






## Frequently Asked Questions about the *Science Technology and Engineering Education (STE) Specification* – with reference to the *Primary STEM curriculum area*

TIME ALLOCATION 	STRANDS 	ELEMENTS 
Stage 1: 3 hours 20 minutes	Nature of STEM	Exploring and understanding
Stage 2: 4 hours	Living things	Creative and critical thinking
Stage 3: 5 hours	Materials	Applying and problem-solving
Stage 4: 5 hours	Energy and forces	Evaluating and communicating
	Technology	
	Engineering	

### What is the *Primary Science, Technology, Engineering and Mathematics (STEM) Education specification*?

The Primary Science, Technology, Engineering and Mathematics (STEM) Education Specification is one of five curriculum areas in the redeveloped Primary School Curriculum for primary and special schools, it is presented in three parts:

- *The Science, Technology and Engineering Education specification*
- *An Approach to Integrated STEM Learning*
- *The Primary Mathematics Curriculum*

The Primary Mathematics Curriculum (the PMC) was published in 2023 and is available on [curriculumonline.ie](http://curriculumonline.ie)

The following questions will focus on the two new parts of the STEM Education Specification - the *Science, Technology and Engineering Education specification* and *An Approach to Integrated STEM Learning*.

## What will children learn about in Science, Technology and Engineering Education (STE)?

In *STE Education*, children learn about nature, materials, the living world, energy and forces. It supports children's learning regarding aspects of technology and rapidly changing technological developments, as well as human endeavours to design and create, all of which makes an impact on their daily lives. This specification aims for a balanced approach to STE learning including conceptual and procedural knowledge, the development of STE/M skills and an understanding of the Nature of STEM.

STE Learning Outcomes describe expected learning and development over a two-year period. Children should be encouraged to work towards Learning Outcomes at a level and pace that is appropriate to them. Embedded within the Learning Outcomes are opportunities to develop the overarching key competencies as outlined in the *Primary Curriculum Framework*.

At the heart of *STE Education* is curiosity, creativity, problem-solving skills and the pursuit of knowledge and advancement. Children develop a range of STEM skills, identify STEM opportunities, make discoveries, engage in hands-on and minds-on learning, design with a purpose and develop as a digital learner. They are encouraged to be innovative and develop an understanding on our natural, tech-driven and engineered world.

## The redeveloped primary curriculum brings together Science, Technology and Engineering. What is new and how does it compare with the 1999 curriculum?

In the Primary School Curriculum (1999), Science was situated with History and Geography in Social, Environmental and Scientific Education (SESE). As a subject, Science is now situated in the new *STE Education*, alongside Engineering and Technology.

STE Education is organised according to the following six strands:

- Nature of STEM
- Living Things
- Materials
- Energy and Forces
- Technology
- Engineering

### What is new in Science?

- Living things, Materials and Energy and forces will be readily identifiable to teachers as strands of learning in science. The focus of learning in science will be on children engaging in scientific inquiries as they explore each of these strands.
- Learning Outcomes in Science strands centre on conceptual knowledge, skills and the scientific inquiry process.
- While topics such as the environment and sustainability are now situated in the *Social and Environmental Education* specification, Science and the environment are intrinsically linked. References to environmental impact, sustainability, conservation and biodiversity also feature in the STE Learning Outcomes.

- Connections with Biology (Living Things), Chemistry (Materials) and Physics (Energy and Forces) are introduced in Stage 4 Learning Outcomes. This aims to develop and enrich the children's STEM literacy, inspire further learning and give them the opportunity to make informed choices as they encounter different science subjects in post-primary school and beyond.
- When learning about forms of energy in the Energy and forces strand, the focus for children's learning will be on building foundational understanding of each form of energy. Specific energy forms are explored in different stages: Stage 1 – Magnetism; Stage 2 – Sound; Stage 3 – Light; Stage 4 – Electricity. Aspects of Heat are explored in the Materials strand at Stage 3.

### *What is new in Technology?*

- The 1999 curriculum referred to Technology, however it is recognised as a subject in and of itself in the redeveloped curriculum (2025).
- Children's learning in Technology focuses on children **using, understanding and creating** with technology.
- Learning Outcomes in the Technology strand centres on conceptual knowledge, skills and the computational thinking process.
- Children will have the opportunity to engage with both digital technologies (e.g. computers, smartphones and digital clocks) **and** non-digital technologies (e.g. pens, paperclips and mechanical clocks). Across both types of technologies, children will explore their purpose and how they function. They will also explore the role of data in the digital world.
- Other aspects of technology such as media and digital wellbeing are explored in the *Wellbeing* specification.

### *What is new in Engineering?*

- The Science curriculum (1999) included a 'Design and Make' process which featured basic learning in Engineering, however it is recognised as a subject in and of itself in the redeveloped curriculum (2025).
- Children's learning in Engineering focuses on children engaging in, understanding and using the design thinking process and developing Engineering skills.
- Through the Nature of STEM strand, children will also learn about how engineers tackle and solve problems, develop their STEM eyes to recognise engineering around them and learn about some of the unique features of engineering.
- This foundational introduction to Engineering aims to develop and enrich the children's STEM literacy and inspire further learning in Engineering in post-primary school and beyond.

## **What will STE look like in practice?**

Chapter 6 supports teachers in bringing the curriculum to life in classrooms. It outlines the main features of **children's learning** in the *STE Education* specification, the **pedagogical approaches** that support and enhance it, and **guidance in assessing** children's learning and progression.

