# Projects for learning – Early numeracy

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.

## Planned learning

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

**Include observations from home and preschool.**

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### **Intended learning outcomes**

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

Numeracy is the capacity, confidence and disposition to use mathematics in daily life. Children bring new mathematical understandings through engaging with problem solving.

Experiences in early childhood settings build on the range of experiences with language, literacy and numeracy that children have within their families and communities.

Positive attitudes and competencies in literacy and numeracy are essential for children’s successful learning. The foundations for these competencies are built in early childhood.

(Early Years Learning Framework, 2009, p. 38)

Child/ren will:

* sort, categorise and classify collections of objects
* recognise pattern in the environment, generalise to describe a pattern, copy, continue and create simple patterns
* recognise and order numerals to ten and beyond where applicable
* count a small group of objects using one to one correspondence and then say how many are in a group
* compare two small groups and say which has more or less
* sort and categorise 3D objects and 2D shapes based on their attributes or characteristics
* describe an object’s position in relation to self or an object
* demonstrate an increasing understanding of measurement to use everyday language to describe size, mass, volume and length
* describe and compare objects according to size, mass, volume or length.

### **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.**

* Provide a wide range of open-ended materials and objects which support hands-on, play-based learning.
* Ensure that there are appropriate numeracy-based materials readily available both indoors and outdoors (measuring tapes, scales or telephones.), to enable children to take on the role of numeracy user in their play.
* Ensure learning experiences and related mathematical ideas are relevant and meaningful to children’s lives.
* Scaffold the children through demonstration and verbal support so they engage with and complete tasks which are more challenging than what they would be able to complete independently.
* Notice how children are engaging with planned tasks in order to provide an appropriate level of support and guidance, modification or extension.
* Use open-ended questions to engage in sustained conversations with children to develop higher order thinking skills.
* Invite children to talk about and describe what they are doing, as well as ask questions.
* Write children’s descriptions of what they are doing (the process), or have made (the product).
* Model mathematical vocabulary, while still accepting and encouraging children's use of informal terms.
* Encourage the families of EALD children to talk in their home language about quantities and numbers.
* Ask children to predict what an outcome may be, including prompting them to explain why.
* Take photos or making sketches of the child’s play, both the process and the product.
* Provide tasks for which the method to complete them is not obvious, or there is more than one method or right answer, to facilitate problem solving.
* Revisit concepts and making links across experiences to deepen understanding and clarify thinking.
* Utilise technology to assist and consolidate learning.

### 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) |
| **Sorting and classifying**Objects can be sorted according to one or more criteria.Key mathematical vocabulary; same, different, group, groups, criteria, rule. | * Conduct a treasure hunt to make a group or collection of objects of the same colour.
* Sort groceries or items in a role-play shop into different groups or categories (tinned foods, food in boxes, fruit and vegetables.). Count how many items in each group and record the number.
* Collect natural items outside (rocks, twigs, seed pods or leaves). Ask the children to determine how the items might be sorted, for example by colour, by size, by weight. Could some items belong in more than one group? What would be a good name for each group?
* Challenge the children to determine how a collection of beads could be sorted (by colour, shape, size or a combination). Take a photo or sketch each group and add text to explain the criteria used for sorting. Use the beads to thread a simple repeating pattern.
* Gather a range of resources together such as soft toys or plastic animals. Ask the children to sort the animals into groups. How did you sort the animals? How many groups do you have? Is there another way you can sort the animals? How can we find out which group is the biggest?
* [Sesame Street sorting game](file:///C%3A%5CUsers%5Cbbardon1%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5CK7GXAIMX%5Csesamestreet.org%5Cgames%3Fid%3D25871):
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| **Patterns**Patterns are everywhere in our environment.Patterns can be copied and continued.Key mathematical vocabulary: repeating, next one, again.  | **Identifying patterns*** Look for patterns inside and outside, for example, patterns in / on; wrapping paper, wall paper, bricks, floor tiles, fabric such as doona covers or clothing, butterfly wings, plant leaves
* Discuss the patterns found:
	+ What objects are in the pattern?
	+ What makes it a pattern?
	+ Is this pattern in a line or circle?
	+ What might come next in this pattern?
* View and discuss traditional Aboriginal artworks which use radiating or circular patterns.

