BORRISOKANE COMMUNITY COLLEGE

STE(A)M EDUCATION POLICY

2025

Policy Area	Schools
Document Reference Number	BCC/STEAM/086/1
Version No.	1
Document Drafted by	Borrisokane Community College
Date previous version Approved by SLT Noted by TETB	 28 June 2021 7 September 2021
Date Reviewed /Amended by School	Developed during school year 25/26
Date Reviewed / Approved by BOM	30 April 2026
Date Noted / to be Noted by TETB	26 May 2026
Document Review Date	To be reviewed on a regular basis
Date of Withdrawal of Obsolete Document	30 April 2026 Document Ref. No. BCC/STEAM/086/0 Version No. 1

STE(A)M Education Borrisokane Community College

2025

Borrisokane Community College Mission Statement

We seek to promote a caring and committed school community which will facilitate the education of our students and where each individual is valued as a unique human being. "Is ar scáth a chéile a mhairimid"

What is STE(A)M?

Science, Technology, Engineering, Arts and Mathematics permeate every aspect of today's world, and the innovations that emerge from these fields underpin much economic development leading to the establishment of creative enterprises and rewarding careers.

People working in STE(A)M in Ireland are changing the face of the world we live in everyday, whether it is by making life-saving drugs and devices, researching new cures for cancer or creating new technologies that keep us healthier, safer and of course, entertain us.

Our education system plays a key role in equipping learners with the knowledge, skills and dispositions to effect these changes.

Science enables us to develop our interest in, and understanding of, the living, material and physical world and develops the skills of collaboration, research, critical enquiry and experimentation.

Technology covers a range of fields which involve the application of knowledge, skills and computational thinking to extend human capabilities and to help satisfy human needs and wants, operating at the interface of science and society.

Engineering is about the design and creation of products and processes, drawing on scientific methods to provide the skills and knowledge to solve real-world problems.

Art(s) is about creativity and design, develops critical thinking skills.

Mathematics equips us with the skills needed to interpret and analyse information, simplify and solve problems, assess risk, make informed decisions and further understand the world around us through modelling both abstract and concrete problems.

STE(A)M education focuses on developing a range of Key Skills that are essential for living and working in today's world. Learners will engage in a range of activities that include:

- using their skills and content knowledge to creatively solve problems
- imagining, questioning and exploring
- collaborating with others
- engaging in inquiry and analysis
- innovating, designing and making
- testing and modifying their solutions to complex problems

Performance of Irish students - Rationale for promotion of STE(A)M

Irish students' performance is weaker than that achieved by students in countries where STEM performance is outstanding. Their performance in the Trends in Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA) shows that:

TIMSS 2015:
At 4th Class in primary level, Irish students ranked 2nd in Mathematics out of the 22 participating EU member states/territories and 9th out of all 49 countries participating. Irish students ranked 10th in science out of the 22 EU participating member states/territories and 19th out of all 47 countries. At post primary level, second year students ranked 1st in Mathematics out of the 8 EU participating member states/territories and 9th out of all 39 participating countries. In Science, Irish students ranked 3rd out of the 8 EU participating member states/territories and 10th out of all 39 participating countries.

TIMMS 2024:
The Trends in International Mathematics and Science Study (TIMSS) assesses the mathematics and science achievement of students internationally at two grade levels: Fourth Class (primary level) and Second Year (post primary level, equivalent to eight grade). Ireland participated in the 2023 cycle, with data published in December 2024. Both mathematics and science were assessed digitally for the first time in Ireland during this cycle, with a subsample also tested on paper for mode comparison, which showed no significant differences.

Key Findings for Ireland Overall Performance

Fourth Class pupils and Second Year students performed significantly above international averages in both mathematics and science.

Ireland is the top-performing EU country in mathematics and science at Second Year level.

Across cycles (2015, 2019 and 2023) Second Year performance has remained stable, while Fourth class achievement is similar to 2015 and 2019 and significantly improved compared to 2011.

