



STEAM Try Five Program:

'STEAM: Try Five' is a research project developed by Technological University Dublin (TU Dublin) under funding from Science Foundation Ireland (SFI). The project is a research-informed suite of workshops developed in line with the Irish Primary School Curriculum and intended to foster, increase and sustain the levels of science aspiration in primary school students. Try Five delivered at least 60 (five per class) hands-on workshops to more than 250 pupils in 5 different STEAM related areas (Science, Technology, Engineering, Electronics and Rocketry) in 12 separate primary school classes, starting when the children are in 4th class and continuing through the year in 2022 - 2023. 'STEAM: Try Five' workshops are delivered to DEIS schools local to the Technological University Dublin Campuses. One workshop was delivered in Technological University Dublin, Grangegorman Campus.

The workshops culminated with an end of year showcase in TU Dublin Grangegorman, to which parents and the wider community were also be invited.

Try Five aims to measure and determine the success of this project in:

- Enhancing children's self-perceived understanding and liking of Science Technology Engineering and Maths (STEAM) topics covered in workshops.
- Increasing awareness of STEAM and future study and career opportunities.
- Improving understanding of basic science methods.
- Increasing belief in the relevance of STEAM subjects in our day to day lives.
- Improving children's sense of self-efficacy in STEAM.
- Reducing stereotypes traditionally linked to STEAM and increasing equality, by portraying STEAM subjects as accessible to all.

All the activities in this program have been thought and developed considering the Department of Education and Skills recommendations for successful STEAM partnerships (mapped in Table 2 below) as well as current scientific research and learning-related scientific trends.

The Try Five program also acknowledges the differences in competence and confidence levels among the teachers, as well as their time constraints, and the diversity of students present in the classroom in terms of origin, socioeconomic backgrounds and developmental levels. Therefore, each workshop is comprised of various interactive and practical components aimed to cater to all students and learning styles as well as supporting teachers CPD1 in the delivery of the STEAM curriculum.

Try Five:

- **Is hands on:** Practical STEAM workshops have been proven to foster ingenuity, creativity and problem solving while building resilience and encouraging teamwork within the class setting.
- **Creativity and development based:** Children will use their imaginations to come up with new creative ideas, experiment and solve problems by using and developing their critical thinking skills.
- **Provides a safe space:** By focusing not only on the science content, but really prioritising the mindset through which science is taught, Try Five aims to better connect with and value the identities, knowledge, and interests of all students whilst at the same time challenging notions of STEAM as being 'hard', 'difficult' or for the 'clever'. While things often go wrong during STEAM activities, and this is a fundamental part of experimenting, we aim to provide children with a safe environment that allows them to experiment, learn from their experiences and try again, moving away from the idea that STEAM is only for the gifted and unfailing.
- **Focus on permanence for a longer acting impact:** Focusing efforts and resources particularly on working with under-represented communities and moving away from single experience initiatives towards longer term, regular partnership work with young people. We make no assumptions about our students' economic wealth or lack thereof, so our workshops are designed so students have something to bring home with them and continue experimenting, rather than relying on their parents and community to provide such support: from project work, support material, research and art challenges to their own created projects and components.

Table 2: Alignment of the Try Five Project with the Priorities for positive STEM engagement as defined in the Department of Education and Skill Guidelines for STEM School – Business/Industry Partnerships (2022).

