

Numeracy? It's play!

Learning Numeracy through Play in Pre-primary



Training Module for Teachers and Headteachers

2023

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Published by:

© 2022 VVOB – *education for development*
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With the support of the LEGO Foundation

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Foreword

The Rwandan Government considers education as a cornerstone pillar to achieving the country's envisioned socio-economic transformation for Rwanda citizens. Pre-primary education plays a pivotal role in the holistic development of young children. The Competence Based Curriculum (CBC) for Pre-primary, developed by Rwanda Basic Education Board (REB), helps teachers to stimulate all development domains. A key pedagogical approach in this is learning through play.


From birth, children naturally learn through play. They explore the world and interact with materials, with problems, with people, with the world around them. Through play young children gain essential knowledge and skills. Children learn through play. Play is learning.


At home, parents and communities can support the development of their children by engaging in playful interactions and games with their children. At school, education should follow children in what they do best: playing. The school should build on and stimulate the learner's curiosity and by doing so build lifelong learning.

Teachers are the most important players in improving education quality. This training module is primarily designed for pre-primary teachers. It helps teachers to better understand learning through play and how it can be applied in emergent numeracy. As in other learning areas, also numeracy takes an integrated and thematic approach. Based on this deeper understanding the module provides concrete handles, via many examples and sample lesson plans, to create playful learning activities, environments and interactions in the classroom. This module complements the CBC and supportive guidelines developed by REB and helps teachers to take the first steps in learning through play in order to help children develop to their full potential.

Additionally, this module helps school leaders to create an enabling environment for pre-primary teachers while they learn and implement learning through play approaches. It guides school leaders and teachers in their interactions with parents on learning through play.

We hope schools and teachers will find this guide helpful to set up playful and age-appropriate learning environment, activities, interactions and materials, helping all children to develop to their full potential.


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Acknowledgements

This Training Module for Teachers and Headteachers on playful numeracy in pre-primary is the result of the collaboration of different institutions and individuals who dedicated their time and expertise.

We extend a special word of gratitude to the Ministry of Education in Rwanda (MINEDUC), Rwanda Basic Education Board (REB), Teacher Training College de la Salle and Teacher Training College Muhanga for their contributions and continued support to education in Rwanda in general and to this “Numeracy? It’s Play!”, a Continuous Professional Development Module on Learning through Play in pre-primary numeracy for teachers and headteachers in particular.

VVOB acknowledges the instrumental contributions given during consultation meetings by development partners and members of the ECE RENCP and ECE Technical Working Groups. This module was produced as part of the IT’S PLAY project with the support of the LEGO Foundation.



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General introduction

1. Why this training module?

Teachers and headteachers play a pivotal role in the holistic development and learning outcomes of children. To ensure quality education the Rwanda Basic Education Board (REB) developed the Competence-Based Curriculum (CBC) for pre-primary education, as well as accompanying teaching and learning resources including teacher's handbook, teacher's guides, guidelines on the development of teaching and learning, assessment etc.

The CBC suggests play as a key pedagogical approach to achieve both the basic and generic competences. Play is one of the most important ways in which young children gain essential knowledge and skills. Children learn through play. Play is learning. Through play children develop holistically, not only academic learning outcomes such as emergent numeracy, but also generic skills such as problem solving, cooperation and communication, ...

It is clear that education should follow children in what they do best: playing. But how to go about this? How to create playful learning experiences, how to create an environment which children can explore and engage with and while doing so, acquire the competences as listed in the CBC?

This module helps teachers to better understand learning through play and how it can be applied in emergent numeracy. This module complements the CBC and supportive guidelines developed by REB. This module helps teachers to take the first steps in learning through play in order to help children develop to their full potential.

2. Who is this module for?

This module primarily targets **pre-primary teachers**. It deepens their understanding of learning through play in emergent numeracy. Based on this deeper understanding it provides concrete handles to create playful learning environments and interactions in the classroom. By doing so it complements guidance by the CBC and other guidelines developed by REB.

While having a numeracy focus, the module is useful to all learning areas through its focus on learning through play. It strengthens the way how teachers set up their learning environment, activities, interactions and materials, helping all children to develop to their full potential.

The module can also be used by **school leaders and education officers** to organise school-based or sector/district based Continuous Professional Development (CPD). The last chapter specifically focuses on how headteachers can encourage learning through play in their schools.

3. What is the content of the module?

The module starts with a general introduction and has three main parts.

The first part (chapter 1, 2, 3) expands on learning through play in general.

Chapter 1 deepens teacher's understanding what is learning through play, why it is important and how it develops the whole child. It introduces the reader to key terminology and concepts on the topic.

Chapter 2 helps teachers to start organising learning through play and reflect on the role the teacher takes. This chapter, answers the following questions: How to establish a playful learning environment and use corners? How to make sure that all children benefit from play activities? How to make play gender responsive?

Chapter 3 focuses on teaching and learning materials for play. It inspires teachers to make and use materials by using locally available and low-cost materials.

In the second part (chapter 4) we zoom in on emergent or early numeracy. It introduces the reader to key terminology and concepts on the topic. It helps teachers to see how number sense, geometry skills and measuring skills can be developed through play. It inspires by examples, materials and sample lessons (as in Annex 4). Clear reference is made to the key competences per grade as mentioned in the CBC. The chapter ends by looking at how emergent numeracy can be assessed.

The last part (chapter 5, 6, 7) shows teachers how to continue their learning and professional development and school leaders to create an enabling environment for learning through play through working with parents and teachers.

Chapter 5 helps teachers with their further learning. How can they continue their practices via reflection and peer learning? The class observation tool in Annex 5 can assist in self-assessment.

Chapter 6 gives suggestions on how schools and teachers can engage with parents to get their buy in and support, both in the classroom and at home by inspiring them with playful interactions and games they can do with their child.

Chapter 7 helps school leaders, sector and district officials to support the learning of teachers and the implementation of changed practices in the classroom. It focuses on creating an enabling environment for change and on encouraging collaborative learning among teachers. It also guides school leaders in supporting and coaching teachers.

4. How to use this module?

This module helps the user -both teachers, school leaders and officers- to develop different attitudes, knowledge and skills towards learning through play and emergent numeracy. It complements and builds on the CBC, teacher's guide and other REB guidelines for pre-primary education.

While sharing basic **knowledge** on learning through play and emergent numeracy, the user is requested to reflect on own practices. As a next step, the module shares good **practices** and hints and tips, and inspiration. The module guides the user to **reflect** on the current practices and formulate clear actions for improvement and application in classes and schools. In each chapter reference is made to other relevant materials, such as existing REB guides.

The module can also be used for **school-based Continuous Professional Development** and sector or district CPD. The clearly listed "Activities", inside this module, and "facilitation plans", as a separate document for trainers, provide facilitators with clear facilitation suggestions to allow teachers to build their competences via a playful and collaborative approach which encourages active engagement. The facilitation of the training on the contents of this module takes a learning through play approach.

Chapter 7 specifically helps school leaders (School Based Mentors, deputy headteachers and headteachers) and education officials to create an **enabling environment** and **support** teachers while they are changing their practices.

Chapter 1: What is learning through play?

In this chapter you will learn:

- what is learning through play
- why learning through play is the right approach for young children
- what are the characteristics of learning through play
- to use the characteristics of play to reflect on your classroom practice
- how children develop holistically through play
- about the spectrum of play.

1.1. Why learning through play?

Activity 1:

Do you know how children develop? What can children of 6 months old do? What can a 3 year old do?

Make the child development puzzle. See Annex 1.

Play is one of the most important ways in which young children gain essential knowledge and skills. Children learn through play. Play is learning. Education should follow children in what they do best: playing.

Play and development are interrelated in the early years. Piaget said: “Young children learn through discovery, through action and active exploration, through interaction with materials.” This means that children naturally learn by touching, by manipulating materials, by doing, by interacting with their environment.

In play children are actively involved and learning becomes easier and more effective. It empowers them, it makes them creative, they become lifelong learners.

Activity 2:

Observe a young child (3-6 year old) while it is playing.

- What is the child playing? What is it doing? What is happening in the child’s mind? What is it thinking?
- Is the child learning?
- What is the child learning?
- Do you see differences between very young children and older children?

At different ages, children play in different ways.

- Babies take objects and smell, feel, listen, look, touch them (sensorimotor play).
- Older babies organise the toys and objects, e.g., put all bottle caps in a row, but they don’t understand yet the purpose of the objects (organising play).

- The young child understands the purpose of the objects and uses them accordingly, e.g., they try to screw the cap on the bottle (functional play).
- Later children engage in pretend play. They pretend they are stirring the soup with a stick or the stick becomes a hoe. They pretend a doll is a baby and talk to it. They pretend they are a farmer or teacher.

At first the child plays alone. Later the child starts watching other children play (and often imitate what others are doing) and playing alongside other children. By the time children go to pre-primary they can engage in social play. They can play with others and they start learning to share ideas with each other.

Children change as they get older. By engaging with materials, people and environments through play, children learn. They develop their social, cognitive, physical, language and emotional skills.

In pre-primary we need to follow the lead of the children: they learn via exploring and playing. So, **education needs to be delivered in such way that children can continue learning via what they do best, playing.** This is what we call learning through play.

1.2. When does play become learning?

The LEGO Foundation (2017) has defined five characteristics for learning through play. This is based on evidence from the science of learning. Researchers looked at how children learn best. Learning through play works best if it meets the conditions below:



Figure 1 Characteristics of learning through play

Play is **meaningful**: Meaningful implies that learners can find meaning in their learning by connecting it to something they already know. By doing so, they can express and expand their understanding.

Play is **joyful**: Joy is at the heart of play. Although play can sometimes be frustrating (oh no, my tower fell down!), but the overall feeling is one of enjoyment, motivation, thrill, and pleasure.

Play is **actively engaging**: When you watch children playing, you will see that they are deeply involved. Learners are immersed in what they are doing, hands-on and minds-on. They stay focussed and don't get easily distracted.

Play is **iterative**: Children play to practice skills, try out possibilities, revise hypotheses and discover new challenges, leading to deeper learning. Children can make mistakes, and try again till they get expected results.

Play is **socially interactive**: Play allows children to communicate ideas, to understand others through social interaction, paving the way to build deeper understanding and more powerful relationships.

The 5 characteristics will not always be present to the same extent in learning through play activities. But all children should experience moments of joy, meaningful connection, be active and absorbed, iterate and interact with others.

Activity 3:

Observe a very young child playing.

- Can you see characteristics of play? Which ones?
- Explain why you think this characteristic is present.

Child agency:

Child agency is a key term in play. In play children take ownership of what they do and how they do it. They make decisions. When children have the opportunity to decide the design and implementation of their play activities, they will be more actively involved and enjoy it more. It is good to stimulate child agency and autonomy.

How can you achieve child agency?

- Make sure children can share what they think and feel.
- Listen to children.
- Use the ideas of children.
- Explain when certain ideas cannot be used.

Activity 4:

Let's reflect on classroom practices. Are the characteristics of play present?

- Think back of an activity you did yesterday with your pre-primary learners.
- Assess each characteristic: was it present, could it improve, ...
- You can use the checklist on the next page to assist your reflection.
- What can you learn from this? What would you want to change?

Characteristics of Learning through play		1	2	3
1: yes, this can be observed– 2: it can be observed a bit, but could improve – 3: not observed		Yes	Yes, but	No
1. Learning is joyful	1.1. The children experience pleasure, motivation, surprise, thrill, etc... (Evidence of joy, smiling, laughter, being silly, celebrating, dancing, ...) during numeracy activities.			
	1.2. The teacher integrates moments of fun and pride in the activity.			
	1.3. The children show a relaxed, open, friendly, positive behaviour.			
	1.4. Children experience joy through success after overcoming challenges themselves.			
2. Learning is actively engaging	2.1. The learning activities attract learner’s interest; children are curious to see what happens.			
	2.2. The children are involved with and absorbed by what they are doing, and they can persist despite distractions. Children are thinking along, they are focused on the activity (not staring out of the window).			
	2.3. The learning activities hold learner’s interest; children are concentrated for a long time and not easily disturbed.			
	2.4. The teacher uses activities with different levels of challenge for children.			
	2.5. The teacher motivates children to engage at the beginning and during tasks and activities.			
3. Learning is iterative	3.1. The children repeatedly try out new possibilities, revise hypotheses and explore other ways to do things. Student(s) started the task again or adjusted when they thought of a better idea/approach.			
	3.2. The teacher motivates children to experiment and try out by themselves.			
	3.3. The teacher responds positively to making mistakes.			
4. Learning is socially interactive	4.1. The children share ideas, have interactions, collaborate and communicate. Children work in pairs or groups; children develop and share ideas with other classmates.			
	4.2. The teacher allows and encourages children to speak out during interaction moments and activities, and responds positively to ideas expressed by the children.			
	4.3. The teacher allows and encourages children to interact with each other.			
5. Learning is meaningful	5.1. The teacher harvests and uses the interests, ideas and initiatives of the children to expand the theme or activities.			
	5.2. Children are given the opportunity to interact with concrete, real life materials. They can manipulate and transform materials.			
	5.3. The teacher responds to observed needs and interests of children with meaningful impulses (e.g., child is playing with blocks, building a tower, and teacher asks “Which tower is highest? What will happen when we add this big block on top?”).			
	5.4. The learning activities relate to something that is already known by the individual children. The teacher starts from what individual children can already do and challenges them to take the next learning step.			
	5.5. Learning activities (such as numeracy) are integrated in meaningful activities such as corner play and free play, are linked to the theme of the week/month and the context of the child.			

1.3. Developing the whole child

The Rwandan curriculum for pre-primary schools is a competence-based curriculum. It wants to cater for the child's holistic development, that is, physical, cognitive, social, emotional, language, moral and spiritual development, especially aimed to prepare a child to be ready for primary education.

Young children learn in a holistic and interconnected way. Play enhances development in all developmental domains as shown in the figure below.

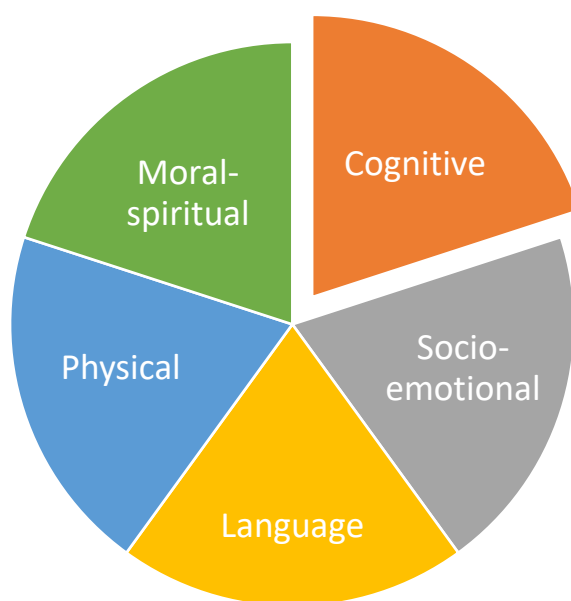


Figure 2 Development domains: Holistic development means that the child develops in all the development domains.

Cognitive development

By having great **cognitive** skills, we are able to learn how to solve complex tasks in our life – no matter if they are related to situations at school, work, or in our private life.

Examples of cognitive skills are: Concentration, problem solving, working memory and flexible thinking. Learning to tackle complex tasks and building effective strategies to identify solutions.

Children learn this through play, for example via discovering, pretending and role play, by making puzzles, playing board games, matching games, shop corner, science experiments,

An important part of cognitive development is **Creative development**

By having strong creative skills, we can come up with new solutions to problems that the world of tomorrow will face. Creative skills support our openness to new experiences and help us transform ideas in meaningful ways.

Examples of creative skills are: Coming up with ideas, expressing them and transforming them into reality, being ok with ambiguity, exploring possibilities, evaluating ideas, identifying the best solution.

Children learn this through play, for example via storytelling and discussing, pretend play, role play, singing and dancing, art and craft, free play, "what if" questions, ...

Physical development

By having strong physical skills, we exercise our minds and bodies to maintain wellbeing towards a successful life.

Examples of physical skills are: Being physically active, understanding movement and space through practicing sensory-motor skills, developing spatial understanding and nurturing an active and healthy body.

Children learn this through play, for example via running, climbing, dancing, using tools for eating, cutting, drawing, dressing, constructing, weaving, ...

Socio-emotional development

By having great **social** skills, we are empowered to be strong collaborators and communicators. Social skills also allow us to have healthy relationships with family and friends.

Examples of social skills are: Collaboration, communication and perspective-taking. Sharing ideas, negotiating rules and building empathy.

Children learn this through play, for example via group work, playing in groups with rules, sharing materials, building a tower together, dancing, morning routines, story telling and interaction, ...

By having strong **emotional** skills, we are better able to tackle challenges in everyday life and relate in important ways to our family and friends.

Examples of emotional skills are: Understand, manage and express emotions by building self-awareness and handling impulses. Staying motivated and confident in the face of difficulties.

Children learn this through play, for example via storytelling, morning routines, pretend play, by discussing and having arguments, via taking the lead and having autonomy, ...

Language development

By having strong language skills, we become great communicators and we can express ourselves. These assist our cognitive and socio-emotional development.

Examples of language skills are: Understand spoken messages and being able to respond to them, having adequate language to express yourself, tell a story. Describe a problem in words.

Children learn this through play, for example via story telling and reading books, via interaction and games with other children, via teachers asking about and describing thinking steps, via pretend play and role play, via rhymes and songs, ...

Activity 5:

Observe a very young child playing.

- What development domains can you observe?
- Explain why you think this development domain is present.

1.4. Learning through play: a spectrum

Activity 6:

Close your eyes and travel back in time. Think of the time you were a child.

- What did you play when you were in school?
- What did you play in your free time?
- How did you play?

There are different ways of applying learning through play. Some teachers might like to do games, other teachers give children time for free play, some others use direct instruction. All of these have value for learning. The differences lie in how much choice there is for the child or how much structure the teacher gives.

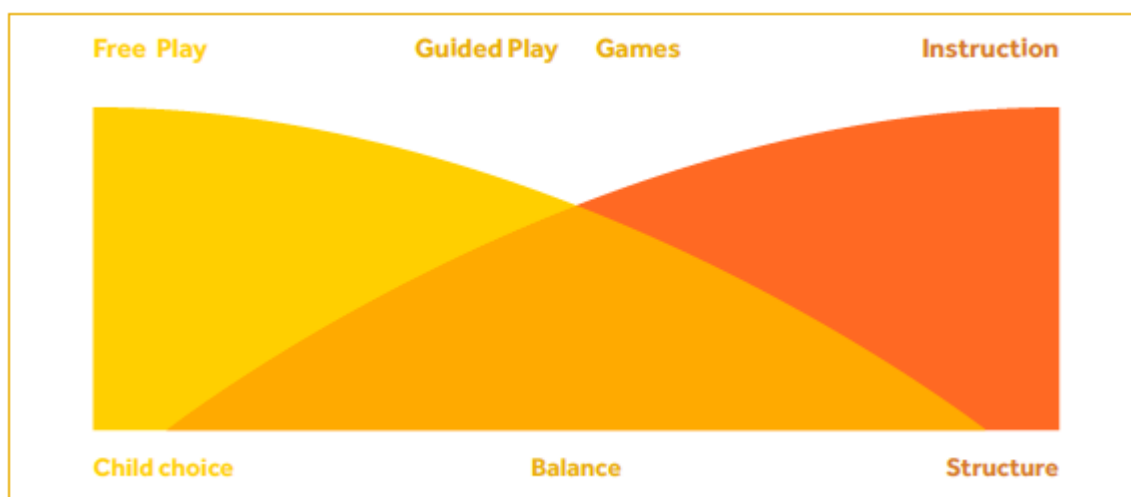


Figure 3 Spectrum of play, depending on how much structure the teacher gives or how much child choice there is (Jensen e.a. 2019).

Learning through **Free play** is almost entirely designed, directed, and controlled by children with little to no teacher involvement. With free play, children can freely find out, play, and discover with minimal intervention/limitation. For example, children playing during break time. This type of play can foster child agency best. [Example: See Picture 1.](#)



Picture 1 Free play: the child has decided where to play, how to play and what to play.

Learning through **Guided play** is still child-led, with adults scaffolding. Scaffolding means that teachers guide and support their learners to make progress and take control of their own learning. Teachers can do this by setting up a playful environment and participating in play, by questioning, by guiding with examples, etc. With guided play, teachers can provide more targeted learning experiences. **Example:** the Free play in picture 1 can become guided play if the teacher asks: “can you fill the cup half with sand?” or “I wonder how many small cups of sand fit in the big cup?” There is a balance between choice by children and structure by teacher.

Learning through **Games** are activities designed by adults who set rules and constraints for play, but children still find it fun and joyful. Examples of educational games are tangrams, logic puzzles, sudoku, crossword puzzles, Uno, chess, card games, coding games (e.g., in Scratch), and educational apps (e.g., Kahoot). **Example:** see picture 2. There is a balance between choice by children and structure by teacher.



Picture 2 Game: The child is wearing a hat with a picture inserted. The child doesn't know what is on the picture. The other children describe what is on the picture without saying the target word "apple". The child wearing the hat has to guess the word.

Learning through **(Playful) Direct instruction** are activities designed by the teacher with a certain structure. The teacher sets the learning goal and provides framing and explicit, direct, and clear instruction to children to follow. The children mainly follow the direct instruction and management without much room for their own ideas, choice and opinions. Direct instruction can be playful. [Example: see picture 3.](#)

What is the difference between free play and guided play?

Imagine a group of children building a house while they are learning about "My house".

In **free play**, children use the available materials such as leaves, fabric, paper, sticks, stones, wooden blocks, etc. to make a house however they want. As a teacher, you just observe.

In **guided play**, as a teacher, you work with the children. For instance, you can ask open-ended questions at key moments (e.g., "What do you think would happen if you tried putting that one on top?" or "Why did you pick that material?"), or you can provide different materials to let the children compare which one will be stronger and more stable.



Picture 3 Playful direct instruction. This activity, writing with water in sand, is playful, but it is initiated and directed by teachers. The teacher instructs the children. There is not a lot of room for child's choice or opinions.

Activity 7:

Play in your classroom

- What types of play are present in your classroom?
- Who initiates and who directs the play?
- When you think of the spectrum of play, where do you situate yourself mainly?
- Can you remember good examples of games and guided play that worked well in your class and led to learning?

All types of play are important and have their purpose, however a situation analysis in Rwandan pre-primary schools (conducted in 2021) shows that direct instruction is the main form of teaching. Teachers also use games, songs and dances, for fun and for energising children. Learning through play does not mean games and songs alone. It means a wide variety of learning activities that meet the 5 characteristics of learning through play.

Further learning about this chapter

There are other materials that can help you to learn more about this topic.

- Have you already worked with the Twigire Mumikino Rwanda (VSO) Schools App? The following modules are relevant to this chapter: Module 1: What is play?; Module 2: Importance of learning through play; Module 4: Play in the CBC.

Chapter 2: How to organise learning through play?

In this chapter you will learn:

- to reflect on your current classroom learning environment
- to create a playful learning environment in your classroom
- to design playful corner activities
- to reflect on your current role as a teacher
- what is the role of the teacher in learning through play
- to enrich the role you take as a teacher
- to include all children at the right level in learn through play
- how gender stereotypes limit the development opportunities of young children
- to create a gender responsive classroom
- to improve your practices via try out and reflection on your try out (=iteration)

2.1. Getting started

The easiest way to get started with learning through play, is to create activities that cover all or most of the **5 characteristics of play**. Besides the 5 characteristics of play, there are **3 principles** that can help us to get started:

1. **Always connect and integrate different learning goals** into activities; make sure all activities have learning goals from the Competence Based Curriculum. In Chapter 3 we will learn how to set up playful activities stimulating the development of emergent numeracy.
2. **Stimulate children's agency**: When children are autonomous, they feel that they are in control of their own learning and are more responsible for their learning, with the support of the teacher. This will encourage learners to find new ways to explore the world around them and to come up with new, creative solutions to solve real problems.
 - The teacher believes in learners to be capable and competent to conduct learning activities. They allow them to discover topics themselves and together, rather than instructing things and telling them what to do.
 - The teacher listens to children and asks their opinions and ideas. Children express themselves. This means that the teacher asks open ended questions, listens actively to responses of children. The teacher uses the answers of children to expand the learning. The teacher helps children to reflect on what they do.

An example:

In the construction corner. Children have built a very high tower. The teacher indicates she will put a very heavy big box on top. Laurence and Keza shout: "no, teacher!". The teacher looks at them and asks: "Should I not put this box on top?". Keza says: "No!". Teacher asks: "Why not?" Laurence says: "It will fall!" Teacher says: "You are afraid the tower will fall? Wow, you are such good engineers. If we put the big box on top the tower, it will fall. So how could we make the tower higher? I am sure you will find a way. Call me when you have found a solution." The teacher leaves the children alone to brainstorm and try, learn and try again.

3. A safe, open and active **classroom environment** with effective classroom management. Read more about this in the next paragraphs.

Activity 1:

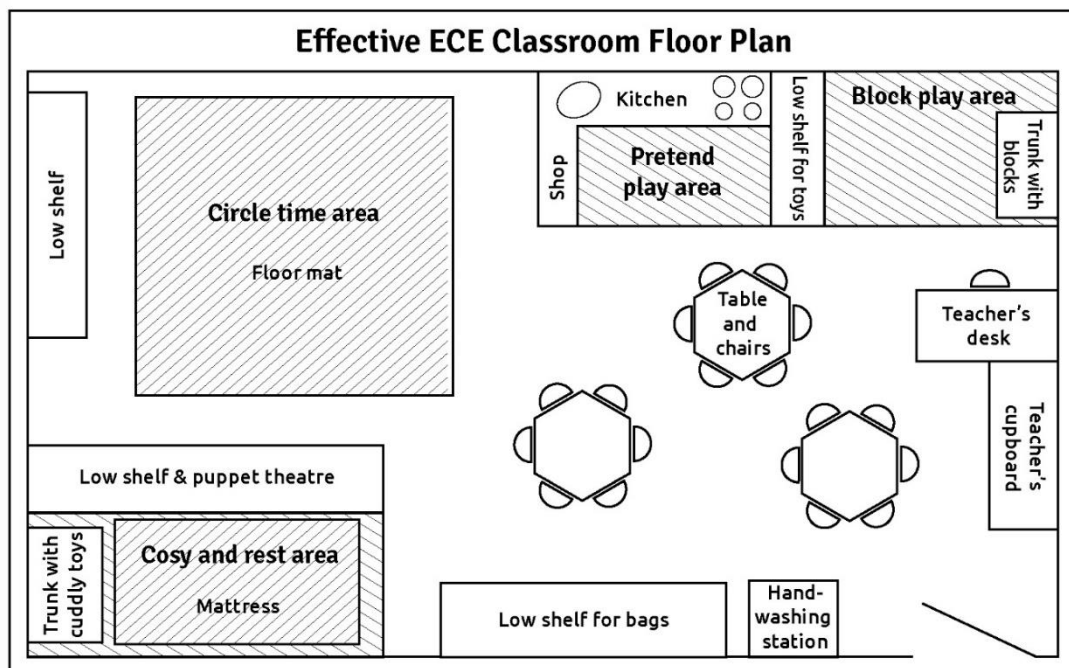
Key principles

- Select an activity that you did in your class before you joined this workshop. Describe it.
- Was this activity integrating different learning goals? Yes/no? Which ones?
- Was this activity stimulating child agency? How?
- How could you improve?

2.2. A playful learning environment

The environment can be regarded as the **physical** environment: the classroom and the school grounds. How does the psychical classroom look? The decoration, set-up of chairs and tables and mats, presentation of learning materials, storage of materials etc.? It is important to make the classroom a safe and attractive place, where the work of children is displayed, and materials are available for children to use.

Picture 4 shows an example of how a classroom could look like. But not all pre-primary classrooms have access to the same space and materials. In small classrooms, it is good to replace all or most of the benches by mats. This will create space for movement and play. Consider also using the outside space for your activities, especially when you have a small classroom. In Chapter 3 you will learn more about how you can make materials from locally available materials.



Picture 4 An example of an effective pre-primary classroom floor plan (VVOB, 2019).

The classroom is not only a physical space, but also a **social** environment, a place where children come to **learn and be safe**.

