

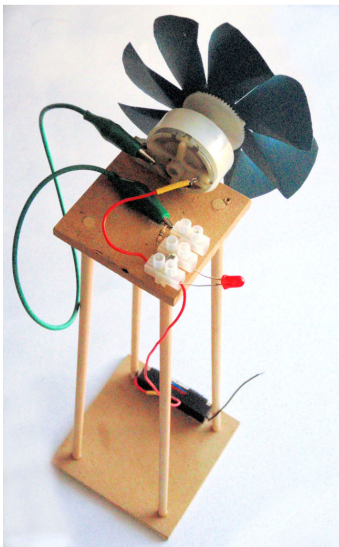
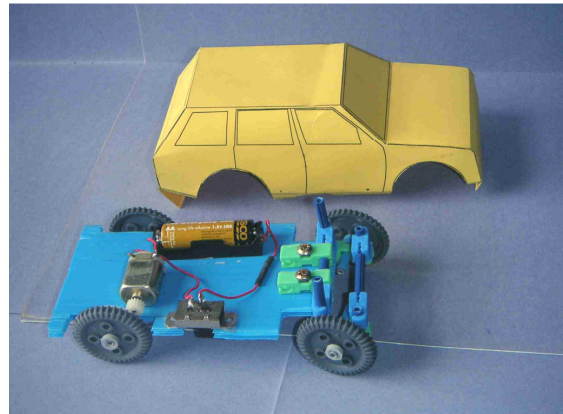
Inter-Engineering Models Summary

The Inter-Engineering model series was developed as a follow-on from the Junior Engineering year series, although it is often run as a stand-alone year. The models are similar in format being provided as kits with instructions for individual construction and at a low overall cost. Finished working models can be taken home when completed. While still fun to do, they are rather more sophisticated than Junior Engineering, with suitability for early secondary school age in mind.

Four of the five projects involve soldering; material for a soldering practice session is provided.

Electric Car

This is based on a corriflute platform chassis cut to shape from a dimensioned drawing and on which is mounted a switch, battery holder and electric motor with a gear drive to the rear wheels. The front wheel assembly includes king pin and track rod features for steering. The body is a net shape development from card giving the opportunity to encourage creative styles.



Windmill Generator

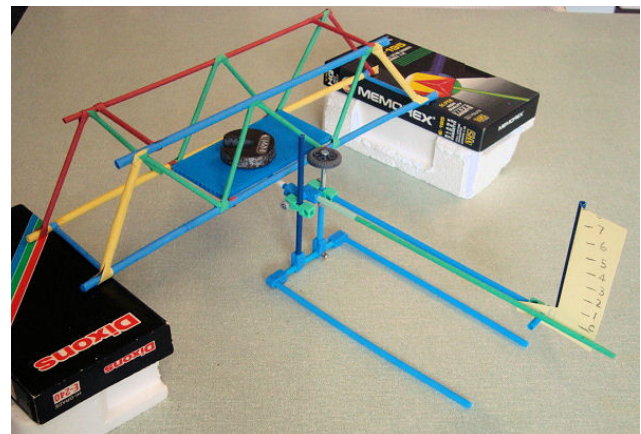
Two part construction: First construction of a tower from wooden dowelling and mdf, and windmill fan by cutting out from aluminium sheet. Second making up a circuit based on a solar motor.

A crocodile clip lead allows connection of the motor driven by a battery to act as a fan, or alternatively when the windmill is blown, as a generator to light an LED.

The subject area of power generation, pollution and the environment can also be discussed.

