



IET Faraday Challenge Days



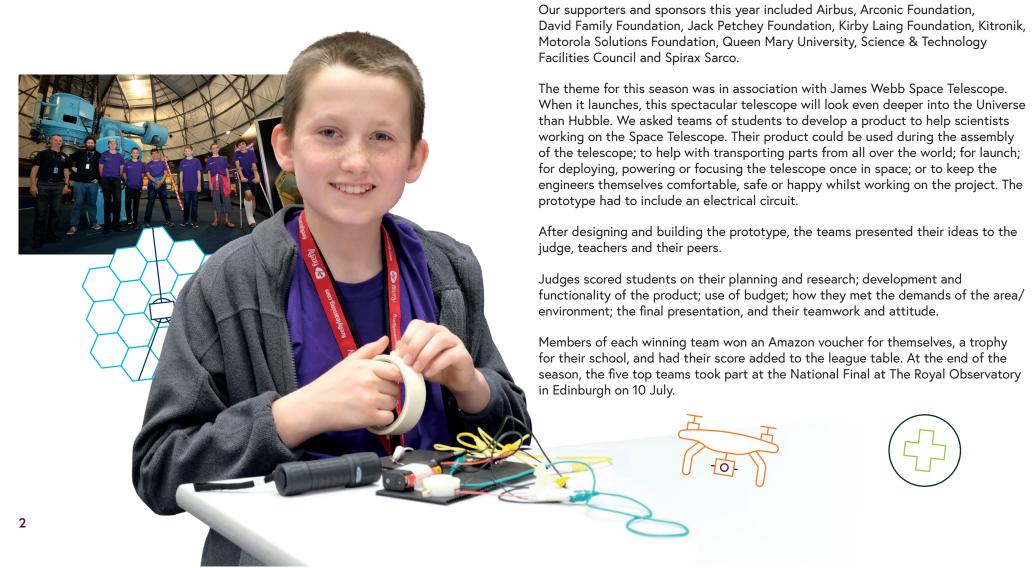




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IET Faraday Challenge Days 2018-2019 Review

This was our biggest season yet. We held 68 IET in-school events, 12 events at our Academic Partner universities and, thanks to the generosity of our supporters, we were able to hold a further 109 events throughout the UK. That's a total of 189 IET Faraday Challenge Days with 475 schools and 6,326 students involved.



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National Final

At the National Final at The Royal Observatory, teams took a tour around the facility and met with the engineers working on the telescope. They then tackled a fresh challenge, creating a prototype to assist with moving the telescope, once assembled, to the launch site in French Guiana.

The prototype could be something to move things out of the way on the route, to sense obstacles or dangers or to monitor the safety of the telescope itself. The prototype had to include an electrical circuit, contain at least two components and be made with materials purchased from the Faraday Shop on a budget of 100 Faradays.

The five national finalists were Bolsover School, Derbyshire; Castle Court School, Wimborne; Holy Family Catholic High School, North Yorkshire;Lenzie Academy in Glasgow and St Benedict's Catholic College, Colchester.

After a close competition with impressive presentations this year's winning team was Lenzie Academy. The team focused their attention on a vehicle that could go ahead of the lorry carrying the telescope. It had a sweeping arm to remove debris from the lorry's path, with a sensor to detect heavier obstacles and an alert system to inform the driver.

It was an inspiring day for everyone involved and we are sure all the students have very bright futures ahead of them!

Faraday Challenge Days really do inspire students and raise the profile of STEM overall. Let's hear from the teachers...

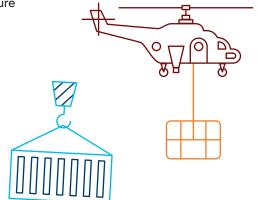


"Outstanding day, impressive organisation and students totally engaged all day - many converted to engineering careers. Easy to host, thank you."

"The day was a success. The students seemed to really enjoy themselves and stay focused. I would highly recommend all schools to participate."

"Fun day for the students, with some excellent activities and constructive feedback. I think all involved will have learned something new today, whether that is practical knowledge or team/leadership skills. Thank you!"

"Brilliant day! Enhanced the learning, teamwork, creativity, communication and confidence of all involved and encouraged enthusiasm for STEM!"





