

## School Self- Evaluation- S.T.E.M. June 2021

A school self-evaluation of teaching and learning in the subject area of STEM took place in term three of 2021. This was in preparation for the development of our third School Improvement Plan in this area.

**School Context:** Harold's Cross NS is a vertical coeducational school. We currently have 409 pupils on roll, an increase of over a hundred pupils since the last self-evaluation. There are now twenty six teachers on staff comprising sixteen class teachers, 8 SEN staff-seven full time and one shared, a full time HSCL coordinator and an administrative principal. The school also has five SNAs who between them support twelve to fifteen pupils throughout the school.

### Focus of the Evaluation:

Pupil Experiences and Learner Outcomes along with Teacher Individual and Collective Practices (Domains 1, 2, 3 and 4)

In order to obtain the staff's input-use was made of the LAOS criteria, focus groups, SWOT analysis and a number of questionnaires (appendix 1, 2 and 3.)

### 2. The findings: Teacher Feedback:

Staff feel that pupils demonstrate very high levels of interest and participation in science. Pupils are motivated to learn through having a clear sense of attainable learning outcomes. There has definitely been a marked improvement in the depth and breath of the curriculum provided to the children over the past three years. The Science Plan (amended again in 2021) has contributed largely to ensuring that there is progression in their science knowledge as the child moves up the school. Science lessons are differentiated for the exceptionally able and for those who find science challenging. Pupils' achievement in summative assessments, including standardised tests are in line with or above realistic expectations for high achieving pupils. Teachers have opportunities to engage in a range of CPD which is based on the identified needs of staff. There is a very good supply of STEM and Digital Learning resources in the school to enable the teaching of STEM.

Pupils are given frequent opportunities to engage in collaborative and cooperative learning and gain great enjoyment from this. Staff are moving towards a much more collaborative approach to science planning within their class groupings.

Those pupils interested in science or high achievers in science from third/fourth/fifth have the opportunity to become involved in Afterschool Science classes which have a focus on aspects of engineering and technology. Using outside personnel (including parents) to present a range of STEM activities in different areas is a source of support and stimulation for both pupils and staff.

Staff feel there is generally a lack of awareness among children as to what STEM is and of its importance in their everyday lives or for their life-long learning.

Staff also feel that their own lack of knowledge/skills/expertise in the areas of Technology and Engineering as it applies to STEM education in primary school is considerable and that this impacts on their capacity to teach the E and T aspects of STEM and also to extend and challenge the pupils' learning in these areas. Apart from the IPSA and teacher observation there is no other form of assessment carried out by staff. This might explain why 49% of pupils said they are unsure as to how they are doing in science. Homework in science is rarely given by teachers and when it is it is usually in the higher classes.

Staff feel that pupils tend not to ask questions or suggest possible scientific solutions confidently. They are unwilling to risk incorrect responses or accept that mistakes are part of the learning process. The vast majority of pupils are unable to negotiate their STEM learning, or really take responsibility for it or to reflect on their attitude to learning STEM. The application of

scientific ideas to everyday life is not really understood by them and age appropriate understanding of life-long learning among the pupils is lacking. While the pupils' knowledge of STEM is assessed, less focus is placed on the assessment of their skills/attitudes and dispositions towards STEM. Due to the lack of time staff find it quite difficult to follow the voice/curiosity of the child in a flexible manner. As always time is a huge factor in endeavouring to get the vast areas of STEM covered.

**Opportunity:** The subject lends itself ideally to the development and improvement of cross curricular links and the use of all the STEM skills in other areas.eg oral language/procedural writing/use of Digital technology/history, maths and geography.

**\* Pupil Feedback** –Use was made of a pupil questionnaire using the Kahoot platform (second/third) and of Google forms (4<sup>th</sup> -6<sup>th</sup> (Appendix 4) and also of a focus group to elicit pupils' feedback.

**Attitudes:** Second/third: Over 84% of pupils have a very positive attitude towards science and said they would like to do more science in school while forty two percent said they would like regular science homework. 54% understood why they studied a particular topic in science. However 46% didn't know the reason they were doing a particular topic or activity. 78% said they felt confident in giving their opinions in science which was at odds with teacher feedback. Fifty four percent stated they did lots of experiments while only 23% said they engage in Make and Design on a regular basis and a small percentage said they did very little in terms of Technology.

