Activity Guide
4 Wheel Drive Race Car

Topic: Maker **Level:** Intermediate **Duration:** 120 mins **Age Range:** 12+

ACTIVITY DESCRIPTION

Build you own four wheel drive race car

LEARNING OUTCOMES

Young People Will:

- ➔ Research the flow of electricity and report findings back to the group
- ➔ Create test circuits and learn how to adopt a tinkering mindset
- ➔ Create prototype plans and discuss with group for feedback
- ➔ Learn how to customise the visual design of the machine

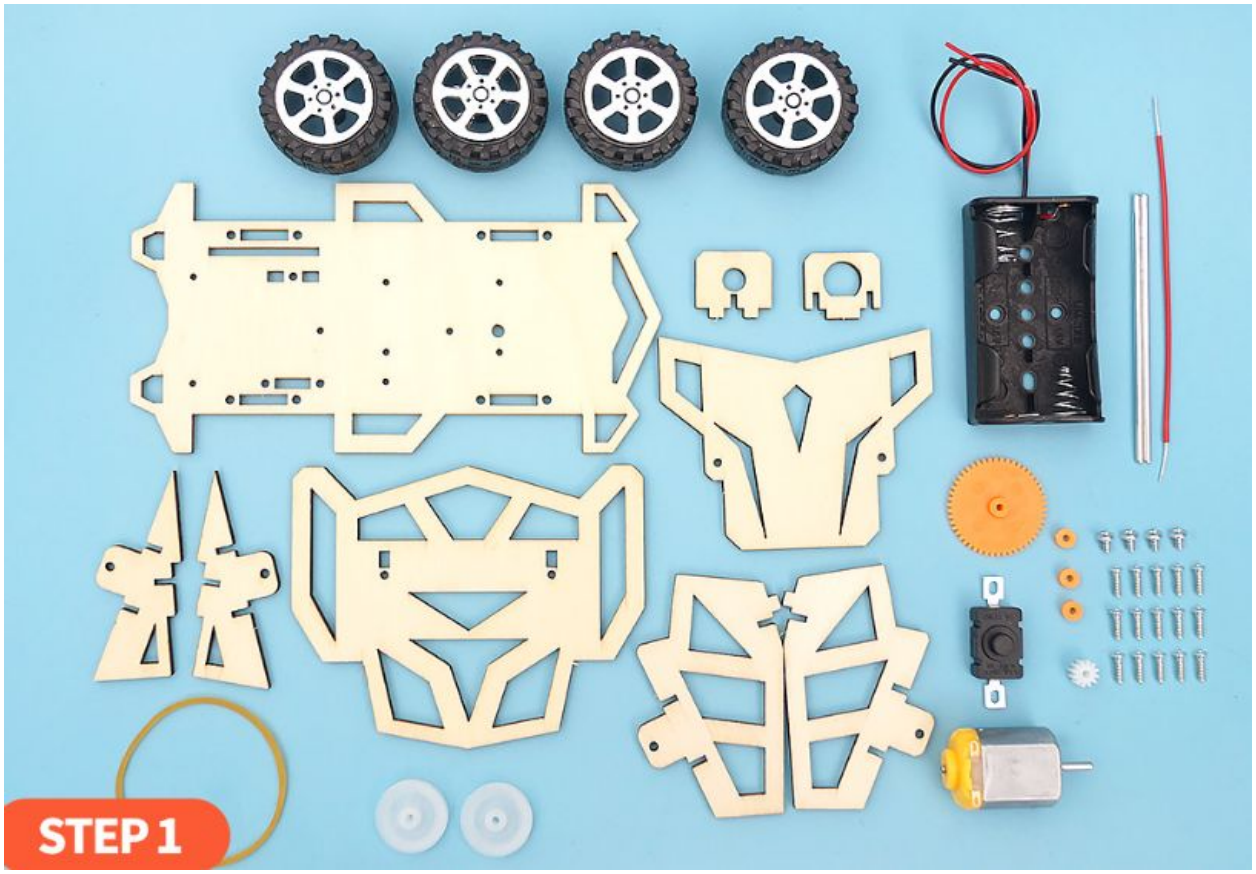
COMPETENCIES

Young People Will Develop 21st Century Skills:

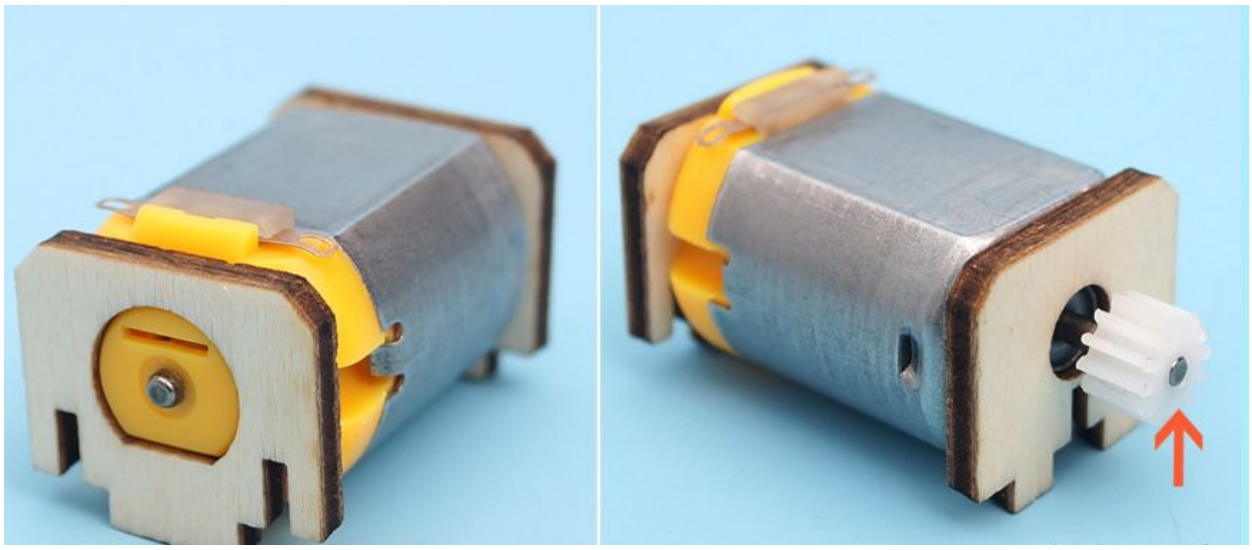
- ➔ Collaboration
- ➔ Communication
- ➔ Creativity and innovation
- ➔ Critical thinking and problem solving

