

Leadership
in STEM Education

Course Overview with Award Framework



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Programme introduction

The SSERC Leadership in STEM Education programme is a 12-month professional learning (PL) programme that provides leadership opportunities at a whole-school level to educators across Early Years, Primary and Secondary settings and seeks to improve how STEM is delivered in their centre. Over the course of the programme participants will receive input across several areas including national STEM policy, leadership theory and practice in schools, STEM enrichment offers, and health and safety. Participants will also complete a professional enquiry on an area of interest relevant to them and their centre and present their findings at a showcase event at the end of the programme.

The Leadership in STEM Education programme is open to educators across the entire 3-18 curriculum and whilst it will appeal to aspiring and existing school leaders, it is also entirely suitable for practitioners who simply want to lead highly effective STEM learning and teaching in their centre.

Course aims

The course has been benchmarked at SCQF Level 11 and is aligned to the GTCS professional standards for Middle Leadership and Career Long Professional Learning. SSERC is working with GTCS to gain Professional Recognition status for the course, meaning that delegates who complete Leadership in STEM Education will be recognised for the accomplished expertise they will gain via the depth of enquiry and increased knowledge, skills and abilities.

Aims of the course are:

- develop a strategic and forward-thinking approach to facilitate, initiate and lead change for STEM improvement within an educational setting
- develop and apply knowledge and understanding of STEM pedagogy to inform practice, extend the use of critical enquiry, reflection skills and data analysis to evaluate and strengthen the impact of practices on self and others
- enhance interpersonal skills, confidence, and resilience to lead change and development
- develop skills that support and empower learning communities to effect change
- develop support networks for personal and professional development
- share, investigate, and exchange information on current national developments.

Programme structure

Unit 1: The STEM Policy Landscape

In this unit, delegates will be introduced to the level of academic reading and writing that is expected of them at a course aligned to SCQF Level 11. They will also work with many of SSERC's delivering partners to gain a broader and deeper understanding of the national educational landscape. Some components of Unit 1 take place at the in-person launch day at SSERC HQ. Other components are completed online or via self-study methods.

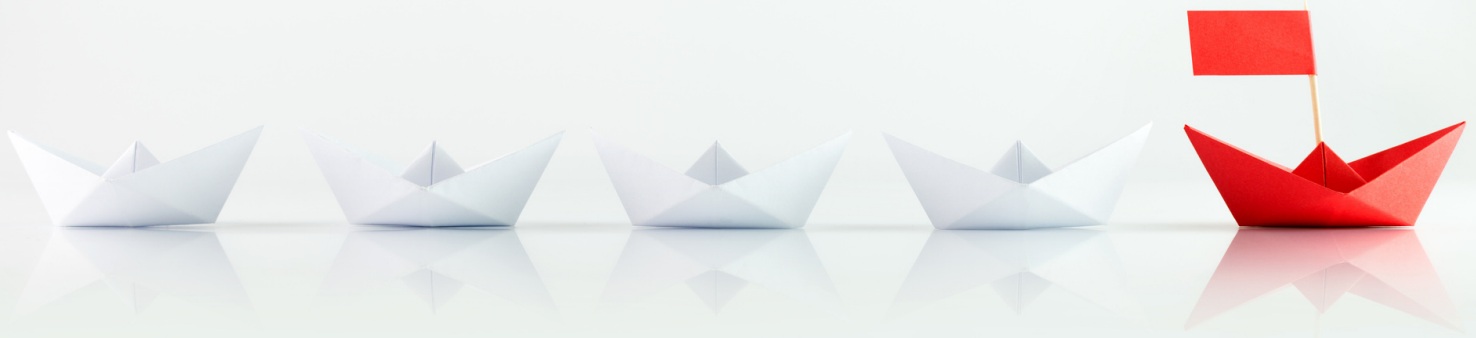
Course component	Tasks to be completed and evidence the delegate will generate
1.1	Completion of an academic writing task: critique and analysis of a STEM article, reflective discussion and journal entry on what has been learned
1.2a	Completion of <i>Exploring Middle Leadership</i> online learning module
1.2b	Reflective journal entry on own leadership skills and areas for development
1.3	A series of engagements with SSERC partners such as Education Scotland, Skills Development Scotland, and key Education Professionals to understand the impact of national STEM education policies and programmes; challenge questions will be set by each partner and answered by delegates
1.4	Self-led research profiling organisations that support STEM education, understanding their aims and vision, and considering the impact they may have in the delegate's own centre
1.5	Completion of a self-evaluation and improvement framework activity (SEIF) within the delegate's own centre

