TEACHING STEM IN ISA SCHOOLS: *ROOM FOR CREATIVITY?*

THE NUMBER OF STUDENTS TAKING GCSES IN STEM SUBJECTS CONTINUES TO RISE, WITH LATEST GOVERNMENT FIGURES SHOWING A 6% INCREASE THIS YEAR. AS DFE RE-ITERATES ITS PLEDGE TO MAKE BRITAIN 'THE BEST PLACE IN THE WORLD TO STUDY STEM SUBJECTS', AND THE DEBATE ON ARTS SUBJECTS GATHERS PACE, WE ASKED TWO ISA SCHOOLS TO SHARE THEIR APPROACH TO STEM TEACHING. WITH SPECIAL REPORTS FROM PARSONS GREEN PREP IN LONDON, AND ALTON CONVENT IN HAMPSHIRE, WE REVEAL HOW IMAGINATIVE STEM PROGRAMMES CAN ENRICH A CURRICULUM – AND EVEN FIND A NATURAL LINK TO THE ARTS.

PARSONS GREEN PREP: *FROM STEM TO STEAM*

As the debate on STEM versus STEAM continues to heat up in education, at Parsons Green Prep we have been reflecting on our own STEM programme and examining whether there is room for a little STEAM.

STEM subjects have been at the heart of our teaching since 2014 and having a whole school STEM focus has enriched our curriculum. Pupils have the opportunity to develop core STEM subject knowledge along with skills such as problem-solving, critical thinking and creativity. Our main aims have been to highlight the importance of these subjects, to create enjoyment and lifelong interest, and to help children see the potential in studying STEM subjects for future careers.

STEM at Parsons Green Prep is promoted in a variety of ways and these subjects are integrated across enriched our curriculum. Our Year 4 pupils recently researched different wind turbines, learnt about how they worked and designed, and created their own working models. This project created links between the STEM subjects within a real life context and increased the children's awareness of engineering. It also spanned many areas of the curriculum. Pupils carried out research, solved problems, applied their understanding of science, used core numeracy skills and were creative with their ideas and designs.

Core skills in maths and science have been further enhanced and enriched through cross-curricular learning opportunities. Our Year 6 pupils take part in a popular project to design a new fairground ride. They use a number of STEM skills with a particular focus on engineering in a real-life context. Pupils need to apply their understanding of science and mathematical skills throughout, and develop their problem-solving abilities to create inventive and successful fairground rides.

More recently the debate about STEM versus STEAM has made us evaluate the importance of including the arts within this focus. We've realised that in a primary school setting the arts are often intrinsically linked to the way we teach STEM subjects. Creativity is naturally embedded in STEM projects through design, presenting, planning and evaluating. And creative thinking in these projects sparks children's imaginations, helping them to better engage.

A recent example is our 'Wonders of the Universe' whole school project, where we invited children to present work inspired by the title. Children interpreted this as they wished and produced a wide variety of creative and innovative projects, showing that art fitted naturally into what was initially









a STEM-based concept. The children's creations ranged from beautiful planets sewn onto a felt background, to a model of a black hole using marbles and even a telescope complete with its own tiny solar system. It was the arts element which captured the children's imaginations and prompted them on a journey of discovery linked with space and science.

CREST activities (creativity in engineering, science and technology) are another way we inspire children and enrich our STEM-led curriculum. Designed by the British Science Association, these activities enable children to solve science, technology, engineering, and maths problems through practical investigation. These challenges have particularly engaged and excited our younger pupils and the focused activities have allowed them to apply and consolidate knowledge across the STEM subjects. A favourite this year was 'Rainbow Colour Collectors', where pupils were given the challenge to collect the colours of the rainbow by exploring outdoors. Children discovered that the world around us is full of colour and the variety of artistic interpretations of the projects was incredible. The children loved this challenge and the links it made with science and nature were a great way to introduce STEM-based learning to our Early Years pupils.

A further example of how naturally art fits into STEM can be found in our computing lessons. Our Year 5 pupils recently designed their own computer games. This unit of learning brought together scientific skills including observation, analysis, planning and testing, combining core programming skills alongside the artistic elements of design. This highlights how art and design can fit organically with STEM projects. Game development and coding give children ownership over their design ideas and help them bring their imaginations to life. They also help teach perseverance, encouraging children to adapt their ideas as they debug and refine their designs through to fruition.

We are not losing our focus with STEM, but recognising that the benefits and links between all of these subjects enhance the pupils' learning in a more rounded and diverse way. The last two years of concentrating on STEM have shown us that we need children to think creatively and artistically in order to solve problems and come up with innovative ideas. Original ideas and problem solving are in demand in today's workplace and it is critical that we provide pupils with opportunities to develop these skills. By bringing the STEM subjects together more naturally and holistically and making cross-curricular links with the arts, we have seen a real benefit to our pupils' enjoyment of the STEM subjects, with many now aspiring to future careers in these areas.

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