

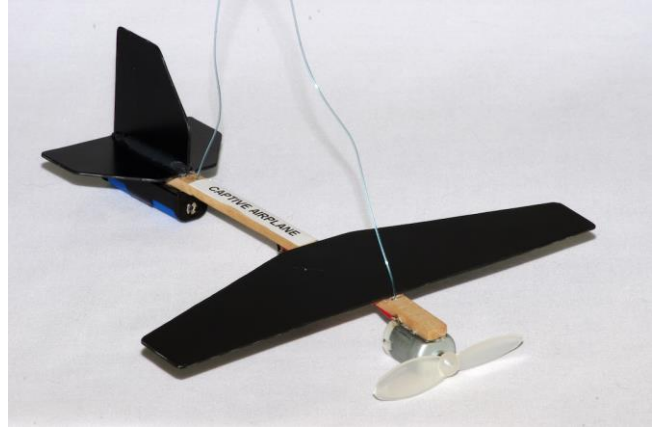


CAPTIVE AEROPLANE – NO SOLDER (Code: CAPTIVE-NS)

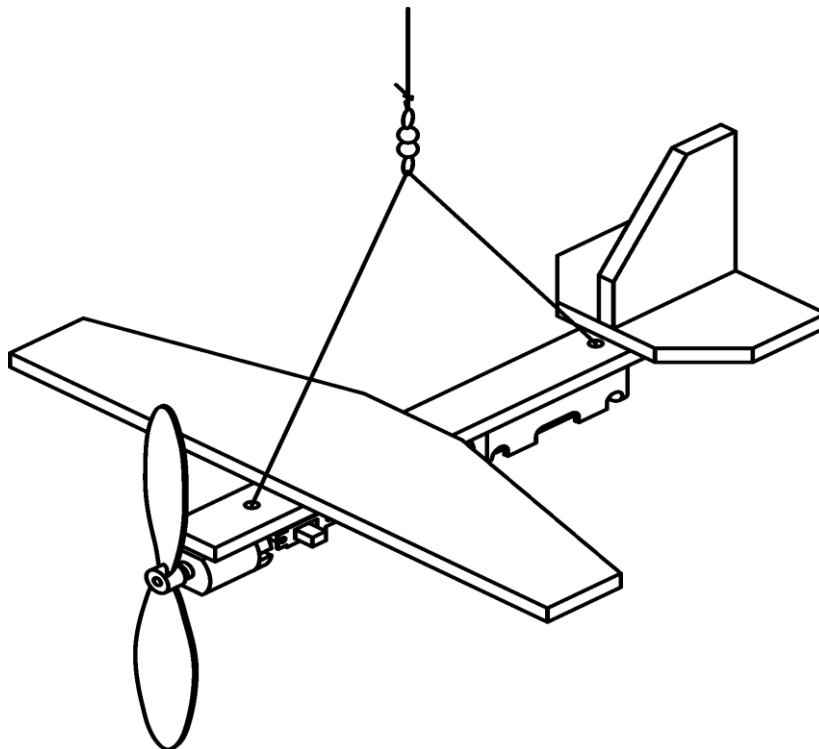
DESCRIPTION

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 woodwork thrown in!).



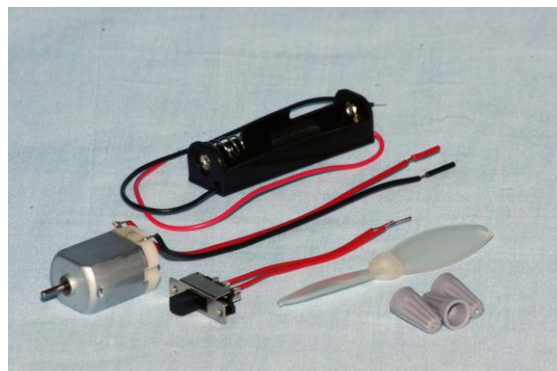
LEVEL:	Introductory
HOURS TO CONSTRUCT:	5 - 7 hours
SKILL DEVELOPMENT:	<ul style="list-style-type: none">• Planning and Design• Manufacturing• Mechanical• Electrical





WHAT'S IN THE KIT?

- All the mechanical and electrical components required to make the *CAPTIVE AEROPLANE* work including the motor, battery holder, switch, propeller and screw-on connectors.
- 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 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 or BATTALK40)
- 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 fuselage (balsa wood, PVC or acrylic sheet, thin plywood, etc.)
- Material for the wings, rudder etc – as above or HIPSB110X220 (High Impact Polystyrene)
- 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. Several are available from Scorpio Technology, and can be ordered separately if required (item codes in brackets):

REQUIRED TOOLS	ORDERING CODE
Assorted hand tools (depending on materials used)	-
Ruler and pen	-
Small drill bit	
Craft knife	CRKNF
Wire strippers	WIRESTR
Drill Bit – 10mm - if using guide hooks	-

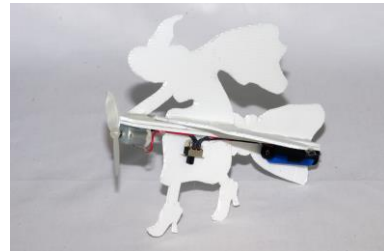
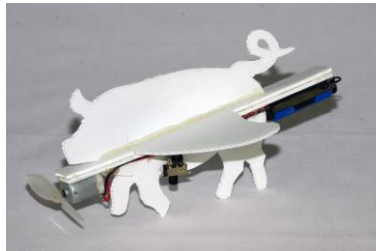
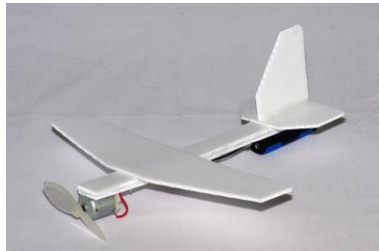


ABOUT THE PROJECT

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 wire up the electrical components
- Affix the suspension wire
- Test and adjust the *CAPTIVE AEROPLANE*
- Troubleshoot any problems!

