The Institution of Engineering and Technology

Education

STEM resources and programmes

from IET Education

2020 – 2021

Science, technology, engineering and maths for a new generation

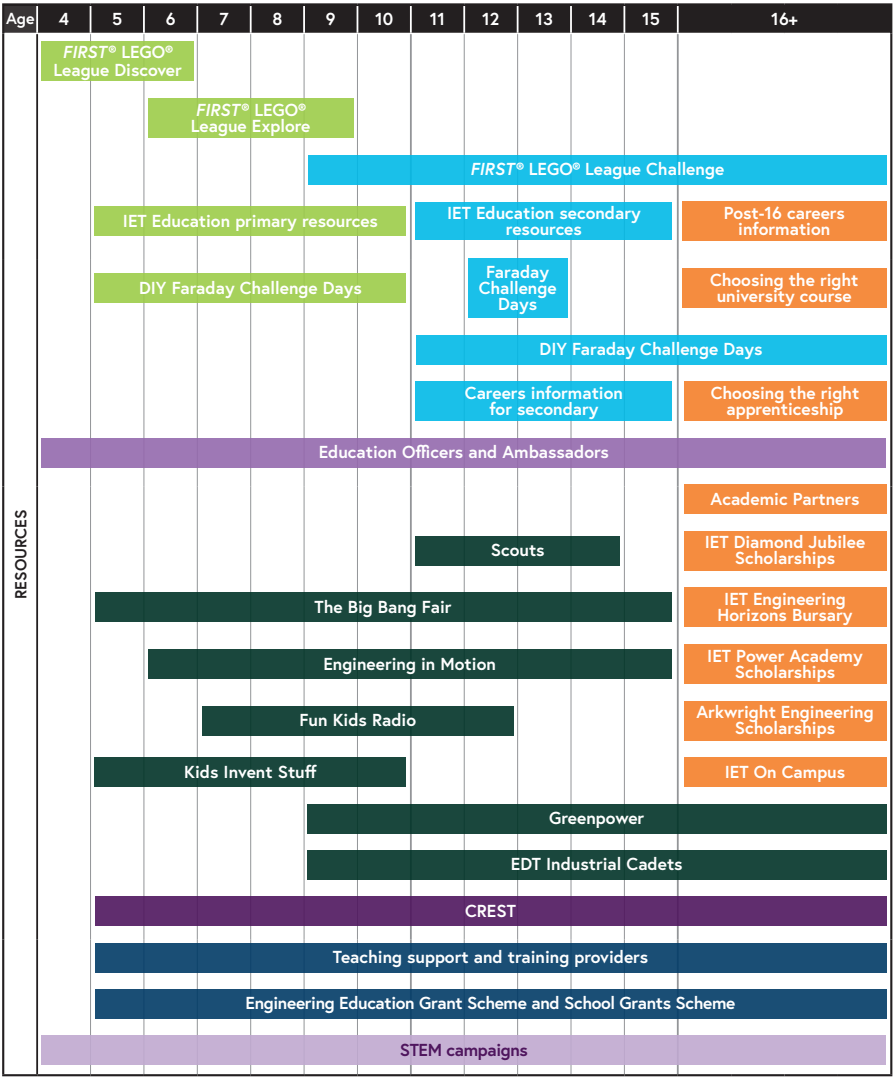
theiet.org/education

@IETeducation

I50
1871 - 2021

Ready to inspire the next generation of engineers?

Discover which IET Education programme is right for you in our resources table – by age group



Sign up to our monthly IET Education Bulletin
theiet.org/education-bulletin

Contents

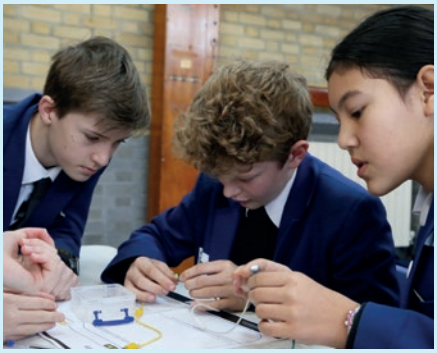
The IET is inspiring the engineers and technologists of tomorrow

As we move into 2021, we'll be celebrating our 150th anniversary, while we help students from all walks of life access the amazing opportunities available on their journey to rewarding careers in engineering and technology.

The world is evolving rapidly around us with technology touching all aspects of everyday life. It has never been more important to inspire young people into STEM (science, technology, engineering and maths).

The IET, along with its partner organisations, provides support to both teachers and students, helping to develop skills which are valuable not just in the engineering sector, but across the global economy.

We offer a wide range of FREE curriculum-linked resources for schools/teachers, community group leaders and parents who are teaching STEM to young people from the age of four through to 19.



Resources include:

- careers information
- grant funding
- support for disadvantaged pupils
- scholarships and training to support the delivery of STEM activities
- initiatives within and outside of the classroom
- curriculum-linked activities

Education as we know it has changed due to the COVID-19 pandemic

Now more than ever, students need to be able to access resources to help them continue their learning, whether that's in the classroom or at home.

The IET remains committed to providing support and opportunities during these unprecedented times and we've been quick to provide home learning resources for parents to access, along with free project kits for schools educating children of key workers.

At the time of producing this education booklet, we're still unsure how education will look for the forthcoming academic year, but whatever the situation and guided by our IET Teacher Advisory Panel, we will adapt our programmes and offerings to meet the STEM education needs of schools, teachers, students and parents.

If you are inspired by the programmes and resources in this booklet, please refer to the website links on each page to ensure you access the most up-to-date and relevant information as we adjust to accommodate the new way of teaching.

David Lakin
IET Head of Education and Safeguarding

Key

Look out for our symbols on each programme page:

This programme has an associated cost

IET Education Officers and Ambassadors are on hand to help *(more info on pages 28-29)*

Awards and accreditation

EDT Industrial Cadets *(page 46)*

CREST *(page 47)*

Gatsby Benchmark ✓
1 2 3 4 5 6 7 8

Government career strategy *(page 50)*

The IET and disadvantaged pupils

"On the tube back home, they were all discussing what they would do differently and how they would continue next year if they were to do it again. As a result, *FIRST*® LEGO® League is continuing as an after-school club and we are hoping to develop our current work to share with the whole school and parents during Science Week."

"Taking part in the competition gave the children a chance to mix with peers they wouldn't normally spend time with and promoted team work and problem solving within a unique setting - at school and as part of the competition day."

Secondary school teacher

At the IET we believe that every child, regardless of their background, deserves the opportunity to participate in our programmes. We are committed to reducing inequality and closing the attainment gap between disadvantaged pupils and their peers across the country by breaking down the barriers to social mobility. We want to see more disadvantaged young people participating in our programmes, attending our finals, being inspired and progressing through to the most rewarding careers in STEM.

To be eligible you need to

1. have more than 25% Free School Meals in your school
2. be one of the 12 Opportunity Areas highlighted by the government

- West Somerset
- Norwich
- Blackpool
- North Yorkshire coast
- Derby
- Oldham
- Bradford
- Doncaster
- Fenland and East Cambridgeshire
- Hastings
- Ipswich
- Stoke-on-Trent

We are proud to be working with sponsors, supporters and donors who enable teams from disadvantaged backgrounds to participate in the IET Faraday Challenge Day and IET *FIRST*® LEGO® League programmes.