Unit 2: Leadership Theory

In this unit, delegates will be introduced to tools that allow the self-evaluation of one's own leadership skills and qualities to take place and also to sample the views and feedback of others using: 360 evaluations, persona analysis, and leadership style indicators. Delegates will also reflect and report on their experience of carrying out their SEIF activity in Unit 1. The content of Unit 2 is covered during day one of a two-day residential event at SSERC HQ and typically takes place in November/December each year.

Course component	Tasks to be completed and evidence the delegate will generate
2.1	Presenting the findings of the SEIF to peers and self-evaluating one's own presentation; reflecting on the challenges of completing the SEIF via reflective journal entry
2.2	Using digital tools and the thoughts of others to identify leadership style, and skills; creation of an action plan to build/improve on these with a reflective journal entry summarising the professional learning that has taken place
2.3	Participation in live session with inspirational leader, group discussion and reflective journal entry on a challenge set by keynote speaker; assessing own motivations for a leadership role





Unit 3: Developing Leadership Skills

In this unit, delegates will review and discuss with peers the findings of the leadership tools which were introduced in Unit 2. Course components 3.1d and 3.2 are covered entirely by a one-day event at SSERC HQ where delegates will work with an external expert to develop leadership skills through a series of workshops, challenges, and activities. This event typically takes place in January/February in the second half of the academic year.

Course component	Tasks to be completed and evidence the delegate will generate
3.1a	Completion of a 360 evaluation (by the delegate) with a supporting action plan, using the Leadership Matters tools
3.1b	Completion of a 360 evaluation (by ten selected peers), followed by a reflective meeting, with minutes, between the delegate and the In-school Coach to discuss the findings
3.1c	Reflective journal entry on a challenge question linked to how the processes in 3.1a and 3.1b have challenged the delegate's own perceptions of their leadership style
3.1d	Participation in a professional group discussion with fellow delegates on all aspects of course components 3.1a, 3.1b and 3.1c
3.2	Completion of a series of leadership skill workshops: dealing with challenging conversations/situations; handling effective meetings; developing influencing skills and assertiveness; coaching skills – giving and receiving feedback.

Unit 4: Professional Enquiry: Stage 1

In this unit, delegates will prepare their professional enquiry, making all the necessary plans and putting in place all relevant resources to formulate and answer a valid question to explore a STEM-related issue. External partners from academia work with delegates to give reasonable guidance and assistance to delegates throughout the enquiry process. The initial components of this unit are delivered as part of a two-day residential course at SSERC HQ, with the rest carried out by the delegate back at their centre.

Course component	Tasks to be completed and evidence the delegate will generate
4.1	Participation in a series of in-person professional learning workshops, delivered by Professor(s) in Education/Academia, to prepare delegates for the professional enquiry
4.2	Formulation and submission of a draft professional enquiry question to the academic partner
4.3	Receiving feedback and reviewing the draft professional enquiry question with the academic partner and submitting the final question
4.4	Carrying out the professional enquiry
4.5	Participation in ongoing progress meetings/reporting to SSERC and academic partner.



Unit 5: Professional Enquiry: Stage 2

In this unit, delegates will present the findings of their professional enquiry to their peers, fellow delegates, SSERC staff and supporting partners. As the professional enquiry is the core assessment tool for the entire course, observational assessment will take place as each delegate delivers a short presentation at the Leadership Showcase in SSERC HQ at the end of the academic year. Reflective professional discussions will also take place as part of the showcase, as will a celebration of the achievements the delegates have made.

Course component	Tasks to be completed and evidence the delegate will generate
5.1	Presentation of Professional Enquiry findings
5.2	Participation in reflective professional discussions with others on the collective and individual enquiry findings for the cohort.



