

THINKING ABOUT STEM PRESCHOOL STEM AUDIT

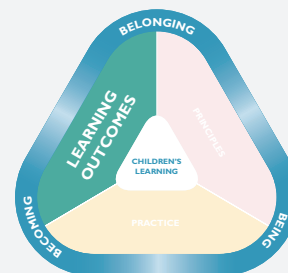


This audit is designed to guide your team through a reflective process on the current STEM teaching and learning at your centre. The data collected from the audit can be analysed and used to plan STEM teaching and learning.

The audit references the *Early Years Learning Framework for Australia* with a particular focus on some key components of **Outcome 4: Children are confident and involved learners** and **Outcome 5: Children are effective communicators** which align most closely with dispositions, capacities and skills for STEM.

The audit is a three step process:

- **STEP 1:** Audit
- **STEP 2:** Analyse and plan
- **STEP 3:** Action.



Process

STEP 1: Audit

- Select **one** key component to audit
- Individually, team members complete the *Audit* template.
- Together reflect upon and analyse the individual findings to develop a shared meaning and understanding of current STEM practices in your site.

STEP 2: Analyse and plan

- Import the chosen key component and dot points into the *Analyse and plan* template.
- Consider the reflective questions in column three to support your strategies for improvement.

STEP 3: Action

- Use the *Action* template to document strategies for improvement.
- Choose one or two main strategies only.
- Connect these strategies with your quality improvement plan as appropriate.

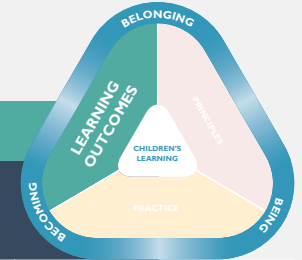


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STEP 1: Audit [PAGE 1 OF 6]



OUTCOME 4: CHILDREN ARE CONFIDENT AND INVOLVED LEARNERS

Key component 4.1: Children develop dispositions for learning such as curiosity, cooperation, confidence, creativity, commitment, enthusiasm, persistence, imagination and reflexivity

Educators are observed promoting this learning by:	Never	Sometimes	Always	Children are observed:	Never	Sometimes	Always
<ul style="list-style-type: none"> recognising and valuing children's involvement in STEM learning 				<ul style="list-style-type: none"> following and extending their own STEM interests with enthusiasm, energy and concentration 			
<ul style="list-style-type: none"> providing learning environments that are flexible and open-ended to enable STEM learning 				<ul style="list-style-type: none"> using play to investigate, imagine and explore STEM ideas 			
<ul style="list-style-type: none"> responding to children's displays of learning dispositions, particularly relating to STEM, by commenting on them and providing encouragement and additional ideas 				<ul style="list-style-type: none"> being curious and enthusiastic participants in their STEM learning expressing wonder and interest in their environments 			
<ul style="list-style-type: none"> encouraging children to engage in both individual and collaborative explorative STEM learning processes 				<ul style="list-style-type: none"> initiating and contributing to play experiences emerging from their own STEM ideas 			
<ul style="list-style-type: none"> modelling inquiry processes, including wonder, curiosity and imagination, trying new ideas and taking on challenges while exploring STEM 				<ul style="list-style-type: none"> participating in a variety of rich and meaningful inquiry-based STEM experiences 			
<ul style="list-style-type: none"> reflecting with children on what and how they have learned to document and plan for STEM learning 				<ul style="list-style-type: none"> persevering and experiencing the satisfaction of achievement with STEM exploration 			

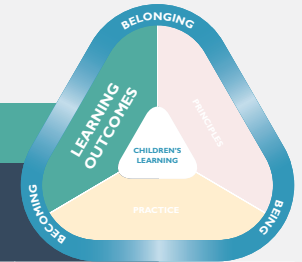


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STEP 1: Audit [PAGE 2 OF 6]



OUTCOME 4: CHILDREN ARE CONFIDENT AND INVOLVED LEARNERS

Key component 4.2: Children develop a range of skills and processes such as problem solving, enquiry, experimentation, hypothesising, researching and investigating