Bridge Construction

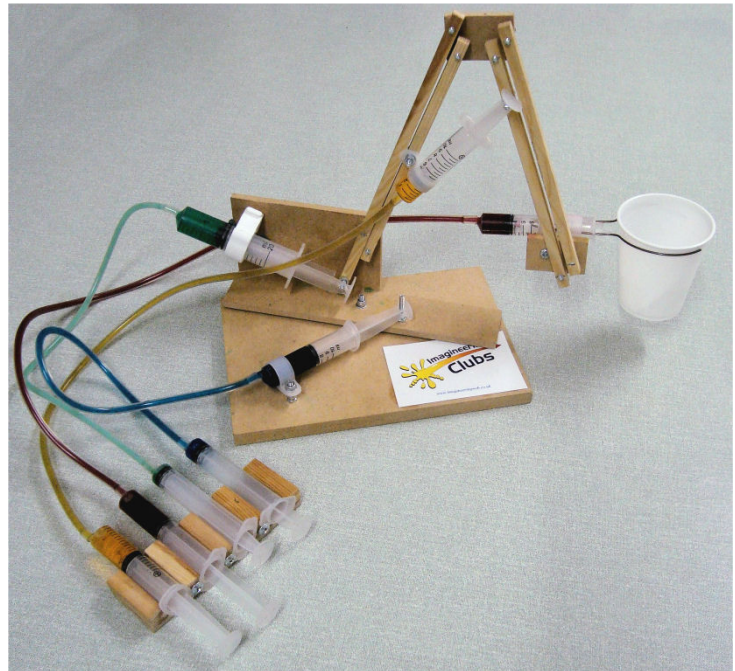
An introduction to the structural design of bridges is provided with a workbook. Each member then designs their own bridge and constructs it using artstraws which have to be 'purchased' from the store. Bridges are then tested for strength, the best strength over cost design winning. Deflection is measured rather than testing to destruction so that intact models can be taken home.



Hydraulic Arm

Plastic syringes connected by plastic tube and filled with coloured water provide the piston-cylinder basis for 3 axes of movement control plus 1 for a gripper which can pick up a beaker or soft drink can.

Parallel arm links maintain the beaker level to avoid spilling. Assembly is by screws and nuts. The project brings out the use of fluids to transmit movement and force remotely, and linkages to achieve defined motion.

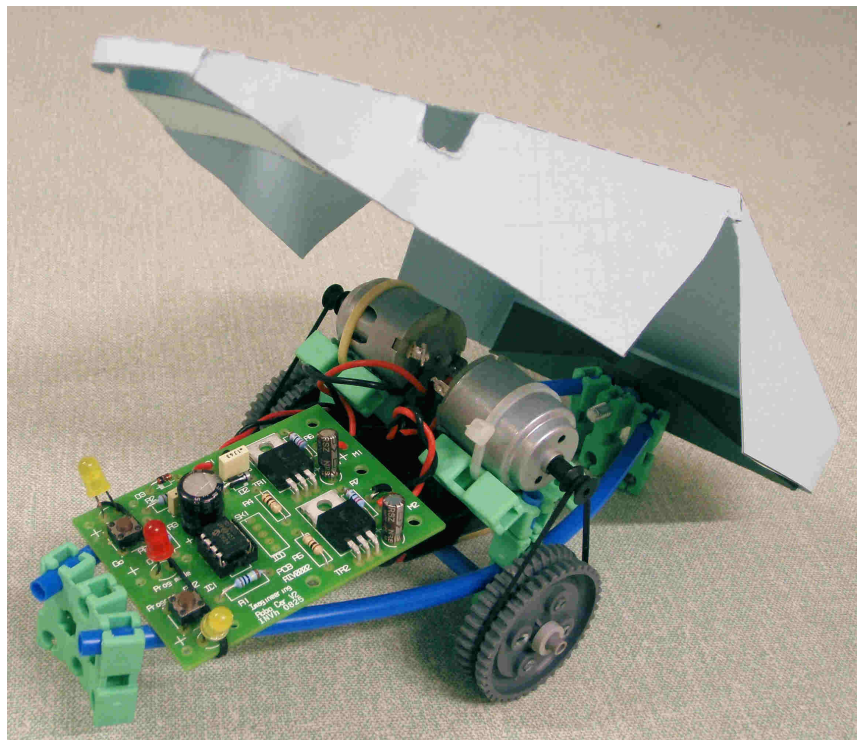


Robo Car

This project is an example of control engineering and a programmable path vehicle. It involves soldering components into a printed circuit board, making a Kre8 chassis and motor drive, and a net-shape body (shown opened up in the picture).

The board includes a pre-programmed PIC chip which interprets and remembers inputs from push-buttons. These define the sequence of straights and turns (with flashing LED indicators) that drive the motors steering the Robo Car. The sequence is stored in memory and re-played whenever the run button is pressed.

A 'How it Works' document describes in basic digital terms how the micro processor operates to control the vehicle.



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