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Quotes from professionals

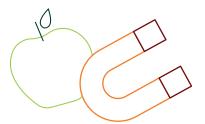
Olivia Johnson

Public Engagement Programme Manager James Webb Space Telescope





STEM activities across all their locations within UK, the Faraday Challenge ticked all the boxes! The IET engaged all the UK Arconic locations to excite and inspire children across the country. With the UK facing a shortfall of new engineers it is paramount we continue to give young people the opportunity to experience engineering in a fun and engaging way and inspire them to consider engineering as a career. We will continue to grow and expand the relationships we have built with local schools across the country and would like to thank the IET for the opportunity to take part in this excellent Project."



Phil Hart

IET Challenge Leader

"What a fantastic season! The 2018-2019 Faraday Challenge Day season was met with great enthusiasm by the students and teachers throughout the UK. Initially, as the awareness of the James Webb Space Telescope (JWST) was likely to be limited, I thought I would have to spend a fair bit of time explaining the potential challenges the JWST engineers face, I could not have been more wrong. On most of the Challenge Days, I found that the students were itching to get on with some practical development as soon as they knew the subject matter.

We purposely designed the brief so it was quite broad and the students could really use their imagination and explore many aspects of the JWST project. This worked particularly well as it allowed for much discussion and debate within the teams, particularly in the Planning section of the day. It was a joy to stand back and see a room of 36 young engineers enthusiastically debating solutions to engineering challenges.

One particularly enjoyable part of the day is when I open the shop and the students are then allowed to buy their components and start to build their chosen developments. So often you see the students looking towards the adults in the room for approval or guidance. This, of course, is not allowed. The students have their own teammates and that's it! Soon they get used to making decisions within the team and after about 15 minutes of the shop opening, the room becomes a really creative environment. To see the belief in their own ability build this way is a real pleasure.

The teachers found this rewarding, often saying that they are used to being given answers to problems and it's great to see them being given the time, space and resource to work things out themselves. The teachers are also regularly surprised that the students are rushing back to the room so early after lunch!

To be in a room where some students will be the next generation of engineers is very rewarding and makes my role of Challenge Leader extremely enjoyable. To see students who had no real grasp of engineering at 9am that day get really excited about the subject by 3pm is great.

Roll on 2019-2020."

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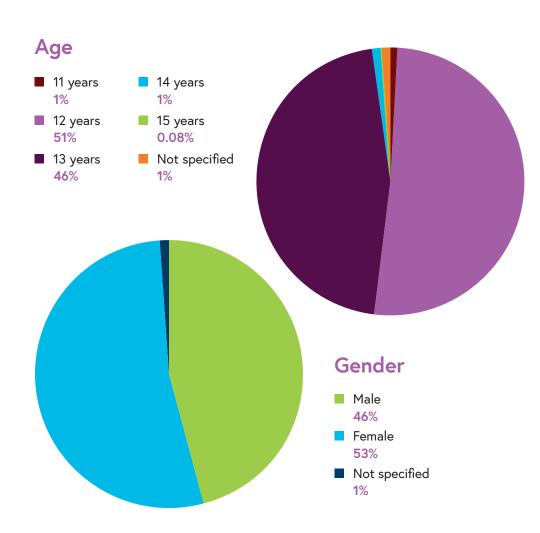


Headline statistics from the full season

No. of events: 189

No. of students: 6,326

No. of schools: 475 (including 1 Pupil Referral Unit)



Student feedback

The following stats represent the % of students who were in agreement with these statements:

- 1	l enjoyed the Faraday Challenge	98 %
- 1	l learnt new things	98%
- 1	I now understand more about what engineering is	97 %
- 1	I have a better idea about what engineers do and the skills they need	96%
- 1	Before today I was considering studying or working in engineering	33%
- 1	Following this event I am now considering studying or working in engineering	59 %
- 1	I'd like to do something like this again	96%



4

Student quotes

"I enjoyed it and it opened my eyes to the world of engineering."

12 year old girl

"Thank you for letting us take part. I had so much fun! I strongly feel that we need more girls in engineering and they have inspired me and my friends. Thanks again."

12 year old girl

"Really enjoyed today. It was great to be learning in a new exciting way. The leader was very nice/friendly ⁽³⁾"

12 year old boy

"The Faraday Challenge is amazing and convinces young people to use their creative ideas to help the world. I love making stuff!"

