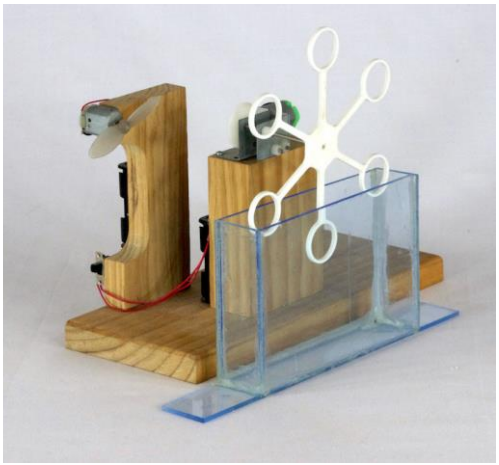
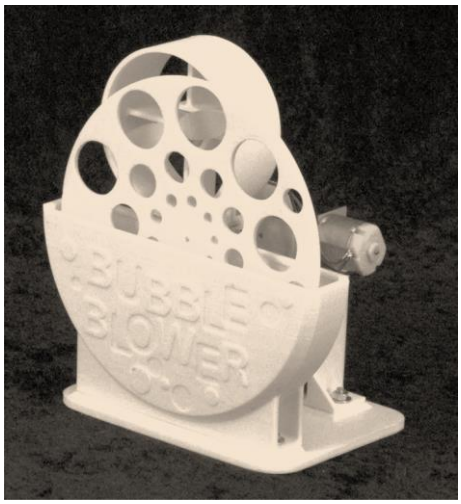
BUBBLE BLOWER NS G4 (Code: BUBBLE NS G4)

DESCRIPTION

This device is designed to automatically blow bubbles! One motor, driving through a gearbox, constantly rotates 6 wire hoops, which continuously dip into a vessel holding the bubble mixture. The propeller (driven by a second electric motor) blows air into the hoops, producing a constant stream of bubbles.



LEVEL:	Intermediate
HOURS TO CONSTRUCT:	8 - 12 hours
SKILL DEVELOPMENT:	• Planning and Design • Manufacturing / Assembly • Soldering • Mechanical • Basic Electric Circuits • Circuit diagram symbol identification • Electrical • Record keeping • Investigation and Testing / Troubleshooting • Testing & Fault finding



* Two other *BUBBLE BLOWER* variants are available:

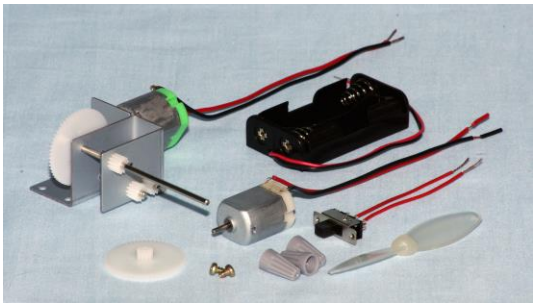
– a NO-solder version with an Un-assembled gearbox - code: *BUBBLE-NS V2*

– a Solder version with an Un-assembled gearbox - code: *BUBBLE V2*

OVERVIEW– BUBBLE BLOWER NS G4

WHAT'S IN THE KIT?

- ☐ All the mechanical and electrical components required to make the *BUBBLE V2* work including the gearbox, motor and switch.
- ☐ A detailed teaching unit with a complete parts list, design suggestions, general construction guidelines and suggestions for testing and further work.



ABOUT THE PROJECT

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

DESIGN PHASE

- ☐ Create your own unique *BUBBLE BLOWER* design based on our drawings and design notes. Focus on component relationships, rather than dimensions. This provides scope for students to individualise their *BUBBLE BLOWER* 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 pine for the base, tower and gearbox mounting
- ☐ Evaluate the suitability of various materials, such as PVC, acrylic or other suitable material for the bubble mix tank
- ☐ Determine the material and the manufacturing / assembly process for the Bubble wheel
- ☐ Evaluate available technologies that can be used, for example:
  - 3D printer
  - laser cutter (which allows more interesting shapes than usual)
  - vacuum former
- ☐ Consider the practical aspects of construction and assembly

MAKING / CONSTRUCTION

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

- ☐ Assemble the motor and gearbox for the bubble wheel
- ☐ Make and assemble the *BUBBLE BLOWER V2* base and motor and gearbox mounting as designed
- ☐ Make the bubble tank and locate it
- ☐ Fabricate the Bubble wheel
- ☐ Assemble the propeller to the motor and mount it
- ☐ Wire up and solder the two motors and switch
- ☐ Test and adjust the *BUBBLE BLOWER*
- ☐ Troubleshoot any problems!

DOES THE TEACHING UNIT INCLUDE ANY THEORY?

The Teaching unit does not have a theory section, but instead it has suggestions for further work and testing.

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 (Heavy duty or Alkaline)	BATTAA, BATTAALK40
Material for the components (PVC or acrylic sheet, timber and plywood, etc.)	---
Wire or other material for the bubble wheel	--- / WIRECOPB18
Wood block, at least 25mm thick to support gearcase or motor at assembly stage, that can be drilled into	---
A small piece of timber (such as pine) to drill a shallow hole in order to rest the propeller boss and mount the motor shaft	---
Bubble mixture	
Single-sided adhesive tape (to help secure motor)	TAPESS
Sand paper (if using hot glue, for roughening surface for better adhesion)	---

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	HAMMERCP/HAMMERCL
Ruler and pen	-
Craft knife	CRKNF
Wire strippers	WIRESTR
Side cutters	SIDECUT or SIDECUTMIN
Mini Bolt Cutters	BOLTCUTM
Flat smooth cut file (for de-burring steel rod ends)	- -
Drill (either powered or a hand drill)	---
Drill bit – 10mm (or similar) – for the timber to install the propeller	---
Philips Head Screwdriver #1 point for screws	SCREWDRPH1/80
Hot glue or Double-sided adhesive tape	GLUESTK or TAPEDS