- It is a place where children feel at home, so the wellbeing of children is high.
- It is a place that triggers children's interests, that let them explore, play and learn and interact. This needs the purposeful use of materials and visuals.
- They should feel part of the class-community and be able to take responsibilities.
- The classroom environment should be organised in such a way that learners are encouraged to interact, e.g., by freeing up space for group work or free play, by offering intriguing and stimulating materials.
- The class needs effective management, so all children can learn and thrive.

In this part we will have a look at:

- The classroom management
- Daily routines
- The set up of corners and play areas

2.2.1. Classroom management

When applying learning through play techniques, teachers will notice that lessons become livelier. Children might move around, talk, and interact with each other more. That does not mean it has to become chaos with running around and shouting. With effective classroom management, teachers can create a productive, respectful, and joyful classroom culture where it can be quiet when needed and more lively other moments.

Teachers can involve children in some classroom management activities:

- Setting the class rules or the rules for each corner (See Picture 5)
- Choosing in which corner to play (see later how to use the choice board)
- Cleaning up materials
- ...



Picture 5 The rules for the circle, visualised so all children can understand.

Doing so, will help increase the autonomy and cooperation of children with teachers and children

with children. Based on that, the classroom is managed more easily and effectively.

Classroom management also depends on how learning through play activities are organised. Avoid too many "teaching" sessions as they don't actively engage learners and hence limit the learning by children, especially in big groups. Rather divide the children in smaller groups to actively engage with materials and activities. This is even more important with very young children. Regularly remind children of the classroom rules and make sure they are visible.

Activity 2:

How do you do classroom management?

- Have you visualised the rules of the class? How have you done that or could you do that?
- What do you do when a child misbehaves? Do you apply positive discipline? How do you do that?
- Are children allowed to make choices or do you decide for them?
- Do you do all class activities or also group activities?

2.2.2. Daily routines

Daily routines are activities that happen every day, sometimes a few times a day, e.g., morning routine, toilet routine, ... They are an important part of the social environment, give structure to the day and have a huge influence on the wellbeing of children.

Daily routines also create opportunities for children to develop many development domains, such as socio-emotional learning, cognitive development, language development.

How could daily routines look like?

Some examples

- Welcoming the learners:
 - calling the names of learners when they enter the classroom, (or shaking their hand),
 - organising a place for free play, preferably in corners so that the learners can freely choose what to play with,
 - ending this period with a visit to the toilet and washing their hands.



Picture 6 Welcoming the children.

- Morning routine: in circle time
 - Greeting each other,
 - welcome song,
 - **attendance list** (putting the children’s name symbol on the attendance chart),
 - **weather chart** (discussing the weather and let a child select the right weather symbol),
 - Talking about the homes, talking about the families, talking about past weekends or holidays
 - Talk about the **day’s schedule**



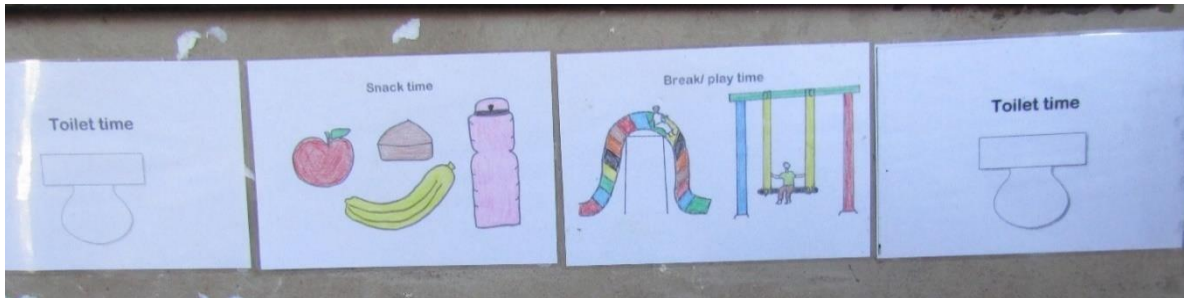
Picture 7 Morning routine: greeting, attendance list, weather chart.

- Cleaning up:
 - cleaning up together on fixed moments of the day,
 - brightening this activity with a well-known song,
 - use well structured spaces and containers for materials so children can do it themselves
- Break:
 - using a fixed signal to start and end the break,
 - letting the children participate e.g., by handing out the snacks and drinks, sweeping the floor after break time.
- End of the day:
 - making time to bring the day to a close.
 - Referring to the done activities of the day
 - looking forward to the following day
 - saying goodbye or maybe using a goodbye song.

What materials can help with daily routines and day structure?

Some examples

- **Day schedule**
 - Visualise the day's schedule for the learners
 - Follow the day's schedule consistently
 - Refer to the timetable when you go to the next learning area
 - This structure makes the children feel safe.



Picture 8 Day schedule or calendar: every activity or lesson is represented by a picture.

- **Weather chart**
 - Create connectedness to the physical environment
 - Create awareness of seasons, of the four elements



Picture 9 Weather chart: children indicate at the start of the day what the weather is like.

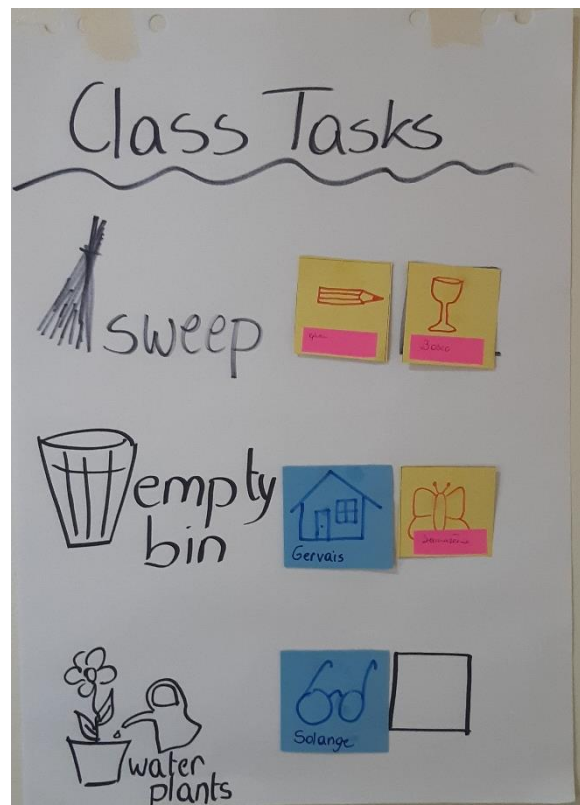
- **Attendance list**
 - Use a specific picture or symbol for each learner and for each teacher, as it helps to stimulate self-reliance in learners and creates a feeling of togetherness. The symbol the child has remains the same throughout the whole year: e.g., Keza has the picture of the butterfly, Maurice is a flower, Yvonne the pencil, ...
 - Visualise attendance in the classroom.



Picture 10 Attendance list: all children hang their symbol on the chart during the morning circle time.

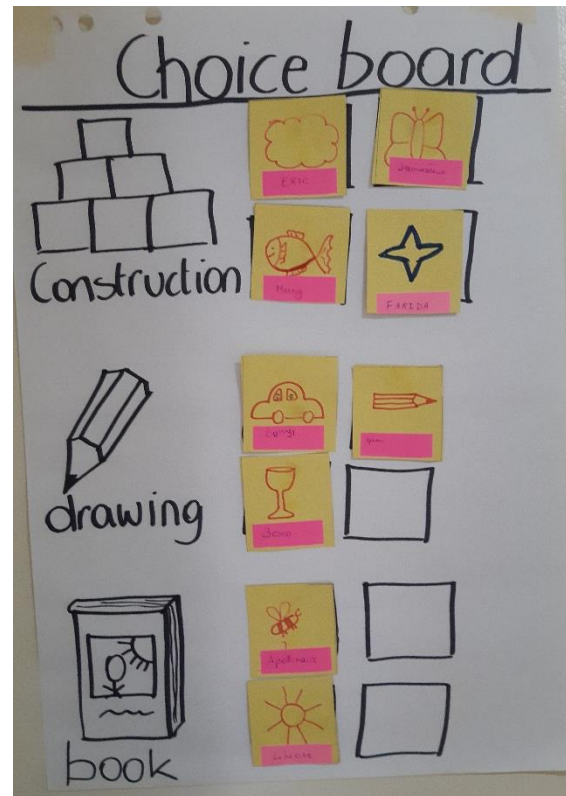
- **Task board**

- When tasks are assigned to learners, they feel responsible for the wellbeing of the group and it stimulates their self-management
- Allow learners the opportunity to choose which task they want to do
- Use the same symbols as the symbols from the attendance list.
- Visualise the tasks they can choose from.
- Invite learners to put their symbol with the task they would like to do.
- Tasks can include: Sweeping the floor, putting bags away, distributing the cookies, counting the learners for the attendance list, erasing the chalk board, etc.



Picture 11 Task board: for each task (e.g., sweeping, watering plants, ...), two children can attach their symbol cards.

- **Choice board** for corner play
 - Visualise all corners and visualise how many spaces each corner have (how many children may play in this corner at 1 time)
 - Allow learners to choose in which corner they will play.
 - Since the available spaces in each corner (see next paragraph) are limited there is a need for a system for children to know when the corner is “full”: E.g.,
 - Think of a symbol for each corner (e.g., a book for the book corner)
 - Make necklaces for each corner, make as many as the available spaces, the necklace has the symbol of the corner.
 - Children who want to play in the book corner put a necklace with the book symbol around their neck. Once the necklaces are finished, the corner is full.
 - When children move to another corner, they take off their “book” necklace and take the necklace of the next corner.



Picture 12 For each activity or corner, there are a certain number of places. Each child puts their symbol to the corner where they want to play. When the spaces are full, the corner is full and no more children can join unless someone else leaves.

In Chapter 3 you can see how to make these charts and tools yourself.

Activity 3:

Daily routines

- How do your daily routines look like?
- Pick one idea from above that you want to work out in your class.

2.2.3. Corners or play areas

Activity 4:

Corners

- Do you work with corners in your class?
- How does that work? When do you do so? What corners do you have?
- Can children choose in which corner they play? How do you organise that?

Corners, play areas or learning stations are separate places in the classroom where a group of children engage in different learning through play activities. Corners stimulate independent learning and interaction between children.

When to use corners?

The **timetable** of the competency-based curriculum provides time specifically for corner play. The time allocated is 50 minutes per day. That is when children can play in a variety of corners: book corner, shop corner, construction corner, etc.

However, the corners can also be used during **welcoming** time in the morning (free play), so before whole class activities start.

Corners can also be used **during a lesson** of a specific learning area, such as numeracy. During a numeracy lesson, the teacher can set up several numeracy activities in different corners (see below for an example). Whole class instruction is then replaced by meaningful and playful learning activities in the corners or small groups. This is especially useful in classes with **many children** as they can all be doing something instead of waiting for limited materials. It also allows to cater for different needs and development levels of children, especially in **multi-grade** classes.

How to set it up?

The Curriculum advises to set up the following corners:

1. Numeracy corner,
2. Construction corner,
3. Role play corner,
4. Literacy corner,
5. Book corner,
6. Art and creativity corner

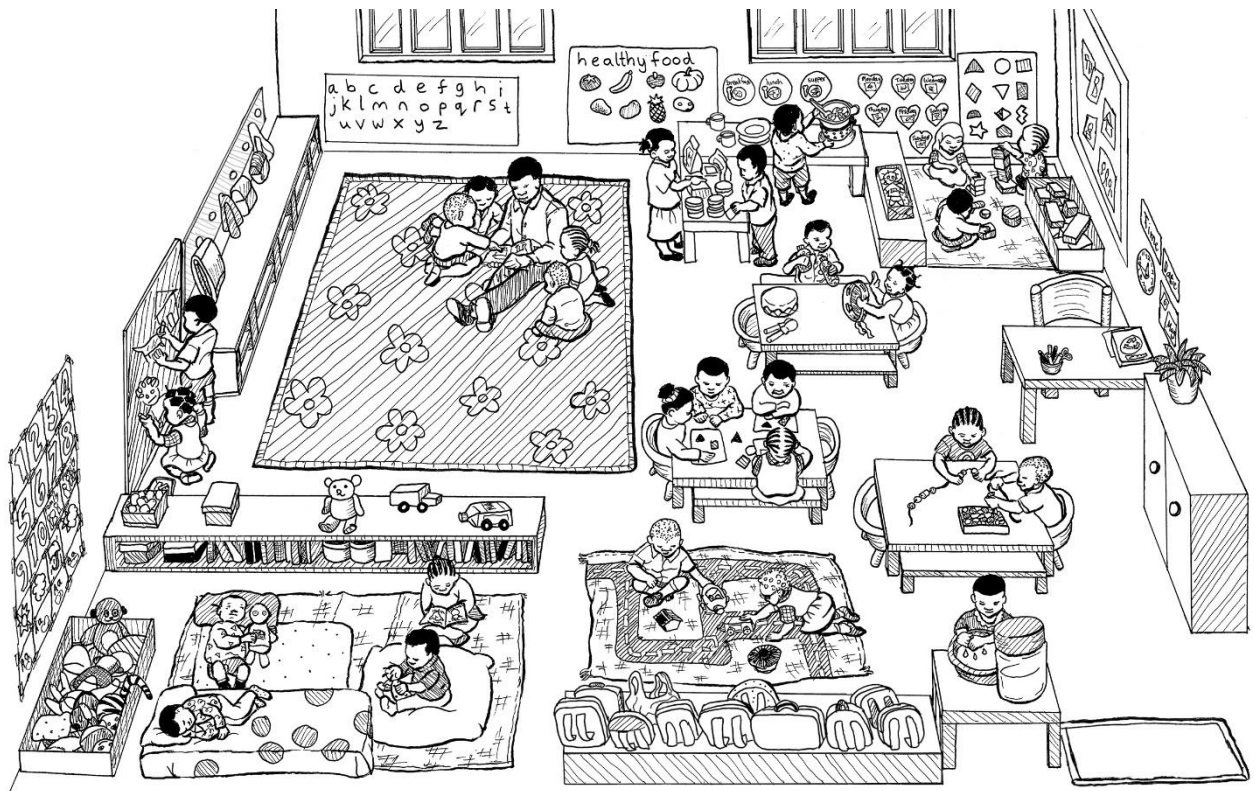
But you can even offer additional corners as well, such as the water or sand box corner, the puppet theatre corner, the obstacle race corner, ...

During specific lessons, for example Numeracy, corners can also be used. Each corner can then expose children to another activity, or activities at different levels. Example: Corner 1: Sorting objects according to colour, Corner 2: Counting bottle caps, Corner 3: Measuring the classroom, Corner 4: Filling bottles half with water, Corner 5: Shop corner, By doing this all children can engage in meaningful activities and interact with materials.

- Activities and materials in corners should change based on the curriculum goals, theme, learning development of children, ...
- Play areas or corners can be spread across different places inside or outside your classroom.

- The space can be created by tables, mats, curtains, boxes or chairs or even a chalk line on the floor.
- Noisy / wet / dirty activity corners should be separate from quiet / dry / clean activity corners. E.g., the books corner should not be next to the creativity corner or sand/water corner.
- The number of children in the corner is limited so all children can engage with the available materials.
- The materials in the corners must change regularly to stimulate learning.
- Each corner must provide activities and materials that allow a range of learning goals from the curriculum to be achieved (e.g., in the numeracy corner children can make puzzles, this helps them to develop numeracy and cognitive skills).
- Activities in corners should be designed in such way that children can play independently.

Picture 13 gives an example of how it could like. But not all pre-primary classrooms have access to the same space and materials. In small classrooms, it is good to replace all or most of the benches by mats. This will create space for movement and play. Consider also using the outside space for your activities, especially when you have a small classroom. In Chapter 3 you will learn more about how you can make materials from locally available materials.



Picture 13 An example of how a pre-primary classroom can look like. The class is divided in separate corners (VVOB, 2019).

How to use corners?

- When you start using corners, you will need to explain how it works to the children. Some activities need some explanation. Especially young children need some help to explore all the corners and the activities in the corners.
- Children can choose in which corner they will play and learn. The teacher can encourage children to vary and visit each corner over time.

- A **choice board** (see 2.2.2.) can help children to see the available options and choose. This board will also help them to know in which corners there is still space to play. Especially young children will need help to make choices. It is good to help children explore the corners, also the corners they did not choose by themselves.)
- The teacher
 - o helps children to make choices, especially young children will need some help to get started
 - o oversees the general classroom management
 but mostly
 - o uses corner time to observe children
 - o spends focused time with smaller groups of children to play and interact with them

Activity 5:

Corners

- Design an activity that can be done in a corner. The template below might help you.

Template Corner Play activity development

Objectives/outcomes	Curriculum goals:
	Development domains:
	Link to other learning areas:
Description of activity process	<i>Explain activity step by step (how will it work)</i>
Materials and set up environment	Materials: <i>What?</i> (locally available)
	Grouping: <i>Circle, full class, individual, group....</i>
	Outdoor or Indoor?
Teaching method	<i>Group work, imitation, role play, games, exploration, demonstration, experimentation, discussion, drama, field trips, problem solving etc</i>
Other	

2.3. The role of the teacher

Activity 6:

Role of the teacher

- How do you describe your role as teacher in learning through play? What is it that you do? And how do you do it?

In a quality learning environment, the teacher has four key roles to play: The teacher as **planner**, as **observer**, as **facilitator** and as **documenter** of children's learning. In each role there are opportunities for supporting learning through play. These roles are relevant for all types of play in the spectrum (more adult directed or more child choice).

The teacher plays different roles in the classroom:

1. The teacher as planner:

The teacher **plans** and **prepares** lessons. In doing so, the teacher combines multiple goals. **The teacher actively looks for learning opportunities and prepares key activities and questions that are relevant and meaningful.**

An example:

The teacher makes a weekly and daily plan. The teacher sets up corners and thinks about which materials and activities could be stimulating the selected and integrated learning goals. The teacher prepares activities. The teacher can use the template in 2.2.3.

2. The teacher as observer:

The teacher **observes** the children's wellbeing and involvement. The teacher identifies the child's interests and needs and responds to the child's learning with meaningful impulses. **The child will learn more in those areas that are triggering its interest, that are more relevant and meaningful.**

An example:

During corner time, teacher observes that most girls don't play in the construction corner. The girls don't seem to be interested in the blocks and cars and trucks. The teacher brings the dolls to the construction corner and asks the children to build a doll house. This triggers the interest of some girls. They want to play in the construction corner now!

3. The teacher as facilitator:

The teacher **facilitates** learning. The teacher creates a safe environment, supports child initiative, and creates speaking and interaction opportunities. **Via interaction, children learn and develop all development domains. The teacher responds to what the child says and does and, via interaction gives support and stimulates further learning.**

An example:

The children in the shop or the market corner don't seem to get started. The teacher helps them **build the play**: "Who will be the seller of fruits? Who will sell fish?" or "Who will come and buy at the market?" or "What will you do? What do you need? What could happen?" Then you let children play and observe how they engage, you describe what you see "Aha, mommy is buying tomatoes and beans in the market".

An example:

The teacher observes the children in the construction corner. The children are building towers with empty milk boxes. She walks to them and **challenges** them: "Which one of these towers is the highest?" "I wonder if you could add 3 more blocks to your tower?" "What do you think will happen if we take this box away?", "Look what Maurice is doing. That looks like a good idea to make a bigger tower, what do you think?". By doing so, the teacher stimulates numeracy, cognitive and language development.



Picture 14 Children can play with locally available materials. The teacher gives impulses by adding a question or challenge.

An example:

The teacher gives input to the play by playing a **role**. The teacher acts as a customer to the market: "I am daddy. Today I want to cook the favourite dish of my two children." Ask the children what their favourite food is. Come to a decision to what you will cook. Go with the children to the market corner and play the role of the customer. "Good day, madam. Today I want to cook this dish for my children. What do I need? What are the ingredients? How much will that cost?" (these are a few of possible questions you can discuss with the children, both those taking the role of your children and those being the sellers at the market.)

4. The teacher as documenter:

The teacher **documents** the learning of the child. **Not only as a way of child assessment** (See Chapter 3), **but also to discuss and evaluate learning with the children after or even during an activity**. These records of learning activities can be shared and discussed with other teachers for reflective learning, with parents to engage them in the learning of their children.

An example of recording an activity

Dorine tells the teacher what happened to her. The teacher encourages her to make a drawing of the story. Then she asks Dorine to tell the story again. The teacher writes the story as it was told by Dorine.

Picture 15 Documenting what happened to Dorine.



My Self-Assessment



















	<p>I did my best work! I did not need any help.</p>
	<p>I needed some help today.</p>
	<p>I needed a lot of help but I will try again!</p>

An example of self-assessment

How did the task go? Every child assesses how their work went that day. The children use the symbols, the text is for clarification for parents and teachers (instruction).

Picture 16 Example of a self-evaluation tool for children.

Sink or Float

Name of object	Float	sink
coin 		
Pencil 		
beach ball 		
wooden stick 		
crayon 		
rubber band 		

An example:

After doing an experiment on floating/sinking objects, teachers and children work together to reflect on the results of the experiment. The teacher says: "You were checking which things can float and which things sink. Let's make a drawing of all things that float on this sheet and of things that sink on that sheet."

Picture 17 Reporting on a science activity: floating or sinking. The children can draw or indicate which object was sinking and which was floating.

An example:

After a trip to a farm, teacher and children retell the day and the teacher uses cell phone pictures or makes drawings of each step: walking to the farm, seeing the animals, feeding the pigs, cutting the grass, ... This recording becomes a short book which can be added to the book corner. Children can "read" and tell the story to each other.

Activity 7:

Let's reflect on classroom practices. How do you apply these 4 roles?

- Think back of your teaching yesterday.
- What roles did you apply and how?
- You can use the checklist on the next page to assist your reflection.
- What can you learn from this? What would you want to change?

Role of the teacher in Learning through play		1	2	3
1: yes, this can be observed– 2: it can be observed a bit, but could improve – 3: not observed		Yes	Yes, but	No
1. Planning and preparing lessons	1.1. The teacher combines multiple goals. Activities show an integration of different competencies and development domains (e.g., children feel encouraged to use numeracy skills in other activities).			
	1.2. The teacher designs exciting playful activities.			
2. The teacher as observer	2.1. The teacher observes wellbeing, involvement, interests and needs.			
	2.2. The teacher responds with meaningful impulses.			
	2.3. The teacher observes developmental progress of all children.			
3. The teacher as facilitator	3.1. The teacher creates a safe environment.			
	3.2. The teacher creates learning opportunities.			
	3.3. The teacher supports and starts from child initiative.			
	3.4. The teacher differentiates activities and supports to the needs/levels of children.			
4. The teacher as documenter	4.1. The teacher documents for differentiation and lesson preparation.			
	4.2. The teacher documents together with children.			
	4.3. The teacher documents with and for parents.			
	4.4. The teacher shares documentation with other teachers for reflective learning.			

Even during children's free play, teachers have an important role to play. The role of the teacher in free play:

Do teachers have to do something when children are engaging in Free Play?

Even during children's free play, teachers have an important role to play. The role of the teacher in free play starts from good **observation**. Based on what the teacher observes:

- Be the security guard: Keep an overview on all children, make sure they are safe.
- Be a player: Play along and with the children, make sure all children are engaged in play.
- Be a referee or mediator: Remind children of the rules, mediate when conflict occurs.
- Be a nurse: Take care of children who hurt themselves.
- Be a teddy bear: Comfort children who have low wellbeing, connect and facilitate interaction between children.

Activity 8:

Time to practice.

In the coming week, try to focus on a different role every day, especially during corner play time. Remember to first make sure all children are clear and engaged in corner activities. Then select one corner and spend time there applying a specific role.

1. Which role did you select? Why?
2. Which corner did you select? Why?
3. What did you observe (in terms of wellbeing and involvement)?
4. What did you learn?
5. What will you do differently next time?

2.4. Including all learners in learning through play

Activity 9:

Think of your learners in your class.

- Are they all the same? Do they all learn in the same way?
- Do you see learners with barriers to learning in your class? What are these barriers?
- How do you address these?

All children should have equal access to play and learning. However, many pre-primary children experience barriers to learning and participation in the classroom. These barriers can be caused by disabilities, poverty, language issues, gender, ...and many other reasons. Also being quick in learning can be a barrier, as children get bored in classroom and disconnect. Barriers keep children from learning. They will not develop to their full potential.

Inclusion means that all girls and boys get equal opportunities to play, learn and meaningfully participate. All children should feel accepted as they are. Pre-primary teachers and their school leaders can play a pivotal role to address many of the barriers, and by doing so, increase children's levels of involvement and wellbeing in their classrooms and school environments. Inclusion benefits all learners as it builds social skills, such as empathy, diversity, respect.

When preparing playful learning activities, it is important to start from the right attitude: **Every child can learn**. But each child might have different needs. Below are some key ideas on how to create inclusion in your class: extension and differentiation, access and meaningfulness of activities.

1. Extension and differentiation

After preparing an activity you can look at how to **extend** the activity. What to do to vary on the activity?

An example:

Today the teacher is counting with children. She has prepared a box full of empty water bottles. In small groups children get a bag with 10 bottles. Each child counts. They count out loud, they whisper, they count while singing.

After counting bottles, children count their fingers. They also count children in class and make groups of 10 children. They count the windows in the classroom. They count while pointing at the objects, but also by jumping next to big object (like when counting children). During snack time, they count the cups for porridge, again making groups of ten.

By doing so, the teacher is extending the activity: The materials are varied (bottles, fingers, children), but also what children do (point and jump) and when the counting is done (in lesson but also during snack time).

How to **differentiate**? Some learners might find the activity too difficult, for some it might be too easy. It is good to prepare in advance how you can make the same activity easier or more difficult. By doing so the activity can challenge the learner at the right level and lead to high involvement and learning. This is called the Zone of Proximal development: Starting from what the child already can do, taking the next learning step that is just within the reach of the child's ability, triggering but not frustrating the child.

An example:

A few learners are doing puzzles in the numeracy corner. The teacher sees that Jean-Paul throws the pieces around and disturbs the other children. Teachers sits with Jean-Paul and start making the puzzle together. Jean-Paul can do it very well. The puzzle is too easy, and Jean-Paul is getting bored. The teacher gives Jean-Paul a puzzle with more pieces. Jean-Paul is interested again and his involvement goes up.

2. Access to activities

Is the activity accessible for all learners? Is the activity inclusive? Below we list some simple ideas, suggestions and practical tips on making play activities and settings more inclusive.

Practical tips to make play activities and settings more inclusive

- Focus on what children **can do**, not on what they cannot.
- Sometimes children with physical disabilities or medical needs have no access to play because adults think it might be dangerous for them. Create the right balance between creating play **opportunities** for children and protecting them from potential risks. Playing is essential for learning as this is the way how children explore the world.
- Provide **materials** for the children on the right level or distance so all children can reach. Adjust size and colours of materials.
- Let the **child lead** and **make choices**. Observe the child carefully and see what interests the child. What toys does she or he like? What does she or he do with it?
- Make it **sensory**. Provide learning opportunities through taste, smell, touch, vision and hearing. Combine all. When you tell a story, show pictures and objects that fit in the story. Let children feel the objects, let them see the pictures. Tell the same story several times, as repetition gives learners a feeling of control.
- Observe the **process** of play. What are children doing? What objects do they like? What movements do they make? Use this information to help children to take the next step. Expose them to new materials, to new skills.
- Encourage **exploration**. Provide baskets full of everyday objects (e.g., wooden spoons, pieces of cloth, shells and big seed pods, brushes ...). Observe what children do with this? How do they engage? What do they like? Let children be creative and make discoveries.
- Think about **communication**. Spend time with small groups of learners to really engage in communication. Learn and use sign language when needed.
- Encourage children to play **together**. Bring children together in play (e.g., roll the ball to each other, help children get involved in each other's favourite play, let them build a cosy place together or for a learner who has multiple needs, let children take different roles...)

- Explore the full learning environment, not only inside. Go **outside** and let the children play freely, let them relax lying in the grass, explore leaves, flowers and trees.

3. Meaningful activities

Is the activity meaningful for all learners, also those with special needs?

A meaningful activity is an activity that makes sense to the children. It connects to what they already know, it connects to their context and experiences. It is based on what at that moment of their development triggers their interest. This means that not all children should be doing the same activities or they could do the same activity in a different way, based on their interests.

Check if:

- Is the activity is fun and engaging for everybody?
- Is the activity at the right level for all children?
- Can all children play together?
- Does the activity meet the needs of all children?

