# Projects for learning - STEM

This template has been designed for use during a preschool or early intervention class closure or extended absence.

The learning experiences provided are a resource that teachers can use to plan for children’s continuity of learning in the home environment while they are unable to access formal early childhood education. It has been designed to support teachers work with families to continue their child’s learning through planned experiences. Teachers may choose to adapt the experience to work within the context of the families they are providing for. Teachers should use knowledge of local Aboriginal communities to support the learning experiences.

Links to the Early Years Learning Framework (EYLF) and the teaching and learning planning cycle are included throughout this template.

STEM encourages learners to engage with the excitement and importance of science, technology, engineering and mathematics, and understand how these are apparent in their everyday lives and learning (STEM Australia, 2020).

## Planned learning

### **Observations of learning and current interests of children**

**Include observations from home and preschool.**

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### **Intended learning outcomes**

**Consider key components of the five learning outcomes.**

The child/ren will:

* take an active role in the projects, recognising the contribution they make to shared projects and experiences.
* interact with others to explore ideas and concepts to clarify thinking
* engage in a process for solving problems to activate a wide range of thinking strategies
* explore a cycle of research that includes investigating, hypothesising, experimenting, collecting and recording data and interpreting results
* use reflective thinking to consider why things happen and what can be learned from this
* create and use representations to organise, record and communicate scientific and mathematical ideas and concepts, incorporating aspects of engineering and technology.

### **Intentional teaching strategies**

**Consider how the learning outcomes will be promoted through your actions, conversation and questions. Draw on strategies from each of the five learning outcomes.**

* Draw child/ren’s attention to exploring and engaging with the look and feel of each ingredient.
* Support child/ren’s curiosity and enthusiasm as they participate fully in the learning and discover what happens.
* Help the child/ren to apply a wide variety of thinking strategies to solve problems in answering open ended questions.
* Facilitate a process for solving problems to activate a wide range of thinking strategies.
* Use reflective thinking with the child/ren to consider why things happen and what can be learned.
* Support the child/ren to explore ideas and concepts to clarify their thinking.
* Record comments or conversations as they occur throughout the experiences or encourage children to record their ideas through drawing or writing.

### Holistic approaches to learning

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| Concepts to be developed  Draw on the outcomes of the Early Years Learning Framework and consider how these provoke higher order thinking. | Experiences and resources for various learning environments  Think about learning which may occur in various spaces across the day – indoors, outdoors, small and large group times and during routine times. |
| Describe the look, feel, smell, sound and taste of the separate and combined ingredients.  Question and discuss the changes that occur as the ingredients are mixed.  Realisation that change occurs to ingredients when we combine them and add heat through cause and effect.  Explore pliable materials that can be used for different purposes.  Explore concepts of floating and sinking. | The examples below provide a sequenced and integrated approach to exploring concepts of STEM through the medium of playdough:  **Making playdough**   * Playdough recipe: [playdoughrecipe.com/cream-of-tartar-playdough-recipe/](https://www.playdoughrecipe.com/cream-of-tartar-playdough-recipe/) * Make playdough, engaging the child/ren in reading the recipe, following the directions and thinking about what might happen at each step.   **Making a boat that floats**   * Roll a lump of playdough and put it in the water. Watch it sink. What could make it float? * Gather the children’s ideas and test them. * Draw their attention to boats that float. Explore ideas of why they float. Research why they float: [sciencewithme.com/why-does-a-boat-float-but-a-nail-sink/](http://www.sciencewithme.com/why-does-a-boat-float-but-a-nail-sink/) * Support the child/ren to keep experimenting and refining their design. * Discuss and trial other things that could be used as a boat and might float (paper, alfoil, plastic, clay, leaves, woodchips). | |
| Make predictions about what might happen.  Engage in a design process that can lead to solutions for problems. | Facilitate a range of experiments where children can explore, investigate, hypothesize, problem-solve and engage in a cycle of research. For example:  **Conducting an experiment**   * Investigate an area of interest for children, for example ‘What is eating the lettuce in our garden? * Conduct some research online, what pests eat lettuce * Hypothesize the most likely culprit and design and record an experiment to find out * Collect all the data on the variables, for example are the lettuces eaten more when it is rainy or dry weather. * Develop a theory and test out the theory, for example “we think it is a slug eating the lettuce and we know that they leave a trail so we look for evidence and take photos of the trails. We do some more research and compare our data/ photos and determine if our hypothesis is correct. | |
| Communicate learning by representing the processes used. | Provide a range of opportunities where children can explore engineering ideas, science and maths concepts. For example:  **Exploring engineering**   * Set a task for children to do some research online, in family photos or in books, identify the building they would like to recreate. * Ask children to analyse what materials will be necessary, what stability and construction issues will they need to consider and then record this in a project plan (on the iPad, by drawing or painting or asking an adult or older child to scribe for them. * The project plan should include location, height and width estimates, how they will make the building stable and stick materials together. * Suggest children make a model or test any design issues they are concerned about. * Hold regular group catch ups to see how the projects are progressing and share common issues and share how they have been resolved. * Showcase structures including the inspiration through creative art works. * Conduct a project review individually with each child as to what they have learned and how they feel about themselves as engineers. | |
| All concepts above | **Extension ideas**  Explore the many uses for playdough and support the child/ren to draw and/or photograph their ideas. For example:   * Make bricks and build with it. * Sculpture (what happens when it dries in the sun). * Combine with raw spaghetti and try to make tall building. * Make a bowl. * Make letters and numbers. * Make play items such as food for home corner. * Let it dry, and experiment with adding water to make it pliable again. Does it work? * Add food colour, scents, textures. * Make a scene for plastic figurines. * Make a chair for a doll. | |

### Evaluating the learning experiences

#### Observations of learning

**Reflect on the learning intentions as you consider these prompts.**

How did the child respond – what did they do, what did they say?

What did the child enjoy?

What was a challenge?

What other things were of interest?

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#### Reflection on teaching

**Reflect on the learning intentions as you consider these prompts. Consider ways you could gather feedback to demonstrate the child’s learning, for example recording children’s words or a conversation with an adult, photos, describe what the child did, work samples.**

Were the planned teaching strategies appropriate?

What strategies worked well?

What didn’t?

Where to next?

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### Critically reflecting on the learning

#### Discussions between educators, families and children

**Reflections of learning – consider how the principles, practices and outcomes of the EYLF have contributed to the child’s learning.**

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#### Where to next?

**What might you do to follow up or extend on the learning based on this experience?**

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