If you think that your school or group might be eligible, please email us to find out more:

ieteducation@theiet.org

"We had a fantastic first year and are excited for year 2 now we know what to do! We won a trophy for best project which was totally unexpected. We've also organised a LEGO® Friendly between local schools that entered the main competition so that we can keep our skill set ticking over for the year."

School teacher

Our IET Faraday programme is completely free to all schools. Schools who meet the criteria on page six will be prioritised on application.

During the 2019-2020 IET Faraday Challenge Day season, we reached 47 schools who met this criteria.

Please apply on our website.

theiet.org/faraday

STEM Ambassadors and our IET Education Officers and Ambassadors are on hand to help provide free STEM resources in your school. Find out more on pages 28-29.

We're sure you are aware that this funding is solely to widen the opportunity to children experiencing hardship and to broaden opportunities. We trust that you as teachers will use this opportunity to reach the children on Pupil Premium, children experiencing hardship, or who may face, or have faced challenges or obstacles in their lives.

IET Education: Primary resources

Engage students with our inspirational and exciting activities.

Our education programme introduces young people to the sheer excitement of science, technology, engineering and maths.

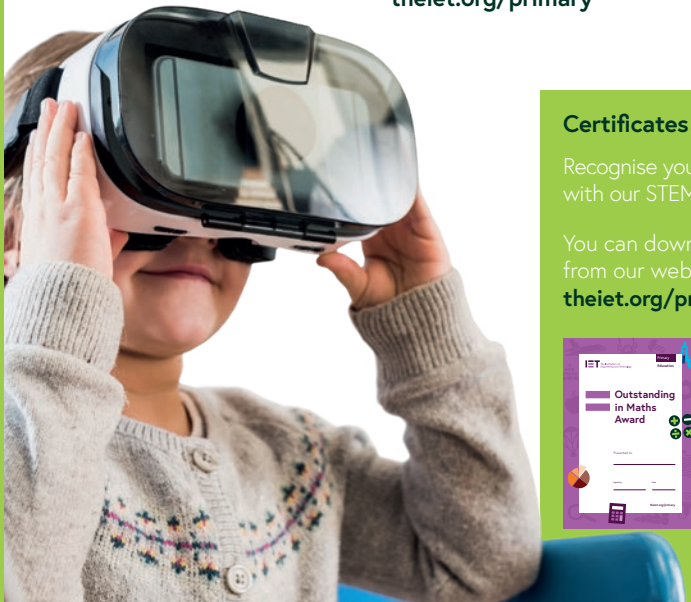
Our primary resources are free and all available through our website.

Teaching resources

Our teaching resources will enhance your teaching and bring students' learning to life. The resources are designed to support the delivery of key topics within design and technology, maths and science. They provide practical activity ideas that could be used as one-off activities or linked with other areas of the curriculum and are all fully editable so you can tailor them to your students' or school's needs.

Join in and work through the activities on offer to spark your pupils' curiosity.

theiet.org/primary



Certificates

Recognise your students' achievements with our STEM certificates!

You can download them from our website **theiet.org/primary**

DIY Faraday Challenge Days

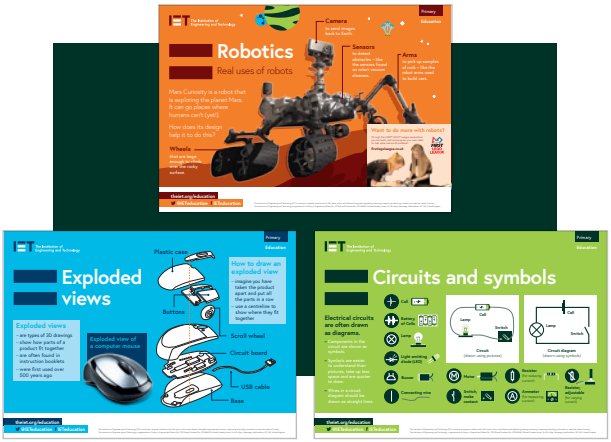
Download our free guidelines and electronic resources that will take you through a classroom-based engineering challenge day, with an introductory presentation, handouts, video clips, printable Faraday currency and student certificates.

theiet.org/primary

STEM posters

Our visual aids bring engineering to life in your classroom or home learning space, with posters covering a range of topics.

With hard copies and PDF downloads available, there's something for everyone!



Find all our primary resources online at **theiet.org/primary**

Follow us online:

IETeducation

FIRST® LEGO® League Discover

Wonder, question and discover.

The IET is the operational partner for *FIRST*® LEGO® League Discover in the UK and Ireland - an exciting STEM programme for 4-6 year olds.

FIRST® LEGO® League Discover is a playful introductory STEM programme which happens in the classroom. Children work in teams of four to explore a real-world theme using an exclusive LEGO® Education Discover model. Using this as inspiration, they then design their own models using LEGO® DUPLO elements to solve meaningful problems.

Children also have a set of Six Bricks that are used for playful starter activities to practice memory, movement, creativity and more! The programme finishes with a celebration event to recognise the children's achievements.

"It has been a brilliant experience to be able to implement STEM activities in such a fun and fascinating way. It has made me more confident as a class teacher."

P1 class teacher

*Class Pack: £55-£105 (+VAT) for Discover Sets, Discover More Sets and supporting materials. LEGO® STEAM Parks are required in addition and are not included. Top-up packs: £6-£10 (+VAT) for additional classes.

"I loved the Six Bricks challenges – I thought it gave a great understanding and insight into the childrens' ability to listen to and follow instructions, solve some problems, communicate with one another etc. I also enjoyed the flexibility and freedom the children had to express and share their ideas and opinions."

Primary class teacher

As they work, the children develop valuable habits of learning, such as persisting with tasks and applying previous knowledge to new situations.

Throughout their experience, teams operate under the *FIRST*® LEGO® League Core Values; celebrating discovery and teamwork, all while having fun!

More details can be found on the *FIRST*® LEGO® League Discover website:

theiet.org/discover

FIRST® LEGO® League Explore

Build, code, research and share. A fun STEM programme for 6-9 year olds.

"We have found *FIRST*® LEGO® League Explore to be a wonderful experience. The children have enjoyed the preparation, subject matter, building and design so much - it has been so good for them on so many levels. The festival was such a super day out for the children (and adults!); it really tops the whole project off!"

FIRST® LEGO® League Explore Coach

***FIRST*® LEGO® League Explore is delivered by the IET as the operational partner in the UK and Ireland.**

Children work in teams to research a specified theme relevant to the world around them, displaying their ideas on a Show Me poster. They also build a LEGO® model and program it to move using LEGO® Education WeDo 2.0. Teams then attend an IET regional festival or an in-school Class Pack event.

*£25 (+VAT) for a team of up to six members, that will go to a regional festival. Includes 1 x Explore Set, 1 x Team Meeting Guide and 6 x Engineering Notebooks.

**£70-£180 (+VAT) for Class Pack Registration, dependent on class size. This includes Explore Sets and supporting materials.

FIRST® LEGO® League Explore rapidly develops teamwork, design, programming and communication skills, but most importantly it is great fun. It makes the children feel proud of what they have achieved - encouraging them to continue engaging with STEM.

