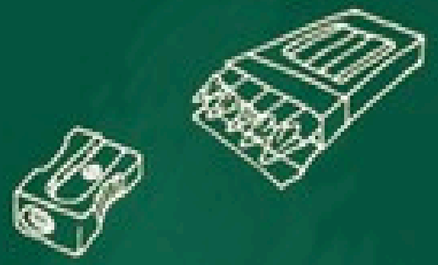
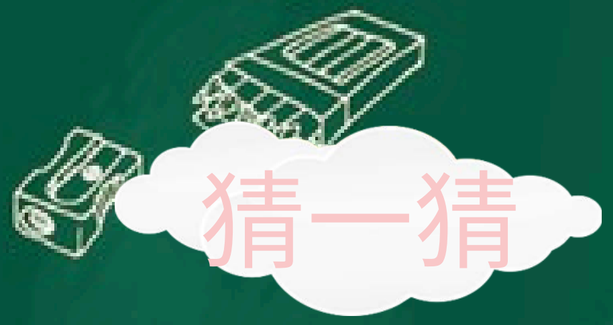


Electric Race Car

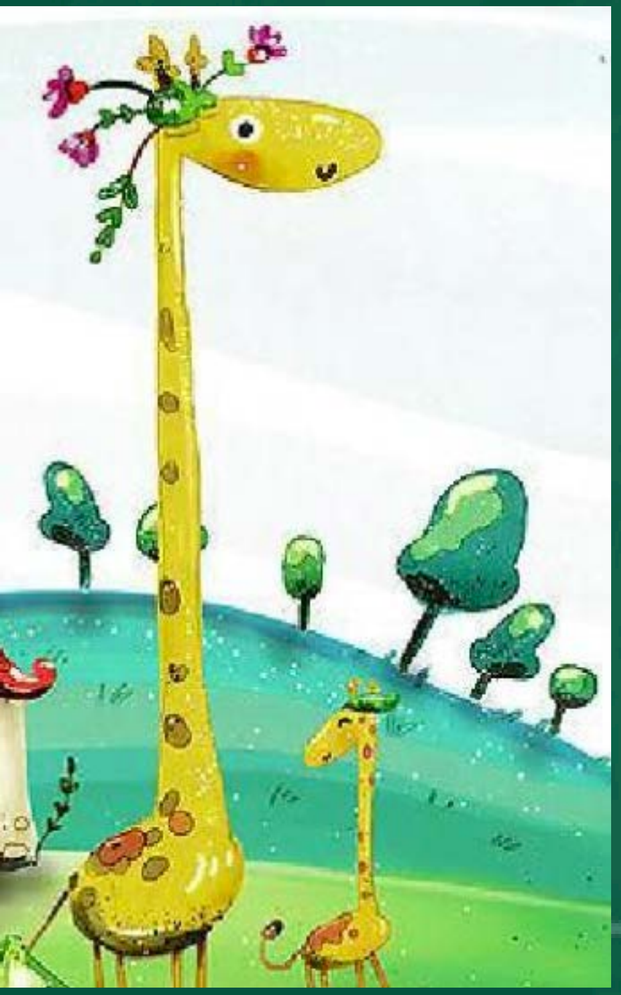
Experiment Objectives

1. Understand the components of an electric four-wheel drive car
2. Learn the scientific principles behind electric four-wheel drive cars
3. Stimulate children's interest in learning through scientific experiments and cultivate their scientific thinking

Introduction



Riddle



A small little room,
with walls and windows too,
Running on the road,
while people walk on both sides.
(Guess a means of transportation)

Answer: Car

What kinds of vehicles do you know?

Train, bus, electric scooter, car, etc.

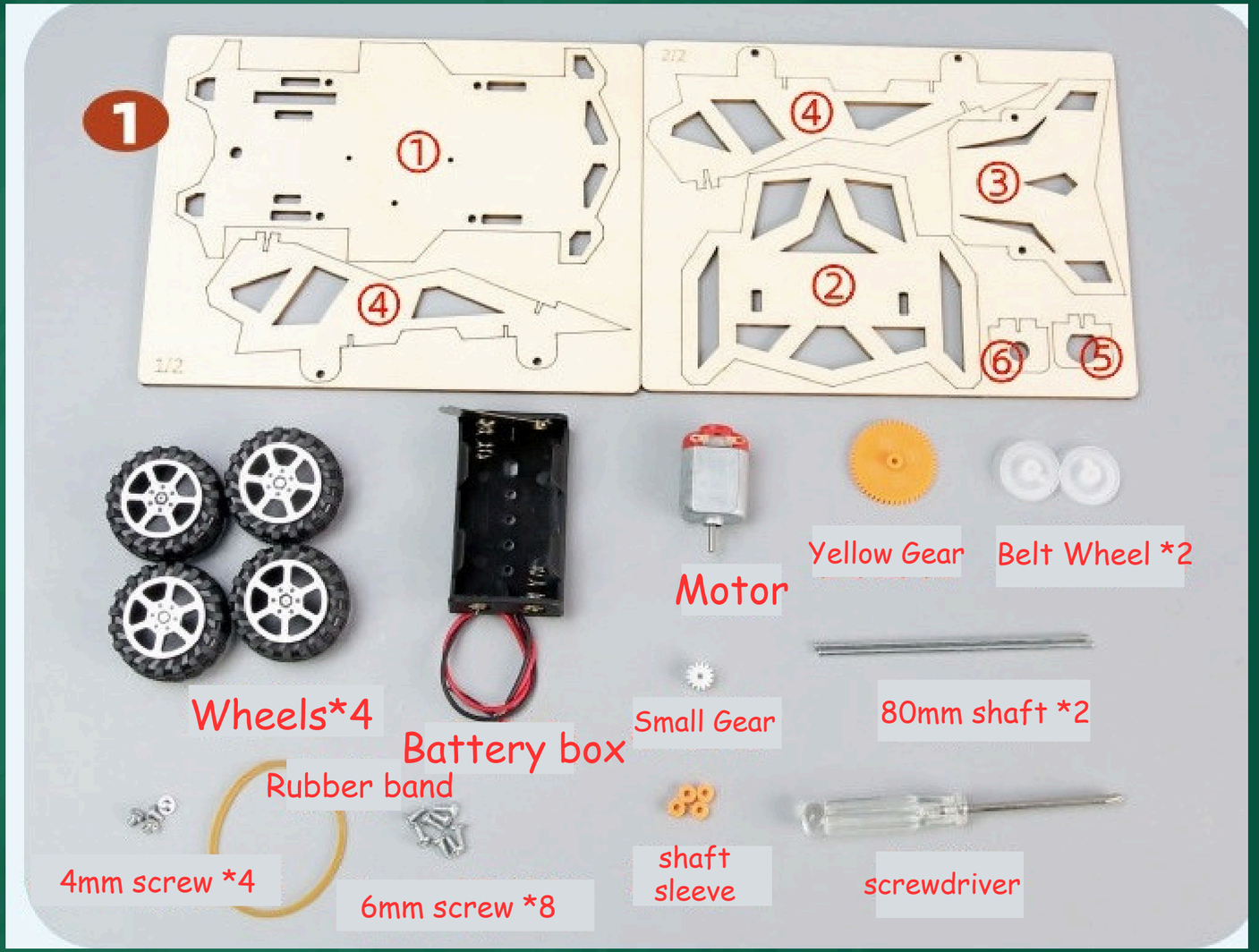
Let's get to know some common vehicles in our daily life

Do you know how an electric four-wheel drive car moves?

