The activities outlined here are divided into long, short and one-off activities. Each activity is categorised as Science, Maths, Technology and Engineering or Cross Curricular. Most of the activities have clear instructions, with downloadable resources to help you easily implement them in your club.

**One-off activities**

One-off activities are completed in one session. They are often highly engaging and can have a real wow factor. Consider:

- using them at recruitment and launch events
- scattering them throughout longer projects to reinvigorate the club
- using make-and-take activities (where participants physically take something away with them at the end)

**Short projects**

Any activity that takes club members two to three sessions to complete might be considered a short project. With a short project you can:

- extend a classroom activity to allow for more free investigation
- enable club members to participate in a number of related one-off activities
- allow club members to try something out before committing to a longer project

Many of the shorter projects will include demonstrations or experiments that can be used as one-off activities.

**Long projects**

Any activity that takes half a term or more to complete might be considered a long project. Completing a long project can be very rewarding, especially if there is an award or a prize involved. Showcase your club’s efforts by:

- getting members to present their work in an assembly, at a parents’ evening, PTA or governors’ meeting
- going to a regional or national science fair allow your club to show off what they’ve achieved
- entering a national competition

You can also search online directories for other activities.

The National STEM Centre Library holds a wealth of resources and activities which would be suitable for clubs. [www.nationalstemcentre.org.uk/elibrary](http://www.nationalstemcentre.org.uk/elibrary)

The STEM Directories is a searchable database of activities offered to schools by external providers, many of which would be suitable for a club setting. Costs vary, although grants to use the listed activities are sometimes made available. [www.stemdirectories.org.uk](http://www.stemdirectories.org.uk)
One-off activities

**British Science Week**

The British Science Association runs the annual British Science Week every March. You can register an event as part of the week long activities, find out if you are eligible for a grant, or search for inspiration using their activity pack.

[www.britishscienceweek.org](http://www.britishscienceweek.org)

**IOP Physics Activity Pack**

The Institute of Physics has an activity pack specifically for STEM clubs, with ideas for each week of a club plus shorter activities.


**Marvin and Milo**

The Institute of Physics’ cartoon cat and dog team perform a different demonstration each month, perfect for a one-off activity.


**Raspberry Pi**

Raspberry Pi have a range of resources which use Raspberry Pi computers in activities that focus across STEM to show how computing and maths can be used to investigate and observe science and engineering.

[www.raspberrypi.org/resources](http://www.raspberrypi.org/resources)

**Royal Society of Chemistry**

The Royal Society of Chemistry has a range of educational resources, including a browsable database of activities, lists of recommended presenters and competitions. Further support is available through regional education co-ordinators.

[www.rsc.org/campaigning-outreach/education-outreach/schools-outreach](http://www.rsc.org/campaigning-outreach/education-outreach/schools-outreach)

**Sciencelive**

Sciencelive is an online directory of speakers, presenters and workshops delivered by professional science and engineering communicators.

[www.sciencelive.net](http://www.sciencelive.net)

**Science Museum**

The London Science Museum has a range of activities and online games. Boxes of kit for specific activities, e.g. Crime Lab and Mars Mission, are available for purchase.

[www.sciencemuseum.org.uk/educators/teaching_resources/activities.aspx](http://www.sciencemuseum.org.uk/educators/teaching_resources/activities.aspx)

**Six week STEM Club**

MerseySTEM has put together a six week programme of activities that you can repeat every half-term with a different set of students each time.

[www.merseystem.co.uk/stemnet/clubs/six-week-stem-club](http://www.merseystem.co.uk/stemnet/clubs/six-week-stem-club)

**whynotchemeng**

The whynotchemeng features hands-on experiments and flash bang demos.

[www.whynotchemeng.com/teachers](http://www.whynotchemeng.com/teachers)

**Young Engineers and Science Clubs Scotland**

Young Engineers and Science Clubs Scotland have put together a list of resources for Scottish STEM Clubs.

[www.yecscotland.co.uk/secondary_school_resources.html](http://www.yecscotland.co.uk/secondary_school_resources.html)
Short projects

Applying Mathematical Processes
The Nuffield Foundation’s Applying Mathematical Processes project has a mix of downloadable investigations and practical explorations that could be used in a club context.
www.nuffieldfoundation.org/AMP

Bowland Maths
Bowland Maths materials consist of case study problems designed to develop thinking, reasoning and problem solving skills.
www.bowlandmaths.org.uk

British Science Week
The British Science Association runs the annual British Science Week every March. You can register an event as part of the week long activities, find out if you are eligible for a grant, or search for inspiration using their activity pack.
www.britishscienceweek.org

James Dyson Foundation
The James Dyson Foundation has various engineering activity resources, plus you can apply for a free loan of an Engineering Box.
www.jamesdysonfoundation.co.uk/resources

I’m a Scientist. Get me out of here
I’m a Scientist... is a free online event where school students get to meet and interact with scientists. It’s a free X Factor-style competition between scientists, where the students are the judges.
www.imascientist.org.uk

Institution of Engineering and Technology
The Institution of Engineering and Technology holds free resources covering all four STEM areas. Activities range from 20mins to 7hrs.
http://faraday.theiet.org/index.cfm

IOP Physics Activity Pack
The Institute of Physics has an activity pack specifically for STEM clubs, with ideas for each week of a club plus shorter activities.