Step-by-Step Instructions

Step 1: Prepare all the assembly materials.

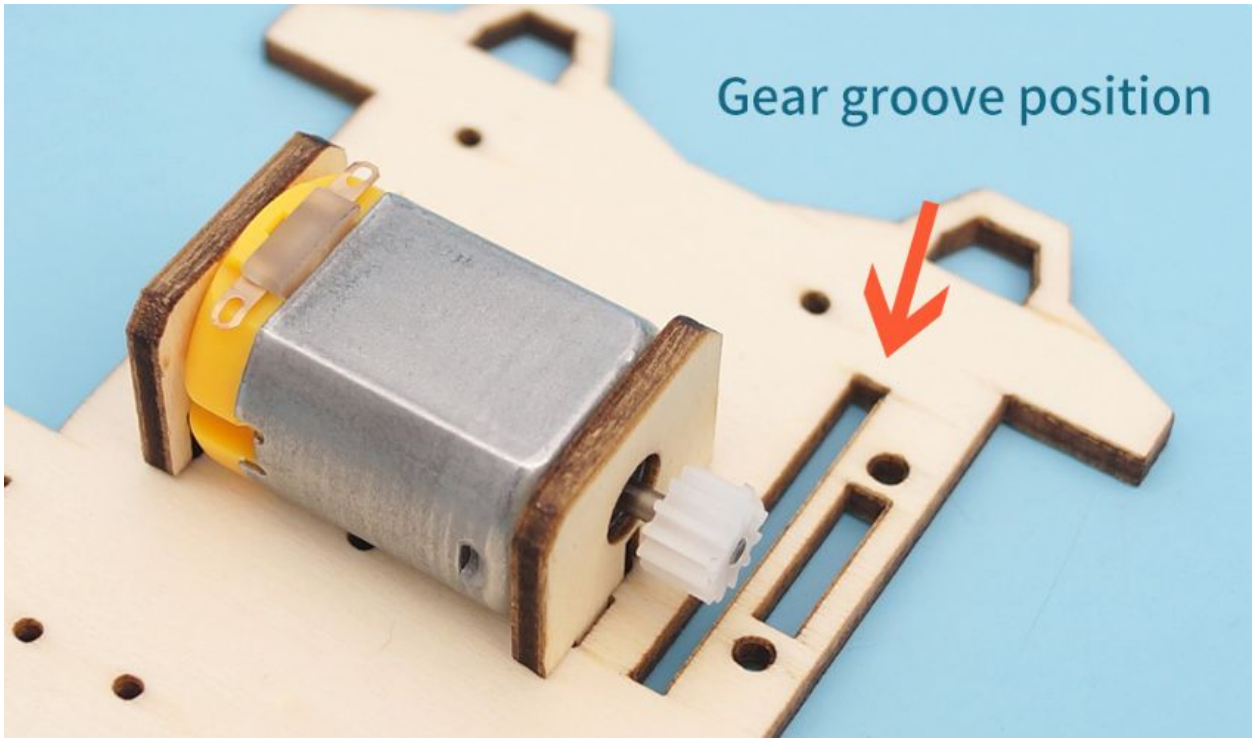


Step 2: Locate the motor No.



