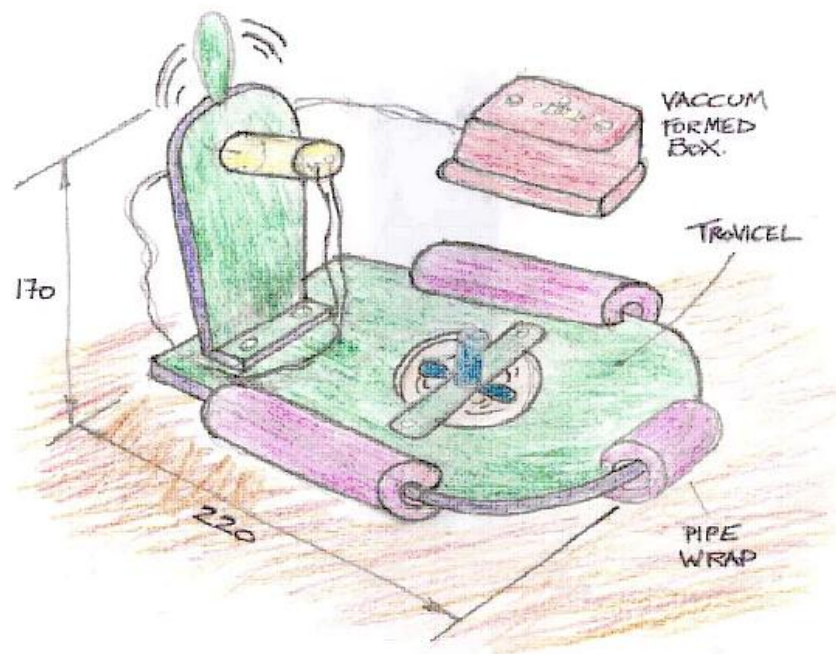


Junior Certificate

Metalwork – Materials & Technology

Class Project

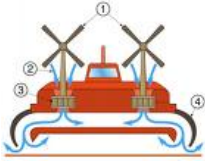


Remote Control - Model Hovercraft

Based on resource work developed for t4 by:

Hugh Coffey

Good Counsel College, New Ross



Design for Manufacture

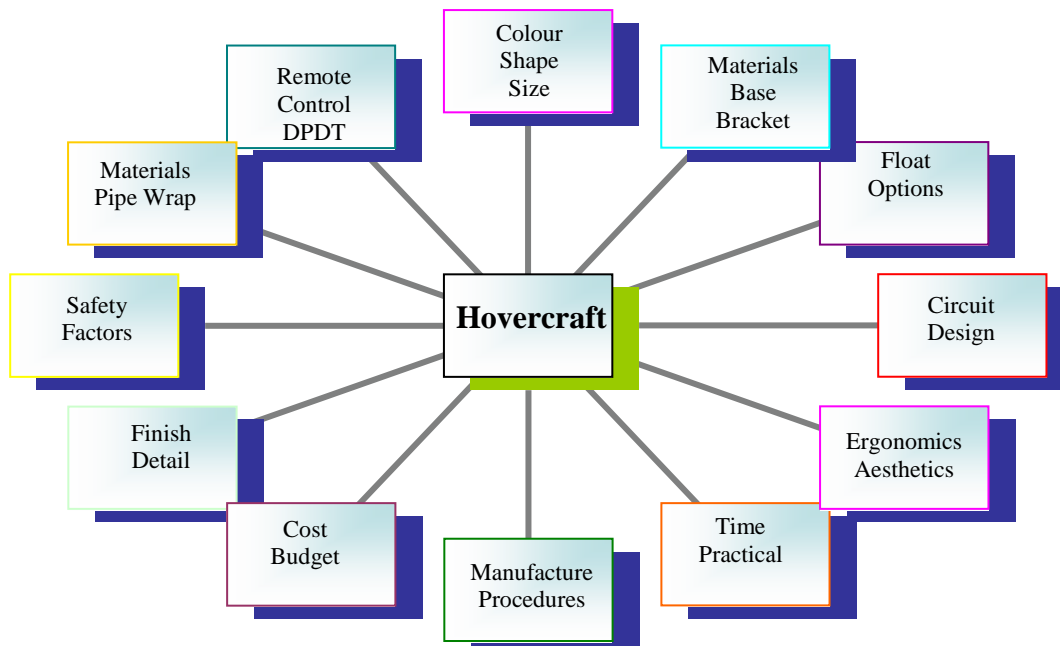
The rationale behind the project is to assist teachers in introducing design and manufacture for Junior Certificate Metalwork – Materials & Technology Students.

