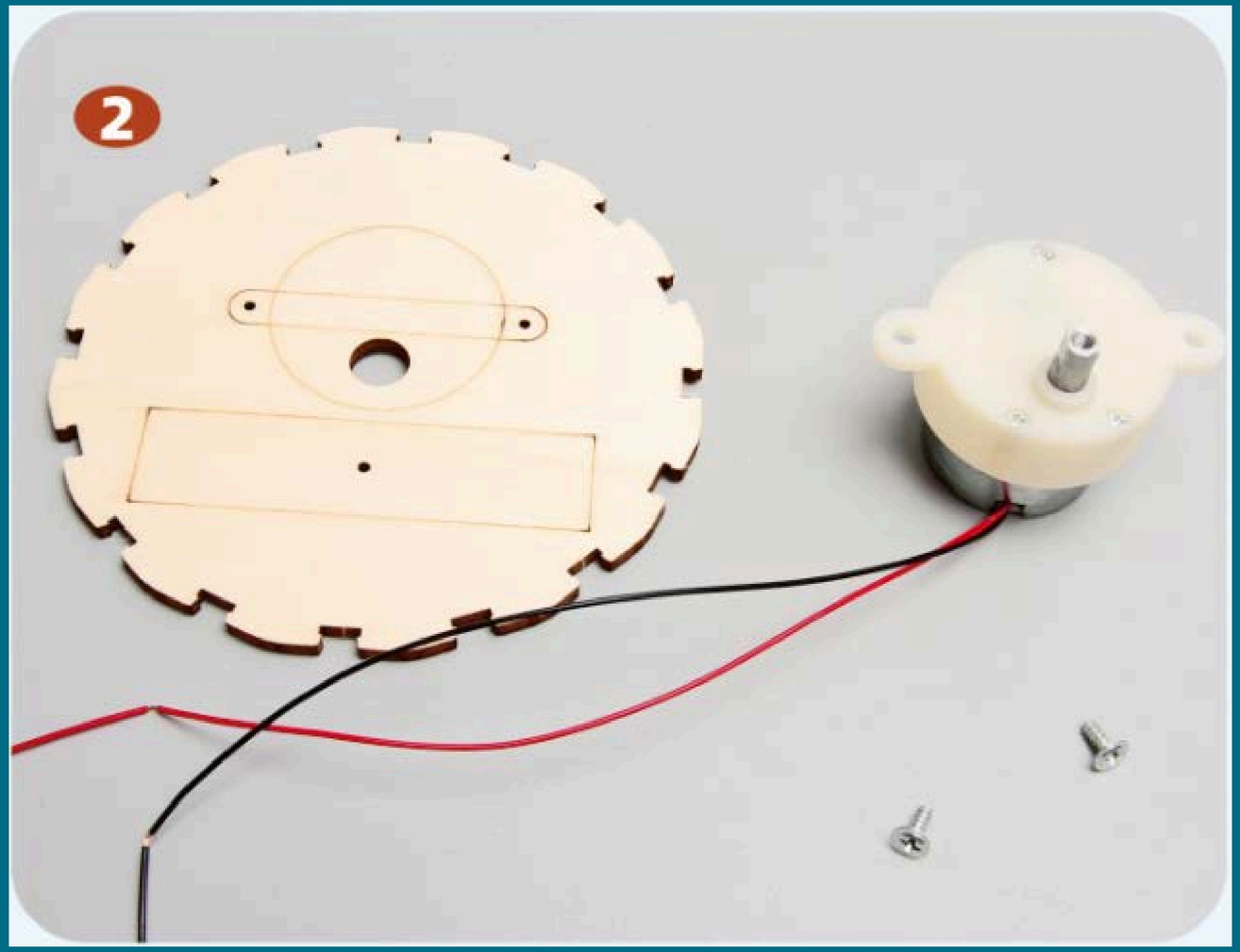
01

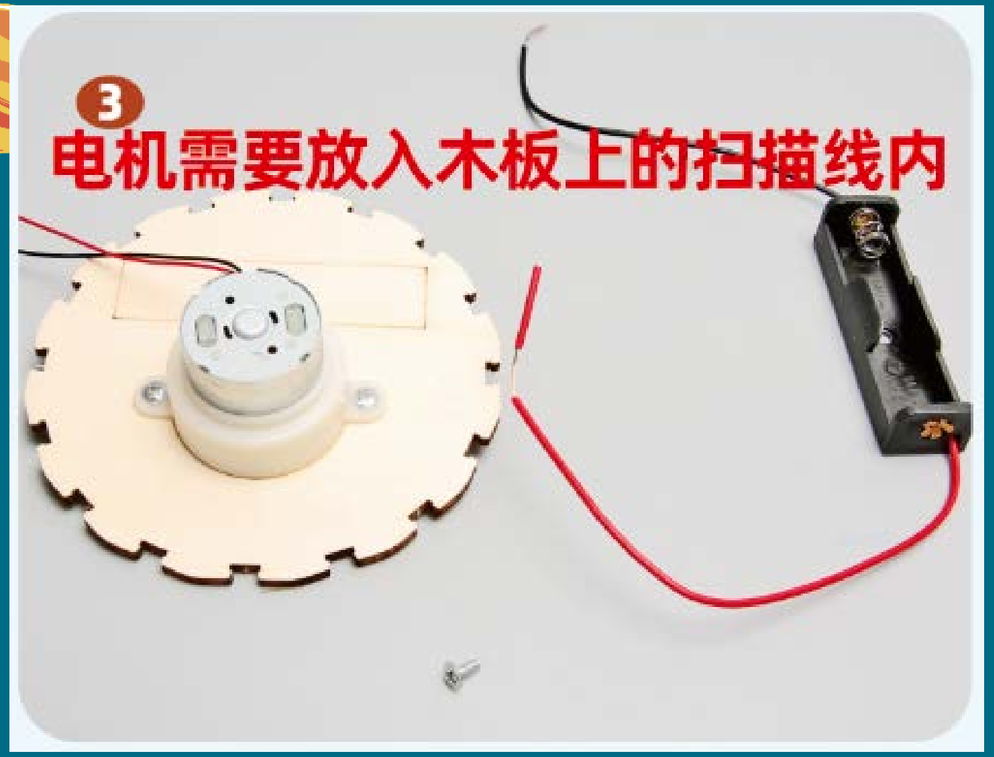
Identify the Materials



02

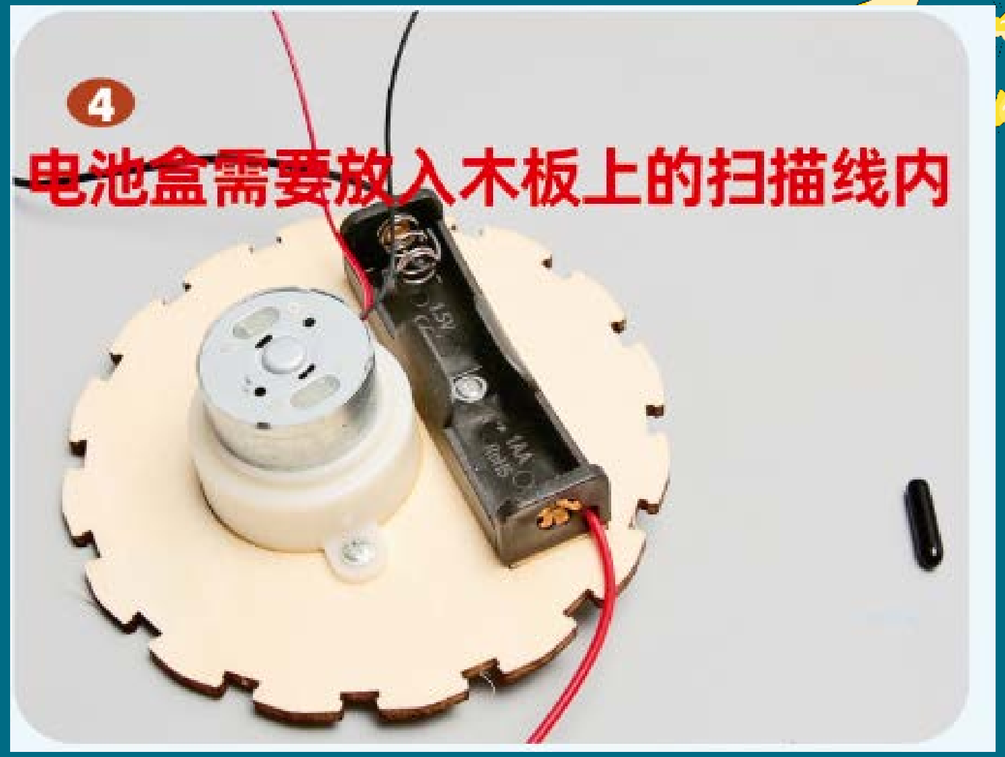
As shown, prepare the wooden parts, motor, and two 6mm screws.





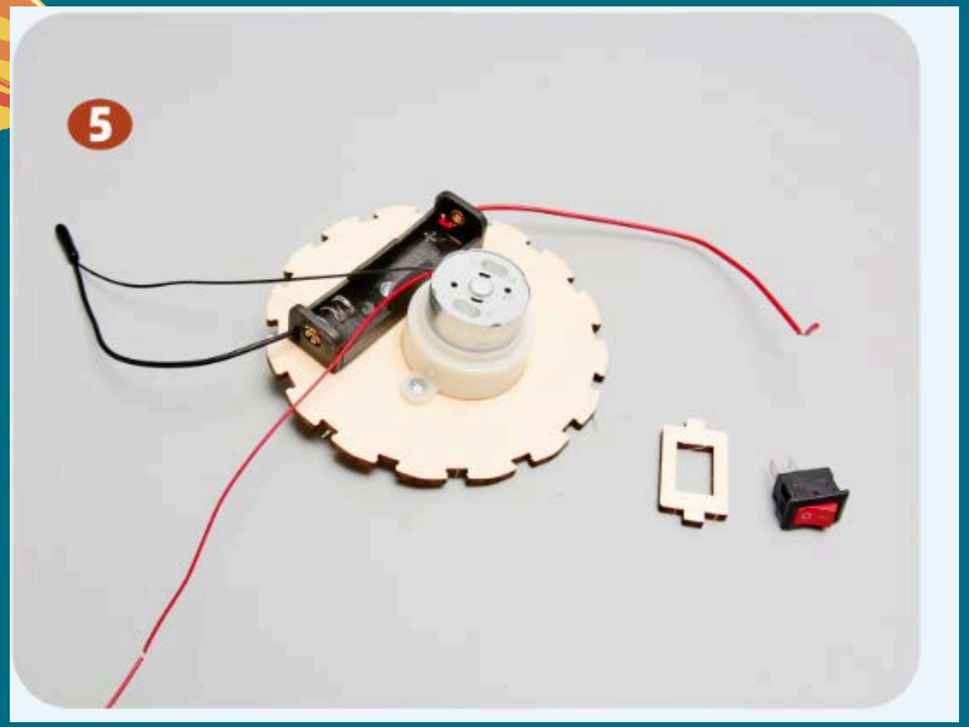