Educators are observed promoting this learning by:	Never	Sometimes	Always	Children are observed:	Never	Sometimes	Always
<ul style="list-style-type: none"> providing experiences that encourage children to investigate and solve problems in STEM 				<ul style="list-style-type: none"> applying a wide variety of STEM thinking strategies to engage with situations and solve problems, and adapt these strategies to new situations 			
<ul style="list-style-type: none"> encouraging children to use language to describe and explain their STEM ideas 				<ul style="list-style-type: none"> exploring their environment 			
<ul style="list-style-type: none"> providing opportunities for involvement in experiences that support the investigation of STEM ideas, complex concepts and thinking, reasoning and hypothesising 				<ul style="list-style-type: none"> contributing constructively to mathematical STEM discussions and arguments 			
<ul style="list-style-type: none"> encouraging children to make their STEM thinking, ideas and theories visible to others 				<ul style="list-style-type: none"> manipulating objects and experimenting with cause and effect, trial and error, and motion to play with STEM thinking 			
<ul style="list-style-type: none"> encouraging children to make their STEM thinking, ideas and theories visible to others 				<ul style="list-style-type: none"> creating and using representation to organise, record and communicate mathematical STEM ideas and concepts 			
<ul style="list-style-type: none"> modelling mathematical, scientific, engineering and technological language 				<ul style="list-style-type: none"> contributing constructively to mathematical STEM discussions and arguments 			
<ul style="list-style-type: none"> joining in children's play and modelling reasoning, predicting and reflecting processes and language, demonstrating STEM skills, knowledge and attitudes 				<ul style="list-style-type: none"> making predictions and generalisations about their daily activities, aspects of the natural world and environments, using patterns they generate or identify and communicate these using mathematical STEM language and symbols 			
<ul style="list-style-type: none"> listening carefully to children's attempts to hypothesise and expand on their STEM thinking through conversation and questioning 				<ul style="list-style-type: none"> using reflective thinking to consider why things happen and what can be learnt from these STEM experiences 			

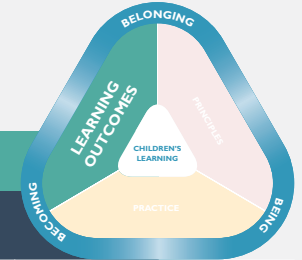


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OUTCOME 4: CHILDREN ARE CONFIDENT AND INVOLVED LEARNERS

Key component 4.3: Children transfer and adapt what they have learned from one context to another

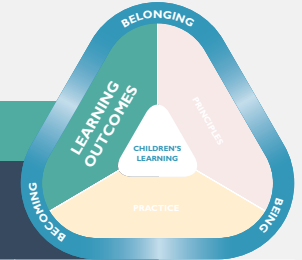
Educators are observed promoting this learning by:	Never	Sometimes	Always	Children are observed:	Never	Sometimes	Always
<ul style="list-style-type: none"> valuing signs of children applying their STEM learning in new ways and talking about this with them in ways that grow their understanding 				<ul style="list-style-type: none"> making connections between experiences, STEM concepts and processes 			
<ul style="list-style-type: none"> supporting children to construct multiple solutions to problems and use different ways of thinking to deepen STEM inquiry and problem solving 				<ul style="list-style-type: none"> applying generalisations from one STEM situation to another 			
<ul style="list-style-type: none"> drawing children's attention to patterns and relationships in the environment and in their STEM learning 				<ul style="list-style-type: none"> engaging with and co-constructing STEM learning 			
<ul style="list-style-type: none"> planning for time and space where children can reflect on their STEM learning and to see similarities and connections between existing and new learning 				<ul style="list-style-type: none"> developing an ability to mirror, repeat and practice the actions of others, either immediately or later 			
<ul style="list-style-type: none"> encouraging children to discuss their ideas and understandings during STEM inquiries 				<ul style="list-style-type: none"> using the processes of play, reflection and investigation to solve problems relating to STEM 			
<ul style="list-style-type: none"> sharing and transferring knowledge about children's STEM learning from one setting to another, by exchanging information with families and with professionals in other settings 				<ul style="list-style-type: none"> trying out STEM strategies that were effective to solve problems in one situation in a new context 			
				<ul style="list-style-type: none"> transferring STEM knowledge from one setting to another 			