Unit 6: Enrichment Courses

In this unit, delegates will explore the many STEM enrichment and engagement programmes, offers and activities that are available for educators and learners in Scotland/the UK and consider their impact and potential within their own centre. There is freedom of choice for the delegate who must complete a short investigation into six of the enrichment offers from a large list which is provided by SSERC. Some aspects of this unit will have been covered in earlier units via engagement with our external delivering partners such as Education Scotland, Learning for Sustainability, and Skills Development Scotland, whilst delegates are likely to be familiar with STEM engagement programmes such as the Young STEM Leader and STEM Ambassador Programmes.

Course component	Tasks to be completed and evidence the delegate will generate <small>*Delegates will complete six from the list below. Please note these options will be subject to change and development each year</small>
6.1	Managing Health and Safety
6.2	The Young STEM Leader Programme
6.3	Building STEM Capital
6.4	Interdisciplinary Learning
6.5	Transitions
6.6	Learning for Sustainability
6.7	Literacy, Numeracy, Health and Wellbeing
6.8	Digital Literacy
6.9	Equality, Diversity and Inclusion
6.10	Grants and Funding Opportunities
6.11	The STEM Ambassador Programme
6.12	Education Industry Partnerships and Enthuse Partnerships.

Assessment

All units and their components have prescribed learning outcomes (LO) which delegates are expected to meet as they progress through the course. Each component/LO is linked to identified SCQF characteristics at a specific level. The course is also aligned to GTCS Professional Standards for Career-long Professional Learning and Middle Leadership.

The main mode of assessment is via the completion of a professional enquiry, which will be externally assessed. Whilst this is the main assessment tool, achievement of the learning outcomes throughout the course is also evidenced via the ongoing completion of a reflective leadership journal and evidence portfolio.

The course has been designed to equate to SCQF level 11 with an indicative credit value of 15.

Additional Information

This course will be partly subsidised through ENTHUSE funding which means on completion of the course, centres will be able to claim back a significant part of the course fee. More information on this will be provided to delegates at or near course completion.

Applications

Applications are made for this course via the [SSERC website](#).

Applications can only be considered where the delegate has the approval of their Headteacher to take part and attend all aspects of the course. Delegates must also identify an In-School Coach as detailed in the In-School Coach Supporting Pack.

Appendix 1 - Award Framework

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
1. The STEM Policy Landscape	1.1 Academic reading and writing	<p>1.1.1 - Recognise the importance of developing a professional network</p> <p>1.1.2 - Understand the aims and outcomes of the course</p> <p>1.1.3 - Recognise the importance of the roles and expectations of you, your centre, your identified in-school coach and your Practitioner Enquiry mentor</p> <p>1.1.4 - Demonstrate an understanding of the process of academic writing</p>	Self-study task with in-person follow-up	1.1 Component overview sheet	3.1.1 - Support the design and provision of a curriculum informed by theoretical principles of curriculum design and purposes of education	Generic Cognitive Skills: Critically review, consolidate and extend knowledge, skills, practices and thinking in a subject/discipline/sector	11	Completion of an academic writing task: critique and analysis of a STEM article, reflective discussion and journal entry on what has been learned
	1.2a Exploring middle leadership (Part 1)	<p>1.2.1 - Explore and develop your understanding of the concept of middle leadership</p> <p>1.2.1 - Consider the ways in which middle leadership can be developed in schools and early learning settings</p>	Online self-study module	1.2a Component overview sheet	2.1.4 - Have knowledge and understanding of Leadership and Management related to your context	Knowledge and Understanding: critical awareness of current issues in a subject/discipline and one or more specialisms	11	Certificated completion of Exploring Middle Leadership online learning module