12 year old boy

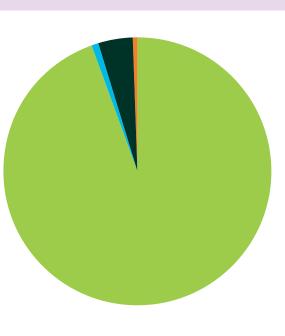


Positive 95%

Negative 1%

■ Both 3%

Other 1%





The following stats represent the % of teachers who were in agreement with these statements:

 The level of complexity was suitable for a National STEM challenge aimed at students aged 12-13 years 	99%
 The interest of the students was retained throughout the day 	100%
- The students learnt new concepts and expanded their knowledge base	100%
 The registration process was straightforward with enough time to plan for the event 	99%
 I would be interested in taking part next year 	100%
 I would recommend the IET Faraday Programme 	100%

Teacher quotes

"Extremely well run - good open brief - inclusive and encouraging to all."

"An excellent activity that provided a high level of stretch and challenge. It challenged students' own perceptions of their skills and strengths. It was possible to see all students learn and grow throughout the day."

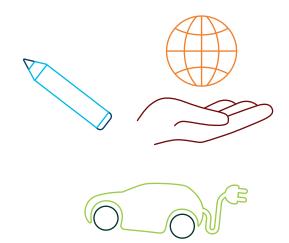
"The students were engaged throughout the day and they all felt like they were winners."

Special thanks

The IET Faraday Challenge has reached more young people than ever before thanks to the generosity of engineering, technology and science companies and charities who have funded individual events or contributed towards the core IET events and online teaching resources.

A HUGE THANK YOU TO YOU ALL.

The next generation of Engineers will have better skills thanks to their IET Faraday experiences and thanks to you.



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Date	Host school
26 September 2018	Thomas Alleyne Academy
27 September 2018	Barnwell School
28 November 2018	Admiral Lord Nelson
12 December 2018	Alun School
20 December 2018	Aerospace Museum Bristol
31 January 2019	Portsmouth University
1 February 2019	Bay House School
12 February 2019	Hawarden School
25 February 2019	Airbus Facility Bristol
26 February 2019	Nailsea School
27 March 2019	St George's School
10 May 2019	Blacon High School

Student feedback

Age: 12: 232 (58%), 13: 162 (41%), not specified: 2 (1%)

Gender: Male: 197 (49%), Female: 200 (50%), not specified: 2 (1%)

The following stats represent the % of students who were in agreement with these statements:

– I enjo	yed the Faraday Challenge	98%
– I leari	nt new things	98%
- I now	understand more about what engineering is	97 %
- I have	e a better idea about what engineers do and the skills they need	96%
- Befor	e today I was considering studying or working in engineering	32%
- Follov	ving this event I am now considering studying or working in engineering	61%
– I'd lik	e to do something like this again	94%

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No. of events: 12

No. of students: 414

No. of schools: 26



46

Student quotes

"Very fun day that I would love to do again.
I learnt that I'd enjoy engineering as a job."

13 year old boy

"I thought the challenge was really fun and has given me a new love for engineering and physics."

13 year old girl

"It was helpful to see what I could do in the future and what it's like to work in those conditions. I will consider becoming an engineer now."

12 year old girl

"Interactive, fun and educational. The perfect day!"

12 year old boy

"I loved this opportunity and before this I never thought I'd love to be an engineer when I'm older but I would now."

13 year old girl

The following stats represent the % of teachers who were in agreement with these statements:

-	The level of complexity was suitable for a National STEM challenge aimed at students aged 12-13 years	100%
_	The interest of the students was retained throughout the day	100%
_	The students learnt new concepts and expanded their knowledge base	100%
-	The registration process was straightforward with enough time to plan for the event	97%
_	I would be interested in taking part next year	97 %
-	I would recommend the IET Faraday Programme to other teachers	100%



Teacher quotes

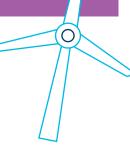
"Absolutely amazing session - it got all of the students thinking and working in an engineering mindset. The presenter's knowledge and enthusiasm was second to none and it was evident all of the students loved the day!"

"This was my first Faraday experience and I was totally impressed. Would recommend and attend again. Very enjoyable and proactive event."

"Absolutely delighted in our student's participation. The day was very enjoyable and stretched and challenged our students very well."

"Excellent challenge day. Fantastic to network with other teachers, the IET, Faraday Staff and engineers. Students rose to the challenge! Our teams appreciated help and advice from a 'proper' engineer. Great to have access to so many resources and the step further of a budget - students experienced this for the first time. Lovely to be inspired by the passion of students from different schools too - lots of potential engineers and designers, and great teamwork."