An example:

While other children are counting bottle caps, Aloisa -a child with Down syndrome- is not interested in counting. It is too abstract for her. However, the teacher observes that she like manipulating these bottle caps, putting them in a jar and throwing them out again. The teacher adjusts the activity and allows children in group to work together. While Aloisa puts each bottle cap one by one in the jar, the other children count them. When finished, Aloisa can throw them out again. Aloisa is engaged in an activity that interests her and she is participating in a group activity which is meaningful for her and the other children.

An example:

During corner time, teacher observes that most girls don't play in the construction corner. The girls don't seem to be interested in the blocks and cars and trucks. The teacher brings the dolls to the construction corner and asks the children to build a doll house. This triggers the interest of some girls. They want to play in the construction corner now!

Activity 10:

Inclusion and differentiation

- Start from the activity you designed in 2.2.3
- Let's look if you can make your activity more inclusive and differentiated. The template below might help you.

Template Corner Play activity development

Extension and differentiation	<i>How to extend and vary on the same activity?</i>
	<i>How to make the activity more difficult?</i>
	<i>How to make the activity easier?</i>
Access	Is the activity accessible for all learners also those with special needs? How?
Meaningful	Is the activity meaningful for all learners also those with special needs? How?

2.5. Gender responsive learning through play

Activity 11:

Gender in your childhood

- Are you a male or a female?
- Think back of your childhood. Were there certain things you had to do because you were a girl or a boy?
- Were there certain expectations because you were a girl or a boy?
- Did you play with certain toys because you were a boy or a girl?

1. Key terms

The differences boys and girls experience are often not related to their biological differences, but to gender, gender bias and stereotypes.

Activity 12:

Gender terminology

Cut out the terms and definitions in Annex 2. Can you match each term with the right definition?

Table 1 Gender terminology (VVOB, 2019)

Terminology	
Sex	The assignment and classification of people as male, female based on biological differences at birth.
Gender	The personal and social characteristics associated with being male, female, or a combination or neither.
Gender identity	A person's internal sense of being male, female, a combination or neither.
Gender roles	Activities, tasks and responsibilities ascribed to a group of people based on their sex. E.g., Men are police men; women do the laundry
Gender non-conforming	When a person does not conform to typical gender roles. E.g., A girl whistles, a boy cries, a woman plays rugby,...
Gender bias	An unfair difference in the way women or men, girls or boys are treated.
Gender stereotypes	Beliefs about the personal attributes, behaviours and roles of a specific social group, based on their sex. E.g., women should take care of babies while men need to provide for the family.
Gender-based discrimination	Exclusion of a person from educational opportunities, meaningful careers, political influence or opportunities for economic advancement based on their sex. E.g., women are not allowed to vote.
Gender balance	The equal participation of women, men, girls and boys in all spheres of society, including schools and the workplace.
Gender equality	The absence of discrimination on the basis of a person's sex and associated gender. This implies that society sees everyone as equal, regardless of their sex.
Gender equity	The process of being fair to women, men, boys and girls. To ensure fairness, measures must often be used to compensate for historical and social

Terminology	
	disadvantages that prevent women and men from operating on a level playing field. ¹¹
Gender responsiveness	Plans and actions that address the different needs and aspirations of women and men, boys and girls, or taking actions to correct or prevent gender bias and discrimination so as to ensure gender equality and equity.
Gender-responsive pedagogy	Teaching and learning processes that pay attention to the specific needs of girls and boys. The processes include lesson planning, teaching, organising and managing the classroom, and managing other forms of interaction.

Gender bias in the classroom

In our classrooms children often learn gender practices by observing how things are done by school staff. Some examples of gender bias:

- Dividing groups by sex and only assigning certain tasks to girls (e.g., sweeping the classroom) and other tasks to boys (e.g., moving the tables).
- Discouraging girls from taking part in activities that are considered rough and boys from playing with dolls.
- Gently comforting a girl who hurt herself and cries, while a boy in the same situation is told to “get up, boys don’t cry.”

Something to think about: Have you considered the impact of the uniforms for girls on their learning? Since girls are wearing skirts, they often feel limited in jumping, climbing, running. This limits their physical development.

Gender responsive play refers to play that address the different needs and aspirations of children of different sexes. It corrects or prevents gender bias and discrimination to ensure gender equality and equity.

All children need to get equal opportunities to develop to their full potential. Children learn and develop optimally when:

- they participate in a variety of learning and play activities
- their teachers make them feel safe and supported
- they receive encouragement to try different things and interact with others

We need to ensure gender responsiveness in the set-up of the learning environment, the learning materials, the learning activities, and the interactions and language used in class.

2. Learning environment

The way in which your classroom and corners are arranged, influences children's involvement in learning.

How can you organise your classroom and outdoor area?

- Reorganise your corners to inspire new games and encourage different children to mingle.
- Encourage children to try out all the learning areas or corners
- Have the class sit in a circle on the floor with you as the teacher as part of the circle for more equal involvement
- Move around the room to make sure everyone is involved and participating
- Arrange children in small groups as it can improve participation of shyer children
- Intervene when a group of children take up all the space or chase children away

An example:

The teacher brought the fantasy and construction corner closer to each other. This inspired children to use materials they were less interested before. The children start building houses for the dolls.

An example:

A group of girls is playing house. Fred wants to join. Henriette shouts: "You can't play in the kitchen area, you are a boy!" The teacher responds by saying: "We can all learn together how to make this recipe and cook food together."

An example:

A group of boys is using all the outdoor space for playing football. The other children are squeezed together in a small area. The teacher divides the different play areas, also outside, allowing each child enough space to play.

Activity 13: (optional)

Scan the QR code or copy the link (<https://youtu.be/Yft3L1ErdR0>) and watch the video.

- What did you learn?
- Why are these approaches gender responsive?
- Has this inspired you to change your class' learning environment? What would you like to change?



3. The learning materials

Children will learn a wider range of skills when they can play with different materials. However, many toys and play materials are often seen as typically for boys or girls. These sex-specific materials and toys may influence children's understanding of different gender roles: if dolls are only for girls, then children may think that caring for children is only for women. When play materials only appeal to one sex only, all children miss important learning experiences.

Activity 14:

Sex-specific play materials

- Can you give some examples of toys that are typically meant for boys?
- Can you give some examples of toys that are typically meant for girls?

How can you equip your classroom with play and learning materials?

- Offer toys and play materials in a way that appeals to different children
- Avoid sex-specific play materials. Provide dolls that can be any sex or provide dolls in different sexes, ages and colours.
- Use open ended materials such as pebbles, shells, big boxes, milk cartons. These will trigger children to explore their own sense of gender and gender roles.
- Encourage children to explore play materials that are typically meant for a specific sex. Question beliefs on who is allowed to play with certain toys.
- Question beliefs about colours and what they mean.
- Model play behaviours. Show children how to use certain play materials to get them started.
- Avoid gender stereotypes in story books or draw children's attention to the stereotypes, and question them.

An example:

"The cars are only for the boys", says Maurice. The teacher questions him: "Are you sure, Maurice? When I was a child, I loved playing with cars. I think many children in this class -also girls- will enjoy playing with the cars." (=question beliefs)

An example:

The teacher observes a boy who is shy to go into the house corner. He looks hesitant to the baby doll. The teacher joins him. Together they take care of the baby, give it a nappy. The teacher says: "Boys also enjoy playing with dolls because they are caring and like being kind to others. Look, there are the nappies and here are the bottles for feeding. What will the baby eat?" (= encourage exploration of play materials, model play behaviours).

An example:

The teacher reads a story. “What are the children doing in this picture?” “Would you like to do this?” “Is it always this way?” “Would you like to be this person? Why or why not?” (=discuss, name and question stereotypes in stories.)

Activity 15: (optional)

Scan the QR code or copy the link (<https://youtu.be/rUUKQW7oJnA>) and watch the video.

- What did you learn?
- Why are these approaches gender responsive?
- Has this inspired you to change the way how materials are used in your classroom? What would you like to change?



4. The learning activities

Activity 16:

While learning about transport, all children made cars and trucks from locally available materials. The children play with their trucks and cars. One boy shouts at a girl: “No, I will be the driver. Girls can’t drive.”

- Why do these children think that driving is for boys?
- What could you do?

The teacher reacts as follows: “Is it fair to tell a child what they can or can’t do? I think children can have any interest they want.”

- What do you think about this reaction? What is the teacher doing?

When children engage in a variety of learning activities, where they have opportunities to interact with different children, they develop a broader range of socio-emotional and cognitive skills. Traditional ideas about gender roles may prevent children from engaging in certain play behaviours or from taking on different roles in group settings. This may happen both during teacher-guided activities, and during free play.

How can you plan your learning activities and organise your time with learners?

- Divide children into groups in random ways, not by sex. E.g., Divide in groups based on the month of birth, favorite food ...
- Avoid making activities sex-specific: All children should be encouraged and free to join all activities. All chores and tasks can be done by all children (e.g., Lifting tables, sweeping ...).
- Create opportunities for all children to engage in a variety of play and learning activities. By having a system of rotation, all children get exposed to all activities/corners.
- Use activities to question gender roles and gender stereotypes. Ask children why they are avoiding certain activities, whether boys or girls can be good at this. Use role models. Explicitly engage all children in activities that break gender roles (e.g., Cooking, construction ...)
- Adjust the text of songs and stories to be more gender responsive.
-

An example:

The teacher observes that the same children always play in the house corner. He invites them to the construction corner and creates some space for inexperienced learners to play with the ball.

An example:

Jean-Paul joins a group of girls in dressing up corner. He is the first boy to do so. Encourage Jean-Paul to continue and discourage or challenge children who might make negative comments.

An example:

During free play teacher models non-stereotypical behaviour: he plays a mother who is building a house, a father who is taking care of the baby and cooking, a woman who is a police officer, ...

Activity 17: (optional)

Scan the QR code or copy this link (<https://youtu.be/mHI1pQEfrm!>) and watch the video.

- What did you learn?
- Why are these approaches gender responsive?
- Has this inspired you to change the way how you organise activities in your classroom? What would you like to change?



5. Interactions and language use in the classroom

Interactions between adult and child and between child and other children play an important role in children's learning and development. It builds their sense of identity and belonging.

Activity 18:

Think of the interactions you have with children in your class.

- Do you address boys and girls in the same way?
- How is that?

The language you use can lead children to believe that there are certain things that only children of a certain sex can do.

- Your voice might be softer when you speak to girls and harsher when speaking to boys.
- You might use words like "good", "strong" for boys and words like "lovely" and "beautiful" for girls.
- You may say things that suggest that certain qualities are typically for boys or girls: "Boys will be boys", "naughty boys", "sweet girls", "girls, show the boys how to clean this up properly".

How can you engage with children in a gender responsive way?

- Treat children equally with the same gentleness or firmness in similar situations, regardless of their sex.
- Respect and praise all children for their unique skills and qualities.
- Celebrate children's self-expression and choices when they challenge gender stereotypes.
- Divide classroom chores and tasks equally.
- Use children's names when giving positive or negative feedback and avoid "boys, stop fighting".
- When you hear children make comments related to gender, respond and break down the stereotype.

An example:

Ephrem says: "Boys are better at sports than girls." Teacher responds: "Some children are better than others at sports. It doesn't have anything to do with their being a boy or a girl. All children have things that they are good at."

An example:

Ineza says: "Boys can't wear pink." Teacher responds: "Colours are just colours and each of us can decide what we like and don't like. Everyone should feel free to choose the colours they like."

Interactions with other children are important, and interactions during early childhood offer learning experiences that provide the foundations for children's peer relationships as they grow and develop.

How to facilitate interaction between learners?

- Help children to treat each other with respect.
- Help all children to express their emotions. An emotion chart (pictures with pictures of the 4 basic emotions -happy, scared, sad, angry) can help.
- Have zero tolerance for hurting other children, with words or physically.
- Help children to develop empathy and appreciate diversity.
- Help children appreciate diversity and differences. If the teacher responds positively to differences (e.g., “I like the way how you did that”, “Can you tell me more about this? It is the first time I hear this.”), children will pick up this positive attitude.

An example:

Ephrem has fallen and hurt himself. He is crying. Marie says: “You act like a girl.” Teacher says: “Ephrem is sad because he feels pain. When something hurts it makes you cry. Every child may cry, boys and girls. Will you and Maurice look after Ephrem until he feels better? Remember, in our class we are all friends.”

Activity 19: (optional)

Scan the QR code or copy this link (<https://youtu.be/I8fjnCJmPXY>) and watch the video.

- What did you learn?
- Why are these approaches gender responsive?
- Has this inspired you to change the way how you interact with children in your classroom? What would you like to change?



Further learning about this chapter

There are other materials that can help you to learn more about this topic.

- Rwanda Education Board (2015). Curriculum for pre-primary school from 3-6 years, Ministry of Education, Republic of Rwanda.
- Rwanda Education Board (2015). Teacher's Guide for Pre- Primary Curriculum. Inyoborabarezi ku Nteganyanyigisho y'Uburezi bw'Inshuke, Ministry of Education, Republic of Rwanda.
- Rwanda Basic Education Board (2021). A handbook for new teachers in Rwanda, Kigali.
- Twigire Mumikino Rwanda (VSO) Schools App: Module 4: Play in the CBC; Module 5: Classroom organization; Module 6: Classroom management; Module 7: Behavior management; Module 10: Inclusion; Module 11: Gender

Chapter 3: Making and using locally available materials

In this chapter you will learn:

- to make locally available play materials for your classroom
- to improve your practices via try out and reflection on your try out (=iteration)

Young children learn through exploring the world and manipulating materials. Concrete materials are essential in the development of children.

Activity 1:

Locally available materials in your class

- What materials are you currently using in your class?
- When do you use them?
- How do you use them? Do children use the materials or do you as a teacher use them?
- Have you made materials yourself? Share some examples and how you used them.

To apply learning through play, a range of appropriate resources are needed. These materials often can be made from locally available resources. In this part, the teacher is guided in crafting materials for routines, for play areas and in making games. Note: when possible, this chapter recommends using low cost or no-cost materials. However, sometimes some basic materials such as markers, cello tape, may need to be bought. It can help to bring in some creativity and problem-solving skills as well: how best can you use what is available for the learning of children?

Think before you start making materials!

Before you start crafting, ask yourself some questions:

- Which outcomes or learning goals do you want to achieve?
- What will children do with the materials? Will they interact, solve problems, take initiative, be creative, explore?
- Can you differentiate the materials? Do they cover the needs of all learners, boys and girls? (adjust levels and access)
- How many do you need? Where will you store?
- How to make it durable?
- Can children use the materials independently?
- How to make it look nice and attractive? (use colours, use same shapes cards, ...)

3.1. How to make materials for daily routines?

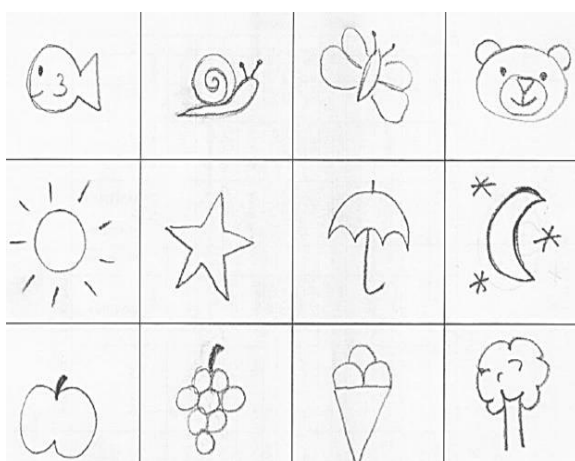
Daily routines are activities that return every day (see 2.2.2). They give structure to the day. By using visual support, children can engage and feel a sense of autonomy.

1. Learner symbols

Every learner should have his or her own symbol. It represents their name as they cannot read yet. The symbol can be used on the **task chart**, the **choice board**, the **attendance list** (see 2.2.2). The symbol remains the same for a whole year.

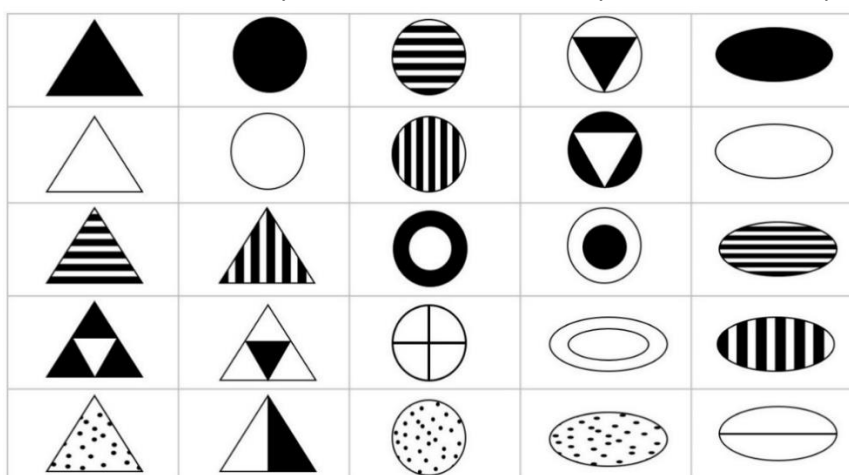
How:

- Use symbols that you can easily draw yourself.
- Adjust the level to the level of children:
 - For the youngest, use colourful pictures.
 - Pictures without colours are a bit more difficult. Chose a symbol for each child, write their name underneath. Use this



Picture 18 Simple drawings as symbols for children.

- For the eldest learners you can also use abstract symbols such as shapes.



Picture 19 More complex symbols for children. These help children to develop their understanding of shapes.

- Make a few sets of symbols as you will use the symbols on the attendance chart, the task chart or choice board.

2. Attendance register

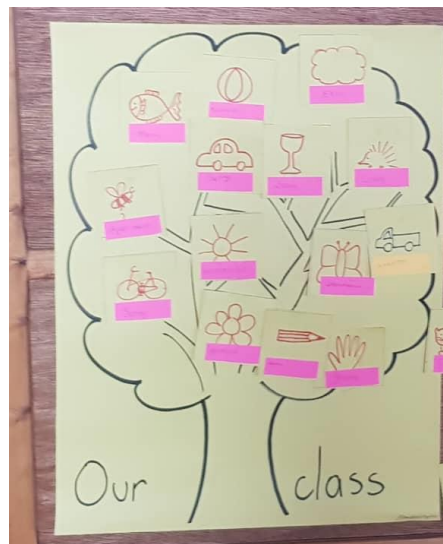
This is a chart where the attendance of children is indicated. During morning circle each child puts their own symbol on the chart. The symbols of children who are absent remain in a box.

How?

- Choose a shape, e.g., A tree or a bus or a house.
- Make it durable, e.g., From cardboard, so it can be used for a whole year
- You can adjust your chart to the theme or learning outcomes: e.g., Different types of transport during learning about transport (each child chooses the transport they prefer); plants ...



Picture 20 Example of an attendance list. During circle time every child takes its symbol from "home" to "school".



Picture 21 Example of attendance list. Every child puts his/her symbol during the morning circle time. Before leaving the class at the end of the school day, they take their symbol off again.

3. A visual daily programme

A visual daily programme shows, in chronological order, pictures of what learners will do that day. It helps them to structure the day and learn concepts of time (Numeracy: first, later, then, last ...).

How?

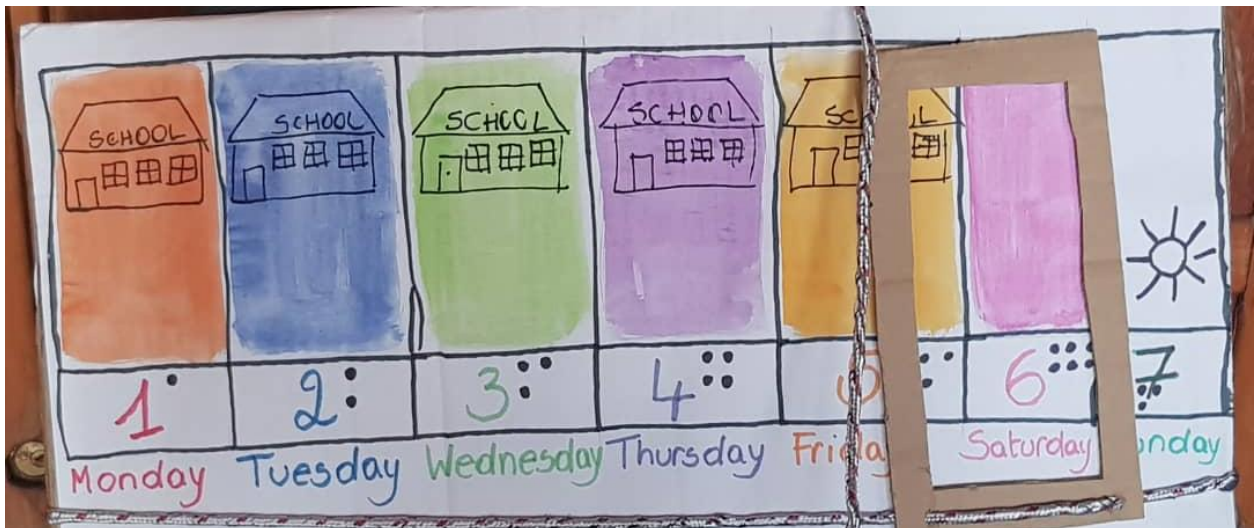
- Start from your written weekly and daily timetable. This might include activities as: arrival, circle time, numeracy, corner play, free play, toilet time ...
- Make for each activity a picture. Some activities come back a few times a day (e.g., Toilet time). You will need more than one picture of those.
- Write the name of the activity on the card.
- Put the relevant pictures every day in chronological order. Discuss the programme of the day with the children every morning during **morning circle**. Use an arrow or pointer to indicate which activity is currently being done.

4. Days of the week chart

A week chart is a resource on which learners mark which day is today and possibly also yesterday and tomorrow. These concepts are part of numeracy development and can be acquired by daily looking at and discussing the week chart.

How:

- Use a rectangular piece of cardboard and divide it in 7 parts.
- Each part symbolises 1 day of the week.
- Every day has a colour and symbol and a number (and the number is represented by the symbol and the quantity).
- All teachers in pre-primary should use the same symbols, colours. The symbol can be based on the name of the day in the language (e.g., Sunday in English: use the symbol of the sun; e.g., Sunday in Kinyarwanda: use white colour). The symbol can also be based on something special that happens that day, e.g., a church on Sunday.
- For older children: add the name of the day in writing in the language of instruction.



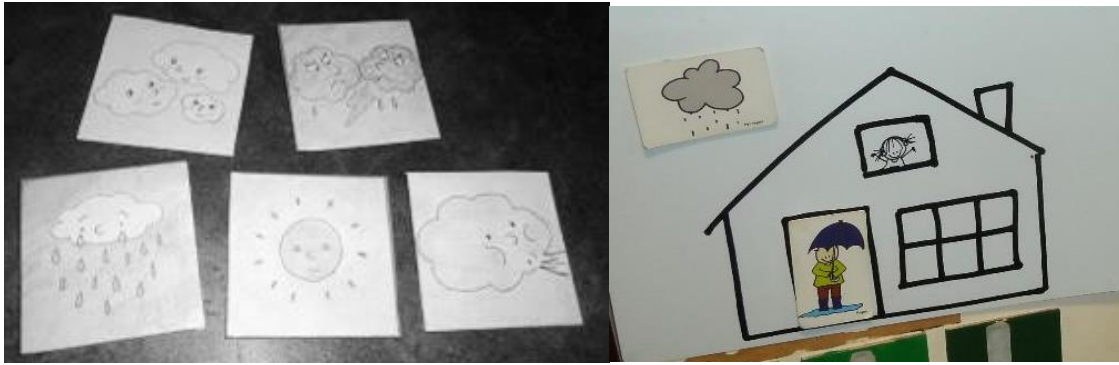
Picture 24 -Example of a week calendar. Note the dot-representation of the number of the day. Replace the English by Kinyarwanda.

5. Weather chart

With a weather chart you want children to identify which weather it is every day, during morning routine. It helps them to be aware of the world they live in and covers these curriculum goals.

How:

- It can be a chart with all types of weather, symbolised by a picture. During the morning circle time, one child then checks the weather and puts a peg or arrow to the right weather.
- It can be a set of pictures of which the right one is selected and attached to the attendance chart.



Picture 25 Examples of weather charts. Children check every day what the weather is like.

6. Task chart

This chart assigns learners to specific tasks for the week. The symbol of the learner is put next to the symbol of the task.

How:

- Make a list of all tasks that children can help with, e.g., sweeping the floor, rearranging the chairs, rolling up the mat, hand out snacks, ... Find a symbol for each.
- Identify how many children can help with each task.
- Make a chart with space for each task (vertically) and for the symbols of the children for each task (horizontally). Indicate with a dot how many spaces are available and where children will put their symbols.
- Find a way to attach the symbols of the children to the chart: sticky stuff, tape, or a pouch

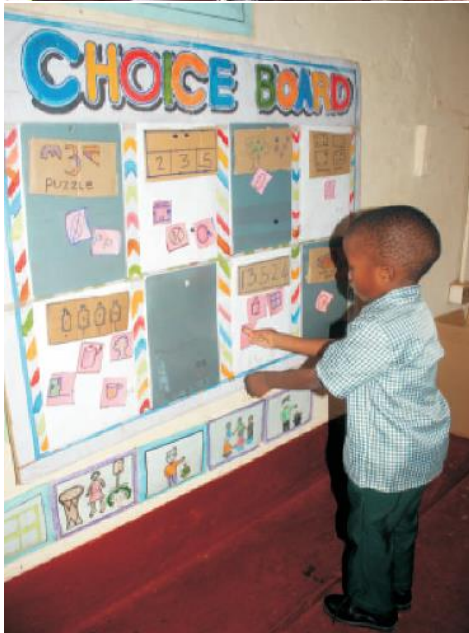


Picture 26 Visual representation of the class tasks, such as sweeping, arranging the school bags, Children volunteering for the task, hang their symbol next to the task.

7. Choice board

During corner play or other moments, children can choose activities. This can be done in a structured way. The choice board helps by listing all activities or corners that are available and the number of

spaces available for each corner/activity. In the picture you can see the teacher discussing the choice board with the children. She explains which activities are available (e.g., construction corner, numeracy corner, ...) and how many children are allowed in the corner (e.g., 4 children can play in the numeracy corner). The way how you use the choice board can differ. Below 2 options are explained.



Picture 27 Examples of choice boards.

How:

- Use one large piece of cardboard, or a sack or a part of the wall. Make symbols/pictures for each activity/corner that is available, e.g., a puzzle piece for the puzzle area, a dice for the games area, a house and a tree for the house area.
- Indicate how many children can play in that corner.
- Option 1: let children hang their personal symbol in the activity they choose.
- Option 2: make necklaces (string and cardboard) for each activity (e.g., numeracy corner gets 4 necklaces with the same picture as the choice board). Children who want to play in the numeracy corner, take the numeracy necklace.

8. Emotion chart

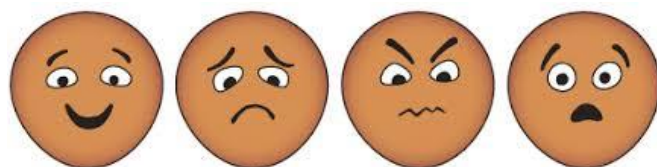
It is good to hang in your class, near to the place where you do the morning routine/circle, drawings of the 4 basic emotions (happy, sad, angry, scared). This can be used by children to express themselves and talk about emotions.

How:

- Use 4 pieces of cardboard of the same shape and size.
- Make drawings of each of the 4 emotions.



Picture 28 Symbols for happy, scared, angry, sad.



Picture 29 Symbols for happy, sad, angry, scared.

Activity 2:

Materials for daily routines

- What has inspired you in this part?
- What would you like to try out?
- Collect the necessary materials and start making the material of your choice.
- How will you use this material?
- Take some pictures and share with your colleagues.

Activity 3:

The use of materials for daily routines: After you have tried out these new materials, reflect on the use.

- What material have you made and tried out?
- How did it go? How did the children respond? Were they learning?
- What would you want to change in the use of the material?
- What would you want to change in the material? Is the material durable enough for children? Is it attractive?