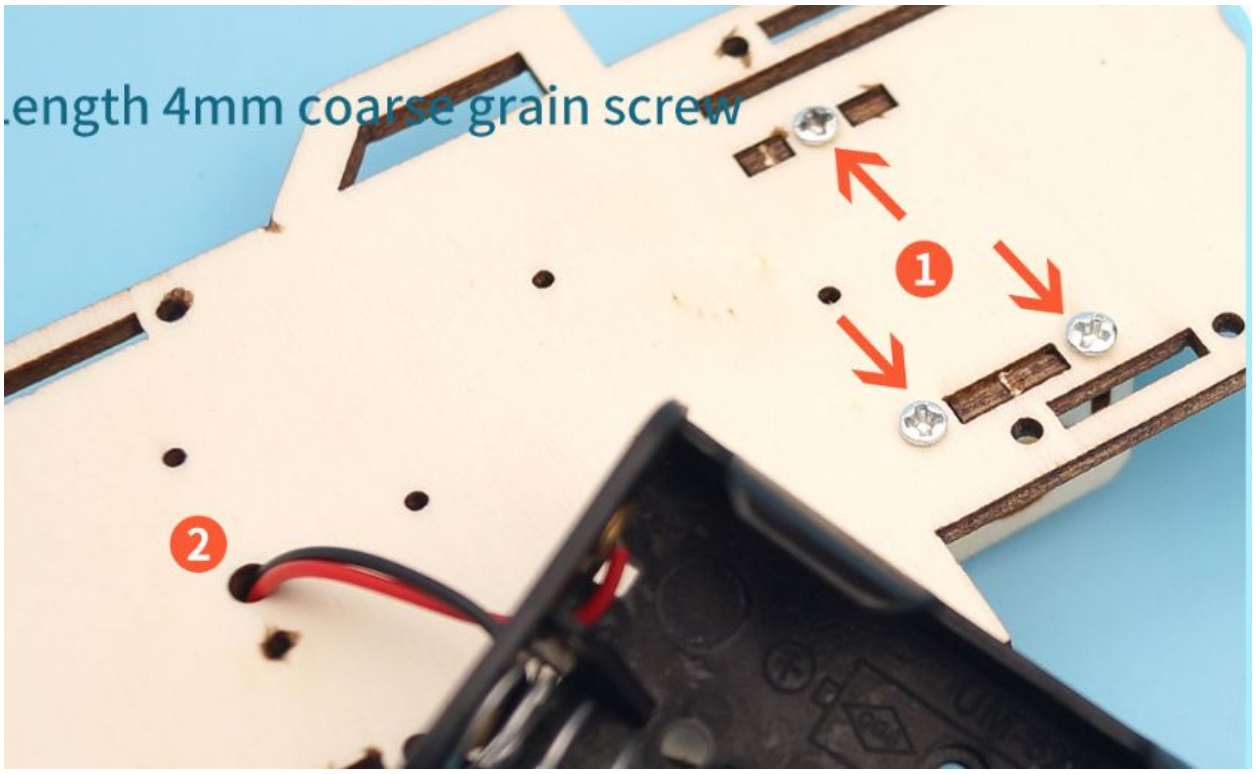
First, the motor clip corresponding to the front and rear shape of the motor is installed on the motor, and then the white gear is installed on the motor shaft, the gear must be level with the shaft.)

Step 3: Motor Connection



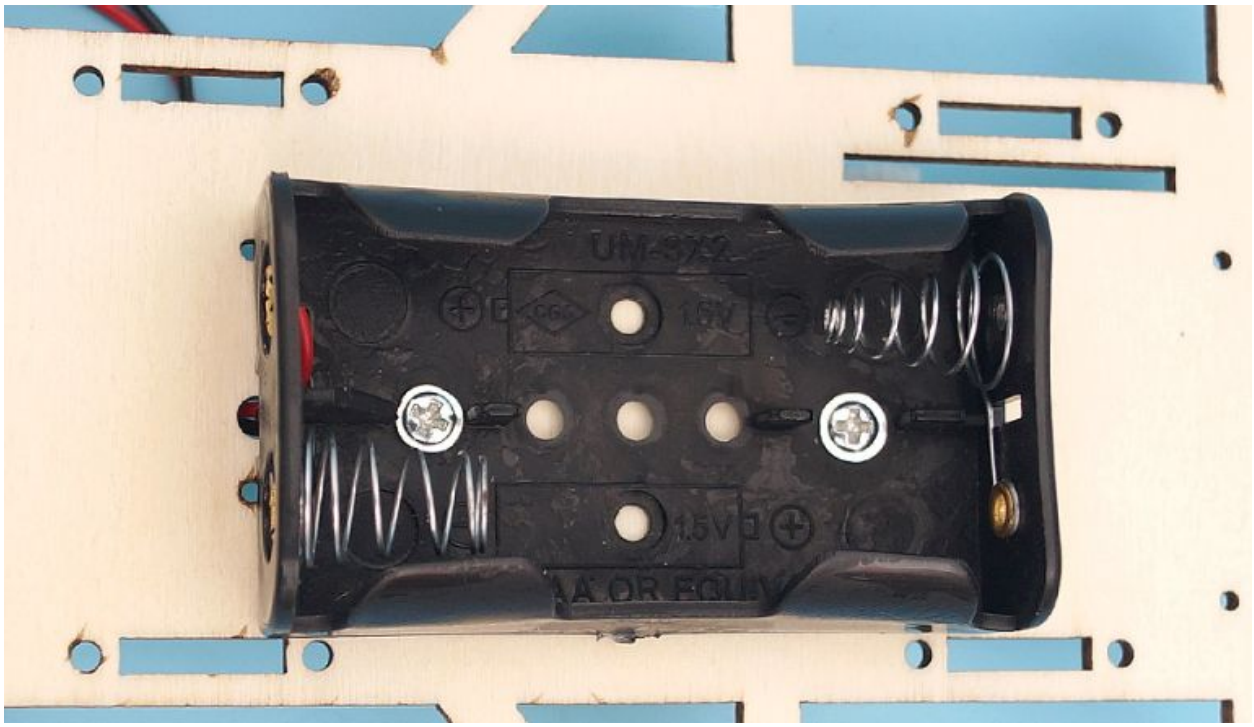
Refer to the figure above. First lay the chassis flat. Gear slots are positioned to the right and the motor is mounted to the chassis.

