ECD practitioners' perspectives on a linguistically and contextually adapted developmental milestone resource (Birth - 3 years 11 months)

In partial fulfilment of the requirements for the degree BA Speech Language Pathology in the Department of Speech-Language Pathology and Audiology, Faculty of Humanities, University of Pretoria.

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Abstract

Objective: This study aimed to describe the perspectives of early childhood development (ECD) practitioners in low-resourced settings on the linguistic and contextual appropriateness of an adapted milestone guide for use in group settings with children between the ages of birth and 3 years 11 months and to gather their recommended classroom activities to support development.

Design: A mixed method, cross sectional exploratory survey design was employed, combining qualitative and quantitative responses.

Study sample: Fifteen ECD practitioners from three centres in low-resourced settings of Pretoria participated in the study.

Results: Participants reported the milestone as linguistically and contextually appropriate, with minor changes. Suggested activities included both activities requiring equipment and those not requiring equipment.

Conclusions: The newly adapted developmental milestone guide was found to be linguistically and contextually appropriate to monitor and stimulate milestones. It is, therefore, ready to be trialled in multiple low-resourced group settings.

Key words: Early childhood development; low-resourced context; ECD practitioners; ECD centre; milestone guide, South Africa

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1. Introduction

Early childhood development (ECD) during the first five years of life is critical in shaping children's future productivity, well-being, and health outcomes (Black et al., 2017). As such, ECD is not only essential for the well-being of individual children but also, when not supported, it is a broader issue, with social and economic implications (Smit et al., 2021). Investing in ECD is considered one of the most cost-effective strategies to reduce inequality, foster economic growth, and enhance social cohesion (World Bank, 2018). ECD initiatives are especially important in South Africa, where socioeconomic gaps are profound (Richter et al., 2019). Research highlights that ECD practitioners, in low-resource settings, express a desire for greater support and practical knowledge related to child development (Smit et al., 2021). This warrants the need for an adapted developmental milestone guide to enhance their ability to identify learning difficulties and developmental delays early on.

In South Africa, approximately three out of five children aged 0-4 years attend ECD centres where various aspects of child development can be promoted (Statistics South Africa, 2022). While the Screening, Identification, Assessment, and Support (SIAS) policy emphasises that all ECD centres should provide structured and consistent opportunities for developmental stimulation, the extent to which this is implemented in practice may vary (UNICEF, 2018). The nurturing care offered in ECD settings plays a central role in fostering holistic growth, including language, social, cognitive, and motor development (UNICEF, 2018; Ayob et al., 2021; Smit et al., 2021).

ECD practitioners, however, are key to delivering this support through their consistent daily engagement with children and helping to bridge developmental support between the centre and the home (UNICEF, 2018). Therefore, ECD practitioners play a central role in implementing the nurturing care framework, which requires an environment that is conducive to children's growth and development (UNICEF, 2018).

Despite the critical role of ECD practitioners, many face considerable challenges (Marieta et al., 2021). ECD practitioners often work in under-resourced centres which lack adequate resources, making it challenging to deliver high-quality care (Marieta et

al., 2021). The lack of sufficient training, informational resources, and professional development opportunities (Smit et al., 2021) further hampers the effectiveness of learning experiences for young children. Developmental milestone guides are important tools that can help practitioners monitor children's development across different domains and provide targeted stimulation by suggesting activities to support progress in those areas (UNICEF, 2017). Milestone guides, such as the South African Road to Health Booklet, are available but are parent-focused for young children only and do not support ECD practitioners in group settings with older children. Although it provides structured checklists to track physical, cognitive, language, and social-emotional development, it does not provide detailed milestones or suggest activities for targeted stimulation of the milestones (South African Department of Health, 2015).

The South African Road to Health Booklet is not the only guide available. The National Curriculum Framework for children from birth to four years also provides ECD practitioners with guidelines on play-based learning and age-appropriate activities. Due to registration discrepancies between high- and low-resource settings, many low-resource ECD centres are not registered, so guides may not be rolled out widely (Sello et al., 2024). In a broader context, other international developmental milestone guides developed in high-income settings may include expectations that do not apply to children in low-resource group settings. This may lead to potential misjudgements or false positive outcomes about a child's developmental status in low-resourced settings (Botes et al., 2023). This mismatch can also hinder the effective implementation of nurturing care, as practitioners may struggle to adapt the resources to the specific needs of the children (Ayob et al., 2021).

Addressing these challenges requires adapting milestone guides to make them both linguistically and contextually appropriate (Botes et al., 2023). To improve contextual relevance, national developmental guides should be adapted to consider the practical realities of the ECD settings in South Africa (Ayob et al., 2022). These include factors such as linguistic diversity, limited resources, varying levels of practitioner training, and the developmental needs of children in low-resource settings (Marieta et al., 2021). ECD practitioners often work with large groups, and milestone guides that include generalised but still actionable steps will allow them to apply the tool efficiently without requiring extensive one-on-one time (Matjokana, 2021). Adapting the guides would

make them more relevant and improve their appropriateness in supporting ECD practitioners in identifying developmental concerns (Botes et al., 2023).

Previous research focused on children in pre-schools aged 3 - 5 years and 11 months; however, it neglected to consider those children who are younger and in ECD centres. Many studies have found that typically, ECD practitioners who are underqualified are working with the younger population of children (Smit et al., 2021). This raises the question: would ECD practitioners in low-resourced settings working with children from birth to age 3 years and 11 months find the adapted milestone guide contextually and linguistically appropriate, and would they use it in their classrooms once it has been adapted and activity suggestions have been included?

2. Methodology

2.1 Research aim

This study aimed to describe the perspectives of ECD practitioners from low-resourced settings on the linguistic and contextual appropriateness of an adapted milestone guide for use in group settings with children between the ages of birth and 3 years 11 months. Additionally, the ECD practitioners were asked to suggest appropriate activities to stimulate milestones within the classroom setting and to produce a preliminary stimulation guide based on their recommendations.

2.2 Research study design

A mixed-method cross-sectional exploratory survey design was employed. This design allows for both quantitative measurement and qualitative exploration of ECD practitioners' perspectives on the linguistic appropriateness of the adapted developmental milestone guide. The biographical information of the participants was captured using checkboxes to standardise, reduce respondent burden, and limit user error (Sinibaldi, 2025). A Likert scale survey enabled the researchers to gain insights into participants' perspectives regarding the adapted milestone guide for use in a low-resourced group setting with children aged birth to 3 years and 11 months (Brink et al., 2018). ECD practitioners' suggestions for activities and changes that were made in the wording of the milestone were gathered in an open-ended question format with suggestion boxes or fields. This research design is quick and flexible, as it allows for

the investigation of multiple variables. The design is cost-effective and involves data collection at a single point in time. This means that all data is gathered concurrently within the same general time frame, which allows the capturing of voices of diverse participants (Pérez-Guerrero et al., 2024). Each variable is measured only once to capture participants' views or behaviours at that specific moment (Pérez-Guerrero et al., 2024).

2.3 Participants and sampling

The study was conducted at three early childhood development (ECD) centres in low-resourced settings around Pretoria, South Africa. Two of the centres were situated in Pretoria's central business district (CBD), an urban low-resourced context, while the third was in Mamelodi, a semi-urban township. All three centres served children from birth to 36 months, which was the targeted age range for this study.

A total of 15 ECD practitioners participated. To be eligible, practitioners were required to meet the following inclusion criteria:

- ECD practitioners were at least 18 years old, as it is the legal age in South Africa.
- They had to be proficient in conversational English as the surveys were provided in English.
- They must have taught at the ECD centre for at least one year and taught children aged 0-12 months, 12-24 months, or 24-36 months, so that there is familiarity between the children and the ECD practitioner.

Convenience sampling was used to recruit participants based on their availability at the selected ECD centres and the age groups they taught. The aim was not to achieve statistical representativeness but rather to gather in-depth insights into the perspectives of practitioners working in low-resourced settings (Ahmad & Williams, 2024).

The sample reflected diversity in age, linguistic background, qualifications, and teaching experience. Most participants were over 40 years old, multilingual with English as the primary language of instruction, and held at least a Grade 12 certificate or a diploma. All of the participants were female, and the majority had more than five

years of teaching experience. The majority of children taught were aged 2–3 years. Table 1 provides a summary of the demographic characteristics of the participating ECD practitioners.

Table 1. Participant demographics (N=15)

Characteristic	Categories	Participants (n)	%
Age	20–30 years	2	13
	31–40 years	2	13
	41–50 years	5	33
	>50 years	6	40
First language	Sepedi	4	27
	Setswana	3	20
	Afrikaans	3	20
	Xitsonga	2	13
	English	2	13
Language of instruction	English	14	93
	Afrikaans	1	7
Educational qualifications	Grade 12	5	33
	Diploma/Bachelor's degree	5	33
	Higher Certificate	1	7
	ECD Training	1	7
	Grade 10 or below	3	20
Age group taught	0–1 years	2	13
	1–2 years	1	7
	2–3 years	8	53

	0–2 years (across)	2	14
	Principal (no direct teaching)	1	7
Teaching experience	<1 year	2	13
	1–5 years	3	20
	>5 years	8	53

2.4 Materials

A paper-based questionnaire was used, which had undergone several adaptations. The original tool was the Centres for Disease Control and Prevention (CDC) milestone guide (CDC, 2017), later adapted for a master's study (Bellini, 2024, unpublished). This version was subsequently adapted by a final-year research group (Arvedson, 2006). Being based on an existing tool (the CDC milestone guide) increases the validity of the tool used in this study (Brink et al., 2018). Content validity was used to establish validity, ensuring that the scale comprehensively represented the full range of the construct being measured (Boateng et al., 2018).

The questionnaire consisted of five sections. Section A pertained to the biographical information of the ECD practitioners. Section B was the history of the use of developmental milestone guides. Section C was the contextual appropriateness of the adapted milestone guide, as well as a suggestion of an activity for milestones that involved prompting from the ECD practitioner. In this section, the participants were asked to respond only to the section that relates to the age range that they teach. Section D was the linguistic appropriateness of the adapted milestone guide. Section E pertained to the ECD practitioner's insights and recommendations regarding the usefulness and implementation of the adapted developmental milestone guide.

2.5 Data collection procedures

Ethical clearance was obtained from the Research Ethics Committee of the Department of Speech-Language Pathology and Audiology of the University of Pretoria (SLPA2025/08; Appendix B). Protecting participants includes ensuring that the research process does not harm the ECD practitioners, either physically or

psychologically; thus, non-maleficence was adhered to. The principals of the ECD centres were approached and provided with information about the study's purpose, procedures, and ethical considerations, including voluntary participation of practitioners. Written permission was obtained from the principals of the ECD centres (Appendix D). Informed consent respects the autonomy and rights of participants, ensuring they are treated with dignity and fairness. The ECD practitioners from the selected ECD centres were provided with information about the study as well as a consent form that was signed (Appendix E).

Practitioners were provided with the adapted developmental milestone guide to review and were required to complete the paper-based questionnaire simultaneously while reviewing the guide for the linguistic and contextual appropriateness thereof. A maximum of three days was allowed for completion, if needed. ECD practitioners were required to suggest activities to target specific developmental milestones for the age range they taught. These activities are what they would use in their low-resourced setting to stimulate certain developmental outcomes of the children they teach to maximise the achievement of developmental milestones appropriate for their age and developmental domain.

The selected methods of data collection prevented researcher bias from occurring by the participants' direct reports on a Likert scale that were used to determine quantitative trends (Brink et al., 2018). Likert scales are effective at achieving high reliability and validity (Rahman et al., 2022). Open-ended data provide insights into participants' thinking, and validity was improved through transparency and documentation of how qualitative responses are interpreted (Conry-Murray et al., 2024).

Once data collection was completed, the responses were analysed, and edits were made to the adapted developmental milestone guide to enhance its contextual and linguistic appropriateness, as well as the relevance of the suggested activities. Data was anonymised and stored for 10 years in a secure storage room in the Department of Speech-Language Pathology and Audiology in the Communication Pathology building at the University of Pretoria.

2.6 Data Analysis

Descriptive statistics, including frequency distributions, measures of central tendency (mode and median), and measures of variability (range and interquartile range), were used to analyse the quantitative data. Nominal data were analysed using the mode, while ordinal data were analysed using both measures of central tendency and variability. The activities suggested by the ECD practitioners were ranked according to frequency of suggestion.

Qualitative data from open-ended questions (activity suggestions) were analysed using thematic content analysis (Braun & Clarke, 2024). The process began with reading all open-ended responses to become familiar with the data. This was followed by generating initial codes by identifying keywords, phrases, or ideas within the text. Codes were then grouped into broader themes, which represented recurring patterns across the data. Themes were reviewed and refined to ensure that they accurately reflected the participants' responses. Finally, themes were defined, named, and interpreted in the context of the study's objectives.