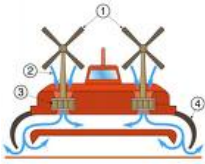
It is important that all students should experience a successful outcome to the project, but the design brief should allow the flexibility and scope for students to enhance their design. As this is an introduction to design and manufacture there are constraints placed on the student and they will be working to defined parameters.

Project Specification:

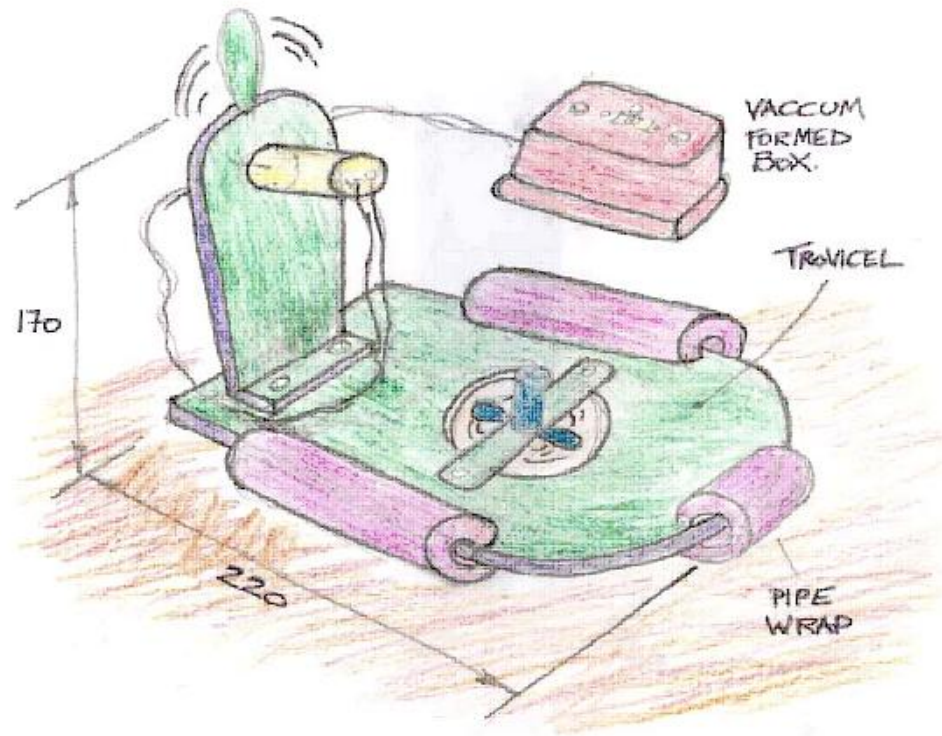
1. The Model Hovercraft must be capable of travelling on land and water.
2. The project must incorporate a remote control – (forward/reverse circuit)
3. The model must not exceed 300 mm in length.