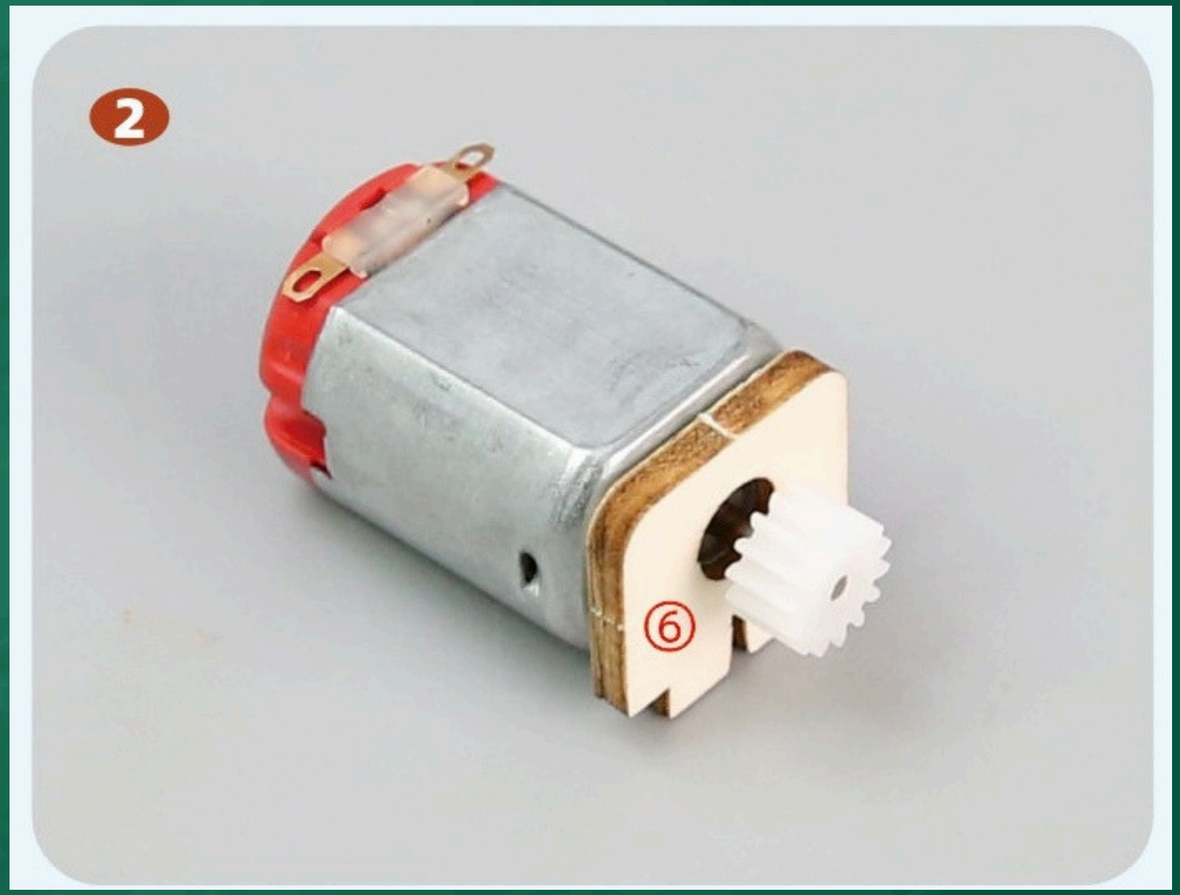
Let's do a small experiment about an electric four-wheel drive car together!

Experiment Steps

Recognize the materials

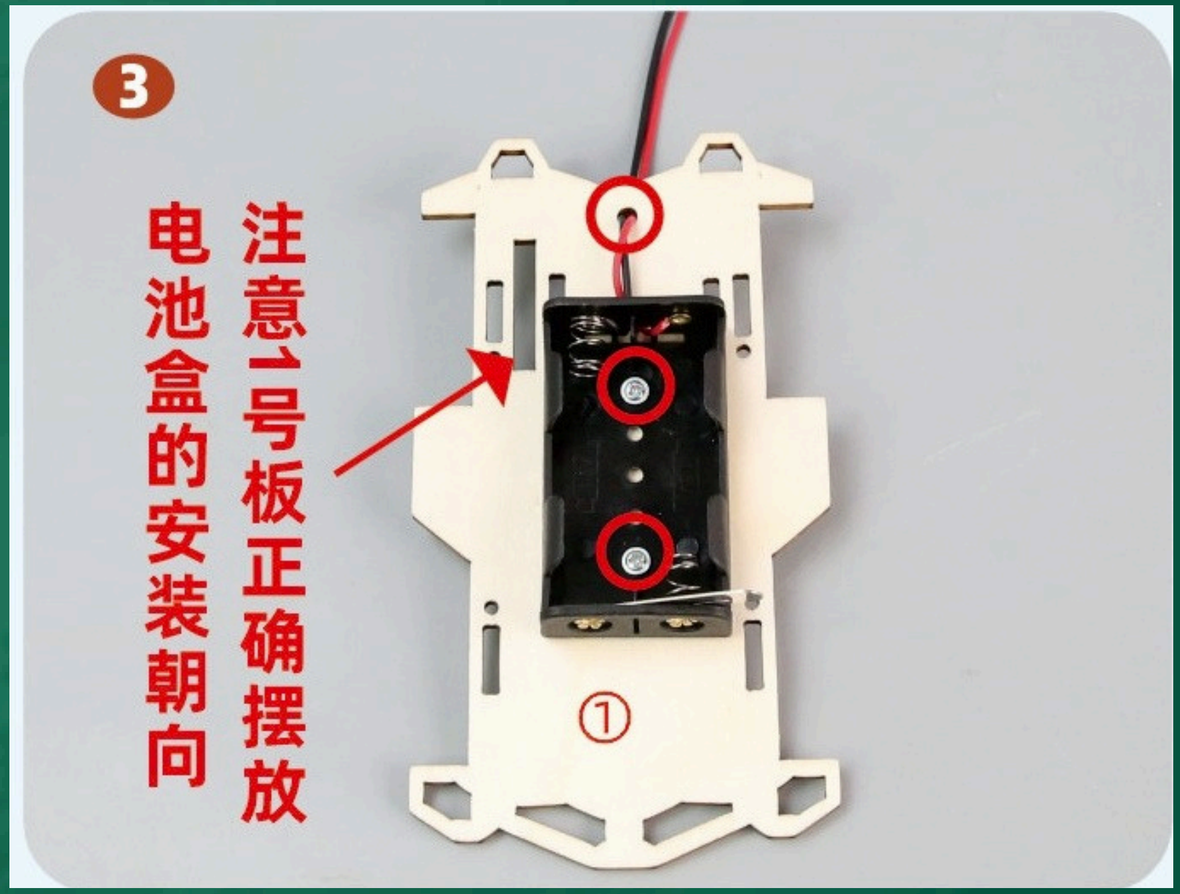


Insert part ⑥ onto the motor shaft and install the small gear as shown.

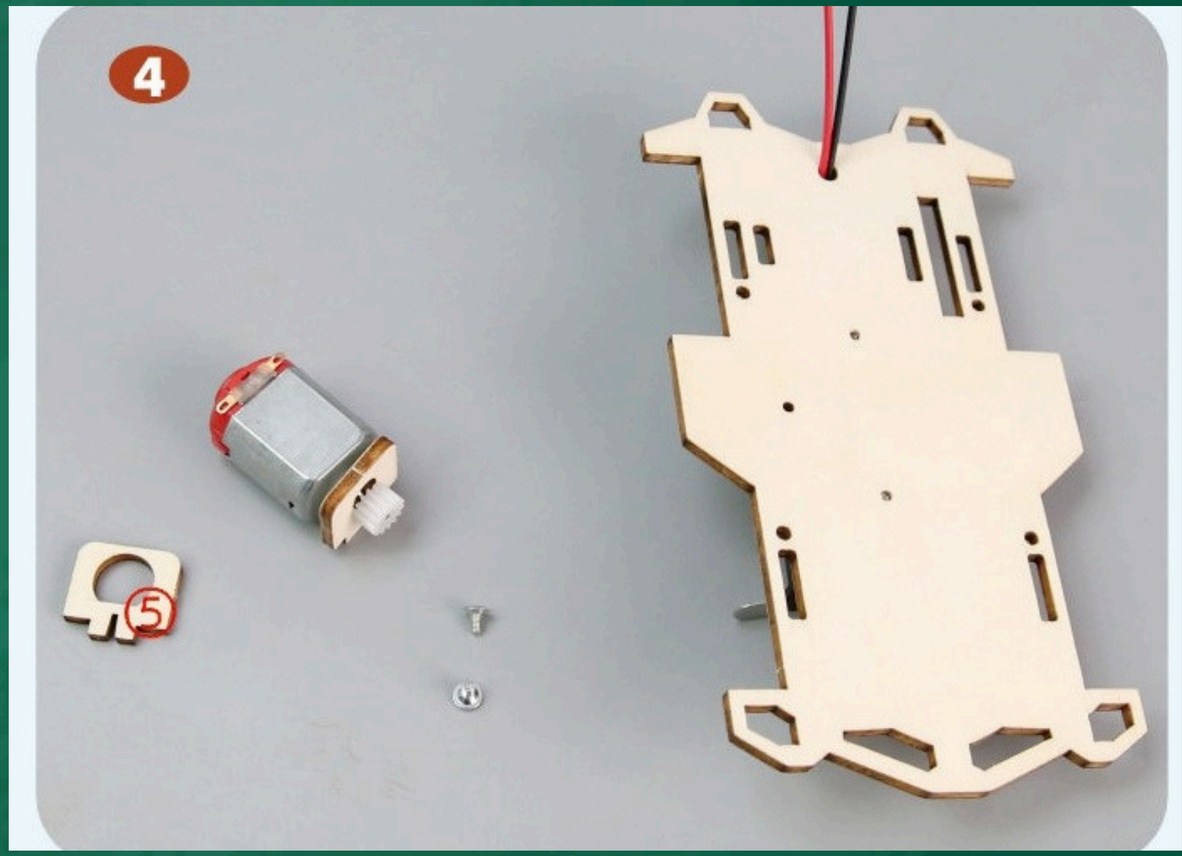


Fix the battery box onto board ① using 4mm screws.
Pass the wires through the small hole as shown.

(Note: Ensure the battery box is installed in the correct direction.)