Step 4: Motor setup



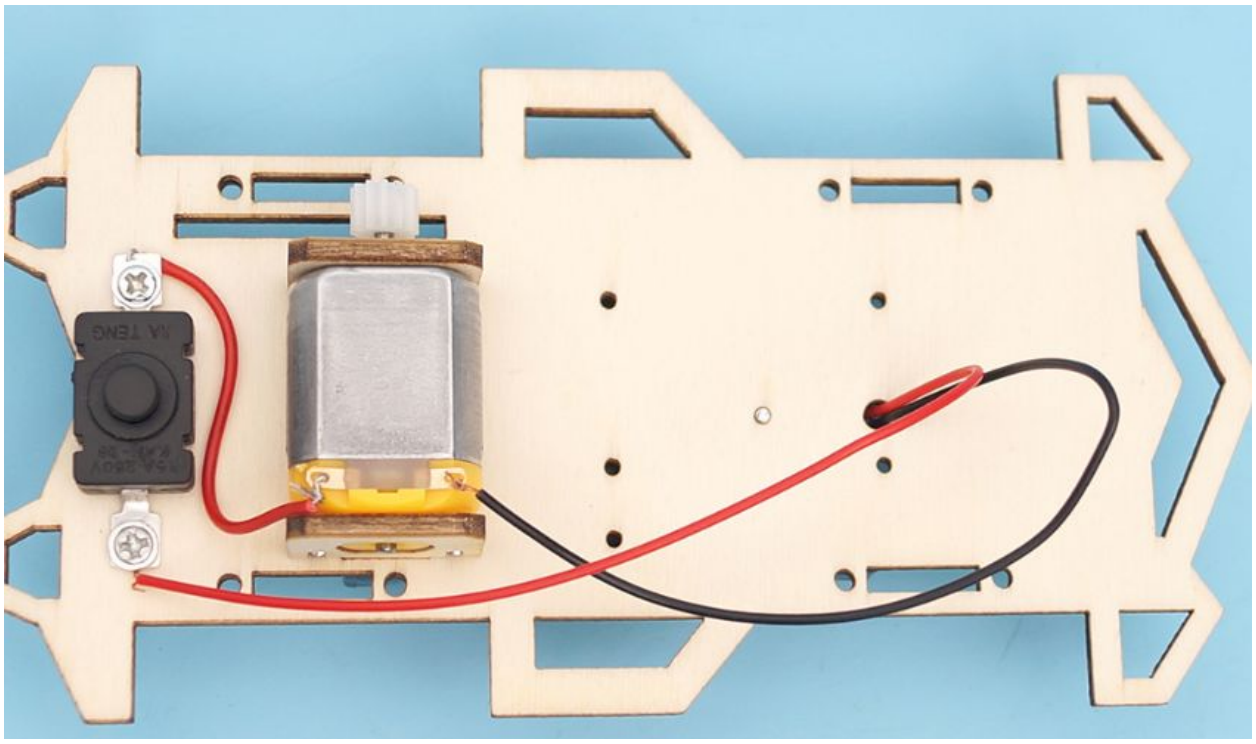
1. Turn the chassis upside down and fix the motor clip with a length 7mm screw.
2. The batter box output line through the chassis of the 3mm round hole-through.

Step 5: Battery Box Connection



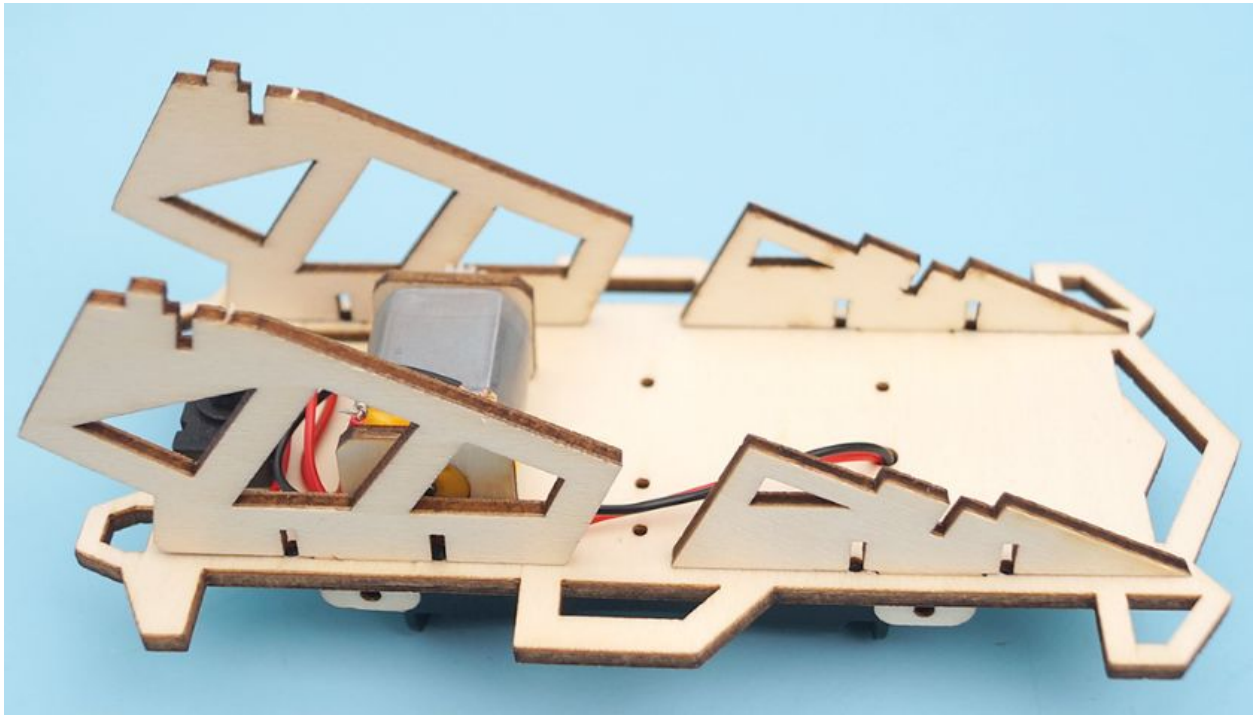
Secure the battery case to the chassis with a long 4mm screw.