"As a *FIRST*® LEGO® League tournament host, I have found the introduction of *FIRST*® LEGO® League Explore into our schools extremely beneficial in terms of embedding the necessary skills earlier in the key stages. Not only does it promote the skills needed to build and program, it encourages the essential skills of independent learning, critical thinking and teamwork. *FIRST*® LEGO® League Explore provides a safe environment to explore these skills without fear of failure or the pressure of attaining a grade/result."

Fran Ward
***FIRST*® LEGO® League Explore Host**

Working in teams of up to six, *FIRST*® LEGO® League Explore can be delivered in two ways:

- **Regionally:** as either curricular or extra-curricular. Teams work towards attending a regional festival along with other teams to share their accomplishments.
- **Class Pack:** within the curriculum. Class Pack engages a whole class working in multiple teams, with an in-school festival to celebrate their achievements.

More details can be found on the *FIRST*® LEGO® League Explore website:

theiet.org/explore

FIRST® LEGO® League Challenge

A global robotics-based life skills competition, run by the IET as the operational partner in the UK and Ireland.

FIRST LEGO LEAGUE CHALLENGE

"There are no words that can express my appreciation for what this programme has done for the children involved. It is for me without doubt of huge value to UK and Irish education. I often tell the students that there are days that stay with you as long as you live. IET *FIRST*® LEGO® League keeps supplying our team with those, so thank you for that."

Neil Corrigan, Team Coach

Competing teams engage with a real-world issue, develop skills which are crucial for the workplace, and work with STEM professionals in a way that is both inspiring and fun.

What is unique about *FIRST*® LEGO® League is that teams must demonstrate Core Values in everything they do. These are about inclusion, teamwork and FUN!

***FIRST*® LEGO® League Challenge can be delivered in two ways:**

- **Regionally:** teams work towards competing at a regional tournament, with the opportunity to qualify for national or international finals.

or

- **Class Pack:** within the curriculum, engages a whole class, working towards an in-school event.

*Team Event Registration: £150 (+VAT) for Challenge Set, supporting materials and registration to a regional tournament. LEGO® MINDSTORMS® or SPIKE™ Prime set and device (laptop/tablet) are required in addition and are not included.

Class Pack: £265 (+VAT) for 2 x Challenge Sets, supporting materials, medals and trophy. LEGO® MINDSTORMS® or SPIKE™ Prime sets and devices (laptops/tablets) are required in addition and are not included.

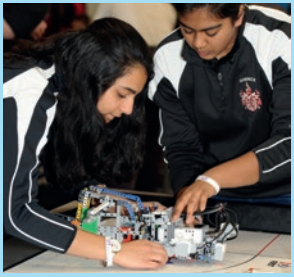
Gatsby Benchmark ✓

1 2 3 **4** **5** **6** **7** 8

Teams consist of up to 10 young people (aged 9-16 years) and an adult coach. Once registered they receive the challenge information and a bespoke set of LEGO® missions to build.

They design, construct and program a robot using a LEGO® MINDSTORMS® or SPIKE™ Prime kit and create an innovative solution to a real-world problem which they present to the judges at the tournament.

The team work together on the different challenges, seeking advice from experts in their community and preparing to give their best performance at their event.



There are four parts to the challenge:

1. **Robot Game:** teams build and program an autonomous robot to undertake a series of tasks around a themed playing field.
2. **Robot Design:** teams are judged on their robot design, programming and strategy.
3. **Innovation Project:** teams research, create and present a solution to a real-world problem linked to the annual theme.
4. **Core Values:** teams are judged on how they demonstrate the *FIRST*® LEGO® League Core Values which include teamwork, impact and innovation.

FIRST® LEGO® League Challenge develops skills in:

- applied science
- design and technology
- programming and control
- computing
- mathematics
- research
- communication and presentation skills
- strategic thinking
- teamwork
- self-confidence

More details can be found on the *FIRST*® LEGO® League Challenge website.

theiet.org/challenge

IET Education: Faraday Challenge Days

Gatsby Benchmark ✓
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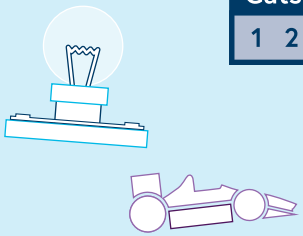


Encourage your students to develop skills for their futures - enter your school into one of our exciting Faraday Challenge Days.

The annual IET Faraday Challenge is an engineering-based competition for schools. Six teams of six students, aged 12-13 years, compete against one another to see who can design, create and promote the best solution to a given challenge. All challenges are genuine, real-life engineering problems.

They draw upon and reinforce learning from science, maths and design and technology lessons. Students need to demonstrate:

- creativity and innovation
- the ability to work as a team
- the capability to project manage and take on team roles
- presentation skills… and more!

Recent set-ups of real-life challenges have included working with Airbus on how they can transport aid or help people in times of need, assisting the engineering mission of the James Webb Space Telescope, designing a new attraction for Thorpe Park Resort and helping to improve the performance of the Land Rover BAR team.

The winners from each event receive prizes for themselves and their schools. The top teams across the UK win an all-expenses-paid trip to the National Final to compete for a cash prize for their school.

Visit our website for more information and apply to take part in a Faraday Challenge Day.

theiet.org/faraday

IET Education: DIY Faraday Challenge Days

Run your very own Challenge Day in your own time and on a theme that suits your students.

Available for schools, these packages offer guidelines and electronic resources that take you through the day, with an introductory presentation, handouts, video clips, printable Faraday currency and student certificates.

These resources are free to download and most of the practical materials you'll need are found in typical science or design and technology departments.

Why not invite our Education Officers and Ambassadors to give you a hand on the day and bring real-life engineering experience into the classroom?

2019-2020 season

52% of participants were **female**

70% increase in students who **after taking part** in a Faraday Challenge Day, would now consider studying or working in engineering

100% of teachers thought students **learned new concepts** and **expanded their knowledge base**

"I really liked this challenge as I love to be creative, I also understand more about engineering and want to look in to the careers available."

13 year old female participant

"Students practically learned in a pressurised, realistic situation, how to create and build different prototypes and improve their knowledge and understanding of scientific concepts. They were inspired to compete with each other and teams learned about what engineers really do!"

Secondary science teacher

IET Education: Secondary resources

Engage students with our secondary teaching activities and videos.

Take the hassle out of your lesson planning with our free curriculum-linked resources and activities.

We can do more to nurture students' interest and achievement in STEM by showing them the exciting, real-life applications of the subjects. If we want students to be fully equipped for their futures, we need to give them a grounding in these subjects and make them aware of the career choices in these fields.

Our resources introduce students to real-life, innovative examples of engineering and technology from around the world.