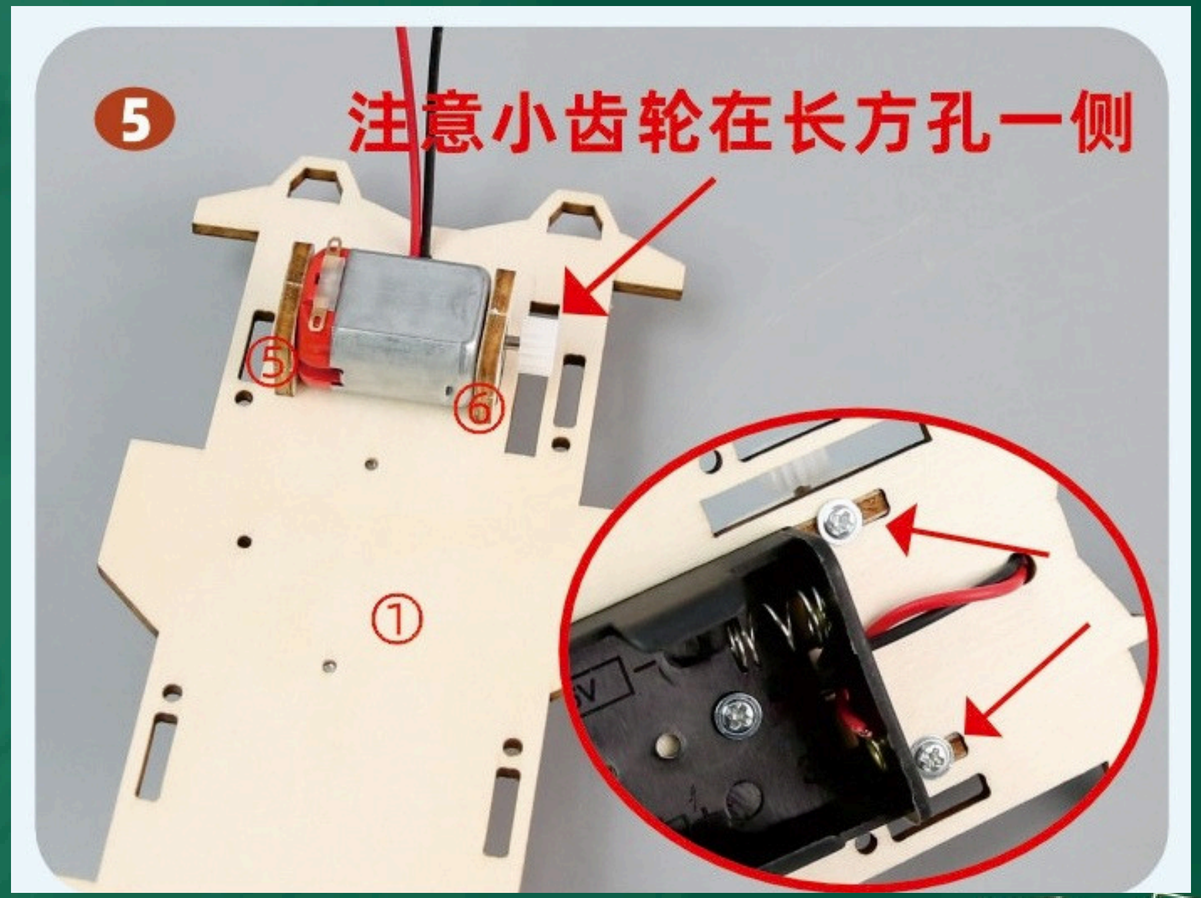


Prepare the motor assembly, board ⑤, and two 4mm screws.

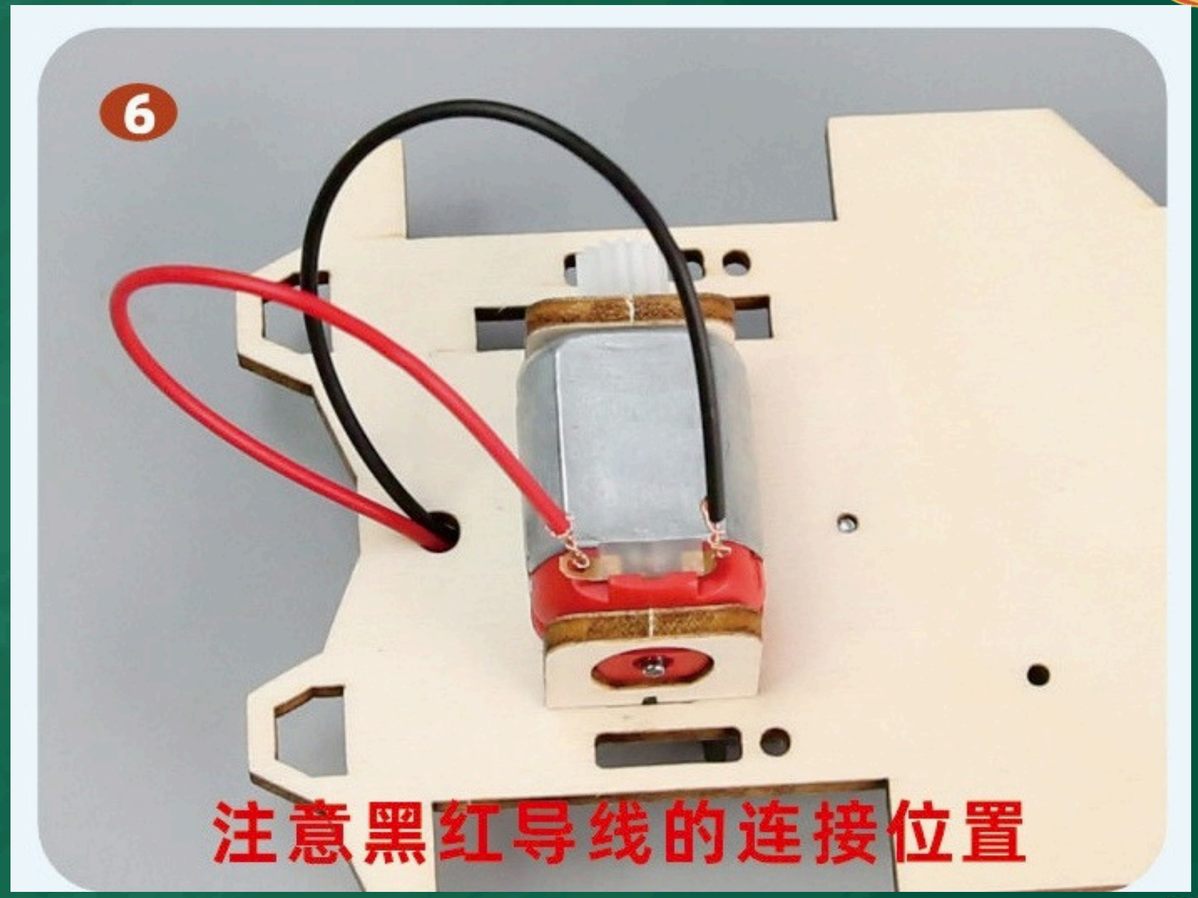


Flip board ① over.
Use boards ⑤ and ⑥ to hold the motor in place at the front and back, then fix them onto board ① with 4mm screws.

(Note: The small gear should face the long slot side.)

