

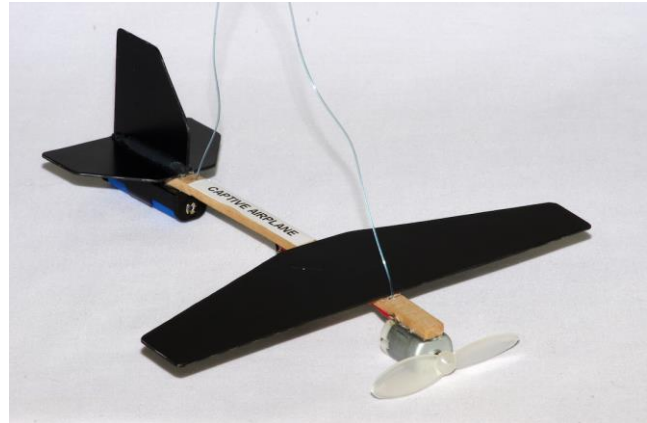


CAPTIVE AEROPLANE (Code: CAPTIVE)

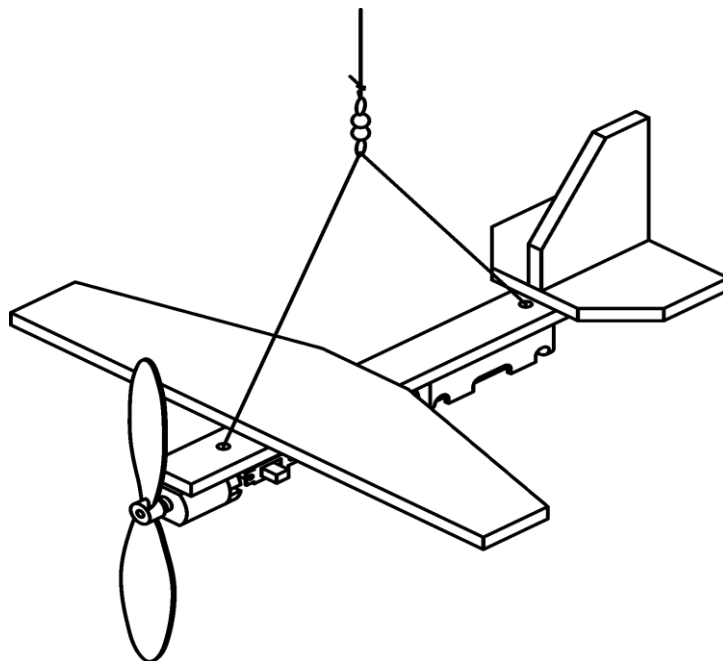
DESCRIPTION

The *CAPTIVE AEROPLANE* is a small aeroplane built from plastic or wood that is suspended from an overhead point and flies in a circle. It is driven by a propeller that is powered by a small electric motor.

The *CAPTIVE AEROPLANE* is a very simple model to construct. This has a lot of scope for combining two different areas of study: technology and art (with a bit of woodworking thrown in!).



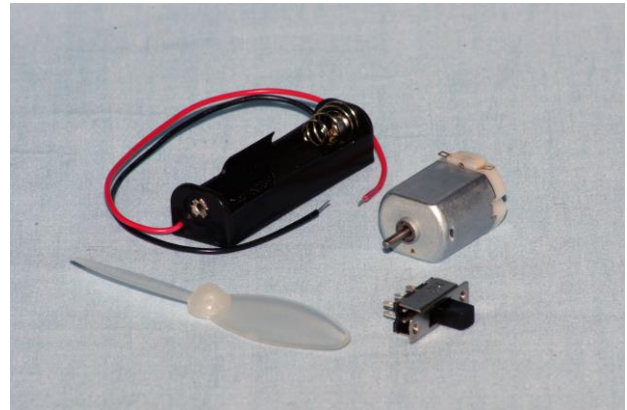
LEVEL:	Introductory
HOURS TO CONSTRUCT:	5 - 7 hours
SKILL DEVELOPMENT:	<ul style="list-style-type: none">• Planning and Design• Manufacturing• Soldering• Mechanical• Electrical





WHAT'S IN THE KIT?

- All the mechanical and electrical components required to make the *CAPTIVE AEROPLANE* work including the motor, battery holder, switch and propeller.
- A detailed teaching unit with a complete parts list, design suggestions, a template (for the wings, fuselage, rudder and tail wings), step by step instructions for constructing your *CAPTIVE*



AEROPLANE and wiring and soldering the electrical components.

WHAT ELSE IS NEEDED?

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

- 1 x Battery – AA (BATTA)
- Multi strand hook-up wire – in a variety of colours (WIREHU10)
- Fishing line (FLINE)
- Hot Glue (GLUESTK) or double-sided adhesive tape (TAPEDS)
- Snap swivel – as used in fishing to connect lures (SNAPSW)

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

- Material for the components (balsa wood, PVC or acrylic sheet, thin plywood, etc.)
- 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

TOOLS REQUIRED

The following tools are required:

REQUIRED TOOLS	ORDERING CODE
Assorted hand tools – depending on the choice of materials to be used	-
Small drill bit	-
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	SOLD500
Wire strippers	WIRESTR
Drill bit – 10mm	-

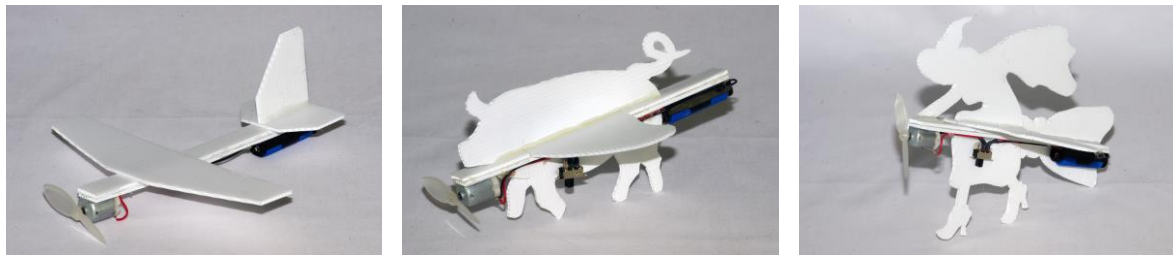


ABOUT THE PROJECT

The major features of this project are the planning, design, construction and assembly stages of a simple aeroplane.

DESIGN PHASE

- Create your own unique *CAPTIVE AEROPLANE* design based on our drawings which focus on component relationships, rather than dimensions. This provides scope for students to individualise their *CAPTIVE AEROPLANE* design and increase their engagement in the project.
 - The aeroplane design shown is a conventional design, utilising the same proportions as used in conventional light aeroplanes.
 - Alternatively, the student can investigate other designs. For example: can pigs really fly or possibly a witch on a broomstick.



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

- Evaluate the suitability of various materials, such as PVC, acrylic, plywood or balsa wood
- Evaluate available technologies that can be used, for example:
 - 3D printer
 - laser cutter
- Consider the weight and weight distribution of the aeroplane
- Consider the practical aspects of construction and assembly. For example, where to drill holes for the suspension wires

MAKING / CONSTRUCTION

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

- Make and assemble the *CAPTIVE AEROPLANE* structure they have designed (wings, fuselage, rudder and tail wings)
- Install the propeller on the motor
- Mount and solder the electrical components
- Affix the suspension wire
- Test and adjust the *CAPTIVE AEROPLANE*
- Troubleshoot any problems!