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
1. The STEM Policy Landscape	1.2b Exploring middle leadership (Part 2)	<p>1.2.1 - Explore and develop your understanding of the concept of middle leadership</p> <p>1.2.1 - Consider the ways in which middle leadership can be developed in schools and early learning settings. (As above 1.2a)</p>	Online live session with follow-up task	1.2b Component overview sheet	2.14 - Have knowledge and understanding of Leadership and Management related to your context	Knowledge and Understanding: critical awareness of current issues in a subject/discipline and one or more specialisms.	11	Reflective journal entry on a challenge question linked to the delegate's own leadership skills and areas for development
	1.3 STEM policy	<p>1.3.1 - Demonstrate your understanding of the policies underpinning the development of STEM education in Scotland</p> <p>1.3.2 - Appraise the opportunities and challenges associated with implementing these key policies in schools</p>	Online live session with follow-up tasks	1.3 Component overview sheet	3.2.4 - Help promote and support partnership working with colleagues, parents/carers and families, other professionals and agencies to support the rights and wellbeing of every learner	Knowledge and understanding: Demonstrate a critical understanding of theories, concepts and principles	10	A series of engagements with SSERC partners such as Education Scotland, Skills Development Scotland, and key Education Professionals to understand the impact of national STEM education policies and programmes; challenge questions will be set by each partner and answered by delegates

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
1. The STEM Policy Landscape	1.4 Organisations that support STEM education	1.4.1 - Critically review the support and impact that a STEM-based organisation provides to the education community in Scotland	Self-study and research	1.4 Component overview sheet	3.2.4 - Help promote and support partnership working with colleagues, parents/carers and families, other professionals and agencies to support the rights and wellbeing of every learner	Demonstrate knowledge and understanding of the ways in which STEM is developed, including a range of established techniques of enquiry or research methodology	10	Completed support organisation flowchart/profile
	1.5 STEM Self-evaluation and improvement framework (SEIF)	<p>1.5.1 - Demonstrate an understanding of the school's context, relevant improvement plans and Education Scotland evaluation document</p> <p>1.5.2 - Apply knowledge and understanding of STEM Self Evaluation and Improvement Framework to carry out an audit at the whole school level</p> <p>1.5.3 - Evaluate and reflect on areas of success and challenges</p> <p>1.5.4 - Demonstrate effective personal and communication skills when undertaking the activity</p>	Live online session, self-study and research, school-based activity	1.5 Component overview sheet	3.4.2 - Develop and sustain the effective use of a wide range of robust and credible information to support and inform decisions and improvements across the school and learning community in line with agreed strategic and operational priorities	<p>Generic Cognitive Skills: Critically review, consolidate and extend knowledge, skills, practices and thinking in a subject/discipline/sector</p> <p>Communication, ICT and numeracy skills: Communicate with peers, more senior colleagues and specialists.</p>	<p>10</p> <p>10</p>	<p>Minutes of meeting with the in-school coach to plan SEIF</p> <p>Completed SEIF paperwork</p> <p>Preparation of a report/presentation (at SSERC residential event) on the findings of the SEIF</p>

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
2. Leadership Theory	2.1 STEM audit reporting	2.1.1 - Explain the findings of your STEM self-evaluation activity 2.1.2 - Assess your presentation and delivery style linked to your presentation 2.1.3 - Develop a professional network	Face to face (two-day residential at SSERC HQ)	2.1 Component overview sheet	2.2.4 - Communicate effectively	Communication: Present or convey formally or informally, information about specialised topics to informed audiences Offer professional insights, interpretations and solutions to problems and issues	10	Presentation the findings of the SEIF to peers and self-evaluating one's own presentation skills; reflecting on the challenges of completing the SEIF via a reflective journal entry
	2.2 Leadership v management	2.2.1 - Develop an understanding of the differences and similarities between leadership and management 2.2.2 - Identify and describe your own leadership/management style 2.2.3 - Explain the impact of the sessions/workshops on your own understanding of leadership	Face to face (two-day residential at SSERC HQ)	2.2 Component overview sheet	2.1.4 - Have knowledge and understanding of Leadership and Management related to your context	Apply critical analysis, evaluation and synthesis to forefront issues	11	Using digital tools and the thoughts of others to identify leadership style, and skills; creation of an action plan to build/improve on these with a reflective journal entry summarising the professional learning that has taken place
	2.3 Aspiring to lead	2.3.1 - Critically reflect on own leadership journey and identify area for improvement/change moving forward	Face to face (two-day residential at SSERC HQ)	2.3 Component overview sheet	2.1.4 - Have knowledge and understanding of Leadership and Management related to your context	Generic Cognitive Skills: Other professional insights, interpretations and solutions to problems and issues	10	Participation in live session with inspirational leader, group discussion and reflective journal entry on a challenge set by keynote speaker; assessing own motivations for a leadership role