3. Results

Nearly all participants (93%, n=14) reported actively stimulating children's development in their classrooms, although only 60% (n=9) reported previously using a developmental guide. Practitioners' experiences with developmental milestone guides were mixed as 40% (n=6) reported never using a guide, 13% (n=2) reported rarely using one, 13% (n=2) sometimes, and 33% (n=5) often or very often made use of milestone guides. Guides the ECD practitioners reported using also varied, including the World Health Organization (WHO) milestones (13%, n=2), internet-based materials (13%, n=2), occupational therapy-developed guides (7%, n=1), year planners and daily programmes such as the National Early Learning and Development Standards for Children birth to four years (NELDS) (7%, n=1), and books and practitioners' own knowledge (13%, n=2).

Of the 60% (n=9) of participants who used milestone guides, several purposes were served, including compiling progress reports (22%, n=2), planning daily activities (22%,

n=2), monitoring children's development (11%, n=1), and providing structured developmental support (22%, n=2). The remaining two participants (22%, n=2) did not provide a purpose for which they used a guide. Fourteen ECD practitioners (93%) targeted the following areas of development: cognitive and fine motor skills were supported through puzzles (n=3, 20%), playdough (n=5, 33%), cutting and tearing (n=2, 13%), sorting and matching (n=2, 13%), and construction toys (n=2, 13%) for cognition.

The participants evaluated the linguistic appropriateness of the adapted developmental milestone guidelines. Most participants (60%, n=6) rated that the language of the items was "just right," while others rated some items as "slightly difficult" (13%, n=2) or "slightly easy" (7%, n=1). Several participants (53%, n=8) suggested changes to improve clarity. Seventy-six responses were received across domains and age ranges, and 31 changes were suggested on 19 different milestones. Suggestions from practitioners were considered in terms of appropriateness and then incorporated into the new adapted milestone guide (Appendix G).

In the 0-12 month range, 10 participants suggested changes (Figure 2). Some (n=8) participants suggested changes that were contextual and not linguistic (the milestone was "*Identifies nipple or bottle by looking,*" and the questionnaire asked for potential linguistic changes; however, the participant responded with *"They do it by touch of the cheek*"). Additionally, 2 participants recommended changes to the wording of that same milestone (from "*strings vowels together ("ah", "eh ", "oh") and likes to take turns with a caregiver while making sounds.*" to "*strings vowels together ("ah", "eh ", "oh") and likes to copy and "talk" to the caregiver while making sounds"*).

In the 12-24 month range, 33% (n=5) of participants had suggestions. No singular milestone was flagged by more than one participant; however, the cognitive domain remained the most prominent. In the cognitive domain, two milestones were commented on as confusing because they were considered too abstract: *"pretend to feed toys"* and *"looks at the right picture (e.g., food brochure or book) when it is named,"* by 1 participant each. In the social-emotional domain, one milestone, *"tantrums may start",* was viewed as vague. One participant recommended specific examples of behaviours, such as "*crying or throwing themselves on the floor*", for clarity. A milestone within movement/physical development was highlighted as problematic due

to the inclusion of multiple actions within a single item (e.g., *"run and step up onto a step"*). In the feeding skills domain, one participant indicated a milestone as confusing in terms of domain placement (e.g., *"stops drinking from the bottle."*), but no alternative was suggested, such as using a cup instead.

In the 24-36 month range, 44% (n=15) of participants had suggestions. Notably, the greatest number of concerns in this age range occurred in the social-emotional domain, where two milestones were identified as difficult to understand. In this social-emotional domain, 5 participants (15%) agreed that in the milestone, "*separates easily from caregiver*," replacing "*caregiver*" with "*parent or guardian*" would be more linguistically appropriate. While the other milestone in the same domain required more specificity, a definition of a "*tantrum*", for example, *"throws him/herself on the floor, Cries when something he wants is taken away, shakes head to indicate anger*". In the language/communication domain, 2 participants reported one milestone as needing adjustment, namely "*points to household object*" to "*recognises and points to familiar object*". Three milestones in the cognitive domain were identified as not descriptive enough, including "*can work items with a switch*." 1 participant suggested the wording could be replaced with "*can work or manipulate items with a switch*". The movement/physical development domain had one milestone that was also commented on; 3 participants suggested changing "*makes or copies straight lines and circles with crayons/uses a stick to draw in the sand"* to *"copies or traces straight lines and circles with crayons (or with sticks in sand)."*

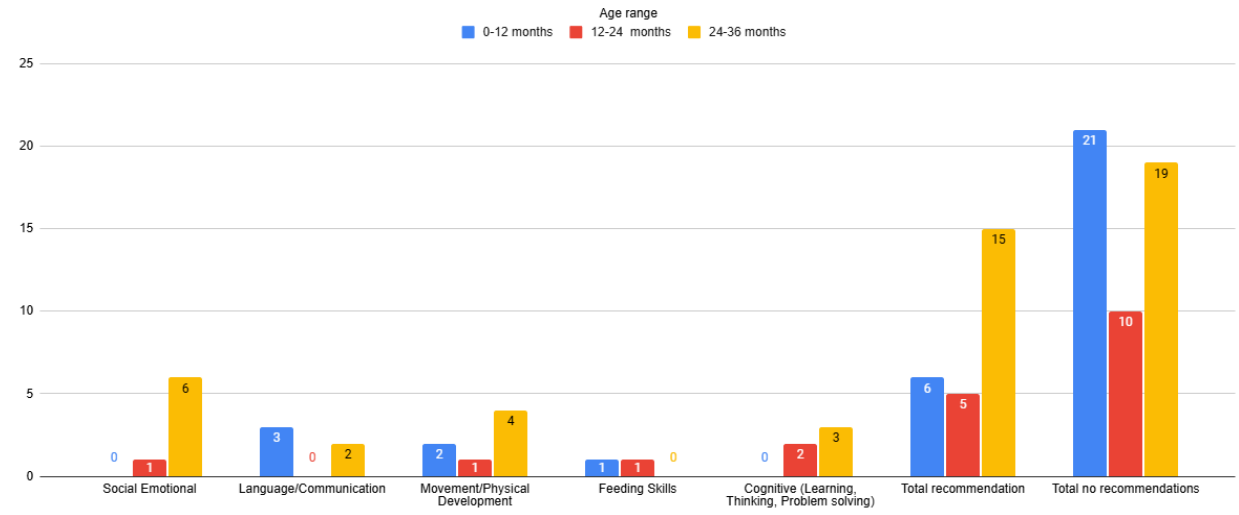

Figure 1. Linguistic recommendations per age range and per domain

Under contextual appropriateness, most practitioners (53%, n=8) agreed that the milestone descriptions in the adapted milestone guide were relevant to the daily contexts of the children they worked with. Some milestones were commented on as being developmentally mis-matched, in the language/communication domain, approximately 26% (n=7) of practitioners indicated that phrases such as *"strings vowels together"* appeared developmentally mismatched as they felt it was too early for those milestones (e.g. "*make a string of vowel sounds, e.g., "ah-ah-ah-ah," "ooh-ooh-ooh," and throaty/gurgling sounds, e.g., "k-k-k-k."*" at 3 months; "*begins to make repeated sounds such as "bababa.*"" at 4 months. Similarly, at 6 months, 2 participants reported that the milestone was not age-appropriate and was considered too early. At 18 months the adapted milestone guide suggests that a child, "Copies circles and straight lines" however 2 participants noted "I think it is too advanced" again at 36 months item number 2 ("*is able to do things for themselves such as undressing.*") and 4 ("*Uses words to describe the position in their home language (e.g., the concept of "in," "on," "under*") were highlighted, but no reasons were given.

ECD practitioners suggested activities to facilitate the milestones in groups of young children in low-resourced settings (Table 2). Two themes emerged from the activities suggested by the ECD practitioners, namely (1) equipment required and (2) no equipment required. Five participants provided 45 activity suggestions for 19 milestones in the 0-12 months age range. The suggested activities tallied 28 requiring equipment and 17 requiring no equipment. The feeding skills domain had the most suggestions (n=14) while the cognitive (learning, thinking, problem solving) domain had the fewest suggestions (n=1) (Table 2).

Seven participants provided 87 activity suggestions in the 12-24 months age range section. The suggested activities tallied 69 requiring equipment and 18 requiring no equipment. While the cognitive (learning, thinking, problem solving) domain had the most suggestions (n=5), the language/ communication domain had the fewest suggestions (n=1) (Table 2). In the 24-36 months age range, 7 participants responded. The suggested activities tallied 58 requiring equipment and 7 requiring no equipment. The cognitive (learning, thinking, problem solving) domain had the most suggestions (n=59), while the social/ emotional domain had the fewest suggestions (n=6) (Table 2).

Table 2. Number of suggested activities per domain per age

Age in months	Social-Emotional	Language/ Communication	Movement/ Physical Development	Feeding Skills	Cognitive (Learning, Thinking, Problem solving)	Total activities suggested per age
2		2				2
3	3		3	4		10
4		4	8			12
6		2		4		6
9			2	6	1	9
12	4				2	6
18		1	2	3	3	9
24		11	26	10	31	78
36	6	13	7	11	28	65
Total	13	33	48	38	65	197

From the total 196 suggested activities, 154 required equipment, and 42 did not require equipment (Figure 2). From those 154 that required equipment, most suggested using equipment that the ECD practitioners found available in their settings, such as a hill or dolls. The 42 activities requiring no equipment from the total 196 suggested activities relied on personal interactions between the children and the ECD practitioner, such as pulling faces and imitation games.

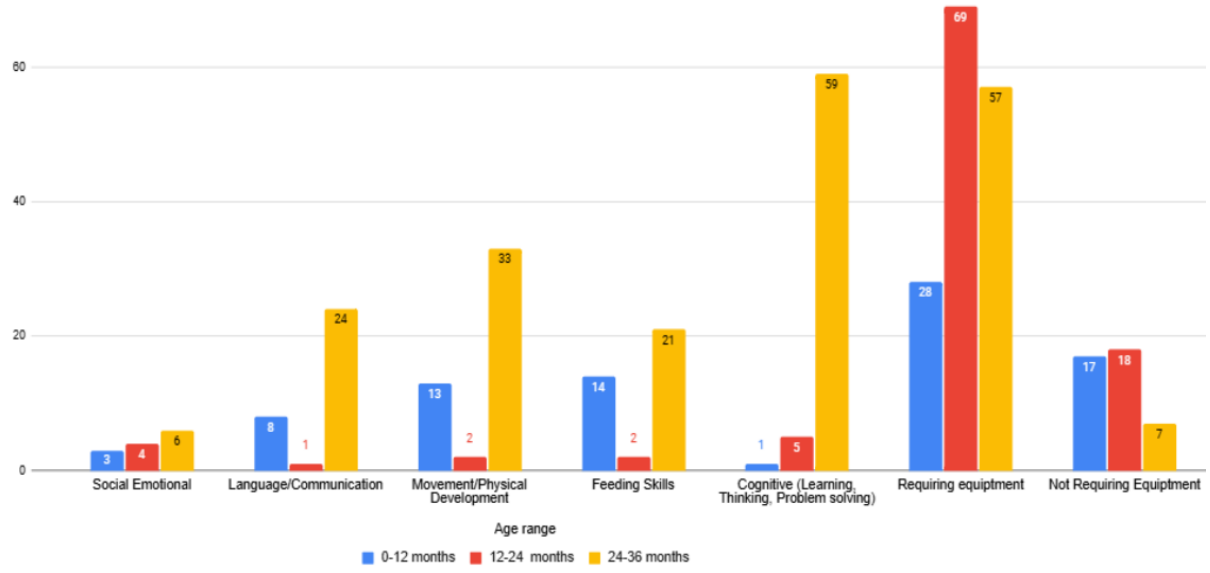

Figure 2. Number of suggested activities per domain per age range and equipment requirement

When asked whether the adapted guide would be useful after incorporating their suggested changes, thirteen participants (86,67%) confirmed that they would use it. They cited reasons such as the ability to guide observation, help plan activities, address barriers to learning, and tailor support to the unique needs of children. One participant indicated they would not use the guide and did not give a reason. One participant stated that only some parts would be useful, noting that milestone guides are mainly used for observation checklists and should be complemented with other frameworks, such as the South African National Curriculum Framework for Children, birth to four (Department of Basic Education, 2015).

In terms of what additional resources or support would be needed for the successful implementation of the adapted milestone guide, 7 participants (47%) suggested additional training on how to use the guide. Five participants (33%) suggested the use of visual aids and posters, and 2 participants suggested translating key sections into local languages.

4. Discussion

This study aimed to evaluate the linguistic and contextual appropriateness of an adapted developmental milestone guide for use in low-resourced group settings with children between birth and 3 years 11 months in South African ECD centres.