Types of resources

We provide the following resources, free-of-charge:

- classroom activities to drop into lessons or for home learning/schooling
- handouts
- classroom presentations
- videos

Each set of resources is brought to life in a modern engineering context by including:

- short films
- case studies and engineer profiles which can be used to inspire project work and help with careers guidance

Find all our secondary resources online at

theiet.org/secondary

Follow us online:

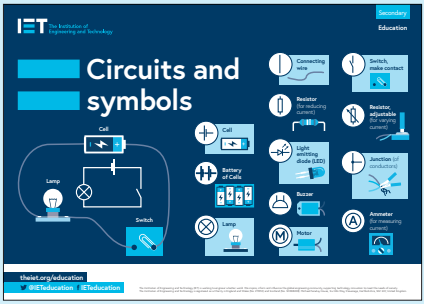
IETeducation

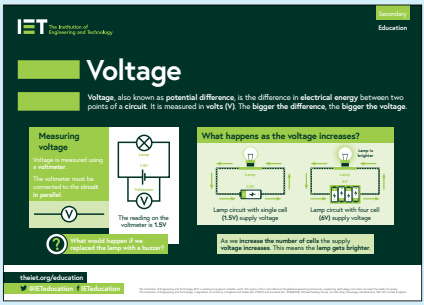
STEM posters

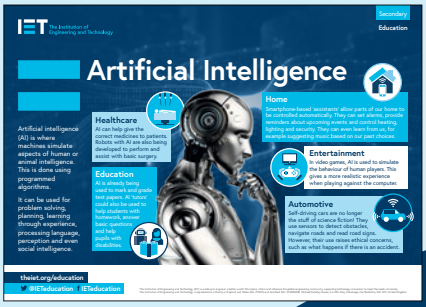
Use visual aids to make STEM topics more memorable.

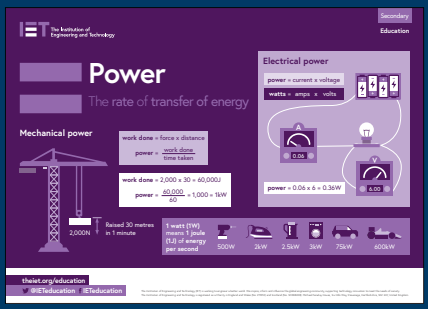
Our poster pack includes reference posters on electricity and electronics and topical posters with examples of some of the most innovative engineering around today.

The exact content of these packs will alter over time as new posters become available.









Find all our secondary STEM posters online at

education.theiet.org/secondary/posters

Careers information and scholarships

For students and apprentices who want to pursue careers in engineering and technology, we offer a number of scholarships and bursaries to support them with their education and training. We also accredit degrees and apprenticeship schemes to ensure they cover the content needed to help them get a job.

For those who are still deciding what they want to do, we provide careers guidance materials. These illustrate the huge range of possibilities open to young people in the sector and the entry routes available.

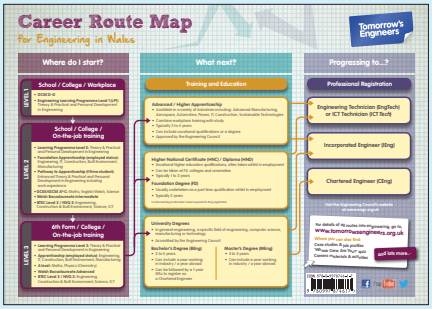
For more information, please visit

theiet.org/engineering-careers

Careers information for secondary students

Tomorrow's Engineers, in collaboration with the IET and other engineering institutions, produces a helpful range of careers information and resources for teachers and young people interested in engineering.

These include a route map (available in formats appropriate for each of the UK nations) illustrating the various academic and vocational routes into an engineering career.



tomorrowsengineers.org.uk

Gatsby Benchmark ✓

1 2 3 4 5 6 7 8

Post-16 careers information

If you're looking to advise sixth form or further education students - we've put together a collection of careers materials especially for them!

The materials include:

- route maps from Tomorrow's Engineers
- booklets about vocational and university engineering courses
- a booklet about 12 key areas of engineering
- IET scholarship and bursary flyers

theiet.org/engineering-careers

Choosing the right university course

Help your students work out which engineering course is right for them.

Students about to start an IET accredited course are eligible to apply for an IET Scholarship or Bursary (see pages 25 and 26).

The routes to engineering section of our website gives up-to-date advice on choosing a course and explains how we support students at university and in their early career.

Accredited courses

We run an accreditation programme, which monitors and certifies courses, checking and approving:

- facilities and staffing
- relevance to employers
- students' opinions about the course

Our list of currently accredited degrees includes mainly BEng (Hons), MEng and MSc qualifications covering electrical and electronic engineering, computing, mechanical and manufacturing engineering and more. Individual programmes include a wide range of specialisations, including nanotechnology, communications and renewable energy.

Go online today and find out how to point your students in the right direction.

theiet.org/career/routes-to-engineering

Search the list of IET accredited degrees and approved apprenticeship schemes at

theiet.org/accreditation

Choosing the right apprenticeship

Help your students work out which apprenticeship is right for them.

The apprentice section of our website is packed with advice on choosing the right apprenticeship, including details of IET schemes.

IET approved apprenticeship schemes

To gain IET approval, an apprenticeship provider needs to have demonstrated that their education and training meets certain quality standards and that they are committed to helping apprentices progress and develop. They must also provide apprentices with the skills they need as a basis for professional registration.

Explore what's available and help your students make the right choices.

Students and apprentices on an IET approved apprenticeship scheme or degree apprenticeship are eligible to apply for an IET Engineering Horizons Bursary (see page 26).

theiet.org/career/routes-to-engineering

Academic Partners

IET Academic Partners are university departments that understand the value of association with the IET and want to enhance the student experience.

Studying at an IET Academic Partner university means students' IET membership fees will be partially or fully funded, and they benefit from an IET accredited course – an internationally respected benchmark awarded to high quality programmes.

Academic Partners work closely with us to make sure students get opportunities to join our On Campus groups, hear from industry speakers, and use our study and professional development resources.

Find out more
partnerships@theiet.org

Arkwright Engineering Scholarships

ARKWRIGHT ENGINEERING SCHOLARSHIPS

The Arkwright Engineering Scholarships programme is run by The Smallpeice Trust and is the most prestigious scholarship scheme of its type in the UK.

Funded by industry, academia, professional institutions (including the IET) and private donations, more than 400 Arkwright Engineering Scholarships are awarded each year. Each scholarship provides two years of enrichment for the student and a financial award for the school each year.

Who can apply?

Students who are currently in the year in which they are taking their GCSE exams (or equivalent) and will go on to study an A-Level (or equivalent) STEM subject at a school affiliated with Arkwright may apply for a scholarship.

arkwright.org.uk

IET Diamond Jubilee Scholarships

These scholarships are for high-achieving students with good A levels and a passion for engineering.

Who's it for?

Students who are about to start an IET accredited engineering or technology undergraduate degree. Successful recipients will be chosen based on the quality of their application, their achievements to date, and their commitment to engineering.

What's on offer?

At least £1,000 per year for up to three years for Bachelor degrees and four years for Master degrees. Successful recipients also receive free student membership for the duration of their course and opportunities to have summer placements, visits and mentoring with engineering companies.