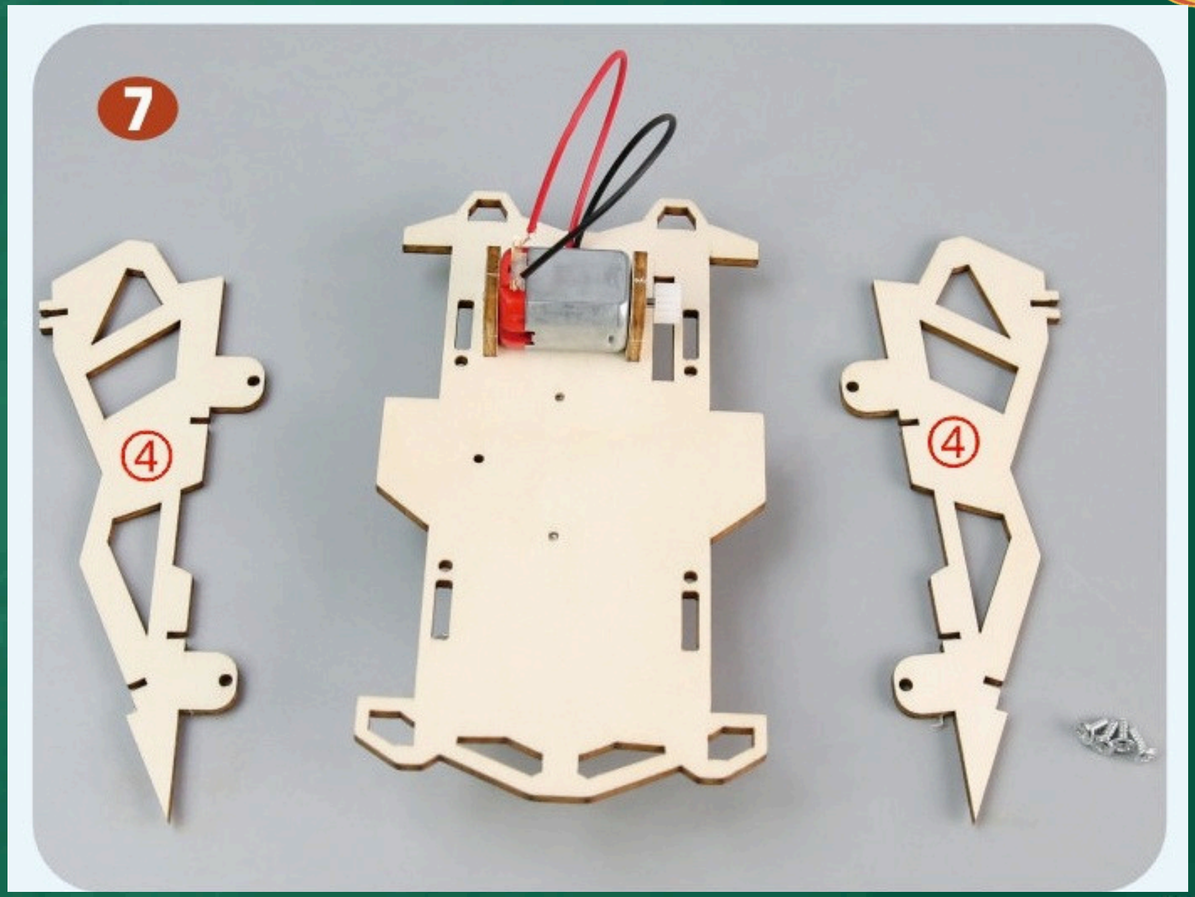


Connect the red and black wires from the battery box to the motor as shown.

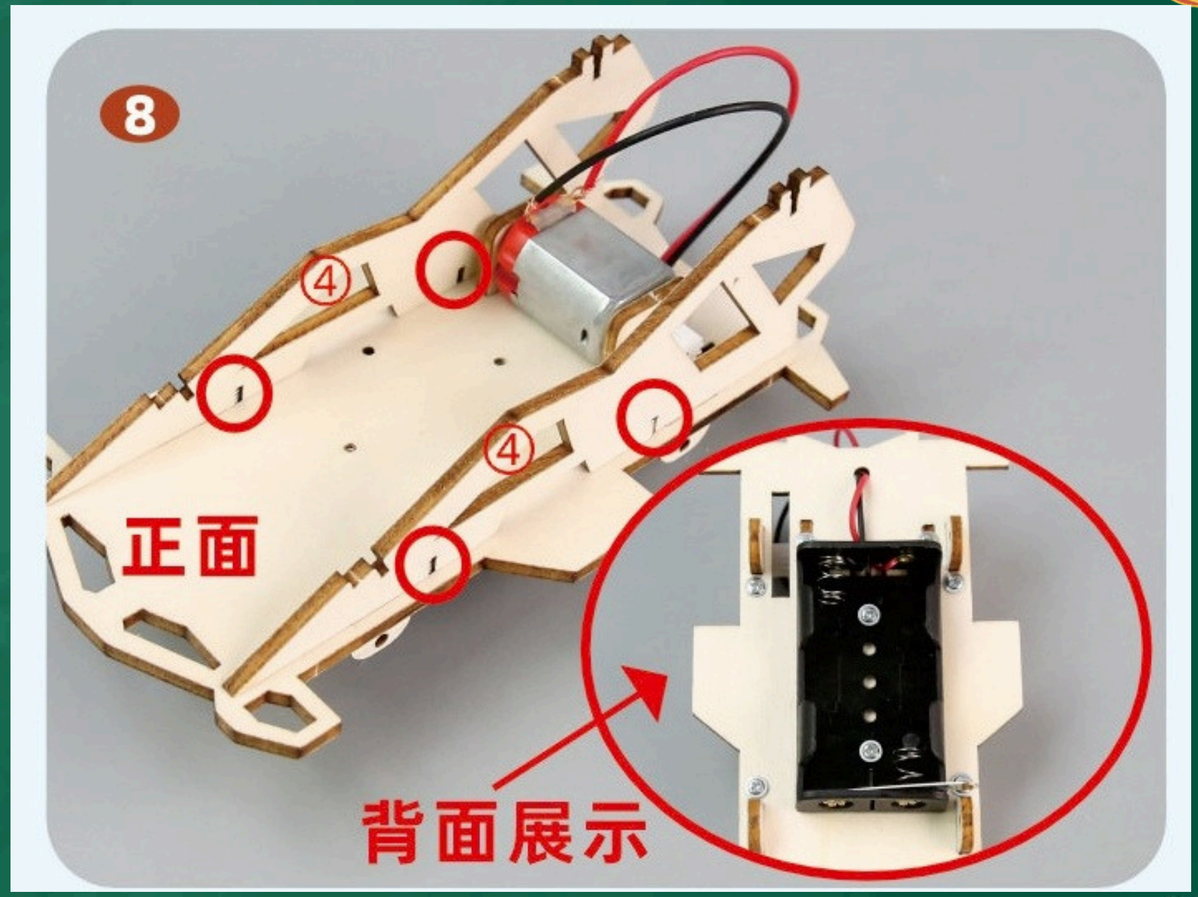


Pay attention to the connection position of the black and red wires.

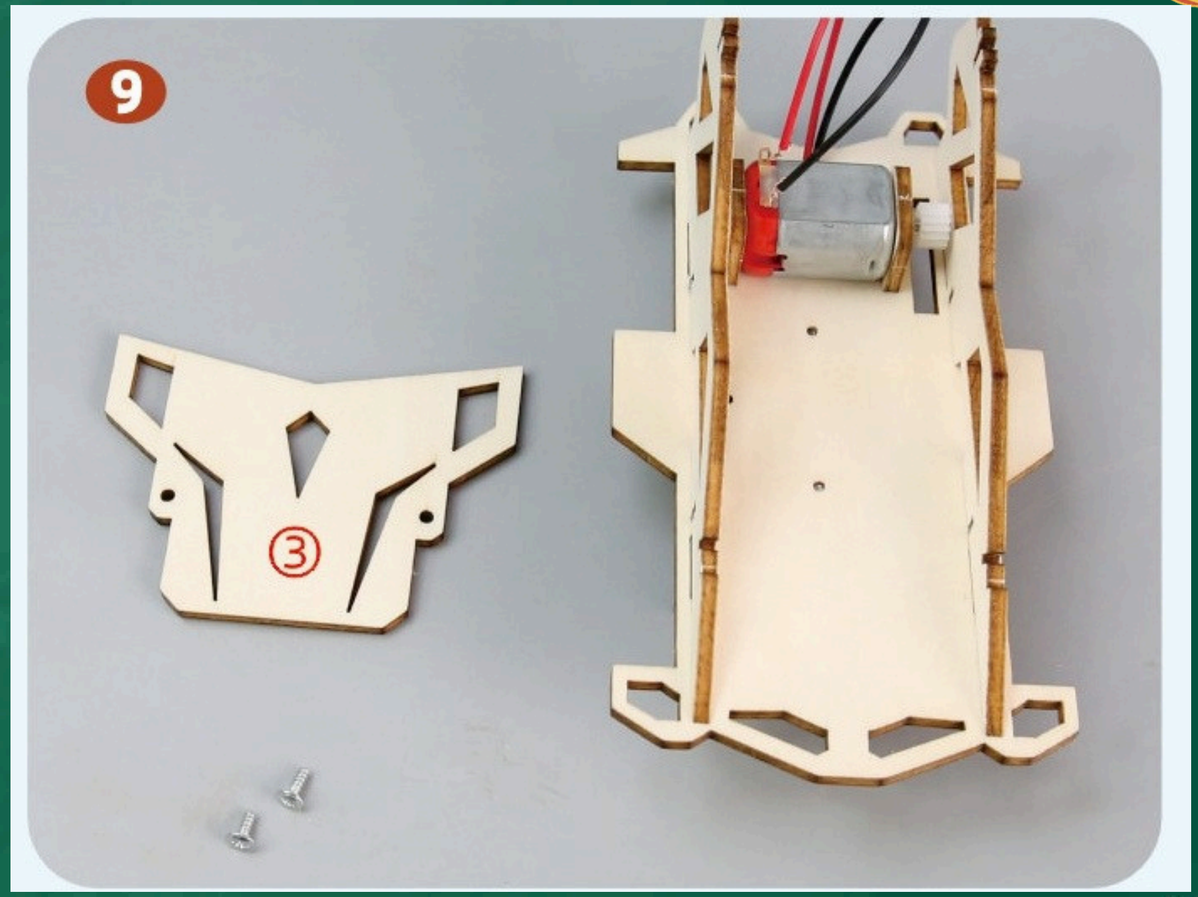
Prepare board ④ and four 6mm screws.



