

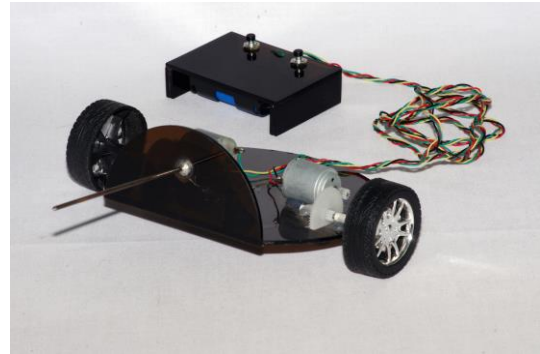


MARK'S MONSTER (Code: MARK)

DESCRIPTION

MARK'S MONSTER is a small agile vehicle that responds to a wired hand held controller, which is used to steer the vehicle, using two push buttons to move forwards, left or right.

MARK'S MONSTER has two independent motors and gear-drives, each controlled by its own push button switch. If both buttons are pushed simultaneously the vehicle travels forward in a straight line, but if only one push button switch is pushed the car turns in the desired direction.



LEVEL:

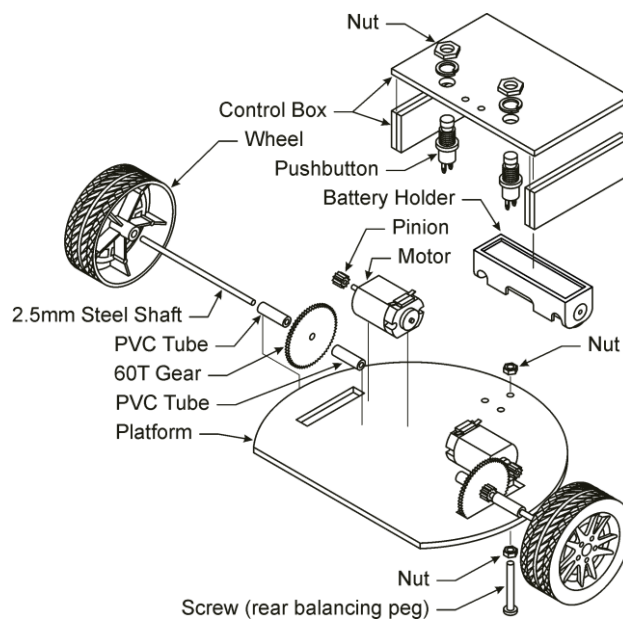
Intermediate

HOURS TO CONSTRUCT:

8 - 10 hours

SKILL DEVELOPMENT:

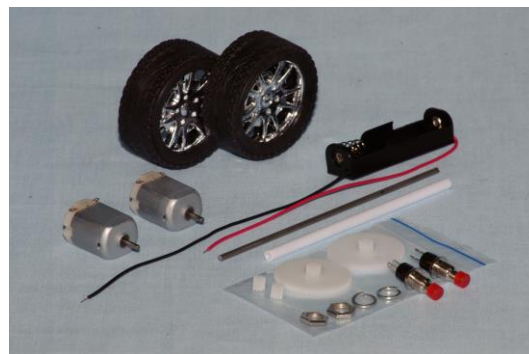
- Planning and Design
- Manufacturing
- Soldering
- Mechanical
- Electrical





WHAT'S IN THE KIT?

- ☐ All the mechanical and electrical components required to make the *MARK'S MONSTER* work including the battery holder, motors and switches.
- ☐ A detailed teaching unit with a complete parts list, design suggestions, general construction guidelines and suggestions for testing and possible applications.



WHAT ELSE IS NEEDED?

The following items are required in addition to the kit and must be supplied by the designer – some are available from Scorpio Technology, but need to be ordered separately (Item codes in brackets):

- ☐ 1 x Battery – AA (BATTA – Pack of 4 or BATTALK40 – Pack of 40)
- ☐ Multi strand hook-up wire (WIREHU10)
- ☐ Cable ties – 100 x 3.65mm (CABTIE100 – Pack of 10)
- ☐ Various sized gears (optional – to provide different speeds or for use as locators)
- ☐ Hot glue (GLUESTK)
or double-sided adhesive tape (TAPEDS)
- ☐ 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 - large (W52C2 – pack of 40)
 - all pinion and spur gears (GEAR8/1.9, GEAR60/10/2.4)
- ☐ Material for the platform (PVC or acrylic sheet, plywood, etc.) – approx. 3mm thck 100x 200mm and Material for the handheld control unit
or Mark's Monster plywood body parts (MMPLYBP)
- ☐ If experimenting with different applications, the following might be required:
 - Battery holder for 2 x AA batteries (BH2AA)
 - Bamboo skewers, balloons, pins, different sized gears, tennis ball / table tennis ball



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	-
Drill Bit – 3.5mm	DB3.5
Mini Bolt Cutters	BOLTCUTM
Hot Glue Gun (if using Glue sticks)	GLUEGUN
Heat gun or hair dryer (optional) – if using hot glue	TH1609 <i>or</i> other
Sand paper (if using hot glue)	-

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 *MARK'S MONSTER* design based on our drawings. Focus on component relationships, rather than dimensions. This provides scope for students to individualise their *MARK'S MONSTER* design and increase their engagement in the project.

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

- ☐ Determine intended use / application of this vehicle
- ☐ Evaluate the suitability of various materials, such as PVC, acrylic, plywood or balsa wood
- ☐ Determine whether to use different sized gears from those provided to experiment with different gear ratios
- ☐ 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 *MARK'S MONSTER* platform they have designed
- ☐ Assemble and mount the wheel assembly, battery holder and motor on to the platform
- ☐ Make and assemble the handheld control unit
- ☐ Wire up and solder the battery holder, motors and switches
- ☐ Test and adjust the *MARK'S MONSTER*
- ☐ Troubleshoot any problems!

DOES THE TEACHING UNIT INCLUDE ANY THEORY?

The Teaching unit does not have a THEORY section.



**SCORPIO
TECHNOLOGY**

OVERVIEW – Mark’s Monster

For more information and ideas, go to our website:

<https://www.scorpiotechnology.com.au/kits-in-action>



SCORPIO TECHNOLOGY VICTORIA PTY. LTD.

A.B.N. 34 056 661 422

Issued: 29 September 2023

www.scorpiotechnology.com.au

sales@scorpiotechnology.com.au