Date	Host school
25 September 2018	S Anselms School
6 November 2018	Haberdashers Abramham Darby
7 November 2018	Polesworth School
8 November 2018	Fulhurst Community College
8 November 2018	Halewood School
20 November 2018	Tile Cross Academy
21 November 2018	Erdington Academy
22 November 2018	King Edward VI Camp Hill School
26 November 2018	Horsforth School
3 December 2018	Onslow St Audrey's
5 December 2018	Fulneck School
19 December 2018	Woodfield Academy
9 January 2019	Sherrardswood School
23 January 2019	King Ecgbert's School
6 February 2019	John Henry Newman Catholic College
25 February 2019	ISCA Academy
1 May 2019	Ecclesfield School
1 May 2019	Soar Valley College
13 June 2019	Glossopdale School

No. of events: 19

No. of students: 647

No. of schools: 36



Student feedback

Age: 12: 393 (62%), 13: 239 (37%), not specified: 6 (1%)

Gender: Male: 292 (46%), Female: 333 (52%), not specified: 5 (1%), other: 8 (1%)

The following stats represent the % of students who were in agreement with these statements:

 I enjoyed the Faraday Challenge 	99 %
 I learnt new things 	98%
 I now understand more about what engineering is 	96%
 I have a better idea about what engineers do and the skills they need 	95%
 Before today I was considering studying or working in engineering 	30%
- Following this event I am now considering studying or working in engineering	59 %
 I'd like to do something like this again 	95%

4

Student quotes

"It was really fun and I'm always up for that especially when against other schools."

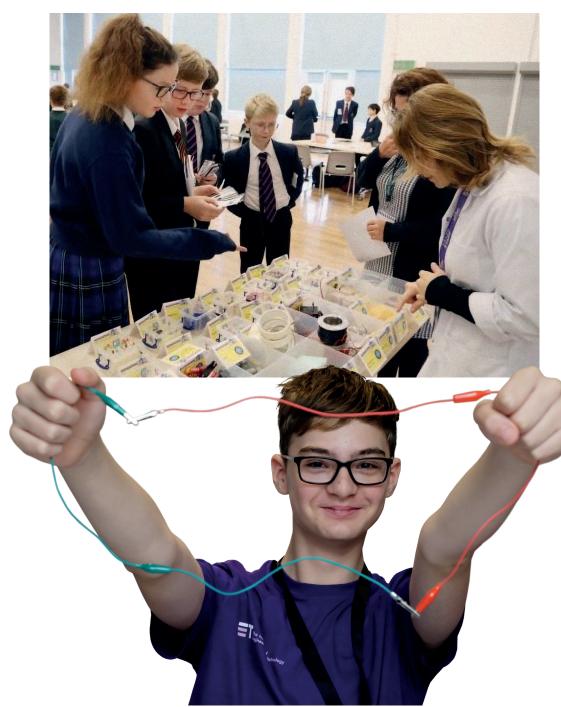
12 year old boy

"I enjoyed the apprenticeship style learning and liked how we had to solve a problem with a budget and then having develop and pitch our solution."

13 year old girl

"I enjoyed being put under pressure and working in proper work conditions."

13 year old girl



The following stats represent the % of teachers who were in agreement with these statements:

 The level of complexity was suitable for a National STEM challenge aimed at students aged 12-13 years 	100%
 The interest of the students was retained throughout the day 	100%
 The students learnt new concepts and expanded their knowledge base 	100%
 The registration process was straightforward with enough time to plan for the event 	100%
 I would be interested in taking part next year 	100%
 I would recommend the IET Faraday Programme to other teachers 	100%

Teacher quotes

"The day was excellent, I particularly enjoyed the fact budgeting was involved and many facets other than just the science focus. Although the STEM content has also been of a high calibre. Stretching but at a suitable complexity for accessibility."

"Inspirational presenter. Students engaged throughout the day.

The day was an accurate representation of real-life situations."

"Lots of skill development. Great ideas, presentations, team work, creativity and time management."