The most valuable finding was that most practitioners regarded the guide as linguistically appropriate and contextually relevant. However, because most ECD practitioners reported no formal ECD training, this perception may also reflect limited linguistic and developmental awareness. Reliance on experiential knowledge can lead to overconfidence about what constitutes optimal practice (Milton et al., 2021). Most participants (80%) found the guide linguistically appropriate and did not suggest major changes. Suggested edits were mainly minor, such as word substitutions or adding words for clarity. Some proposed changes were excluded where practitioners' personal views on developmental appropriateness conflicted with evidence-based norms, highlighting the conflict between standardised guidelines and practitioner intuition. South African ECD literature shows that inadequate training and support can result in knowledge gaps that influence practitioner recommendations (Smit et al., 2021; Farley et al., 2018). Thus, the feedback pointed more to a need for clearer examples and practitioner training than to fundamental flaws in the guide itself. The developmental milestone guide was adapted accordingly (Appendix G).

This positive reception is reinforced by the finding that the majority of practitioners (87%) indicated they would implement the guide in their classrooms. These results align with studies that emphasise adapting milestone tools to local settings to improve usability and effectiveness (Charge et al., 2025; Vargas-Baron et al., 2019). ECD practitioners' interest in training is also consistent with previous research, which identified a clear need for further professional development on how to use such guides (Smit et al., 2021; Marieta et al., 2021). This shows the need for further research to determine the specific type of training required to support effective implementation of the adapted developmental milestone guide.

The 24–36 month age range attracted the most suggestions across domains, particularly in social-emotional and cognitive areas. One ECD centre principal reported that most trained practitioners teach this age group, a finding confirmed by participant

data. Their greater training and experience likely enabled more detailed feedback. While this highlights the value of input from experienced practitioners, it also underlines the need for accessible milestone guides in low-resourced settings, where less experienced practitioners may lack the knowledge to identify and stimulate developmental milestones effectively. This finding supports literature linking practitioner education and training to greater confidence and depth of knowledge, affecting their ability to provide detailed input (Smit et al., 2021).

Practitioners' suggestions for contextualised activities were mostly equipment-based. While contextually appropriate for some settings, the focus on equipment raises concerns about sustainability in centres with fewer resources. A trial period is therefore recommended to evaluate the practicality and viability of equipment-based suggestions in low-resource settings, consistent with literature advocating piloting resources before large-scale implementation (Pillay & Saloojee, 2019; Richter et al., 2017).

One practitioner recommended using milestone guides as observation checklists complemented by broader developmental frameworks. This aligns with literature indicating that developmental tracking alone is insufficient in multilingual and underserved communities, where children's needs are shaped by broader social and educational settings (Smit et al., 2021). Given limited training and contextual challenges reported by participants, checklists combined with flexible frameworks provide a practical starting point. There is a move away from rigid milestone frameworks towards context-sensitive approaches that reflect the diverse activity settings in which children develop. Literature has shown that in low-income settings, children's development is heavily influenced by family-based activities, highlighting the importance of developmental frameworks to be grounded in real-world settings (Balton et al., 2019). Therefore, the development of this adapted milestone guide is imperative as it takes into consideration the perspectives of the people who work in these settings every day.

Language and communication milestones generated greater uncertainty than movement and physical milestones. South African children often show stronger

physical than language development, a pattern more apparent in multilingual settings. Fewer than half of children enrolled in early learning programmes meet expected cognitive milestones, with language and literacy outcomes particularly low; this is compounded by the fact that over 80% of classrooms involve second-language learning (Van der Berg et al., 2023; Spaull, 2019). This necessitates the importance of having an adapted developmental milestone guide that is linguistically and contextually appropriate due to the decreased number of children on track for language development (Mohohlwane et al., 2023).

5. Conclusion

Feedback on the linguistic appropriateness of the guide was minor, and revisions were made. Successful implementation will depend on practitioner buy-in, training, and supplementary resources (Smit et al., 2021). The newly adapted developmental milestone guide addresses the original research problem by offering a linguistically and contextually appropriate tool that can enhance developmental outcomes and activities to stimulate the milestones in low-resourced group settings in South Africa. The newly adapted developmental milestone guide is contextually and linguistically appropriate to monitor and stimulate milestones for a low-resourced group setting, such as an ECD centre. Thus, it is ready to be trialled in multiple low-resourced group settings. A key direction for further research is to evaluate the implementation of the newly adapted developmental milestone guide across various low-resourced group settings.

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Appendices

Appendix A: Plagiarism declaration

PLAGIARISM DECLARATION

Full name: Adine Jacobsen

Student Number: u21606821

Degree/Qualification: BA Speech and Language Pathology

Title of thesis/ dissertation/ mini dissertation**:**

ECD practitioners' perspectives on a linguistically and contextually adapted developmental milestone resource (Birth - 3 years 11 months)

I declare that this thesis/ dissertation/ mini dissertation is my own original work. Where secondary material is used and has been carefully acknowledged and referenced in accordance with university requirements.

I understand what plagiarism is and am aware of university policy and implications in this regard.

26-09-2025

Signature **Date**

PLAGIARISM DECLARATION

Full name: Zwivhuya Muswede

Student Number: u20611422

Degree/Qualification: BA Speech and Language Pathology

Title of thesis/ dissertation/ mini dissertation**:**

ECD practitioners' perspectives on a linguistically and contextually adapted developmental milestone resource (Birth - 3 years 11 months)

I declare that this thesis/ dissertation/ mini dissertation is my own original work. Where secondary material is used and has been carefully acknowledged and referenced in accordance with university requirements.

I understand what plagiarism is and am aware of university policy and implications in this regard.

26-09-2025

Signature **Date**

PLAGIARISM DECLARATION

Full name: Samkeliso Precious Ncube

Student Number: u21504963

Degree/Qualification: BA Speech Language Pathology

Title of thesis/ dissertation/ mini dissertation:

ECD practitioners' perspectives on a linguistically and contextually adapted developmental milestone resource (Birth - 3 years 11 months)

I declare that this thesis/ dissertation/ mini dissertation is my own original work. Where secondary material is used and has been carefully acknowledged and referenced in accordance with university requirements.

I understand what plagiarism is and am aware of university policy and implications in this regard.

26-09-2025

Signature **Date**

Appendix B: Ethics form

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Humanities 100 Since 1919

Department of Speech- Language Pathology and Audiology

20 February 2025

Dear Researchers,

Project:	ECD Practitioners' perspectives on a linguistically and contextually adapted developmental milestone resource (birth - 3 years 11 months)
Researchers:	Jacobsen, Adine (u21606821); Muswede, Zwivhuya (u20611422); Ncube, Samkeliso (u21504963)
Supervisors:	Prof. Jeannie Van Der Linde, Dr Maria du Toit, Prof. Renata Eccles
Department:	Department of Speech-Language Pathology and Audiology
Reference Number:	SLPA2025/08

Thank you for the application submitted to the Research Committee of the Department of Speech-Pathology and Audiology, Faculty of Humanities. We have the pleasure of informing you that the above application was approved on 20 February 2025.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal.

We wish you success with the project.

Sincerely

Prof Lidia Pottas
Chair: Departmental Research Committee

Prof J van der Linde
HEAD: DEPARTMENT OF SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY
UNIVERSITY OF PRETORIA

Room 3-6, Humanities Building
University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Email lidia.pottas@up.ac.za | www.up.ac.za

Appendix C: Data management

UNIVERSITY OF PRETORIA
Office of the Vice-Principal: Research and Postgraduate Education

Project Research Data Management Plan

1. PURPOSE

A Project Data Management Plan documents how researchers plan to collect, store, secure, and share their research data. Creating a plan at the beginning of the project will identify and address the main considerations. This will make it easier to identify what the key points are to address the requirements of the research funding and publishing bodies.

A good data management plan is essential for successful research, as managing the data effectively across the data lifecycle is necessary for the success of the research project or postgraduate study. In fact, a data management plan is a living document that can be updated as the project develops and the data management strategy is refined.

0.	**Proposal name**
ECD practitioners' perspectives on a linguistically and contextually adapted developmental milestone resource (Birth - 3 years 11 months)	
1.	**Description of the data**
1.1	**Type of study** A mixed-method cross-sectional exploratory survey design was used.
1.2	**Types of data** A survey with both qualitative and quantitative components, a combination of two types of data. This type of design provides a more comprehensive view of the research topic (Creswell & Plano Clark, 2018).
1.3	**Format and scale of the data** The format of the data is categorical and textual. The scale of the data is ordinal and nominal. The data was captured in secure Excel spreadsheets with passwords to enable charts to be made.

2. Data collection/generation

New data was needed as the perspectives of the ECD practitioners on the adapted milestone guide had not previously been captured.

2.1 Methodologies for data collection/generation

The data was collected via a paper-based questionnaire after written permission was signed and informed consent letters were signed. The questionnaire was first explained to the participants to ensure that they understood and were aware of what was expected of them and that they could withdraw at any time without any repercussions.

2.2 Data quality and standards

Quality of the data was ensured by making use of Likert scales where possible to minimize participants' errors. During the creation of the questionnaire, an expert panel was utilized to ensure the questions were at a language level the participants would understand. During data collection, the questionnaire was thoroughly explained to each participant to avoid any ambiguity in questions.

3. Data management, documentation, and curation

3.1 Managing, storing, and curating data.

Data was anonymised and no personal information, such as names, addresses, or phone numbers, was captured. During the period of research, the data was kept in a secure folder where only the researchers had access to the data.

3.2 Metadata standards and data documentation

Instrumental metadata, such as a copy of the questionnaire and provenance metadata such as how the data was collected and analysed, were described in the article for transparency, and if future researchers recreate the study. This can also then be used by other researchers in their own studies. This includes analytical and procedural information.

3.3 Data preservation strategy and standards

Physical and password-secured digital copies were stored for 10 years in a secure storage room in the Department of Speech-Language Pathology and Audiology in the Communication Pathology building at the University of Pretoria. This is in line with international frameworks (WMA Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Participants), national laws (Protection of Personal Information Act), and institutional guidelines.

4. Data security and confidentiality of potentially disclosive information

4.1 Formal information/data security standards

Ethical clearance was obtained through the Departmental Research Committee of the Department of Speech-Language Pathology and Audiology. Written permission letters were signed by each principal of the ECD centres as well, and informed consent letters were signed by each participant. No identifying or personal information was captured to ensure the anonymity of the participants. The data itself was further anonymised using codes assigned to participants.

4.2 Main risks to data security

Due to no identifying information being captured, the risks involved are low. However, the risk of participant identification is further managed by data being stored securely with password protection, and only the names of the ECD centres involved are used.

5. Data sharing and access

Data will be stored in a storage room in the Department of Speech-Language Pathology and Audiology in the Communication Pathology building at the University of Pretoria.

5.1 Suitability for sharing

The data collected is not suitable for sharing, as ethical approval and participant consent were granted on the understanding that the data would only be used by the research team for the stated purposes of this study. Therefore, sharing the data externally would violate confidentiality agreements, ethical guidelines, and the Protection of Personal Information Act (POPIA).

5.2 Discovery by potential users of the research data

Not applicable.

5.3 Governance of access

Not applicable.

5.4 The study team's exclusive use of the data

Only the primary research team should have access to the data.

5.5 Restrictions or delays to sharing, with planned actions to limit such restrictions

Not applicable

5.6 Regulation of the responsibilities of users

Not applicable

6. Responsibilities

No one apart from the research team is responsible for the study-wide data management, metadata creation, data security, and quality assurance of data.

7. Relevant institutional, departmental, or study policies on data sharing and data security

Policy	URL or Reference
Data Management Policy	University of Pretoria Policy on Research Data Management

& Procedures	
Data Security Policy	Protection of Personal Information Act
Data Sharing Policy	Protection of Personal Information Act
Institutional Information Policy	University of Pretoria Policy on Research Data Management
Other:	
Other	

8. Author of this Data Management Plan
Jacobsen Adine u21606821 Muswede Zwivhuya u20611422 Ncube Samkeliso u21504963

Appendix D: Informed consent

Title of research: ECD Practitioners' perspectives on a linguistically and contextually adapted milestone resource (birth - 3 years 11 months)

Institutional Contact: University of Pretoria: Department of Speech-Language Pathology and Audiology

Principal Investigators:

- Adine Jacobsen
- Zwivhuya Muswede
- Samkeliso Ncube

Supervisors:

- Dr Maria du Toit
- Prof Renata Eccles
- Prof Jeannie Van der Linde

DATE AND TIME OF FIRST INFORMED CONSENT DISCUSSION:

			:	
Date	**month**	**year**	**Time**	

Dear Early Childhood Development Practitioner,

We are a group of final-year Speech-Language Pathology students from the Department of Speech-Language Pathology and Audiology, University of Pretoria. We are conducting research and would like to invite you to join our study. Our study aims to provide ECD practitioners, such as yourselves, with an adapted milestone guide with activities for groups of young children. It would be valuable for you as an ECD Practitioner working with groups of young children from low-resourced settings to provide your views on the recently adapted milestone guide. Additionally, we will ask you to suggest how to target some of the milestones in group activities within the classroom. This will provide researchers with suggestions on what refinements can be made to the guide so that it is beneficial for the ECD practitioners in settings similar to yours.

