



PROPELLER DRIVEN CAR (Code: PROPC)

DESCRIPTION

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



LEVEL:

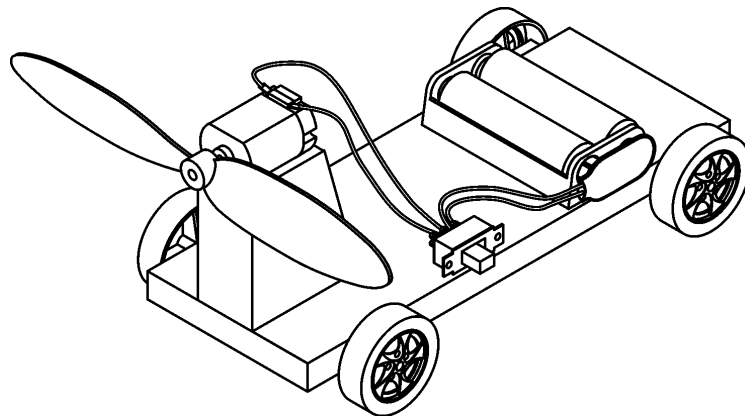
Introductory

HOURS TO CONSTRUCT:

5 - 7 hours

SKILL DEVELOPMENT:

- Planning and Design
- Manufacturing
- Soldering
- 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 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)
- Multi strand hook-up wire – in a variety of colours (WIREHU10)
- Single-side 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:

REQUIRED TOOLS	ORDERING CODE
Assorted hand tools (depending on materials used)	-
Hammer	HAMMERC/HAMMERCL
Ruler and pen	-
Craft knife	CRKNF
Soldering Iron and Soldering iron stand: – a good quality soldering iron, with a fine tip or	SOLDIRN SOLDIRNSTD
Soldering station	SOLDSTN
Solder: – 0.71mm 60/40 solder is recommended	SOLD500
Wire strippers	WIRESTR
Side cutters	SIDECUT or SIDECUTM
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 propeller driven 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:
 - o 3D printer
 - o laser cutter (which allows more interesting shapes than usual)
 - o 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
- Wire up and solder 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
 - o A historical research of propeller driven cars
 - o Technical questions and considerations