PRIORITIES FOR POSITIVE STEM ENGAGEMENT	TRY FIVE
The benefits for learners and the learning experience should be central to the partnership plan being put forward by either the school or business/industry and there should be clarity as to roles and responsibilities of all parties. This may be informed by Learning Outcomes on the subject specification.	The Try Five Project was designed following several successful pilot outreach activities with schools. Taking the learning from these activities and in consultation with teachers, the current project delivers a series of STEM workshops over the school year providing for a long term focused and in-depth STEM learning experience for the learners in line with the learning outcomes from primary school STEM curriculum.
The activity/ initiative should have clear, tangible links to the curriculum, the STEM Education Policy Statement, the Digital Strategy for Schools, school priorities and other relevant policies.	Try Five activities have been developed in line with the Irish Primary curriculum subjects and strands for the intended age. This allows for a seamless integration into the classroom planning, less disruption for the teacher, and increased benefit for the learner.
Consideration should be given to the scale and sustainability of the plan over short, medium and long-term.	Try Five has been designed as a project that can be scaled up and sustained over time. Once the initial programme has been successfully delivered, we see potential internal and external partnering opportunities to sustain this project into the long term and build on it, targeting additional age groups.
Those engaging with schools must adhere to any relevant codes of practice in the school, in particular in relation to child protection, health and safety and General Data Protection Regulation (GDPR).	The staff delivering Try Five workshops, as well as any support staff and volunteers are and will be fully garda vetted Child Protection trained. All data collected is managed and stored in compliance with GDPR regulations.
It is important that the teacher is present and involved at all times when there is interaction between the business/industry and the learners. Focus should be on the transfer of skills and knowledge from the business/industry to the teachers and learners.	Presence and engagement of teachers during workshops is required and emphasised through the program. All workshops have been developed with teachers in mind. Additional support materials as well as one-in-one engagement with the Try Five scientific lead are provided to teachers as part of Try Five. In addition, Try Five scientific staff is available to answer any student questions during all workshops.
It is important that the activities are appropriate for the audience. Activities should take into account prior knowledge of the group.	Try Five has been developed by staff with a background in both science, research, and education. Consultation with teachers to continuously improve and adapt our workshops is also an integral part of the program. Try Five also uses storytelling and an overarching theme of space exploration to link with real-life careers and research, and facilitate student engagement.
The learning experience should be interactive and inclusive of all learners. If learners can interact with the process they will engage better, having a practical task for learners to do on site or in a classroom situation is important.	All workshops include practical and interactive activities that keep students engaged. All workshops are developed to provide materials and experiments that students get to keep and follow up activities that they can do in class and at home for a more sustained and longer-term engagement.
Connecting real world experiences to STEM education is important to help the learner understand the practical application of what they study as well as identifying the different pathways they can take toward a STEM career.	The overarching space theme provides a multidisciplinary link to real world experiences and applications that highlights the importance of each study subject to future career pathways.
The business/industry should support the provision of information and experience on future skills needs.	Try Five workshops are designed to foster reflection, creativity, problem solving, teamwork and self-sufficiency skills among students, which is in line with the skills highlighted in the primary school curriculum for that age.
HEAs as well as Business/Industry should give great consideration to the staff who engage with schools. Presenters should be enthusiastic, engaging and inspiring and able to relate to their audience. It is important to keep presentations brief and relevant, in order to keep the audience engaged.	Try Five staff in charge of program delivery has background in education, outreach engagement and a proven track record in the delivery of engaging content to the relevant age groups. In Try Five we firmly believe that curiosity and enjoyment drive learning, and we live and work by this. While failure is part of science it can detract from student engagement with the activity. Our experiments are carefully designed, planned and tested prior to delivery to ensure maximum impact, "wow"-factor and minimal chance of failure.
It is important to look towards sustaining the momentum beyond the engagement itself. Some companies give out a goodie-bag, a pen or note pad at the end of a visit. It might be preferable to engage learners with an activity to follow-up with at home or school, something that can further develop their STEM/Digital skills and bring parents into the process. It is also important to consider creating a follow-up activity for the teacher, in order to sustain the impact of STEM/Digital Technologies learning for all.	Try Five is designed to sustain interest and continue engagement with STEM disciplines even after we have left the classroom. After each workshop: <ul style="list-style-type: none"> • The student keeps their creations and experiments to keep engaging with them in class or at home. • Students receive follow-up activities, exercises and material that they keep in their Try Five STEM binder. • Teachers receive a copy of all material as well as additional material they can use in their class with minimum effort.

Bridging the gaps between schools and higher education.

Try Five pillars:

STEAM Try Five builds on the relationships that TU Dublin has established with inner city DEIS schools over the last 20 years, and does not stop there, aiming to create relationships with other schools within TU Dublin wider catchment area (including TU Dublin Blanchardstown and Tallaght campuses). STEAM Try Five has been designed around the following key areas to ensure an integrated approach that guarantees a successful program with immense growth potential:

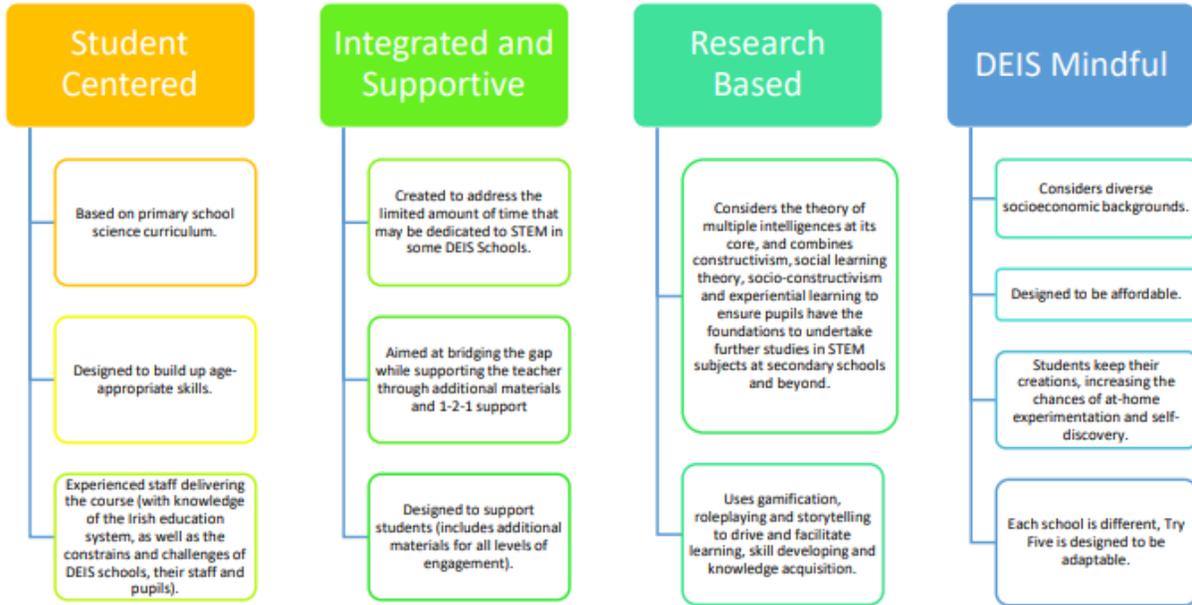


Table 3: STEM Try Five Workshop mapping.

	WORKSHOP	CORE STEM	CORE SUBJECTS	ACTIVITY	GENERAL DESCRIPTION
	Workshop 1 Think Like a Scientist!	SCIENCE MATHS	<ul style="list-style-type: none"> SCIENCE MATHS GRAPHING ECOLOGY PLANTS 	Understanding and using the scientific method on your daily life. Can plants grow in Space?	During this activity students will explore the different parts of the scientific method as they learn to think scientifically. Students will carry on their own experiments: first establishing a research question, a hypothesis, followed by testing and graphing their results. Finally, students will explore the fundamental requirements for life by conducting their own mini experiments growing plants. These experiments will delve into what makes plants grow, not grow or grow better in different environments, and how this can be applied to space exploration and future space settlements.
	Workshop 2 The Science of Ecosystems!	SCIENCE	<ul style="list-style-type: none"> BIOLOGY GEOLOGY MICROSCOPY FITOLGY ECOLOGY 	Build your own self sustainable ecosystem.	During this activity, students will explore the different components that make an ecosystem to make their own self watering terrarium. Students will be able to observe and learn about the cycle of water and the stability of their own ecosystem.
	Workshop 3 Stars and Electronics	ENGINEERING TECHNOLOGY	<ul style="list-style-type: none"> ELECTRONIC CIRCUITS MATERIAL SCIENCE ASTRONOMY 	Build your own circuit. Creating a star projector.	During this activity students will learn about the basics elements of electric circuits and will use this knowledge to create a portable star projector to learn about their favourite constellations.
	Workshop 4 The sustainable Space Explorer	ENGINEERING TECHNOLOGY	<ul style="list-style-type: none"> SCIENCE CIRCUITS SCIENCE SUSTAINABILITY RENEWABLE ENERGIES 	Building your own wind turbine	Building on the previous workshop, students will learn to harvest energy from the wind by building their own wind turbine and learning about how the shape and size of the blades impacts energy generation.
	Workshop 5 Rocket Science	TECHNOLOGY ENGINEERING SCIENCE MATHS	<ul style="list-style-type: none"> SCIENCE ASTRONOMY ENGINEERING CHEMISTRY PHYSICS MATHS 	Rocket Science	Building on previous workshop about engineering and design principles, students will develop their own paper rockets to be launched using an air pressure rocket launcher. Students will the STEM skills developed during previous workshops to make improvements and compete for the highest or longest time-of-flight rocket. The activity will culminate with the launch of a solid fuel rocket.