Description of the Research:

Once you provide consent, you will read through the adapted milestone guide and complete a questionnaire on the adapted milestone guide's linguistic and contextual appropriateness. The questionnaire is paper-based and will take approximately 30

minutes to complete. You will also be asked to suggest activities that would facilitate some of the milestones.

Potential Risks & Discomforts:
You will not be paid to participate in our study. There are no risks in taking part in this study. You will not be penalised if you choose not to participate in this study. You can withdraw from this study at any time and will not be penalised. Withdrawing from the study will not impact your employment at the ECD centre.

Potential Benefits:
ECD is essential for later success for children. Should you decide to participate in the study, your input will help refine the adapted milestone guide so that it may benefit you and other ECD practitioners with similar needs and settings. The results of the study may help by showing researchers if the adapted milestone guide can be useful in an ECD group setting in South Africa.

Ethical considerations

Ethical clearance has been obtained from the Department of Speech-Language Pathology and Audiology, University of Pretoria. The study has been structured in accordance with the Declaration of Helsinki (last update: October 2013), which deals with the recommendations guiding doctors in biomedical research involving human/subjects. A copy of the Declaration may be obtained from the investigator should you wish to review it.

Confidentiality:

A numeric code will be assigned to all identifying information. This will ensure the confidentiality of the information so collected. Data may be used in ongoing research that attempts to deliver professional and responsible services. Only the researchers will be able to identify you as a participant. The names of the participants and centre will not be used in the study to ensure confidentiality. You will have the right to request that your data be withdrawn from the research project at any time. The hard copies of

all your records will be kept locked in room 3/14 at the Department of Speech-Language Pathology and Audiology, University of Pretoria.

Information

If I have any questions concerning this study, I should contact:

Coordinating researcher: Samkeliso Ncube u21504963@tuks.co.za, Prof Renata Eccles - renata.mosca@up.ac.za

Researchers:

Adine Jacobsen	Zwivhuya Muswede	Samkeliso Ncube

Research Supervisors:

Prof. Jeannie Van Der Linde _____

Prof. Renata Eccles _____

Dr. Maria du Toit _____

Appendix E: Permission Letter

2025

Principal of [ECD Centre]

PERMISSION TO CONDUCT RESEARCH AT Confidence College Kidicol

Dear [Name of Principal]

We, Adine Jacobsen, Zwivhuya Muswede and Samkeliso Ncube, are final-year Speech-Language Pathology students at the Department of Speech-Language Pathology and Audiology, University of Pretoria. We are conducting research titled **ECD practitioners' perspectives on a linguistically and contextually adapted milestone resource**.

This study aims to provide ECD practitioners, such as the teachers in your school, with an adapted milestone guide with activities for groups of young children. It would be valuable for ECD practitioners working with groups of young children from low-resourced settings to provide their perspectives on the adapted guide. Additionally, we will ask them to suggest how to target some of the milestones in group activities within the classroom. This will provide researchers with suggestions on what refinements can be made to the guide so that it is beneficial for the ECD practitioners in settings similar to yours.

With your permission, we will approach ECD Practitioners working at your centre to participate in the study. Once they provide consent, they will read through the adapted milestone guide and complete a questionnaire on the adapted milestone guide linguistic and contextual appropriateness. They will also be asked to suggest activities that would facilitate some of the milestones.

The ECD practitioners would have the right to decline participation in this study, and may withdraw consent to participate at any time. The names of the participants and centre will not be used in the study to ensure confidentiality

Should you require any further information, please do not hesitate to contact the spokesperson of the group or the study supervisor, Samkeliso Ncube (4th year spokesperson) u21504963@tuks.co.za, Prof Renata Eccles - renata.mosca@up.ac.za

Please let us know if you would like feedback on this study after completion. Your permission to conduct this research study will be greatly appreciated. Thank you for your correspondence.

Yours sincerely,

_____	_____	_____
Adine Jacobsen	Zwivhuya Muswede	Samkeliso Ncube

_____ _____

Prof. R. Eccles Dr M. du Toit

Supervisor **Supervisor**

_____

Prof J. van der Linde

Head of the Department of Speech-Language Pathology and Audiology

Supervisor

Permission

I, _____, give permission to the final year Speech-Language Pathology students at the University of Pretoria to conduct their study, **ECD practitioners' perspectives on a linguistically and contextually adapted milestone resource** at [ECD Centre].

_____

Principal of [ECD Centre]

STAMP HERE

Appendix F: Questionnaire

Thank you for taking the time to participate in this study. Your insights are invaluable in evaluating the appropriateness and suggesting activities of the adapted developmental milestone guide for group settings. This questionnaire consists of several sections. The first section gathers biographical information about you as a practitioner. The following sections focus on your opinions on its suitability within your context and the language that you use in the classroom and then you will have to suggest some activities that can be used to support development for the different items in the age groups that you teach. We have provided you with the guide to use while completing this questionnaire to help you understand it better and provide some relevant activities. Your input and ideas will help us make the guide easier to use and more effective for early childhood group settings.

These next sections are all about whether the content makes sense for your context and if the language used feels right. As you go through it, think about whether it fits your situation, how clear the wording is, and whether it sounds natural. After that, you'll get to suggest some fun and useful activities too.

Questionnaire

Please review the following questions and select the relevant option(s) by checking the appropriate box(es) or providing your answers in the open-ended text box.

A. ECD Practitioners information

1. How old are you?
    - 20-30 years
    - 31-40 years
    - 41-50 years

2. What is your first language?
   (Please select one. If your first language is not listed, choose "Other" and specify.)
    - Afrikaans
    - English
    - isiNdebele
    - isiXhosa
    - isiZulu
    - South African Sign Language (SASL)
    - Sepedi (Northern Sotho)
    - Sesotho (Southern Sotho)
    - Setswana

- siSwati
- Tshivenda
- Xitsonga
- Other: _____

3. What language do you use most often in your classroom? *(Please select one.)*
   - Afrikaans
   - English
   - isiNdebele
   - isiXhosa
   - isiZulu
   - South African Sign Language (SASL)
   - Sepedi (Northern Sotho)
   - Sesotho (Southern Sotho)
   - Setswana
   - siSwati
   - Tshivenda
   - Xitsonga

4. What is your highest level of education?
   - Grade 10 or less
   - Grade 12
   - ECD training
   - Higher certificate
   - Diploma/Bachelor's degree

5. Which age range do you currently teach?
   - 0-1 year
   - 1-2 years
   - 2 -3 years

6. How many years of experience do you have working with this specific age range?
   - Less than 1 year
   - 1–2 years
   - 3–5 years
   - More than 5 years

7. Do you stimulate development in your classroom? If yes, provide an example of how you do this?

B. Feedback on the adapted milestone guide

8. Have you used a developmental milestone guide before?

    - 1 = Never
    - 2 = Rarely
    - 3 = Sometimes
    - 4 = Often
    - 5 = Very Often

9. If yes, please briefly explain

    - Which guide(s) did you use?

    - When did you use it?

    - What was the reason for using the guide?

C. Contextual Appropriateness of the Adapted Milestone Guide for Group Settings

Please evaluate all of the following milestones, regardless of the age group you work with. When suggesting activities, focus only on those relevant to the age range you work with.

Item	Adapted Milestone	Age: 2 months	What activity would you use to elicit this
1	**Language/ communication domain**	Coos with (aaa)/ throaty/ gurgling sounds.	

Item	Adapted Milestone	Age: 3 months	What activity would you use to elicit this (fill in non-shaded blocks)
1	**Social - emotional domain**	Copies movements and facial expressions like smiling and frowning.	
2	**Movement/ physical development domain**	Can hold head up and begin to push up when lying on the tummy/ bed/ floor/ caregiver's chest.	
3	**Feeding skills* (Adapted from Arvedson,2006)**	Brings objects to mouth	
4	**Feeding skills* (Adapted from Arvedson,2006)**	Identifies nipple or bottle by looking.	

Item	Adapted Milestone	Age: 4 months	What activity would you use to elicit this (fill in non-shaded blocks)
1	**Language/ communication domain**	Begins to make repeated sounds such as “bababa.”	
2	**Language/ communication domain**	Makes repeated sounds with expression and copies sounds he hears.	

3	**Movement/ physical development domain**	Tries to roll from tummy to back.	
4	**Movement/ physical development domain**	Can hold a toy/object, shake it, and swing/ swipe at dangling toys/objects such as keys.	
5	**Movement/ physical development domain**	When lying on tummy, push up to rest on elbows.	

Item	**Adapted Milestone**	**Age: 6 months**	**What activity would you use to elicit this (fill in the non-shaded blocks)**
1	**Language/ Communication Domain**	Strings vowels together (“ah,””eh,””oh”) and likes to take turns with a caregiver while making sounds.	
2	**Feeding skills* (Adapted from Arvedson,2006)**	Holds bottle without any help needed.	
3	**Feeding skills* (Adapted from Arvedson,2006)**	Drinks from cup when held by someone.	
4	**Feeding skills* (Adapted from Arvedson,2006)**	Feeds self-biscuits.	

Item	Adapted Milestone	Age: 9 months	
1	**Social - emotional domain**	May be shy/ nervous/ afraid of strangers.	
2	**Social - emotional domain**	Prefers a familiar adult.	
3	**Social - emotional domain**	Has a favourite household item/ toy/ object.	
4	**Cognitive (learning, thinking, problem-solving) domain**	Picks up small items like rocks/ beans between thumb and index finger.	
5	**Movement/ physical development domain**	Crawls on hands and knees.	
6	**Feeding skills* (Adapted from Arvedson,2006)**	Holds soft biscuits in mouth without biting.	
7	**Feeding skills* (Adapted from Arvedson,2006)**	Bangs spoon on table.	
8	**Feeding skills* (Adapted from Arvedson,2006)**	Copies stirring a spoon in a bowl/cup.	

Item	Adapted Milestone	Age: 12 months	What activity would you use to elicit this (fill in non-shaded blocks)
1	**Social - emotional domain**	Is shy/nervous/ afraid of strangers.	
2	**Social - emotional domain**	Cries when caregiver leaves.	
3	**Social - emotional**	Shows caregiver they	

	domain	want to play with the adult/needs help (e.g. gives objects they need help with).	
4	**Social - emotional domain**	Plays games such as hiding and showing face from behind towel / joins in on songs with actions.	
5	**Cognitive (learning, thinking, problem-solving) domain**	Looks at the right picture (e.g. food brochure or book) when it is named.	
6	**Feeding skills* (Adapted from Arvedson,2006)**	Bites through soft biscuit.	
7	**Feeding skills* (Adapted from Arvedson,2006)**	Holds cup with some spilling when drinking.	
8	**Feeding skills* (Adapted from Arvedson,2006)**	Drinks from a straw.	

Item	**Adapted Milestone**	**Age: 18 months**	**What activity would you use to elicit this (fill in non-shaded blocks)**
1	**Social - emotional domain**	Tantrums.	

2	**Social - emotional domain**	May be shy/ nervous/ afraid of strangers.	
3	**Social - emotional domain**	May cling/stay close to caregiver in new situations.	
4	**Cognitive (learning, thinking, problem-solving) domain**	Shows interest in teddy bear/ soft toy/ doll by pretending to feed.	
5	**Movement/ physical development domain**	Can run and step up onto a step/object.	
6	**Feeding skills* (Adapted from Arvedson,2006)**	Scoops food with spoon and turns spoon while placing in the mouth.	
7	**Feeding skills* (Adapted from Arvedson,2006)**	Stops drinking from the bottle.	

Item	**Adapted Milestone**	**Age: 24 months**	**What activity would you use to elicit this (fill in non-shaded blocks)**
1	**Language/ Communication Domain**	Points to household objects.	
2	**Language/ Communication Domain**	Points to pictures when they are named (e.g., family photos/ newspaper pictures).	
3	**Cognitive (learning, thinking, problem-solving) domain**	Completes words and sentences in familiar songs.	
4	**Cognitive (learning,**	Begins to sort similar	

	thinking, problem-solving) domain	objects and objects of the same colour (e.g., clothes or socks).	
5	**Cognitive (learning, thinking, problem-solving) domain**	Builds towers of 4 or more items (e.g., blocks, Tupperware, cups).	
6	**Cognitive (learning, thinking, problem-solving) domain**	Follows two-step instructions such as “Pick up your shoes and put them by the bed.”	
7	**Cognitive (learning, thinking, problem-solving) domain**	Names items on a picture (e.g., magazines, newspapers, food brochures) such as “banana,” “shoe,” or “dog.”	
8	**Movement/ physical development domain**	Kicks a ball.	
9	**Movement/ physical development domain**	Walks uphill/downhill holding onto a hand or up and down stairs holding on.	
10	**Movement/ physical development domain**	Throws ball/object above head.	
11	**Movement/ physical**	Makes or copies straight	

	development domain	lines and circles with crayons/uses a stick to draw in the sand.	
12	**Feeding skills* (Adapted from Arvedson,2006)**	Holds small cup in one hand with little spilling.	
13	**Feeding skills* (Adapted from Arvedson,2006)**	Bites into food with different thicknesses, e.g. meat, potatoes, bread.	

