Royal Society Partnership Grants

A teacher's experience

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The Royal Society's commitment to science goes back several centuries.

Since its conception, following a lecture by Sir Christopher Wren in 1660, the Royal Society has counted some of the most famous scientists among its Fellows: Isaac Newton, Charles Darwin, Michael Faraday, Rosalind Franklin, Dorothy Hodgkin and, more recently, Elon Musk. Its Partnership Grant scheme offers the chance for you and your pupils to carry out your own scientific research and, in doing so, become a small part of the work of the world's oldest scientific academy.

If you have never heard of the Royal Society's Partnership Grants, its website provides comprehensive information on the projects and how to apply for them. In this article, I'm going to share my own experience of the scheme and hopefully encourage you to take part in it. My pupils and I recently submitted our final report and the experience gained from the project was unexpectedly varied and rewarding.

The children's experiences were just like those of real scientists, all the way from collecting and interpreting data to sharing their findings with others at a conference.

Background to Partnership Grants

The Partnership Grants scheme, which is open to primary and secondary schools in the UK, provides funding to run scientific research projects with the support of professional scientists. A more recent extension to the scheme, 'Tomorrow's climate scientists', focuses more specifically on research relating to climate change and biodiversity. As it says on the Royal Society website, "The programme aims to give students not just a voice but an opportunity to take action themselves to address climate and biodiversity issues." This sounded great to me, but I didn't know where to start.

Turning your idea into a project

What's stopping you?

I knew what skills I wanted my pupils to take away from a project, but I had no idea how to go about planning one. I wasn't sure what counted as a Partnership Grant project - how long it should last, how challenging it should be, and more importantly, I had no idea how to get a STEM partner involved.

I had decided to apply for a grant when I noticed how responsive my pupils were to news stories about climate activism. They engaged with Greta Thunberg and were inspired by seeing other young people speaking to government and sharing their views. However, it was also clear that my pupils were not very sure about what the climate protests were demanding. Whilst they knew they were about campaigning to those in power about climate change, they didn't know what they would

want governments to do if they themselves had a voice. The message they were taking away was how to flag up discontent rather than how to try to be part of a solution and I hoped to change that. I wanted them to learn a bit about taking an overwhelming problem and breaking it into manageable steps. We teach this all the time in maths lessons but rarely in real world situations.

At this stage, my first step was to come up with a question. My initial idea was, "Could we use renewable energy to provide the electricity for our school?" I knew that the children had heard of wind turbines and solar panels, so renewable energy seemed a good place to start. My advice to anyone at this stage, where you have the seed of an idea but not much more, is to contact the education team at the Royal Society. They can help you by advising on whether your idea is likely to be supported by their funding panel and can guide you on how to improve it based on their past experience. They helped me improve my initial idea and I was then able to come up with the smaller questions that would form the steps of our investigation. My title became, "How can we reduce our school's use of fossil fuels by generating renewable energy on site?" This big question acted as an umbrella over a series of smaller questions that formed the manageable steps we needed:

- How much fossil fuel does our school use?
- How much electricity could we generate from wind energy?
- How much electricity could we generate from solar energy?
- How much renewable energy could be stored and used on site?

The questions other primary schools have used can be found on the Royal Society website and their range is diverse, for example: Why are the earthworms such an important part of our world? What would be the impacts of growing green walls on our learning and well-being in our school? and How can science help us investigate the impact of humans on our shoreline?

Approaching a STEM partner

You need to have a STEM partner before you submit the first part of the application and, for me, the thought of finding one was the most daunting part of planning a project. I had decided upon the topic but didn't know anything about current research in that area. I began by searching key words on the internet to find out the technical name of the area of research. My next step was to look at the websites of STEM organisations to see whether they had a group working in that field. I started with universities in our county and was lucky enough to find a relevant department at the University of Exeter. I wrote to them, and whilst the first person that I contacted was unable to help, he put me in touch with the scientist who was to become our STEM partner.

If the idea of writing a 'cold calling' letter to an unknown scientist and asking for their help worries you, then you need to remember that the Royal Society is famous and well respected. This means that if you approach a STEM professional, they will already know the organisation and are likely to be keen to be associated with it. Some scientists are inherently interested in sharing their ideas with the public through outreach activities. However, in recent years, the pressure for all scientists to do so has increased. Organisations that provide the funding for scientific research often have a formal requirement for outreach work, including engagement with schools. This provides a great incentive for a STEM professional to get involved in your project.

What is the STEM partner supposed to do?

Figure 1

Figure 2

Our industry partner was Andrew Mitchell. He works at the Centre of Energy and the Environment at the University of Exeter and is an expert in the field of energy use and renewable energy. As well as showing children potential career opportunities, working with a STEM partner provides them with the experience of working like a scientist, with a scientist. For this to really work, it is important that you plan for the STEM partner to be actively involved with the children and their work, not just acting as a teacher's advisor. However, the exact role of the partner may vary, depending on the stage of the project. At the start of our research, Andrew advised me on the equipment I would need (Figs. 1&2), where to buy it and how to install it, allowing me to come up with a budget for the grant. Once the project had begun, he gave workshops to the children explaining

Figure 3

the importance of renewable energy and answering their questions. Later, he taught us how to process and interpret our data, whilst in the final stages, the roles were reversed: the pupils presented their own findings to Andrew, and he asked the questions. At the end of the project, Andrew said, "On a personal level, I found the project hugely rewarding: being able to pass on some of my experience of setting up equipment to others; talking through the concepts and findings with the children and seeing how engaged they were in the whole project."

Should you bother?

It is undeniable that for you, the teacher, the project is likely to take up quite some time. However, the rewards are huge and the experience for your pupils is hard to beat. Our project encouraged pupils to act as real scientists in ways not covered in normal school science: they collected and analysed longer-term data sets (Fig.3) and learnt about the strengths and weaknesses of renewable energy. From the STEM professional, they learnt how to explain climate change and interpret data sets (Fig. 4) and, most importantly, they presented their research in termly updates to the rest of the school, to our local MP and to other schools. In doing so, they become scientific ambassadors who had to share their research and use it to deliver a message.

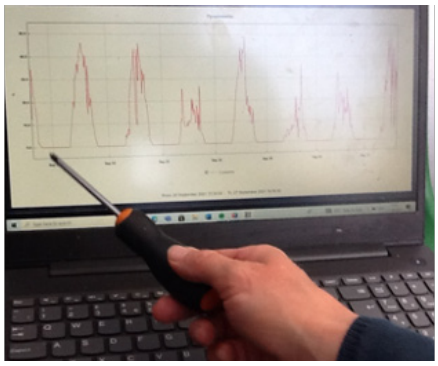

Figure 4

The experience was valued in different ways by different children: some felt the highlight had been learning more about climate change; some valued the applied maths skills they had developed and others said that they had learned how to present both sides of an argument. All the children commented that one of their favourite parts had been presenting their work to others and being listened to.

As a teacher, watching the children represent themselves and their science, at first nervously and later with growing confidence, was incredibly rewarding. They began to see lists of numbers and graphs as tools to support their own understanding and arguments. Through the project, they started to become critical scientists who now have the belief that there are solutions to tricky problems and that they can be part of them.

The Royal Society's motto is 'Nullius in verba' which means 'take nobody's word for it' (I am told!). I urge you to apply for a Partnership Grant as a way to teach your pupils to think critically and to give them the belief that they do not have to take other people's word for it. Their 'agency' and voice may work towards solving some of the world's problems in the future.

You can watch Katharine's project video on the Royal Society website here.