

2019 UK-JAPAN YOUNG SCIENTIST WORKSHOP PROGRAMME SUMMARY REPORT

- **2019 Cambridge University Workshop, 21-27 July;** with **Pre-Workshop** for Japanese students and teachers principally from the Tohoku area, hosted at Rikkyo School in England **18 July- 1 July, 2019.**
- **2019 Kyoto University Workshop, 27 July-5 August 2019 with contribution from Kyoto University of Education** with **Pre-Workshop Briefing Weekend** for UK students and teachers travelling to Japan hosted at the Rikkyo School in England **12-14 July**

1.1 Participants; a total of **98** senior high school students (age 16-18 years, 44 female, 54 male; 48 British, 48 Japanese) from the 26 schools listed below participated in the two 2019 UK-Japan Young Scientist Workshops, the numbers split approximately evenly between the two workshops. Students were accompanied by 38 teachers who observed but did not take part in the science, and shared professional experience through the Teachers' Forums which are a part of each Workshop. The two schools marked * took part in both Workshops but with different students.

The numbers were closely similar to the two 2018 Workshops (then 100 students total) although the ratio of girls to boys was lower (previously 58 female, 42 male)

County Upper School, Bury St Edmunds	Fukushima High School
Fulford School, York	Furukawa Reimei Senior High School
Hinchley Wood School, Esher	Iwaki High School
Kamaishi High School	Kyoto Prefectural Rakuhoku SHS
Kyoto Seibo Gakuin SHS	Kyoto University ELCAS
Kyoto University of Education attached SHS	Newham Collegiate 6th Form Centre, East Ham*
President Kennedy School, Coventry	Rikkyo Ikebukuro High School
Rikkyo School in England	Ritsumeikan Moriyama SHS
Ritsumeikan Uji SHS	School 21, Stratford, London
Soma High School	St Benedict's RC School, Bury St Edmunds
St Mary Redcliffe & Temple School, Bristol	Thomas Hardy School, Dorchester*
Tohoku University "Tamago"	UCL Academy
Wells Cathedral School	Wycombe Abbey School

The Japanese schools represented in the Cambridge Workshop were communities in Tohoku areas afflicted by the 2011 tsunami and earthquake. Students from these schools gave presentations and led discussion on the Thursday morning on current issues following the tsunami.

1.2 Programme: The projects followed the successful format developed by Clifton Scientific Trust in partnership with Japanese colleagues in previous years. The students - a small number selected by each school- lived closely together, British and Japanese students sharing rooms in both Workshops - in Cambridge in Murray Edwards College/the Kaetsu Centre. In each Workshop, the students worked for three days in small international student teams with scientists and engineers across the university on specially devised research projects and at the end of the week gave formal team presentations of their achievements and answered questions in front of an audience including invited guests. An equally important of the student experience was the interaction through their student-centred evening social programme and by living as well as working together. The teachers also shared good science education practice both informally, and also formally through the Teachers' Forum which was an integral part of each Workshop.

1.3 Projects; The students worked in a total of 15 projects led by British and Japanese scientists/ engineers.
Cambridge University Projects

- **Supramolecular Hydrogels for Drug Delivery** Cambridge Chemistry Dept; Prof Oren Scherman's Group
- **Bacterial Phenotypes in the Local Environment** Cambridge Biochemistry Dept and Cancer Research UK
- **Aerodynamics in Jet Engines** The Whittle Laboratory, Cambridge Dept of Engineering
- **Cretaceous Cambridge; Investigating Climate Change from a 120 million year old clay sequence and its relevance today** Cambridge Dept of Earth Sciences Godwin Laboratory/ the Sedgwick Museum,
- **Radiation All Around Us** Cambridge Dept of Earth Sciences, Dr Ian Farnan's Group
- **Energy Production & Environmental Radiation;** Prof Wade Allison, Physics Dept, Oxford University
- **Science Communication- Creating a Workshop Podcast** The Naked Scientist Team; podcasts now on line at <https://www.thenakedscientists.com/podcasts/short/uk-japan-workshop-young-scientists-2019>
<https://www.thenakedscientists.com/podcasts/short/2019-uk-japan-workshop-young-scientists>

Kyoto Projects (Kyoto University unless stated)

- **Spectroscopic analysis of colours in nature** Graduate School of Science
- **Earthquake engineering and structural control** Graduate School of Engineering
- **Human Behaviours, sensing, modelling, and simulating** Graduate School of Engineering
- **High Performance Microscale Separation of Biorelated Materials** Graduate School of Engineering
- **Producing polymeric materials; synthetic design** Graduate School of Engineering
- **Environmental Geoinformation and Earth Observation** Graduate School of Global Environmental Studies
- **Examining membrane efficacy in purifying proteins** Institute for Integrated Cell-Membrane Sciences
- **Relationship between soil environment and animal community** Kyoto University of Education