The motor needs to be placed within the marked area on the wooden board.

As shown in the picture, fix the motor onto the wooden board using a 6 mm screw.
Prepare the battery box and one 6 mm screw.

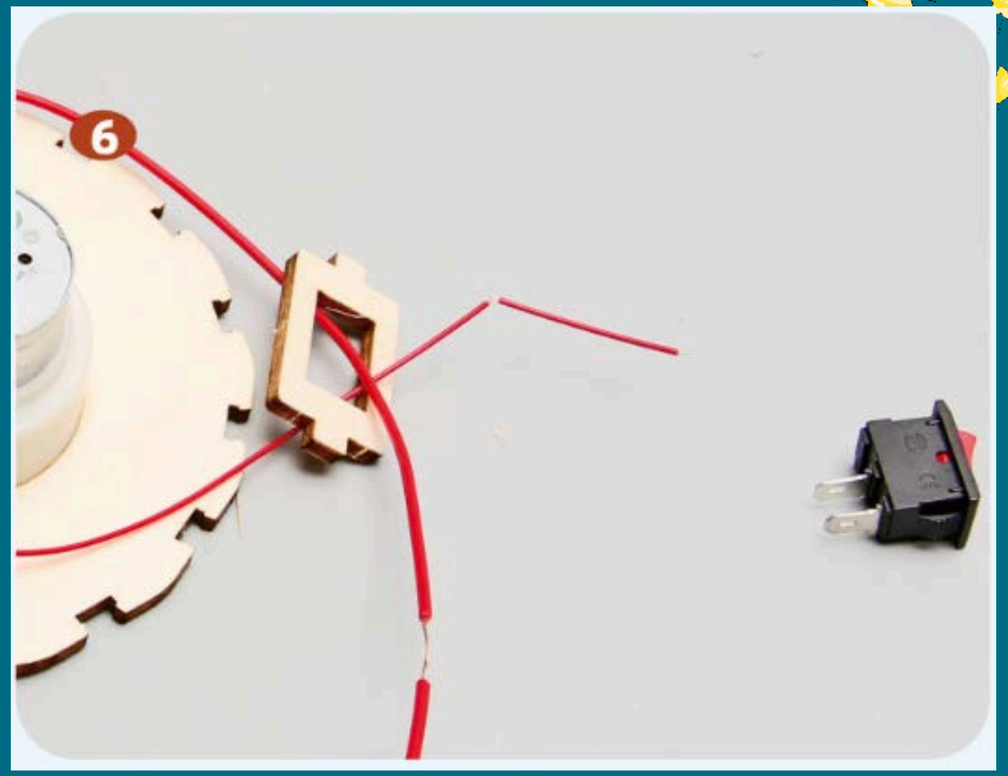


The battery box needs to be placed within the marked area on the wooden board.