NRICH – enriching mathematics
The NRICH website contains many maths-related activities and features a specific list of those suitable for STEM clubs.
www.nrich.maths.org/8975
Practical Action Challenges
The Practical Action STEM Challenges are a range of activities based around how science and technology can be used to address global issues such as energy, water and food.
www.practicalaction.org/schools

Real-Life Maths
STEMNET has developed six classroom resources that enable students to have a go at solving some real-life maths challenges for themselves. Each resource features a STEM Ambassador who tackles these types of real-life maths challenges in their day-to-day STEM job role.
www.stemnet.org.uk/real-life-maths

Royal Academy of Engineering
The RAEng has a range of free activities and resources with specific advice and suggestions for STEM clubs.
www.raeng.org.uk/education/schools/education-programmes-list

Royal Society of Chemistry
The Royal Society of Chemistry has a range of educational resources, including a browsable database of activities, lists of recommended presenters and competitions. Further support is available through regional education co-ordinators.
www.rsc.org/campaigning-outreach/education-outreach/schools-outreach

Science and Plants for Schools
The Science and Plants for Schools site features a range of activities, including ones specifically recommend for a STEM club setting.
www.saps.org.uk/secondary/science-club-activities

Science Museum
The London Science Museum has a range of activities and online games. Boxes of kit for specific activities, e.g. Crime Lab and Mars Mission, are available for purchase.
www.sciencemuseum.org.uk/educators/teaching_resources/activities.aspx

STEM Challenges
The STEM Challenges programme started as a series of Challenge competitions for secondary schools. Each Challenge was originally inspired by London 2012 and aimed to provide students with an opportunity to use their STEM skills and help provide a real-life context for these skills.
www.stemchallenges.net

Tomorrow’s Engineers
Tomorrow’s Engineers have activities that introduce engineering principles and examples of engineering challenges in real life.
www.tomorrowsengineers.org.uk/resources/engineering_activities
Long projects

4×4 in Schools
The 4×4 in Schools Technology Challenge involves teams of students designing and building a radio controlled 4×4 vehicle that can negotiate a test track. There are regional and national finals.
www.4x4inschools.co.uk

Bloodhound Project
The Bloodhound Project, which seeks to inspire students by building a car to break the world land speed record, has related educational resources including a design and engineering competition.
www.bloodhoundssc.com/education

BP Ultimate STEM Challenge
The Ultimate STEM Challenge is a competition brought to you by BP, the Science Museum and STEMNET. Teams of 2 to 4 students aged 11 to 14 from across the UK to put their Science, Technology, Engineering and Maths skills to the test and win some fantastic prizes.
www.bpes.bp.com/stem-challenge/ultimate-stem-challenge

Citizen Science Projects
There are a number of online citizen science projects that students can take part in and contribute useful data to. The Zooniverse site hosts a range of projects, from finding planets around other stars to characterising bat calls, with some having specific teacher resources.
www.zooniverse.org

CREST Awards
CREST, managed by the British Science Association (BSA), is a UK award scheme recognising success, building skills and demonstrating personal achievement in STEM project work. The scheme offers a structured method of building evidence towards gaining different levels of award.
www.britishscienceassociation.org/crest-awards

F1 in Schools
The F1 in Schools Challenge sees teams of students use CAD/CAM software to design, manufacture, test and then race miniature gas powered F1 cars. Winning teams can progress from regional to national then international finals.
www.f1inschools.co.uk

FIRST LEGO League
The FIRST LEGO League involves teams building, testing, and programming a robot to complete a series of missions in a specialised arena. The theme of the challenge varies each year. Requires the use of LEGO Mindstorms kit.
http://firstlegoleague.theiet.org

Greenpower
The Greenpower competition sees students constructing, within specific regulations, an electric car and then racing it. There are regional and national finals.
www.greenpower.co.uk
Jaguar Cars Maths in Motion Challenge
Using software that simulates the setting up of a racing car, students perform a variety of mathematical tasks in an effort to win a series of races, first in school then at a regional and national level.

www.mathschallenge.co.uk

Longitude Explorer
Longitude Explorer is a youth focused challenge for secondary school pupils aged 11-16, which aims to provide a practical education opportunity linking young people to the history of the Longitude while supporting them to develop STEM skills for the 21st century.

www.longitudeprize.org/schools

OPAL
The OPAL (Open Air Laboratories) project hosts a range of programmes across England that allow participants to monitor the state of the natural environment and its biodiversity.

www.opalexplorenature.org

National Science and Engineering Competition
The National Science and Engineering Competition is open to all 11-18 year olds living in the UK and in full-time education. The Competition aims to recognise and reward young people’s achievements in all areas of science, technology, engineering and mathematics (STEM).

www.nsecuk.org

NCUB Talent 2030 Competition
The National Centre for Universities and Businesses Talent 2030 competition aims to encourage talented young females to pursue careers in manufacturing and engineering – including software development.

www.talent2030.org

Nuffield STEM projects
The Nuffield Foundation have a range of cross-curricular projects that give 11-14 year olds the opportunity to apply STEM knowledge and skills to solve topical problems.

www.nuffieldfoundation.org/stem

Smallpeice Trust – STEM-in-a-Box
The Smallpeice Trust offers for purchase a kit designed for a STEM club for Year 8 and Year 9 students to run 6-8 weeks. The current kit focuses on propelled gliders.

www.smallpeicetrust.org.uk/index.php?option=com_content&task=view&id=1216&Itemid=475

VEX Robotics Competition
The VEX Robotics Competition allows students to design and build a robot from scratch to compete in regional, national and international events. Requires the use of the VEX Robotic Design System.

www.vexrobotics.com/vex/competition/vex-robotics-competition