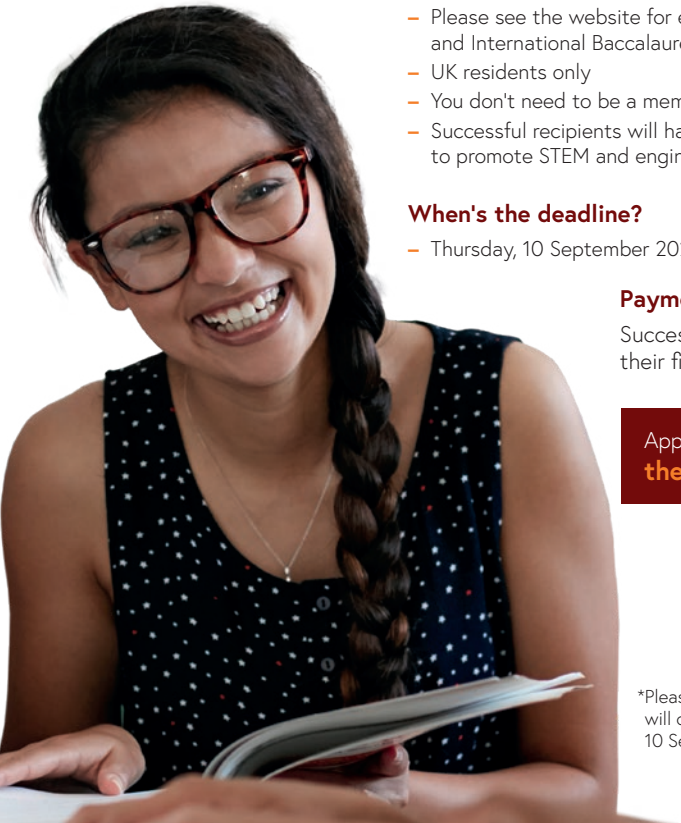
What else do I need to know?

You should have achieved at least **ABB** at A Level.

- Please see the website for equivalent Scottish and International Baccalaureate qualifications
- UK residents only
- You don't need to be a member of the IET
- Successful recipients will have opportunities to promote STEM and engineering

When's the deadline?

- Thursday, 10 September 2020*



Payments

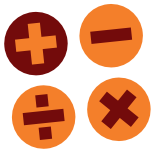
Successful candidates will receive their first payment in January 2021.

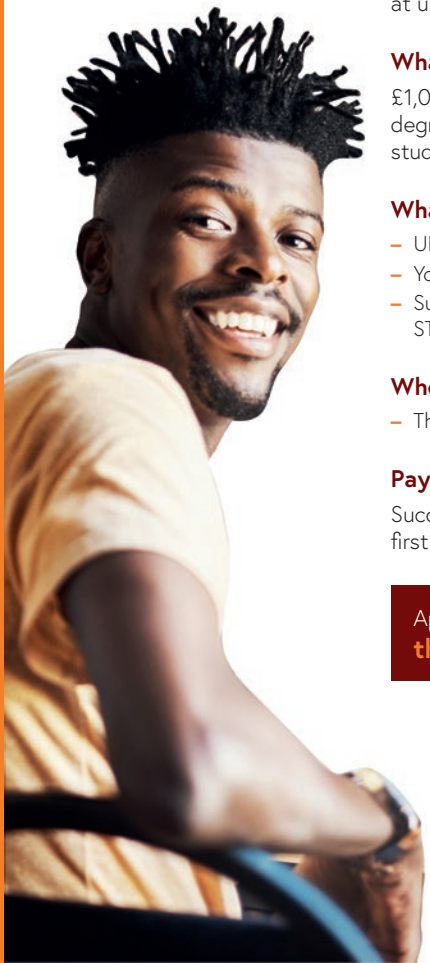
Apply today
theiet.org/diamond

*Please note the application system will close promptly at 5pm BST on 10 September.

IET Engineering Horizons Bursary for Students

These bursaries are for students who have not necessarily followed the A level route, have faced financial challenges or personal obstacles and have a passion for engineering.





Who's it for?

Students could be about to start their undergraduate degree, or already enrolled on it in any year, but their course must be IET accredited. They can be a part-time or full-time or a mature student. We especially welcome applicants joining university with a HNC, HND, Access to Higher Education Diplomas or similar qualifications, or those who have just completed a Foundation Year at university.

What's on offer?

£1,000 per year for up to three years for Bachelor degrees and four years for Master's degrees, plus free student membership.

What else do I need to know?

- UK residents only
- You don't need to be a member of the IET
- Successful recipients will have opportunities to promote STEM and engineering

When's the deadline?

- Thursday, 10 September 2020*

Payments

Successful candidates will receive their first payment in January 2021.

Apply today
theiet.org/horizons

*Please note the application system will close promptly at 5pm BST on 10 September.

IET Power Academy Scholarships

The Power Academy partnership between companies and universities offers a host of benefits to help students enhance and progress their career in engineering.

We have a number of scholarships each year for students to get an annual bursary, mentoring from leading industry partners, paid summer placements and the opportunity of a career with their sponsoring company after graduation.

For more information, visit
theiet.org/poweracademy

IET On Campus

This initiative allows students to set up their own engineering societies with support from the IET. They gain fantastic opportunities that they might not otherwise have had access to.

Groups promote engineering and the IET, as well as develop soft skills that students do not typically gain through their studies.

Benefits for students

- develop skills necessary for the workplace
- network with professional engineers
- explore career opportunities
- get funding for events and activities
- discover volunteering opportunities

Find out more
theiet.org/oncampus

oncampus@theiet.org

IET Education Officers and Ambassadors

Gatsby Benchmark ✓
1 2 3 4 **5** **6** 7 8

IET Education Officers (EOs) and IET Education Ambassadors (EAs) are IET members who volunteer to help introduce young people to the exciting world of STEM and raise awareness about engineering careers.

Education Officers and Ambassadors are typically registered STEM Ambassadors, and can support a variety of opportunities for young people to learn about engineering. They:

- represent the IET at careers and science fairs
- give careers talks
- act as advocates for applications to the Engineering Education Grant Scheme
- support competitions, after-school clubs and other school events

There is generally one Education Officer or Ambassador in each UK county. For an introduction to your local volunteer contact us at **ieteducation@theiet.org**

STEM Ambassadors

Bringing engineers into the classroom.

IET members registered as STEM Ambassadors are available to support school activities and bring real-life engineering experience into the classroom.

STEM Ambassadors can support activity days, after-school clubs, careers events and even lessons.

The national STEM Ambassador programme enables teachers to bring trained and checked professionals into the classroom to support teaching and inspire students.

To find out more and request a STEM Ambassador visit **stem.org.uk**

If you are interested in learning how you could get involved with these programmes, then please contact us at ieteducation@theiet.org to start your rewarding journey today.

Look at me now

For children, toys and imagination represent a world of possibilities and invention. For engineers and scientists, the possibilities and invention never end. They are proof that our toys and dreams today impact our innovations tomorrow.

The child who loved LEGO® now designs buildings. The child with the telescope is now an astronaut. And, the child who dreamed of being a magician is now an electronics engineer, changing the world through technology.

#IETLookAtMeNow explores which toys and dreams our engineers had as children and how they've influenced what they're doing now – sharing these great stories from around the world.

Our stories – our engineers reveal the dreams and toys of their childhood, which set them on the path to their careers today and discuss how you could get there too. We are releasing a new profile every week throughout 2020.

Children's activities - activities, games and resources to have a go at with children! Get creative, invent and consider engineering as a possible and real future career.

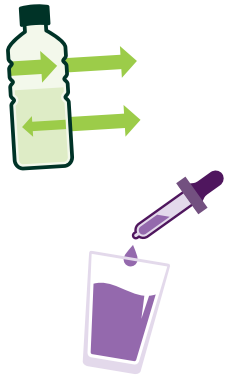
Take a look at
theiet.org/look-at-me-now

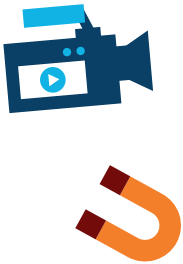
IET video resources

Looking for fun and engaging STEM experiments to do with children?