3.2. How to make materials for play areas and corners?

Each corner or play area can be equipped with relevant materials, related to the learning goals set. This means that the materials should change, that the level of difficulty can increase. In this part we look at what materials can be made from locally available materials. The materials will be described or pictures will be shared to inspire you. Can you inspire colleagues with your materials?

Activity 4:

Corners and play areas in your class

- Which corners do you have in your class?
- What materials are used in these corners?
- Did you make these materials yourself? How?
- How do children use these materials?

1. Numeracy area

The numeracy corner can contain many materials, related to the outcomes and learning goals relevant at that moment. In the next chapter (Chapter 4) these will be discussed in detail.

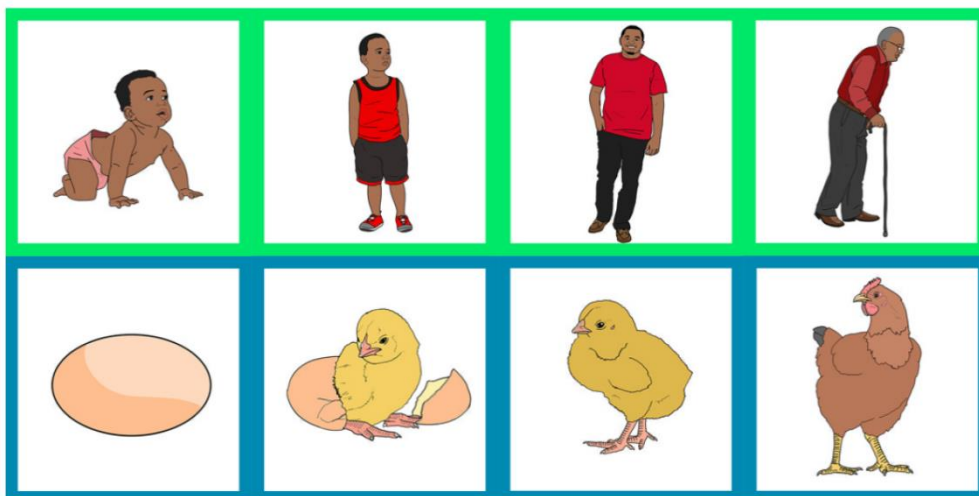
- Numbers, counting, operations (see also 4.1.)
 - o Any number related game such as memory, bottle caps, bottle bowling, bingo, lace cards, etc.
- Measuring (see also 4.2.)
 - o Something to weigh (using non-standardised units such as blocks) e.g., Clothes hanger scales, seesaw....
 - o Something to measure time e.g., sand timer made out of plastic bottles.
 - o Standardised measuring instruments such as rulers, tape measure, folding meter stick,
 - o Non-standardised measuring units such as blocks, sticks, shoes, steps etc.
 - o Objects to sort according to size, weight etc.
 - o Sand and water
- Classification (sorting, matching, ordering, sequencing) (see also 4.2.)
 - o containers to be used for sorting, for example egg cartons
 - o objects to sort, for example, different types of seeds (small objects also work towards learners fine motor skills)
- Patterns (see also 4.3.)
 - o Pattern games such as lace cards (see 4.4.5), domino, etc.
 - o Beads (e.g., from pasta, straws, thin roll of paper, bottle caps with holes punched in, etc.)
 - o It is interesting if pictorial instruction drawings are also offered with examples of patterns to create with these beads increasing in difficulty.
 - o Tangrams
 - o Loose parts. A collection of smallish similar objects which learners can use to make patterns or drawings; for example: Seeds, seedpods, dried leaves, stones, little twigs, etc.

2. Literacy and book area

This is the area where children play with letters, sounds and words. This is where they can write and draw. Many of the literacy activities can be integrated in other corners, such as a shopping list in the shopping corner or a recipe in the house corner.

Materials in this corner need to be at the right level of children and closely related to the learning activities and outcomes. Some examples are:

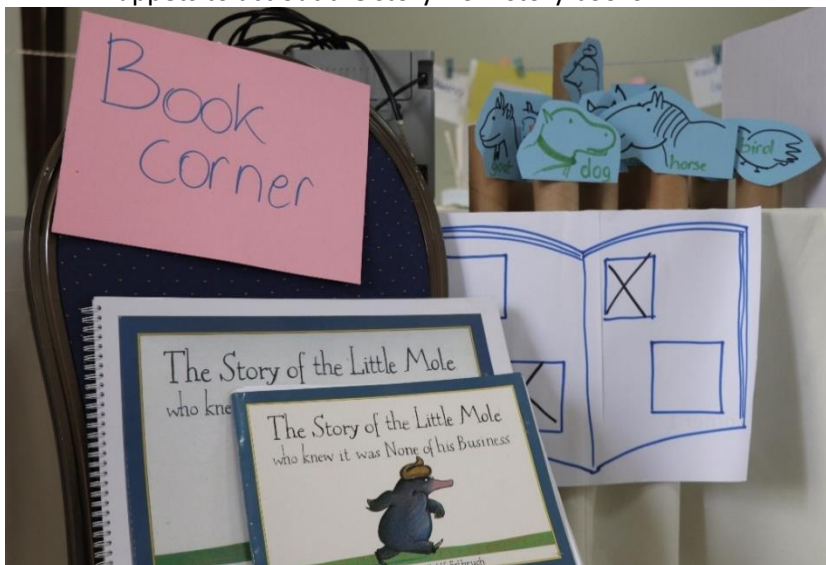
- Pens, paint, pencils
- Paper (can be recycled paper that you get from an office nearby)
- Templates of letters, for children to copy, paint, draw, write in the sand
- Picture and word puzzles
- Story telling cards
- Rhyming cards
- Syllable counting cards



Picture 30 Examples of storytelling cards (the life of a human being; from an egg to a chicken)

The literacy corner can have a special area for books.

- A cosy place to sit
- Books, this can be self-made books.
- Puppets to act out the story from story books.



Picture 31 Example of the book corner. The book is present as well as puppets for children to role play or act out the story.

3. Music area

All materials that can make noise

- Drums and shakers
- Pictures of body percussion: such as clapping, stamping feet



Picture 32 Instruments made from locally available materials in the music area.

4. Water and/or sand area

A water or sand area can be used for different learning areas:

- Numeracy: Explore quantities and volumes, concepts as “half”, “full”, “more”, “less”;;
- Science: Sink and float activities, Different shapes of water (water and ice);
- Discovery of the world: Fishing games;
- Health: Hygiene: washing hands, soap ...

You need:

- A big container with water/sand (a basin, tub or a plastic sheet in a tyre);
- A variety of shapes and sizes of bottles, cups, tins;
- Straws, spoons, ...

5. Pretend area

The pretend area is a place where children can pretend they are someone else. They can pretend or engage in role play. Examples are the role play area, the shop area, the small world area and the puppet area. Can you find more examples? You can also create a hospital area, or a bus and transport area?

Pretend areas help the child’s understanding of the world. Materials depend on what the learning outcomes are, on the theme, on the interest of the children.

Role play area

- Collect a series of real materials like cooking pots, a spoon...
- Provide dolls and soft toys.
- You can also make cardboard furniture for dolls, a TV, cars or trucks ...



Picture 33 Children playing in the kitchen of the role play area.



Picture 34 A TV which children can use to role play TV programmes.



Picture 35 The role play area can have cupboards, beds, stoves, TVs, pots and pans made from locally available materials.

Shop area:

- Collect empty packages of food (washed and clean) or other items that can be sold (a shoe shop, art shop ...);
- Price tags;
- Something that can be used as money (bottle caps, numeral cards ...);
- A scale like a clothes hanger.

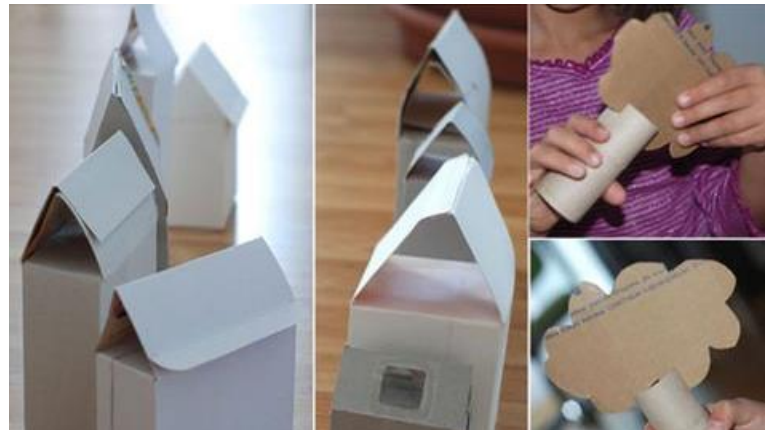
Note: In Chapter 4 (4.2.2.) you will learn more about how to use shop activities for the development of number sense.

Small world area

This corner brings the world in small scale to the child. It can include a transport area with roads and cars. Don't forget to make some puppets who can live and move in this small world. Children can enact stories and happenings from real life into this small area.

You can create the world, possibly with the help of children, but children decide on the rules in the world and how they will play with it. This is a great place to develop socio-emotional skills.

- Houses, trees, roads, cars;
- Puppets (human and animals).





Picture 36 The small world area allows children to play with small puppets in a small world. Anything is possible. Specific themes can be enacted here, such as traffic, farming, festivals. All materials can be made from locally available materials.

Puppet theatre:

With these puppets, children can act out conversations and stories, while others can watch.

- Finger puppets, hand puppets, sock puppets
- A theatre: Made of a table, or cardboard, or a box, or a piece of cloth



Picture 37 A puppet theatre can be made with a piece of kitenge. Both teachers and children can play and act out stories.

6. Construction area

In this area children build and construct. This helps them develop a set of skills, such as cognitive skills, (problem solving, creativity), social skills (collaboration), mathematical skills (size, shape, direction), ... Children can engage freely with the materials, or children can be guided what to do (e.g., Make a tower, construct a house, follow a plan on how to build something ...)

- Pieces of wood, branches;
- Blocks: these can be made from boxes. Try to collect a lot of blocks in the same shape (e.g., milk cartons);
- Egg cartons;
- Paper rolls;
- Bottle caps;
- Empty bottles, empty tins with the lid glued on ...

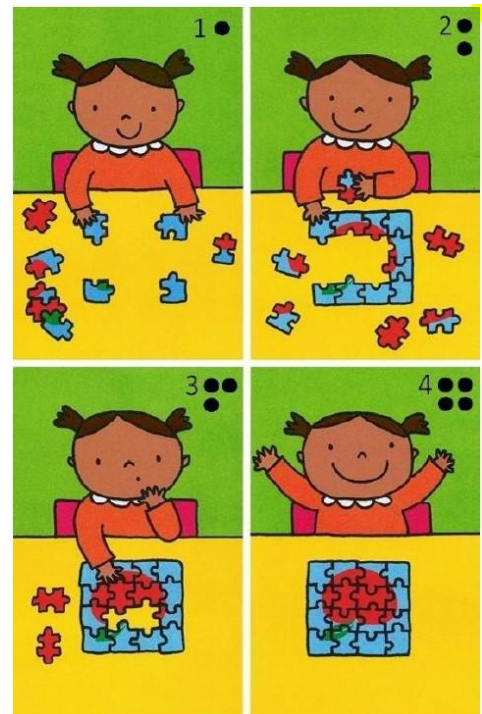


Picture 38 Examples of low-cost materials that can be used in the construction corner.

7. Puzzle area

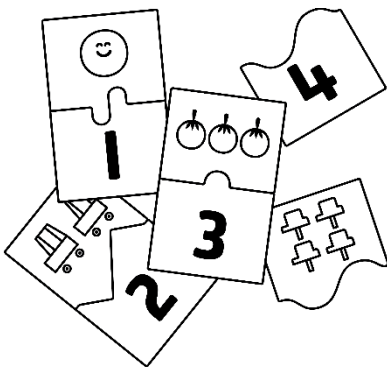
A puzzle is a picture that has been cut in pieces. Puzzles can be part of other corners, e.g., A letter puzzle in the literacy area, a number puzzle in the numeracy area, or have their own corner. Puzzles help children develop problem solving skills, spatial orientation, hand-eye coordination, perseverance, independent work In addition, the picture on the puzzle can relate to the specific learning goals, like mathematics (combining a number symbol with the quantity), literacy (a picture with a word), discovery of the world (animals ...)

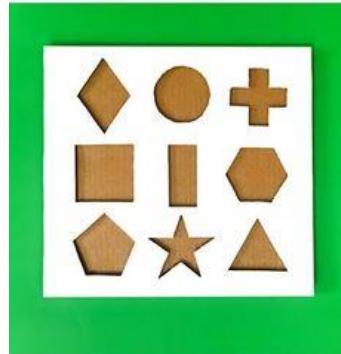
- Provide age-appropriate puzzles to the learners to make independently. This means they can make them alone, but they must not be too easy.
- Coach learners to complete puzzles by giving simple instructions.
- Puzzles are easier or more difficult depending on:
 - o Number of pieces;
 - o The size of the pieces;
 - o The details on the picture;
 - o The way the pieces are cut (oddly shaped is easier than straight cuts).



Picture 39 This plan can help children to develop a strategy on how to make puzzles.

- Plan for differentiated learning (puzzles made for different levels of ability.). It is useful to mark the containers of puzzles with colours to indicate the level of difficulty. For example: a green mark on easy puzzles, orange for medium and red for tricky puzzles.
- To keep the area interesting, add a different puzzle every so often and store other puzzles until next school year. For example, in term one, you may have mostly easy and medium puzzles whereas in term 3 there will be few easy puzzles and mostly medium and tricky puzzles.





Picture 40 Examples of self-made puzzles

Activity 5:

Materials for corners and play areas

- What has inspired you in this part?
- What would you like to try out?
- Collect the necessary materials and start making the material of your choice.
- How will you use this material?
- Take some pictures and share with your colleagues.

Activity 6:

The use of materials in corners and play areas: After you have tried out these new materials, reflect on the use.

- What material have you made and tried out?
- How did it go? How did the children respond? Were they learning?
- What would you want to change in the use of the material?
- What would you want to change in the material? Is the material durable enough for children? Is it attractive?

3.3. How to make games from locally available materials?

Activity 7:

Games in your class

- Do you have materials for games in your class?
- What games are these?
- Did you make these materials yourself? How?
- How do children use these games? Can they do it independently?

Games are an important part of play. Games have set rules, expectations, The children can engage independently. Children develop cognitive skills (memory, problem solving, spatial skills, ..), socio-emotional skills (losing/winning, following rules, play together), language and communication skills, and a variety of other skills depending on the focus of the game.

Some games can be done individually, like the lace cards (see below). Those games should include some kind of self-control: children can find out by themselves whether they have done it correct or not.

- The games stay available in class for several weeks but not necessarily much longer. Then they are stored and a different or adjusted version can be introduced in class.
- Games should be linked to themes and learning objectives relevant at that moment, they need to cover different levels of difficulty to cater for all learners and challenge learners differently.
- The games need to be introduced by the teacher, but after a while children know how to play it and can do it by themselves.

In this section a variety of games are explained. The theme or the specific learning goal might change but the game's rules remain the same.

1. Memory game

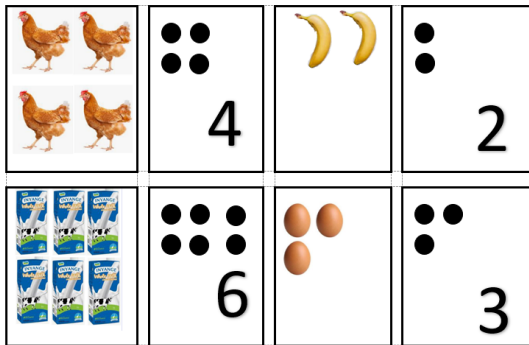
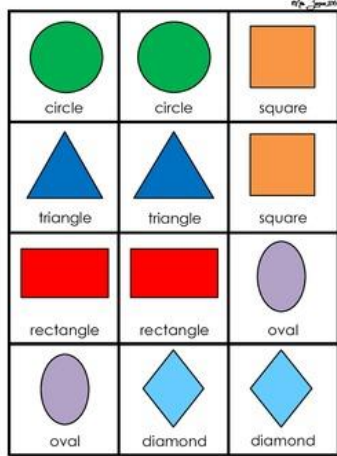
Memory games are easily made and they can cover a wide variety of learning goals and areas. The game exist of a lot of paired cards. These are placed face down in neat rows. Children need to try to locate matching pairs by turning 2 cards and checking if they match. If so, they score a point and keep the pair. If not, the cards are put back face down and another child tries to find a pair.

Many learning outcomes can be covered:

- Match number symbol and quantity (numeracy)
- Match sound and word (literacy)
- Match means of transport, professions, fruit, vegetables, ... (Discovery of the world)
- ...

How:

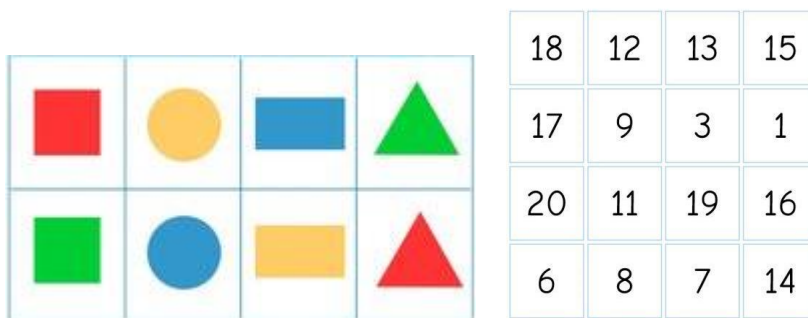
- Decide on the learning outcome (e.g., numeracy: number sense upto 5)
- Decide on the number of pairs, based on the level of the children
- Decide whether you will have pairs:
 - o consisting of 2 identical pictures (e.g., 2 bananas, 2 pine apples, 2 mangoes)
 - o consisting of 2 related pictures (e.g., "5" and a picture of 5 flowers).
- Make all cards on the same material and the same size; make them durable.
- Store the game in small boxes or in an envelop.



Picture 41 Examples of memory games: children have to find the matching cards and form pairs. E.g., find the two triangles, find the numeral and the dot representation of 4, find the two bees.

2. Bingo game

Bingo is a game in which learners cover pictures which were called, on a learner bingo card with a small object. Each learner tries to be the first to cover all the pictures on their bingo card. The learner bingo cards are different. When the card is full, the learner should shout “BINGO!” to win the game. Bingo can easily be adapted to a variety of contexts.



Picture 42 Bingo games, an example on shapes and colours, an example on numbers.

A bingo game involves matching, sorting, language development, etc. Every game can work towards other learning outcomes. Bingo can be adapted to a variety of outcomes.

- Parts of the body
- Components of the universe (sun, moon, stars, clouds, lightning, ...)
- Different clothes

Bingo can also be played with identical pictures or with matching pictures For example:

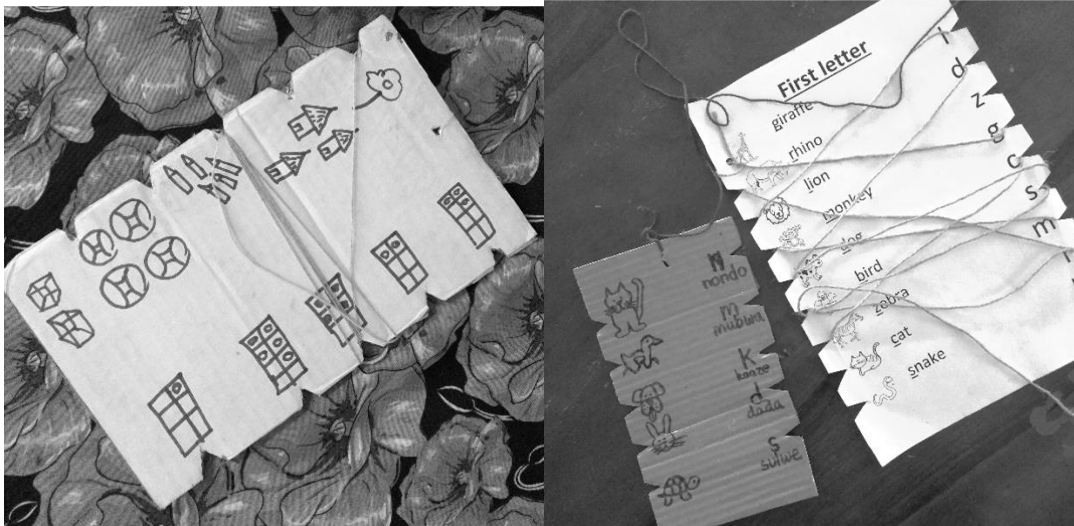
small cards	learner Bingo card
9 dots	number 9
fruit or seed	leaves of the plant
small letters	capital letters
a picture of something which starts with a certain sound e.g., pencil	a different picture of something which starts with that same sound e.g., pan
a simple addition, e.g., 2+1	the correct outcome of this addition, E.g., 3

How:

- Decide on the learning outcome (e.g., Numeracy: shapes)
- Decide on the words you want your learners to practice (e.g., triangle, circle, square ..). decide to use matching or identical pairs.
- Make for each word a card with a picture and the word.
- Make learner cards: combine 4 or 6 or 8 (depending on the level) of the words you identified before. Each learner card must have a different combination of words. And the same word may occur twice.
- Collect enough bottle caps or pebbles (for each learner participating enough to cover all the words on their card)
- How to play:
 - o Give all learners a learner card, put the box with pebbles/bottle caps in the middle, put the stack of small cards in the middle – face down.
 - o The first learner turns the top small card: the child says the word and shows the picture to all players. All players who have this word, cover it with a pebble/bottle cap. The next learner takes a picture from the pile, and so on, until someone’s card is fully covered. This player shouts Bingo and wins the game.

3. Lace cards


Lace cards are cards with drawings on both sides and a string attached to the top. Learners connect the pictures using the string and can check using the pattern at the back if they were correct. Children play individually. A variety of learning outcomes can be covered. And the level of difficulty adjusted.



Picture 43 Lace cards, an example for numeracy (combine the quantity with the dot representation) and for literacy (combining pictures with the initial sound)

- Decide on the learning outcome (e.g., Numeracy: quantities, items and symbolic representation)
- Decide on number of items which depend on the level of your learners
- Cut the cards, add the pictures on the left side, and the matching picture on the right, but another order.
- Cut out little triangles next to the pictures, for the string to fit in.
- Make a hole in top middle to attach the string.
- Lace the card, matching the pairs. Turn the card and draw the pattern the string makes. This is the solution.
- Loosen the string. The learners can now play with it.

Examples for numeracy:

Numeracy	
Numbers	ladders with the corresponding number of steps
Drawing of a number of objects e.g., 3 balls	Corresponding numbers
Dice with dots	Corresponding number of stars
Numbers e.g., 3, 4, 0	Shapes with the corresponding amount of corners (best ensure that the corners are marked. E.g. 

Activity 8:

Materials for games

- What has inspired you in this part?
- What would you like to try out?
- Collect the necessary materials and start making the material of your choice.
- How will you use this material?
- Take some pictures and share with your colleagues.

Activity 9:

The use of games: After you have tried out these new materials, reflect on the use.

- What games have you made and tried out?
- How did it go? How did the children respond? Were they learning? Could they do it independently?
- What would you want to change in the use of the material?
- What would you want to change in the material? Is the material durable enough for children? Is it attractive?

Further learning about this chapter

There are other materials that can help you to learn more about this topic.

- A Partner in Education (APIE) EQUIP online course:
<http://umubanoprimary.org/equip/EQUIP.html>
- Twigire Mumikino Rwanda (VSO) Schools App: Module 9: Teaching and learning materials
- Rwanda Education Board (2015). Teacher's Guide for Pre- Primary Curriculum. Inyoborabarezi ku Nteganyanyigisho y'Uburezi bw'Inshuke, Ministry of Education, Republic of Rwanda.
- Rwanda Basic Education Board (2020). Teacher's guide on making teaching and learning materials for pre-primary schools. Inyoborabarezi yo gukora imfashanyigisho n'ibikinisho mu mashuri y'inshuke, Ministry of Education, Republic of Rwanda.

Chapter 4: Learning through play in emergent numeracy

In this chapter you will learn:

- how mathematical or numeracy skills develop in young children
- to stimulate this development with age and level appropriate play activities
- what materials can be used for learning through play in emergent numeracy
- to assess learner's progress in numeracy
- to improve your practices via try out and reflection on your try out (=iteration)

Numeracy is not the same as counting. While counting is something that children also learn in pre-school, they need to learn more than just counting. They need to learn to recognise quantities and add and subtract tangible materials, they need to learn basics of measuring, time, money, directions and so much more. In this section we will look at all numeracy skills (number sense, measuring, geometry). We will look at how these skills are normally acquired (the development line) and how this development can be stimulated in a playful way.

4.1. Number sense

Activity 1:

Number sense

- What activities do you currently do regarding counting and number sense?
- What is number sense?
- How do you think it develops?
- Use Annex 3: Try to put all stages in the right order.

Number sense is not the same as being able to count. **Number sense is a person's ability to understand, relate, and connect numbers.** Strong number sense helps build a foundation for mathematical understanding in later years.

You cannot teach number sense, but you can **expose children to a variety of activities and materials that help them to develop number sense.** Children can only develop number sense when they can do, act, play. They cannot develop it via seeing others do it. They cannot develop number sense by repeating counting rhymes every day.

4.1.1. The development of counting

If we know how number sense and counting develops, we can also:

- observe the level of where the child is in the development of number sense and counting.
- create activities and materials that help children take the next steps.

Below, each stage is described in detail. Note that these are not learning goals by itself, but steps children take to finally be able to count and understand numbers. When you know at which step the child is, you can stimulate the child to take the next step.

1. Acoustic counting

In acoustic counting the child learns the **number words** (e.g., One, two, three, ...) and the fixed order in which they occur. This is the phase where counting songs and rhymes are important.

Examples of playful activities:

- Counting songs
- Counting rhymes

1, 2, 3 my sister's name is
Marie
With her hands she can clap.
With her feet she can step
1, 2, 3 my sister's name is
Marie

Picture 44 Example of a counting rhyme.

2. Asynchronous counting

The child starts realising a link between quantity and numbers. But the child is still missing the principle of **one-to-one correspondence**. You see children counting, missing some items, or counting some items twice.

It is important that children use concrete objects at this stage. Each child must interact with concrete objects and count them. They cannot learn by watching others do it.

Examples of playful activities:

- Provide concrete objects which can be counted: rocks, shells, bottle caps, bottles, ...
- Counting activities: count the children in class, count the blocks used in the tower, count the windows in the room, ...



Picture 45 Counting activity in class. Only the child moving the bottles is learning. The others are only watching, not doing, so they are not really learning. At this age, children learn by doing.



Picture 46 In this class all children have materials to manipulate and learn.

3. Synchronous counting

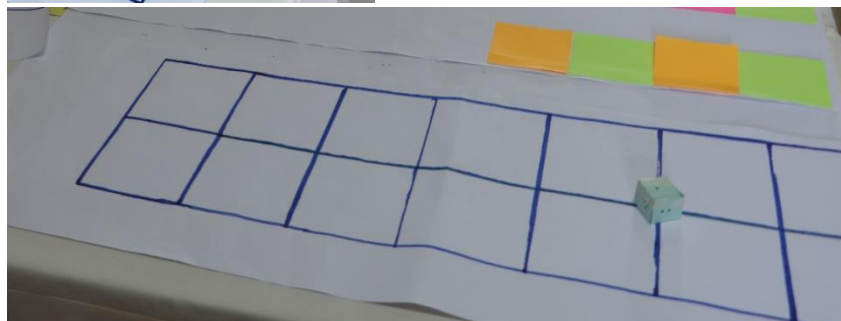
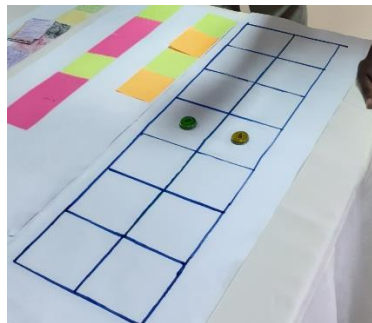
The child now realises that they need to count each object once. They do not skip objects anymore or don't count items twice. The **one-to-one correspondence** has been acquired. Objects can be counted by moving, touching, pointing or looking at them.

What is the **one-to-one correspondence**?

= the act of counting each object in a set once, and only once with one touch per object. Focus on what children **can do**, not on what they cannot.