2 Breaking New Ground

The UK-Japan Young Scientist Workshop programme is to our knowledge unique in bringing British and Japanese senior high school students, at a very formative stage in their lives, together to live and work at a very high level with university research scientists and engineers, in a way which enables them to develop transferrable skills in such as areas as international teamworking and communication, and to grow as persons and as international citizens in ways which transcend the science itself. Each workshop breaks new ground in that each science project is new even if in some cases based on a previous workshop project, with new students and with (new as well as returning) scientists and engineers. The students are selected by their schools as those who would gain most from the experience. Some schools have an internal formal application procedure where students seek to justify why they should be selected. The Trust is keen to engage as many able UK students from disadvantaged backgrounds as possible. We see these Workshops as a model for others to emulate. In this we are delighted that colleagues in Japan work with us to mirror these UK-Japan Young Scientist Workshops in Japanese Universities.

3 Principal Outcomes

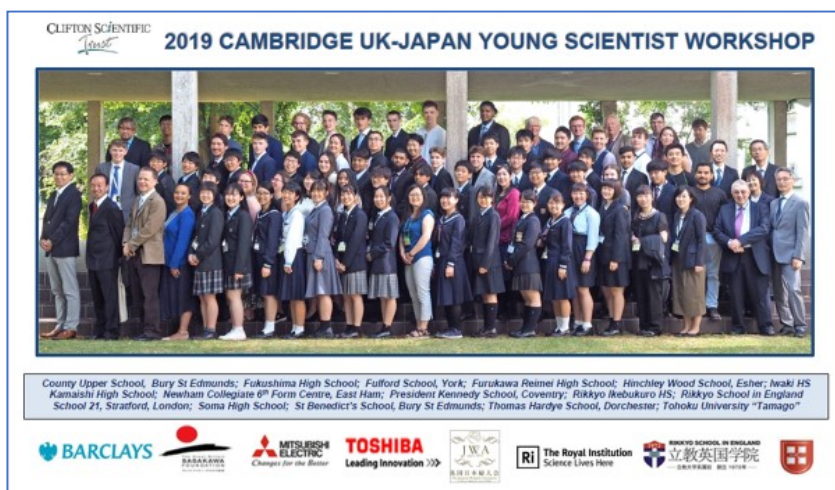
- For the 98 British and Japanese students who took part in the two workshops; the quality of their achievements in such a short time working with British and Japanese university scientists and engineers is evidenced by the quality of their team presentations of their achievements at the end of the week (their team presentations are available on request), not only in content in areas far removed from anything they would have experienced in school, but also in how well they presented. The international team-working where they were required to organise and think for themselves and the final public presentations of their achievements further developed to a high degree a whole range of transferable skills. Students grew visibly in self-confidence, grew in global awareness and formed strong international friendships.
- The British and Japanese teachers who accompanied their students gained professionally not only by observing and learning from the areas covered by the projects, but also by sharing internationally their experience of teaching very particularly through the formal Teachers' Forum which is part of each Workshop. These insights and understandings the teachers could then bring back to their own schools. The benefit of these Workshops is seen by Japanese teachers not only in terms of the science experience the students gain, but also as a potent context for enhancing English language skills
- On their return to the UK, students commonly give whole school presentations to their schools and also sometimes produce articles in the local press. We are currently gathering this information.
- Trust Director Dr Eric Albone and participating teacher, Mr Simon Lewis will give an hour's presentation "UK-Japan Young Scientists Researching Together; Science and a Cultural Bridge" at the 2020 Association for Science Education Annual Conference in Reading in January.

4 Future Plans

Clifton Scientific Trust is planning two further Workshops in the summer of 2020 hosted in Cambridge and Tohoku Universities respectively, and is currently recruiting schools to participate. In addition we are working hard to build on its achievements to broaden its financial support and achieve long term financial sustainability to enable it to expand its outreach, and for others to share our vision.

5 Acknowledgements Clifton Scientific Trust wishes to thank Barclays Bank, the Great Britain Sasakawa Foundation, Mitsubishi Electric Europe, Toshiba Research Europe and The Japan Women's Association in Great Britain for their invaluable support for the 2019 programme, and in Japan the Japan Science and Technology Agency. We are also indebted for support in kind from the Rikkyo School in England, The Royal Institution, the university scientists and engineers who worked so hard to make the workshop possible and others

6 Further information is available on www.clifton-scientific.org and other documentation is available on request.



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