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
3. Developing Leadership Skills	3.1a Self-evaluation of skills, abilities and attributes	3.1.1 Understand and analyse own leadership skills through self-reflection and the feedback of others 3.1.2 Critically reflect on own leadership skills and identify areas for development	Self-study	3.1 - Component overview sheet	2.2.2 - Understand and demonstrate self-awareness and inspire and motivate others	Practise in ways which draw on critical reflection on own and others' roles and responsibilities	11	Completion of a 360 evaluation (by the delegate) with a supporting action plan, using the Leadership Matters tools
	3.1b Self-evaluation of skills, abilities and attributes		Self-study		2.2.2 - Understand and demonstrate self-awareness and inspire and motivate others	Practise in ways which draw on critical reflection on own and others' roles and responsibilities	11	Completion of a 360 evaluation (by ten selected peers), followed by a reflective meeting, with minutes, between the delegate and the In-school Coach to discuss the findings
	3.1c Self-evaluation of skills, abilities and attributes		Self-study		2.2.2 Understand and demonstrate self-awareness and inspire and motivate others	Practise in ways which draw on critical reflection on own and others' roles and responsibilities.	11	Reflective journal entry on a challenge question linked to how the processes in 3.1a and 3.1b have challenged the delegate's own perceptions of their leadership style.
	3.1d Self-evaluation of skills, abilities and attributes		Face to face (one-day event at SSERC HQ)		2.2.4 Communicate effectively	Practise in ways which draw on critical reflection on own and others' roles and responsibilities	11	Participation in a professional group discussion with fellow delegates on all aspects of course components 3.1a, 3.1b and 3.1c

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
3. Developing Leadership Skills	3.2 Developing leadership skills	3.2.1 Develop skills in key leadership areas: dealing with challenging conversations/situations; handling effective meetings; developing influencing skills & assertiveness; coaching skills; giving and receiving feedback	Face to face (one-day event at SSERC HQ)	3.2 Component overview sheet	2.2.2 Understand and demonstrate self-awareness and inspire and motivate others	Apply critical analysis, evaluation and synthesis to forefront issues	11	Completion of a series of leadership skill workshops

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
4. Professional Enquiry - Stage 1	4.1 Methodology and support	4.1.1 - Develop an understanding of the professional enquiry process	Face to face (two-day residential at SSERC HQ)	4.1 Component overview sheet	3.3.1 - Lead and promote a culture of career-long professional learning which builds and sustains individual and team capacity and supports identified and agreed priorities	Practice: Applied knowledge, skills and understanding	11	Participation in a series of in-person professional learning workshops, delivered by Professor(s) in Education/Academia, to prepare delegates for the professional enquiry
	4.2 Developing the enquiry question and process	4.2.1 - Devise a draft methodology for the completion of a professional enquiry 4.2.2 - Devise a draft professional enquiry question	Self-study	4.2 Component overview sheet	3.4.1 Develop and sustain a range of inclusive and supportive relationships, processes and practices which promote a culture of self-evaluation in line with agreed strategic and operational priorities	Autonomy. Accountability and working with others	11	Submission of a draft enquiry question to SSERC staff and Professor(s) in Education/Academia
	4.3 Reviewing and finalising the enquiry method and question	4.3.1 - Review draft submissions of process and question with peers and supporting staff 4.3.2 - Develop a final methodology for the completion of own professional enquiry 4.3.3 - Develop a final professional enquiry question	Self-study and online working with SSERC staff and academic partners	4.3 Component overview sheet				Receiving feedback and reviewing the draft professional enquiry question with the academic partner and submitting the final question

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
4. Professional Enquiry - Stage 1	4.4 - Carrying out the professional enquiry	4.4.1 Complete the professional enquiry process	Self-study	4.4 Component overview sheet	2.1.4 - Have knowledge and understanding of Leadership and Management related to your context	Various	11	Completed professional enquiry with all relevant supporting materials and evidence
	4.5 - Ongoing tracking of enquiry progress and results	4.5.1 - Monitor, record and report on professional enquiry progress to SSERC staff and academic partner	Self-study and online working with SSERC staff and academic partners	4.5 Component overview sheet	2.1.4 - Have knowledge and understanding of Leadership and Management related to your context	Autonomy. Accountability and working with others	11	Participation in ongoing progress meetings/reporting to SSERC and academic partner