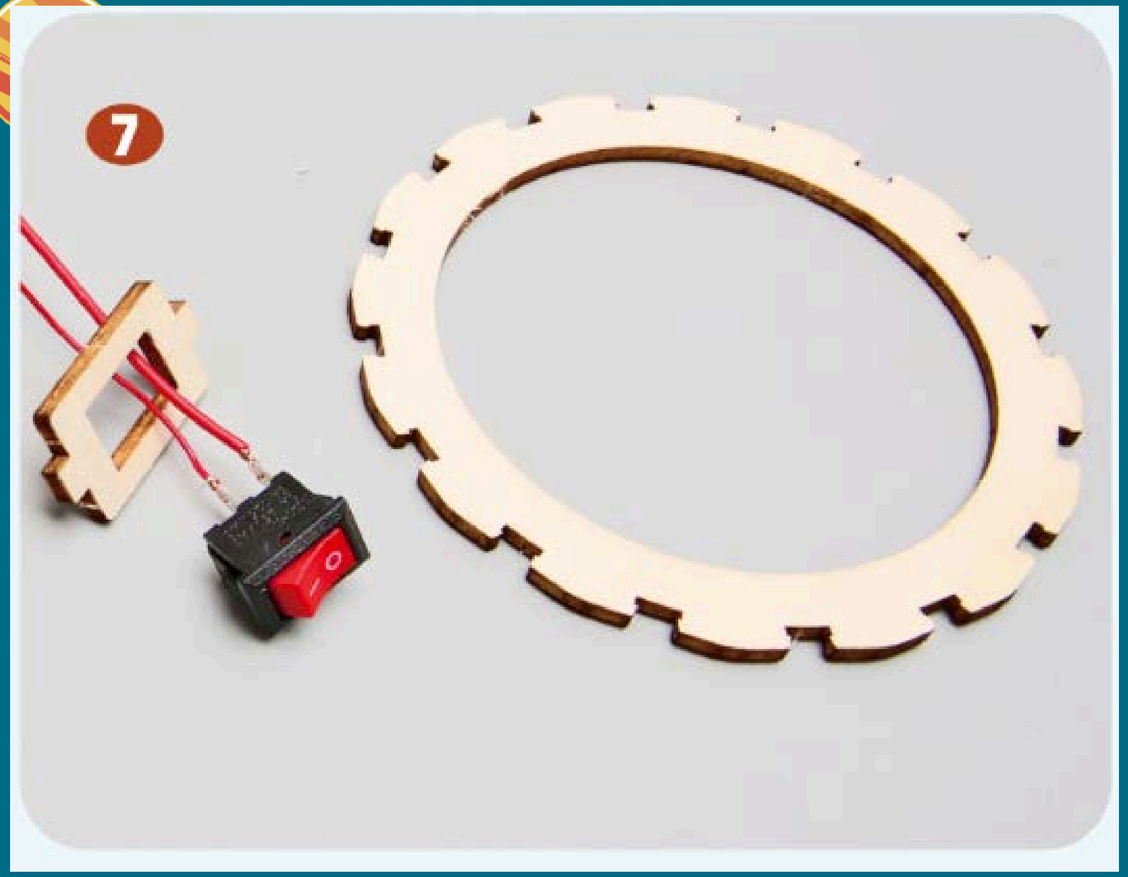
As shown in the picture, use a 6 mm screw to secure the battery box, and prepare the insulating cap.



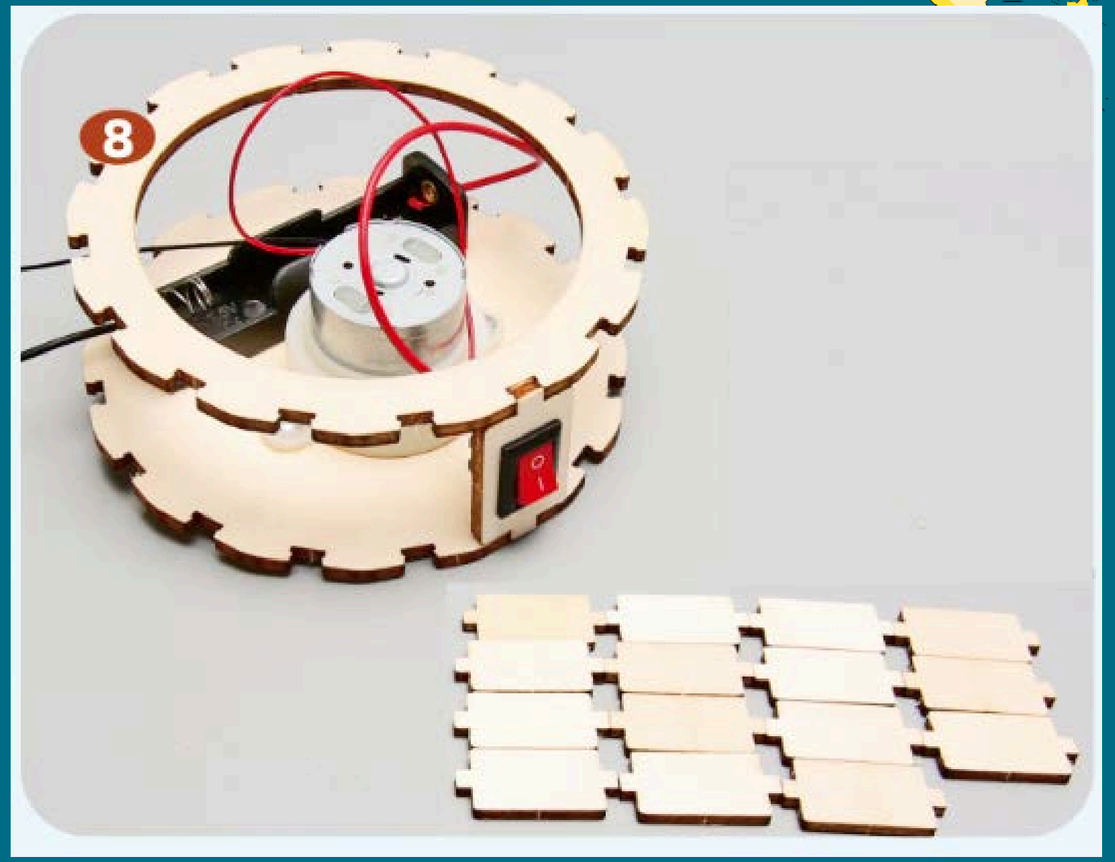
Connect the battery holder's wires to the motor's wires.
Prepare the switch and wiring.