Step 6: Motor Housing



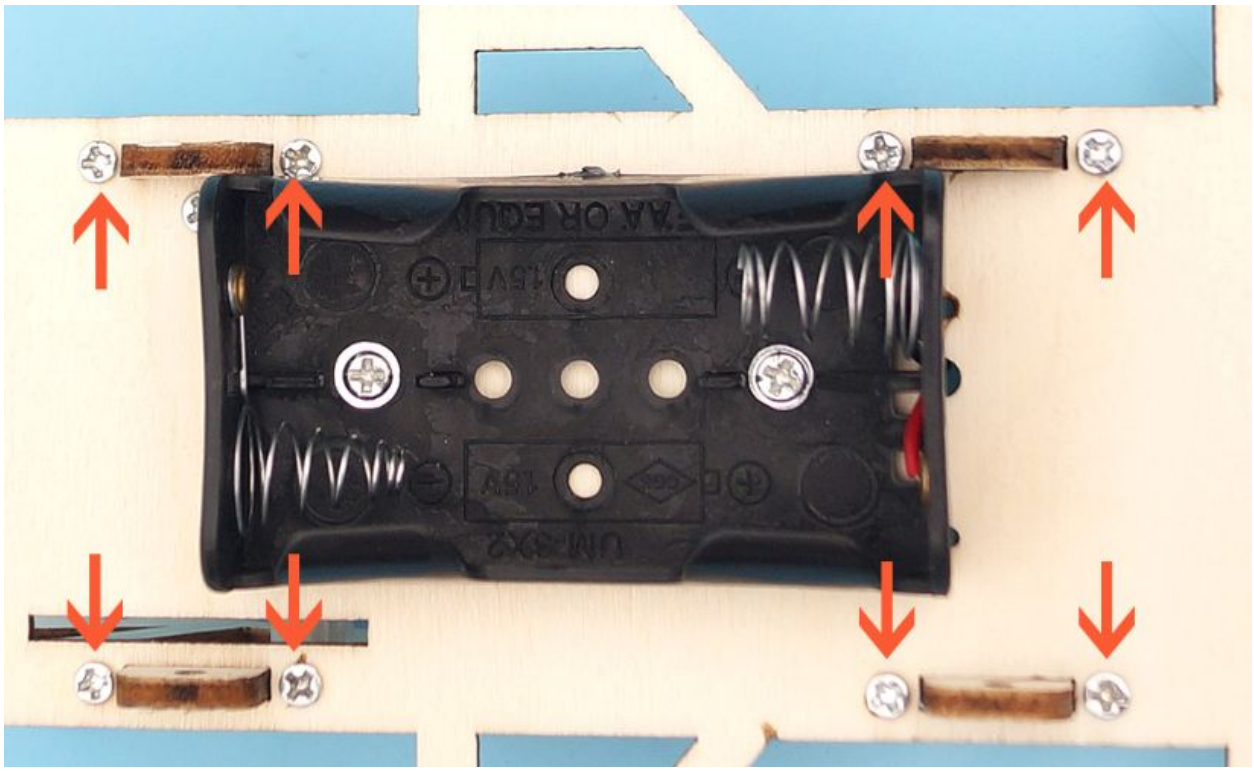
Refer to the figure above, connect the black wire of the electric box to the copper plate on the right side of the motor, connect the red wire ofthe battery box to the switch, and connect the other end of the switch to the motor with a red wire.Wiring method: first screw the metal wire core into a spiral shape, and then put the metal money core through the holes in the copper motor

Step 7: Turbine Connection



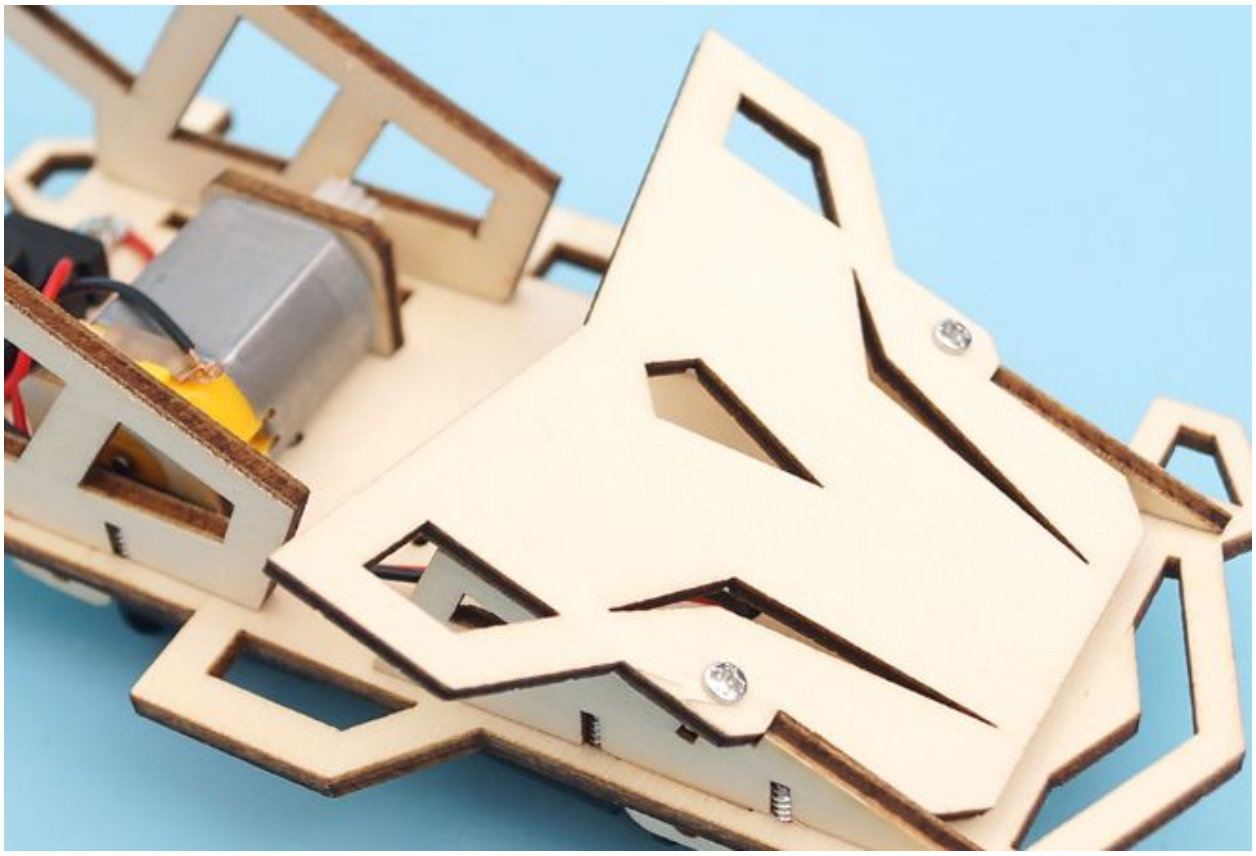
Insert the front and rear side panels into the chassis as shown above.

