Imagineering Clubs

Introduction Pack and Application Form

For Schools, Club Tutors and Guide Engineers

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INTRODUCTION

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 below the level required.

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 partner companies and organisations such as the Engineering Development Trust, Young Engineers, local STEMPoints, Education Business Partnerships, and education organisations. There are now over 150 Imagineering Clubs, with some 2000 children benefiting from an hour of this experience each week.

We welcome your interest in Imagineering Clubs. This Introduction Pack is intended to

* introduce the world of Imagineering and how it engages children,
* inform potential Schools and Tutors about the organisation of the Clubs,
* provide background prior to application to join the Imagineering community.

When you have considered, please fill in one of the Application Forms associated with this pack, to request a Club and/or join as a Tutor.

Contents:

1. ETHOS OF IMAGINEERING

1.1. 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 applications. The Club leader demonstrates what to do, gives practical help and explains the principles of the models.

1.2. 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.

1.3. 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.

1.4. 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. Older children may be negative and dismissive about tasks they might find difficult (not having learnt them earlier in life), and unwilling to risk failure or being shown up.

1.5. How it works

Imagineering is growing through a networking and team-oriented approach, in collaboration with other agencies.

Clubs may be lead by teachers or volunteer engineers/scientists, when available.

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 busy people to give the input and experience they can, and gain from the response of young people
* 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.

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

There are two programmes of models available; Junior Engineering (the majority of Clubs, at primary schools) and Inter-Engineering, designed as a follow-on but also free standing.

1.6. Typical 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 from this.

	TERM	Duration
Autumn Term / First Term of Club		(No of weeks)
1	Introduction & Aero Glide model	2
2	Health and Safety & Use of Tools	1
3	Magnetic Compass	2
4	Steady Hand game	2
5	Morse Key and Buzzer	3
	Slide Rule (End of Term Activities require flexibility in this session).	1
Total		10/11 weeks
Spring Term / Second Term		
6	Helicopter	2
7	Soldering practice	2
8	Bloodhound Rocket Car	2
9	Robot Duck	2
10	Factory Visit (including preparation for)	2
Total		10 weeks
Summer Term / Third Term		
11	Telescope	3
12	Micrometer	3
13	Resistor Chart	1
14	Fuse Tester	2
15	Moisture Detector	2
Total		11 weeks

Notes:

Kits for the above models 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. Each kit has illustrated assembly instructions. The cost for 2012/13 for one year's set of kits for a Club is £660 plus VAT. Most Clubs ask for 70p - £1.80 per week (or equivalent termly) from each member which covers some or all of the cost of materials.

These projects do relate to parts of the KS2 Curriculum in D&T and Science; a mapping showing this is available.

1.7. The **Inter-Engineering** programme of models is aimed more at early secondary school age. It is designed to follow on from Junior Engineering but can be free-standing. It includes an Electric Car, Windmill Generator, Robocar, Hydraulic Arm and Bridge Building project. The cost for 2012/13 is the same as Junior Engineering.

1.8. 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.
- Members – normally children from years 4, 5 or 6, that is ages 8-10. There are also Year 7/8 (11- 12 year olds) Clubs which usually do Inter-Engineering.

- 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 £130 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.

1.9. **Club Sessions**

- 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.

2. THE TUTOR

2.1. What makes an Imagineering Club Tutor?

A Tutor – who may be an interested Teacher/Teaching Assistant, or a volunteer Engineer/Scientist, Technician/Skilled person - is someone motivated to give to children an opening into what engineering is 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.

2.2. Ways of filling the Tutor Role

If the Club is to be lead by a volunteer (rather than a teacher) it may be possible for one person to fill the role regularly for 1 hour a week, 30 times a year. But generally we are looking for at least 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.

2.3. Induction and Training

Ideally tutors should have the opportunity to attend a short session covering - the Imagineering Approach, Starting a new Club, Working with Children and management, How the clubs operate, the models and their construction, insurance, police checks (CRB) and finance. If there is support longer sessions involving trial model building from kits can be arranged.

2.4. IPD or CPD opportunities

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

2.5. The Tutor Community

Tutors and contact teachers are a crucial part of Imagineering and children really value the time and the effort they put in. They become members of the Imagineering Foundation charity when they sign on. The website ***www.imagineering.org.uk*** has a comments and queries facility for sharing solutions and ideas.

We aim to hold a Tutor Symposium every year in the Midlands, and the annual **Imagineering Fairs** up and down the country which normally have a Clubs stand are also occasions to express the interest and progress of the movement.

3. IN THE SCHOOL

3.1. Teachers and Parent Helpers

It is a requirement that a qualified Teacher from the School be 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. This makes the operation of the Club much more effective.

3.2. 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. This file should be kept at school during the year. A box each is also desirable for keeping partly completed models between sessions – for several years these have been provided through sponsorship by Jaguar Land Rover.

3.3. 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 should 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. They should also be 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.

4. GETTING STARTED

The School needs to complete the Application Form for a Club. 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. If it is intended to look for one before starting, then the despatch of kits can be delayed. 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 form. Where practicable for a group, Imagineering can arrange an Induction session (about 1½ hours), or more formally, longer practical Training sessions for teachers/teaching assistants. 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 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 CRB check free. Registration for this is via *www.stemnet.org.uk/register.cfm* which links to the local STEMPoint who arrange for completion of the CRB form and checking of documents.

5. COMMUNICATIONS & DEVELOPMENTS

5.1. Website

Our website, www.imagineering.org.uk, supported by National Grid, contains lots of useful information and pictures which give a real flavour of the Clubs and the way that they operate. There is a **Clubs Document Library** with all the current model instructions. All signed-on tutors and school contacts are automatically given membership with a password to access the copyright part of this. There is a comments facility for raising issues and exchanging ideas on-line. Please visit it and join in.

5.2. **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. Imagineering Clubs have also achieved a **Quality Approved Certificate** from independent assessors.

6. USEFUL CONTACTS

Imagineering Foundation:

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