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
5. Professional Enquiry - Stage 2	5.1 Presenting the findings of the enquiry	5.1.1 - Presentation of own professional enquiry to peers, SSERC staff and academic partner	Face to face (Leadership Showcase at SSERC HQ)	5.1 Component overview sheet	2.1.1 - Understand how to develop and demonstrate a strategic vision	Communication, ICT and numeracy skills	11	Presentation of Professional Enquiry findings
	5.2 Reflection and analysis of findings	5.2.2 - Analyse own findings via professional discussions with peers, SSERC staff and academic partner	Face to face (Leadership Showcase at SSERC HQ)	5.2 Component overview sheet	2.2.2 - Understand and demonstrate self-awareness and inspire and motivate others	Autonomy, accountability and working with others	11	Participation in reflective professional discussions with others on the collective and individual enquiry findings for the cohort

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
6. Enrichment Units	6.1 Managing Health and Safety	6.1.1 - Research and describe how this aspect of STEM education has/could impact at own centre	Online live/recorded sessions followed by self study	6.1 Component overview sheet	2.1.3 - Promote and support learning beyond curricular areas/ subject boundaries and of cross curricular subjects, e.g. literacy, numeracy and health and wellbeing, Learning for Sustainability, interdisciplinary learning and digital literacy;	Critically review, consolidate and extend knowledge, skills, practices and thinking in a subject/discipline/ sector	11	Completion of a relevant challenge question in the Reflective Journal
	6.2 Young STEM Leader Programme	6.1.2 - Research and describe how this aspect of STEM education has/could impact at own centre		6.2 Component overview sheet			11	
	6.3 STEM Capital	6.1.3 - Research and describe how this aspect of STEM education has/could impact at own centre		6.3 Component overview sheet			11	
	6.4 Interdisciplinary Learning	6.1.4 - Research and describe how this aspect of STEM education has/could impact at own centre		6.4 Component overview sheet			11	
	6.5 Transitions	6.1.5 - Research and describe how this aspect of STEM education has/could impact at own centre		6.5 Component overview sheet			11	
	6.6 Learning for Sustainability	6.1.6 - Research and describe how this aspect of STEM education has/could impact at own centre		6.6 Component overview sheet			11	

Unit	Component	Learning outcomes	Delivery method	Supporting documentation	GTCS Professional Standards	SCQF characteristic	SCQF level	Task and evidence to be collected
6. Enrichment Units	6.6 Literacy, Numeracy, Health and Wellbeing	6.1.7 - Research and describe how this aspect of STEM education has/could impact at own centre	Online live/recorded sessions followed by self study	6.7 Component overview sheet	2.1.3 - Promote and support learning beyond curricular areas/ subject boundaries and of cross curricular subjects, e.g. literacy, numeracy and health and wellbeing, Learning for Sustainability, interdisciplinary learning and digital literacy;	Critically review, consolidate and extend knowledge, skills, practices and thinking in a subject/discipline/ sector	11	Completion of a relevant challenge question in the Reflective Journal
	6.8 Digital Literacy	6.1.8 - Research and describe how this aspect of STEM education has/could impact at own centre		6.8 Component overview sheet			11	
	6.9 Equality, Diversity and Inclusion	6.1.9 - Research and describe how this aspect of STEM education has/could impact at own centre		6.9 Component overview sheet			11	
	6.10 Grants and Funding Opportunities	6.1.10 - Research and describe how this aspect of STEM education has/could impact at own centre		6.10 Component overview sheet			11	
	6.11 The STEM Ambassador Programme	6.1.11 - Research and describe how this aspect of STEM education has/could impact at own centre		6.11 Component overview sheet			11	
	6.12 Nuffield Research Placement programme	6.1.12 - Research and describe how this aspect of STEM education has/could impact at own centre		6.12 Component overview sheet			11	