Item	**Adapted Milestone**	**Age: 36 months**	**What activity would you use to elicit this (fill in non-shaded blocks)**
1	**Social - emotional domain**	Separates easily from caregiver.	
2	**Social - emotional domain**	Is able to do things for themselves such as undressing.	
3	**Language/ Communication Domain**	Understands position words in their home language (e.g., the concept of “in,” “on,” and “under”).	
4	**Language/ Communication Domain**	Uses words to describe the position in their home language (e.g., the concept of “in,” “on,” “under”).	

5	**Cognitive (learning, thinking, problem-solving) domain**	Can work items such as toys with a switch, opening a lid, and closing a tap.	
6	**Cognitive (learning, thinking, problem-solving) domain**	Plays pretend games with people/toys such as “teacher-teacher” and “mommy-child.”	
7	**Cognitive (learning, thinking, problem-solving) domain**	Does puzzle with 3- or 4-piece puzzles (e.g., puts together a picture cut into 3 or 4 pieces).	
8	**Cognitive (learning, thinking, problem-solving) domain**	Understands what “two” means (e.g. Child takes two bananas when caregiver says “take two”).	
9	**Cognitive (learning, thinking, problem-solving) domain**	Turns pages of magazines, newspapers, or books.	
10	**Cognitive (learning, thinking, problem-solving) domain**	Builds towers of over 6 items (e.g., blocks, Tupperware, cups).	
11	**Movement/ physical development domain**	Climbs well (onto furniture, jungle gym, or people).	
12	**Movement/ physical development domain**	Walks uphill/downhill holding onto a hand or up and down stairs	

		holding on.	
13	**Feeding skills* (Adapted from Arvedson,2006)**	Pours from small cup.	
14	**Feeding skills* (Adapted from Arvedson,2006)**	Feeding self with a fork.	

10. Are the examples used in the adapted milestone guide descriptions relevant to the daily experiences of the children you work with?

- Yes
- No, please specify

_____

_____

D. Linguistic Appropriateness of the Adapted Milestone Guide

Please evaluate each of the following milestones **applicable to the age range that you work with** and then answer the questions that follow.

Item	Adapted Milestone	Age: 3 months
1	**Social - emotional domain**	Copies movements and facial expressions like smiling and growing.
2	**Language/ communication domain**	Make a string of vowel sounds, e.g., “ah-ah-ah-ah,” “ooh-ooh-ooh,” and throaty/gurgling sounds, e.g., “k-k-k-k.”

3	**Movement/ physical development domain**	Can hold head up and begin to push up when lying on the tummy/ bed/ floor/ caregiver's chest.
4	**Feeding skills* (Adapted from Arvedson,2006)**	Brings objects to mouth
5	**Feeding skills* (Adapted from Arvedson,2006)**	Identifies nipple or bottle by looking.

11. Did you understand the language?
    - Yes
    - No

12. Are there any words or phrases that you think other practitioners such as yourself will struggle to understand?

13. How would you change these words/ phrases to better understand it? *(give a recommendation for each word/ phrase that was hard to understand.)*

Item	Adapted Milestone	Age: 4 months
1	**Language/ communication domain**	Begins to make repeated sounds such as “bababa.”
2	**Language/ communication domain**	Makes repeated sounds with expression and copies sounds he hears.
3	**Movement/ physical development domain**	Tries to roll from tummy to back.
4	**Movement/ physical development domain**	Can hold a toy/object, shake it, and swing/ swipe at dangling toys/objects such as keys.
5	**Movement/ physical development domain**	When lying on tummy, push up to rest on elbows.

14. Did you understand the language?
    - Yes
    - No

15. Are there any words or phrases that you think other practitioners such as yourself will struggle to understand?

16. How would you change these words/ phrases to better understand it?
(give a recommendation for each word/ phrase that was hard to understand.)

Item	Adapted Milestone	Age: 6 months
1	**Language/ Communication Domain**	Strings vowels together (“ah,””eh,””oh”) and likes to take turns with a caregiver while making sounds.
2	**Feeding skills* (Adapted from Arvedson,2006)**	Holds bottle without any help needed.
3	**Feeding skills* (Adapted from Arvedson,2006)**	Drinks from cup when held by someone.
4	**Feeding skills* (Adapted from Arvedson,2006)**	Feeds self-biscuits.

17. Did you understand the language?
    - Yes
    - No

18. Are there any words or phrases that you think other practitioners such as yourself will struggle to understand?

19. How would you change these words/ phrases to better understand it?
(give a recommendation for each word/ phrase that was hard to understand.)

Item	Adapted Milestone	Age: 9 months
1	**Social - emotional domain**	May be shy/ nervous/ afraid of strangers.
2	**Social - emotional domain**	Prefers a familiar adult.
3	**Social - emotional domain**	Has a favourite household item/ toy/ object.
4	**Cognitive (learning, thinking, problem-solving) domain**	Picks up small items like rocks/ beans between thumb and index finger.
5	**Movement/ physical development domain**	Crawls on hands and knees.
6	**Feeding skills* (Adapted from Arvedson,2006)**	Holds soft biscuits in mouth without biting.

7	**Feeding skills* (Adapted from Arvedson,2006)**	Bangs spoon on table.
8	**Feeding skills* (Adapted from Arvedson,2006)**	Copies stirring a spoon in a bowl/cup.

20. Did you understand the language?
    - Yes
    - No

21. Are there any words or phrases that you think other practitioners such as yourself will struggle to understand?

22. How would you change these words/ phrases to better understand it?
    (give a recommendation for each word/ phrase that was hard to understand.)

Item	Adapted Milestone	Age: 12 months
1	**Social - emotional domain**	Is shy/nervous/ afraid of strangers.
2	**Social - emotional domain**	Cries when caregiver leaves.
3	**Social - emotional domain**	Shows caregiver they want to play with the adult/needs help (e.g. gives objects they need help with).
4	**Social - emotional domain**	Plays games such as hiding and showing face from behind towel / joins in on songs with actions.
5	**Cognitive (learning, thinking, problem-solving) domain**	Looks at the right picture (e.g. food brochure or book) when it is named.
6	**Feeding skills* (Adapted from Arvedson,2006)**	Bites through soft biscuit.
7	**Feeding skills* (Adapted from Arvedson,2006)**	Holds cup with some spilling when drinking.
8	**Feeding skills* (Adapted from Arvedson,2006)**	Drinks from a straw.

23. Did you understand the language?
    - Yes
    - No

24. Are there any words or phrases that you think other practitioners such as yourself will struggle to understand?

25. How would you change these words/ phrases to better understand it?
(give a recommendation for each word/ phrase that was hard to understand.)

Item	Adapted Milestone	Age: 18 months
1	**Social - emotional domain**	Tantrums may start.
2	**Social - emotional domain**	May be shy/ nervous/ afraid of strangers.
3	**Social - emotional domain**	May cling/stay close to caregiver in new situations.
4	**Cognitive (learning, thinking, problem-solving) domain**	Shows interest in teddy bear/ soft toy/ doll by pretending to feed.
5	**Movement/ physical development domain**	Can run and step up onto a step/object.
6	**Feeding skills* (Adapted from Arvedson,2006)**	Scoops food with spoon and turns spoon while placing in the mouth.

7	**Feeding skills* (Adapted from Arvedson,2006)**	Stops drinking from the bottle.

26. Did you understand the language?
    - Yes
    - No

27. Are there any words or phrases that you think other practitioners such as yourself will struggle to understand?

28. How would you change these words/ phrases to better understand it? *(give a recommendation for each word/ phrase that was hard to understand*.)

Item	Adapted Milestone	Age: 24 months
1	**Language/ Communication Domain**	Points to household objects.
2	**Language/ Communication Domain**	Points to pictures when they are named (e.g., family photos/ newspaper pictures).
3	**Cognitive (learning, thinking, problem-solving) domain**	Completes words and sentences in familiar songs.
4	**Cognitive (learning, thinking, problem-solving) domain**	Begins to sort similar objects and objects of the same colour (e.g., clothes or socks).
5	**Cognitive (learning, thinking, problem-solving) domain**	Builds towers of 4 or more items (e.g., blocks, Tupperware, cups).
6	**Cognitive (learning, thinking, problem-solving) domain**	Follows two-step instructions such as “Pick up your shoes and put them by the bed.”
7	**Cognitive (learning, thinking, problem-solving) domain**	Names items on a picture (e.g., magazines, newspapers, food brochures) such as “banana,” “shoe,” or “dog.”
8	**Movement/ physical development domain**	Kicks a ball.
9	**Movement/ physical development domain**	Walks uphill/downhill holding onto a hand or up and down stairs holding on.
10	**Movement/ physical development domain**	Throws ball/object above head.
11	**Movement/ physical development domain**	Makes or copies straight lines and circles with crayons/uses a stick to draw in the sand.
12	**Feeding skills* (Adapted from Arvedson,2006)**	Holds small cup in one hand with little spilling.

13	**Feeding skills* (Adapted from Arvedson,2006)**	Bites into food with different thicknesses, e.g. meat, potatoes, bread.

29. Did you understand the language?
    - Yes
    - No

30. Are there any words or phrases that you think other practitioners such as yourself will struggle to understand?

31. How would you change these words/ phrases to better understand it? *(give a recommendation for each word/ phrase that was hard to understand*.)

Item	Adapted Milestone	Age: 36 months
1	**Social - emotional domain**	Separates easily from caregiver.
2	**Social - emotional domain**	Tantrums are still occurring.
3	**Language/ Communication Domain**	Understands position words in their home language (e.g., the concept of “in,” “on,” and “under”).
4	**Language/ Communication Domain**	Uses words to describe the position in their home language (e.g., the concept of “in,” “on,” “under”).
5	**Cognitive (learning, thinking, problem-solving) domain**	Can work items such as toys with a switch, opening a lid, and closing a tap.
6	**Cognitive (learning, thinking, problem-solving) domain**	Plays pretend games with people/toys such as “teacher-teacher” and “mommy-child.”
7	**Cognitive (learning, thinking, problem-solving) domain**	Does puzzle with 3- or 4-piece puzzles (e.g., puts together a picture cut into 3 or 4 pieces).
8	**Cognitive (learning, thinking, problem-solving) domain**	Understands what “two” means (e.g. Child takes two bananas when caregiver says “take two”).
9	**Cognitive (learning, thinking, problem-solving) domain**	Turns pages of magazines, newspapers, or books.
10	**Cognitive (learning, thinking, problem-solving) domain**	Builds towers of over 6 items (e.g., blocks, Tupperware, cups).
11	**Movement/ physical development domain**	Climbs well (onto furniture, jungle gym, or people).

12	**Movement/ physical development domain**	Walks uphill/downhill holding onto a hand or up and down stairs holding on.
13	**Feeding skills* (Adapted from Arvedson,2006)**	Pours from small cup.
14	**Feeding skills* (Adapted from Arvedson,2006)**	Feeding self with a fork.

32. Did you understand the language?
    - Yes
    - No

33. Are there any words or phrases that you think other practitioners such as yourself will struggle to understand?

34. How would you change these words/ phrases to better understand it?
    (give a recommendation for each word/ phrase that was hard to understand.)

Item	Adapted Milestone Domain	Who to consult if your child does not meet the milestones in his/ her age range.
1	**Social-emotional domain**	Speech- Language therapist or an Occupational Therapist
2	**Language/ communication domain**	Speech- Language therapist/ Audiologist
3	**Cognitive (learning, thinking, problem-solving) domain**	Speech- Language therapist/ Occupational therapist
4	**Movement/ physical development domain**	Physical therapist/ Occupational therapist
5	**Feeding skills* (Adapted from Arvedson,2006)**	Speech- Language therapist

35. Overall, how appropriate is the language used in the milestone guide?
    - 1 = Far too difficult
    - 2 = Slightly difficult
    - 3 = Just right
    - 4 = Slightly easy
    - 5 = Far too easy

E. Practitioners' Insights and Recommendations

36. To support the successful implementation of the guide in group settings, what additional resources or support would help you the most? (Select all that apply)

    - Additional training on how to use the guide
    - Translations of key sections into local languages
    - Visual aids or posters to support implementation
    - Other (Please specify)

F. General Reflections

37. Do you think the current adapted milestone guide would be useful to use in your classroom with your group of children?

- Yes
- No, I would not use it
- Yes, some parts of it (if so please specify)

38. Do you think the adapted milestone guide, including your suggested changes, would be useful for use in your classroom with your group of children?

- Yes
- No, I would not use it
- Yes, some parts of it (if so please specify)

39. What aspects of the guide do you find most useful?

Thank you for completing this questionnaire and sharing your insights. We appreciate your time and expertise!