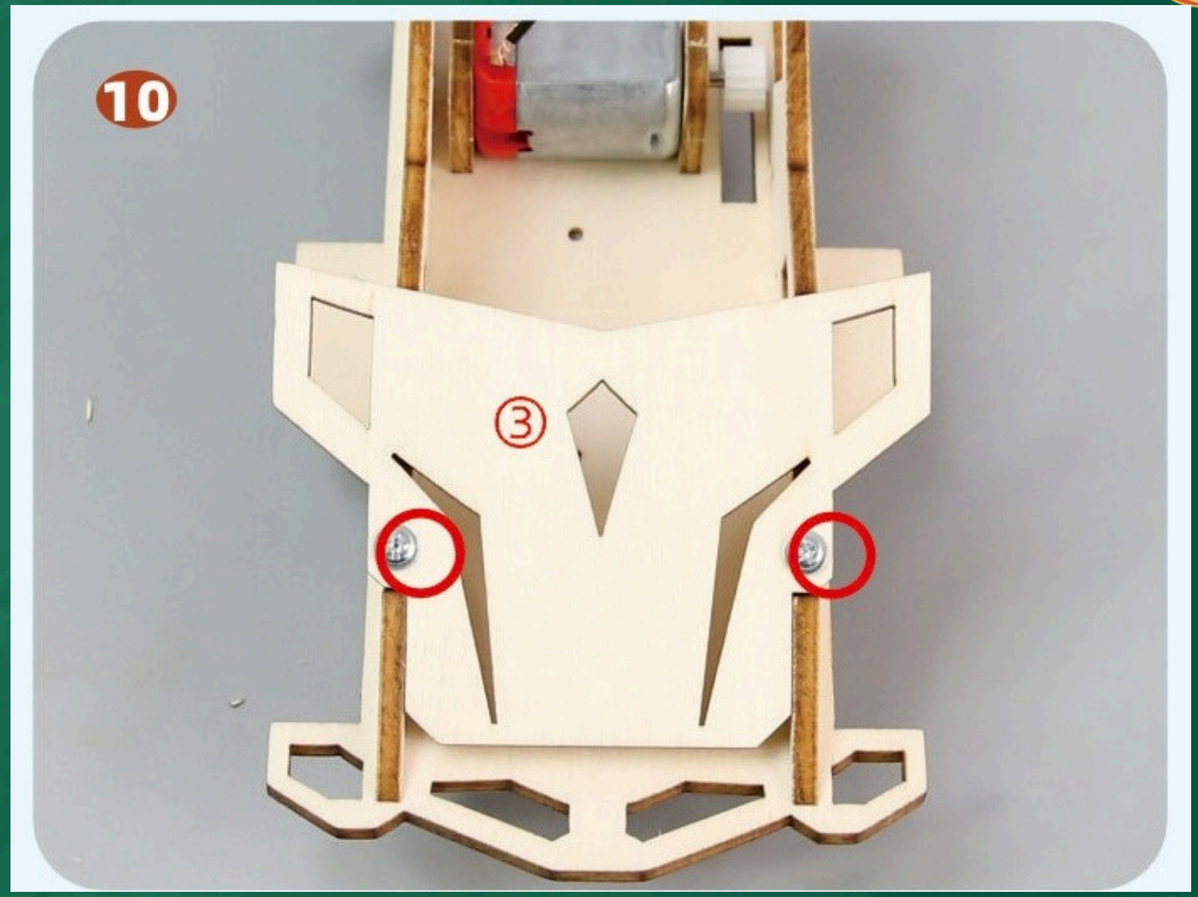
Install the two ④ boards into the side slots of board ① and fix them from the back using 6mm screws (as shown by the red circles).



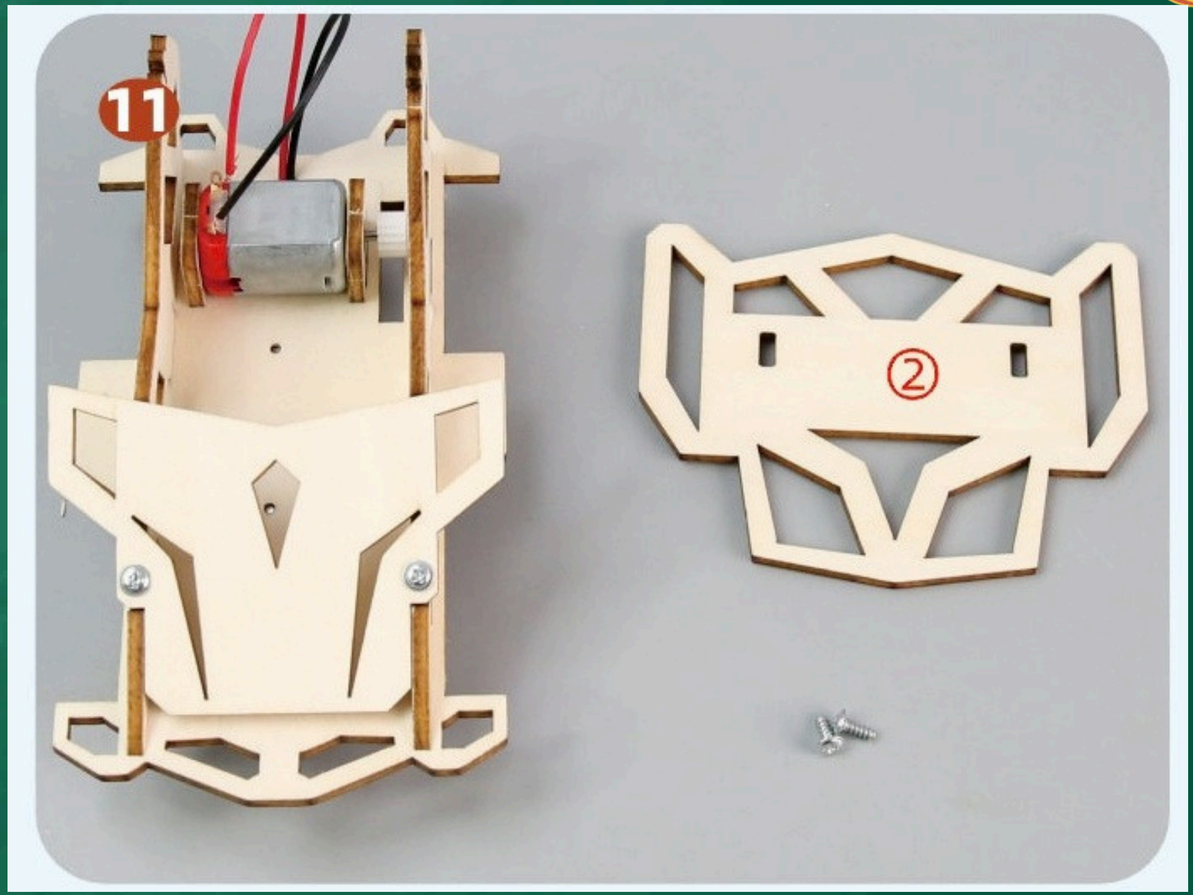
Prepare board ③ and two 6mm screws.



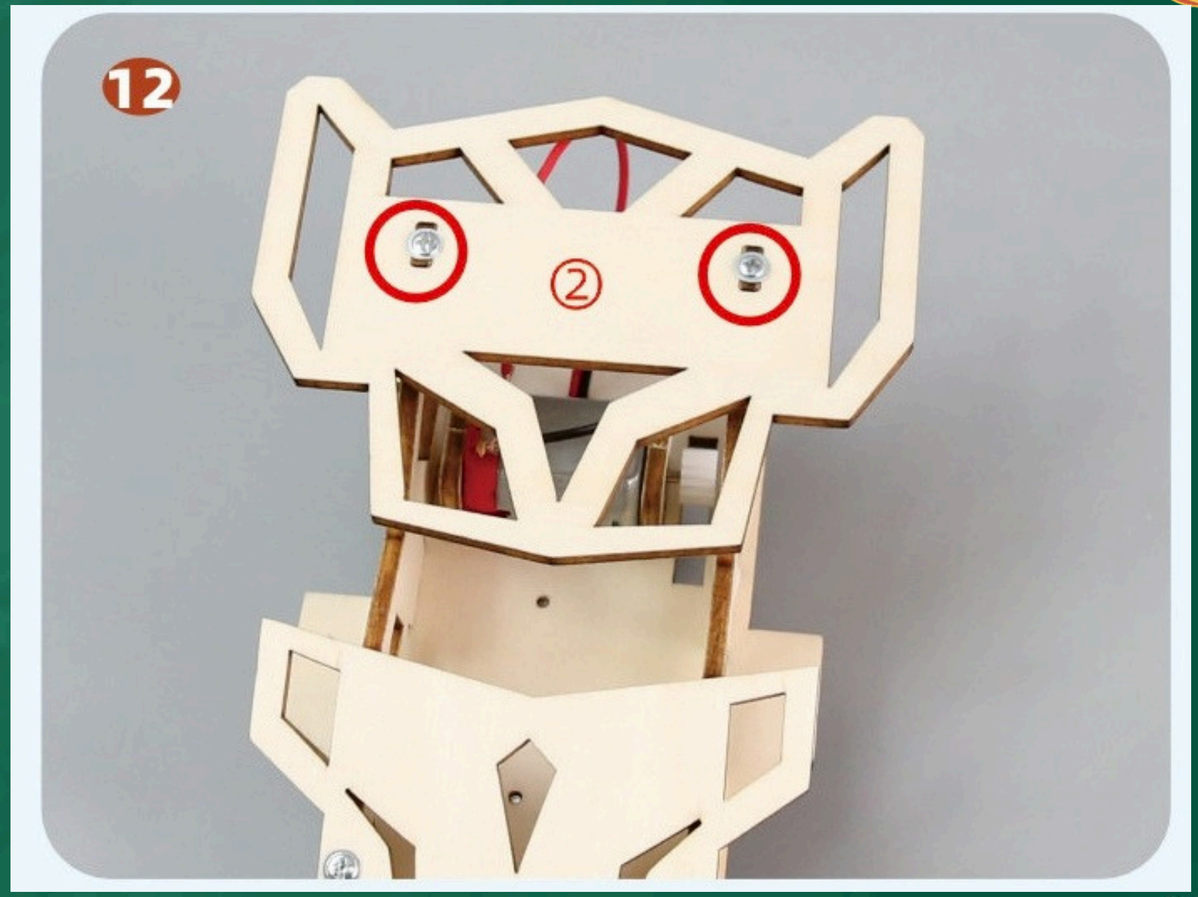
Fix board ③ to the front of the two ④ boards using 6mm screws (as shown by the red circles).



