

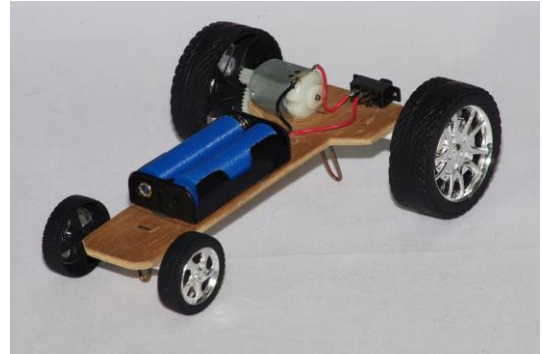


DRAGSTER – NO SOLDER (Code: DRAG-NS)

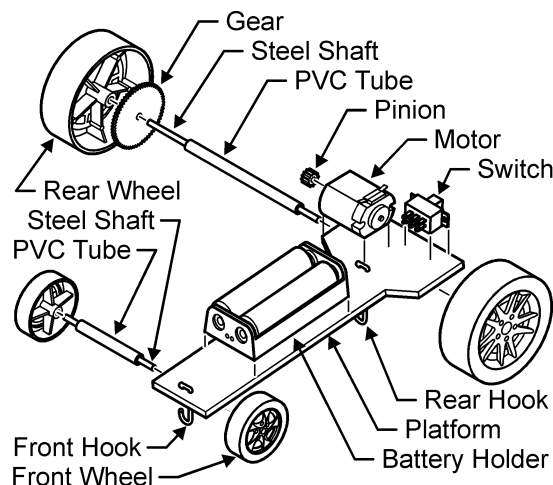
DESCRIPTION

The *DRAGSTER* is a simple motorised vehicle, for students to design and construct. It is powered by a small electric motor, and students are able to select the vehicle's gearing, dependent upon the speed and acceleration required.

The vehicle has been designed to provide an easy introduction to electro-mechanical devices. It is also intended that a number of *DRAGSTERs* can be used to compete in a class environment. This puts the additional requirement on students to look into the effects of gearing on speed and acceleration, and to consider these factors in their vehicle design.



LEVEL:	Intermediate
HOURS TO CONSTRUCT:	10 - 14 hours
SKILL DEVELOPMENT:	<ul style="list-style-type: none">• Planning and Design• Manufacturing• Mechanical• Electrical• Investigation and Testing• Testing and Troubleshooting• Record keeping• Basic Mathematics & Physics (Electric Circuits)



* a solder version is available – code: *DRAG*



WHAT'S IN THE KIT?

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



WHAT ELSE IS NEEDED?

The following items are required in addition to the kit and must be supplied by the maker – some are available from Scorpio Technology, but need to be ordered separately:

ADDITIONAL REQUIREMENTS	ORDERING CODE
2 x Battery - AA (available in packs of 4 or 40)	BATTAA or BATTALK40
Single-sided adhesive tape	TAPESS
Hot glue or Double-sided adhesive tape + Single Sided Adhesive Tape	GLUESTK or TAPEDS + TAPESS
Material for the platform (PVC or acrylic sheet, plywood, corflute, etc.)	-
Fishing line for racing	FLINE

RECOMMENDED SPARES

We recommend the following spares when buying class sets of kits to replace parts damaged or lost by students:

ITEMS	ORDERING CODE
Steel rod and Plastic guide tube (pack of 5 of each)	SRGTW
Wheels – 52mm diameter (chrome) (pack of 40)	W52C2
Wheels – 30mm diameter (chrome) (pack of 40)	W30C
All Spur gears (packs of 10 or packs of 50 available)	GEAR50/10/2.4, GEAR60/10/2.4
All Pinion gears (packs of 10 or packs of 50 available)	GEAR8/1.9, GEAR10/1.9, GEAR12/1.9,
Screw-On connectors (Pack of 100)	CONN-SC
Motors with wires (Pack of 5)	MOT12W
Small Sliding Switch with Wires (Pack of 5)	SSWS-W





TOOLS REQUIRED

The following tools are required. Some 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
Scroll saw or hand saw	-
Wire strippers	WIRES
Side cutters	SIDECUT or SIDECUTMIN
Mini Bolt Cutters	BOLTCUTM
Hot glue gun (unless using double & single sided tape)	GLUEGUN or TAPEDS & TAPESS
Glue sticks – 11mm – Pack of 5 (if using hot glue gun)	GLUESTK
Flat smooth cut file (for de-burring steel rod ends)	-
Sanding block and Sandpaper- 180 – 220 grit	-
Drill (either powered or a hand drill)	-
Drill bit 2.3mm	DB2.3

ADDITIONAL / USEFUL EQUIPMENT

Heat gun (if using hot glue gun) – for softening hot glue for repositioning or removal of components or Hairdryer	TH1609 or ---
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ABOUT THE PROJECT

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

DESIGN PHASE

- ☐ Create your own unique *DRAGSTER* design based on our drawings. Focus on component relationships, rather than dimensions. This provides scope for students to individualise their *DRAGSTER* 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
- ☐ Determine which gears will be used from the selection of spur and pinion gears provided
- ☐ 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 *DRAGSTER* platform they have designed
- ☐ Make the axles and attach wheels
- ☐ Attach motor, switch, wheel assembly on to the platform
- ☐ Wire up and connect the battery holder, motor and switch
- ☐ Test and adjust the *DRAGSTER*
- ☐ Troubleshoot any problems!

DOES THE TEACHING UNIT INCLUDE ANY THEORY?

The Teaching unit has a THEORY section that covers:

- ☐ Speed and Acceleration
- ☐ How to calculate
 - average speed
 - average acceleration
- ☐ Using Crocodile Technology software to investigate:
 - Gears
 - Circuit of the racing vehicle
 - The effect of weight on the operation of the motor

For more information and ideas, go to our website:

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