Investigation & Research:

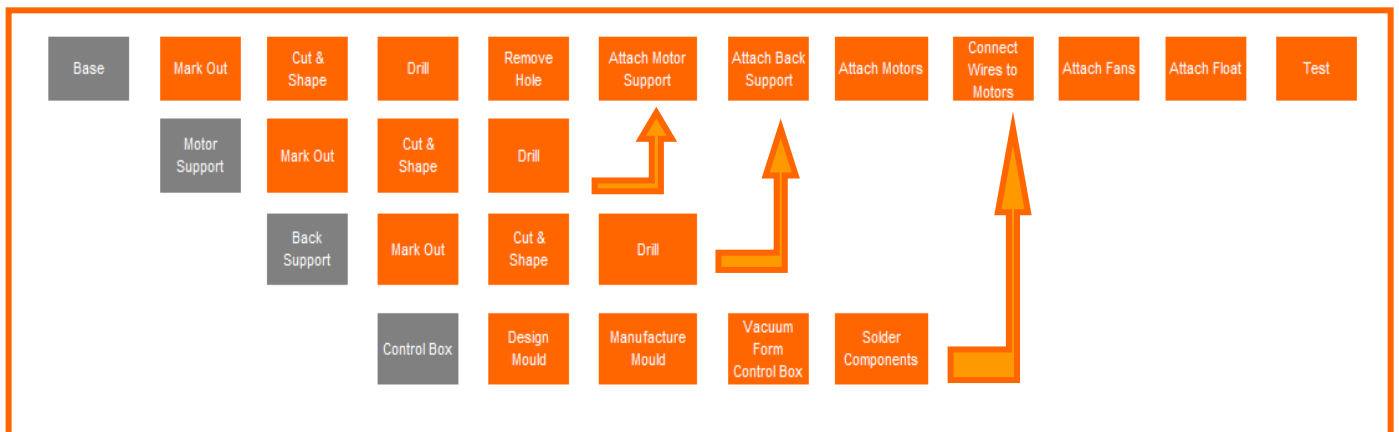


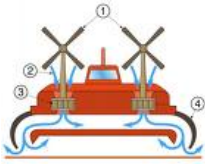


Sketch of Chosen Solution:



Work Breakdown Structure:

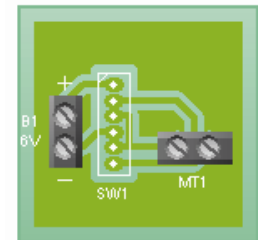
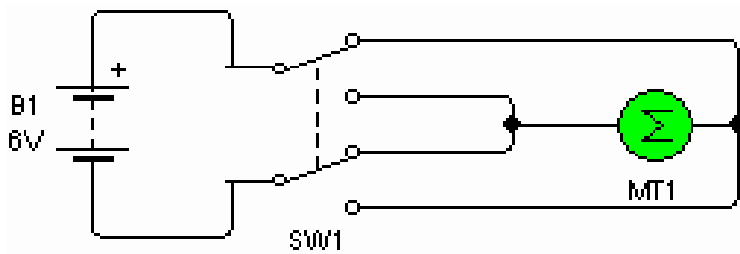




Parts List:

Part	Material
Base	3mm Trovicel Plastic
Motor Support	1.5mm Aluminum
Back Support	3mm Trovicel Plastic
Pipe wrap	20mm Inside centrepipe wrap
Control Box	Vacuum Forming sheet
Electronics	Motors, Switch, PCB Board, Etc.
Others	Screws, Nuts, Adhesives, etc.

Circuit Diagram & PCB Layout



Shown is a circuit which uses a 6V battery, DPDT slide switch with centre off, and a motor. This circuit will rotate the motors clockwise and anti-clockwise. A 2nd motor can easily be added.

DPDTCO Slide switch

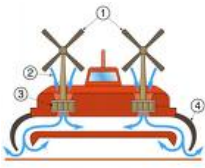


DC 6V Motor



3 Blade Propeller





Factors to consider:

Working with plastics, drilling, bending, filing, using adhesives, vacuum forming, soldering of electronic components and general assembly.