We're working with STEM Ambassadors, IET Education Officers and Ambassadors, teachers and parents to bring you a range of videos that you can watch at home or in school with children.

Give them a go yourselves - each video will show you how to create some fantastic STEM experiments using everyday items found in the home or simply refresh your memory on some popular lesson topics!





Take a look at

education.theiet.org/video-teaching-resources

Engineer a Better World

Our annual nationwide **Engineering Open House Day** attracted over

4,000

children and their parents to more than **60 organisations** across the UK in 2019.

Our **Life on Mars** competition in 2019 achieved **115 pieces of media coverage** across broadcast, national, regional and trade press.

The IET's Engineer a Better World campaign shows parents and their children the huge variety of exciting, creative and stimulating careers in modern engineering.

Engineering and technology are improving our world and shaping our future, touching every part of our lives. From the music you listen to and the phone in your hand, to the clean water you drink and the innovations that are helping to restore our oceans, engineering and technology are at the heart of everything.

This campaign aims to show young people that they can make a difference and demonstrates just how inspiring and fantastic a career in engineering and technology can be. We've worked with the likes of Blue Peter and the Beano, as well as Mark Cavendish and Konnie Huq to help us spread the word that engineering and technology is for everyone.

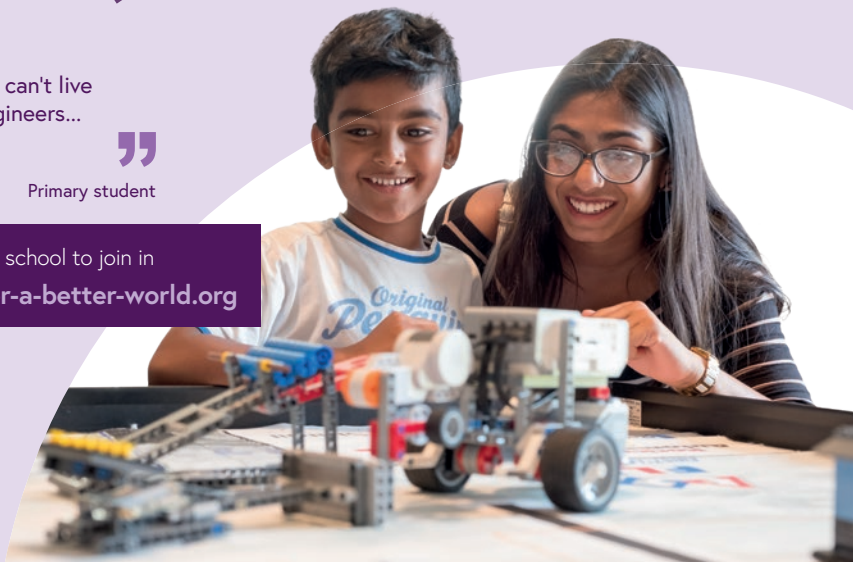
Engineering Open House Day is also part of this campaign and is an educational and fun day out for parents and their children. Companies across the UK open their doors and give us behind-the-scenes access to the wonderful world of engineering and technology.

"I learnt you can't live without engineers..."

Primary student

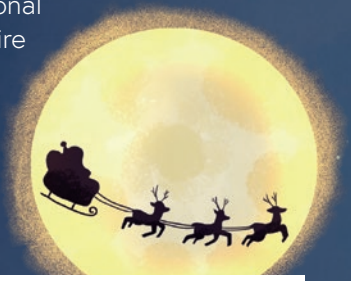
Help your school to join in

engineer-a-better-world.org



Santa Loves STEM

This IET campaign aims to spread some seasonal magic as well as inspire the next generation.



"More than 200,000 people with engineering skills are required each year to meet demand through to 2024, however, it's estimated that there will be an annual shortfall of 59,000 engineers and technicians to fill these roles..."

David Lakin, IET Head of Education and Safeguarding

The IET has

1,000s of resources

download our free educational activity packs and find one to suit you at theiet.org/education

Each year, our campaign gets bigger and better as we show how STEM subjects are integral to the festive celebrations.

We've had poems and animated stories about Christmas and in 2019, Steve Backshall (BBC TV's Deadly 60 and Expedition with Steve Backshall) told the story of how science, technology, engineering and maths saved the day for Santa and his family.

The poem tells young people and their influencers the importance of STEM in solving problems and the fulfilling and exciting careers available through studying these subjects.

The IET's vision is to engineer a better world and with a shortage of engineers, especially women, this important campaign aims to encourage children into STEM in a festive and heart-warming way.

Steve Backshall said: "There is a real need for the next generation to have STEM skills and the IET's festive campaign is a really engaging way of reaching the younger generation and showing them the ways in which STEM is used to help solve problems of all shapes and sizes."

Last year, we reached **over 600K children**.
How many can Santa inspire this December?
Join us **#SantaLovesSTEM**

theiet.org/santa-loves-stem

Teaching support and other STEM providers

Working alongside others to engage young people with engineering and technology.

Tomorrow's Engineers

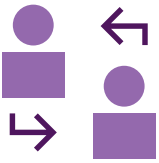
Tomorrow's Engineers is a collaborative project from the engineering community to promote engineering careers to young people, their teachers and their parents. It includes high quality careers resources, STEM enrichment activities and builds links between employers and schools.

tomorrowsengineers.org.uk

Association of Science Education (ASE)

The professional association for science teachers. The ASE provides a range of resources, training and networking opportunities, including their annual and regional conferences.

ase.org.uk



The Design and Technology Association

The professional association for design and technology teachers. The association provides a range of resources, training and networking opportunities.

data.org.uk

Institute of Physics (IOP)

Promoting physics and bringing physicists together for the benefit of all. The IOP provides a range of resources, funding, training and networking opportunities for physics teachers.

physics.org
iop.org

Project ENTHUSE

Project ENTHUSE is a funding partnership that allows the provision of subject-specific Continuing Professional Development (CPD) for teachers, technicians and other support staff at the National STEM Learning Centre in York and through partners in Northern Ireland (Department of Education Northern Ireland), Scotland (SSERC) and Wales (Techniquest).

stem.org.uk/project-enthuse

Institution of Mechanical Engineers (IMechE)

The IMechE is a professional engineering institution, improving the world through engineering. In addition to the collaborative work with the IET, Tomorrow's Engineers and Teachers in Residence programme, the IMechE support Bloodhound SSC and Primary Engineer.

imeche.org

ESP

ESP is a collaboration of Scotland's colleges and industry partners, established to increase Scotland's capability and capacity to deliver the right skills for the energy, engineering and construction sectors to meet industry demand. ESP works to promote STEM initiatives in colleges around Scotland.

esp-scotland.ac.uk

EESW

EESW is an independent registered charity running schemes to inspire and motivate young people in Wales aged 8 - 19 to choose careers in STEM.

stemcymru.org.uk

Teach First

Teach First aims to end educational inequality. It finds, trains and supports new teachers to work in low income communities, developing these new teachers to become leaders in schools and to inspire children towards the future they want.

teachfirst.org.uk

The Big Bang Fair

The Big Bang is the largest celebration of science, technology, engineering and maths for young people in the UK.

The Big Bang UK Young Scientists and Engineers Fair is an award-winning combination of exciting theatre shows, interactive workshops and exhibits, together with careers information for school groups and families, provided by a wide range of people who are working in the field.