Examples of playful activities:

- Simple board games: child A throws the dice and moves his counter (a bottle cap) as many steps as indicated on the dice. Then child B plays, and so on.
- Jumping game: moving around in class: "let's take 2 steps: 1, 2", "let's take 4 steps: 1, 2, 3, 4"



Picture 47 A simple board game. Each child plays in another row. They move their counter as many steps as the dice indicates. Who finishes first?

4. Resultative counting

Resultative counting means that children know that the last number they say when counting objects is the total or the quantity. So when you ask: "How many bottles do we have?" The child will count: "1, 2, 3, 4" and the child will say "we have 4 bottles".

What is the principle of cardinality?

Understanding that the last number used to count a group of objects represents how many are in the group.

Children now understand that:

- they should count each object once
- the last number mentioned gives the total
- each said number refers to a higher quantity (e.g., 5 is more than 4)
- Where you start counting, doesn't matter.
- Objects can be different.
- Each number has its own positions

Examples of playful activities:

- Counting and recording the number of children present for the attendance register during morning routine
- Form groups of 5 children.
- Games and worksheets with exercises like this: draw 4 mangoes, how many cows are in this picture?

5. Structured counting

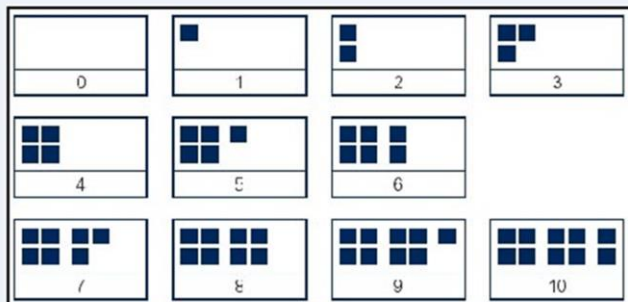
Counting is easier when the items you are counting are nicely arranged. Children now start grouping items in regular patterns while counting. E.g., when counting all children in class, the children go and stand in one line.

Examples of playful activities:

- Provide egg boxes to count items
- Model how to arrange materials when counting: e.g., when counting bottles or pencils, you arrange them neatly before counting.
- Use visual representation of quantities that are structured. Below is an example of how numbers till 10 can be represented (visualized). The structure (grouping per 4) helps to quickly count and even recognize quantities.



Picture 48 Counting is easier when you first arrange the materials nicely.



Picture 49 Dot or visual representation of the numbers from 1 to 10.



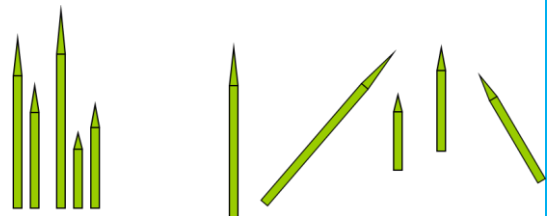
Picture 50 In the market corner the teacher used dot representation and the number symbol to indicate the price of the products.

6. Conservation principle

Children learn that a quantity does not depend on whether the items are spread out or nicely arranged, whether they are big or small. So 4 cows or 4 bottle caps, although the cow is much bigger, the quantity remains 4. To understand this, children need to be able to count many different types and size of objects. E.g., Bottle caps, matches, seeds, milk boxes, chairs, children, adults ...

Examples of playful activities:

- A variety of objects to count.
- A variety of spacing: Spread out or nicely arranged Provide egg boxes to count items
- Ask triggering questions: Are there the same number of chairs as seeds?



Picture 51 In both pictures there are the same number of pencils. Very young children think that when the pencils are spread out, there will be more pencils. They still need to acquire the conservation principle.

7. Flexible counting

Flexible counting is a more difficult skill for many children. Some children may only acquire some of these skills in Primary 1. It does not need to be acquired in pre-primary. This includes:

- Counting from a number different from one (e.g., "Let's count the windows in our class: 1, 2, 3. Oh, so we have 3 at this side, now let's have a look at the other side, we were at 3, so 4, 5, 6. We have 6 windows in our class!")
- Counting in 2's or 10's (or any other number)
- Counting backwards

Examples of playful activities:

- Games
- When you start an activity or a run contest: 3, 2, 1, start!

Activity 2:

Number sense

- What have you learnt about the development of counting?
- At what stage are the learners in your class?
- Is there anything you want to change in your teaching? What activities would match the level of your learners?

Activity 3:

Number sense

- Do you see opportunities for integrating number sense activities in other learning areas?
- How?

Activity 4:

After you have tried out some playful activities that help your children take the next steps in their development of counting, reflect on this:

- What have you tried out? What materials did you make?
- How did it go? How did the children respond? Were they learning? Could they do it independently?
- What would you want to change in the use of the material and the activity?

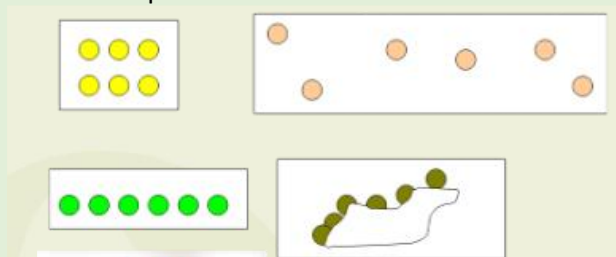
4.1.2. The development of number sense

Counting (see 4.1.1.) is only one element of number sense. To develop number sense the following steps need to be taken.

1. Subitising (recognising quantities)

Activity 5:

Look at the picture.



- How did you count? Or did you not count but recognised the number immediately?
- Which picture was easiest to recognise?

Recognise quantities is easier when the items to be counted are nicely arranged.

As children develop number sense, they also start recognising small quantities without counting. E.g., They see 2 pens, and say “two pens”. They do not need to count them. Subitising is easier when objects are nicely arranged. Children in grade 3 of pre-primary should be able to recognise quantities up to 5.

What is **subitising**?

= the ability to recognize the quantity of a small numbers of objects without counting.

2. Number bonds

What are **number bonds**?

= numbers that belong together to make a new number, e.g., for a total of 5, the number bonds are 1 and 4, 2 and 3, 3 and 2, 4 and 1, 0 and 5, 5 and 0.

Number bonds are very important in preparation of addition and subtraction. Again, it is important to let children play with concrete materials, to develop these skills. Do not go beyond number bonds up to 10 in pre-primary.

Examples of playful activities:

Children engage with materials.

- Make number boxes. The total of the box is written on the outside. Inside the box is divided in 2 spaces. Children add bottle caps, seeds, or bottles in each part to get to the right total.
- Dividing pants: each trouser leg ends in a different box. Children take a card from a pile which indicates a total number (up to 5). Children add counters in each leg to form the total number on the card. E.g., the card indicates 4. Children put 3 counters in the left leg, and then 1 in the right. They count the total. They form all possible combinations.



Picture 52 Number bond box. This box totals 5, the teacher has put already 2 in one side and the child will add 3 at the other side to make 5. Other bonds are 1 and 4, 3 and 2, 4 and 1, 0 and 5, 5 and 0. Each of these bonds can have a separate box.

3. The different meanings of numbers

Numbers do not only represent a quantity.

Activity 6:

Other meanings of numbers

- We use numbers for counting and quantities. But also for other things. Can you think of any other use of numbers in our daily life?

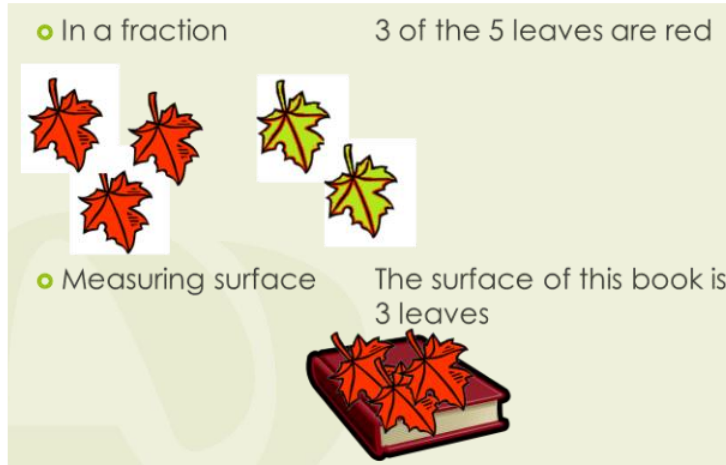
Numbers also have different meanings such as:

- Numbers as proportion (e.g., The size of something -shoe size 5-, the surface, a fraction -half of the bottle)
- Numbers for order (e.g., Who is the first, second, third)
- Numbers as a code (e.g., A combination lock, registration plate, MoMo pay, a telephone number...)

Examples of playful activities:

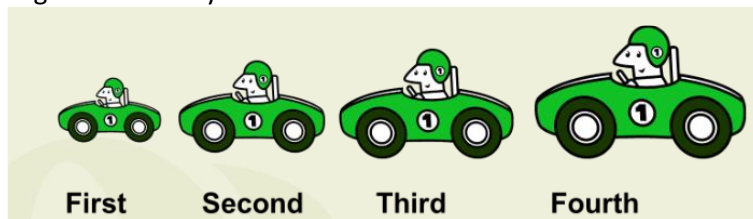
Bring the other representations in the corner play and numeracy activities:

- Numbers as proportion: In Discovery of the world: Comparing leaves: Colour and size. How many leaves do we need to cover this book? And how many leaves from the other plant do we need?



Picture 53 Numbers in fractions (2 out of the 5 leaves are green) or numbers to measure area/surface.

- Numbers to represent rank or order: use terms as first, last, second in activities and games. Order 5 children from short to tall. Who is first in the row, who is last? Let the children organise their toy cars. Which is fourth?



Picture 54 Ranking size by using numbers.

- Numbers as a code: make children aware of registration plates while walking through the village, let them copy one. Bring in credit cards in the shop corner.



Picture 55 Examples of numbers as a code.

Activity 7:

Other meanings of numbers

- Do you have any additional ideas about how to bring other meanings of numbers (besides quantities) into your daily class practice? Share with your colleagues.
- In which learning areas could this fit?

Activity 8:

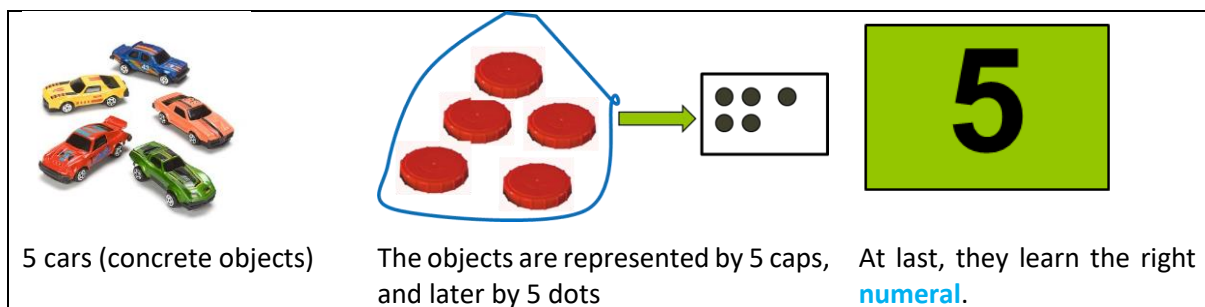
After you have tried out some playful activities that help your children take the next steps in their development of number sense, reflect on this:

- What have you tried out? What materials did you make?
- How did it go? How did the children respond? Were they learning? Could they do it independently?
- What would you want to change in the use of the material and the activity?

4.1.3. The representation of numbers

Number sense also includes the representation of a given number or quantity in writing. This does not mean that we ask children to copy numbers from the board.

Children learn from concrete over pictorial to abstract. Children start with counting and manipulating concrete materials. Then they also learn that this quantity can be “written” or represented. They first learn how to represent by dots (they draw 5 dots when the quantity is 5). Later they write the number symbol or numeral.



Picture 56 Example of the development of number sense, from concrete objects over dot representation to the numeral.

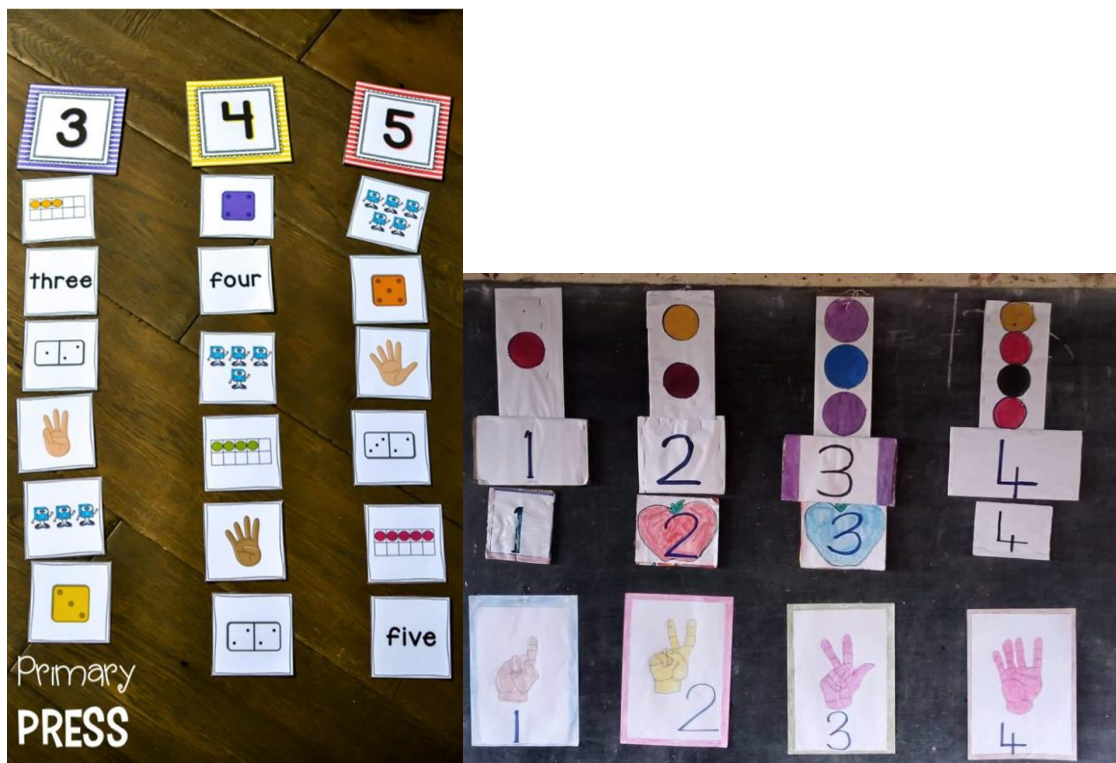
So, the numeral (symbol 5) is the end of the learning, not the start. It should always be representing a quantity. Dot representation next to the numeral should be continued from pre-primary to primary 1.

Examples of playful activities:

Select a **number of the week**, write it in the middle of a poster together with the dot representation (2 dots). Together with the children, search and collect examples of quantities that fit this number (e.g., focus on “2”: children might identify that they have 2 ears, that a bicycle has 2 wheels, the class has 2 windows, ...). Add a drawing of each example to the poster.



Picture 57 Example of number of the week activity. In this example the focus number is 5. Children collect examples of 5: five fingers on a hand, 5 circles in the Olympic symbol, 5 dots, a star with 5 points, 5 seeds in an apple,



Picture 58 Examples of representation of numbers: the numeral, the dot representation, number of fingers, sign language, By always combining these representations, children develop number sense.

Activity 9:

Number representation

- How could you work on number representation in your numeracy lessons?
- Do you see opportunities for integrating number sense activities in other learning areas?
- How?

Activity 10:

After you have tried out some playful activities that help your children represent numbers, reflect on this:

- What have you tried out? What materials did you make?
- How did it go? How did the children respond? Were they learning? Could they do it independently?
- What would you want to change in the use of the material and the activity?

4.1.4. How to stimulate the development of number sense?

In the previous parts we looked at how counting develops, how numbers can be represented and how number sense develops, besides the counting. Each of these included playful approaches which teachers can use. In this part, we make the link with the Competence Based Curriculum and give an easy overview of how you can teach number sense.

By the end of pre-primary, children should be able to:

1. Count in the right order from 1 to 20
 2. Count, read and write numbers from 1 to 10
 3. Add, subtract and divide real objects not exceeding 10
- (REB, 2015)

How to do this in grade 1?

In **grade 1**: key unit competence: Use numbers in songs, poems and short games:

- Sing counting songs
- Use counting rhymes
- Play games using numbers: clap in your hands, ...
- Count children during morning routine
- Provide children with lots of materials which they can count. Help them count (keep the development steps in mind, observe where children are. See 4.1.1., and trigger them to take the next step by doing the activities listed).

How to do this in grade 2?

In **grade 2**: key unit competence: Count, read and write numbers from 1-5

- Do what is listed under grade 1. Pay more attention to the correct sequence of the numbers.
- Count with children concrete objects (e.g., number of children, number of windows, bottles, ...). Let them do the counting.
- Observe where children are in the development steps of Counting described in 4.1.1. and trigger them to take the next step by doing the activities listed.
- Introduce the numerals (number symbols): to begin write the numbers from 1 to 5 on the board or in the sand outside. Read and show each numeral as you count.
- Build number sense for individual numbers from 1 to 5:
 - o Introduce a number of the week, e.g., 2.
 - o Introduce the numeral (number symbol) but always combine with the dot representation, e.g., 2 dots
 - o Collect objects in the selected quantity (e.g., 2 chairs, 2 pens, 2 beans ...)
 - o Make number posters (see 4.1.2.) representing concrete objects in the selected quantity. E.g., 2: draw two eyes, two apples, a bike with 2 wheels ...
 - o Try if children can do number bonds when the number sense for the selected number is acquired: e.g., 2: I have already 1 banana, how many do I need to have 2 in total? Do this with concrete materials (no sums on paper!)
- Show children how to write the selected number.
 - o Let children count concrete objects which represents the number you want to teach, e.g., 1
 - o Write the target number on the blackboard
 - o Invite pupils to observe how the number is written and the lines which compose it, the direction to follow: "e.g., it starts here, we go up, then down": follow the shape with your finger (trace) while you describe it.
 - o Ask the pupils to repeat the number while tracing the number.
 - o Ask the pupils to write the number in different places, in the air, on the board, in the sand. Let them practice. Children can mould numbers out of clay, cut numbers out of paper, glue bottle tops in the shape of numbers, line up stones to form numbers and other tasks beyond paper and pencil work.
- Play board games, give tasks that relate to counting (e.g., "for the next activity you need to form groups of 5" ...)
- Bring numbers in all the corners: e.g., Make credit cards to pay or momo codes in the shop corner, add numbers to the houses in the small world/role play corner, go and check the address of the school (street number, house number) ...



Picture 59 Writing numerals by using pebbles.

How to do this in grade 3?

In **grade 3**: Key unit competences:

1. Count, read and write numbers from 1 to 10
 2. Add subtract and divide not more than 10 real objects
- Do what is listed under grade 1 and 2. Pay more attention to the correct sequence of the numbers.
 - Count with children concrete objects (e.g., Number of children, number of windows, bottles, ...). Let them do the counting.
 - Observe where children are in the development steps of Counting described in 4.1.1. and trigger them to take the next step by doing the activities listed.
 - Help them to count from any number not just from the number one (**flexible** counting). E.g., Keza counted 5 stones, but Maurice found another one. There is no need to start counting from 1 again. We can continue counting ...”..5, 6”. Or, if Maurice has a pile of 5 cards and adds two, there is no need to start counting the first 5 again. Instead he can continue to count “I had 5... six, seven”. So instead of counting all items, the child learns to count on. Later this concept will form the foundation of addition.
 - Introduce the numerals (number symbols): To begin write the numbers from 1 to 10 on the board or in the sand outside. Read and show each numeral as you count.
 - Build number sense for individual numbers from 1 to 10 (continue from what was done in grade 2):
 - o Introduce a number of the week, e.g., 6.
 - o Introduce the numeral (number symbol) but always combine with the dot representation, e.g., 6 dots
 - o Collect objects in the selected quantity (e.g., 6 chairs, 6 pens, 6 beans ...)
 - o Make number posters (see 4.1.2.) representing concrete objects in the selected quantity. E.g., 6: draw 6 eggs in a box, 6 apples, 6 dots on a dice, ...

- Do number bonds when the number sense for the selected number is acquired: e.g., 6: I have already 1 banana, how many do I need to have 6 in total? And what if I have 3 already? Do this with concrete materials (no sums on paper!)
- Show children how to write the selected number.
 - Let children count concrete objects which represents the number you want to teach, e.g., 6
 - Write the target number on the blackboard.
 - Invite pupils to observe how the number is written and the lines which compose it, the direction to follow: “e.g., It starts on top, goes down and turns around”: Follow the shape with your finger (trace) while you describe it.
 - Ask the pupils to repeat the number while tracing the number.
 - Ask the pupils to write the number in different places, in the air, on the board, in the sand. Let them practice. Children can mould numbers out of clay, cut numbers out of paper, glue bottle tops in the shape of numbers, line up stones to form numbers and other tasks beyond paper and pencil work.
- Play board games; give tasks that relate to counting (e.g., “for the next activity you need to form groups of 6” ...
- Engage children in small mathematical challenges: how many groups of 5 can we make in our class (dividing), do we have enough pencils for all?, can you make your tower two floors higher? ...
- Bring numbers in all the corners: e.g., Make credit cards to pay or momo codes in the shop corner, add numbers to the houses in the small world/role play corner, go and check the address of the school (street number, house number), let children make invoices ...

In **annex 4** you will find example lesson plans for playful number sense activities.

4.1.5. How to stimulate number sense in the shop corner?

Activity 11:

Shop corner

- Do you have a shop corner in your class?
- How does it look like? How do children use it? What materials do you use?

1. Adjusting the shop corner to the number sense development stages

The shop corner is an ideal place to train the number concept and do simple arithmetic operations (addition and subtraction). A shop corner is one of many possible learning corners in an ECE classroom.






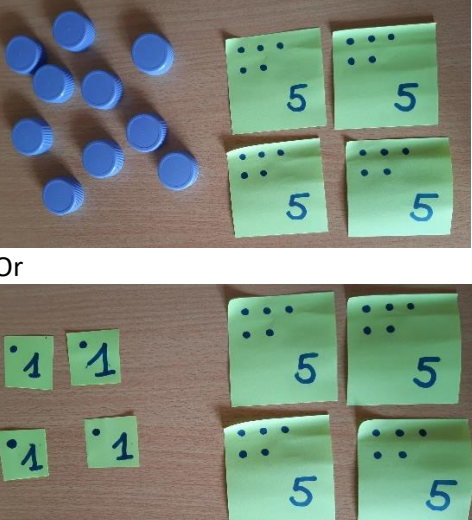
There are many **types** of shops:

- Shoes or dresses
- Grocery
- Bakery
- Books
- Fruit and vegetables
- Jewellery
- Hardware store
- It is also possible to have more unusual kinds of shops, such as a restaurant, a café or pub, a pharmacy, a market or a supermarket

If we want to use the shop experience for the development of number sense, we need to carefully think about how we adjust the ways how **money and price** are indicated according to the numeracy level of the child. There is no need to use real money.

Note that this part explains how to use the shop corner for the development of number sense. This does not focus on the development of the understanding and use of money as described in the CBS (see Measurement).

Table 2 Using the shop corner to stimulate number sense requires adjusting to the development of the child. Both the prices as the money need to change as children are developing number sense.

3 year old	4 year old	5 year old
<p>Prices can be represented by coloured cards or cards showing a symbol. No number symbols (numerals) need to be used.</p>	<p>Prices of items can be shown by dots on a small card.</p>	<p>Prices are shown using cards with dots and a numeral.</p>
 <p>A photograph showing four items on a wooden surface: a bag of Cafe de Maraba, a carton of UHT Whole Milk, a plastic bottle of INYANGE water, and a box of GREEN TEA. Each item has a colored paper tag attached to it, representing its price.</p>	 <p>A photograph showing the same four items as in the previous image. In front of each item is a small yellow card with black dots, representing the price of the item.</p>	 <p>A photograph showing the same four items. In front of each item is a small yellow card with black dots and a numeral: 8, 2, 1, and 5.</p>
<p>Money can be the same coloured cards as those used to indicate the price. Children swap 1 card for 1 item</p>	<p>Money can be counters or paper money with value 1. Children have to use the correct number of counters or paper money to buy items.</p>	<p>Money can be counters of value 1 and paper money of value 5. This allows simple additions and subtractions (giving change).</p>
 <p>A photograph showing several strips of colored paper (green, pink, yellow) laid out on a wooden surface, representing money.</p>	 <p>A photograph showing several blue bottle caps scattered on a wooden surface, representing counters of value 1.</p>	 <p>A photograph showing blue bottle caps (counters of value 1) and green paper strips with dots and the numeral 5 (paper money of value 5) on a wooden surface. Below the main image, the word "Or" is written, followed by another photograph showing the same items but with the numeral 1 on the paper strips.</p>

Activity 12:

Shop corner

- Why does the example above not use Rwandese francs, such as notes of RW1000, 2000, 5000?
- Do you see the different levels in the example above?
- How can you adjust your shop corner? Start making the money and show some pictures to your colleagues.

Answer: This shop corner specifically wants children to develop number sense (understanding quantities). The numbers must be at the level of the child. That is why all numbers stay below 10. By doing so, children can grasp the quantity, start making small “change” activities (which is addition and subtraction). When your shop is equipped with Rwandese currency, you are working on key unit competences in measurement.

2. How to play in the shop corner

There are different stages in playing in the shop corner. Each phase creates interesting learning moments for children and lots of playful experiences. Observe the level of your children, so you can adapt the play to their needs and interests.

a. Phase 1: Decide what to sell

- Look at available materials together with the children and let the children decide what will be sold in the shop. This can be based on the theme of the week.
- Sort the materials that will be used in groups that belong together.
- Possible materials can include empty packages of all kinds of items, such as food, biscuits, empty bottles (e.g., shampoo), etc.

b. Phase 2: Arranging things in the shop

3 year old	4 year old	5 year old
They cannot yet imagine what someone sees from another <i>perspective</i> . The shopkeeper may put things at the back from his point of view, but in front from the point of view of the customer. 3-year olds have to physically move to each position to find out how it will look from different perspectives.	The teacher can watch how it goes and let the children decorate the shop to make it pretty.	The children can arrange the shopping corner by themselves and make posters to decorate the shop (showing items on sale).


c. Phase 3: Decide on the price of each item in the shop

This is an important process as it helps children to understand value: prices depend on size, weight, At first the teacher does this together with the children (work in small groups). Later, children can do this themselves.

3 year old	4 year old	5 year old
The teacher shows the cards and explains how to use them.	Prices are limited to maximum 5. The teacher talks with the children about the price of the items. At this stage, children will often propose a price which is simply the number of available items (e.g., In the example above they will price the tea at "2" because there are 2 boxes of tea; 2 big bottles are assigned a price of 2 and 5 small bottles will be assigned a price of 5). It is up to the teacher to talk further with the children and ask why the small items should have a higher price than the big items.	A maximum price of 10 can be used. The teacher decides with the kids what the price of items will be depending on <i>weight, content, length, value</i> , etc. All these are important mathematical concepts.

d. Phase 4: Play the game

The first time the teacher will sell and some children buy. Next, the children sell and the teacher buys. Finally, children sell and buy and play alone in the corner. The teacher encourages children to check whether all items are paid correctly.

3 year old	4 year old	5 year old
They swap 1 thing for 1 card. E.g., they give a yellow card to the shop owner and receive a box of tea.	They buy 1 item and pay the correct amount using a 1 – 1 relationship. To help the children there can be a card with dots on the table so that children put a counter (or card) on each dot. 	They can buy 2 or more items at a time and pay the sum. An abacus or pencil and paper or card with 10 dots can be used to help work out the amount to pay. With 5-year olds there can also be change to be paid back by the shopkeeper.

e. Phase 5: Evaluating the game

Teacher and children can have a conversation about their play.

3 year old	4 year old	5 year old
They can tell their experiences when playing the game.	Teacher can ask what they bought and if they have some money left.	Teacher can find out how much money they have left and what they could still buy. Maybe children have ideas to make the shop bigger and nicer? Children can also make items for sale themselves or go and collect them.

Activity 13:

Shop corner

- Are you ready to play shop with the children in your class? Get ready and go for it.
- How did it go?
- What would you do differently?