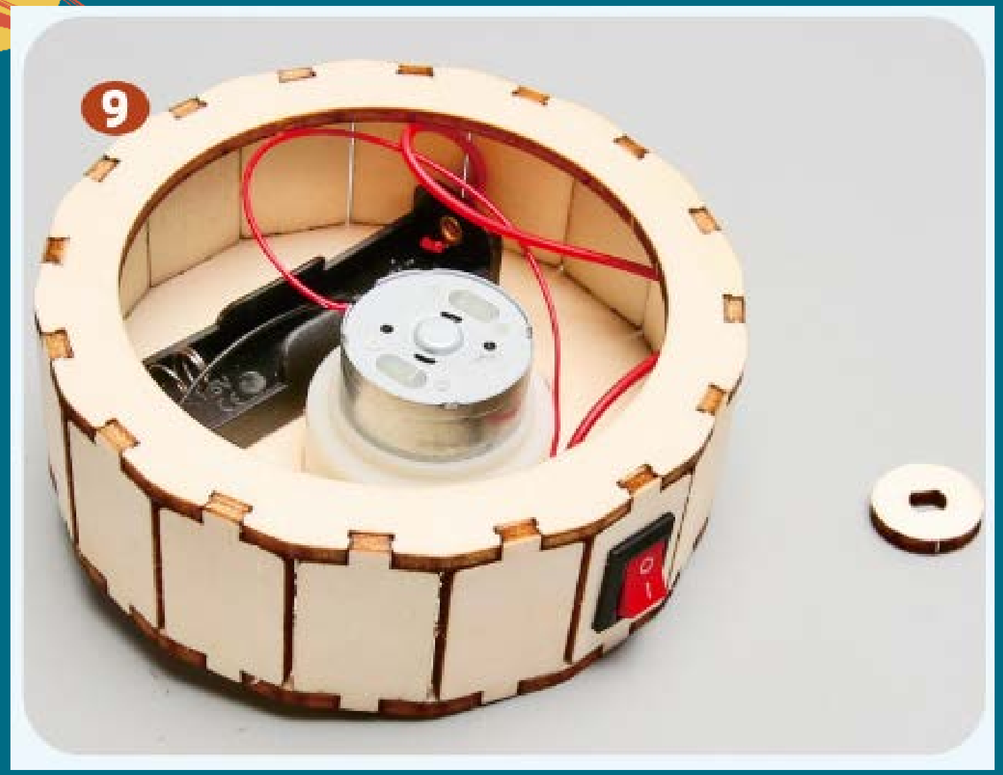
Thread the red wire through the switch hole and prepare for installation.



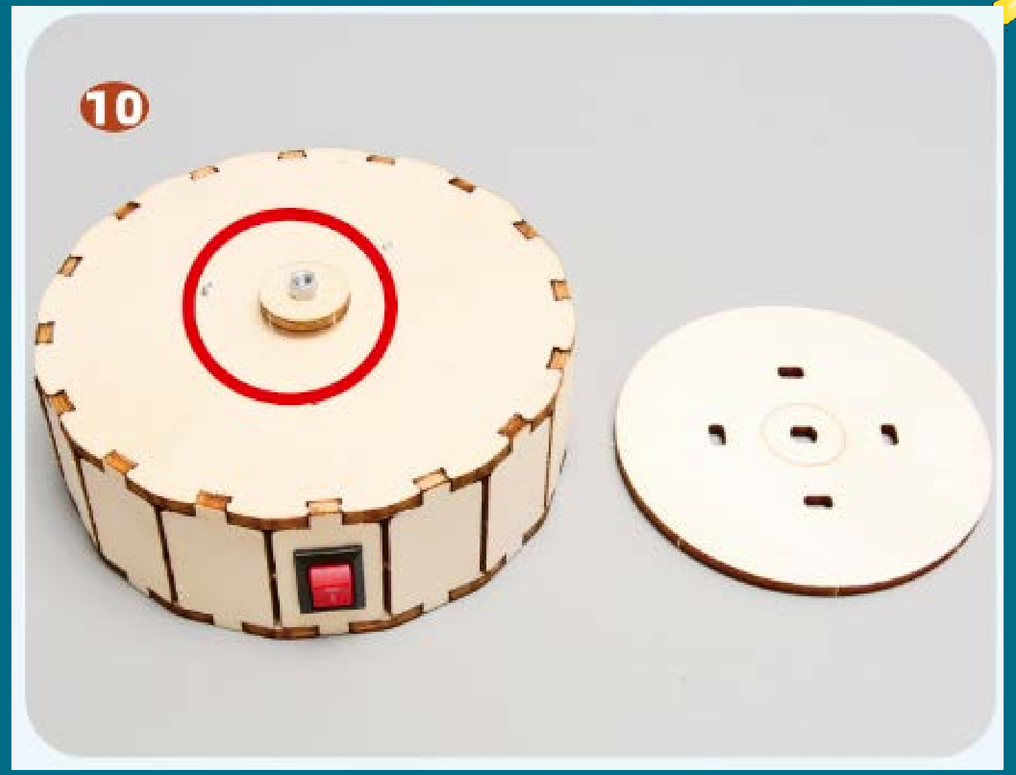
Connect the red wire to the switch and prepare the next set of parts.



Install the switch and prepare the next set of parts.

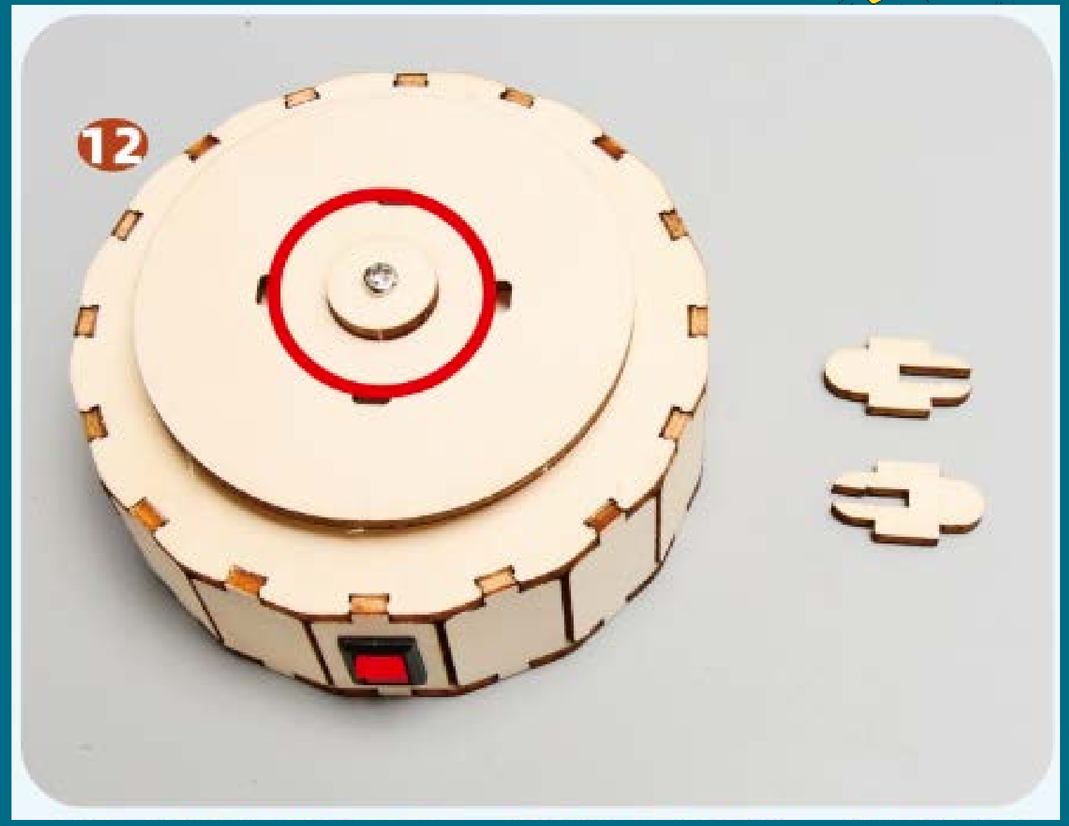


Assemble all wooden panels as shown and prepare the next parts.