Step 8: Turbine Connection



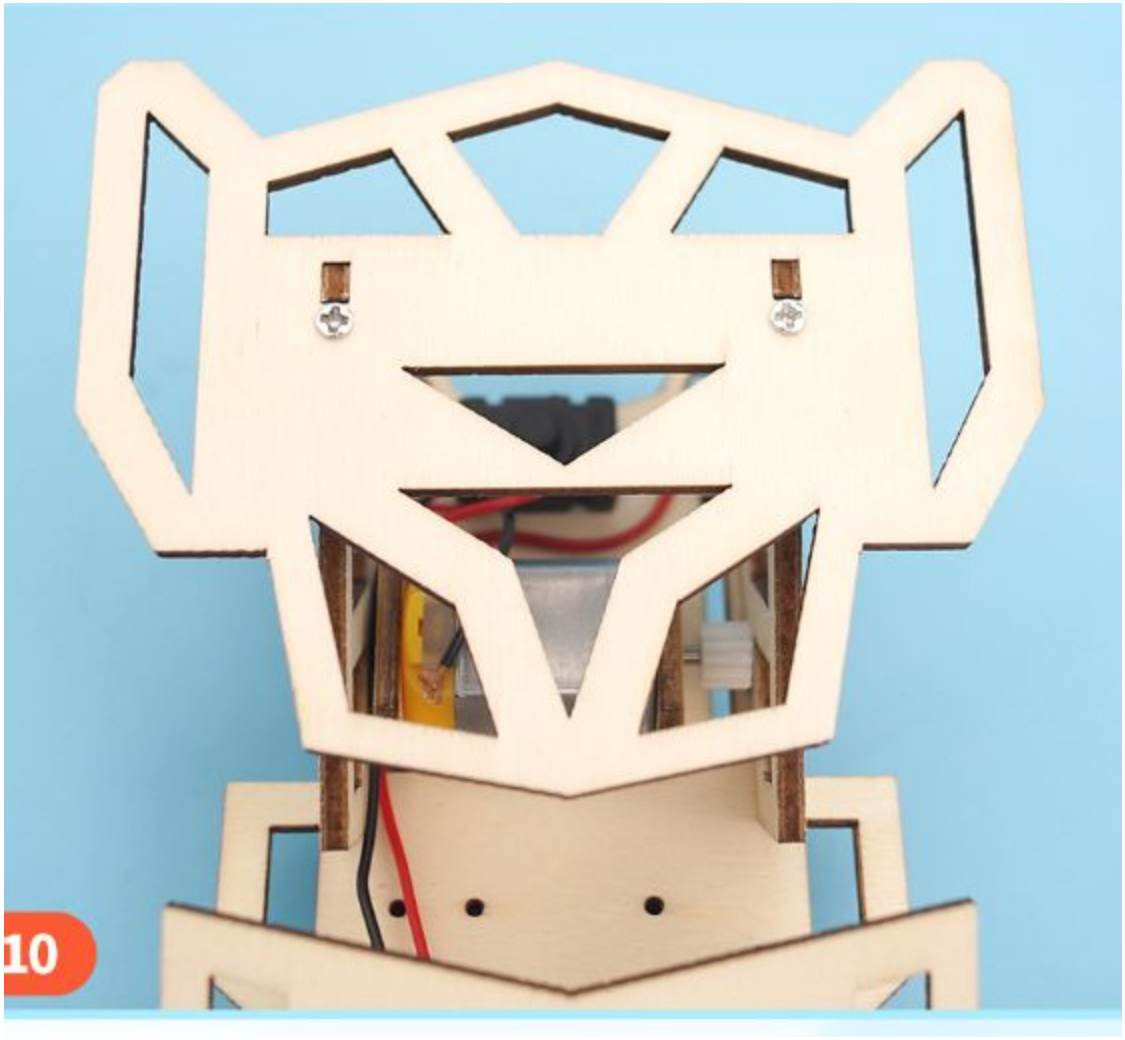
Secure with long 7mm screw front and rear side plate.

