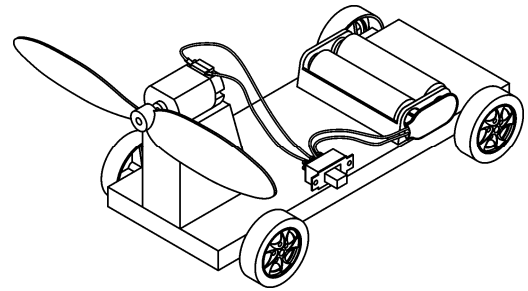


PROPELLER DRIVEN CAR

DESCRIPTION

This vehicle is a simple four wheeled, propeller driven device. The propeller is driven by a small battery powered electric motor.



THE PROJECT

The major aspects of this project are the planning, design, construction and assembly stages of the *PROPELLER DRIVEN CAR*.

1. COMPONENTS REQUIRED

1.1 COMPONENTS SUPPLIED

The following components are supplied in a plastic bag :

1x	3 V electric motor (flat)	2x	Steel shaft 2.5 mm dia 120mm long
1x	Sliding switch (small)	1x	100mm PVC guide tube
1x	2 x AA battery holder	4x	40 mm dia wheels
1x	Propeller 74 mm long		

Note: it is suggested that, before you commence construction, you check the components in your kit.

1.2 ADDITIONAL REQUIREMENTS

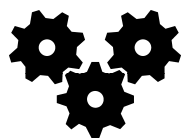
1.2.1 Available from us are AA batteries, and need to be ordered separately.

1.2.2 The additional requirements are: Material for the chassis and motor pedestal and fine electric wire.

2. DESIGN

NOTES:

- while this vehicle at its most basic, it also allows scope for the student to develop and make a more interesting vehicle. Students can fabricate a body to simulate a monster truck, hot rod or other vehicle.
- the designer should look at the design of the vehicle as a complete unit – not just a collection of components.
- The drawings in this unit show the basic construction of the *PROPELLER DRIVEN CAR*.
- The student has to make a full size drawing to determine the size of the vehicle's platform, the size and position of wheels, motor and battery holder. The body can be made from a single long piece of balsa wood or plastic, or even polystyrene. Lighter is better – if the car is too heavy it will have difficulty moving – or just move slowly.
- When deciding on the chassis size, the axle shaft provides an upper limiting factor. At the lower end, while the chassis can be made from any piece of material, even a very narrow one, stability needs to be considered. This is due to the high location of the motor, as it raises the centre of gravity. (The motor support has to be high enough for the propeller to clear the ground). Note: Cut-outs can be made for the wheels to allow wider material to be used



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- Weight distribution (which affects the balance) and ease of operation should be taken into account.
- Use the guide tube to make bearings for the axle shafts. Cut the guide tube into four short lengths to reduce friction.
- With this vehicle only fixed steering is possible. However, you may wish to make it, so that the steering turns the car in one direction all the time, by angling one or both axles.

3. FABRICATION AND ASSEMBLY

3.1 FABRICATION

- Cut the chassis material to the required size.
- The motor support must be fabricated and attached to the chassis.
- Cut the axles to length. To determine the length of the axle, place a nail or piece of wire into the wheel hole to measure its depth. The length of the steel rod needed is worked out by taking the length of the plastic tube plus 2 times the depth of the wheel hole (for both wheels) plus 2 mm for clearance (so the wheel will not jam up against the platform).
- De-burr the steel shaft ends with a file.

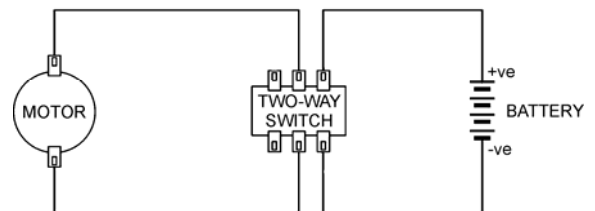
3.2 ASSEMBLY

- Attach the motor, switch and battery holder on to the chassis / support using hot glue or double sided foam tape. (Roughen the surfaces to be glued, with sandpaper to improve adhesion).
- Remove the burr from the steel shaft ends. With the shafts in place, press the wheels on to both shafts.
- Ensure that the shaft guide tubes are at right angles to the car body and both guide tubes are parallel to each other. Glue these in place.

4. WIRING

The Switch should be wired as shown in the “Wiring Schematic”

- Solder both the battery holder’s wires to both of the terminals at one end of the switch. Solder two wires to the switch’s middle terminals.
- Connect the other ends of those two wires to the motor’s terminals. If the air is blown rearwards, and the vehicle is propelled forward, solder the wires to the terminals. it goes in reverse, swap the wires & then solder them.



WIRING SCHEMATIC

CONGRATULATIONS! YOU HAVE BUILT A PROPELLER DRIVEN CAR!