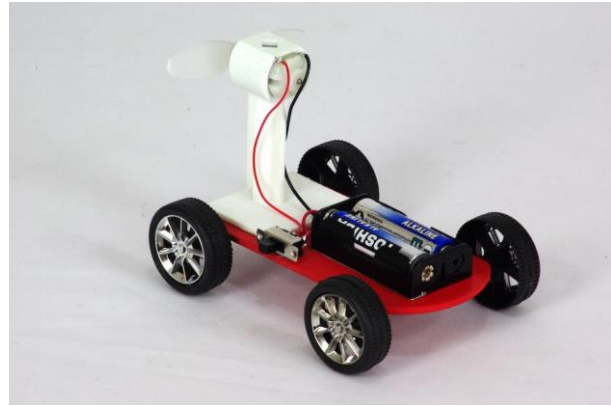




## *PROPELLER DRIVEN CAR – NO SOLDER* (Code: PROPC-NS)

### **DESCRIPTION**

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



**LEVEL:**

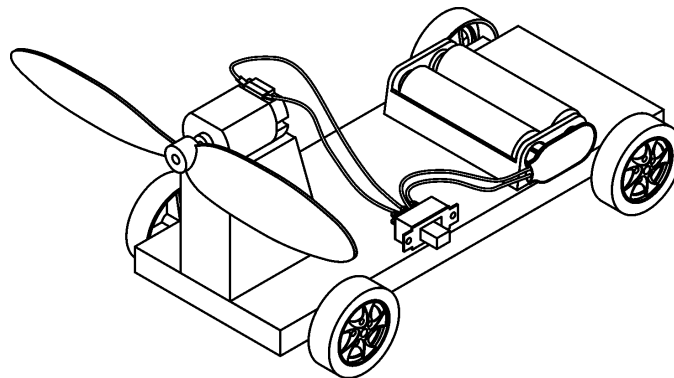
Introductory

**HOURS TO CONSTRUCT:**

5 - 7 hours

**SKILL DEVELOPMENT:**

- Planning and Design
- Manufacturing
- Mechanical
- Electrical
- Basic Physics





## **WHAT'S IN THE KIT?**

- All the mechanical and electrical components required to make the *PROPELLER DRIVEN CAR* work including the motor, propeller, battery holder, axles, wheels, screw-on connectors and switch.
- A detailed teaching unit with a complete parts list, design suggestions, general construction guidelines and suggestions for testing the cars.



## **WHAT ELSE IS NEEDED?**

The following items are required and are available from Scorpio Technology, but need to be ordered separately:

- 2 x Battery – AA (BATTAA or BATTALK40)
- Single-sided adhesive tape (TAPESS)
- Hot glue (GLUESTK)
- or** Double-sided adhesive tape (TAPEDS / TAPEDS20x15x1)
- We recommend the following spares when buying class sets of kits to replace parts damaged or lost by students:
  - Steel rod and Plastic guide tube (SRGTW – 5 of each in a pack)
  - Wheels – 38mm dia. – 2.4mm hole (W38C – pack of 40)

The following material is to be supplied by the student / teacher:

- Material for the platform (PVC or acrylic sheet, balsa, plywood, etc.)
- A small piece of timber (such as pine) to drill a shallow hole in order to rest the propeller boss and mount the motor shaft

## **TOOLS REQUIRED**

The following tools are required. Several are available from Scorpio Technology, and can be ordered separately if required (item codes in brackets):

REQUIRED TOOLS	ORDERING CODE
Assorted hand tools (depending on materials used)	-
Hammer	HAMMERC/HAMMERCL
Ruler and pen	-
Craft knife	CRKNF
Wire strippers	WIRESTR
Drill Bit – 10mm	-
Mini Bolt Cutters	BOLTCUTM



## ABOUT THE PROJECT

The major features of this project are the planning, design, construction and assembly stages of a simple solar vehicle.

## DESIGN PHASE

- Create your own unique *PROPELLER DRIVEN CAR* design based on our drawings. Focus on component relationships, rather than dimensions. This provides scope for students to individualise their *PROPELLER DRIVEN CAR* design and increase their engagement in the project.

During the **Design phase**, students will need to:

- Evaluate the suitability of various materials, such as PVC, acrylic, plywood or balsa wood
- Investigate the possibility of adding steering
- Determine if forward/reverse operation is desired (additional components will be required such as a three-way toggle switch or our large slide switch)
- Evaluate available technologies that can be used, for example:
  - 3D printer
  - laser cutter (which allows more interesting shapes than usual)
  - vacuum former
- Take into account weight distribution and ease of operation
- Consider the practical aspects of construction and assembly. For example, clearance for the wheels

## MAKING / CONSTRUCTION

Once the Design process has been completed, the students will be able to start **building their design**. They will:

- Make and assemble the *PROPELLER DRIVEN CAR* platform they have designed
- Install the propeller on to the motor's shaft
- Mount the motor, switch, battery holder, axles and wheels on to the platform
- Connect the motor, battery holder and switch
- Test and adjust the *PROPELLER DRIVEN CAR*
- Troubleshoot any problems!

## DOES THE TEACHING UNIT INCLUDE ANY THEORY?

The Teaching unit has a FURTHER RESEARCH & WORKSHEET IDEAS section covering:

- Sources for further research into propeller driven cars
- Speed and acceleration
- Worksheets
  - A historical research of propeller driven cars
  - Technical questions and consideration