Appendix G: Development of Adapted Developmental Milestone guide

Age 2 months				
Item	**Domain**	**Masters 2023 research adapted developmental milestone guide**	**Undergraduate 2024 research adapted developmental milestone guide**	**Undergraduate 2025 research adapted developmental milestone guide and activities to stimulate milestone**
1	**Language/ communication domain**	Coos, makes gurgling sounds	Make string of vowel sounds e.g. “ah-ah-ah-ah”, “ooh-ooh-ooh”, and throaty/gurgling sounds e.g. “k-k-k-k.”	(no adaptations made)

Age 3 months				
Item	**Domain**	**Masters 2023 research adapted developmental milestone guide**	**Undergraduate 2024 research adapted milestone guide**	**Undergraduate 2025 research adapted milestone guide and activities to stimulate milestone**
1	**Social-emotional domain**	Copies some movements and facial expressions, like smiling or frowning (originally at 4 months)	Copies movements and facial expressions like smiling and frowning.	Face Time Fun: Sit face-to-face with the children, not too close. Make slow exaggerated facial expressions: big frown, big smile, gentle frown, raise eyebrows, stick out tongue.
2	**Movement/ physical development domain**	Can hold head up and begins to push up when lying on tummy	Can hold head up and begin to push up when lying on the tummy/ bed/ floor/ caregiver's chest.	**Can hold head up and begin to push up when lying on the tummy/bed/ floor/ parent's or guardian's chest.** Tummy Time Look and Lift: Place the children on their tummy on a soft, flat surface. If necessary, place a rolled towel under their chest with arms forward to make lifting with arms easier. Get down to the children's eye level and talk and smile or show a high-contrast toy or a mirror just in front of them. Encourage the children to look up, reaching toward your face or toy. Praise any head lifting or arm pushing.

3	**Feeding skills (Adapted from Arvedson,2006)**		Brings objects to the mouth	Hand-to-Mouth Play: Lay children on their back on a soft blanket, gently bring their hands together in front of their chest. Gently bring their hands together in front of their chest, and say," Look at your hands! Can you bring them to your mouth?" Encourage hand exploration by slowly guiding their hands to their mouth if needed. Praise any movement.
4	**Feeding skills (Adapted from Arvedson,2006)**		Identifies nipple or bottle by looking.	You can show the bottle briefly to the children a few cm away during tummy or play time to help the children visually track and recognise it outside of feeding time.

Age 4 months				
Item	**Domain**	**Masters 2023 research adapted developmental milestone guide**	**Undergraduate 2024 research adapted milestone guide**	**Undergraduate 2025 research adapted milestone guide and activities to stimulate milestone**
1	**Language/ communication domain**	Begins to babble.	Begins to make repeated sounds such as “bababa.”	Sit face-to-face with the children, holding them upright so they can see your mouth. Say simple exaggerated sounds like “ba-ba-ba” and “da-da-da” slowly and with clear lip movement. Pause after each set of sounds. Giving the children time to respond. If they make the sounds, repeat them. Smile/ Clap/ Encourage.
2	**Language/ communication domain**	Babbles with expression and copies sounds he hears.	Make repeated sounds with expression and copies sounds he hears.	Hold the children close, face-to-face. Say a sound like “ma-ma-ma” or “goo-goo”, matching it with a facial expression - smile wide with big open eyes. Vary your tone (happy and sad) and volume (loud and soft). Pause and give the children time to respond. If they make any sound. Repeat their sounds back to them several times in different emotional tones.

3	**Movement/ physical development domain**	May be able to roll over from tummy to back	Tries to roll from tummy to back.	Place the children on their tummy. Hold a shoulder to one side. Let them turn toward it, helping slightly at the hip if needed. Cheer when they roll.
4	**Movement/ physical development domain**	Can hold a toy and shake it and swing at dangling toys	Can hold a toy/object, shake it, and swing/ swipe at dangling toys/objects such as keys.	Place the children on their back under a play gym or hanging toys within reach. Give them a lightweight rattle to hold. Gently guide their hand to shake or swing it. Encourage swiping by moving dangling toys slightly to attract attention.
5	**Movement/ physical development domain**	When lying on stomach, pushes up to elbows	When lying on the tummy, push up to rest on the elbows.	Place the children on their tummy on a soft mat. Sit in front of them. Sing a simple song, “Twinkle-twinkle”, while gently moving a soft toy side-to-side at eye level. As the children watch, they naturally lift their head and push up on their elbows to follow the motion.

Age 6 months				
Item	**Domain**	**Masters 2023 research adapted developmental milestone guide**	**Undergraduate 2024 research adapted milestone guide**	**Undergraduate 2025 research adapted milestone guide and activities to stimulate milestone**
1	**Language/ Communication Domain**	Strings vowels together when babbling (“ah”, “eh”, “oh”) and likes taking turns with parents while making sounds.	Strings vowels together (“ah”,”eh”,”oh”) and likes to take turns with caregiver while making sounds.	**Strings vowels together (“ah”, “eh”, “oh”) and likes to copy and “talk” to the parent or guardian while making sounds.** Hold children face-to-face. Say vowel sounds with clear expression. Pause and wait for the children to respond. When they make a sound, mimic it, back to them with excitement. Continue taking turns like a fun back-and-forth chat.
2	**Feeding skills (Adapted from Arvedson,2006)**		Holds a bottle without any help needed.	Guide the children to the bottle during the feeding. Use a light, easy-to-hold bottle independently.
3	**Feeding skills (Adapted from Arvedson,2006)**		Drinks from a cup when held by someone.	(no adaptations made)

4	**Feeding skills (Adapted from Arvedson,2006)**		Feeds self biscuits.	Provide biscuits while sitting in e.g., a plastic chair, a feeding chair, or big cushions.

Age 9 months				
Item	**Domain**	**Masters 2023 research adapted developmental milestone guide**	**Undergraduate 2024 research adapted milestone guide**	**Undergraduate 2025 research adapted milestone guide and activities to stimulate milestone**
1	**Social-emotional domain**	May be afraid of strangers	May be shy/ nervous/ afraid of strangers.	(no adaptations made)
2	**Social-emotional domain**	May be clingy with familiar adults	Prefers a familiar adult.	(no adaptations made)
3	**Social-emotional domain**	Has favourite toys	Has a favourite household item/ toy/ object.	(no adaptations made)
4	**Cognitive (learning,**	Picks up things like cereal o's between thumb and	Picks up small items like rocks/ beans between	Place small items in a basket. Sit the children in front of it and let

	thinking, problem-solving) domain	index finger.	thumb and index finger.	them pick items up. Show how to use the thumb and forefinger. Supervise closely.
5	**Movement/ physical development domain**	Crawls	Crawls on hands and knees.	Set up a tunnel/low obstacle path. Place the toy at the end. Encourage the children to crawl through on hands and knees to reach it. Crawl alongside to model if needed.
6	**Feeding skills (Adapted from Arvedson,2006)**		Holds soft biscuits in the mouth without biting.	Sit children upright. Offer a biscuit and gently place it near their lips. Encourage the children to explore holding it in their mouth without biting. Supervise closely the entire time.
7	**Feeding skills (Adapted from Arvedson,2006)**		Bangs the spoon on the table.	Give the children a spoon while seated on the surface. Let the children explore sounds by banging, tapping and drumming.
8	**Feeding skills (Adapted from Arvedson,2006)**		Copies stirring a spoon in a bowl/cup.	Show the children how to stir the spoon in the bowl. Hand them a spoon and encourage copying. Use sound or texture (dry rice) to keep it engaging.

Age 12 months				
Item	**Domain**	**Masters 2023 research adapted developmental milestone guide**	**Undergraduate 2024 research adapted milestone guide**	**Undergraduate 2025 research adapted milestone guide and activities to stimulate milestone**
1	**Social-emotional domain**	Is shy or nervous with strangers	Is shy/nervous/ afraid of strangers.	(no adaptations made)
2	**Social-emotional domain**	Cries when mom or dad leaves	Cries when caregiver leaves.	**Cries when parent or guardian leaves**
3	**Social-emotional domain**	Hands you a book when he wants to hear a story	Shows caregiver they want to play with the adult/needs help (e.g. gives objects they need help with).	**Shows parent or guardian they want to play with the adult/needs help (e.g. gives objects they need help with)** Give the toy to the children but make it slightly more challenging to use. Wait for the children to look at you, gesture or vocalise for help. Respond warmly and help by saying things like: “Oh, you need help,” or “You want me to play with you?” Encourage simple gestures like handing you the toy, pointing or reaching.

4	**Social-emotional domain**	Plays games such as “peek-a-boo” and “pat-a-cake”	Plays games such as hiding and showing face from behind a towel / joins in on songs with actions.	Start with Peekaboo. Hide your face behind a towel/your hands, then pop out and say “Peekaboo!” Encourage the children to try hiding, too. Help them hold the towel and pull it down. Follow with a simple encouragement: clapping/ waving.
5	**Cognitive (learning, thinking, problem-solving) domain**	Looks at the right picture or thing when it’s named.	Looks at the right picture (e.g. food brochure or book) when it is named.	**Looks at the correct picture (e.g. food brochure or book) when it is named.** Name, e.g. apple, show a real apple, then show a picture and ask, “Where is the apple?”
6	**Feeding skills (Adapted from Arvedson,2006)**		Bites through a soft biscuit.	Sit the children upright. Offer them a biscuit, holding it gently if needed at first. Encourage them to say “Mmm, Bite”. Wait and praise when they bite through.
7	**Feeding skills (Adapted from Arvedson,2006)**		Holds a cup with some spilling when drinking.	Sit the children up upright. Fill the cup with a little water. Help guide the children’s hands to hold onto the cup with both hands. Say “Take a sip” and gently tip if needed. Supervise closely.

8	**Feeding skills (Adapted from Arvedson,2006)**		Drinks from a straw.	Show the children how to sip from a straw. Let them try drinking with a small amount of water. Help a bit if needed by squeezing into the mouth (Use a sipping cup).

Age 18 months				
Item	**Domain**	**Masters 2023 research adapted developmental milestone guide**	**Undergraduate 2024 research adapted milestone guide**	**Undergraduate 2025 research adapted milestone guide and activities to stimulate milestone**
1	**Social-emotional domain**	May have temper tantrums	Tantrums may start.	**Tantrums may start, e.g. throw themself on the floor. Cries when something they want is taken away and shakes their head to indicate that anger may start.**

2	**Social-emotional domain**	May be afraid of strangers	May be shy/nervous/ afraid of strangers.	**Children may be shy/ nervous/afraid of strangers**.
3	**Social-emotional domain**	May cling to caregivers in new situations	May cling/stay close to caregivers in new situations.	**May cling/stay close to parents or guardians in new situations.**
4	**Cognitive (learning, thinking, problem-solving) domain**	Shows interest in a doll or stuffed animal by pretending to feed.	Shows interest in a teddy bear/soft toy/doll by pretending to feed.	Sit with the children and the teddy. Pretend to feed teddy: “Teddy is hungry! Let’s feed him.” Hand the children a spoon and encourage them to try. Praise any attempt to feed or care for Teddy.
5	**Movement/ physical development domain**	May walk up steps and run	Can run and step up onto a step/object.	Let the children run a short distance towards the “stoep”. Encourage them to “Run to the “stoep”- can you step up?” Hold their hand if needed as they step up and down. Repeat and praise them.
6	**Feeding skills(Adapted from Arvedson,2006)**		Scoops food with a spoon and turns the spoon while placing it in the mouth.	Show them how to scoop and turn the spoon in their mouth. Let the child try. Turn..... turn... yum...” Praise effort and not just success.
7	**Feeding skills (Adapted from Arvedson,2006)**		Stop drinking from the bottle.	(no adaptations made)

Age 24 months				
Item	**Domain**	**Masters 2023 research adapted developmental milestone guide**	**Adapted milestone**	**Undergraduate 2025 research adapted milestone guide and activities to stimulate milestone**
1	**Language/ Communication Domain**	Points to things or pictures when they are names.	Points to household objects.	Picture Hunt and Match: Show a picture of a spoon to the children. This is a spoon. Can you find the spoon? Praise when executed correctly
2	**Language/ Communication Domain**	Knows names of familiar people and body parts.	Points to pictures when they are named (e.g., family photos/ newspaper pictures).	Place 3-4 pictures on the floor or table. “Can you find the apple?” Let the children pick/tap it. Celebrate “You found the apple” mix up cards and try again.

3	**Cognitive (learning, thinking, problem-solving) domain**	Completes sentences and rhymes in familiar books.	Completes words and sentences in familiar songs.	Start singing a well-known song (Twinkle Twinkle) slowly & clearly. Pause before a keyword or phrase. Look at the children expectantly. The children may say star. Provide pictures to help.
4	**Cognitive (learning, thinking, problem-solving) domain**	Begins to sort shapes and colours.	Begins to sort similar objects and objects of the same colour (e.g., clothes or socks).	Use a small set of objects/toys of different colours, 2-3 bowls. Model: Put red into the red bowl! Then let the children try. “Can you put the blue toys in the blue bowl?” Use cars and animals; cars go here, and animals go here. Use clear, simple language and gestures. “This is red. Can you find another red one?” Cheer & support and praise attempts.
5	**Cognitive (learning, thinking, problem-solving) domain**	Builds towers of 4 or more blocks.	Builds towers of 4 or more items (e.g., blocks, Tupperware, cups).	Start building a 2-block tower together “Can you make it taller?” Help the children add blocks to reach 4 or more. Cheer each time they add a block. Knock it down and start again. Use blocks with pictures/ numbers to add learning.

