



## AN INTRODUCTION TO IMAGINEERING CLUBS

**Manufacturing Industry and Engineering in general are major contributors to the wealth of the UK and will be for the foreseeable future. However to compete in changing global markets and technologies they depend on a stream of young talent coming forward. Currently this is well below the level required. Imagineering provides a complete resource for developing and engaging with the engineers of the future**

Imagineering Clubs are aimed at encouraging children to become the next generation of Engineers and Scientists. In these Clubs children of Primary/early Secondary age are helped to make working models from a series of kits. As well as acquiring practical skills in the safe use of tools, through their natural curiosity they gain an understanding of how their models work, and related aspects of engineering and science. And when they take their completed models home, parental interest further encourages their enthusiasm.

In developing Clubs and widening the network, Imagineering collaborates with manufacturers, utilities, engineering organisations professional institutions and educational establishments as well as other partners like Manufacturing Technologies Associations, local STEMPoints, and Education Business Partnerships.

There are now Imagineering Clubs all across the country, where children benefit from an hour of this experience each week.

This **Introduction Pack** :

- ◆ **introduces the world of Imagineering and how it engages children,**
- ◆ **informs Schools, companies and potential Tutors about the organisation of the Clubs,**
- ◆ **provides background prior to application to join the Imagineering community.**



# ETHOS OF IMAGINEERING

## Learning through Fun

Fun comes from the different learning approach in the Clubs - hands-on and constructional – with an informal, non-classroom character. The model kits provided for each child introduce a range of engineering principles and real-life applications. The Club leader demonstrates what to do, gives practical help and explains the principles of the projects.

## Inclusive

Club activities have been shown to draw in many of those having difficulty with classroom working as well as extending gifted children. Indeed it has value in providing new avenues for achievement. Imagineering has no barriers of gender, race or even language.

## Parental Involvement

Children take home their completed work, receiving praise for what they have made and often having a chance to explain to others how it works; this all reinforces the learning element.

## An Early Start

It is easier to enthuse younger children of Primary or early Secondary school age range in practical skills, especially with positive support. They will develop self-confidence and a sense of self-achievement which will also be reflected in their other school work.

## How it works

The typical Imagineering Club will have 12 members and meet for an hour a week after school.

There are **two programmes of projects** available:

**Junior Engineering** (the majority of Clubs, at primary schools) - ideal for Years 5-6

**Inter-Engineering**, designed as a follow-on but also free standing—ideal for Years 7-8

Clubs are lead by working or retired engineers but may also be lead by graduate engineers or apprentices, as well as teachers. Teachers are also present at each session.

In Imagineering Clubs the aim is to lower the threshold to get started by providing:

**Complete kits of materials with instructions** - so that Clubs can function in an effective and timely way

**Flexibility** – to enable tutors to give the input and experience they can, and gain the response from pupils

**Basic information** – for reference while allowing freedom to operate according to local needs, abilities and interests

**Standards and training** – to give children a quality introduction to engineering and paths to a career

**Communications** – to capture and share experience, and facilitate improvements.

# RUNNING A CLUB

## Example Schedule

The following is illustrative of the range and duration of project models in the **Junior Engineering programme**; the actual programme in a given year may vary .

## JUNIOR ENGINEERING

<b>Autumn Term / First Term of Club</b>	<b>10-11 weeks</b>
◆ Introduction & Aero Glide model	2 weeks
◆ Health and Safety & Use of Tools	1 week
◆ Magnetic Compass	2 weeks
◆ Steady Hand game	2 weeks
◆ Morse Key and Buzzer	3 weeks
◆ Slide Rule	1 week

*(End of Term Activities require flexibility in this session)*

<b>Spring Term / Second Term</b>	<b>10 weeks</b>
◆ Helicopter	2 weeks
◆ Soldering practice	2 weeks
◆ Bloodhound Rocket Car	2 weeks
◆ Robot Duck	2 weeks
◆ Factory Visit (where appropriate)	2 weeks
◆	

<b>Summer Term / Third Term</b>	<b>11 weeks</b>
◆ AM Radio	3 weeks
◆ Micrometer	3 weeks
◆ Resistor Chart	1 week
◆ Fuse Tester	2 weeks
◆ Moisture Sensor	2 weeks

## CLUB OPERATION

- ◆ **Club sessions** are one hour each week, generally after school (typically starting 3.00 pm – 3.30pm) but may be arranged at other times. Kits for the above projects in junior Imagineering Clubs will be provided at the start of each term in sets of 14, that is, 1 for each of 12 children, 1 for the tutor to practice build and demonstrate, and 1 for spares. The cost per child is around £3.60 per week.
- ◆ **Junior Imagineering Clubs** are aimed at Years 5/6 9-11 years) The **Inter-Engineering** programme of models is aimed more at early secondary school age—Years 7/8 (11-12 year olds). It is designed to follow on from Junior Engineering but can be free-standing. It includes an Electric Car, Wind Turbine, BMFA Dart, Hydraulic Arm and Imagibot project. The cost is the same as Junior Engineering.
- ◆ The projects relate to parts of the KS2 Curriculum in D&T and Science; a mapping showing this is available online.
- ◆ **Adult support** – preferably 3 adults for the 12 children – a tutor, and teacher (if the tutor is not a teacher) and another helper – teaching assistant or parent
- ◆ **Tools** – each Club needs a set of tools e.g. pliers, soldering irons, which the school orders direct from the supplier. The recommended list totals about £295 in cost but this is a one-time investment since they will be used again in subsequent years.
- ◆ **Teacher/Tutor Notes** - are provided for each model together with illustrations of the principles associated. These are based on experience of the best way to present the activity.