Note: We refer to age here to differentiate between different development levels. Children develop at different paces (e.g., Some children learn to walk when they are 10months, others when they are 18 months). The level of development is not defined by the age. The teacher needs to accommodate those different levels, possibly by grouping per level.



Picture 60 The market corner in action.

4.2. Measurement skills

Activity 14:

Measuring

- What activities do you currently do regarding measuring?
- What is measuring?
- How do you think it develops?

By the end of pre-primary, children should be able to:

1. Sort out and group things based on a given criteria such as colors, shapes, usage, nature, etc.
2. Use appropriate terms when comparing things and arranging objects according to their length, weight, volume and size
3. Differentiate days of a week and willingly follow daily schedules and weekly timetables both at home and at school; - Sequence events in their periods of happening, e.g.: yesterday, we drew a car, today we have learned a song, and tomorrow we will play football.
4. Prove that he/she knows the value of money through using and keeping it well
5. Measure things using traditional methods (e.g.: stride, feet, hands) not exceeding 10 times; (REB, 2015)

4.2.1. Key concepts children need to develop

1. Classification

What is classification?

= is dividing into classes or sub-classes based on specific characteristics and being to explain why. E.g., the children with skirts stand in the front, the children with shorts in the back.

- Characteristics used can be positive (presence) or negative (absence, e.g., Bottles without a cap). Introduce negative characteristics (e.g., The absence of something) only to oldest pre-schoolers.
- Children can at first sort items without clearly stating what characteristic they are using.
- Young children sometimes move from one characteristic to another one while sorting (e.g., First sorting based on colour, then using shape or size as characteristic)

Examples of playful activities:

- Prepare materials that can be classified. Each box contains 1 set of materials that can be classified. Youngest children can use one characteristic (e.g., Small and big identical water bottles). Older ones can use two characteristics (e.g., Small and big identical water bottles of which the bottle caps have different colours; big and small leaves from a tree ...).
- Classification promotes logical thinking – **ask questions and talk** about what children are doing



Picture 61 A box which contains materials that can be classified according to different characteristics. It has 4 shapes, 3 colours, 2 thicknesses. You need 48 pieces in total ($4 \times 3 \times 2 \times 2$).



Picture 62 Self-made classification materials. It has 4 colours ((blue, green, yellow, red), 4 numbers of whiskers (1, 2, 3, 4), 2 sizes (big and small), 2 lengths of tail (short, long). You need 64 pieces in total ($4 \times 4 \times 2 \times 2$).

Activity 15:

Classification

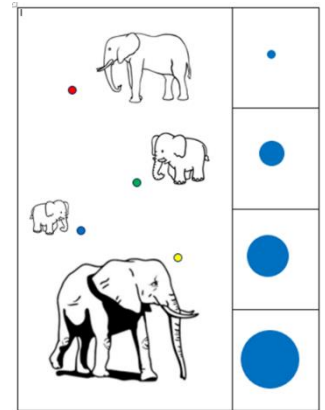
- Design some materials for classification. What game can you come up? Work it out and collect the materials.
- Take a picture and share with your colleagues.

2. Seriation

What is seriation?

= is ordering based on a certain characteristic that is changing, e.g., from few to a lot, from light to heavy, from tall to short or based on number value. The value can go up or down (e.g., small to big or big to tall).

- The youngest children need clear differences; older ones can deal with smaller differences.
- During seriation activities you can **introduce words** that indicate the order: e.g., *The first, the last, the middle one*. For older children, use also terms as e.g., *One but last, second one but last* (up to 10);
- Let children rank according to their own preference (e.g., rank fruit according to taste: what they like most/less.)



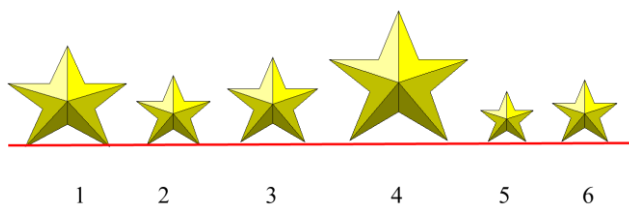
Picture 63 Example of a worksheet. Children connect the biggest elephant with the biggest dot.

Examples of playful activities:

- Make seriation boxes. Each box contains materials that can be ordered: e.g.



Picture 64 Seriation bottles: children will arrange from empty to full, or reverse.



Picture 65 Example of an activity in a worksheet for elder children. Which is the biggest star? Put them in the right order.

- Apply this skill in the shop corner: arrange items from cheap to expensive.
- Arrange books from small to big.

Activity 16:

Seriation

- Design some materials for seriation. What game can you come up? Work it out and collect the materials.
- Take a picture and share with your colleagues.

3. Conservation

Very young children think that items might be more when they are presented in another shape.

For example:



Picture 66 The conservation test. The child sees that the content of the two glasses is the same (step 1). One glass is poured in a taller, narrow glass (step 2) while the child is looking. The teacher asks the child which glass has most water (step 3). The child thinks that the tall glass contains more water. The same applies to a rope. The child might think that an unrolled rope is longer than the one rolled up. These children have not yet acquired conservation.

What is **conservation**?

= is the realisation that quantity is not dependent on spatial structure, such as place, shape, colour and distance.

Examples of playful activities:

Let children play with materials, let them count or measure materials that are represented in different ways. By doing so they can discover this principle.

- Water and sand table, provide a variety of cups and bottles to fill and empty
- Construction corner: provide blocks (e.g., Milk bottles) and let children arrange them in a box, or make a pile.

Activity 17:

Conservation

- Design some materials for seriation. What game can you come up? Work it out and collect the materials.
- Take a picture and share with your colleagues.

4.2.2. How to stimulate the development of measurement?

In pre-school, children don't need to be able to use the metric system (e.g., Centimetres, kilograms ...). They need to use natural units and start using the **language** that we need to measure. Measuring complements the development of number sense. It is important to let young children do lots of different measurement activities.

Activity 18:

Measurement

- How do you teach measurement?
- Can you share a lesson plan or an activity on measurement?
- Is there measurement integrated in other activities or learning areas? How?

1. Measurement activities

Note: Below we use the terms “young” and “older”. This doesn't really refer to age but rather to the development stage. Children develop at different paces (e.g., Some children learn to walk when they are 10 months, others when they are 18 months) and the teacher needs to accommodate all. Grouping per level can help.

Examples of playful activities:

Younger children

Children need to engage with and play with a variety of materials (different size, shape, weight ...)

- Children can play with full or empty bottles, fill up empty boxes and try to move them, play with lengths of ribbon or string, filling large pots with small cups of sand (different sizes), covering an area with papers, leaves, etc... of different sizes.
- The youngest children experience and get passive understanding of basic concepts such as *full – empty, heavy – light, wide – narrow, low – high, small – large and short – long*
- Let the children compare quantities or properties in a qualitative way and order them (e.g., Shape, colour, weight, feeling, sound, ...)



Picture 67 In this example, children measure the length of the ribbons against the red line on each box. They put the ribbon in the right box.

Older children

- Through ranking items with relatively small differences children become better at noticing and appreciating them.
- Somewhat older children discover relationship terminology through comparison of items, e.g., “Agnes is taller than Fred”, “this box is lighter than that one”.

- Use words *longer – shorter, heavier – lighter, bigger – smaller ...*
- Use words *longest – shortest, heaviest – lightest,*
- Rank according to size or from dark to light, hot to cold, tasty to not tasty.



Picture 68 This is a difficult ranking exercise which needs a lot of concentration: there are many pencils and all need to be arranged from small to big.



Picture 69 The children measured each other and indicate on the wall how tall they are. Each child puts their name or symbol and a ribbon or line which shows their length.

- Fill up areas in a drawing using paper pieces, stamps, paint ...
- Introduce concepts as *half full, not thin enough, as wide as.*
- They can also look at several characteristics at a time, such as *This book is bigger than that book but smaller than this book.*

Actual measuring:

- Use simple measures, such as:
 - o small and big steps to measure the size of the classroom: how many big steps, how many small steps)?
 - o how many children fit on a small carpet and how many puppets (or sheets of paper)?
 - o how many cups of sand fit in this bottle (small cups/big cups)?
 - o How many leaves cover the desk?
 - o How many blocks weigh the same as this doll?

- Use natural units chosen by the children, e.g., Measuring the classroom using giant steps or mouse steps, weighing things with a coat hanger balance, sticking different sizes of paper cuts on a balloon ...
- Especially for older pre-schoolers, start introducing measuring instruments (self – made)
- For area the cover method is most appropriate: e.g., How much tissues do we need to cover this table?



Picture 70 A self-made scale from a clothes hanger. Which is heavier, the shoe or the toy?



Picture 71 Children can measure themselves, using natural units, in this case bananas. Is there anyone who measures more than 6 bananas in class? Or less?



Picture 72 This bottle and other bottles are measured using a natural unit, in this case a block.

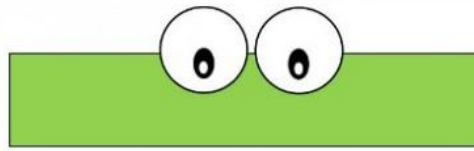
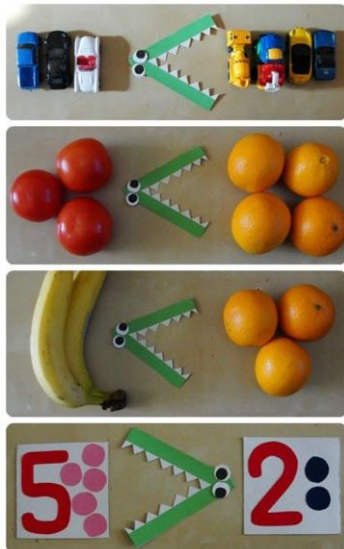


Picture 73 Self-made measuring tools.



Picture 74 measuring the outline of each child, using natural units such as blocks. How many blocks do we need with each child?

- Bring elements of measuring in the corners: A recipe in the kitchen, a menu with prices in the role play corner when children pretend they run a restaurant, ...
- Introduce symbols $>$, $=$, $<$ with eldest learners and grade 1 in a playful way only: Hungry crocodile who always eats the biggest or doesn't eat when it is the same ($=$ is mouth closed):



is equal to

Picture 75 Introducing symbols such as $<$, $>$ and $=$ in a playful way. The crocodile is hungry and always eats the biggest quantity.

Estimation:

- With measuring the idea of estimating can also be introduced: Ask the children before they measure how many times their measuring unit will go into the measurement (“How many steps do you think our class is?”).
- You can ask additional questions, such as “why do you think it is so many times?”
- After the actual measurement, compare the estimate with the measurement and ask questions such as “was it bigger / smaller, more / less?”, etc...

Activity 19:

Measuring

- What has inspired you in this part?
- What would you like to try out?
- Collect the necessary materials and start making the materials of your choice.
- How will you use this material?
- Take some pictures and share with your colleagues.

Activity 20

Measuring

- Do you see opportunities for integrating measurement activities in other learning areas?
- How?

2. Measuring time

Time is a difficult concept to grasp. You cannot see or hold time. The concept of time develops purely through experiencing time. So, we need to create opportunities for children to experience time and make them aware.

Examples of playful activities:

- Use calendars in the daily routines: see 2.2.2 and 2.6.1
 - o Day calendar: keep track of daily activities
For older children more complex calendars can be used with more sub-divisions.
With older children the link to clock time can be introduced by placing a clock at the centre of the calendar
 - o Week calendar: keep track of the days of the week.
 - Every day has a colour and symbol and a number
 - All teachers in pre-primary should use same symbols, colours
 - For older children: add the name of the day in writing
 - o Countdown calendar: count down to an event, a birthday, a celebration, the start of holiday.
- Make a timer: this tool consists of 2 connected containers. One side is filled with sand. By turning it upside down, the sand will start flowing from the top to the bottom. This takes time. When the top part is empty a specific period of time has passed. It can be used to help children see time pass. It could be used to indicate the time available for an activity (e.g., when the top part is empty, we stop this activity")
 - o Take two empty plastic bottles of equal size.
 - o Punch a hole in the centre of the lid of each bottle.
 - o Glue the lids together.
 - o Put sand in one of the bottles
 - o Screw both bottles onto the lids.
 - o Timer is now ready.
 - o Period of time measured can change based on the size of hole and amount of sand.



Activity 21:

After you have tried out some playful activities that help your children take the next steps in their development of measurement, reflect on this:

- What have you tried out? What materials did you make?
- To which key competence does your activity relate?
- How did it go? How did the children respond? Were they learning? Could they do it independently?
- What would you want to change in the use of the material and the activity?

Key competences on “Measurement” per grade

In grade 1:

- To sort and classify things with the same attributes following given criteria.
- To compare two things according to their length and size
- To do activities in their appropriate time and use greetings appropriate to different times of a day.
- To differentiate money from other objects and talk about the importance of money.

In grade 2:

- To sort and pair objects according to at least two criteria of their choice
- To compare at least 3 different objects according to their length, height, size, volume and arrange them.
- To state freely days of a week, and use appropriate adverbs of time such as: yesterday, today and tomorrow.
- To differentiate coins from bank notes and use money- related terms used by sellers and buyers.

In grade 3:

- To sort similar objects according to at least two criteria of their choice
- To order at least three different things according to their length, height, weight, size and capacity.
- To list their daily and weekly activities and show appropriate behavior in respecting the schedule of activities on a daily schedule.
- To buy things using not more than 100 Rwf; state the importance of money and how to keep it safely.

(REB, 2015)

In **Annex 4** you will find an example lesson plan for a playful measuring activity.

4.3. Geometry skills

Geometry skills relate to all skills regarding shapes (circle, squares ...), patterns (a repetition of something like AABAAB or yellow yellow red red yellow yellow yellow red red), direction (left, top, down ...) and orientation.

Activity 22:

Shapes, patterns, direction

- What activities do you currently do regarding shapes, patterns, directions?
- What is shapes, patterns and directions?
- How do you think it develops?

By the end of pre-primary, children should be able to:

1. Differentiate shapes (rectangles, triangles and circles) and adequately use prepositions and directions to locate himself/herself and locate things.
2. Continue a pattern following a given example.

(REB, 2015)

4.3.1. Shape

Children can better develop the concept of shape when they can interact a lot with the shapes during free play and regularly search for the shapes in their environment. They start seeing differences before the age of 4, especially the difference between a rectangular and round shape. Later they start paying attention to more details and they obtain the language to describe.

Examples of playful activities:

- Let children play with a variety of shapes and compare them.
 - Use a variety of shapes, e.g., A triangle with 2 long sides and a short one or an angle greater than 90°). Use different types of rotation (not only side down).



Picture 76 A variety of triangles, with corners of different sizes and different rotations.

- Present non-examples of the shape to children, to better point out essential characteristics / attributes (e.g., Show a triangle with curved sides or rounded angles).
- When describing characteristics: Take into account the development of counting. Very young children might not be able to count sides/angles, ...

- Go on a shape hunt: Where can we find rectangles in our class? Do we have examples of circles?
- Make children aware of shapes when seeing them on a trip to the village.



Picture 77 Going on a shape hunt in the neighbourhood yields interesting examples, in this case, a church with lots of shapes.

Activity 23:

Shapes

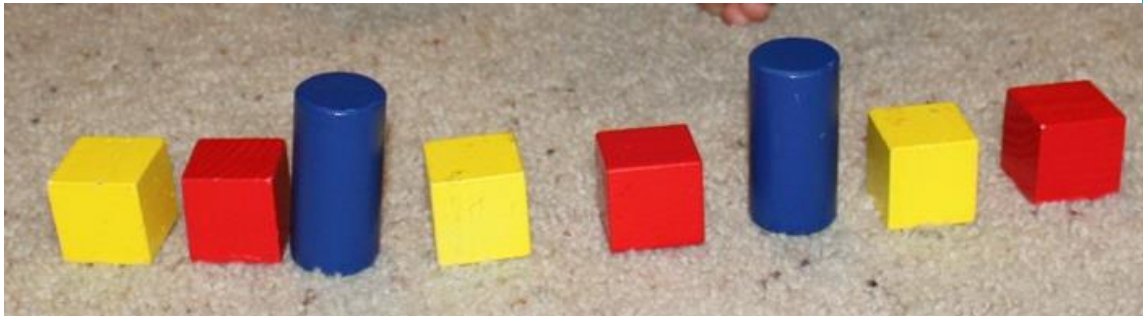
- What would you like to try out?
- Do you see opportunities for integrating shape activities in other learning areas?
- How?

4.3.2. Patterns

Patterns are mathematical structures. Children need to see the differences and similarities. Students' ability to change focus from counting individual items to identifying the structure of a group or unit is fundamental to the development of their number knowledge.

Examples of playful activities:

- Start with simple patterns for youngest children (e.g., Stringing beads of the same colour; putting blocks in a row)
- Increase complexity with simple repeating patterns (ABABA...)
- Let children continue more and more complex patterns and generate their own patterns.
 - o ABC (car, truck, plane, car, truck, plane)
 - o AABB (crayon, crayon, pencil, pencil, crayon, crayon, pencil, pencil)
 - o AAB (Mango, Mango, Banana, Mango, Mango, Banana)
 - o ABB (stomp, clap, clap, stomp, clap clap)



Picture 78 A pattern made with blocks: yellow cube, red cube, blue cylinder

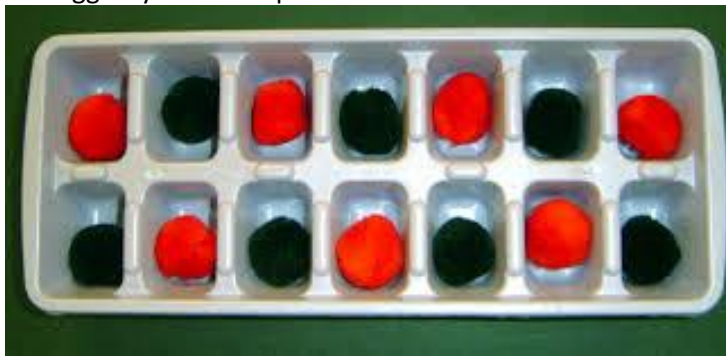


Picture 79 Patterns to be completed: what shape should be on the red line? Let children complete each sequence.



Picture 80 Patterns on clothes.

- Point out patterns in the surroundings, e.g., On clothes
- Make a pattern by doing something. "Let's make a pattern with how we **move**. Jump. Step. Jump. Step"
- Make a sound pattern with **rhythm** instruments. BANG, tap, tap, BANG, tap, tap. Start out by making a pattern and having the child copy you.
- Make a variety of patterns with bottle tops
- Use egg trays to make patterns



Picture 81 Egg trays are great for laying out patterns with bottle caps.

- Create patterns with objects you find in nature or everyday objects in the home
- Use coins to make patterns

How to make bottle cap string patterns?

- Collect as many bottle caps as you can and make wholes in the centre.
- Take a piece of string. Attache one set of the pattern on the string (e.g., For young children: 2 blue caps, 2 red caps; For older learners green-blue-red-red). Make a knot so the example pattern cannot fall off.
- Give the children a box with loose bottle caps and a box with model string patterns from which children can chose. Adjust the difficulty to their level.



Picture 82 Patterns with locally available bottle caps: green-blue-orange-red-green is the instruction sequence (it is secured with a knot); children then repeat this sequence.

Activity 24:

Patterns

- What would you like to try out?
- Do you see opportunities for integrating pattern activities in other learning areas?
- How?

Activity 25:

Patterns

- Can you solve this pattern exercise?
Arrange 4 colours so that,
Each colours occurs only one in each row
Each colour occurs only one in a block of 4 squares
- Could your children do this? Draw the pattern on a piece of cardboard. Attach the caps of the pattern to the cardboard or paper. Provide the children with loose bottle caps in the right colours to put in the empty spaces.

■		■	■
	■	■	
	■	■	■
■		■	

4.3.3. Orientation and direction

Children’s spatial abilities start from their own position in space. They start recognising certain landmarks and routes (e.g., How to go to the toilets). Engage children in movement activities that help them to develop concepts such as “under”, “behind” ... Use verbal descriptions of where you are going (first we go straight, then we will turn left) or where something is (you will find it in the box at the bottom of the pile”).

Examples of playful activities:

- Create an **obstacle course** inside or outside the classroom: Describe what children do “through the tire, over the hay stack, ...”



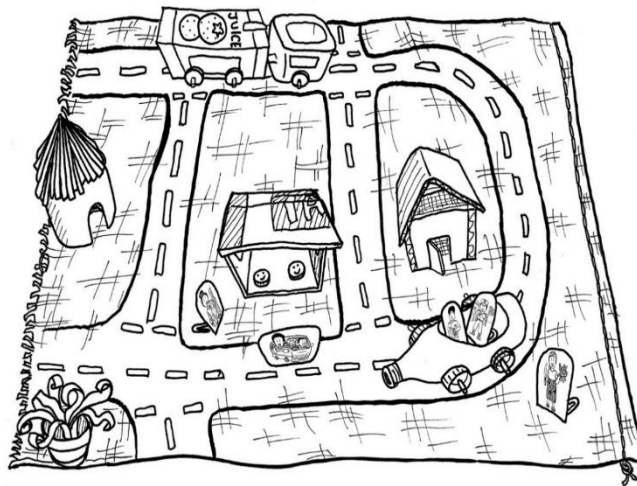
Picture 83 Obstacle course for children made from locally available materials.

- **Hide and seek:** Let children hide themselves, the others go looking “you were hidden under the table”, “behind the door”
- **Treasure hunt:** Hide something in the classroom, the children must search.
- **Stop-Move:** Children are like robots. They can only move when they get instructions or commands from “the computer. The instructions can be given by arrows and symbols such as “↑ = 1 step forward”, “→→ = 2 steps to the right”. This prepares children for simple coding activities, like those in Scratch.
- Go on a walk or **excursion** and describe where you are going.
- **Orientation boxes:** Two children have 2 **identical** boxes that are decorated, e.g., like a house. Child A and B sit opposite each other. Each child has a box in front of them. Child A positions a puppet in the room. Child A explains to child B where the puppet is in the room. The other one must try to place puppet in the same place. When ready, compare positions to see if it is right.



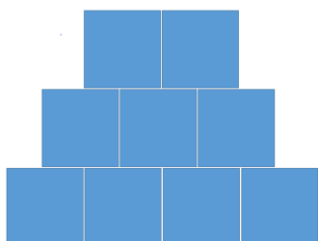
Picture 84 Orientation box. make 2 identical boxes and let children play in pairs, each has a box in front of them, but cannot see the box of the other child.

- Imagining other **points of view**:
 - o Older learners: Draw an object from the top. How would a car look like from the top? Or a jug?
 - o In the small world area (see 2.6.2.): Let children stand at opposite sides of the world. Child A gives instructions to child B on how to move the car.

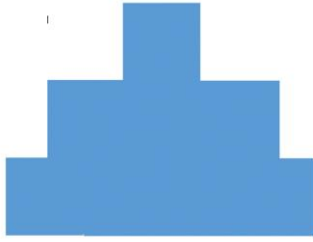


Picture 85 Taking perspective during playing in the small world: child A directs child B on how to move the car or truck.

- **Construction** corner: Playing with blocks:
 - o make a construction and make a plan of the construction you made
 - o make a construction based on a plan:
 - simple real size plan showing individual blocks
 - real size plan but not showing individual blocks
 - the plan is smaller than the actual blocks



Picture 86 A simple real size plan showing individual blocks.

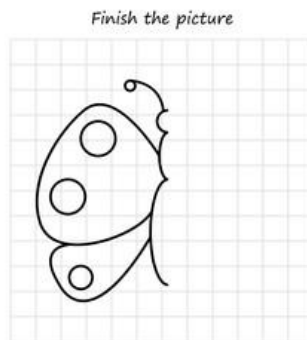
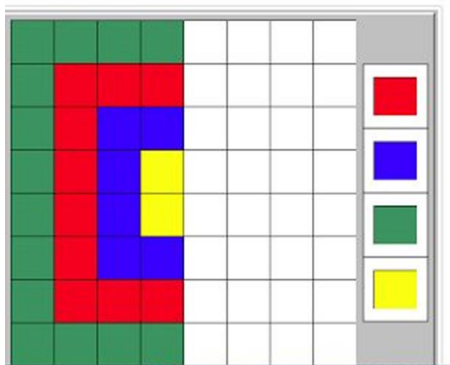


Picture 87 A real size plan but not showing individual blocks.



Picture 88 The plan is smaller than the actual blocks.

- **Symmetry:** (older learners): Ask learners to complete the drawing in a symmetrical way.



Picture 89 Symmetry exercises: completing the drawing in a symmetrical way.

Activity 26:

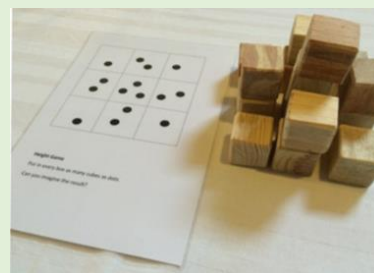
Orientation and direction

- What would you like to try out?
- Do you see opportunities for integrating orientation activities in other learning areas?
- How?

Activity 27:

Patterns and direction

- Can you solve this orientation exercise?
Take a set of building blocks (like milk boxes) and build the tower based on the instruction.
- Could your children do this?



Activity 28:

After you have tried out some playful activities that help your children take the next steps in their development of geometry skills, reflect on this:

- What have you tried out? What materials did you make?
- How did it go? How did the children respond? Were they learning? Could they do it independently?
- What would you want to change in the use of the material and the activity?

Key competences on “Geometry” per grade

In grade 1:

- To identify the location of things using appropriate prepositions

In grade 2:

- To locate things/people using appropriate prepositions
- To make rectangle, triangle and circle shapes using different objects
- To discover the patterns in the arrangement of objects they are given and to continue the same patterns according to the given example

In grade 3:

- To draw, build and talk about square, triangle, and circle.
- To use appropriate prepositions to identify where things or people are located and use prepositions and directions in reading and writing activities and in their daily life.
- To make patterns of their choice from simple to complex patterns or follow the teacher’s example; find patterns in their daily life: day/night, daily schedules, colors in the clothes, etc.

(REB, 2015)

In **Annex 4** you will find an example lesson plan for a playful geometry activity.

4.4. Assessing numeracy in the learners

Assessment is gathering information on the learning of children. In pre-primary assessment is done in an informal way, e.g., By observing, by asking children to do something, by looking through the child's work. This is how teachers get an idea about what learners know and can do. Assessment is an integral part of teaching and learning and it informs the teaching and learning.

4.4.1. The teacher as observer and documenter

Activity 29:

Assessment in pre-school

- How do you assess your learners?
- For what do you use the information you collect?
- Can you give a concrete example on how you have used the assessment?

In Chapter 2.3 we discussed the role of the teacher in a pre-primary learning through play environment.

The teacher as observer and documenter. Observing and documenting are both part of **assessment** practices. Observation is the only way how assessment in pre-primary can be done.

In pre-primary there is no period for exam, there are no tests. Assessment is done progressively through observation. Assessment is holistic and qualitative rather than quantitative. Children are compared to developmental standards/milestones rather than to one another. So, the assessment serves as a way to record progress in the child's development.

Teachers can observe children's progress on a **daily basis**, and for more formal record keeping also at **middle and end of each term**. The information gathered helps teachers to **adjust** learning environment, activities, materials or interactions.

4.4.2. How to observe and document?

In this part we will discuss:

- Daily/weekly assessment practices
- mid-term and end of term assessments, which lead to a progress report
- self- and peer assessment by children

We will then look at how all of this leads to the child's file. Also, we will look at how the assessment of the progress of children can help the teacher to adjust class practices.

1. Daily or regular observation

When children engage in learning through play activities, the teacher takes a step back to observe the children's **wellbeing and involvement**. By observing, the teacher learns more about their interests and needs. Through observation, teachers connect children's interests and needs with the curriculum contents and goals. Observation forms the basis for differentiation according to children's interests and needs.

What is wellbeing?

Children with a high level of wellbeing enjoy pleasure and radiate vitality as well as relaxation and peace. They adopt an open, receptive and flexible attitude towards their environment. These children show a high level of self-confidence, they feel good about the way they are. They have the courage to be themselves, to stand up for themselves. They know how to handle life, they can deal with unexpected events.