Step 9



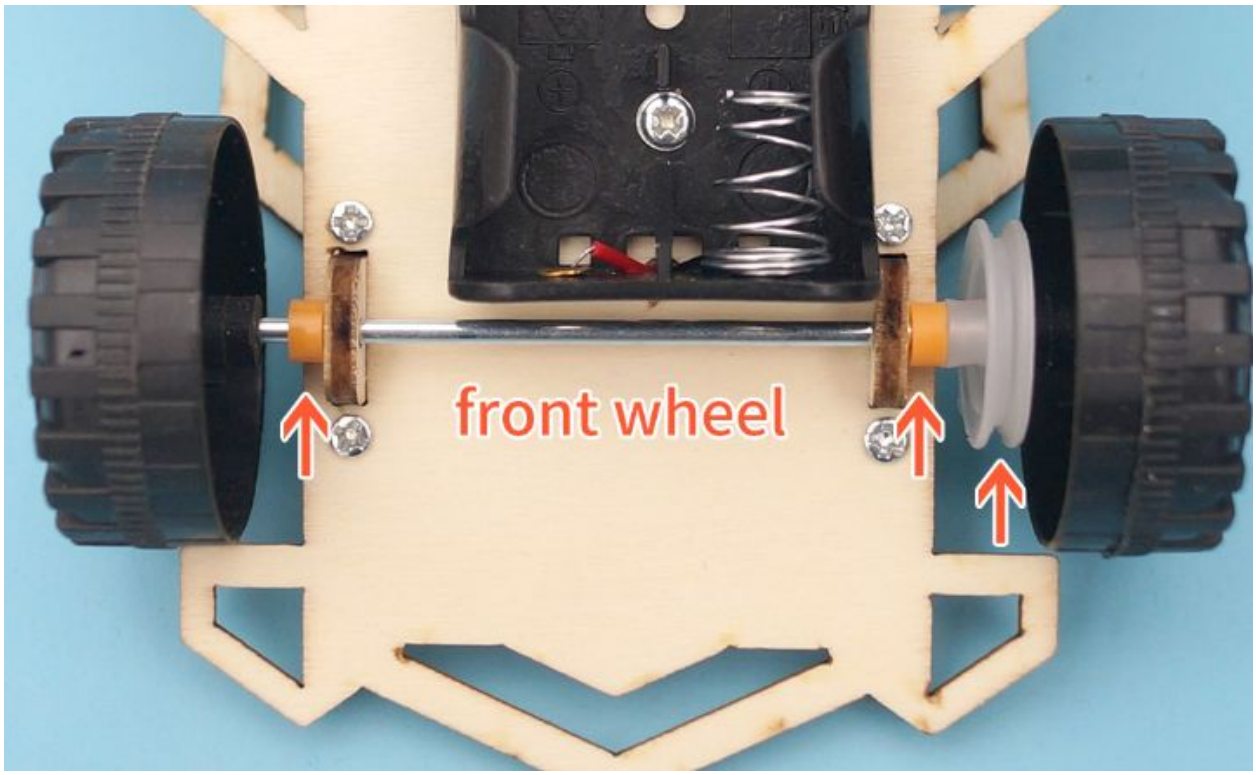
Install the front cover with a length Tmm screw.

Step 10



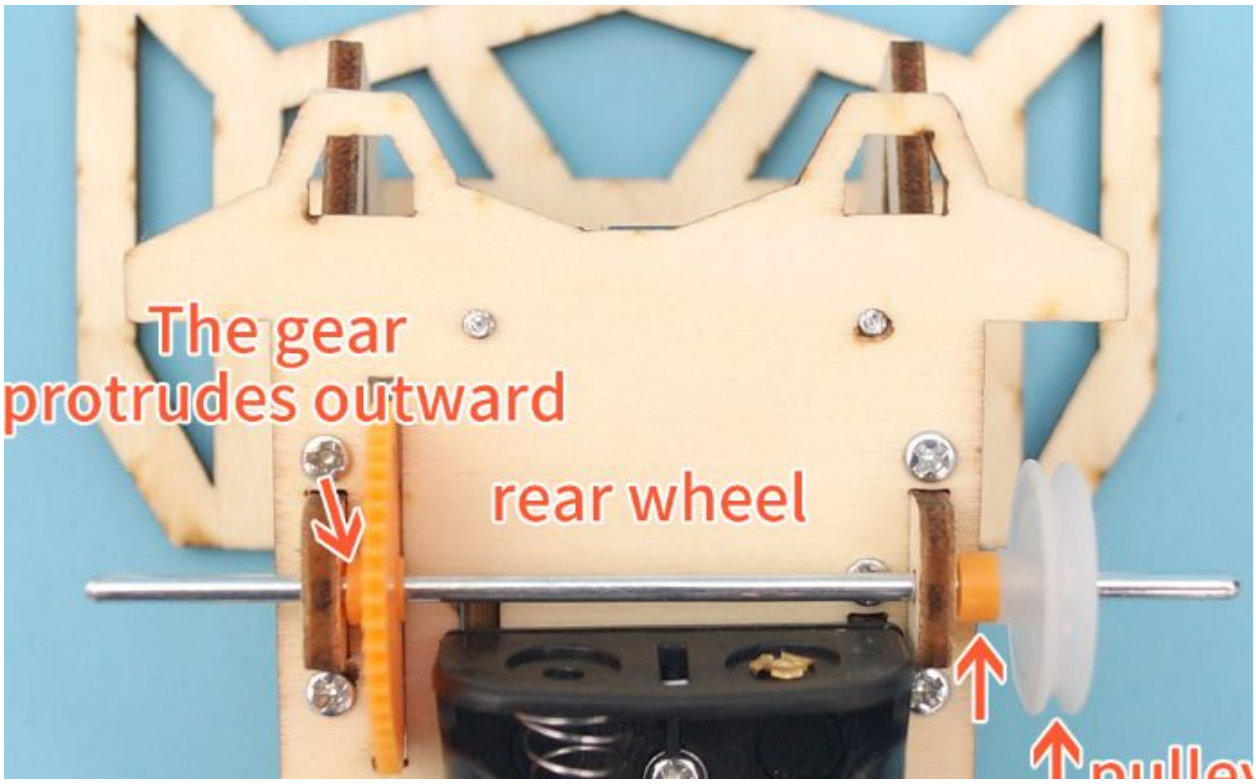
Install rear fin with length 7mm screw.