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STEP 1: Audit [PAGE 4 OF 6]



OUTCOME 4: CHILDREN ARE CONFIDENT AND INVOLVED LEARNERS

Key component 4.4: Children resource their own learning through connecting with people, place, technologies and natural and processed materials

Educators are observed promoting this learning by:	Never	Sometimes	Always	Children are observed:	Never	Sometimes	Always
<ul style="list-style-type: none"> providing opportunities and support for children to engage in meaningful STEM learning relationships 				<ul style="list-style-type: none"> engaging in STEM learning relationships 			
<ul style="list-style-type: none"> providing sensory and exploratory STEM experiences with natural and processed materials 				<ul style="list-style-type: none"> using feedback from themselves and others to revise and build on a STEM idea/s 			
<ul style="list-style-type: none"> providing STEM experiences that involve children in the broader community and environment beyond the early childhood setting in order to solve authentic problems 				<ul style="list-style-type: none"> using their senses to explore natural and built environments to demonstrate STEM thinking and learning 			
<ul style="list-style-type: none"> thinking carefully about how children are grouped for play, considering possibilities for peer scaffolding during STEM inquiries 				<ul style="list-style-type: none"> experiencing the benefits and pleasures of shared STEM learning exploration 			
<ul style="list-style-type: none"> introducing appropriate tools, technologies and media and provide the skills, knowledge and techniques to enhance children's STEM learning 				<ul style="list-style-type: none"> using information and communication technologies (ICT) to investigate and problem solve to deepen STEM thinking and learning 			
<ul style="list-style-type: none"> providing opportunities for children to both construct and take apart materials as a strategy for STEM learning 				<ul style="list-style-type: none"> manipulating resources to investigate, take apart, assemble, invent and construct for STEM inquiry and investigation 			
<ul style="list-style-type: none"> developing their own confidence with technologies available to children in the setting 				<ul style="list-style-type: none"> experimenting with different technologies 			
<ul style="list-style-type: none"> providing resources that encourage children to represent their STEM thinking 				<ul style="list-style-type: none"> exploring STEM ideas and theories using imagination, creativity and play 			

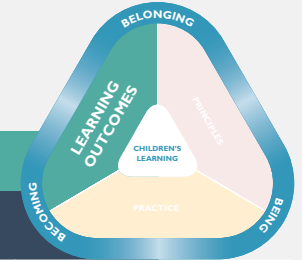


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STEP 1: Audit [PAGE 5 OF 6]



OUTCOME 5: CHILDREN ARE EFFECTIVE COMMUNICATORS

Key component 5.1: Children begin to understand how symbols and pattern systems work

Educators are observed promoting this learning by:	Never	Sometimes	Always	Children are observed:	Never	Sometimes	Always
<ul style="list-style-type: none"> drawing children's attention to symbols and patterns in their environment and talking about patterns and relationships, including the relationship between letters and sounds to further STEM understandings 				<ul style="list-style-type: none"> using symbols in play to represent and make meaning through STEM thinking and learning 			
<ul style="list-style-type: none"> providing children with access to a wide range of everyday materials that they can use to create patterns and to sort, categorise, order and compare to encourage STEM exploration 				<ul style="list-style-type: none"> beginning to make connections between and seeing patterns in their feelings, ideas, words and actions and those of others beginning to sort, categorise, order and compare collections and events and attributes of objects and materials, in their social and natural worlds while exploring STEM 			
<ul style="list-style-type: none"> engaging children in discussions about symbol systems, for example, letters, numbers, time, money and musical notation while making connections to STEM learning 				<ul style="list-style-type: none"> drawing on their experiences in constructing meaning using symbols 			
<ul style="list-style-type: none"> encouraging children to develop their own symbol systems and provide them with opportunities to explore culturally constructed symbol systems 				<ul style="list-style-type: none"> developing an understanding that symbols are a powerful means of communication and that ideas, thoughts and concepts can be represented through them to represent STEM thinking 			