Children show:

- Pleasure and enjoyment
- Vitality
- Relaxation and inner peace
- Open, receptive and flexible
- Spontaneous and comfortable
- Self-confidence and self-esteem

This can be scored* as follows:

1. **Red**: The child has a difficult time
2. **Yellow**: The child often does not feel okay
3. **Blue**: The child feels more or less okay
4. **Green**: The child often to always feels great

**The process-oriented child monitoring system (Laevers e.a., 2012) uses a 5-point scale which was adapted here to fit the REB recommendations regarding progressive assessment and reporting.*

What is involvement?

Children with a high level of involvement are highly concentrated and absorbed by their activity. They show interest and will complete a task with fascination. That is why they tend to persevere. Their mimic and posture indicate intense mental activity. They fully experience sensations and meanings. A strong sense of satisfaction results from the fulfilment of their exploratory drive. When there is involvement, we know children are being positively challenged, they are operating at the very limits of their capabilities.

Children show:

- Deep concentration
- High interest and motivation
- Intense mental activity
- Deep satisfaction
- Operating at the limits of one's capacities

This can be scored as follows:

1. **Red**: The child hardly engages in activities
2. **Yellow**: The activities are often interrupted
3. **Blue**: The child is busy, but seldom absorbed
4. **Green**: The child is often to mostly intensely engaged

**The process-oriented child monitoring system (Laevers e.a., 2012) uses a 5-point scale which was adapted here to fit the REB recommendations regarding progressive assessment and reporting.*

Observing wellbeing and involvement gives teachers an immediate idea of children's learning. When children have high wellbeing and involvement, they are learning. When it is low, children are not learning.

The teacher can do:

- Spot checks while all children are in corner play and observe selected children. This can lead to immediate small interventions or adjustments. Example: a teacher can observe the children in the construction corner. The teacher observes that 2 children are not highly involved. They look a bit bored. The teacher adds a challenge to the construction corner or additional materials that trigger the attention and involvement of the 2 learners.
- A systematic observation of all children in a period of time. This means that the teacher specifically observes wellbeing and involvement of all children and records this information. By analysing the results, the teacher can see whether the classroom practices need adjustments.

Activity 30:

Observing wellbeing and involvement

- Look again at the description of wellbeing and involvement
- Observe a child in your class and describe its levels of wellbeing and involvement
- Why did you select the score?
- What will you do to improve wellbeing and involvement?

After observation, the teacher analyses the results and adjusts the learning environment, activities, materials or interactions.

Children with either wellbeing or involvement scoring level 1 or 2 are not doing well, and are in risk of not learning. This needs actions by the teacher. Children with level 3 for wellbeing and involvement, need special attention. They might be at risk.

An example:

During corner time, teacher observes that Hyacinthe is lowly involved in the construction corner. Hyacinthe doesn't seem to be interested in the blocks and cars and trucks. The teacher brings the dolls to the construction corner and asks Hyacinthe to build a doll house. This triggers her interest. Her involvement goes up immediately!

In this example, the observation of wellbeing and involvement helped the teacher to identify the child's interests and needs and responds to the child's learning with meaningful impulses. **The child will learn more in those areas that are triggering its interest, that are more relevant and meaningful.**

Below is a form which can help you to observe wellbeing and involvement.

Wellbeing and involvement observation tool

No	Name	Age	Sex	Wellbeing					Involvement					Observation notes	
				?	1	2	3	4	?	1	2	3	4		
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															

Besides observing wellbeing and involvement, teachers can also observe **specific learning outcomes or progress in learning areas**. This can happen throughout the day and activities as you work with children and take note of what they do and say.

An example:

in large group discussion on the topic 'materials we have at home', the teacher notes down which children can actively participate in the discussion, and which children do not participate or respond to the question.

Tips for observation

- It is good to always have paper and pen ready to take some notes.
- Remember that observation notes should be factual and objective (e.g., Don't write "Alezia is bored." But "Alezia repeats the same action while looking outside the window.")
- You may observe one child over a period of time and jot down what you see and hear at the time.
- To use observations to assess (see later) children's learning, teachers should write them down.
- To be useful, observation notes should be objectives and factual

Some examples of observation notes:

Grade 1: Free play and Morning routine

Alezia points to her name card and says "That is my name."

Assessment: Alezia recognizes her symbol name card.

Grade 1: Arts corner.

Arthur draws a tree and says "Trees have leaves. They are green. They also have fruits."

Assessment: Arthur can make a drawing and describe what he draws. He makes short sentences.

Grade 2: Group activity

Keza counts the number of children in her group (6) and collects 6 pencils, one for each.

Assessment: Keza can count till 6 and uses one-to-one correspondence.

2. Mid and end of term assessment: progress report

Also, the mid and end of term assessment can be based on observations and a tool can be used. The assessment covers the six learning areas based on **specific expectations** according to the curriculum:

- Discovery of the world
- Numeracy
- Language and literacy: Kinyarwanda and English
- Creative Art and Culture
- Physical Development and Health
- Social and Emotional Development

To assess progress on each of these learning areas, teachers systematically observe children and **collect evidence**. Such evidence can be found in observation notes (see above), children's work in the portfolio, in pictures or recordings of children's actions, or during specific, but meaningful and contextualised real-life situations created by the teacher where a child is challenged to apply certain competencies. Rubrics and checklists can be used. These are all assessment tools which can be adjusted based on the content/learning objectives of a fixed period of time, e.g., a week, a term.

Periodically, the evidence is then **analysed to evaluate** where the child situates itself **against fixed performance criteria**. This is recorded in the **progress report**. The progress report uses a colour coded system. This is also used to communicate clearly with parents:

- Green: the child is consistently skillful in this area;
- Blue: the child is making more progress, but has not yet mastered the skill;
- Yellow: the child continues to work on these skills and is starting to develop this skill;
- Red: the child will benefit from support to further develop these skills; the skill has not been yet observed.

Activity 31:

Progress report

- Do you already keep progress reports of the children in your class? How do these look like?
- What would you like to change?

Below is an example of a progress report which covers the key learning steps or key competencies for numeracy for 3 to 6 year old learners.

ACADEMIC YEAR

GRADE: 3

TERM

Child's name:

Teacher's name:

Green

The child is consistently skillful in this area

Blue

The child is making more progress but not yet mastering the skill

Yellow

The child continues to work on these skills and is starting to develop this skill

Red

The child will benefit from support to further develop these skill, the skill has not been yet observed

	NUMERACY Key competences	Colour	Observation	Interpretation and comments
Numbers	Classifying: Sort and classify things with the same attributes following given criteria such as colours, shapes, nature, ...			
	Classifying: Differentiate and name colours			
	Classifying: Compare and sort quantities and size			
	Classifying: Sort and pair objects according to at least two criteria of their choice			
	Counting: Use numbers in songs, poems and short games			
	Counting: Match numbers to real objects/quantities			
	Counting: Count in the right order from 1 to 10			
	Counting: Read and write numbers via body movement, writing in sand, paint, others from 1-5			
	Counting: Read and write numbers via body movement, writing in sand, paint, others from 1-10			
	Operations: Add, subtract, and divide real objects, not exceeding 10			

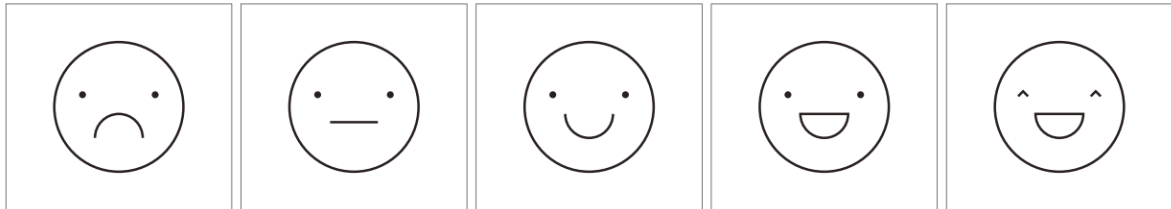
	NUMERACY Key competences	Colour	Observation	Interpretation and comments
Measurement	Compare two things according to their length and size, eg. Differentiate big/small/long...			
	Compare at least 3 different objects according to their length, height, size, volume and arrange them			
	Order at least three different things according to their length, height, weight, size and capacity			
	Use appropriate terms when comparing things based on given criteria such as colours, shapes, usages, nature, ...			
	Measure things using traditional methods (e.g., stride, feet, hands) not exceeding 10 times			
	Money: To differentiate money from other objects and talk about the importance of money			
	Money: To differentiate coins from bank notes and use money- related terms used by sellers and buyers.			
	Money: To buy things using not more than 100 Rwf; state the importance of money and how to keep it safely			
	Time: To do activities in their appropriate time and use greetings appropriate to different times of a day.			
	Time: State freely days of a week, and use appropriate adverbs of time such as: yesterday, today and tomorrow			
	Time: to list their daily and weekly activities and show appropriate behaviour in respecting the schedule of activities on a daily schedule. E.g yesterday we drew a car, today we learned a song, tomorrow we'll play football			

	NUMERACY Key competences	Colour	Observation	Interpretation and comments
Shapes and directions	To identify the location of things using appropriate prepositions E.g., the crayons are in the box on the bottom shelf, walk to the end of the room			
	To locate things/people using appropriate prepositions			
	To use appropriate prepositions to identify where things or people are located and use prepositions and directions in reading and writing activities and in their daily life.			
	To differentiate shapes (rectangles, triangles, circles)			
	To make rectangle, triangle and circle shapes using different objects			
	To draw, build and talk about square, triangle, and circle.			
	To discover the patterns in the arrangement of objects they are given and to continue the same patterns according to the given example			
	To make patterns of their choice from simple to complex patterns or follow the teacher's example; find patterns in their daily life: day/night, daily schedules, colours in the clothes, etc.			

3. Self and peer-assessment by children

Engaging children in assessment is very important. It helps them to identify their own strengths and weaknesses. Self-assessment activities help learners to self-adjust their learning methods to satisfy expected learning objectives and minimum requirements.

The teacher can ask children to indicate at the end of an activity how they perceived that activity, using the symbols as shown below: from left to right unhappy, neutral, good, happy, very happy.



Children can also help with the assessment of the work done by other learners. What do they think about a product? Do they have ideas on how to improve it? This is a great way of developing social and communicative skills, as well as cognitive skills. Teachers can help children to be appreciative and constructive in their feedback.



4. Child's file

The assessments are documented in the child's file. A child's file contains the following:

- one written anecdotal **observation of each child per term**, this can include observations on wellbeing and involvement
- some copies of **children's work (or the full portfolio)**,
- notes from meetings with parents,
- **children's assessment reports** for the month/term/year
- **Progress report** of each child for teacher's use

5. Reflection and adjustment

Assessment of children's wellbeing, involvement and learning progress is only useful if the information is used to adjust teaching practices.

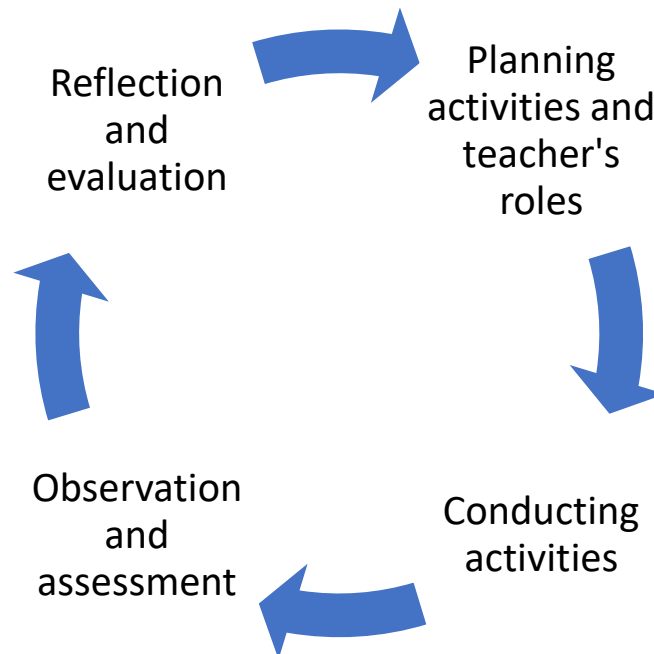


Figure 4 Reflective process: Plan - Do - Observe - Reflect

Adjustments based on observation can happen immediately, while the activity is still happening or afterwards for future activities and systematic learning environment adjustment.

Activity 32:

After you have tried out assessment practices as described in this chapter, reflect on this:

- What have you tried out?
- How did it go?
- What have you learnt from the analysis of the assessment information?
- How will you change your class practices to better respond on the needs of your children?

Further learning about this chapter

There are other materials that can help you to learn more about this topic.

- Rwanda Education Board (2015). Curriculum for pre-primary school from 3-6 years, Ministry of Education, Republic of Rwanda.
- Rwanda Education Board (2015). Teacher's Guide for Pre- Primary Curriculum. Inyoborabarezi ku Nteganyanyigisho y'Uburezi bw'Inshuke, Ministry of Education, Republic of Rwanda.
- Rwanda Education Board (2016). Teacher's Guide for Pre- Primary Curriculum. Inyoborabarezi ku Nteganyanyigisho y'Uburezi bw'Inshuke, Ministry of Education, Republic of Rwanda.
- Rwanda Basic Education Board (2020). Numeracy in pre-primary schools grade 1, 2, 3. Teacher's book. Imibare. Amashuri y'Inshuke: Igitabo cy'Umwarimu, Umwaka wa 1, 2, 3. Ministry of Education, Republic of Rwanda.
- Rwanda Basic Education Board (2021). A handbook for new teachers in Rwanda, Kigali.
- Twigire Mumikino Rwanda (VSO) Schools App: Module 3: CBC; Module 8: School readiness; Module 12: Assessment

Chapter 5: How to continue to improve in learning through play?

In this chapter you will learn:

- to use child observation and reflection tools for improvement and continuous learning
- to can collaborate and learn with and from peers
- to improve your practices via try out and reflection on your try out (=iteration)

In the previous chapters you learnt about Learning through play and numeracy. You have tried out and made changes in the way how you arrange your class, the materials you use, the activities you organise and the way how you interact with children. Congratulations for trying out new things!

And now? Are you finished? No. Improvement is a continuous process. Improvement starts from reflection.

5.1. Reflecting and adjusting based on observations and reflections

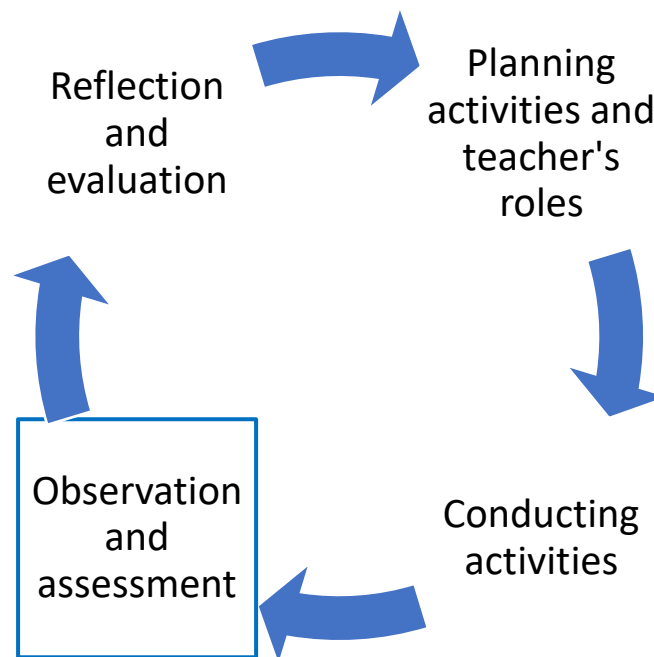


Figure 5 Reflective process: Plan - Do - Observe - Reflect

It is important to reflect on what you are doing and how it is going. Which information can you use?

1. Assessment of children's wellbeing, involvement and learning progress

Observing the children in the classroom can tell you most on how to further adjust your practices. See chapter 4.4. On how to assess children's wellbeing, involvement and learning progress.

2. Analysis of the set-up of your learning environment

Use a reflection tool to assess your own practices. Or ask a colleague to help you. You can ask your colleague in advance to observe a specific point: what is it you would want to focus on? What is it you want input on?

- How did you set up the learning environment?
- How are materials used in your classroom?
- How do you interact with children?

You can use Part 1 of Annex 5.

3. Analysis of the characteristics of play

Are your activities and approaches:

- Joyful?
- Meaningful?
- Socially interactive?
- Actively engaging?
- Iterative?

You can use Part 2 of Annex 5 to assess whether your activities and approaches are playful.

4. How do you stimulate generic competencies during numeracy activities?

Through Numeracy activities many generic skills can be practiced. How do you stimulate critical thinking and problem solving? You can use Part 3 of Annex 5.

Activity 1:

Reflection and observation

- Try out each of the tools listed above.
- What have you picked up? Is there something you would want to change in your practice?
- Do you already keep progress reports of the children in your class? How do these look like?
- What would you like to change? Explain.
- How will you go about this?

5.2. Learning is easier when you do it together

Activity 2:

Learning together

- Have you learnt any professional classroom practice from your colleagues? What?
- Has a colleague learnt things from you? How?
- How did that feel?
- How did you learn with each other?

Together you know more than alone. Together you can find solutions for challenges you experience. You can inspire each other.

Here are some ideas on how you can do professional development in your school:

1. In your school/sector meetings:
 - a. **Share a case** from your classroom. Explain all steps: what have you observed, what barriers and challenges did you see, what have you changed. **Ask** colleagues for additional ideas. "I have tried this, but I would like your ideas".
Ask colleagues to do the same in the same or the next meeting. Make this a standard item on the agenda of each school meeting.
 - b. **Inspiration** sessions: Focus on one playful numeracy activity and share the lesson plan and materials. Have you thought of capturing some video or pictures to illustrate how it was done? Challenge each other to come with more creative ideas!
 - c. **Good practice** exhibition. All colleagues prepare a poster describing a successful change in your class, how it was initiated, what effect it had. Engage with the posters, ask questions and interact.
 - d. **Challenge and solution session**. Share a challenge and ask all your colleagues to generate solutions and ideas. Select some possible ideas. Discuss together how you can apply this in practice.
2. Peer observation:
 - a. Do you like **what a colleague is doing** in her classroom? Ask her if you may come and visit her class. Observe how she is applying a specific action point. Check how it impacts on the wellbeing and involvement of the children.
After the observation, discuss with your colleague what you have learned.
 - b. Would you like your **colleague's input** on what you are doing? Ask her to come and observe you in your class. Discuss with her what she should observe for you. Your interaction with children? The effect of you as a teacher on the wellbeing and involvement on some specific children? Learning through play?
After the observation, discuss with your colleague what she has observed. What can you learn from this? Can she inspire you with some next steps?
3. Communities of practice:

Do you know some teachers in your school or sector who just like you want to learn more about learning through play? This could be in pre-primary or primary, as learning

through play is relevant for both. Create a group and meet regularly. Together you can decide what the agenda of your meeting is. Maybe you want to help each other to develop some learning through play numeracy activities? Maybe you want to reflect and see how to further improve your class practice? You want to inspire each other?

How? You can do the same activities as described above It is all about **learning from and with each other!**

4. Professional learning visits:

Do you know about a school where great class practices are applied? Is this school prepared to host you? Go and have a look. The different approach of the hosting school might inspire you to tackle challenges that you also experience. Prepare your visit well in advance and **be clear on what you want to learn**. This will create the best learning opportunities. Don't forget to ask the school you visit how they learn with and from each other.

5. Internet and social media:

Have you thought of getting inspiration from the rest of the world? On YouTube and Pinterest there are many examples of pre-primary activities, classroom set up and materials. There are great resources and toolkits out there.

Have you considered discussing and sharing ideas with other teachers, all over Rwanda or the world? Use WhatsApp, Twitter or Facebook to connect and relate.

Don't forget to discuss your ideas for professional learning with your school leader who will support you in the implementation.

Activity 3:

Learning together

- What would you like to learn with and from your colleagues?
- How would you like to learn with and from your colleagues?
- Choose the way how you would want to learn together and get started
- Share the result of your learning with your trainer

Further learning about this chapter

There are other materials that can help you to learn more about this topic.

- Rwanda Education Board (2016). School-Based Mentor Program Framework, 2017-2022, Kigali.
- Rwanda Basic Education Board (2021). A handbook for new teachers in Rwanda, Kigali.

Chapter 6: How to engage with parents on learning through play?

In this chapter you will learn:

- why it is important to engage with parents on learning through play
- to show the benefits of learning through play to parents
- to encourage parents to do learning through play at home
- to improve your practices via try out and reflection on your try out (=iteration)

Activity 1:

Play and parents

- Have you ever had questions from parents about your teaching approach and class practice? What was it about?
- How did you deal with this?

Pre-school teachers and school leaders strengthen parental, family and community involvement in ECE in order to promote a conducive learning environment for young children in schools and their homes.

This part doesn't aim to elaborate on parent involvement and engagement but adds to existing guidelines on this topic with specific suggestions on **learning through play**.

6.1. Show the learning in play

Teachers know the value of play and parents see their children play at home. But sometimes parents don't expect the child to play at school, as they expect their children to learn. Parents and caregivers often think that learning should be teacher centred and focusing on academics only. When they see play in class they might be disappointed.

As a teacher it is important to:

- Explain what children learn during learning through play.
- Show parents what their child is learning while playing.
- Show parents how the teacher is deliberately creating learning moments in play (by guided play, by adding challenges to the play, by the type of play activities and materials the teacher prepares).
- Show learning progress of children
- Explain why learning through play helps children to develop holistically (as compared to teacher centred approaches).
- Engage parents in learning through play activities in school.

Activity 2:

Play and parents

- The mother of Maurice comes to fetch him and sees the children playing in corners. All children are doing numeracy activities. Maurice's mother says: "The children are just playing. Why don't you teach them to write numbers and sums? We pay school fees. Maurice needs to be prepared for grade 1 soon, and now the children are just playing."
- How could you respond to this?

Activity 3:

Play and parents

- Develop a poster that shows the benefits and characteristics of play. The charts below could help you.



Figure 6 Characteristics of learning through play.

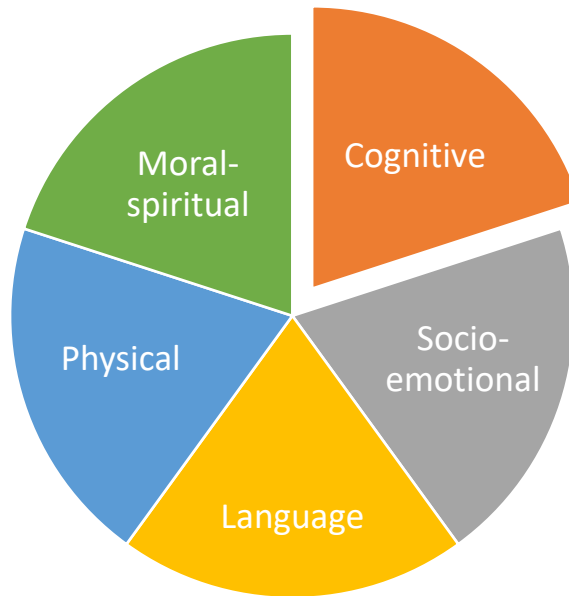


Figure 7 The 5 development domains as described in the Competence Based Curriculum.

It helps to have regular and informal conversations with parents. Invite them in your classroom or ask them for help. Maybe some parents can share come to class to share about their jobs? Other parents might want to help you to make play and learning materials? Other parents can help you do an excursion (e.g., Walk and visit a farm) or facilitate play activities in class (e.g., Teach some local dances)?

Activity 4:

Play and parents

- How could you engage parents in learning through play activities in your class or school? What help could they give you?
- Brainstorm some ideas.
- Select one idea and work it out.

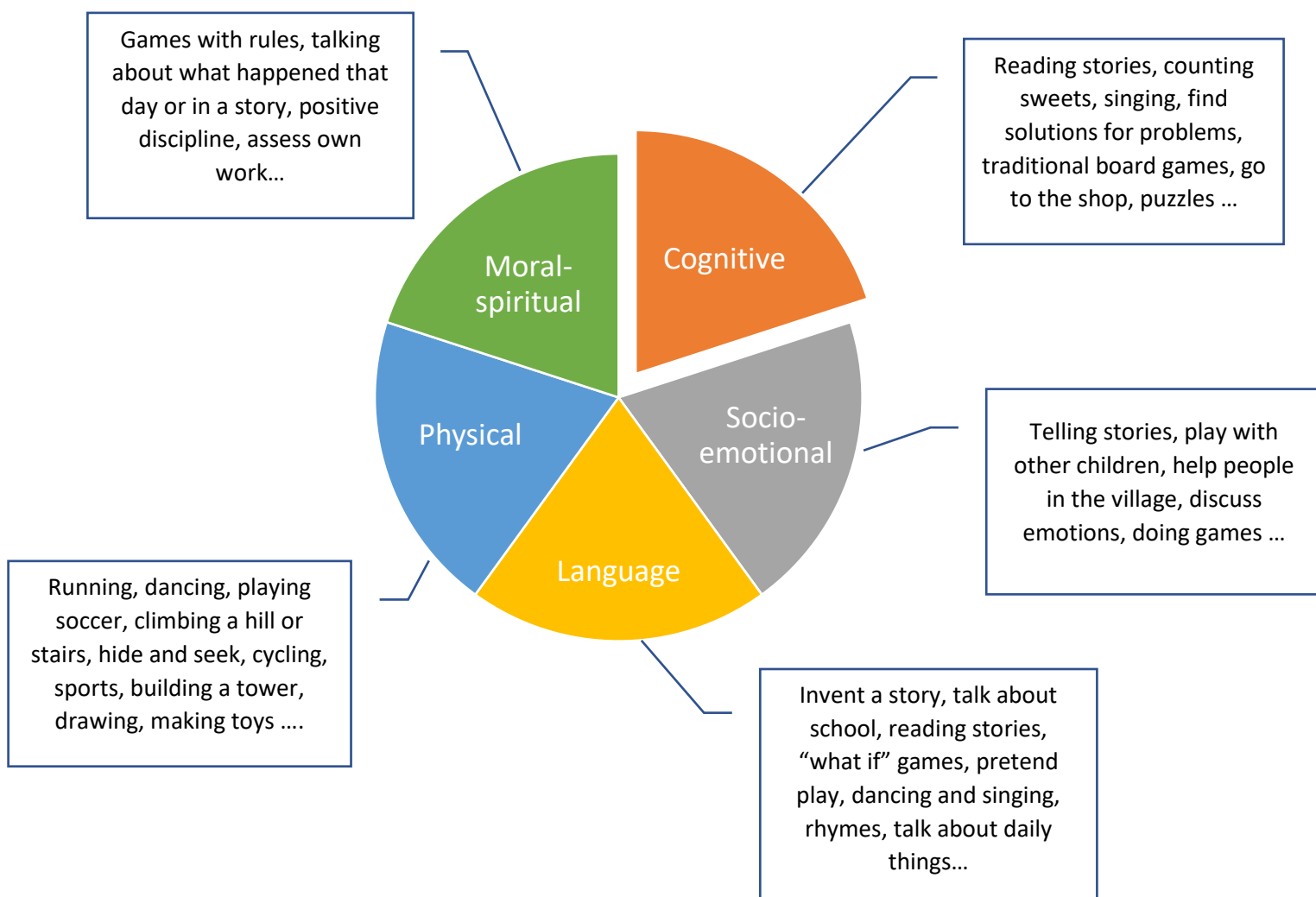
6.2. Stimulate play at home

After school time, children go back home. However, there is need to continue with the learning through play even at home.

To promote continued learning through play at home, teachers can:

- Explain to parents the value of play
- Show parents what children are learning through play activities
- Suggest playful activities parents can do with children at home

Some ideas on how parents can stimulate each development domain via playful activities



Singing and dancing:

- Promotes language development and promotes cultural, social, moral and spiritual identity
- Is a great way of bonding
- Can stimulate a lifelong interest in music
- Listening to music contributes to the wellbeing of a child (e.g., Relaxes the mind and makes child feel at peace and sleep ...)



Story telling:

- This can be existing traditional stories, stories from a book, or self-made up stories
- This stimulates a child's imagination, creativity and language development
- Is a great way of bonding
- stimulates their interest in books and future reading
- the ability to listen carefully is enhanced, learners learn to express their own thoughts (without inhibition or fear), and they learn to speak in complete utterances



Games:

- a variety of games such as hide and seek, board games, soccer, ... each have their specific learning objectives
- all development domains can be stimulated: physical, socio-emotional, cognitive
- children have fun and improve their self-regulation and self-confidence



Free Play:

- give children time to play freely, to invent their own games and play
- this stimulates self-confidence, agency and many other development domains
- make sure the space and materials they play with are safe and children know the rules (where may they play, with whom, how long, ...)