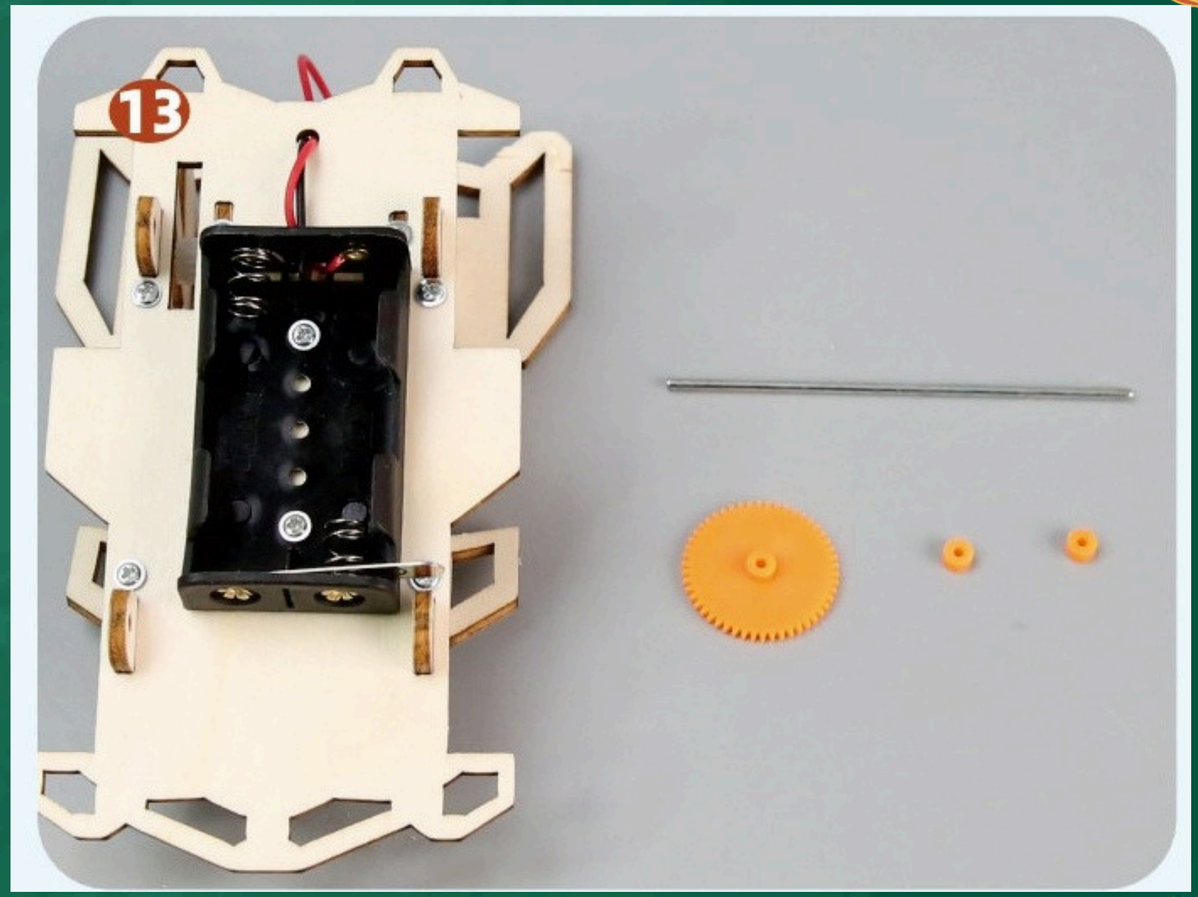
Prepare board ② and two 6mm screws.



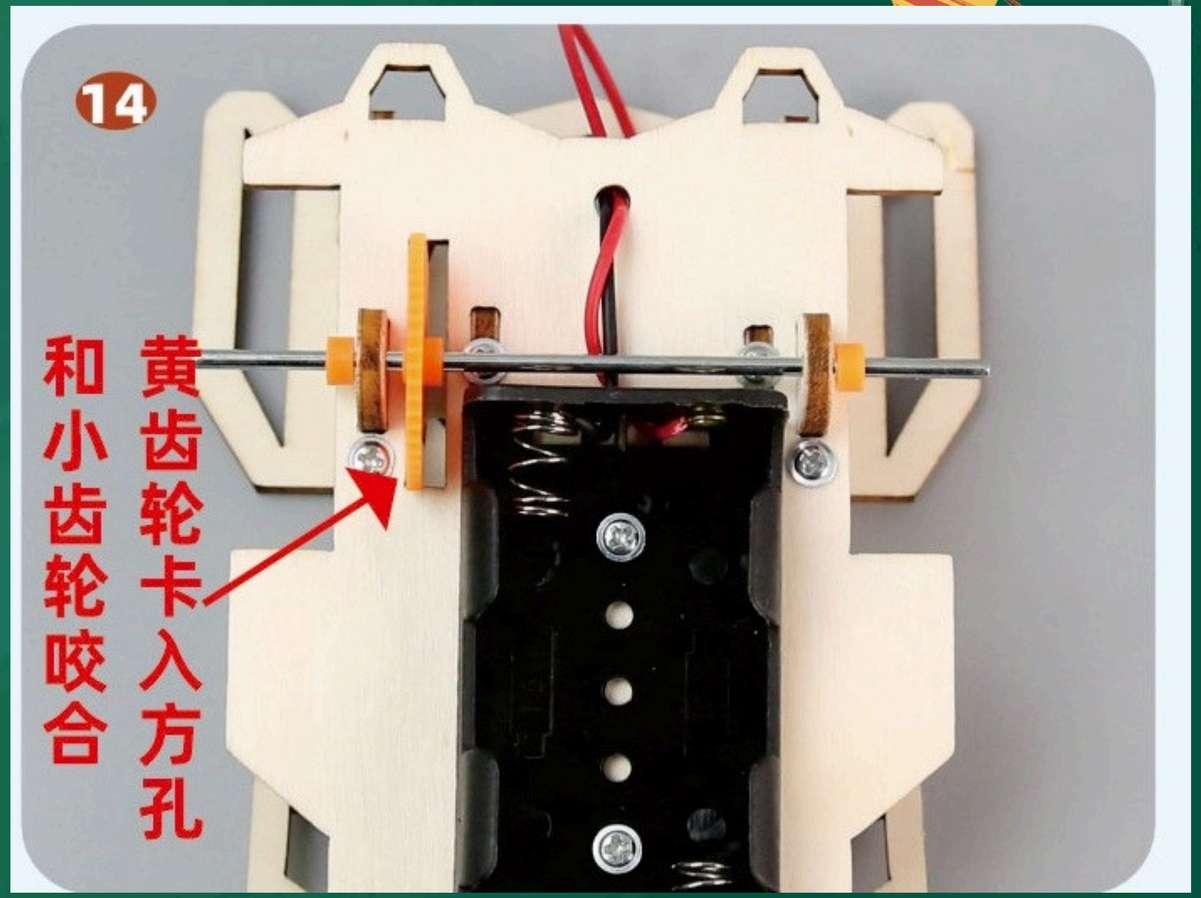
Fix board ② to the rear of the two ④ boards using 6mm screws (as shown by the red circles).



Prepare the metal shaft, yellow gear, and two shaft sleeves.