## CLUB SESSIONS — an outline

- ◆ **Preparation** – first time – have a go at the trial kit beforehand to anticipate difficulties and best techniques. Before the session check that all the materials are to hand; the kits, the tools, instructions, safety equipment such as goggles, and apron for soldering.
- ◆ **Introduction** (5 - 10 minutes) continuity from previous sessions, explain principles and real world applications, what is to be done, safety reminders.
- ◆ **Style** – interactive and involving; practical demonstration and help with ‘how to’ but they do it; safety first; patient and encouraging of initiative, praising effort, informal but orderly.
- ◆ **Wrap up** – start to wind down 10 minutes before the end to tidy up before leaving.
- ◆ **Other activities** – hopefully an engineering visit during the year; entry into competitions such as K’nex Challenge, Greenpower Cars

## THE TUTOR

### What makes an Imagineering Club Tutor?

A Tutor may be an interested Teacher/Teaching Assistant, or a volunteer Engineer/Scientist, Technician/Skilled person - someone inspire children and to provide them with an insight into modern engineering and what it involves and why engineers are enthusiastic about what they do. This will require:

- ◆ practical skills to help those learning simple, hands-on activities and safe use of tools
- ◆ an appreciation of basic engineering/scientific principles
- ◆ aptitude for and an interest in working with young people, and seeing them progress
- ◆ the lightness of approach to make the Club fun.

### Ways of filling the Tutor Role

- ◆ If the Club is to be lead by a volunteer engineer tutors (rather than just a teacher) ideally there should be two people to share the tutor role to provide continuity and flexibility.
- ◆ Alternatively Companies may take on the commitment as a community action and form a group to support a Club. Similarly Colleges and Universities may provide groups with staff and undergraduates or graduates where a tutor role can form part of their programme. Some companies have apprentices or year-placement undergraduates providing the tutors.
- ◆ Where the tutor is a teacher it would help to find a Guide Engineer in support who would come a couple of times each term, and be available on the phone for advice.

### PD or CPD opportunities

The Engineering Institutions have indicated that the Club Tutor role is relevant to elements of Professional Development towards chartered membership.

## IN THE SCHOOL

### Teachers and Parent Helpers

- ◆ It is a requirement that a qualified Teacher from the School is present during Club sessions, for insurance, discipline and overall responsibility for the children. Even if not leading the Club, teachers usually join in with the activities.
- ◆ Schools are asked to recruit one or more parent or other adults as helpers if possible. This makes the operation of the Club much more effective.

### The Club Member's File and Box

The school should provide each child with a file in which to keep records of the work (Instructions, Test Sheets, Quiz Worksheets), and Health and Safety information they receive. At the end of the year, they can put in their Certificates they receive for completing a Club . This file should be kept at school during the year. Each pupil has a box for keeping partly completed models between sessions .

### Health and Safety

- ◆ Health and Safety is a serious matter, but should not be an obstacle to teaching children how to use tools. Some may not be familiar with tools and most will not be adept at using them.
- ◆ Children are be shown collectively and individually the correct way and circumstances in which tools should be used.
- ◆ Guidance notes are provided and collaboration with the teacher will help to ensure the messages are taken in by the children. Tutors are also prompted on the whereabouts of the School's First Aid Facility and who to see.
- ◆ Typically the third session of the Club is dedicated to Health and Safety when children get an opportunity to handle the tools in a controlled situation.

## GETTING STARTED

- ◆ The School needs to complete the **Application Form for a Club**, available on website. This is effectively an order for Imagineering to supply the packs of kits. On it the school can indicate if they have a volunteer(s) to help.
- ◆ On receipt of the completed form Imagineering will send a **template letter to parents**, sample risk assessments and the current recommended tool list.
- ◆ Tutors likewise complete the **Tutor Application** form, also available on website.
- ◆ Where practicable for a group, Imagineering can arrange an **Induction session** (about 1½ hours). It may also be possible to arrange a visit to a session at an existing Club. In any case volunteer tutor(s) should visit the school to meet the contact teacher and discuss arrangements as soon as they can.
- ◆ All tutors will need a **DBS Check** (formally known as a CRB check). In some cases this is done through the school. Generally tutors sign on as STEM Ambassadors. This is a national scheme which provides the DBS check free. Registration for this is via <https://www.stem.org.uk/stem-ambassadors> (Register as a STEM Ambassador which links to the local STEMNET Manager who arranges for completion of the DBS form and checking of documents. )

## USEFUL CONTACTS

### Imagineering Foundation:

**Chairman:** **Bob Shanks** T: 01926 859441 E: [bob@imagineering365.onmicrosoft.c](mailto:bob@imagineering365.onmicrosoft.c)

### IMAGINEERING CLUBS:

**Imagineering Clubs Administrator** **Toni Stockley**, [admin@imagineeringfoundation.onmicrosoft.com](mailto:admin@imagineeringfoundation.onmicrosoft.com)  
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## KEEPING IN TOUCH

Our website, [www.imagineering.org.uk](http://www.imagineering.org.uk), contains lots of useful information and pictures which give a real flavour of the Clubs and the way that they operate.

**Quality and Updates** - Quality monitoring is applied to the supply of kits and changes are made to design and instructions to improve function and clarity.

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