International Comparison

- Only a few East Asian countries scored higher than Irish Fourth Class pupils; only four East Asian countries outperformed Second Year students.
- At Second Year level, no other EU country scored significantly higher in either subject.

Gender Differences

- For the first time, TIMSS 2023 revealed gender differences at Second Year.
- Boys significantly outperformed girls in both mathematics and science.
- Girls' scores in Second Year mathematics decreased since 2019 and in science since 2015.
- Fourth Class scores remained relatively balanced by gender.

Higher-Performing Students

- More students reached the advanced benchmarks in mathematics and science compared to previous cycles, indicating improvement among higher-achieving pupils.
- There remains scope for supporting students at both ends of the proficiency spectrum, high achievers benefiting from targeted enrichment.

Equity Considerations

- While consistent achievement is observed across socio-economic contexts students in disadvantaged (DEIS) schools are still at a performance gap, though the gap has not widened since the last cycle.
- Initiatives like the STEM Passport for Inclusion aim to improve participation and achievement among female students from disadvantaged schools.

Educational Implications

- Ireland's strong performance reflects dedication of teachers, students, and schools and resilience despite COVID-19 disruptions and the transition to digital assessments.
- Curriculum updates that are underway:
  Primary mathematics curriculum (2023) and post-primary biology, physics, and chemistry curricula (2025) aim to strengthen outcomes further.
- Digital literacy and STEM initiatives are expected to contribute to high performance and engagement.

Ref: Educational Research Centre (ERC) in December 2024 and are based on data gathered in 2023.

PISA 2015:
In Science Irish students ranked 6th among EU member states/territories and 19th out of all countries participating. In Mathematics, Irish students ranked 9th among EU member states/territories and 18th out of all countries participating. This data shows the progress that we are making in relation to STE(A)M education and while it indicates encouraging trends an analysis of the uptake of Mathematics in the Junior Cycle Examination, from 2012 to 2017, shows an increase in the proportion of students taking higher-level, from 52% in 2012 to just above 59% in 2017. The proportion of girls taking higher-level Mathematics in the Junior Cycle increased from 24% of the Mathematics cohort in 2012 to 29% in 2017.

There has also been an increase in the proportion of students taking higher-level Mathematics in the Leaving Certificate in recent years. In 2017, 30% of Leaving Certificate students sat higher-level Mathematics, an increase of 8% from 2012. In 2017, 41% of the total cohort who sat higher-level Mathematics were girls, a decrease of 5% from 2012.

In 2017, 14% of all students sat Physics and 17% sat Chemistry at Leaving Certificate. Both Physics and Chemistry have shown a small increase in uptake from 2012 to 2017 (+1.3% and +3.6% respectively). With regard to uptake of Science subjects by girls at Leaving Certificate in 2017, almost 60% took Biology, while less than 20% took Physics or Chemistry. The numbers of Leaving Certificate students taking Engineering in 2017 was 9% while in Technology the uptake was slightly less than 3%.

PISA 2022:
In the latest PISA 2022 results (published in December 2023), **Ireland was the top-performing country in the OECD and EU for reading literacy** and scored significantly above the OECD average in all three assessed domains (reading, mathematics, and science).

Key Findings for Ireland (PISA 2022)

- **Reading Literacy:** Irish students were the **best performers** in reading literacy among all 37 OECD and 26 EU countries. Globally, Ireland ranked 2nd out of 81 participating countries (behind only Singapore). The average score remained stable compared to 2018, while the OECD average declined.
- **Mathematics Literacy:** Ireland ranked 11th globally in mathematics, an improvement of 10 places since 2018. While Ireland's mean score declined by 8 points, this drop was less severe than the OECD average decline of 15 points. Irish students performed significantly above the OECD average.
- **Science Literacy:** Ireland ranked 12th globally in science, also a 10-place improvement from 2018. The mean score increased slightly, returning close to 2015 levels, and was significantly above the OECD average.

