

CREST Awards: why the key to success is thinking scientifically

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(British Science Association, UK)

Science goes beyond just being a body of facts. In its essence, science is nuanced, changeable and explorative. Its distinctive feature is the scientific method; the process of dreaming up ideas or hypotheses and scrutinising them through investigative trials, tests and analysis, which can simultaneously answer your questions and create even more questions. The hypotheses become refined with every investigation, adding to the ever-growing body of knowledge and discovery that form the bread and butter of science, informing us of nature and world we inhabit.

To 'think scientifically' is a key aspect of education, not just in childhood but throughout life. Our modern world is full of complex challenges and ideas—from climate change and artificial intelligence, to politics and population growth—which have impacts for everybody on the planet to varying degrees. To approach these challenges effectively and fairly, we need to be able to apply balanced but rigorous critique, analysis and evaluation.

Throughout school children are encouraged to think scientifically, but how do we best teach this way of thinking? It helps to look towards other subjects—in most areas of learning and development there is an emphasis on experience, i.e. getting your hands dirty.

No-one learns to play football by solely reading a textbook day after day, instead you get outside and play. The same applies to music, painting, even tying

shoelaces. From a young age, in most areas of life, we're taught things by being encouraged to 'do', to try them out through trial and error until we master whatever it is that we're learning.

The same should apply to science. Children need the freedom and tools to practise scientific thinking, by applying the scientific method as often and creatively as possible.

With time, resource and target pressures on the education system, there is often little time or opportunity for children to explore ideas about things that matter to them. This is where a structured, extra-curricular resource can make a huge difference.

The British Science Association's CREST Awards use enquiry-based learning approaches to give students a methodical way to lead their own research or engineering design projects, usually outside of formal lesson time. They plan and manage their own project, present their findings and reflect afterwards on what worked well and what didn't.

When left to come up with their own research question, the range of topics and methods deployed are impressive. Examples of previous questions asked by Key Stage 3 students (age 11–14) include: which music is the best to revise to? Which conditioner makes your hair the shiniest? Can hamsters be trained to use a potty? How does a slinky defy gravity?

The CREST Awards are based on the principle that by doing science or engineering, young people learn about science or engineering, just like they learn music or football.

One teacher, Jack, has been engaged with CREST for the last six years and has found it to be a: "structured and respected programme to offer something extra to



Biochemical Society creates three new awards

Launching in May 2019, the Biochemical Society has created three new Gold CREST Awards to support and inspire learners 16 years and older to investigate contemporary and globally relevant biomolecular topics: Biochemical Solutions to Antibiotic Resistance, which invites students to find new treatments for drug resistant bacteria in the context of a post-antibiotic era; Saving the World with Enzymes, where students delve into novel and unorthodox uses for these molecular catalysts; and Feed the World with Biochemistry, created around the mission of solving world hunger. Designed to encourage young people to think like scientists, these resources are aligned with the UN's sustainability goals and highlight the ability of biochemistry to help solve global challenges.

students looking for a challenge". Jack runs CREST as an extra-curricular club, which is called the CREST Society. The newly formed group allows students to attend lectures after school on a range of skills such as literature searching, referencing, research methods and data analysis. These lessons enable the students to carry out and write up their projects in their own time, choosing a topic they prefer. Jack believes: "giving students the option to explore any topic is equally thrilling for the teachers who have to support the students, as it allows everyone to discover something".

He believes the greatest strength of CREST is that students work independently and are self-managed, meaning they take on all the risk that their ideas will fall apart and all the glory when they succeed. If Jack could offer advice to teachers who have just started running CREST, he'd tell them to: "talk to other teachers and get them on board", he believes: "a team, however small, will make CREST more manageable and more enjoyable".

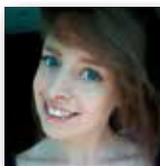
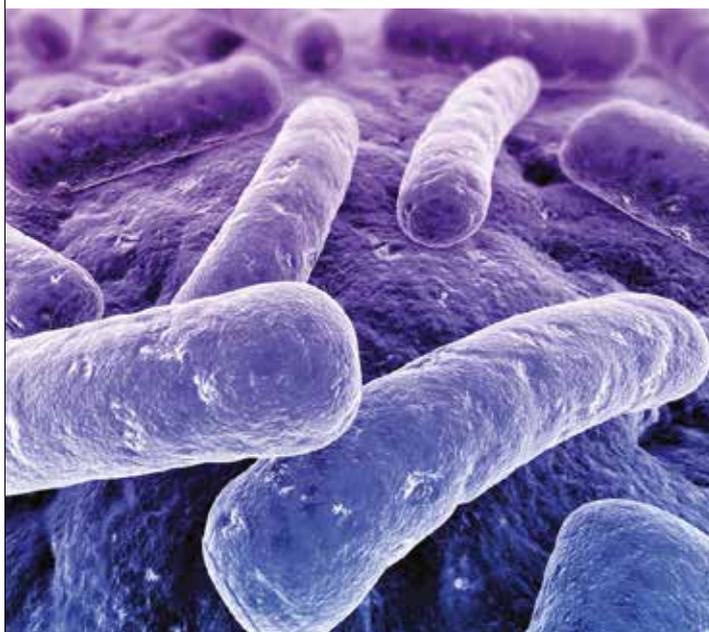
It's not just anecdotal evidence supporting the Awards. A report published in 2016 found that students who'd done a Silver CREST Award obtained, on average, half a grade higher in their best science GCSE compared to a matched controlled group (a link for the full report is available in Further reading). Students eligible for pupil premium saw an even bigger effect: they got, on average, two-thirds of a grade higher.

The CREST Awards have been around now for over 30 years. On average 30,000 pupils take part in the scheme each year. It was set up to address the variable quality of practical STEM work in UK secondary schools. By giving students the opportunity to do their own independent research project, the British Science Association hoped this would inspire them to think and behave like a scientist, sparking their interest in investigation and celebrating their work.

To find out more visit [crestawards.org](https://www.crestawards.org).

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Jessica Rowley is the PR Officer at the British Science Association (BSA) with a background in science communication. She completed her BSc in Biomedical Science from the University of Sheffield in 2013 and then went on to gain an MSc in Science Communication. She previously worked as a science conference producer, a marketing/communications intern at a tech start-up company, and in a medical communications agency. Her work at the BSA involves curating the press programme for the annual British Science Festival, running PR campaigns for major initiatives such as British Science Week, managing the organization's social media, and creating content for its blog and website.

Further reading

- Why CREST? <https://www.crestawards.org/why-crest/>
- CREST Silver Awards: Impact Report (2016): <https://static1.squarespace.com/static/5b072a8af79392cac386efed/t/5b7d2da76d2a73947ed55158/1534930372797/CREST-Report.pdf>
- Expert tips that will make any UCAS personal statement stand out: <https://www.britishscienceassociation.org/blog/expert-tips-that-will-make-any-ucas-personal-statement-stand-out>