6	**Cognitive (learning, thinking, problem-solving) domain**	Follows two-step instructions such as “Pick up your shoes and put them in the closet”.	Follows two-step instructions such as “Pick up your shoes and put them by the bed.”	Little helper mission: Pretend you’re working in a home or school; you are my helpers today! Can you do 2 things for me? Pick up the book and give it to Teddy.
7	**Cognitive (learning, thinking, problem-solving) domain**	Names items in a picture book such as a cat, bird, or dog.	Name items on a picture (e.g., magazines, newspapers, food brochures) such as “banana,” “shoe,” or “dog.”	Show picture cards on the table. “Show me the cat” Let the children point to the picture. Say it together. Cheer for their effort!
8	**Movement/ physical development domain**	Kicks a ball	Kicks a ball.	Take a ball. “Kick the ball and run after it! Cheer as they kick and chase the ball. Join in for a fun game together. Repeat to build confidence and coordination.
9	**Movement/ physical development domain**	Walks up and down stairs holding on	Walks uphill/downhill, holding onto a hand, or up and down stairs, holding on.	Use a ramp (safe). “Let’s walk up the ramp like big climbers. “Now let’s walk down like a slow turtle! “Add a toy at the top or bottom as a goal. Celebrate with

				high fives!
10	**Movement/ physical development domain**	Throws ball overhand	Throws ball/object above head.	Stand behind the children or next to them and say. “Let's throw the ball to the sky. Let's throw the ball to the sky over your head! Model it “Watch me! I throw like this.” Hand them the ball and encourage. “Now you try! Throw it over your head like me! Wheee! Up it goes! Cheer any attempt.
11	**Movement/ physical development domain**	Makes or copies straight lines and circles	Makes or copies straight-lines and circles with crayons/ using a stick to draw in sand.	**Copies or traces straight lines and circles with crayons (or with sticks in sand).** Introduce the shapes: say “Let's make tracks for our cars” Model a straight line. This is a road! Vroom vroom! Let's drive on it. Can you make a road too? Model a circle. Draw a circle and say “Now let's make a roundabout or a loop. Look, it goes round and round. Can you make a round loop like this? Use a toy/finger to drive along the line or circle after drawing it to enforce the shape.
12	**Feeding skills (Adapted from Arvedson,2006)**		Hold a small cup in one hand with little spilling.	Give a small cup with a little water. “Hold it with one hand” Let the children sip/carry it. Praise the effort, “Nice and careful!”

13	**Feeding skills (Adapted from Arvedson,2006)**		Bites into food with different thicknesses, e.g. meat, potatoes, bread.	The game is going on a food safari. Let's try to bite like animals. Present one food at a time "This is a crunchy cucumber! Can you take a big bite like a giraffe? Now try a soft banana. Bite like a bunny!"

Age 36 months				
Item	**Domain**	**Masters 2023 research adapted developmental milestone guide**	**Undergraduate 2024 research adapted milestone guide**	**Undergraduate 2025 research adapted milestone guide and activities to stimulate milestone**
1	**Social-emotional domain**	Separates easily from mom and dad	Separates easily from caregiver	**Separates easily from parent or guardian**
2	**Social-emotional domain**	Dresses and undresses self	Can do things for themselves, such as	Play the "Dress up race" Give them a playful challenge: Can you take off your

			undressing.	shoes before the music stops? Let's see how fast you can take off your jacket. You did it all by yourself! You are big helpers!
3	**Language/ Communication Domain**	Understands words like “in”, “on”, and “under”.	Understands position words in their home language (e.g., the concept of “in,” “on,” and “under”).	Set up a simple obstacle path: Guide the children through it using position words in their home language: Crawl under the table, step over the pillow, go around the chair, sit next to the teddy. Encourage the children to repeat the words as they do each action.
4	**Language/ Communication Domain**	Says words like “I”, “on”, and “under”.	Uses words to describe the position in their home language (e.g., the concept of “in,” “on,” “under”).	Hide a toy in/on/under/behind different objects. Ask them “where is Teddy?” Prompt them to respond with a position word. Teddy is under the table. The car is on the chair.
5	**Cognitive (learning, thinking, problem-solving) domain**	Can work toys with buttons, levers, and moving parts.	Can work items such as toys with a switch, opening a lid, closing a tap.	**Can work or manipulate items such as toys with a switch, tap lid opening, and tap closing.** Set up a play area with these items and say, "Let's see what these toys can do!” Ask the children “can you open the lid?

				Can you turn on the tap? Can you flip the switch?" Model the actions.
6	**Cognitive (learning, thinking, problem-solving) domain**	Plays make-believe with dolls, animals, and people.	Plays pretend games with people/toys such as "teacher-teacher" and "mommy-child."	Game: Today, you will take turns to be the teacher! I'll be the student. Prompt gently: What will the teacher do? Can you tell me what to draw? Or read us a book!
7	**Cognitive (learning, thinking, problem-solving) domain**	Does puzzles with 3 or 4 pieces.	Does puzzle with 3- or 4- piece puzzles (e.g. puts together a picture cut into 3 or 4 pieces).	**Completes puzzle with 3- or 4-piece puzzles (e.g., puts together a picture cut into 3 or 4 pieces).**
8	**Cognitive (learning, thinking, problem-solving) domain**	Understands what 'two' means.	Understands what "two" means (e.g., a child takes two bananas when the caregiver says, "take two").	**Understands what "two" means (e.g., a child takes two bananas when the parent or guardian says, "take two").** Two of everything treasure hunt: let's find 2 of something. Guide the children to collect pairs of items and place them in a basket. "Can you find two spoons?" After each find, count them together. "1...2.. That's 2 spoons!" Mix different

				sets “Can you find 2 different things?”.
9	**Cognitive (learning, thinking, problem-solving) domain**	Turns books pages one at a time.	Turns pages of magazines, newspapers, or books.	Sit with the children and say, “We’re going to read a story together, and you get to turn the pages!”. After reading each page. Pause and cue them: “Can you turn the page now? Let's see what happens next”, praise the action.
10	**Cognitive (learning, thinking, problem-solving) domain**	Builds towers of more than 6 blocks.	Builds towers of over 6 items (e.g., blocks, Tupperware, cups).	Tall Tower challenge: Let's build the tallest tower ever! Can we make one with more than 6 blocks? Start building together, counting aloud as you stack. Keep stacking & cheering.
11	**Movement/ physical development domain**	Climbs well	Climbs well (onto furniture, jungle gym, or people).	Mountain Climber Adventure: The jungle gym is your mountain. Can you climb to the top of the mountain? Encourage step by step and praise.
12	**Movement/ physical development domain**	Walks up and down stairs, one foot on each step	Walks uphill/downhill, holding onto a hand, or up and down stairs, holding on.	Let’s help the animals get to the top of the mountain (stairs)! Give them a teddy and say: “Can you carry the teddy to the top of the stairs? Now bring the teddy down! Encourage both actions: Let's go up to the top! Time to come back down! Count steps aloud to add language and rhythm: one…two…three.
13	**Feeding skills (Adapted from**		Pours from a small cup.	Pour and serve cafe Game: You are the servers today! Can you pour water into

	Arvedson,2006)			the cups? Demonstrate first and invite them to try. Encourage, repeat and praise.
14	**Feeding skills (Adapted from Arvedson,2006)**		Feeding self with a fork.	You and the teddy are having a feast! Can you feed yourself with a fork like big children? Demonstrate the action for them. Encourage them to try. Poke the pasta, nice job! Now bring it to your mouth - yum! Offer encouragement and celebrate success.

List of professionals to contact when children do not meet the milestones in his/ her age range?

Item	**Adapted Milestone Domain**	**Who should they consult if the children do not meet the milestones in their age range?**

1	**Social-emotional domain**	Speech-Language therapist or an Occupational Therapist
2	**Language/ communication domain**	Speech-Language therapist/ Audiologist
3	**Cognitive (learning, thinking, problem-solving) domain**	Speech- Language therapist/ Occupational therapist
4	**Movement/ physical development domain**	Physical therapist/ Occupational therapist
5	**Feeding skills (Adapted from Arvedson, 2006)**	Speech- Language therapist

Appendix H: Undergraduate 2025 adapted developmental milestone guide

Item	Adapted Milestone	Age: 2 months	Activities for stimulation of milestones
1	**Language/ communication domain**	Coos with (aaa)/ throaty/gurgling sounds.	

Item	Adapted Milestone	Age: 3 months	Activities for stimulation of milestones
1	**Social - emotional domain**	Copies movements and facial expressions like smiling and frowning.	Face Time Fun:Sit face-to-face with children, not too close. Make slow exaggerated facial expressions: big frown, big smile, gentle frown, raise eyebrows, stick out tongue.
2	**Movement/ physical development domain**	Can hold head up and begin to push up when lying on the tummy/bed/floor/ parent or guardian's chest.	Tummy Time Look and Lift: Place children on their tummies on a soft, flat surface. If necessary place a rolled towel under their chest with arms forward to make lifting with arms easier. Get down to children's eye level and talk and smile or show high contrast toy or mirror just in front of them. Encourage the children to look

			up, reaching toward your face or toy. Praise any head lifting or arm pushing.
3	**Feeding skills* (Adapted from Arvedson,2006)**	Brings objects to mouth.	Hand-to-Mouth Play: Lay children on their backs on a soft blanket gently bring their hands together in front of their chest and say ”Look your hands! Can you bring them to your mouth” Encourage hand exploration by slowly guiding their hands to their mouth if needed. Praise any movement.
4	**Feeding skills* (Adapted from Arvedson,2006)**	Identifies nipple or bottle by looking.	You can show the bottle briefly to the children a few cm away during tummy or play time to help children visually track and recognise it outside of feeding time.

Item	**Adapted Milestone**	**Age: 4 months**	**Activities for stimulation of milestones**
1	**Language/ communication domain**	Begins to make repeated sounds such as “bababa.”	Sit face-to-face with the children holding them upright so that they can see your mouth. Say simple exaggerated sounds like “ba-ba-ba” and “da-da-da” slowly

			and with clear lip movement. Pause after each set of sounds. Giving the children time to respond. If they make the sounds repeat it. Smile/ Clap/ Encourage.
2	**Language/ communication domain**	Makes repeated sounds with expression and copies sounds he hears.	Hold the children close, face-to-face. Say a sound like “ma-ma-ma” or “goo-goo” matching it with facial expression - smile wide with big open eyes. Vary your tone (happy and sad) and volume (loud and soft) Pause and give the children time to respond. If they make any sound. Repeat their sounds back to them several times in different emotional tones.
3	**Movement/ physical development domain**	Tries to roll from tummy to back.	Place the children on their tummies. Hold a shoulder to one side. Let them turn toward it, helping slightly at the hip if needed. Cheer when they roll.
4	**Movement/ physical development domain**	Can hold a toy/object, shake it, and swing/swipe at dangling toys/objects	Place the children on their back under a play gym or hanging toys within

		such as keys.	reach. Give them a lightweight rattle to hold. Gently guide their hand to shake or swing it. Encourage swiping by moving dangling toys slightly to attract attention.
5	**Movement/ physical development domain**	When lying on tummy, push up to rest on elbows.	Place children on their tummies on a soft mat, sit in front of them. Sing a simple song “Twinkle-twinkle” while gently moving a soft toy side-to-side at eye-level. As the children watch, they will naturally lift their head and push up on elbows to follow the motion.

Item	**Adapted Milestone**	**Age: 6 months**	**Activities for stimulation of milestones**
1	**Language/ Communication Domain**	Strings vowels together (“ah”, “eh”, “oh”) and likes to copy and “talk” to the parent or guardian while making sounds.	Hold the children face-to-face. Say vowel sounds with clear expression. Pause and wait for the children to respond. When they make a sound mimic it, back to them with excitement. Continue taking turns like a fun back and forth chat.
2	**Feeding skills* (Adapted from**	Holds a bottle without any help needed.	Guide the children to the bottle during the

	Arvedson,2006)		feeding. Use a light, easy-to-hold bottle independently.
3	**Feeding skills* (Adapted from Arvedson,2006)**	Drinks from cup when held by someone.	
4	**Feeding skills* (Adapted from Arvedson,2006)**	Feeds self biscuits.	Provide biscuits while sitting in e.g. plastic chair, feeding chair, big cushions.