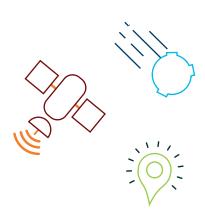
David Family Foundation

Date	Host school
19 October 2018	Christ the King College
20 November 2018	Bowland High School
10 January 2019	Belmont Community School
22 January 2019	Reddish Vale High School
7 February 2019	Blue Coat C of E Academy
19 March 2019	Netherhall Learning Campus School
26 March 2019	St Peter's School
27 March 2019	Sunderland University
21 May 2019	Parkside Academy
24 May 2019	Bethany School

No. of events: 10

No. of students: 336

No. of schools: 24





Student feedback

Age: 11: 3 (1%), 12: 103 (46%), 13: 115 (52%), not specified: 3 (1%) Gender: Male: 104 (47%), Female: 115 (52%), not specified: 3 (1%)

The following stats represent the % of students who were in agreement with these statements:

 I enjoyed the 	e Faraday Challenge	97 %
 I learnt new 	things	98%
 I now unders 	tand more about what engineering is	97 %
 I have a bett 	er idea about what engineers do and the skills they need	98%
 Before today 	I was considering studying or working in engineering	28%
 Following thi 	s event I am now considering studying or working in engineering	51 %
- I'd like to do	something like this again	95%

74

Student quotes

"I had a great day and I learnt the true meaning of engineering... Creativity!"

12 year old girl

"I liked this, and it was a good experience and helped with much more than just engineering."

12 year old girl

"I enjoyed working with all the electronics and figuring out how it all worked. It was amazing fun and genuinely worthwhile."

12 year old boy

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The following stats represent the % of teachers who were in agreement with these statements:

-	The level of complexity was suitable for a National STEM challenge aimed at students aged 12-13 years	100%
_	The interest of the students was retained throughout the day	100%
_	The students learnt new concepts and expanded their knowledge base	100%
-	The registration process was straightforward with enough time to plan for the event	90%
_	I would be interested in taking part next year	100%
_	I would recommend the IET Faraday Programme to other teachers	100%





Teacher quotes

"Fantastic day which has inspired a number of students."

"Really impressed with the prototypes year 8 came up with, excellent experience for them."

"Good session. I liked the fact that it also concentrated on soft skills as well as engineering. Fabulous!"

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Jack Petchey Foundation

Date	Host school
10 October	Oasis Academy Southbank
15 October	Clacton County High School
16 October	Colchester County High School for Girls
17 October	Maltings Academy
30 October	Ernest Bevin College
31 October	Lilian Bayliss Technology School
2 November	Wallington High School for Girls
12 November	Orleans Park School
13 November	Grey Court School
14 November	Malden Oaks PRU
14 November	St Olave's Grammar School
15 November	St Catherine's Catholic School for Girls
16 November	Ravensbourne School
28 November	Loxford School
29 November	Shenfield High School
30 November	Mayfield School
4 December	Park High School
5 December	Greenford School
6 December	Walthamstow School for Girls
7 December	Highams Park School
12 December	The Sandon School
13 December	Sweyne Park School
14 December	Anglo European School
20 December	Greenwich Free School

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Date	Host school
10 January	Vyners School
11 January	Harlington School
14 January	St Thomas More Catholic School
15 January	Edmonton County School
16 January	St Marks West Essex Catholic School
29 January	Philip Morant School
4 February	Southchurch High School
5 February	Chase High School
6 February	Royal Liberty School
6 March	Overton Grange
7 March	Southborough High School
8 March	Tiffin Girls School
12 March	Petchey Academy
13 March	Sarah Bonnell School
14 March	St Bonaventure's School
28 March	Chiswick School
29 March	Marylebone Boys
1 April	Langley Park Girls
2 April	Harris Academy Purley
2 April	Woodside High School
3 April	Ramsey Academy
3 April	Riddlesdown Collegiate
4 April	Tabor Academy
23 April	Lady Margaret School

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Date	Host school
24 April	Harris Academy St John's Wood
25 April	Kingsley Academy
26 April	Copthall School
29 April	Harris Girls Academy East Dulwich
3 May	Eastbury School
4 May	Dagenham Park High School
15 May	Coopers Company & Coborn School
16 May	Harris Academy Rainham
17 May	Billericay School
22 May	Dormer Wells High School
13 June	Eastbrook School
25 June	Chislehurst & Sidcup Grammar School

