



Learning notes

For teachers
and STEM
club leaders

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Doing your own research project

Main Article: [Choose Plant Science For Sustainable Future](#)

In this article Dr Manisha Sharma talks about how science and scientists, in particular plant science research, can use problem solving to overcome some of the challenges facing our planet. She recommends that young people get research experience if they are thinking of a career in this area or exploring whether such a pathway is for them.

Independent scientific research projects give secondary school students a rich understanding of what it means to be a scientist and of scientific processes. Student-led, open-ended practical projects help students engage with science beyond normal curricular learning.

Use this an opportunity to think about research projects and scientific investigations, to give your students an insight into how science works, as well as developing skills such as decision making, investigation, collaboration and presenting ideas.

Learning Task:

A good starting point is to watch the video, ['From cell to planet in 90 seconds'](#) from the Gatsby Plant Science Education Programme.

- Discuss with the students what they think about the idea that scientific research can 'change the world.'

Take your learning further:

Engage the students in conducting their own scientific research project and involve them in the following:

- Will students work individually or in small groups? Discuss what the pros and cons might be.
- Have the students investigate topics they wish to research and then prepare a reasoned case for the project they will conduct. Considering why have they chosen that project, topic or scientific investigation, what outcomes they expect and any potential difficulties they might encounter.
- Identify key skills, curricular knowledge and employability skills that will be enriched and enhanced through the chosen project. What are the wider implications from developing skill sets.
- Will students conduct the project in classroom lessons, through a STEM Club or extracurricular engagement or through a combination?
- Could the project be part of a scheme such as CREST Awards or Nuffield Research Placement or be entered into a competition, helping to raise the profile, sense of achievement and increase their learning potential?

To find out more:

The following offer students' valuable opportunities to explore potential projects, awards and recognition, careers insight and enhance valuable skill sets. Helping to widen student knowledge of the practical application of science, the processes involved and increase academic potential.

Nuffield Research Placements

Engaging, real-life research or development projects, where talented year 12 (or equivalent) students are placed at the heart of a UK host organisation. They are a fantastic opportunity for students to apply skills and knowledge learned at school while providing a meaningful contribution to the work of researchers and industry professionals. Find out more: www.stem.org.uk/nuffield-research-placements

CREST Awards

The only nationally recognised accreditation scheme for STEM project work for 5-19 year olds. Around 40'000 students in the UK gain CREST Awards every year through investigations and enquiry-based learning, supporting them to solve real-life STEM challenges. Find out more: www.stem.org.uk/cx5dd

IntoBiology

Designed to inform and inspire the next generation of biologists. IntoBiology supports UK biology students aged between 17 and 21, with science news, careers guidance, project ideas and study skills support. It is funded the Gatsby Charitable Foundation and based at the Sainsbury Lab, Cambridge, and Cambridge University Botanic Garden, both part of the University of Cambridge. Find out more: intobiology.org.uk/category/student-projects/

Citizen Science

These are projects where students can engage with data collection and analysis, without having to design the full investigation. From astronomy to zoology, wildlife surveys to exploring diaries from the First World War. The principal behind citizen science is to use the power of collaborative volunteer research to explore or collect huge data sets. These are ones that researchers simply could not manage by themselves, and where computers are not up to the task of analysing. The following are just a few suggestions as there are many citizen science projects available:

BBC: www.bbc.co.uk/programmes/articles/4BZZdHm64S051q2lnZ1Nr7p/citizen-science

The Wildlife Trusts: www.wildlifetrusts.org/citizen-science

Natural History Museum: www.nhm.ac.uk/take-part/citizen-science.html

UKRI: www.ukri.org/our-work/public-engagement/how-we-support-public-engagement/

Royal Society Partnership Grants

Do you have a great idea for bringing research alive in schools? Partnership Grants of up to £3,000 are available to UK schools and colleges to carry out investigative STEM research projects in their classrooms in partnership with a STEM professional from academia or industry. The grants are designed to help schools and colleges purchase equipment to run these projects. The scheme is open to both primary and secondary schools, including sixth form colleges. Schools outside of the UK are not eligible to apply. Find out more: royalsociety.org/grants-schemes-awards/grants/partnership-grants/