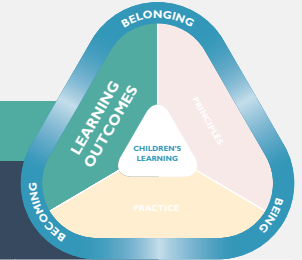
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OUTCOME 5: CHILDREN ARE EFFECTIVE COMMUNICATORS

Key component 5.2: Children use information and communication technologies to access information, investigate ideas and represent their thinking



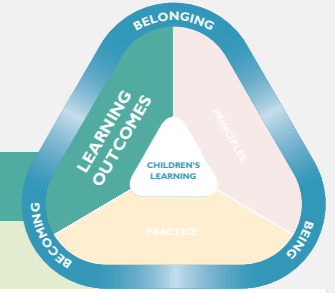
Educators are observed promoting this learning by:	Never	Sometimes	Always	Children are observed:	Never	Sometimes	Always
<ul style="list-style-type: none"> providing children with access to a range of technologies to investigate and record STEM findings 				<ul style="list-style-type: none"> engaging with technology for fun and to make meaning for STEM learning 			
<ul style="list-style-type: none"> integrating technologies into children's play experiences and projects to further STEM learning 				<ul style="list-style-type: none"> identifying the uses of technologies in everyday life and using real or imaginary technologies as props in their play for STEM investigations 			
<ul style="list-style-type: none"> teaching skills and techniques and encouraging children to use technologies to explore new information and represent their STEM ideas 				<ul style="list-style-type: none"> using information and communication technologies as tools for designing, drawing, editing, reflecting and composing to represent STEM thinking 			
<ul style="list-style-type: none"> encouraging collaborative STEM learning about and through technologies between children, and children and educators 				<ul style="list-style-type: none"> using information and communication technologies to access images and information, explore diverse perspectives and make sense of their world with a STEM focus 			



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STEP 2: Analyse and plan [PAGE 1 OF 2]



OUTCOME 4: CHILDREN ARE CONFIDENT AND INVOLVED LEARNERS

Key component:

Educators are observed promoting this learning by:	Children are observed:	Reflections on areas for growth: <ul style="list-style-type: none">• What evidence have you documented?• Can you identify particular strengths amongst the team with relation to this key component?• What small changes can you make to support this key component?• How might you incorporate these strategies into your planning cycles for children?



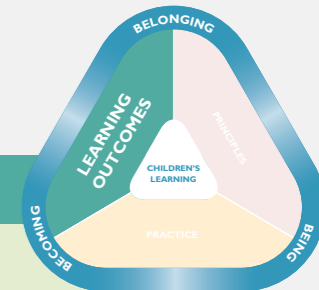
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STEP 2: Analyse and plan [PAGE 2 OF 2]

OUTCOME 5: CHILDREN ARE EFFECTIVE COMMUNICATORS

Key component:



Educators are observed promoting this learning by:	Children are observed:	Reflections on areas for growth: <ul style="list-style-type: none">• What evidence have you documented?• Can you identify particular strengths amongst the team with relation to this key component?• What small changes can you make to support this key component?• How might you incorporate these strategies into your planning cycles for children?



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STEP 3: Action

Reflective practice is more likely to lead to change when it is undertaken collectively. Learning together with colleagues draws upon the diverse knowledge, experiences, views and attitudes of individuals within the group. It is a way to experiment with new ideas and ways of teaching and caring, and to keep motivated about making a positive difference to children's learning. (DEEWR, 2010, p7)

NAME:	DATE:
What will you start doing as a result of completing the Preschool STEM Audit?	
What is something you are going to stop doing?	
What questions for further investigation have arisen? Were there any aspects that surprised or provoked you?	
How will you know that this aspect of your pedagogy is continually improving ? What will you do now?	

Department of Education, Employment and Workplace Relations (2010) *Educators Belonging, Being & Becoming: Educators' Guide to the Early Years Learning Framework for Australia*, Council of Australian Governments, Commonwealth of Australia