Key Observations

- **Above Average Performance:** In all three domains, a considerably lower proportion of students in Ireland performed below the baseline proficiency level compared to the OECD average.
- **Gender Differences:** A notable gender gap persists. Girls significantly outperformed boys in reading, while boys had significantly higher mean scores in mathematics. No significant gender difference was found in overall science performance.
- **Socio-economic Status:** The gap in mathematics performance between socio-economically advantaged and disadvantaged students in Ireland is smaller than the OECD average gap, and this gap narrowed between 2012 and 2022.
- **COVID-19 Context:** The PISA 2022 assessment was conducted in the autumn of 2022 following a one-year postponement due to the COVID-19 pandemic. Irish schools experienced longer closures (over three months for 80% of students) than the OECD average.

Ref: OECD's Education GPS or the Irish Department of Education website.

We at Borrisokane Community College will look to promote STE(A)M with the aim of increasing uptake in STE(A)M for all.

Objectives for STE(A)M Borrisokane Community College

For learners:

- We will provide a STE(A)M education experience that enables all learners, including those at risk of educational disadvantage and learners with special educational needs, to participate, influence and succeed in a changing world
- All learners will have an understanding of STE(A)M disciplines, methods and processes, and a positive attitude towards STE(A)M education
- Uptake of STE(A)M related subjects will increase for learners of all backgrounds, ability and gender, with a particular focus on uptake by females
- All learners will have access to information on STE(A)M careers

For Teachers:

- Teachers will have an understanding of STE(A)M disciplines, methods and processes

- Building on cultures of collaborative professionalism, teachers and will provide effective and engaging STE(A)M teaching, learning and assessment approaches where appropriate
- Teachers where practicable will provide collaborative environments, both in and out of school, for STE(A)M learning, fostering curiosity, inquiry, persistence, resilience and creativity
- Teachers will share STE(A)M practice in collaborative settings
- Adapt to keep STE(A)M education relevant to industry standards and modern technological advancements.

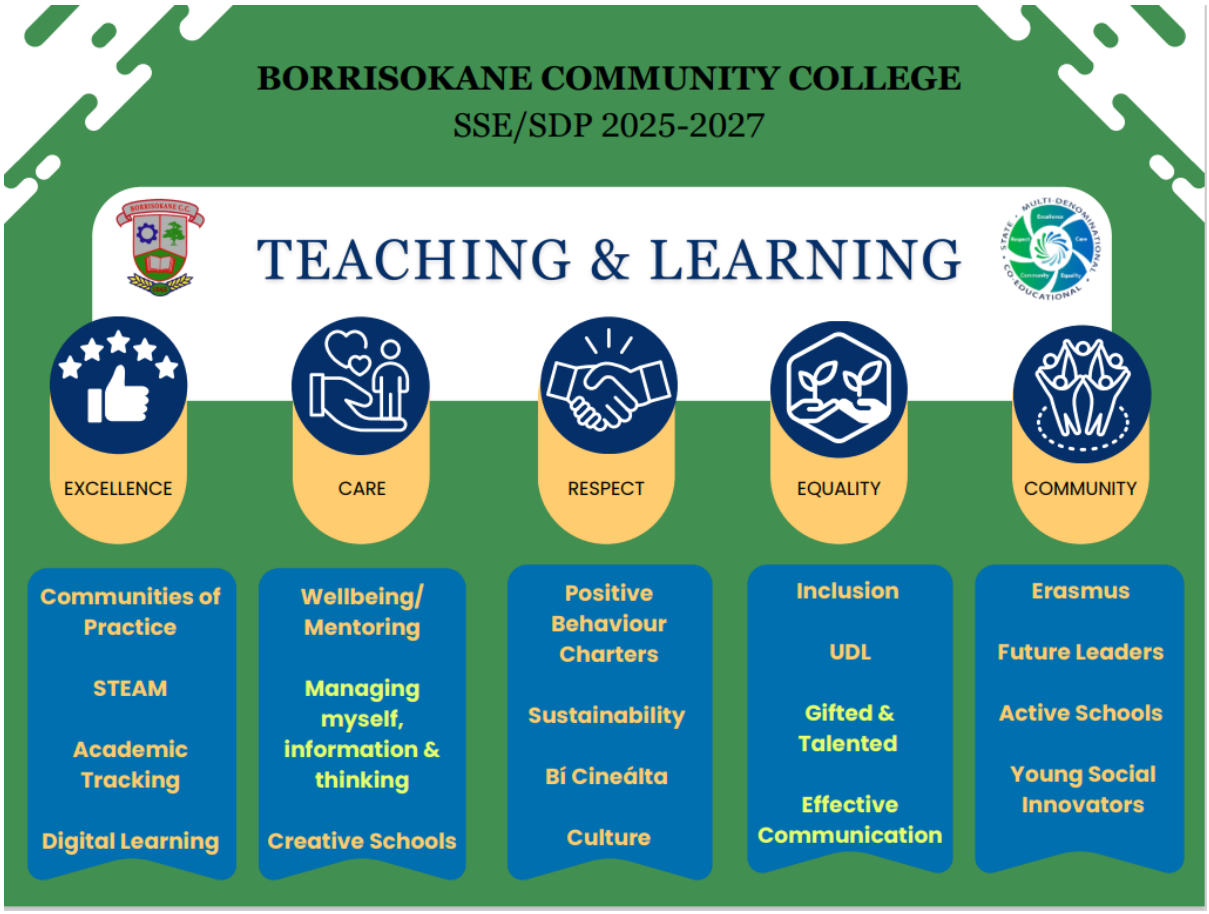
For Community:

- Our students will be equipped with the relevant STE(A)M skills and understanding to engage and lead in an ever-changing world
- Our students will be enabled to actively engage in informed STE(A)M discussions
- We will encourage a growing proportion of school leavers into STE(A)M studies and careers

Targets and Implementation of STE(A)M in Borrisokane Community College 2025-2027

- Increasing participation of learners in STE(A)M education
- Create a STE(A)M Team in school-student lead
- Increase uptake of STE(A)M subjects for learners of all backgrounds, ability and gender increasing awareness of STEM education
- Undertake awareness programmes that promote STE(A)M
- Enhance support for learners to make informed choices about STE(A)M higher and further education, traineeships, apprenticeships and other training options.
- Provide for digital technologies to support STE(A)M education
- School to establish links with business and industry
- Provide STE(A)M training for all staff
- STE(A)M to be continually developed through SSE and SIP

SSE - Looking at our Schools



STE(A)M education has become a focus of Borrisokane community college as seen in our school self-evaluation for 2025 –2027. In order to meet the needs of this there are several strategies that have been put in place to help promote and enhance the delivery of STEAM subjects in our school. These include, but are not limited to:

- STEAM passport for inclusion
- STEAM module in Transition year
- STEAM trips organised (NZEB)
- Coding offered at junior cert level
- Computer science offered at leaving cert level
- STEAM SDP
- Young Scientist

LAOS 2022

STEAM education is delivered through the lens of the LAOS document. Below are some relevant parts of the document which are a key focus for setting our STEAM targets in school

Whole-School STE(A)M Approach

	Domains	Standards
Learning and Teaching	Learner outcomes	Students: enjoy their learning, are motivated to learn, and expect to achieve as learners have the necessary knowledge, skills and attitudes to understand themselves and their relationships demonstrate the knowledge, skills and understanding required by the post-primary curriculum attain the stated learning outcomes for each subject, course and programme
	Learner experiences	Students: engage purposefully in meaningful learning activities grow as learners through respectful interactions and experiences that are challenging and supportive reflect on their progress as learners and develop a sense of ownership of and responsibility for their learning experience opportunities to develop the skills and attitudes necessary for lifelong learning
	Teachers' individual practice	The teacher: has the requisite subject knowledge, pedagogical knowledge and classroom management skills selects and uses planning, preparation and assessment practices that progress students' learning selects and uses teaching approaches appropriate to the learning intentions and to students' learning needs responds to individual learning needs and differentiates learning and teaching activities as necessary
	Teachers' collective / collaborative practice	Teachers: value and engage in professional learning and professional collaboration work together to devise learning opportunities for students across and beyond the curriculum collectively develop and implement consistent and dependable formative and summative assessment practices contribute to building whole-staff capacity by sharing their expertise