For more information, visit
thebigbangfair.co.uk

Scouts

£*

Inspiring generations with skills for life

The Scouts give almost half a million young people – of all genders, races and backgrounds – the skills they need for life.

Across the UK they're helping young people speak up, play their part and find their place in the world. By helping more young people gain these skills, they're inspiring generations, building stronger communities and contributing to a stronger society. We're so pleased to work in partnership with Scouts to inspire more young people into a STEM career. People like Tim Peake, Helen Glover and Chief Scout Bear Grylls all got their start in Scouts; now they're helping others follow in their footsteps.

Sponsoring the Scouts Electronics Badge, we have created a great resource pack to help volunteer deliver the electronics badge, a badge which can be challenging to deliver. Now, through our partnership, thousands more young people are taking steps to becoming STEM ambassadors of the future.

For more information, visit
scouts.org.uk

*Please refer to our partner's website for costs relating to this programme

eim ENGINEERING IN MOTION
INNOVATIVE EDUCATIONAL PROJECTS

4 x4 IN SCHOOLS technology challenge

SUBS in Schools UNITED KINGDOM

F1 in Schools

F1 in Schools Primary Class

4x4 in Schools

The challenge is to design and build a remote controlled electric 4x4 vehicle that will negotiate obstacles and perform specific tasks on an emulated off-road course.

For the 2020/21 season, 4x4 in Schools will operate as an in-school activity with a return to physical events planned later in 2021.

For more information, visit
4x4inschools.co.uk

SUBS in Schools

SUBS in Schools enables children to build a Remotely Operated Vehicle (ROV) before putting it through a series of underwater tests including a speed challenge, object retrieval and an obstacle course.

The competition is for teams of students, helping them explore scientific materials and manufacturing techniques. Underlying these activities is a core ethos of developing employability skills including communication and entrepreneurship. The challenge is supported by the IET, Royal Navy and several marine industry organisations.

For more information, visit
subsinschools.co.uk

F1 in Schools™

Students use CAD/CAM software to design, manufacture and race a miniature compressed air-powered F1® car.

The cars are small, made from an F1 in Schools Model Block and raced on a track just 25 metres long. With tremendous support from industry and the endorsement of Formula 1®, F1 in Schools is a truly inspiring opportunity for young people.

F1 in Schools Primary Class

The global education project F1 in Schools is now bringing STEM learning to life in the primary school classroom.

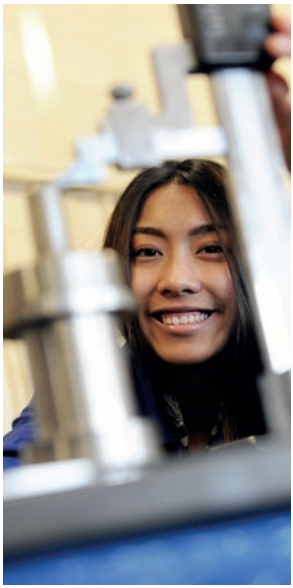
The F1 in Schools primary class enables children to design, make and test a model car before competing at a regional final and possibly progressing to a UK National Final. It is a complete cross-curricular action learning project.

For further information please visit
f1inschools.co.uk

For more information, visit
engineeringinmotion.com

*Please refer to our partner's website for costs relating to this programme

National Saturday Club



Across the UK, the National Saturday Club gives 13–16 year olds the opportunity to study subjects they love for free at their local university, college or cultural institution. In 2018/19 there were 78 Saturday Clubs and 1,600 Club members in 58 locations across the UK.

Offering dynamic creative learning programmes in four subject areas – Art and Design, Science and Engineering, Fashion and Business, and Writing and Talking – the model works to develop young people's skills, nurture their talents and encourage their creativity.

Through a year-long programme of weekly Saturday classes, national events and Masterclasses, Science and Engineering Club members are introduced to the latest industry thinking and technologies, encouraging them to develop practical and analytical skills and giving them the confidence to pursue future study and career opportunities in STEM.

For more information please visit
saturday-club.org

Follow us on Twitter **@NatSatClub**

The Micro:bit Educational Foundation

The BBC micro:bit device is a tiny, inexpensive computer that forms a bridge between abstract concepts and tangible experiences in the classroom. The Micro:bit Educational Foundation provides a supporting free educational package for teaching computing and digital skills to children aged from 7 to 14.

The Micro:bit Educational Foundation works with its founding partners (the IET, the BBC, Arm, Microsoft, Nominet, the British Council and Lancaster University) to secure a global legacy for the BBC micro:bit. A million devices were donated to UK schools in 2016 and there are now 20 million children learning worldwide with 4.5 million micro:bits in 60 countries.

Get started videos and guides explain computing concepts through real-world examples and quick physical computing projects children can create in minutes.

Free curriculum-linked **lessons** have easy-to-download editable resources for primary and secondary aged children.

Free online code editors take children from block coding in Microsoft MakeCode through to text-based Python. The MakeCode simulator means you don't even need physical micro:bits for many lessons and activities.

micro:bit classroom is a free tool that allows you to run live coding lessons, in person or remotely.

Dozens of quick **Make it: code it** projects are perfect for formal or informal learning.

You can access all these resources for free and without registration at **microbit.org**

*Please refer to our partner's website for costs relating to this programme

Fun Kids Radio

Fun Kids is a national radio station providing entertaining and informative programmes for children, available across the UK through DAB digital radio, online at funkidslive.com and through smart speakers.

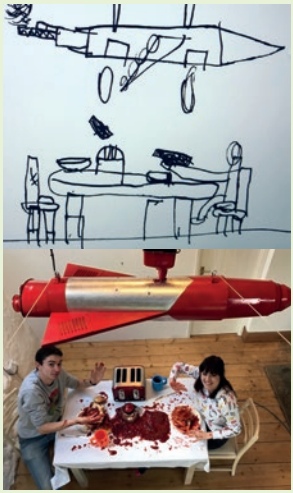
The IET and Fun Kids have developed several series of short audio programmes and videos for 8 to 12 year olds called 'Techno Mum' which aims to explain a wide range of technology that young people see around them.

Starring Tim and his engineer mother, Techno Mum, each episode looks at different ideas and the engineering behind it - from electric cars and motion sensor games, to supermarket scanners and much more.

You can even ask for a Techno Mum smart fact through Alexa.

The audio podcasts and videos, and even a comic, can be downloaded at
funkidslive.com/techno-mum

Kids Invent Stuff



Kids Invent Stuff is the YouTube channel where 5-11 year olds have the chance to get their invention ideas built by real engineers. This gives more primary school kids the chance to engage with real engineering projects.

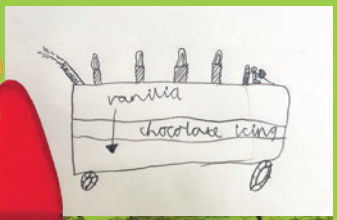
Kids are encouraged to submit their ideas for inventions to solve a different challenge each month. Ideas can be submitted as drawings or videos uploaded below.

The most creative inventions are showcased on their YouTube channel and each month one idea is built and tested on camera, with hilarious consequences.