Item	**Adapted Milestone**	**Age: 9 months**	**Activities for stimulation of milestones**
1	**Social - emotional domain**	May be shy/nervous/afraid of strangers.	
2	**Social - emotional domain**	Prefers a familiar adult.	
3	**Social - emotional domain**	Has a favourite household item/ toy/ object.	
4	**Cognitive (learning, thinking, problem-solving) domain**	Picks up small items like rocks/ beans between thumb and index finger.	Place small items in a basket. Sit the children in front of it and let them pick items up. Show how to use thumb and forefinger. Supervise closely.
5	**Movement/ physical development domain**	Crawls on hands and knees.	Set up a tunnel/ low obstacle path. Place the toy at the end. Encourage the children to crawl through on hands and knees to reach it. Crawl alongside to model if needed.
6	**Feeding skills* (Adapted from**	Holds soft biscuits in mouth without biting.	Sit children upright. Offer a biscuit and

	Arvedson,2006)		gently place it near their lips. Encourage the children to explore holding it in their mouth without biting. Supervise closely the entire time.
7	**Feeding skills* (Adapted from Arvedson,2006)**	Bangs spoon on table.	Give the children a spoon while seated on the surface. Let the children explore sounds by banging, tapping and drumming.
8	**Feeding skills* (Adapted from Arvedson,2006)**	Copies stirring a spoon in a bowl/cup.	Show the children how to stir the spoon in the bowl. Hand them a spoon and encourage copying. Use sound or texture (dry rice) to keep it engaging.

Item	**Adapted Milestone**	**Age: 12 months**	**Activities for stimulation of milestones**
1	**Social - emotional domain**	Is shy/nervous/afraid of strangers.	
2	**Social - emotional domain**	Cries when the parent or guardian leaves.	
3	**Social - emotional domain**	Shows parent or guardian they want to play with the adult/needs help (e.g. gives objects they need help with).	Give the toy to the children but make it slightly more challenging to use. Wait for the children to look up at you, gesture or vocalise for help. Respond warmly and help saying things like: “Oh, you need help” or “You want me to

			play with you?" Encourage simple gestures like handing you the toy, pointing or reaching.
4	**Social - emotional domain**	Plays games such as hiding and showing face from behind towel / joins in on songs with actions.	Start with Peekaboo. Hide your face behind a towel/your hands, then pop out and say "Peekaboo!" Encourage the children to try hiding too. Help them hold the towel and pull it down. Follow with a simple encouragement: clapping/waving.
5	**Cognitive (learning, thinking, problem-solving) domain**	Looks at the correct picture (e.g. food brochure or book) when it is named.	For example name an apple, then show a real apple then show a picture of the apple and ask "Where is the apple?"
6	**Feeding skills* (Adapted from Arvedson,2006)**	Bites through soft biscuit.	Sit children upright. Offer them a biscuit, holding it gently if needed at first. Encourage and say "Mmm, Bite". Wait and praise when they bite through.
7	**Feeding skills* (Adapted from Arvedson,2006)**	Hold a cup with some spilling when drinking.	Sit children upright. Fill the cup with a little water. Help guide the children's hands to hold onto the cup with both hands. Say "Take a sip" and gently tip the cup if needed. Supervise closely.

8	**Feeding skills* (Adapted from Arvedson,2006)**	Drinks from a straw.	Show the children how to sip from a straw. Let them try drinking with a small amount of water. Help a bit if needed by squeezing into mouth (Use a sipping cup).

Item	**Adapted Milestone**	**Age: 18 months**	**Activities for stimulation of milestones**
1	**Social - emotional domain**	Tantrums may start e.g. throwing themself on the floor. Cries when something they wants is taken away, shakes their head to indicate that anger may start.	
2	**Social - emotional domain**	Children may be shy/nervous/afraid of strangers.	
3	**Social - emotional domain**	May cling/stay close to parent or guardian in new situations.	
4	**Cognitive (learning, thinking, problem-solving) domain**	Shows interest in teddy bears/soft toys/dolls by pretending to feed.	Sit with the children and Teddy. Pretend to feed Teddy: "Teddy is hungry! Let's feed him." Hand the children a spoon and encourage them to try. Praise any attempt to feed or

			care for Teddy.
5	**Movement/ physical development domain**	Can run and step up onto a step/object.	Let the children run a short distance towards the “stoep”. Encourage them to “Run to the “stoep”- can you step up?” Hold their hand if needed as they step up and down. Repeat and praise them.
6	**Feeding skills* (Adapted from Arvedson,2006)**	Scoops food with a spoon and turns the spoon while placing it in the mouth.	Show them how to scoop and turn the spoon in their mouth. Let the child try. “Scoop.. Turn.. yum..” Praise effort and not just success.
7	**Feeding skills* (Adapted from Arvedson,2006)**	Stops drinking from the bottle.	

Item	**Adapted Milestone**	**Age: 24 months**	**Activities for stimulation of milestones**
1	**Language/ Communication Domain**	Points to household objects.	Picture Hunt and Match: show a picture of a spoon to the children. “This is a spoon. Can you find the spoon?” Praise when executed correctly.
2	**Language/ Communication Domain**	Points to pictures when they are named (e.g., family photos/newspaper pictures).	Place 3-4 pictures on the floor or table. “Can you find the apple?” Let the children pick/tap it.

			Celebrate “You found the apple” Mix up cards and try again.
3	**Cognitive (learning, thinking, problem-solving) domain**	Completes words and sentences in familiar songs.	Start singing a well-known song (Twinkle Twinkle) slowly and clearly. Pause before a keyword or phrase. Look at the children expectantly. The children may say “star”. Provide pictures to help.
4	**Cognitive (learning, thinking, problem-solving) domain**	Begins to sort similar objects and objects of the same colour (e.g., clothes or socks).	Use a small set of objects/toys of different colours 2-3 bowls to use. Model: “Put red into the red bowl!” Then let the children try. “Can you put the blue toys in the blue bowl?” Use cars and animals; cars go here and animals here. Use clear simple language and gestures. “This is red, can you find another red one?” Support and praise attempts.
5	**Cognitive (learning, thinking, problem-solving) domain**	Builds towers of 4 or more items (e.g., blocks, tupperware, cups).	Start building a 2 block tower together “Can you make it taller?” Help the children add blocks to reach 4 or more. Cheer each time they add a block. Knock it down and start again. Use blocks with pictures/ numbers to add learning.

6	**Cognitive (learning, thinking, problem-solving) domain**	Follows two-step instructions such as "Pick up your shoes and put them by the bed."	Little helper mission: pretend you're working in a home or school, you are my helper today! Can you do 2 things for me? Pick up the book and give it to Teddy.
7	**Cognitive (learning, thinking, problem-solving) domain**	Names items on a picture (e.g., magazines, newspapers, food brochures) such as "banana," "shoe," or "dog".	Show picture cards on the table. "Show me the cat" Let the children point to the picture. Say it together. Cheer for their effort!
8	**Movement/ physical development domain**	Kicks a ball.	Take a ball."Kick the ball and run after it! Cheer as they kick and chase the ball. Join in for a fun game together. Repeat to build confidence and coordination.
9	**Movement/ physical development domain**	Walks uphill/downhill holding onto a hand or up and down stairs holding on.	Use a ramp (safe). "Let's walk up the ramp like a big climber. "Now let's walk down like a slow turtle! "Add a toy at the top or bottom as a goal. Celebrate with high fives!
10	**Movement/ physical development domain**	Throws ball/object above head.	Stand behind the children or besides them and say. "Lets throw the ball to the sky-over your head! Model it "Watch me! I throw like this." Hand them the ball

			and encourage them. “Now you try! Throw it over your head like me! Wheee! Up it goes! Cheer any attempt.
11	**Movement/ physical development domain**	Copies or traces straight lines and circles with crayons (or with sticks in sand).	Introduce the shapes: say “Lets make tracks for our car” Model a straight line. This is a road, vroom vroom! Let's drive on it. Can you make a road too? Model a circle. Draw a circle and say “Now lets make a round about or a loop. Look, it goes round and round. Can you make a round loop like this? Use a toy/finger to drive along the line or circle after they draw it to enforce the shape.
12	**Feeding skills* (Adapted from Arvedson,2006)**	Hold a small cup in one hand with little spilling.	Give a small cup with little water. “Hold it with one hand” Let the children sip/carry it. Praise the effort “Nice and careful!”
13	**Feeding skills* (Adapted from Arvedson,2006)**	Bites into food with different thicknesses, e.g. meat, potatoes, bread.	Game going on a food safari. Let’s try to bite like animals. Present one food at a time “This is a crunchy cucumber! Can you take a big bite like a giraffe? Now try a soft banana. Bite like a bunny!”

Item	Adapted Milestone	Age: 36 months	Activities for stimulation of milestones
1	**Social - emotional domain**	Separates easily from parent or guardian**.**	
2	**Social - emotional domain**	Can do things for themselves such as undressing.	Play the “Dress up race” Give them a playful challenge: Can you take off your shoes before the music stops? Lets see how fast you can take off your jacket? You did it all by yourself! You are big helpers!
3	**Language/ Communication Domain**	Understands position words in their home language (e.g., the concept of “in,” “on,” and “under”).	Set up a simple obstacle path: Guide the children through it using position words in their home language: Crawl under the table, step over the pillow, go around the chair, sit next to the teddy. Encourage the children to repeat the words as they do each action.
4	**Language/ Communication Domain**	Uses words to describe the position in their home language (e.g., the concept of “in,” “on,” “under”).	Hide a toy in/on/under/behind different objects. Ask them “Where is Teddy?” Prompt them to respond with a position word. Teddy is under the table. The car is on the chair.

5	**Cognitive (learning, thinking, problem-solving) domain**	Can work or manipulate items such as toys with a switch, opening a lid, and closing a tap.	Set up a play area with these items and say: “Let's see what these toys can do!” Can you open the lid? Can you turn on the tap? Can you flip the switch? Model the actions.
6	**Cognitive (learning, thinking, problem-solving) domain**	Plays pretend games with people/toys such as “teacher-teacher” and “mommy-child”.	Game: Today you will take turns to be the teacher! I’ll be the student. Prompt gently: What will the teacher do? Can you tell me what to draw?
7	**Cognitive (learning, thinking, problem-solving) domain**	Completes puzzle with 3- or 4-piece puzzles (e.g., puts together a picture cut into 3 or 4 pieces).	
8	**Cognitive (learning, thinking, problem-solving) domain**	Understands what “two” means (e.g. Child takes two bananas when parent or guardian says “take two”).	Two of everything treasure hunt: let’s find 2 of something. Guide the children to collect pairs of items and place them in a basket. “Can you find two spoons?” After each find, count them together. “1..2.. That’s 2 spoons!” Mix different sets “Can you find 2 different things?”.
9	**Cognitive (learning, thinking, problem-solving) domain**	Turn pages of magazines, newspapers, or books.	Sit with the children and say “We’re going to read a story together and you get to turn the pages!

			After reading each page. Pause and cue them: Can you turn the page now? Let's see what happens next. Praise the action.
10	**Cognitive (learning, thinking, problem-solving) domain**	Builds towers of over 6 items (e.g., blocks, Tupperware, cups).	Tall Tower challenge: Lets build the tallest tower ever! Can we make one with more than 6 blocks? Start building together, counting aloud as you stack. Keep stacking and cheering.
11	**Movement/ physical development domain**	Climbs well (onto furniture, jungle gym, or people).	Mountain Climber Adventure: The jungle gym is your mountain. Can you climb to the top of the mountain? Encourage step by step and praise.
12	**Movement/ physical development domain**	Walks uphill/downhill holding onto a hand or up and down stairs holding on.	Lets help the animals get to the top of the mountain (stairs)! Give them a teddy and say: “Can you carry the teddy to the top of the stairs? Now bring the teddy down! Encourage both actions: Let's go up to the top! Time to come back down! Count steps aloud to add language and rhythm one…two…three.
13	**Feeding skills* (Adapted from**	Pours from a small cup.	Pour and serve cafe Game: You are the

	Arvedson,2006)		servers today! Can you pour water into the cups? Demonstrate first and invite them to try. Encourage, repeat and praise.
14	**Feeding skills* (Adapted from Arvedson,2006)**	Feeding self with a fork.	You and Teddy are having a feast! Can you feed yourself with a fork like big children? Demonstrate the action for them. Encourage them to try. Poke the pasta, nice job! Now bring it to your mouth - yum! Offer encouragement and celebrate success.

Item	**Adapted Milestone Domain**	**Who to consult if your child does not meet the milestones in his/ her age range.**
1	**Social-emotional domain**	Speech- Language therapist or an Occupational Therapist
2	**Language/ communication domain**	Speech- Language therapist/ Audiologist
3	**Cognitive (learning, thinking, problem-solving) domain**	Speech- Language therapist/ Occupational therapist
4	**Movement/ physical development domain**	Physical therapist/ Occupational therapist
5	**Feeding skills* (Adapted from Arvedson,2006)**	Speech- Language therapist

Appendix I: Turnitin report

2025 KMP 481 [Jacobsen; Muswede; Ncube].docx

ORIGINALITY REPORT

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