Standards	Statements of effective practice	Statements of highly effective practice
Students engage purposefully in meaningful learning activities	Students demonstrate high levels of interest and participation in learning.	Students demonstrate **very high** levels of interest and participation in learning.
	Students are able to learn both independently and collaboratively in a purposeful and creative manner.	Students are able to learn both independently and collaboratively in a **very purposeful, creative and productive** manner.
	Students understand and can explain the purpose of their learning tasks.	Students understand and can explain the purpose of their learning tasks, **and can extend and develop the activity meaningfully**.
	Students are able to report on, present, and explain the process and outcome of learning activities to a competent level.	Students are able to report on, present, and explain the process and outcome of learning activities to a **highly competent** level.
	Students display initiative, self-reliance, positive self-esteem and self-confidence. They demonstrate positive learning dispositions such as creativity, problem-solving, time management, critical thinking, resilience, resourcefulness and persistence.	Students display initiative, self-reliance, positive self-esteem and self-confidence. They **ably and actively** demonstrate positive learning dispositions such as creativity, problem-solving, time management, critical thinking, resilience, resourcefulness and persistence.

Students experience opportunities to develop the skills and attitudes necessary for lifelong learning	Students make meaningful connections between learning in different subjects and areas of the curriculum.	Students make meaningful **and authentic** connections between learning in different subjects and areas of the curriculum **and use these connections to guide their learning**.
	Students make meaningful connections between school-based learning and learning that takes place in other contexts.	Students make meaningful **and authentic** connections between school-based learning and learning that takes place in other contexts.
	Students can, with some guidance, transfer and apply skills learned in one context to another context.	Students can, **of their own initiative**, transfer and apply skills learned in one context to another context.
	Students are aware of the key skills underpinning the curriculum and of their relevance to present and future learning.	Students **can explain** the key skills underpinning the curriculum and **understand** their relevance to present and future learning.
	Students take the opportunities provided by curriculum and other learning experiences to apply and develop these key skills.	Students take the opportunities provided by curriculum and other learning experiences to apply and develop these key skills **consciously and deliberately**.
	Students are confident in using technology individually and with peers to enhance the learning experience and develop appropriate skills. They are responsible and aware of the impact of technology use for themselves and others.	Students are **innovative**, confident **and creative** in using technology individually and with peers to enhance the learning experience and develop appropriate skills. They are responsible in their use of technology and **actively mitigate risk to ensure technology has a positive impact on themselves and others**.
	Students have an age-appropriate understanding of the concept of lifelong learning, and are well disposed to continuing education and training.	Students have an age-appropriate understanding of the concept of lifelong learning, and **see themselves engaging in** continuing education and training.

The teacher selects and uses teaching approaches appropriate to the learning intentions and to students' learning needs	Teachers select and use approaches to match the learning intentions of the lesson and meet the learning needs, interests and abilities of students.	Teachers select and use approaches to match the learning intentions of the lesson, meet the learning needs, interests and abilities of students, **and to open up further learning opportunities**.
	Teachers deliver good-quality instruction which elicits student engagement and supports autonomous learning opportunities. Teachers maintain a balance between their own input and productive student participation and response.	Teachers deliver **highly effective** instruction which elicits **deep** student engagement and supports autonomous learning opportunities. Teachers **optimise** student engagement, response **and reflection by skilfully managing their own input**.
	Teachers use a range of questioning techniques effectively for a variety of purposes including the stimulation of substantial student responses and the facilitation of deeper engagement with lesson content.	Teachers use a range of questioning techniques effectively for a variety of purposes including the stimulation of substantial student responses, the facilitation of deeper engagement with lesson content **and the extension of learning beyond the lesson**.
	Teachers meaningfully differentiate content and activities to cater for the varying needs, interests and abilities of students.	Teachers meaningfully differentiate content and activities **to ensure that all students are challenged by the learning activities and experience success as learners**.
	Teachers purposefully develop relevant literacy and numeracy skills during lessons.	Teachers **integrate** relevant literacy and numeracy skills **into the lesson**.
	Teachers enable students to make meaningful links between lesson material and their learning in other subjects and elsewhere.	Teachers enable students to make meaningful links between lesson material and their learning in other subjects, **and to transfer their learning to new experiences.**