Find out more at
kidsinventstuff.com

Kids Invent Stuff as seen on *Tomorrow's World Live*, *The One Show* and *BBC News Online*

Have you seen our feature on *BBC News Online*? Search for
The inventors bringing kids' crazy creations to life

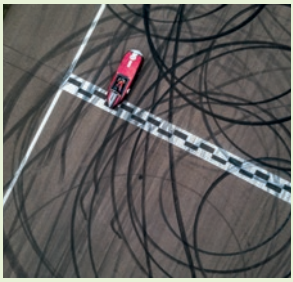


Greenpower

The highly successful Greenpower challenge to design, build and race a single-seat electric car provides young people with a unique hands-on opportunity to engage in STEM.

The proven project uses the excitement of motorsport to inspire students from primary school through to university to excel in the STEM subjects along with business studies, computing and physics.

Primary



IET Formula Goblins

Teams of students aged 9-11 assemble a Greenpower supplied kit following industry standard engineering diagrams. Bodywork is left for the teams to design and build using clear safety regulations as a guide. The winners will be the team that perform best in technical driver challenges and informal presentations at a Greenpower Goblin event.

Secondary

IET Formula 24

IET Formula 24 consists of two subdivisions. The first of these features teams of students aged 11-16 who race their cars at regional events in two races each lasting 90 minutes. The winners will be the car that achieves the greatest distance in that time, proving to be the most efficient vehicle.

Scratch built: Students design and build their cars using clear safety regulations as a guide. Only batteries and an electric motor are supplied as standard issue kit.

Kit car: Students assemble a Greenpower supplied kit following industry standard engineering diagrams. Bodywork is left for the teams to design and build using clear safety regulations as a guide.

IET Formula 24+

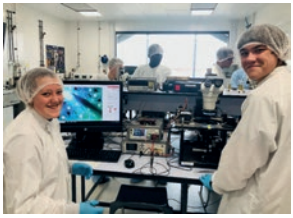
IET Formula 24+, the second subdivision, consists of teams from schools, Further and Higher Education institutions, industry (apprentices), and private entries. Participants are aged between 16-25 and will design and build their cars using clear safety regulations as a guide.

greenpower.co.uk

*Please refer to our partner's website for costs relating to this programme

EDT Industrial Cadets

Creating pathways to unlock potential and promote achievement.



EDT is a UK wide education charity, working in collaboration with industry, educators and partners to provide opportunities for young people of all ages, offering 40,000+ experiences each year. With young people at the heart of what we do, our vision is of a society where young people across the UK have equal access to engage with STE(A)M (arts) subjects and achieve their potential in STEM careers and opportunities for further study.

Industrial Cadets is a key component to EDT's portfolio. Industrial Cadets accredited programmes include experience days, projects and placements; providing opportunities through education to employment. These quality experiences inspire young minds, encourage attainment and bridge the gap between industry and education.

The Industrial Cadets flexible framework allows:

- **Young people** to gain a unique insight into industry and demonstrate experience and progression. Young people receive recognition at the end of their experience and graduate as an Industrial Cadet; becoming part of a national accreditation network. They can build their Industrial Cadets portfolio and explore further opportunities.
- **Educators** to enrich the curriculum, with inspiring experiences for their students that provide unique insight into courses, careers and routes to employment. Educators strengthen their CPD by working collaboratively with employers to develop and enhance their student's skills, building their confidence and preparing them to make informed decisions about their future in STEM.

For more information, visit
etrust.org.uk
industrialcadets.org.uk

*Please refer to our partner's website for costs relating to this programme

CREST

CREST is a scheme that inspires young people to think and behave like scientists and engineers. CREST projects allow students to be creative with their STEM project-based work and find solutions to questions they care about.

CREST offers educators an easy-to-run framework for curriculum enhancement and is student-led, encouraging young people to take ownership of their own projects. Students who engage in CREST awards are proven to have better GCSE grades, with disadvantaged students seeing the biggest impact.

There are six CREST Award levels for ages 5-19, allowing students to progress through the scheme throughout their education. The awards are well regarded, high quality and a tangible recognition of success. CREST is easy to organise and can be run in schools, clubs, youth groups, other organisations or at home.

Sign up for your free CREST account online
crestawards.org

*Please refer to our partner's website for costs relating to this programme

Funding for engineering projects and activities in schools

Engineering Education Grant Scheme

Funding for extra-curricular engineering projects and activities.

The IET and the Institution of Mechanical Engineers (IMechE) collaborate to provide the Engineering Education Grant Scheme (EEGS).

The scheme supports projects that aim to engage young people in learning about engineering and to develop the professional skills of those involved in supporting STEM learning and careers awareness. The scheme also supports projects that improve wider engineering literacy.

Any youth-based organisation, school or individual able to develop and deliver STEM activities in the UK can apply for funding.

There are two funding rounds each year, opening in Autumn 2020 and Spring 2021.

Find further information and apply at **theiet.org/funding**

School Grants Scheme

The Institute of Physics (IOP), the IET and the Science and Technology Facilities Council (STFC) provide schools with up to £600 for projects, to participate in activities or to purchase materials not normally covered by school budgets.

The scheme awards funds for projects linked to teaching or promoting of physics or engineering and is open to all UK educational organisations teaching students aged 5-19. There are three opportunities to apply each year, with deadlines in February, June and November.

Further information, including guidance notes and examples of funded projects, can be found on the IOP website.
iop.org/schoolgrants

You and the IET

The IET promotes the exchange of information and ideas for the advancement of science, engineering and technology worldwide.

We have over

167,000

members in over

150

countries

How we can help

We provide our members with a Professional Home for Life® – a range of professional services and products that support members throughout their career.

Some of our members volunteer as IET Education Officers or IET Education Ambassadors and help support the teaching of STEM with IET Education. They are here to help you and support with access to funding, programmes and information.

Email us at **ieteducation@theiet.org** for contact details of your local Education Officer or Ambassador. They will be on hand to help you every step of the way.

Gatsby Benchmark

Gatsby Benchmark ✓

1 2 3 4 5 6 7 8

A number of our IET Education programmes meet the Gatsby Benchmark, as identified in the government's careers strategy to define world-class career guidance within schools.

The eight Gatsby Benchmarks are	
1	A stable careers programme
2	Learning from career and labour market information
3	Addressing the needs of each pupil
4	Linking curriculum learning to careers
5	Encounters with employers and employees
6	Experiences of workplaces
7	Encounters with further and higher education
8	Personal guidance

Key dates 2020-2021

Dates	Activity	
10 September 2020	**IET Diamond Jubilee Scholarships**	**application deadline**
10 September 2020	**IET Engineering Horizons Bursary**	
30 September 2020	**IET Power Academy Scholarships**	
September 2020 - June 2021	**IET Faraday Challenge Days**	
September 2020 - July 2021	***FIRST*® LEGO® League Discover**	
Autumn 2020 / Spring 2021	**Engineering Education Grant Scheme Applications**	
March 2021 - July 2021	**IET *FIRST*® LEGO® League Explore Festivals**	
March 2021 - May 2021	**IET *FIRST*® LEGO® League Challenge Tournaments**	
May 2021 - July 2021	**IET *FIRST*® LEGO® League Challenge National Finals**	
July 2021	**IET Faraday Challenge Day National Final**	

For more information and application deadlines visit:
theiet.org/education

Sign up to our monthly IET Education Bulletin to receive updates on all your areas of interest:
theiet.org/education-bulletin

Join us:

@IETeducation

FIRST LEGO LEAGUE
@FIRSTLEGOLeagueUK
@FLLUK

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For more information about the IET, visit **theiet.org**

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