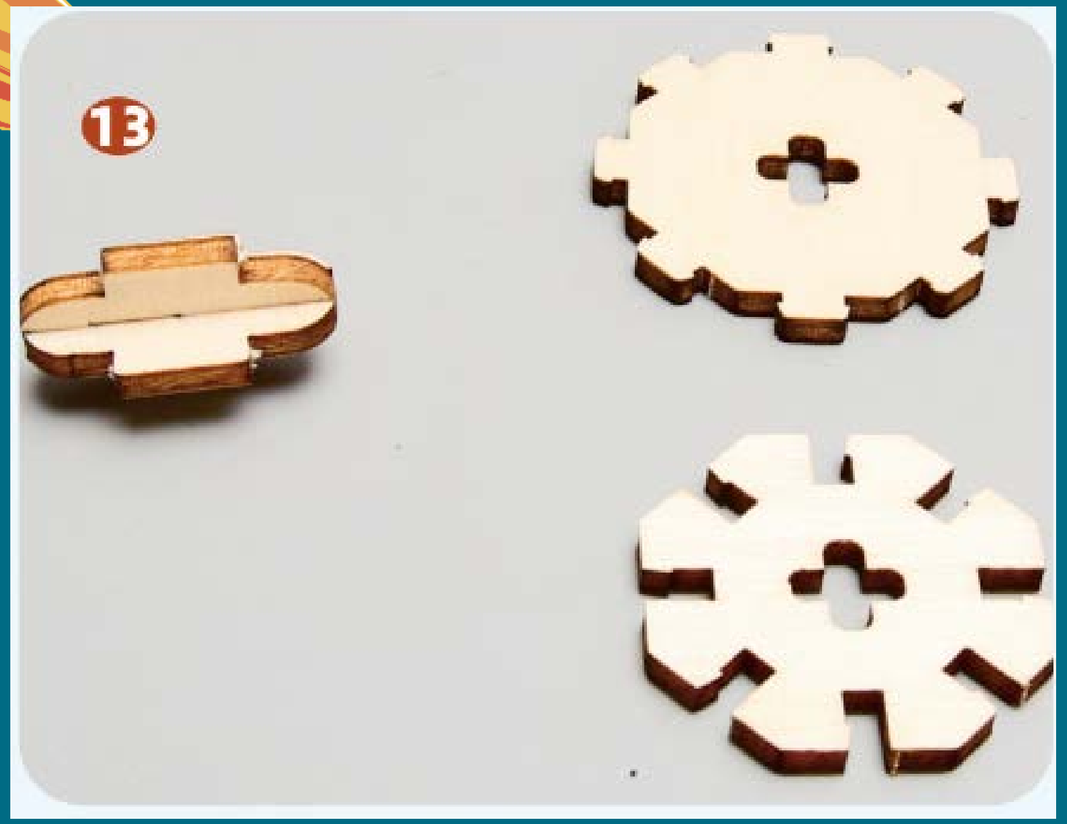


Install the round cover and prepare the next step.

Install the top cover and prepare the next step with large screws.



Insert the large screw into the center hole and prepare the next parts.



Assemble the parts as shown and prepare for the next step.

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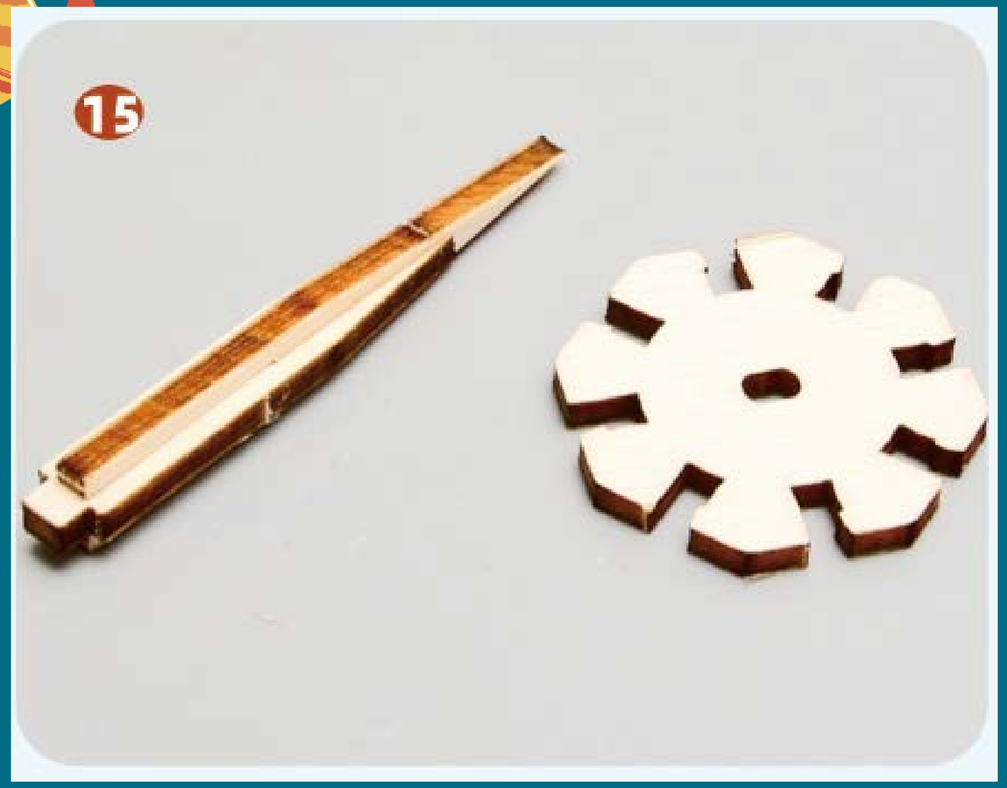

