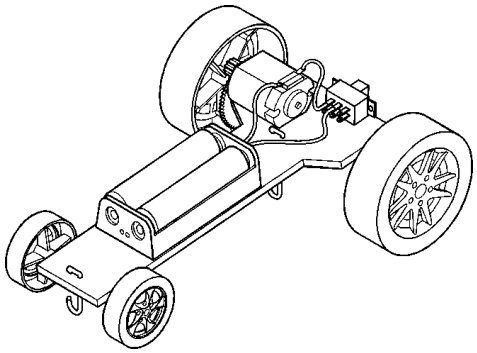
Need For Speed...



The very popular ***DRAGSTER*** is a simple mechanical & electrical vehicle that is powered by a small electric motor.

In spite its simplicity the ***DRAGSTER*** requires the student to:

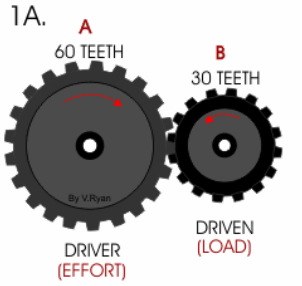
- ✓ Plan & design platform size & shape,
- ✓ Design taking into account weight distribution and ease of operation.
- ✓ Calculate and select gear ratios to achieve the speed & acceleration required.
- ✓ Investigate construction materials
- ✓ Keep a log/diary to document their progress
- ✓ Test the completed ***DRAGSTERS*** by racing along a set course.

Level:	Intermediate kit
Type:	Mechanical & Electrical
Hours required:	10 – 14
Cost:	
Solder variant ***DRAG***	1-19 $6.60; 20+ $6.32
Non solder variant ***DRAG-NS***	1-19 $7.16; 20+ $6.77

Calculation of Gear ratio / velocity

The larger gear revolves one revolution. The number of rotations of the second gear has then to be worked out.

In this example the DRIVER has 60 teeth and because it is the largest we say that it revolves once. The DRIVEN gear has 30 teeth. Simply divide 60 teeth by 30 teeth to work out the number of revolutions of the driven gear.

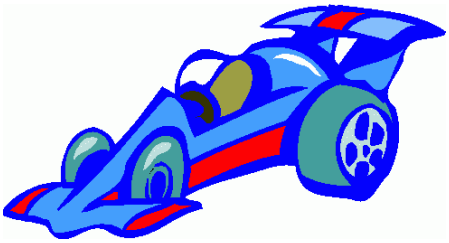


$$\frac{\text{Distance moved by Effort}}{\text{Distance moved by Load}} = \frac{\text{60T (GEAR A)}}{\text{30T (GEAR B)}}$$

$$= \frac{1}{2} = \frac{\text{Input movement}}{\text{Output movement}}$$

$$= \text{Driver : Driven} \quad 1 : 2$$

http://www.technologystudent.com/gears1/gears5.htm



Success depends upon previous preparation and without such preparation there is sure to be failure.

Confucius

SCORPIO TECHNOLOGY Vic Pty Ltd
17 Inverell Ave, Mt. Waverley Vic 3149
www.scorpiotechnology.com.au

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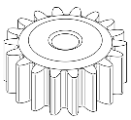
Q: *Can I use a multi-ratio gear box with the DRAGSTER?*

It is not worth modifying the Dragster with a multi-ratio gear box. This effectively makes it the same as the Simple Vehicle but with smaller front wheels.

Q: What is the difference between a pinion gear and spur gear? What other gears do you have?

Scorpio supplies and uses 0.5 module gears in the kits.



PINION GEARS

(one single gear). These are small gears, and most are a press fit onto the motor shaft. These are described by the number of Teeth. For example - 12T = 12 Tooth. These are available with either a 1.9mm hole (for motor shaft) or with a 2.4mm hole (to press onto a 2.5mm rod).

SPUR GEARS

(2 gears in one - a large gear and a small one). These are described by listing the two sets of gears, with the larger gear listed first. For example a Spur gear 50T/ 10T or 50T x 10T has a 50 Tooth large gear and a 10 Tooth small (pinion type). These are usually mounted on the axle, and mesh with the motor mounted pinion gear.

WORM GEARS

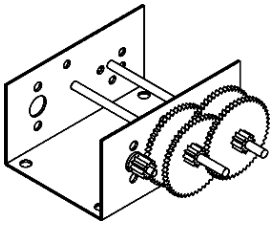
We use only one size of worm gear which provides a ratio of 1:60.

GEAR RACK

This is an 0.5 module gear rack which meshes with our range of 0.5 module

pinion and spur gears. It is useful for steering or linear movement (e.g. raising the tines on the **Forklift** kit)

GEARBOXES



An alternative to using individual Pinion and Spur gears is to use a gearbox with a fabricated gearcase. We have a range of gearboxes, with a variety of different ratios, offering a choice of up to 4 different ratios in a compact package. These can be achieved by the use of different mounting holes and gears (e.g. Versatile Gearbox) or the use of freewheeling gears (e.g. Multi-Ratio Gearbox).

Inspirational projects for teaching Design, Creativity & Technology

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