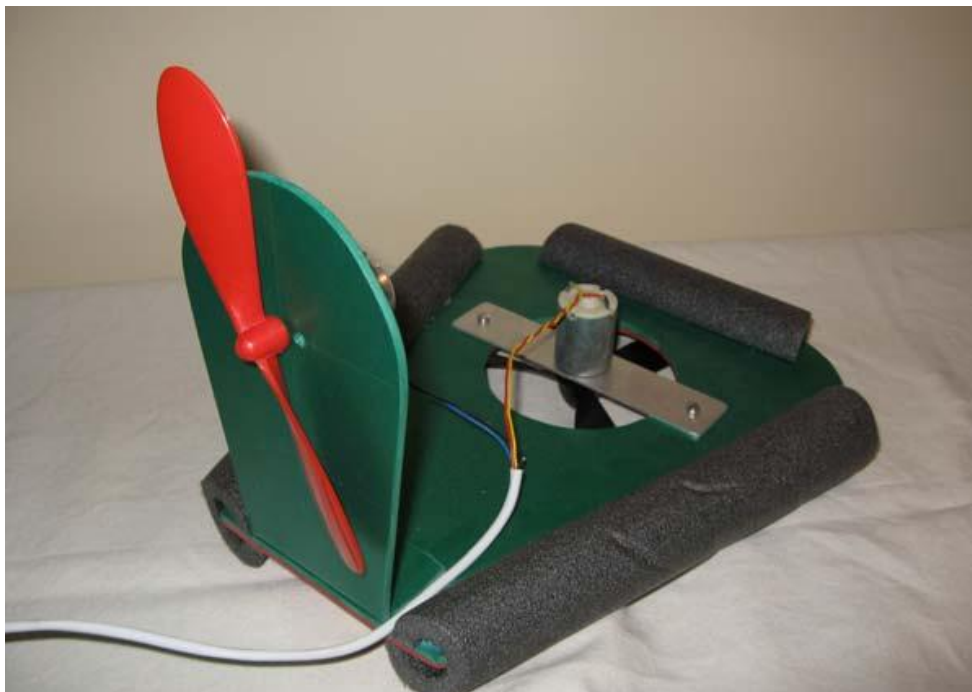
Hint: Pipe Wrap can be used to aid the buoyancy of the hovercraft.

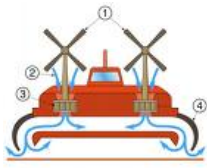


Impact adhesive is great glue for joining different materials together.



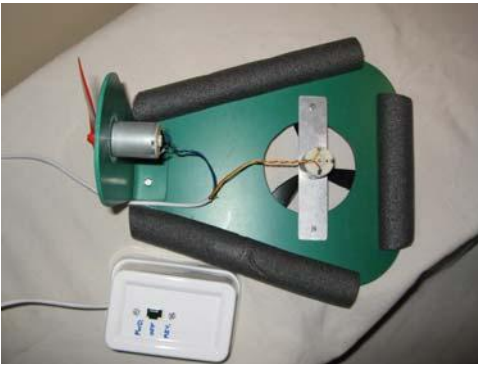
Completed Project:





The solution includes:

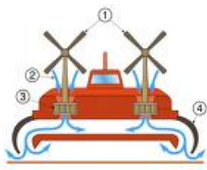
1. Base with pipe wrap
2. Back Motor Support
3. Remote Control Box
4. Two Motors and Fan



Another Possible Solution:

This solution has a Perspex base with a camping mat used as the buoyancy aid. An aluminum 1.5mm bracket is used to support the motor.





The fan, seat and steering column can be designed to each student's requirements. A purpose built vacuum formed mould is used to house the electronic DPDT circuit.



Possible applications for Leaving Certificate Technology:

Design and make a hovercraft with radio control.

Design and make a hovercraft with speed control and directional indicators. An electronic circuit could be used to speed up or slow down the lift and rear fans. A rear rudder could be used to steer the craft.