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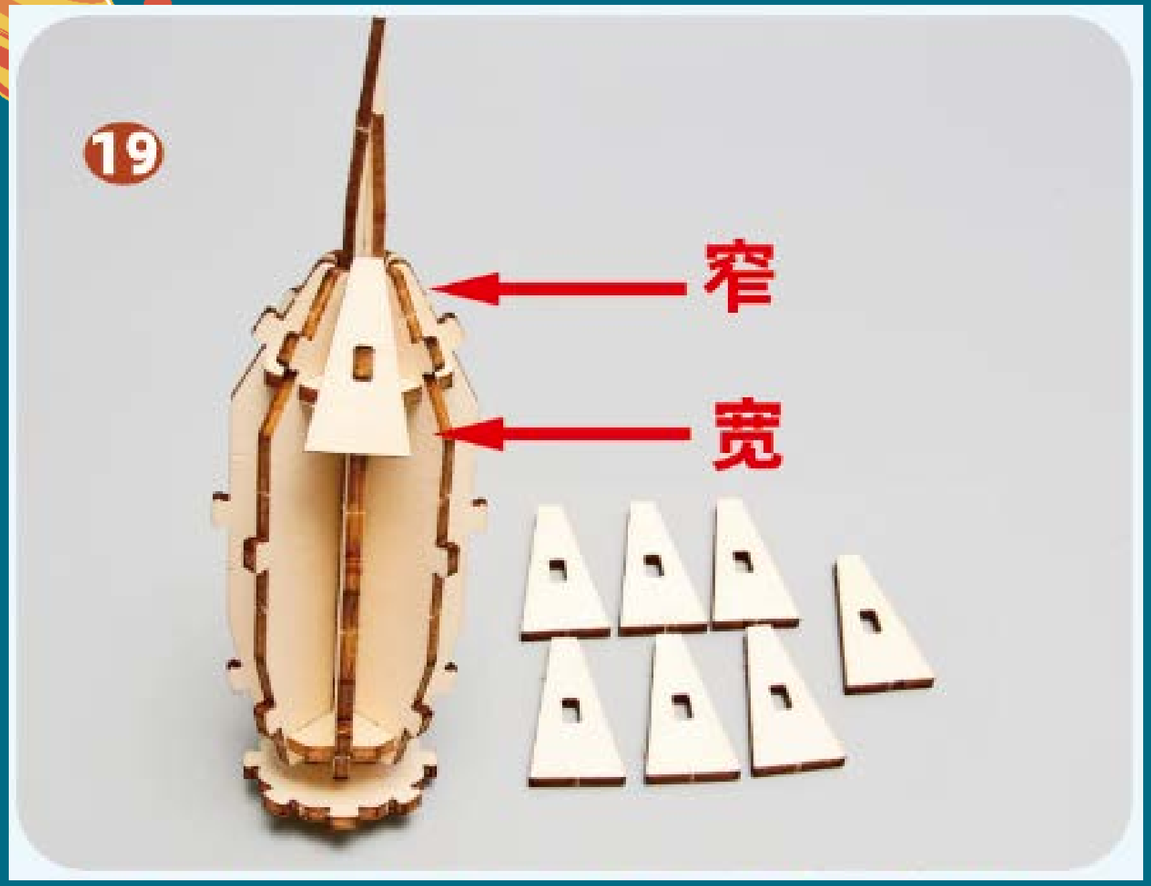
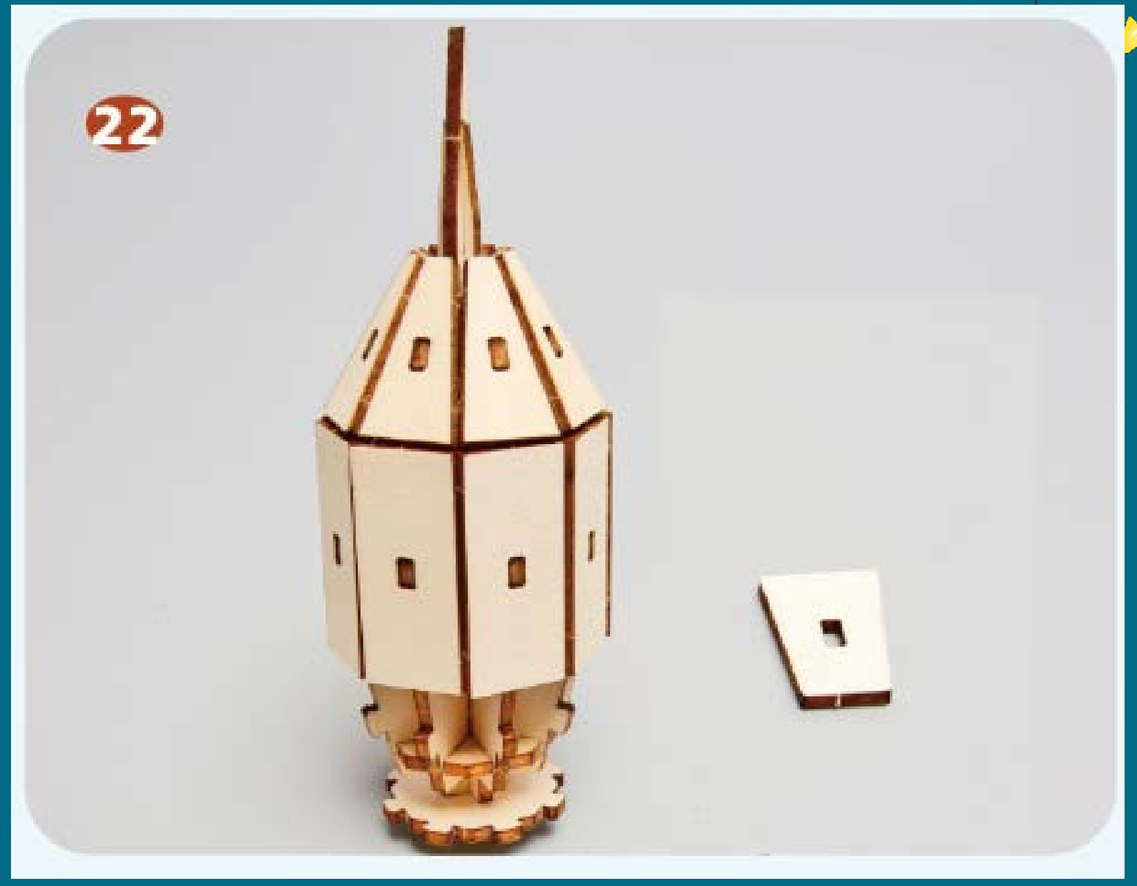