Surprisingly 49% of pupils responded by saying they were unsure as to whether they were good at science or not. When asked what their understanding of STEM was 69% said they didn't know and when asked what science was they mostly replied "doing experiments, learning about nature, caring for the environment, biodiversity and making and designing things. Interestingly when asked about engineering being a man/woman's role, 79% said it was a "man's job". Only 26% said they would like a job in science. When asked about what they did at home in science the majority said they looked at science programmes on tv, read books, did experiments or build and designed things which also reflected the feedback of parents when asked this question. A very positive change in the past three years is the increased amount of time children now engage in doing experiments which was at 8% in 2018. This figure rose to 58% this time round.

**Fourth/fifth/sixth Feedback:** In this category, 37% said they liked doing science while 42% said it depended on the topic.35% felt that they were good at science while 49% said it depended on the topic. When asked what they thought science was 73% said, "doing experiments, 44% said learning about plants/ animals, 40% learning about biodiversity 42% it was make & Design and 49% said engineering.(It is important to point out that one of the classes who responded to the questionnaire were currently engaging in STEM in a Box, an engineering activity) 18% stated science was all of the choices listed. Learning about Magnetism was the topic they most enjoyed learning about and heat and the properties of materials were the ones they least enjoyed. 58% said they knew what STEM was. When asked if they would like regular homework in science, 50% said yes, but felt that homework should be dropped in another subject and 19% said no. When asked what skills they felt they learned when doing science, the ones that came up most often were predicting and estimating. There seemed to be a lot of confusion around their understanding of the skills with reference being made to the brain, making a volcano, construction etc. Little reference was made to any of the other skills. When asked about their mastery of the skills most responses were in the Fair to Somewhat categories although, predicting was very strong. Only 33% of pupils said they felt confident responding when being asked questions. 55% were unsure why they were studying particular topics in science and 14% said they had no idea. There was good awareness around possible careers in STEM and reassuringly 91% of respondents said that engineering was a job both men and women could do.

**Parent Feedback;** A questionnaire, drawn up in collaboration with members of the PTA was sent out to the parent body. Thirty one percent of parents responded. 92% of parents stated that their children enjoy doing science, while 73% said that their children enjoy exploring and engaging in problem solving. 95% think that science is a very important subject and 66% would

like their child to get a job in science. When asked if they understood what STEM is, 76% said they knew. The following is a list of the main skills/activities the parents felt are covered in science – Problem solving, forming conclusions/observing, critical thinking, understanding the world around them, designing and making items, team building skills. 39% of parents said they don't get enough feedback on how their child is doing in science and they don't really know what is being covered.

#### **Progress made on previously identified targets:**

There is a definite improvement in ensuring that there is progression and development across all classes in the area of science. Knowledge and awareness of what science is has improved further since 2018.

The Science Plan was recently updated (May 2020) to further ensure breadth and depth.

The recent CPD provided by Darren Shiels of the PDST has definitely been very beneficial in building confidence and competence of staff in relation to the teaching of some of the science skills.

Further investment in the Digital Technology especially in the past two years has enabled the school to provide progressive training in coding to the pupils of 4/5/6<sup>th</sup> for a 10 week period annually and has also increased the pupils' ability to carry out research and to deepen their knowledge.

Those with a passion for or are interested in science are catered for through the provision of an After School Club in science although this has had to be curtailed because of Covid 19 both this year and last. The school attained its fourth Green Flag in Biodiversity and classes participated in events such as Science Blast, Engineering in a Box, Izak 9, a pilot programme involving UCD on Women in science.

## **4. Summary of School Self-Evaluation findings:**

### **4.2 Areas for Prioritization:**

**The following areas have been identified for improvement over the coming three years 2021-24:**

1. Raising awareness among pupils and staff as to the meaning of STEM and of its importance for their life long learning and future careers (especially in relation to Technology and Engineering)
2. Embedding of STEM skills among the student body to a very high standard while ensuring the skills are linked to the identified areas of focus in Numeracy.
3. Building confidence and capacity among the staff and pupils in relation to STEM
4. Use of assessment to inform pupils and parents as to progress.
5. Provision of STEM homework in order to extend and challenge the pupils' knowledge of and skills base in STEM
6. Listening to and following the voice of the child in a more flexible manner

**All regulatory and legislative requirements have been addressed. Policies specified are reviewed regularly. Annual reviews are carried out of Child Protection and Anti- Bullying policies.**

June 2021