## Section 6A: Children's Learning

- Chapter 6A in the *STE Education* specification outlines essential, playful and engaging learning experiences for children in STE. For example, incrementally, children will be given opportunities to organise and make sense of information, critique ideas for relevance and clarity, troubleshoot and modifying approaches and use evidence and reasoning to justify decisions and draw conclusions
- Additional Support Pathways are included in Chapter 6 of the *STE Education* specification. They outline different ways that children can engage in learning in STE which may be useful for children with special educational needs who require more individualised and inclusive learning experiences.

## Section 6B: Pedagogical Approaches

- Section B describes important pedagogical approaches that teachers can use to support and enhance children's learning in STE. Common pedagogical approaches such as Dialogic pedagogy, Explicit teaching, Integration and Play and playful pedagogies are outlined – As well as three pedagogical approaches that are particularly important in STE, namely Scientific Inquiry, Design Thinking and Computational Thinking.

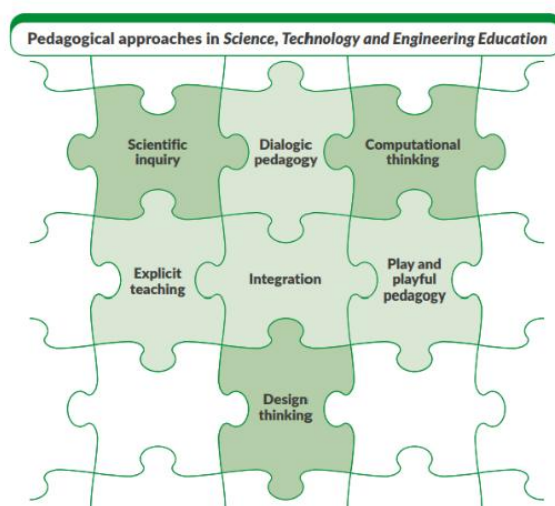


Figure 5: Teaching in Science, Technology and Engineering Education

## Section 6C: Assessment

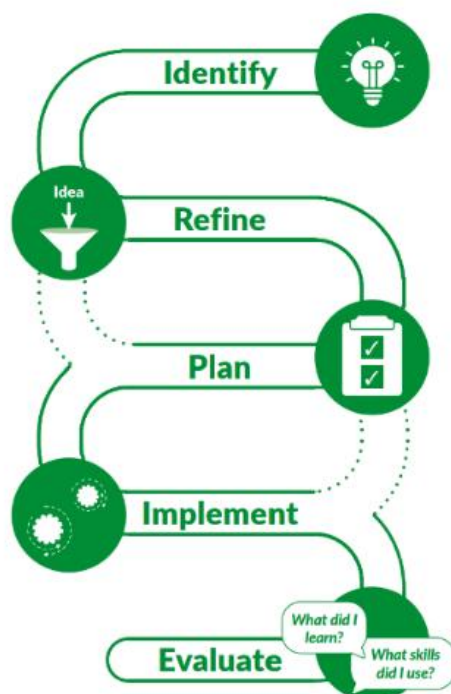
- Guidance in assessment includes a range of methods that can be used to gather rich information about children's learning progress in STE Education, for example, teacher questioning and observation, children's self-assessments, as well as digital portfolios and STEM journals. Importantly, the guidance also outlines how the information gathered can be used to inform next steps in the children's learning.

## What does 'An Approach to Integrated STEM Learning' entail?

'An approach to integrated STE+M learning' draws on both the *Science, Technology and Engineering Education (STE) Specification* and the *Primary Mathematics Curriculum (PMC)* for the purpose of meaningful integration.

It outlines a five-phase approach to integrated STEM learning that mirrors STEM in the real-world situations. Meaningful Integration of Mathematics with Science, Technology and Engineering is a core aim of this integrated learning approach. Application of Mathematics learning should be included in all projects.

The STEM Specification is designed to develop children's STEM Literacy, nurture a STEM mindset, foster active problem-solving skills and cultivate ethical and responsible attitudes and approaches to STEM.



## What is 'Nature of STEM' in Science, Technology and Engineering Education?

The Nature of STEM strand aims to give children a broader understanding of STEM, beyond subject-related content knowledge, procedural knowledge and skills. For example, through learning about the Nature of STEM, children can consider what STEM is and how it works, develop STEM Mindsets, look at challenges through STEM Eyes and explore the impact of STEM on our society.

## How does STE Education align with Aistear and the Junior Cycle?

- Aistear: the Early Childhood Curriculum Framework includes a theme called 'Exploring and Thinking'. Through this theme, babies, toddlers and young children are encouraged to be curious and make sense of their world by playing, investigating, thinking,

questioning, and forming, testing and refining ideas. STE Education in primary school builds upon this foundational learning, fostering resilient explorers and creative thinkers.

- In post-primary education, the Junior Cycle includes full subjects such as Science, Applied Technology and Engineering as well as short courses, for example, Coding and Food Glorious Food. The Junior Cycle also includes topics such as the Nature of Science. Opportunities in STEM learning in post-primary school can build on foundations formed in early years and primary school and further develop the children's STEM Literacy.

### **What supports can be found in the *Science, Technology and Engineering Education Online Toolkit*?**

The STE Toolkit offers practical support to teachers in creating enriching STE learning experiences for children. It includes a range of support materials and examples of children's learning. Designed to be accessible, user-friendly, and adaptable to various school settings, the toolkit will be continually developed and updated to assist teachers across mainstream and special schools.

### **Where can I find more information?**

Parents and teachers can access the *STE Education* specification and the STEM Toolkit on NCCA.ie and on [www.curriculumonline.ie](http://www.curriculumonline.ie).