Assemble the parts as shown and repeat it for rest of the seven pieces

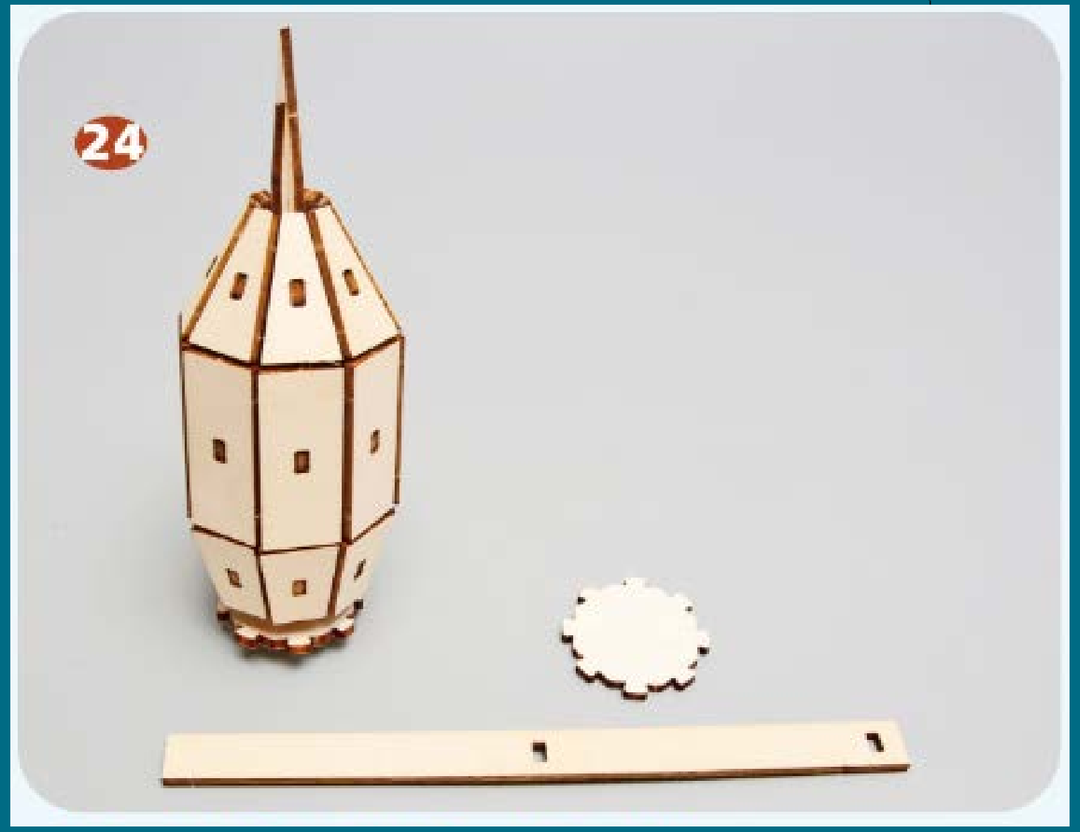
Assemble the parts as shown and prepare for the next step.

Install the seven identical parts as shown.



Prepare the next part for assembly.

Install the seven identical parts as shown.

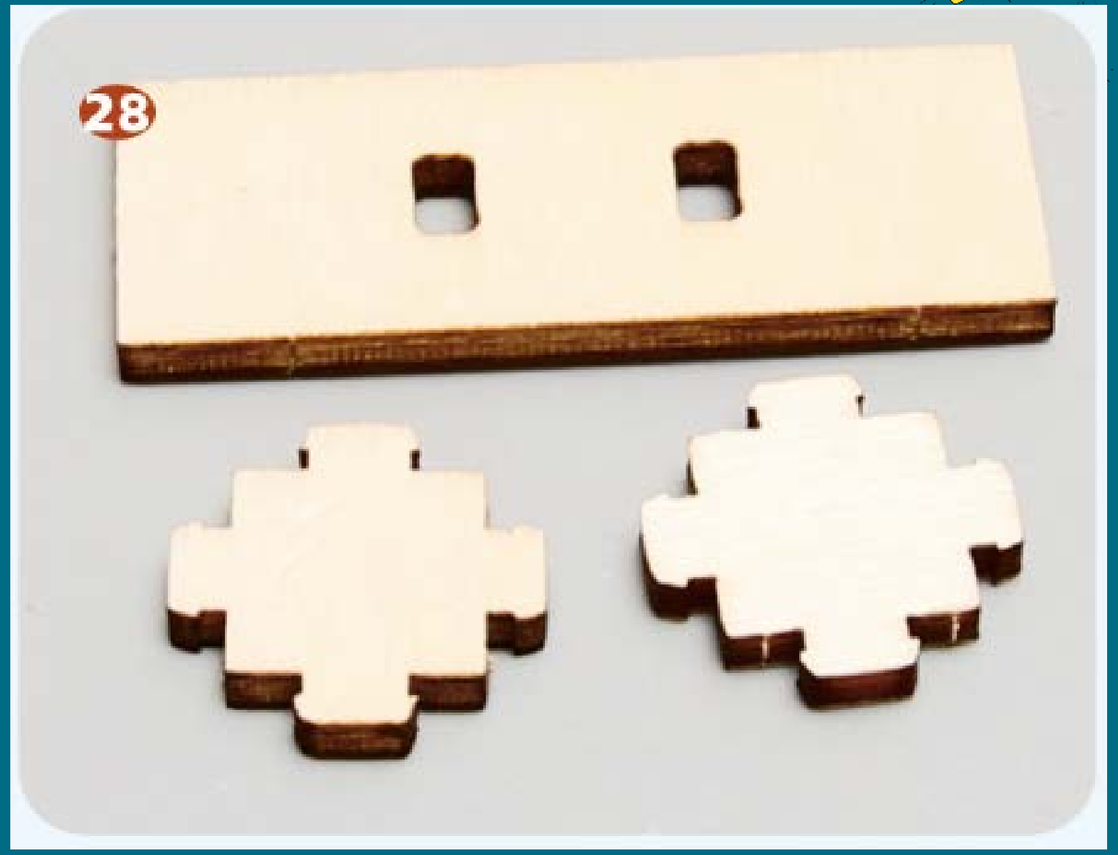


Prepare the next round piece and long wooden strip.

Use the wooden boards with two holes as shown in the picture.
Prepare another three identical parts for the next step.

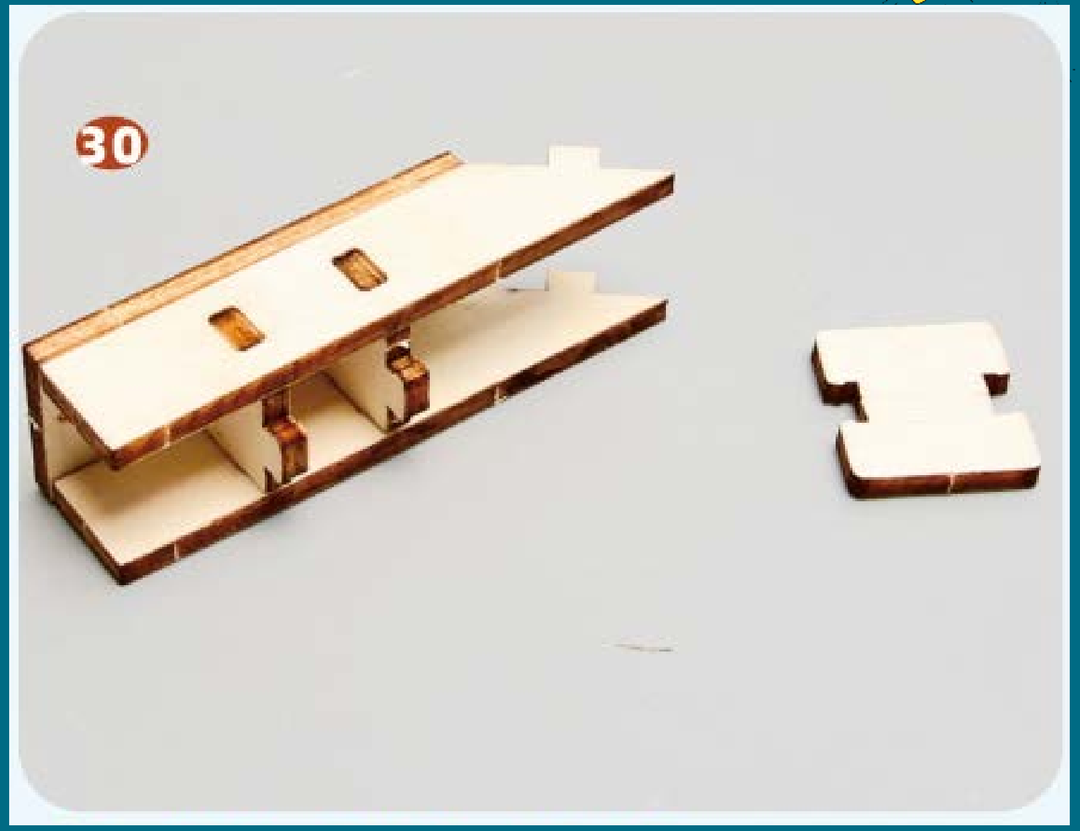
Install one board, leave a space, then install the next one as shown.
After assembly, prepare four identical parts as shown for the next step.