**Copy and create a pattern*** Demonstrate how to create a repeating colour pattern, such as with pegs on a string or washing line, or threaded beads on a string. Ask a child to pass you the item which comes next to continue the pattern. Make this activity harder by using three or four different colours or doubles of some colours (red, red, blue, red, red, blue).
* When you cut up fruit, thread it onto a skewer or arrange it in in a pattern around the edge of a plate. Ask a child to tell you about the pattern and then add more fruit to continue the pattern.
* Clap a pattern and ask the children to join you (three claps, pause, three claps, pause). Stop clapping and ask the child to continue the pattern on their own. Make this activity harder by using more body actions (clap, slap knees, touch head, turn around, clap).

**Creating patterns*** As the children play with playdough, demonstrate how to roll it out to make a flat, circular surface for them to “press” various objects into to create a pattern. Prompt the children to try a pattern organised in a line or circle or radiating in circles from a central point.
* Using construction materials, demonstrate how to make a growing pattern in the style of a staircase (one step, two steps, three steps). Encourage the children to make their own growing patterns. Ask the children to count how many steps or levels there are. Take a photo of their creation to share.
* Make a growing pattern using body percussion (shake; shake and tap your head; shake, tap your head and stamp; shake, tap your head, stamp and clap).
* Outside, use collected natural materials to explore and create patterns. After collecting the materials, ask the children to sort their materials into groups. As they create, ask the child about their patterns:
	+ What have you used to make your pattern?
	+ What makes it a pattern?
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| **Number**Numerals can be sequenced.Objects are counted using one to one correspondence. The last number said when counting a group tells how many in the total group.Groups can be ordered according to number.Key mathematical vocabulary; number names, more, less, how many?, total, group. | * Put playing cards or any items with numerals on them in order.
* Walk up the stairs, counting each aloud as it is stepped on. Go back down the stairs counting backwards. If the steps are outdoors, use chalk to write each numeral on a step.
* Take a photo or sketch each numeral found in the environment
* Enjoy counting picture books with an Aboriginal perspective, such as:
	+ An Australian 1, 2, 3 of Animals - Bronwyn Bancroft
	+ Counting our country - Jill Daniels

**Enlarge cover** 3356594* Counting songs and finger plays:
	+ Five little ducks
	+ Ten in the bed
	+ 1,2,3,4,5, Once I caught a fish alive
	+ Ten little dinosaurs
	+ There were 10 in the bed.
* Sing along to recorded songs.
* Count out loud as actions are performed (putting toys away, popping bubbles, jumping on the trampoline)
* Sort a group of objects (pencils, blocks, shells), and then count how many is in each group, touching each as the number is said.
* Throw and catch a ball with a friend. How many times do you think we can throw and catch without dropping? Did we catch more or less this time?
* Keep a balloon in the air as long as possible by tapping it with your hand. Count each tap. How many taps? Who did the most / least taps?
* Estimate how many objects are in a small group (apples in a bowl, toy cars in a container), and then count to check.
* Make two small groups of the same objects (coins, marbles). How many in each group? Which group has the most / least? How can we check?
* Cook or prepare simple foods, emphasising the measuring and counting of the ingredients. For example, ask a child to add “four full cups” of flour to the pancake mixture.
* Play dominoes or board games which use a dice.
* View video - Cool ways to count 1-5: [education.abc.net.au/home?sf42311017=1#!/media/29574/representing-numbers-1-to-5](https://education.abc.net.au/home?sf42311017=1#!/media/29574/representing-numbers-1-to-5)
* View video - Cool ways to count 6-10: [education.abc.net.au/home#!/media/29583/representing-numbers-6-10](https://education.abc.net.au/home#!/media/29583/representing-numbers-6-10)
* ABC for kids number activity: [abc.net.au/abcforkids/games/sesamestreet/guacpop/index.html](https://www.abc.net.au/abcforkids/games/sesamestreet/guacpop/index.html)
* Pre-K and K number games, [abcya.com](https://www.abcya.com/)
* Share books about numbers and counting:
	+ The very hungry caterpillar:

[youtube.com/watch?v=vkYmvxP0AJI](https://www.youtube.com/watch?v=vkYmvxP0AJI)* + One fish, two fish, red fish, blue fish: [youtube.com/watch?v=0waeG\_x2eow](https://www.youtube.com/watch?v=0waeG_x2eow)
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| SpaceKey mathematical vocabulary: shape, object, round, curved, pointy, ball, box, straight, flat, circle, oval, heart, triangle, square, rectangle, over, under, in front, behind, on top. | **3D objects*** Provide a range of recycled food packets and containers, scissors and strong sticky tape for the children to create 3D constructions. As the children build, discuss with them what they are doing and model the use of mathematical language to describe the recycled materials, for example, I see you have used the curved container on top.
* Using a collection of 3D materials such as blocks, demonstrate sorting into two groups using one criteria, for example curved or straight edges; ones that will roll and ones that will not roll. Ask the children if they can tell you how the objects have been sorted (what the sorting criteria is).

**2D shapes** * Provide a range of paper shapes cut from magazines, paper or cardboard (various sized circles, triangles, squares, rectangles). Ask the children to sort the shapes into groups. The children might sort according to colour, size or shape. Ask the children to use the paper shapes to make a collage or picture. Engage them in conversation about their picture, for example, tell me about your picture and the shapes you have used.
* Demonstrate how to use a plastic knife to cut shapes from playdough. Discuss each shape as cut, for example, you cut four straight sides, two long and two short. What shape is that? What other shapes have four straight sides?
* View a piece of traditional Aboriginal artwork and discuss the use of shape, for example, what shapes do you see? Are the shapes in a pattern? I wonder what the story of this artwork is.

**Position** * Play ‘Simon says’. Include instructions which use prepositional language, for example, put your hands under your feet. Stand behind a chair. Sit on top of something. Ask the children to take turns calling out the instructions.
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| Measurement Objects can be described and ordered according to attributes of mass, volume, length and time.Key mathematical vocabulary: weigh, weight, heavy, light, heaviest, lightest, heavier, lighter, empty, emptying, filling, most, least, holds, tip, pour, full, empty, half full, long, longest, short, shortest, same, equal, day-time, night-time, morning, afternoon, evening, long time, short time, summer, winter, seasons. | **Mass** * As the children handle everyday items or familiar toys, engage them in conversation, for example, which of these is heavier or lighter? Can you find two things which are the same or equal weight?
* Select half a dozen objects the children are familiar with, ask them to predict which is heaviest and then check: Is there another way we can find out which is heaviest? Put the objects in order of weight. Model the use of mathematical language such as lighter, lightest, heavier, heaviest.
* Ask the children to consider why a balloon or large ball might be lighter than a small rock.

**Volume*** Set up a large container of water with a range of empty, recycled containers for the children to use for water play. As they play, ask questions such as:
	+ Which container holds the most? How do you know?
	+ Can you make a container half full?
	+ How can we find which container of these three holds the least?
* Rather than water, fill the containers with objects such as rocks, marbles or coins. Select a container and estimate how many of a particular object will be needed to fill it. After filling the container, count how many units were needed.

**Length*** Demonstrate how to measure objects by lining up informal units end to end (pencils, shoes, paperclips, spoons). Place a line of string / masking tape on the floor and measure its length using different objects.
* Make a series of playdough “worms”. Using direct comparison, determine which is the longest / shortest. Order the worms in order of height, ensuring they all start from the same point.
* Cut a piece of string (any length). Use the string to measure objects around the house. Engage the children’s thinking with questions such as: What is longer / shorter than the string? What is the same length or equal?
* Order a collection of soft toys according to height.

**Time*** As you go about your daily activities, use the language of time, for example, we will play outside in the afternoon.
* Use craft materials to create day, night, winter or summer pictures.
* Discuss that Aboriginal languages refer to many more seasons to describe time passing over the year, than what English does. Aboriginal people use knowledge of the seasons to know which particular foods are ripe and ready to be picked to eat. Research and share with the children the names of the seasons for the local area.
* Provide picture cards or photos showing familiar activities for the child to sort into three groups:
	+ things we do in the morning
	+ things we do in the afternoon
	+ things we do in the evening.
* To make this activity harder, sequence the cards in order, for example: wake up, eat breakfast, brush teeth.
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### 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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