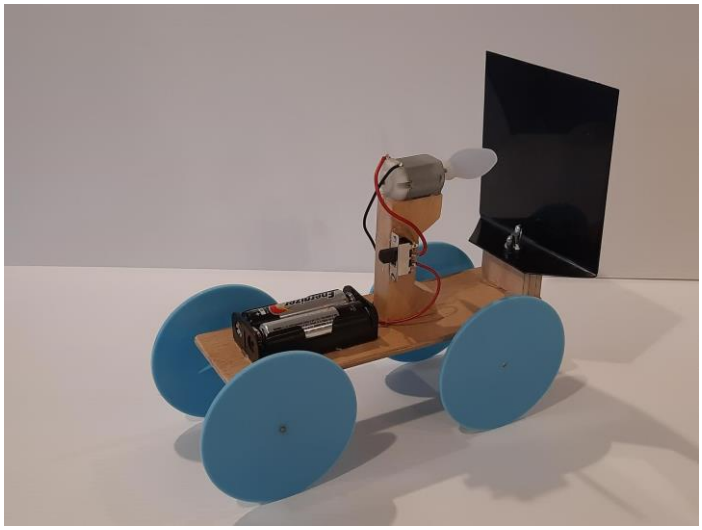
OVERVIEW

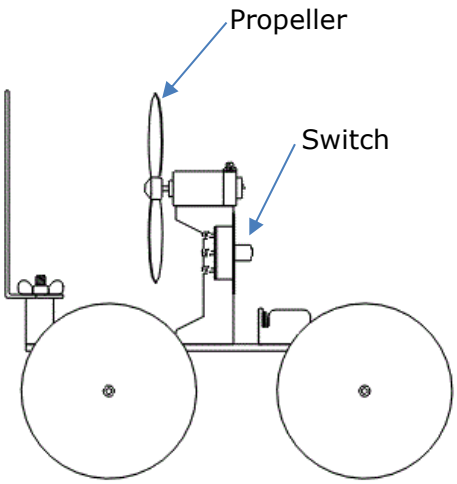
BLUE FIN FAN CART (Code: BLUEFIN)

DESCRIPTION

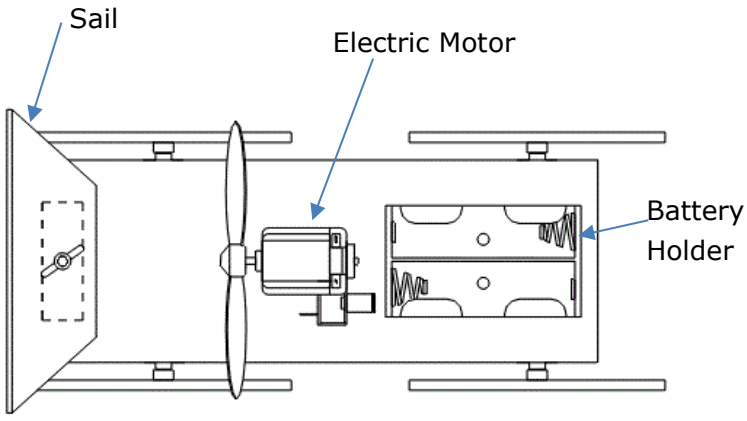
The *BLUE FIN FAN CART* is a simple four wheeled, propeller driven device with a sail that can be adjusted or removed to test the theory of Newton's 3rd Law of Motion. The propeller is driven by a small battery powered electric motor.



LEVEL:	Introductory
HOURS TO CONSTRUCT:	2 - 4 hours
SKILL DEVELOPMENT:	• Planning and Design • Manufacturing • Soldering • Mechanical • Electrical



SIDE VIEW

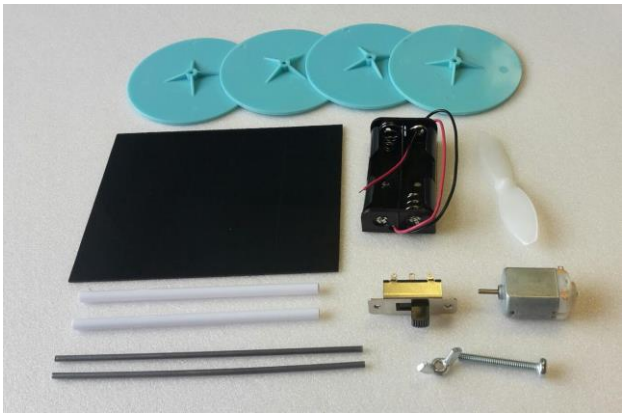


TOP VIEW

OVERVIEW – BLUE FIN FAN CART

WHAT'S IN THE KIT?

- ☐ All the mechanical and electric components required to make the *BLUE FIN FAN CART* work including the motor, wheels and axles, battery holder, switch, "sail" and propeller.
- ☐ A detailed teaching unit with a complete parts list, design suggestions, general construction guidelines and experiment activities.



WHAT ELSE IS NEEDED?

The following items are required and are available from Scorpio Technology, but need to be ordered separately:

- ☐ 2 x AA Battery (BATTAA – pack of 4; BATTALK40 – alkaline pack of 40)
- ☐ Multi strand hook-up wire (WIREHU10)
- ☐ Hot Glue (GLUESTK)

For the advanced activities, the following will also be required:

- ☐ A pulley with clamp (PUCLAMP70) or (PH0297A – Adjustable)
- ☐ A set of weights that includes 1g, 2g, 5g and 10g
- ☐ Lead with Alligator clips
- ☐ Stopwatch (STOP)
- ☐ String / cord

The following material is to be supplied by the student / teacher:

- ☐ Material for the platform, motor support, wheel mounting blocks and sail support block (pine, plywood, etc.)

TOOLS REQUIRED

The following tools are required:

REQUIRED TOOLS	ORDERING CODE
Assorted hand tools – depending on the choice of materials to be used	-
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	SOLD250/SOLD500
Wire strippers	WIRESTR
Side cutters	SIDECUT or SIDECUTM
Mini Bolt Cutters	BOLTCUTM
Hot Glue gun	GLUEGUN
Drill Bit – 4mm	-

ABOUT THE PROJECT

The major features of this project are the planning, design, construction and assembly stages of a simple vehicle and then using the vehicle in a set of experiments to demonstrate Newton's Third Law of Motion.

DESIGN PHASE

- ☐ Create your own unique *BLUE FIN FAN CART* design based on our drawings which focus on component relationships, rather than dimensions. This provides scope for students to individualise their *BLUE FIN FAN CART* design and increase their engagement in the project.

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

- ☐ Evaluate the suitability of various materials, such as pine, PVC, acrylic, plywood or balsa wood
- ☐ Determine the location of all components
- ☐ Evaluate available technologies that can be used, for example:
  - 3D printer
  - laser cutter
  - vacuum former
- ☐ Consider the practical aspects of construction and assembly. For example, clearance for the wheels, or ease of fitting/removing the sail.

MAKING / CONSTRUCTION

Once the Design process has been completed, the students will be able to start **building their design**. They will:

- ☐ Make the *BLUE FIN FAN CART* platform and mounting blocks they have designed
- ☐ Mount the motor support, motor and propeller, battery holder, switch, sail support and guide tubes on to the platform
- ☐ Wire up the battery holder, motor and switch
- ☐ Mount the wheels onto the axles
- ☐ Test and adjust the *BLUE FIN FAN CART*
- ☐ Troubleshoot any problems!

EXPERIMENTING

- ☐ The students can then use their *BLUE FIN FAN CART* to work through the six suggested experiments and the three advanced experiments included in the teaching unit