Assemble as shown.



Prepare the next two parts.

Assemble the parts as shown and prepare for the next step.



Assemble the parts as shown and prepare for the next step.

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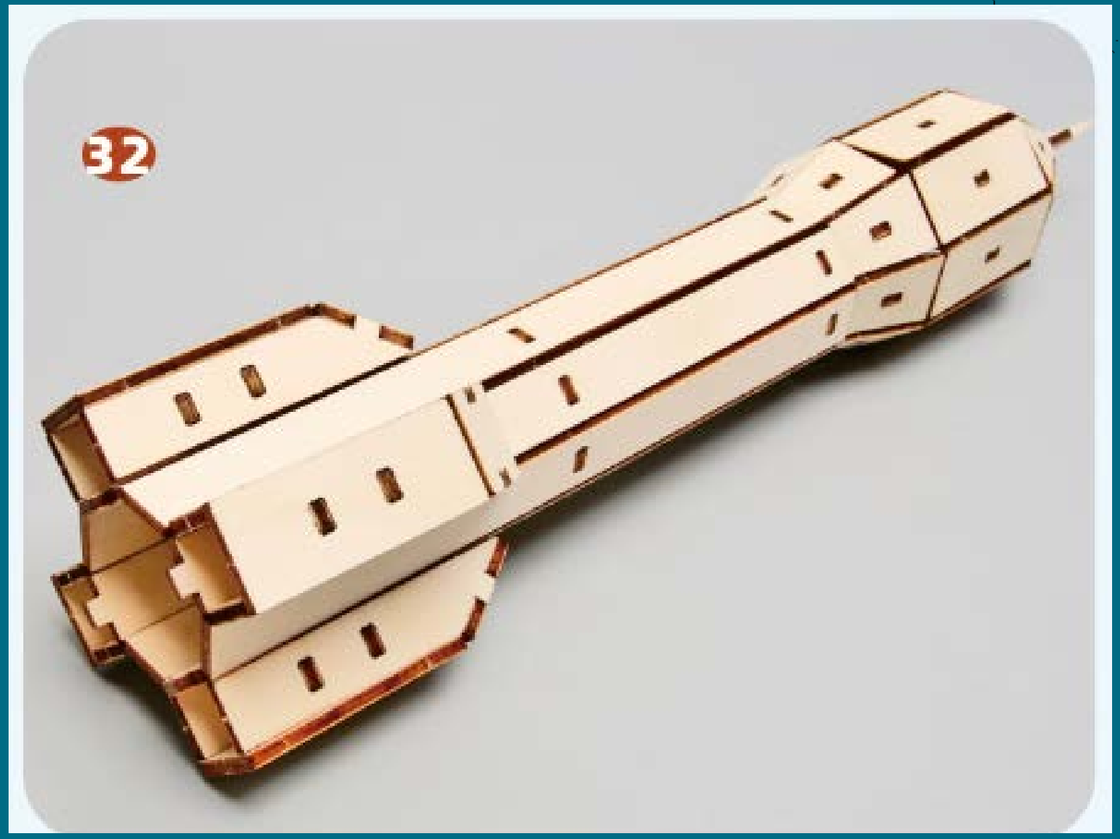
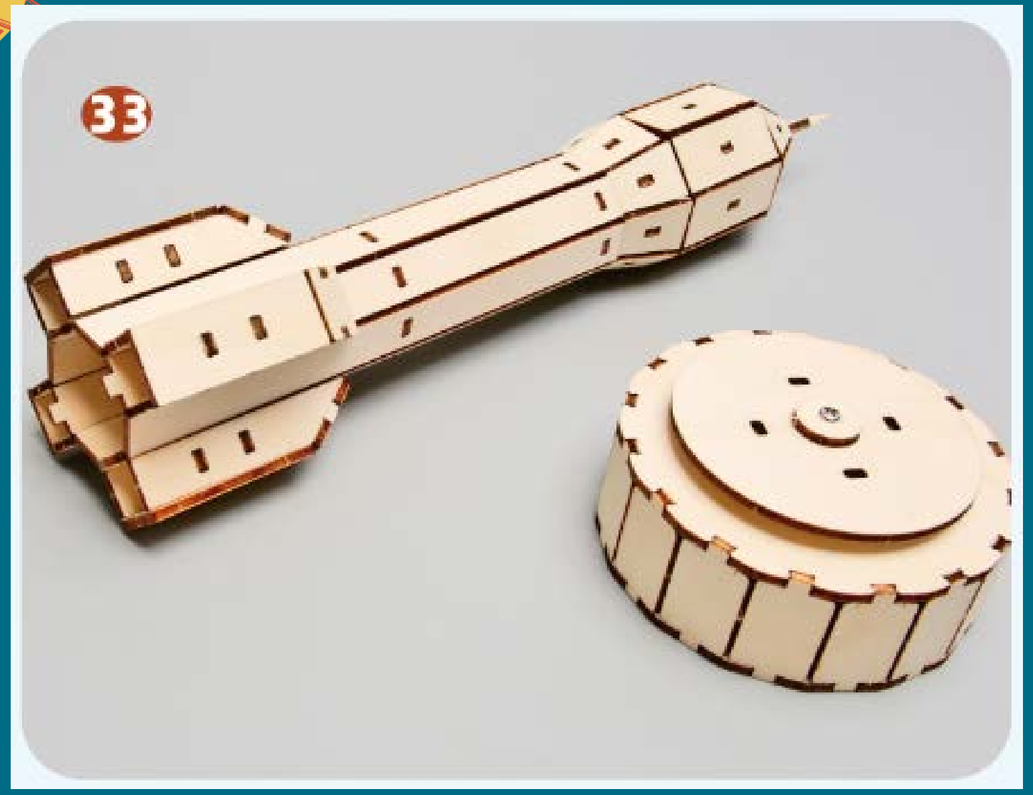


Assemble the parts as shown.



Assemble all parts together as shown.

Final Product Display

Science Knowledge

Principle

The rocket's thrust is generated by its engine. After ignition, the propellant (liquid or solid fuel and oxidizer) burns in the combustion chamber, producing large amounts of high-pressure gas.
The gas is expelled rapidly through the nozzle, creating a reaction force that propels the rocket forward.