No. of events: 60

No. of students: 1,954

No. of schools: 117





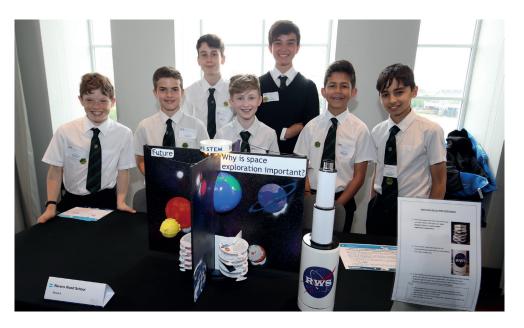
Student feedback

Age: 11: 21 (1.1%), 12: 987 (52%), 13: 881 (46%), 14: 2 (0.1%), not specified: 23 (1%)

Gender: Male: 886 (46%), Female: 1,007 (53%), not specified: 21 (1%)

The following stats represent the % of students who were in agreement with these statements:

 I enjoyed the Faraday Challenge 	98%
 I learnt new things 	97 %
 I now understand more about what engineering is 	97 %
 I have a better idea about what engineers do and the skills they need 	97 %
 Before today I was considering studying or working in engineering 	32%
- Following this event I am now considering studying or working in engineering	60%
 I'd like to do something like this again 	96%





JackPetchey Foundation Inspire • Motivate • Achieve

Jack Petchey Foundation

Student quotes

"It was extremely fun to do and showed engineering in a positive way and helped me to understand the jobs engineers do and problems they may face."

12 year old girl

"I thought before this that engineering was boring, but it is actually amazing!"

12 year old girl

"Engineering is better and had more of a range of skills than I thought."

12 year old boy

"This was a great taster of what engineers do in real life."

12 year old boy

"I really enjoyed today, it has taught me you do not have to be a boy to be a decent engineer!"

13 year old girl





Teacher quotes

"Excellent day. Really well presented. It's really rare for pupils to have free design - it worked brilliantly. Thank you."

"Very easy to plan/organise from a teacher's perspective. We'll continue to participate and highly recommend to any school wanting to expand their STEM exposure."

"Brilliant day. Hopefully it will inspire our students to do more STEM projects. It has inspired me!"

Teacher feedback

The following stats represent the % of teachers who were in agreement with these statements:

-	The level of complexity was suitable for a National STEM challenge aimed at students aged 12-13 years	99 %
_	The interest of the students was retained throughout the day	100%
_	The students learnt new concepts and expanded their knowledge base	100%
-	The registration process was straightforward with enough time to plan for the event	99 %
_	I would be interested in taking part next year	100%
_	I would recommend the IET Faraday Programme to other teachers	100%

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Festival for Aspiring Engineers Wednesday 26 June 2019







The winning teams from each of the Jack Petchey Foundation supported events were invited to attend an afternoon event on 26 June at IET London: Savoy Place.

This was to celebrate the achievements of all the teams and an opportunity for students to showcase their products and share ideas. The afternoon involved the students marketing their ideas to the IET judges and peers, and then the students voted for their favourite team. The team with the most votes received the coveted 'Aspiring Engineers Choice Award'.

There were speeches from Professor Colin Cunningham, University of Edinburgh and Trudy Kilcullen, CEO at the Jack Petchey Foundation with a special appearance from Bobby Seagull. There were 7 different award categories.



And the winners are:

- Team Spirit
 Harwich and Dovercourt High School
- Innovation
 St Mark's West Essex Catholic High School
- Product DesignPark High School
- Most Promising Engineers
 Northwood School
- Best DisplayEdmonton County School
- Team We Would Most Like To Spend a Day With Ramsey Academy
- Aspiring Engineers Choice Award Ravens Wood School





Date	Host school
22 January 2019	Rutherford Appleton Laboratory
12 June 2019	Daresbury Laboratory

No. of events: 2

No. of students: 71

No. of schools: 10







Student feedback

Age: 11: 1 (1.4%), 12: 25 (35.2%), 13: 45 (63.4%)

Gender: Male: 34 (48%), Female: 34 (48%), not specified: 3 (4%)

The following stats represent the % of students who were in agreement with these statements:

_	I enjoyed the Faraday Challenge	100%
_	I learnt new things	97 %
_	I now understand more about what engineering is	94%
_	I have a better idea about what engineers do and the skills they need	89 %
_	Before today I was considering studying or working in engineering	24%
_	Following this event I am now considering studying or working in engineering	61%
_	I'd like to do something like this again	94%

☐ ☐ St

Student quotes

"I like how complicated it was and the trust that we were given to make our own idea."

13 year old boy

"I wish we knew a bit more about engineering as a team because we don't do it at school and I would like to do it more!"