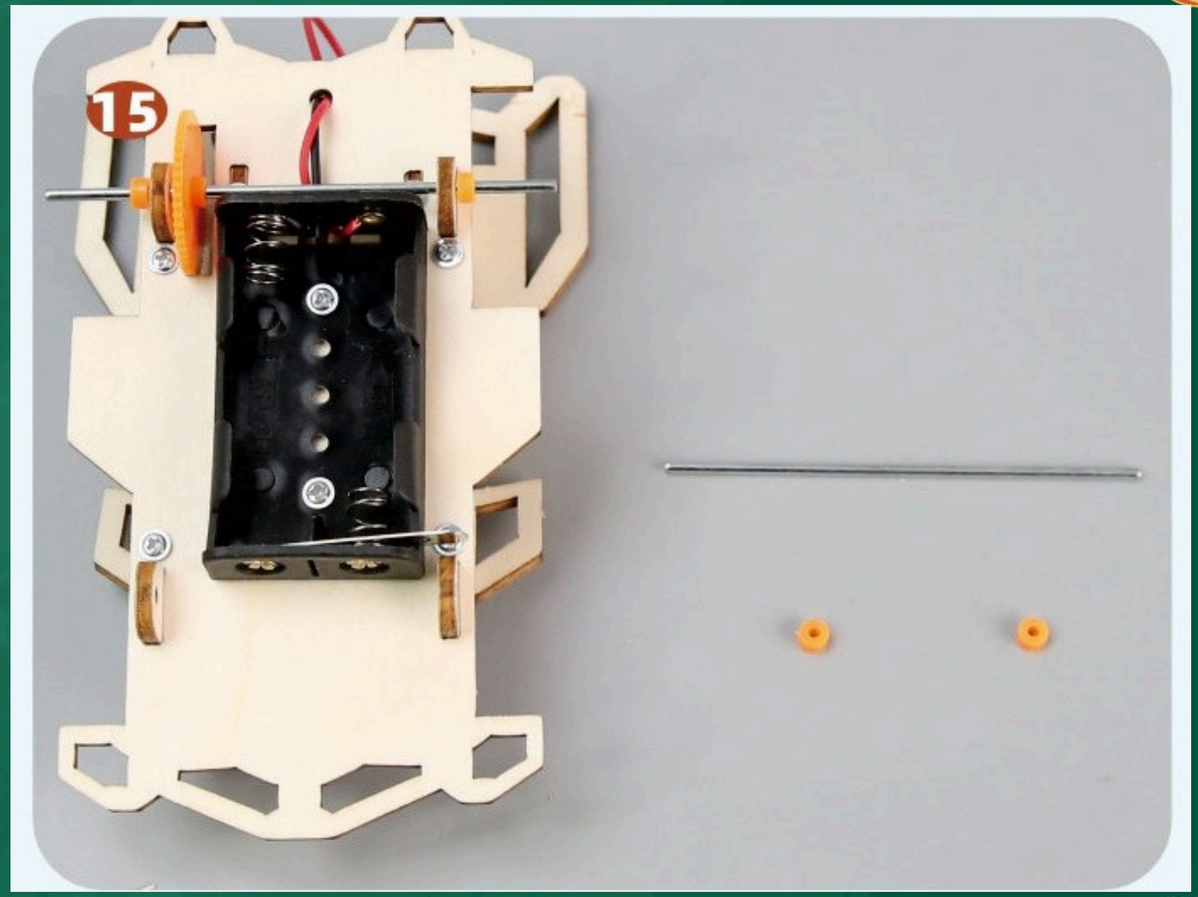


Insert the shaft on the side of the battery box wires, install the yellow gear, and secure both sides with shaft sleeves (do not tighten too much).

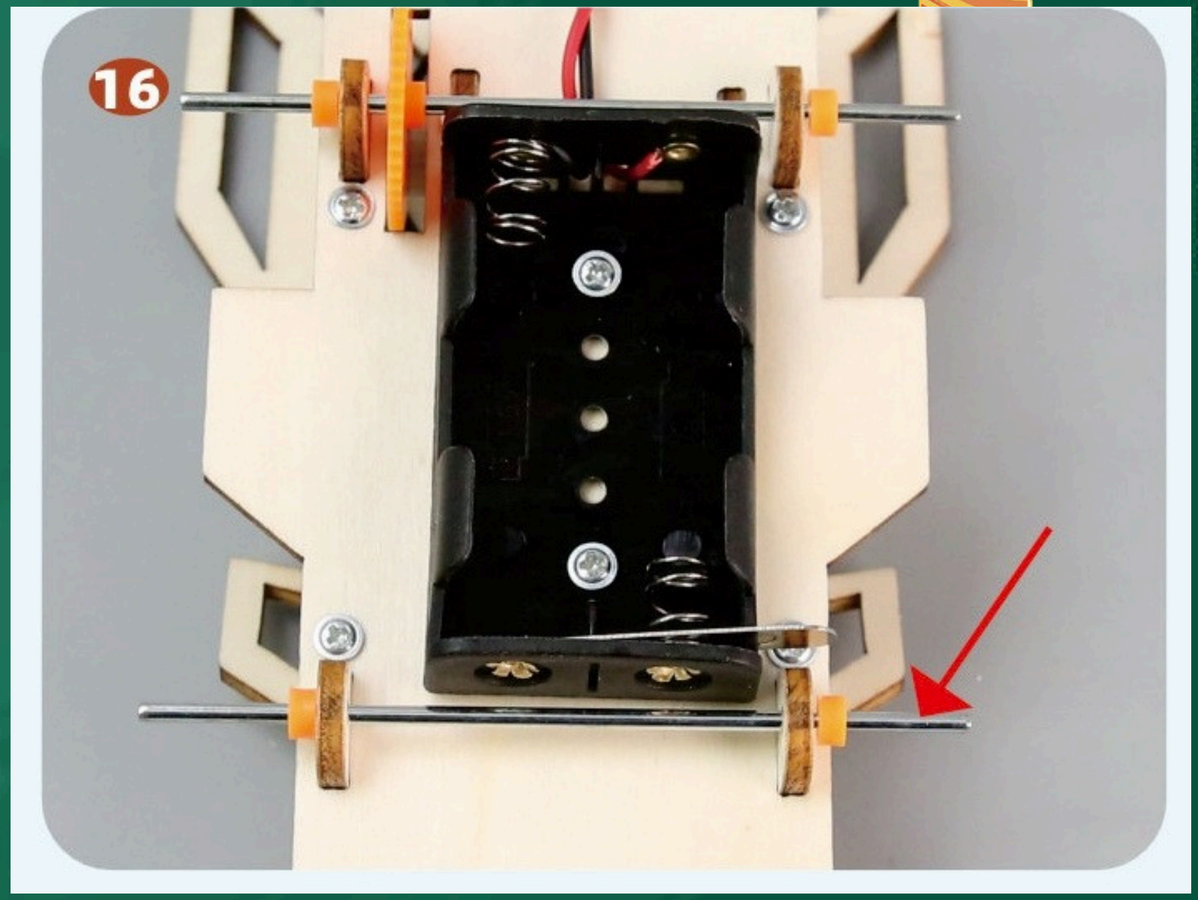


The yellow gear fits into the square hole and meshes with the small gear.

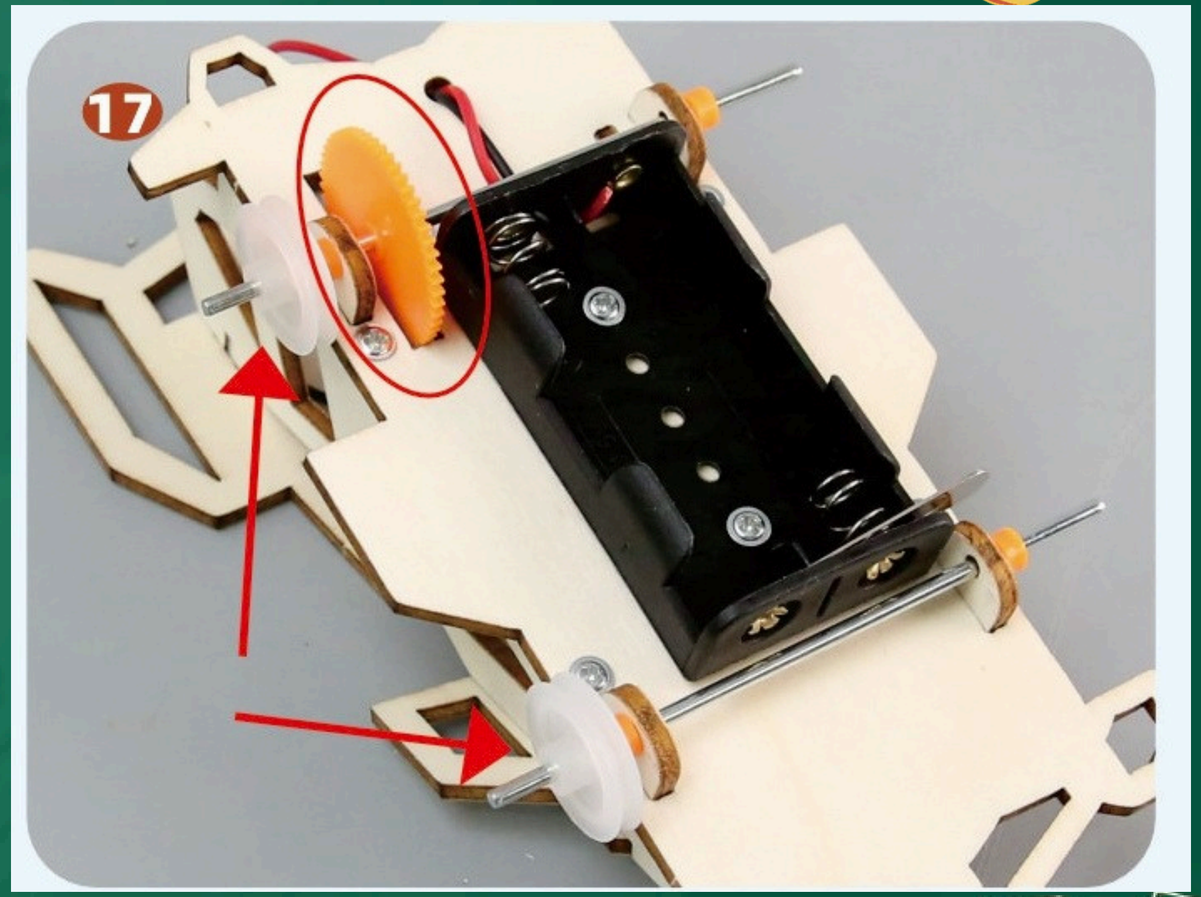
Prepare another metal shaft and two shaft sleeves.