Teachers contribute to building whole-staff capacity by sharing their expertise	Teachers recognise the value of building whole-staff capacity and are willing to share their expertise with other teachers in the school.	Teachers **value their role within a professional learning organisation** and, **as a matter of course**, share their expertise with other teachers in the school.
	Teachers are willing to share their expertise with teachers from other schools, for example through education centres, online forums, and school visits.	Teachers **share** their expertise with teachers from other schools, for example through education centres, online forums, and school visits.
	Teachers engage regularly in professional collaborative review of learning and teaching practices and use it to identify approaches.	Teachers engage regularly in professional collaborative review of learning and teaching practices, and **use it to identify and build on effective approaches**.
	Teachers respond positively to change and are open to building collective expertise in the skills and approaches, including those relating to digital competence, that are necessary to facilitate current and future student learning.	Teachers respond positively to change and are **proactive** in building collective expertise in the skills and approaches necessary, including those relating to digital competence, to facilitate current and future student learning.

STE(A)M In The Classroom

Students experience opportunities to develop the skills and attitudes necessary for lifelong learning	Students make meaningful connections between learning in different subjects and areas of the curriculum.	Students make meaningful **and authentic** connections between learning in different subjects and areas of the curriculum.
	Students make meaningful connections between school-based learning and learning that takes place in other contexts.	Students make meaningful **and authentic** connections between school-based learning and learning that takes place in other contexts.
	Students can, with some guidance, transfer and apply skills learned in one context to another context.	Students can, **of their own initiative**, transfer and apply skills learned in one context to another context.
	Students are aware of the key skills underpinning the curriculum and of their relevance to present and future learning.	Students **can explain** the key skills underpinning the curriculum and **understand** their relevance to present and future learning.
	They take the opportunities provided by curricular and other learning experiences to apply and develop these key skills.	They take the opportunities provided by curricular and other learning experiences to apply and develop these key skills **consciously and deliberately**.
	Students have an age-appropriate understanding of the concept of lifelong learning, and are well disposed to continuing education and training.	Students have an age-appropriate understanding of the concept of lifelong learning, and **see themselves engaging in** continuing education and training.

Teachers work together to devise learning opportunities for students across and beyond the curriculum	Teachers plan collaboratively for learning activities that enable students to make meaningful connections between learning in different subjects.	Teachers plan collaboratively for learning activities that enable students to make meaningful **and progressively more challenging** connections between learning in different subjects.
	Teachers collaboratively plan learning experiences that help students to see learning as a holistic and lifelong endeavour.	Teachers collaboratively plan learning experiences that **enable and empower** students to see learning as a holistic and lifelong endeavour.
	Teachers work effectively with each other and with parents to support students with identified learning needs.	Teachers work **very effectively** with each other and with parents to support students with identified learning needs.
	Teachers use parent-teacher meetings and other communication with parents constructively to support parents' meaningful involvement in their children's education.	Teachers use parent-teacher meetings and other communication with parents **very constructively** to support parents' meaningful involvement in their children's education and **development as learners**.
	Teachers collaborate with relevant and appropriate outside personnel to provide meaningful learning experiences for students.	Teachers collaborate with relevant and appropriate outside personnel to provide meaningful learning experiences for students, and **work together to ensure that the learning is integrated**.