13 year old girl

The following stats represent the % of teachers who were in agreement with these statements:

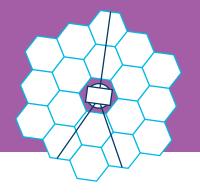
 The level of complexity was suitable for a National STEM challenge aimed at students aged 12-13 years 	100%
 The interest of the students was retained throughout the day 	100%
- The students learnt new concepts and expanded their knowledge base	100%
 The registration process was straightforward with enough time to plan for the event 	100%
 I would be interested in taking part next year 	100%
 I would recommend the IET Faraday Programme to other teachers 	100%

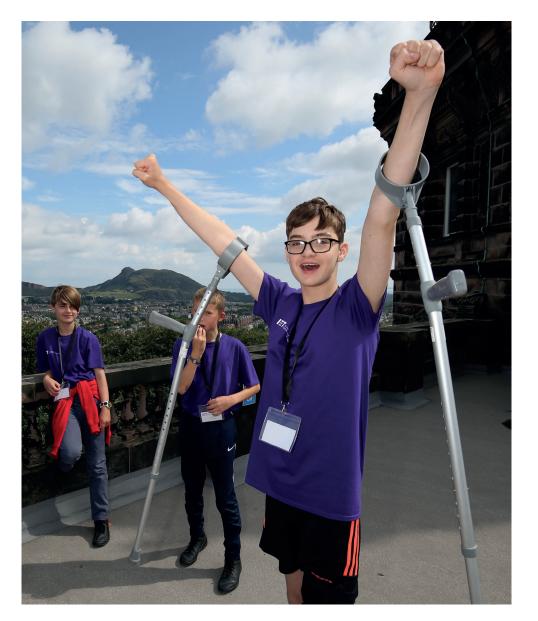
Teacher quotes

"Great day. Very relatable and fun. Lots of scope for different ideas/skills. Surprised how much they got done."

"Really great to be able to bring the students to Rutherford Appleton Laboratory for this event."

"Really excellent day, good challenging event and competing against other schools was brilliant. Boys learnt a lot. We'll be back!"





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Date	Host school
14 February 2019	Penryn College
15 February 2019	Helston Community College
20 March 2019	All Saints Academy
21 March 2019	Pittsville School
21 May 2019	Chosen Hill School

No. of events: 5

No. of students: 163

No. of schools: 9



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Student feedback

Age: 12: 74 (46%), 13: 81 (50%), 14: 4 (2%), 15: 1 (1%), not specified: 1 (1%)

Gender: Male: 103 (64%), Female: 57 (35%), not specified: 1 (1%)

The following stats represent the % of students who were in agreement with these statements:

 I enjoyed the Faraday Challenge 	98%
 I learnt new things 	99%
 I now understand more about what engineering is 	99%
 I have a better idea about what engineers do and the skills they need 	99%
 Before today I was considering studying or working in engineering 	43%
- Following this event I am now considering studying or working in engineering	67%
 I'd like to do something like this again 	96%

44

Student quotes

"I really enjoyed being able to learn new things, this has opened my mind."

13 year old girl



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The following stats represent the % of teachers who were in agreement with these statements:

_	The level of complexity was suitable for a National STEM challenge	100%
	aimed at students aged 12-13 years	
_	The interest of the students was retained throughout the day	100%
_	The students learnt new concepts and expanded their knowledge base	100%
_	The registration process was straightforward with enough time to plan	71 %
	for the event	

- I would be interested in taking part next year

- I would recommend the IET Faraday Programme to other teachers

Teacher quotes

"Fantastic day! Students thoroughly enjoyed the day. Well organised and it allowed the students to work together and think outside the box."

"Awesome. I was really interested to see the level of creativity allowed in the task. Students rose to the challenge set."

"An enlightening experience for students and teachers. Highly recommended."



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100%

100%

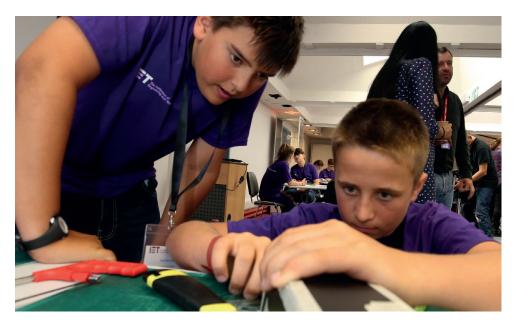


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