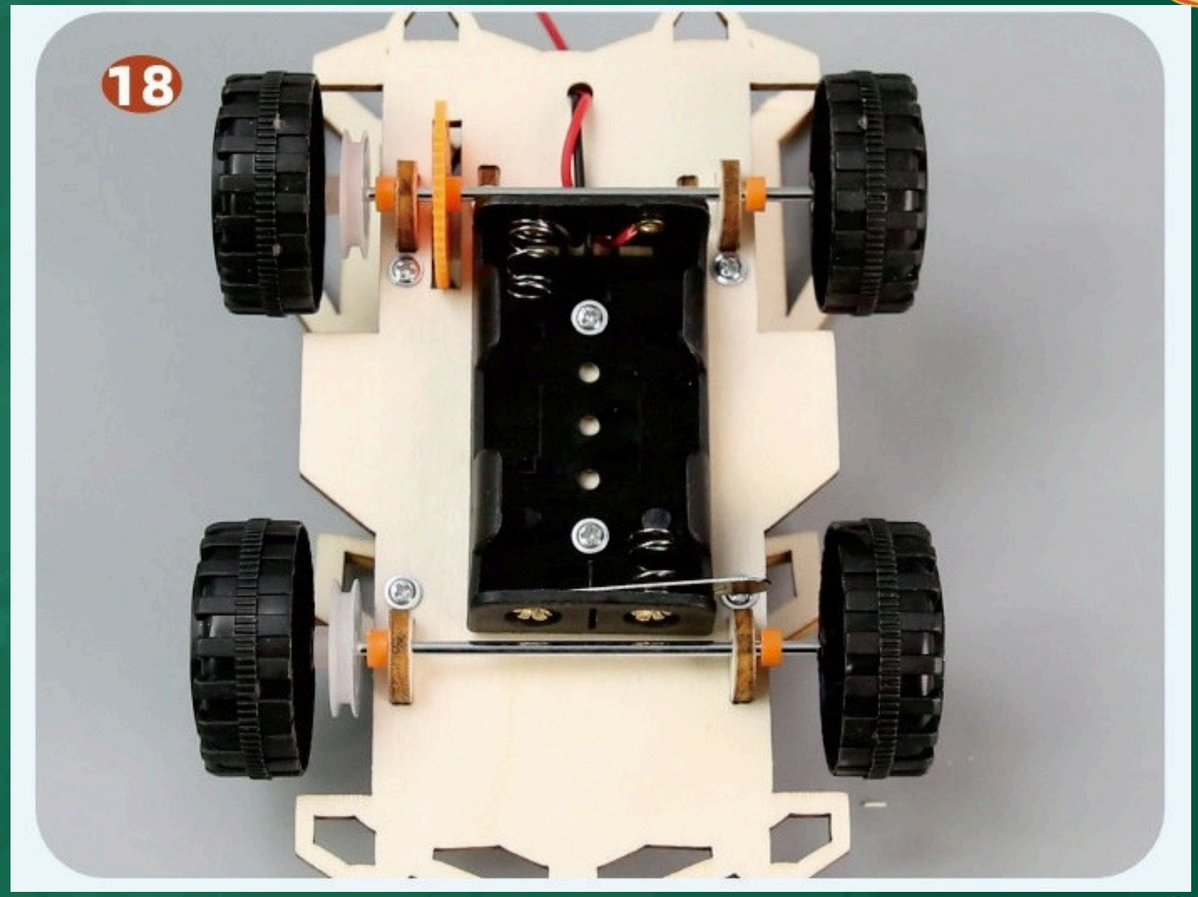
Install the shaft on the side of the battery box switch and secure both sides with shaft sleeves (do not tighten too much).



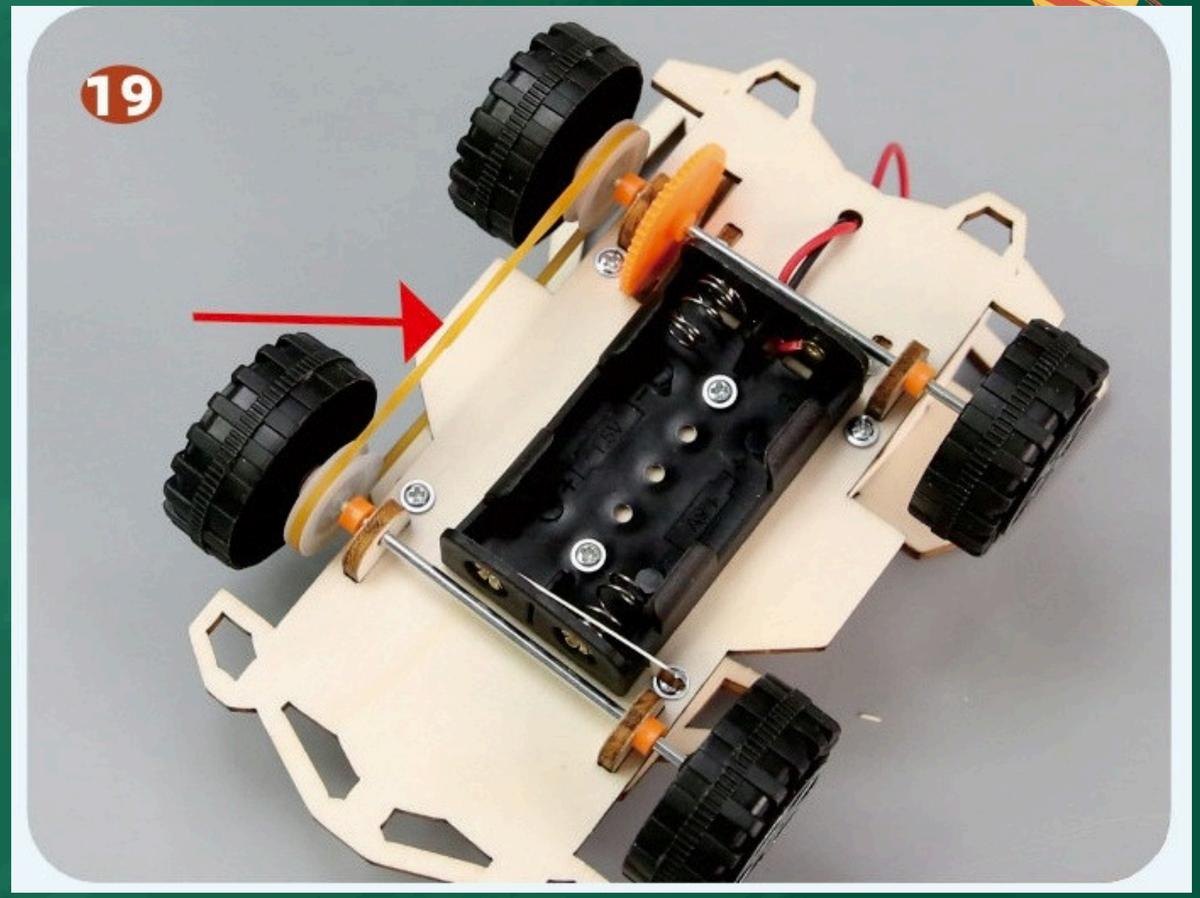
Install the belt wheels on the front and rear shafts (note: install on the same side as the yellow gear).



Install the wheels as shown.

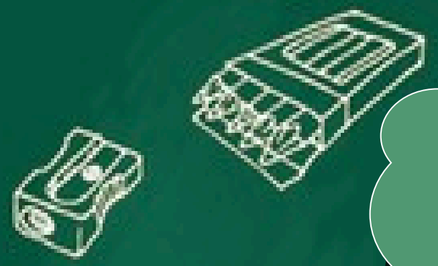


Loop the rubber band over the front and rear belt wheels as shown.



Finished Product Display

Experiment Summary



Experiment Principle

A four-wheel drive car is a vehicle with front and rear differential linkage that drives all four wheels.
Because the engine power is transmitted to all four tires, each wheel can exert force.
In a regular two-wheel drive car, if one of the driving wheels slips, the other loses power too, and the car cannot move.
However, in a four-wheel drive car, the other two wheels can still provide traction, allowing the car to continue moving.

The Role of Cars in Our Lives

- Carrying people

- Transporting goods