Step 11



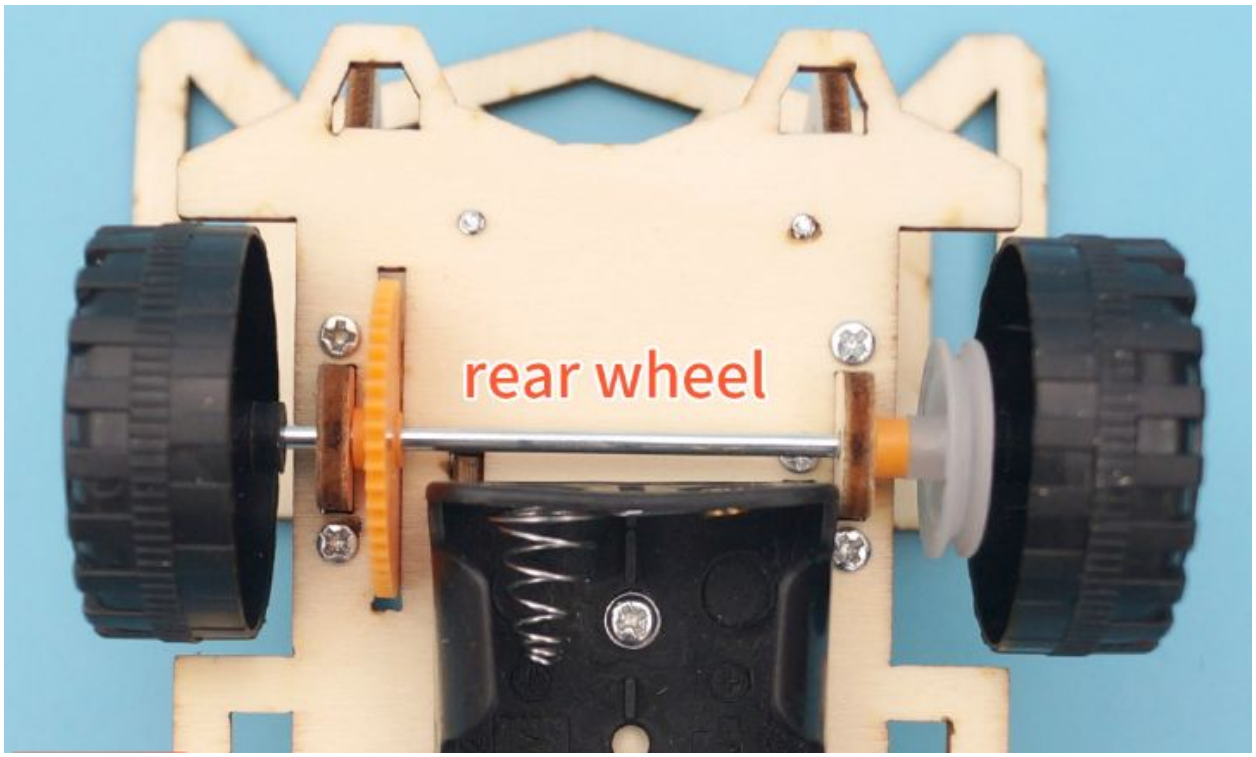
First put the wheel axle through the frame round hole, then put the orange fixing ring and white belt wheel on both sides of the axle(belt wheel is installed on the right side), and then install the wheel. After the wheel is installed, check the rotation resistance. If it is too tight, please loosen it until the wheel can rotate easily.

Step 12



First put the orange gear into the gearbox, then install the wheel shaft and the orange fixing ring on the right and the white pulley, with the pulley protruding towards the orange fixing ring.

Step 13



Install the wheel on the axle. After Wheel installation, please check the rotation resistance. If it is too tight, please loosen it until the wheel can rotate by loosening.

Step 14

Install the belt on the pulley and the car is finished.Install the battery, open the car in the rear of the power switch, the small car can exercise!

Usage Notice

The solar fan will not rotate under the LED and fluorescent lights. This is not to say that the solar panel does not generate electricity, but that these two lamps have no heat and the generated electricity is very weak, which can be basically ignored. Solar fans can only rotate under sunlight or tungsten filament lights. When the temperature is below 15 degrees Celsius, the sunlight may be weak and may not be able to rotate.

Troubleshooting

1. After pressing the switch, the car doesn't move
    a. Check whether the wiring is connected properly.
    b. Check whether the battery is low in power, if it is, replace it with a new one.
2. The car moves backwards
    a. Check whether the wiring sequence of the motor is wrong. Please refer to the wiring diagram in the manual.

What is racing

A real racing car is very different from an ordinary car. The racing car represents the highest level of technology in the automobile industry. Race car teams have the choice of the best and the most advanced technology, every part of the design of the car industry is the ultimate level of performance, each part of the car contributes to the speed of the car around a track.

Building any car involves a lot of science.

Physics is needed when designing and building the car out of many different materials, some materials have to be very light but be strong enough to withstand the weight of the car and the temperatures it reaches, as well as how the wind impacts on the shape of the car.

Chemistry is used to develop more efficient fuel and oils to help the engine run smoothly. It is used to design and make the rubber on the tires and the safety clothes on the driver.

Biology is very important when it comes to the Drivers health and safety. A driver must be able to withstand huge forces on their bodies and be able to perform using all of their senses at once. The long term impact of driving at very high speeds can have a big impact on people's health.

Computer Science is essential when working with advanced numerical control systems, which allows the car to adjust the parameters of each system according to the road conditions, so that the performance of the car is at its maximum for the full duration of a race.

FURTHER TRAINING, SUPPORT & HARDWARE

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