Numeracy in daily activities:

Each household has many numeracy related activities in which children can engage. With the guidance of parents these can be excellent learning through play activities. Some examples are:

- sorting laundry according to colour or type (e.g., put all socks together, let's first take all the white towels) (classification)
- arranging fruits or veggies according to size
- putting enough spoons on the table for the whole family (How many will we be? How many spoons do we need?)
- go to the market or shop together, speak about size, shape, weight, price of fruits and veggies.



Activity 5:

Play and parents

- Maurice's mother was very interested in your response. She understands the value of play. She asks: "Should Maurice play at home as well? How?"
- How could you respond to this?
- Look at the list of playful activities that can be done at home. Do you have other ideas? Which?

Further learning about this chapter

There are other materials that can help you to learn more about this topic.

- Rwanda Education Board (2016). Teacher's Guide for Pre- Primary Curriculum. Inyoborabarezi ku Nteganyanyigisho y'Uburezi bw'Inshuke, Ministry of Education, Republic of Rwanda.
- Twigire Mumikino Rwanda (VSO) Schools App: Module 13: Parental involvement.

Chapter 7: How can school leaders stimulate learning through play in my school?

In this chapter you will learn:

- key messages on ECE and learning through play
- to create an environment that enables learning through play
- to take different roles in supporting learning through play at your school
- to support professional learning on learning through play for teachers
- to encourage teachers to learn with and from each other.
- to coach and support teachers in their learning process
- to improve your practices via try out and reflection on your try out (=iteration)

Learning through play is a powerful approach that stimulates holistic development of all children in pre-school. Via learning through play teachers can help children to develop to their full potential.

But learning through play differs from traditional approaches to learning. It needs an enabling environment to materialise. It is important to give attention to teachers' professional development needs. It is also important that parents are on board.

This chapter targets school leaders primarily. Sections 7.3, 7.4 and 7.5 are relevant for school leaders and any person involved in or supporting the school in general and teacher professional development in particular, such as sector education inspectors, School Based Mentors, etc.

7.1. Key messages about pre-school education and learning through play

Activity 1:

Pre-primary school

- Are you an advocate for ECE?
- How do you see education in pre-primary in terms of activities, materials, learning environment and interaction?
- How do you support this?

1. General information of ECE in Rwanda:

Pre-primary education in Rwanda caters for children between 3-6 years of age. There should be three grades: Grade 1: 3-4 years children, Grade 2: 4-5 years children, Grade 3: 5-6 years children. Pre-primary education caters for the child's holistic development, that is physical, cognitive, social, emotional, language, moral and spiritual development to prepare a child to be ready for primary education.

The curriculum for pre-primary is Competence Based (CBC).

It concludes Six learning areas and the teaching should be based on the child's holistic development:

1. Discovery of the world
2. Numeracy
3. Language and literacy
4. Creative arts and culture
5. Physical and health development
6. Social and emotional development

2. Key pedagogical documents for teachers in pre-school:

1. National CBC pre-primary curriculum and syllabus
This shows the basic elements of what will be taught and how. It includes: the topics and units to be covered in each grade; the key competences children should develop, learning objectives, learning activities, how to assess the students' learning, the materials teachers need, and the time required to teach each lesson or unit.
2. Teacher guide
This guide contains information about the curriculum and how it can be implemented. It gives concrete guidance on teaching, learning and assessment in pre-primary. It gives ideas on how to make and use locally available materials, how to cater for children with special education needs and how to engage with parents.
3. Scheme of work
This is a breakdown of content into smaller parts to be taught over a given period of time. A scheme of work is drafted out for one term or a whole year, by dividing the content in the syllabus according to the number of teaching weeks available.
4. Class diary
This is a daily planning tool which the teacher uses to plan every lesson every day.
5. Daily and weekly plans that are based on themes, integrating all CBC learning areas
6. Children's attendance list or call register
7. Learner's progress records and portfolio
This shows the learners' progress and achievements in every learning area so that the teacher can address children's needs by adjusting activities, learning environment, interactions and materials used in class.
8. Assessment tools: teachers can use assessment tools to collect information about children's progress and learning (see examples in 4.4). Assessment can be done while observing children while they are engaged in activities. For example: teachers can observe how a child engages with a story book.

Additional documents (school administration):

9. The notebook for visitors indicates the services offered, dates and signature by the health worker.
10. Children's health cards
11. Children's registration forms include medical history, up-to-date immunizations, emergency contact
12. National Pre-primary Education Minimum Standards and Guidelines for Rwanda;

3. The importance of learning through play:

Playing is an essential part of pre-primary education. It follows the natural development paths a child takes from birth: learning through manipulation, exploration and self-drive. It builds competencies in all development domains and it helps to integrate learning objectives.

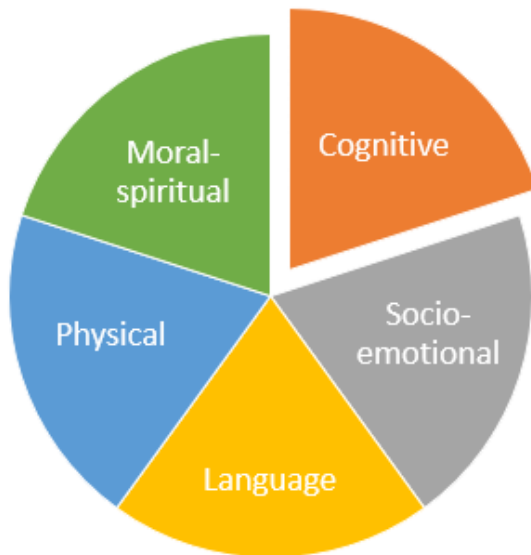


Figure 8 The 5 development domains as described in the Competence Based Curriculum.

4. Characteristics of Learning through play:

For play to lead to learning it needs to have the following characteristics:

1. Joyful: play motivates and creates enjoyment
2. Meaningful: Children find meaning in their learning by connecting it to what they already know.
3. Socially interactive: Children interact, communicate, build relationships.
4. Actively engaging: Children are deeply involved and not easily distracted.
5. Iterative: Children try, make mistakes, try again.



Figure 9 Characteristics of learning through play.

In Chapter 1 you can read what these terms mean. In Chapter 2 you can read more about how to organise learning through play. A class where learning through play is used, looks different from a class using traditional teacher-centred methods. There is more movement and even more noise and interaction. It is important that a school leader knows what learning through play is and understands how it can be done.

7.2. What is your role in learning through play at your school?

Activity 2:

Your role

- How could you support learning through play at your school? What is your role? Take the 5 standards for school leadership into account.
- Look at the list below and add additional ideas

Towards teachers	<ul style="list-style-type: none"> • Encourage teachers to engage in CPD on learning through play and try out and implement changes • Provide time for CPD on learning through play • Encourage collaboration and peer learning • Provide necessary resources for play materials • Encourage collaborative learning, such as in CoP on learning through play • include ECE in the school improvement plan, the work of SBM and the CPD plan • Monitor quality of education and documentation • ...
Towards children	<ul style="list-style-type: none"> • Guarantee the wellbeing of all children • Work with relevant services to cater for children's needs • Apply positive discipline; be positive and accessible • ...
Towards parents	<ul style="list-style-type: none"> • Sensitisation on children's wellbeing and development at home • Communication and interaction, participation • Advocate and demonstrate for learning through play in school and at home • ...

Activity 3:

The mother of Maurice comes to your office. She says: "I pay for my child, but I see he is playing in class. We pay you, Maurice needs to be prepared for P 1 soon, and now the children are just playing. I am not happy."

- How will you respond?
- Read Chapter 6 and see how you can enrich your response.
- Does Chapter 6 inspire you to other parents' engagement activities? What will you do?

Activity 4:

Teacher Molly enters your office. "I am worried about Jerome. When I observe his wellbeing and involvement, both score very low. He cries a lot and avoids physical contact. I see bruises on his arms. His mother told me that he falls a lot, but I am afraid it might be something else. What could we do?"

- How will you respond?

Activity 5:

Teacher Hyacinthe enters your office. "I am trying, really. It is numeracy. It seems like I just always make children count. We sing and dance and that is nice. They can count very well, but it is like a song. It doesn't look like they actually learn anything new. They are getting bored. I don't know how to help them take the next step in their learning. I just don't know how to teach numeracy in a playful way. Can you help me?"

- How will you respond?

Activity 6:

An ECE teacher is coming back from the ECE teacher training. He brings a very nice package with him: different resources, a manual and teaching and learning materials. The headteacher claims the package, because he wants to register the materials first. The ECE teacher would love to start using the materials and implement what he has learned. He is afraid that the package will not leave the headteacher's office anymore, now that it has been claimed by the headteacher.

- Which materials do you usually keep in the office?
- Which materials are used by teachers?
- Which materials can stay in the classroom?
- What is the best way to handle materials, if they are part of a capacity building trajectory?
- How will you respond?

Activity 7:

Teacher Karabo enters the headteacher's office with a challenge: She would like to have more storybooks, but she does not have the budget to buy books. Together with the headteacher she wants to discuss what role the community can play in providing more storybooks.

- How will you respond?
- What can be the role of the community? What is your role?

7.3. Creating an enabling learning environment for teachers' CPD

Although new knowledge and skills can be introduced during a training, a COP or a workshop or via reading this material, the actual learning takes place at school, in the classroom, where teachers try to implement what they have learnt. Attending a training on how to improve the language and interaction in the classroom is just the first step of the learning process for change.

Activity 8:

An enabling environment for teacher CPD on learning through play

- What could an enabling environment look like?
- What is it that you can do?

An environment where teachers feel **safe** to try out, where they can **take initiative** and own the changes they are making, where they **feel supported** and motivated, is called *an enabling learning environment*. The table below further explains which elements are essential in an enabling environment.

Activity 9:

An enabling environment for teacher CPD on learning through play

- Are you creating an enabling environment for your teachers to grow, where they can take initiative and lead their own learning, where they feel supported?
- Identify opportunities for improvement.

An enabling environment includes:

- Trust, safety and respect: Teachers trust their leadership and colleagues
- Shared or distributed leadership: Teachers may and can take the lead in the topics they have expertise in
- Cooperative culture: There is a habit of working and learning together
- Shared meaning, vision and mission: All teachers have a common understanding about learning through play
- Clear communication: There is clear communication about expectations, innovations and change
- Support throughout the whole process of change towards learning through play.

How can you create an enabling environment?

- Develop a school wide vision on learning through play in your pre-primary.
- Integrate school based CPD on learning through play in planning and monitoring.
- Identify learning and support needs of teachers.
- Create a learning culture which is conducive to collaborative learning, promoting enquiry and building capacity; teachers learn from and with each other. The school leader (Headteacher, deputy headteacher, SBM) supports learning by facilitating professional reflection (bring teachers together to jointly reflect on the teachers’ classroom observations of learners and subsequent actions) and problem solving. This can include learning from peers across schools.
- Space for teacher’s initiative; autonomy for teachers to try out new approaches and adapt existing plans and methods.
- Create a safe environment where teachers can share their worries, challenges and opinions and where teachers can try out, make mistakes, and improve.
- Do targeted monitoring of class practice (environment, materials, interactions, activities), document and celebrate successes towards higher wellbeing, involvement and participation in learning of all children. You can use tools as shared in Annex 5.
- Create practical conditions to implement by providing resources, materials, space and time for teachers to learn and develop.
- Apply support and coaching (see later).

Activity 10:

Teacher Constance enters your office. She is a teacher in primary 6. “I don’t know what teacher Immaculee (teacher ECE) is doing in her class. I never see these children sitting on their benches and writing in their notebooks. They are sitting in little groups and they talk. And sometimes they are even doing activities outside. Seriously, we are a school! What is all this about?”

- How will you respond?

7.4. Encourage collaborative learning

In this guide many new approaches and ideas are discussed. Applying these in the classroom means changing practices. Changing habits is not easy. Fortunately, teachers are not alone. They can work together. **Learning is easier when you do it together.**

- Teachers can share their experiences.
- Teachers can learn from the experiences from other teachers.
- Teachers can jointly develop, design and try out

Together teachers know more than alone. Together teachers can find solutions for challenges they experience. They can inspire each other.

As a school leader you can encourage teachers to work together and learn with and from each other.

Read Chapter 5 for more ideas.

Activity 11:

Teacher Constance has attended a training on learning through play. She is trying out some new activities but feels uncertain. You want to support her by encouraging collaborative learning. How will you do that? (Use the inspiration from Chapter 5).

7.5. Supporting and coaching

Another powerful method for CPD is a **coaching** conversation with a teacher after a class **observation**. This coaching conversation will be more powerful if it is complemented by some video recordings and if it has a clear **focus**.

Focus?

A key word in CPD in general and in coaching specifically is *focus*. The more specific the observation objective is, the more learning effect your observation and coaching will have. Remember that it is the person who is observed and coached who should set the objective. But this is done jointly.

An example:

The focus of today's observation with teacher Constance is the characteristics of learning through play during corner work. The school leader/SBM (coach) will not focus on classroom decoration, but specifically on whether all characteristics of play are in place. The school leader will use the Characteristics of learning through play observation tool and will note down examples.

7.5.1. Class observation

This class observation is not part of teacher assessment, but solely for teacher professional development. By doing class observations, school leaders/SBMs help individual or small groups of teachers in their professional development.

In the tables below you will find some points for attention and tips and tricks. You can also use this table as a check list.

Before the class observation:

- I create a comfortable, safe and friendly atmosphere, that focuses on learning. I clarify that this observation is not part of teacher's assessment.
- I work with teachers to identify their critical needs for support and coaching. I use this as a starting point for the observation and learning. The observation can also lead to identification of learning needs.
- We jointly agree on a clear learning and observation focus.
- We agree on the **observation tool** (or part of a tool) that will be used.
- I ask permission of the teacher to make some video recordings with the phone of the teacher which will be mainly used for the reflection meeting after the class observation.

Observation tool

An observation tool is a form that allows you to keep focus during observation. The tool needs to correspond with the objective for the observation. More focus will improve the learning potential of the TPD activity.

An example:

- In Annexure 5 an ECE classroom observation tool can be found. This tool provides guidance for observing all aspects of an ECE classroom (learning environment, playful activities, interactions, materials).

Both tools can be used entirely, or certain parts can be selected, depending on the objective of the observation and coaching activity.

During the class observation:

- I create a comfortable, safe and friendly atmosphere, that focuses on sharing, interaction and learning.
- I use the **observation tool** to observe.
- I observe the teacher's approach in relation to the children's actions (verbal and non-verbal).
- I write down what I have seen/heard (observations), not interpretations or judgements.
- I record short video clips that show good practices, but that also have potential for improvement.
- I am focused and present.

After the class observation:

- I thank the teacher for the observation.
- We agree on a moment to discuss the observation soon after the observation.
- I look through my notes (observations) and identify:
 - o Positive and good examples of learning through play practices.
 - o Opportunities to expand learning through play practices.
- I select video clips that have most potential for learning on the agreed observation focus.

Activity 12:

1. Plan a class observation with one of your teachers.
2. Use the text above to guide you.
3. After the observation you can use the points for attention and tips and tricks as your check list. What did you do well? What could you improve?
4. Formulate at least 3 actions: "Next time, I will...."

7.5.2. Coaching and support conversation

This conversation is not part of teacher appraisal or assessment. It is a very powerful tool in teacher professional development. The school leader helps individual or small groups of teachers reflect, identify points for growth and take the next steps in their professional learning and in their professional development.

Instead of giving direct instructions, a coach aims to unlock a person's potential to maximise their own performance. It is helping them to learn rather than teaching them. As a coach, **you don't need to give the answers**, nor solutions or advice. You actually help the person you coach to find answers and a way forward.

Before the coaching conversation:

See "After" Class observation

During the coaching conversation:

- I thank the teacher for the observation.
- I take time for the conversation and remain focused.
- In case of video coaching: We jointly watch video clips.
- I invite teachers to self-assess and state what they are satisfied with and what they are not satisfied about, regarding to the selected objective within learning through play practices.
- I share observations where relevant.
- I ask deepening questions. I relate the children's wellbeing and involvement the teacher's actions.
- I help teachers to keep focus and reflect deeply on what was observed. I am specific and use concrete examples that I have observed (action teachers and effect on children).
- I invite teachers to suggest how to change/adjust the learning through play practices.
- I help teachers to come to a specific and feasible way forward.
- I ask teachers what support they need for the next steps.
- I link the observation to further opportunities for professional development:
 - o I share and jointly discuss guides such as videos, lesson plans ...
 - o teachers get the opportunity to try out the suggested adjusted approaches
 - o teachers can observe a good practice of a peer (in school or district) who is more experienced in this area (e.g., This teacher is good in asking open ended questions)
 - o teachers can collaborate with other teachers to jointly learn more about selected topics
- I ask teachers how the coaching conversation was experienced. "Can something be improved in my approach?" "What should happen during the next observation and discussion, to make it a more worthwhile learning experience for you?"

After the coaching conversation:

- I create opportunities and timing for teachers to try out/practice new approaches.
- I link the observation to further opportunities for professional development:
 - o I share and jointly discuss guides such as videos, lesson plans ...
 - o teachers get the opportunity to try out the suggested adjusted approaches
 - o teachers can observe a good practice of a peer (in school or district) who is more experienced in this area (e.g., this teacher is good in asking open ended questions)
 - o teachers can collaborate with other teachers to jointly learn more about selected topics
- I follow-up implementation of what was agreed upon.
- I encourage and celebrate teachers' achievement.
- I reflect on my coaching by answering the questions in the box "activity".

This coaching conversation will be more powerful if it is complemented by some video recordings.

Video coaching

Video coaching is coaching that uses not only information noted by the observer during the observation but also video recordings. The conversation becomes more interesting because the teacher can also see what the observer (the coach, the school leader) has seen. The teacher can reflect more on what has happened, and the coach can listen more. By watching the video together, the teachers may realize points for further improvement by themselves.

Teachers can record themselves or ask a colleague or the coach to do so. The coach and the teacher can watch the video together and have a coaching conversation.

However, teachers do not always feel comfortable about being recorded.

What can you do?

- Ask *permission* of the teacher. Respect the teacher's choice.
- Use the *teacher's cell phone* for recording. By doing so the teacher remains the owner of the recordings.
- Record *short* clips that show good practices, but that also have potential for improvement.

Activity 13:

1. Plan a coaching conversation with one of your teachers.
2. Use the text above to guide you.
3. After the observation you can use the points for attention and tips and tricks as your check list. What did you do well? What could you improve?
4. Formulate at least 3 actions: Next time, I will....

Further learning about this chapter

There are other materials that can help you to learn more about this topic.

- Rwanda Education Board (2015). Curriculum for pre-primary school from 3-6 years, Republic of Rwanda.
- Rwanda Education Board (2016). School-Based Mentor Program Framework, 2017-2022, Kigali.
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Annexes

Annex 1: Stages in child development

Stages in child development from 1 to 3 year

Cut this table in pieces and match the terms and definitions.

3 Months	Follows objects with eyes 	Turns head toward sounds 	Holds head upright 	Smiles when you speak 	Reaches for objects 
6 Months	Babbles Ahahah... 	Rolls over 	Tries to get things out of reach 	Responds to caregiver emotions 	
9 Months	Mamama... Sits without support Babbles 	Picks up objects with two fingers 	Imitates sounds and gestures of caregiver 	Responds to own name Janett! 	
1 Year	Crawls and stands without support 	Says first words, waves "bye-bye" 	Searches for hidden objects 	Points to objects 	
18 Months	Walks supported by hand 	Says 2-3 words 	Feeds herself/himself with a spoon 	Where is your nose? Begins to point to body parts 	
2 Years	Uses short sentences Nice chicken! 	Bring me 2 papayas, daughter. Responds to requests 	Builds towers of 4 or more blocks 	Imitates actions of adults 	
3 Years	Plays with other children 	Pretends to feed the doll 	Groups similar objects 	Begins to dress and undress by her/himself 	Says first name and tells a short story 

Source: 2018, PATH, Kenya Ministry of health

Stages in child development from 4 to 8 year

4-8 year	4 years	5 years	6-8 years
Cognitive	<ul style="list-style-type: none"> May be able to count Can draw stick figures May be able to predict what will happen in a story May play simple board games Can name a few colors, numbers, and capital letters 	<ul style="list-style-type: none"> Draws more complex “people” Counts up to 10 things Can copy letters, numbers, and simple shapes Understands the order of simple processes Can say name and address Names many colors 	<ul style="list-style-type: none"> Can complete instructions with 3 or more steps Can count backward Knows left and right Tells time
Social and emotional	<ul style="list-style-type: none"> May play games that have roles like “parent” and “baby” Plays with, not just beside, other kids Talks about their likes and dislikes Pretends; may have trouble knowing what’s real and what’s pretend 	<ul style="list-style-type: none"> Is aware of gender Likes to play with friends Sings, dances, and may play acting games Switches between being compliant and being defiant Can tell the difference between made-up and real 	<ul style="list-style-type: none"> Cooperates and plays with others May play with kids of different genders Mimics adult behaviors Feels jealousy May be modest about bodies
Language	<ul style="list-style-type: none"> Can talk about what happens in day care or at school Speaks in sentences May recognize or say rhymes Can say first and last name 	<ul style="list-style-type: none"> May tell stories that stay on track Recites nursery rhymes or sings songs May be able to name letters and numbers Can answer simple questions about stories 	<ul style="list-style-type: none"> Can read books at grade level Understands speech and speaks well
Movement/Physical	<ul style="list-style-type: none"> Can hammer a peg into a hole Walks backwards Climbs stairs confidently Can hop Pours liquids with some help 	<ul style="list-style-type: none"> May be able to somersault Uses scissors Hops or stands on one foot for about 10 seconds Can swing on swingset Goes to the bathroom in the toilet 	<ul style="list-style-type: none"> Can jump rope or ride a bike Can draw or paint Can brush teeth, comb hair, and complete basic grooming tasks Can practice physical skills to get better at them

Source: <https://www.cdc.gov/ncbddd/actearly/milestones/index.html>

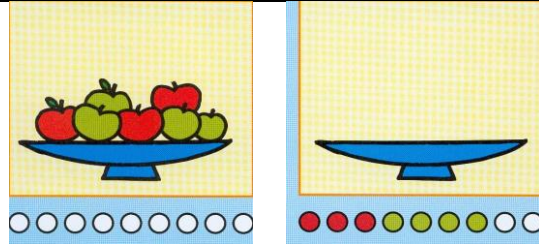
Annex 2: Gender terminology

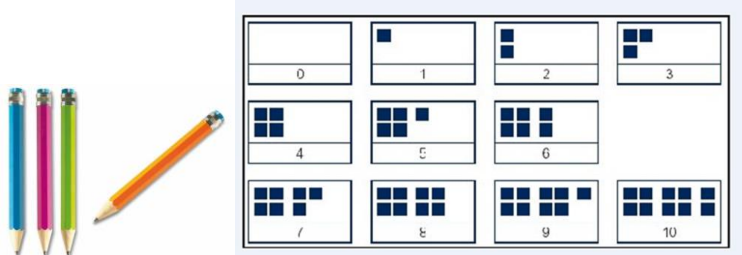
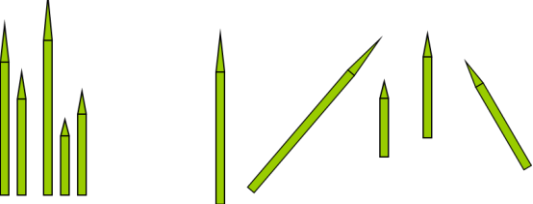
Cut this table in pieces and match the terms and definitions.

Sex	The assignment and classification of people as male, female or intersex, based on biological differences at birth.
Gender	The personal and social characteristics associated with being male, female, or a combination or neither.
Gender identity	A person's internal sense of being male, female, a combination or neither.
Gender roles	Activities, tasks and responsibilities ascribed to a group of people based on their sex. E.g., Men are police men; women do the laundry
Gender non-conforming	When a person does not conform to typical gender roles. E.g., A girl whistles, a boy cries, a woman plays rugby,...
Gender bias	An unfair difference in the way women or men, girls or boys are treated.
Gender stereotypes	Beliefs about the personal attributes, behaviours and roles of a specific social group, based on their sex. E.g., Women should take care of babies while men need to provide for the family.
Gender-based discrimination	Exclusion of a person from educational opportunities, meaningful careers, political influence or opportunities for economic advancement based on their sex. E.g., Women are not allowed to vote.
Gender balance	The equal participation of women, men, girls and boys in all spheres of society, including schools and the workplace.
Gender equality	The absence of discrimination on the basis of a person's sex and associated gender. This implies that society sees everyone as equal, regardless of their sex.
Gender equity	The process of being fair to women, men, boys and girls. To ensure fairness, measures must often be used to compensate for historical and social disadvantages that prevent women and men from operating on a level playing field. ¹¹
Gender responsiveness	Plans and actions that address the different needs and aspirations of women and men, boys and girls, or taking actions to correct or prevent gender bias and discrimination so as to ensure gender equality and equity.
Gender-responsive pedagogy	Teaching and learning processes that pay attention to the specific needs of girls and boys. The processes include lesson planning, teaching, organising and managing the classroom, and managing other forms of interaction.

Annex 3: Stages in the development of number sense

Cut this table in pieces and make this giant puzzle

Concept	What is it?	How can you do it? (Activities)
Acoustic counting	In acoustic counting the child learns the number words and the fixed order in which they occur	Songs Rhymes 1, 2, 3 my sister's name is Marie With her hands she can clap. With her feet she can step 1, 2, 3 my sister's name is Marie
Asynchronous counting	Child starts realising a link between quantity and numbers but is still missing principle of one-to-one correspondence It is important that: <ul style="list-style-type: none"> • Children use concrete objects at this stage. • each child must interact with concrete materials to train counting objects (not just watching others count) 	Interact with concrete objects, counting activities
Synchronous counting	Counting and pointing out objects by: <ul style="list-style-type: none"> • Moving objects • Pointing out • Only looking No longer skipping objects or counting objects twice One-to-one principle has been acquired.	Simple board games using counters or dice can help develop the principle of one-to-one correspondence. Movement helps, e.g., Living goose board
Resultative counting	You know that... <ul style="list-style-type: none"> • You can count every object only once. • The last mentioned = total. • The numbers are referring to always bigger quantities • The place you start doesn't matter • Objects don't have to be identical • How the objects are placed doesn't matter • Each number has his own position The principle of cardinality has been mastered.	

Concept	What is it?	How can you do it? (Activities)
Structured counting	Grouping objects into regular patterns while counting	
Conservation principle	<p>Spread out or nicely organised; small or big items: spacing or size has no impact on counting</p> <p>To acquire this, children need to be able to count many different objects, quantities, ...</p>	
Flexible counting	<p>Flexible counting is a more difficult skill for many children. Some children may only acquire some of these skills in grade 1</p> <p>This includes:</p> <ul style="list-style-type: none"> • Counting from a number different from one • Counting in 2's or 10's (or any other number) • Counting backwards 	<p>Games</p> <p>Start something: 3, 2, 1 start!</p>

Annex 4: Sample lesson plans for playful numeracy activities

1. Sample lesson plan 1: Numbers: Counting real objects, introducing number 5

Class	Academic year	Term	Week	Date	Duration	Class size
Grade 2						
Learning area	Numeracy					
Theme of the week	Institutions and occupations					
Unit title	Unit 1: Numbers from 1to 5					
Key unit competence	Children should be able to read and write numbers from 1 to 5					
Lesson title	Discovering 5					
Generic competences and cross cutting issues	<ul style="list-style-type: none"> • Critical thinking through Grouping objects according to the number previously learned, discover the new number • Peace and value education through making agreement on different ideas. • Problem solving through identification and read the learned number from other figures previously learned. 					
Instructional objective	Using one-to-one correspondence with visual/manipulative supports (Materials), learners will be able to count objects from 1-5 through collaborative play and song effectively. They will understand and build the concept of 5					
Learning materials	A box with bottles, a box with pebbles, a box with bottle caps, a box with pencils, a box with blocks.					
Type of Special Educational Needs to be catered for in this lesson and number of learners in each category						
Teaching and learning activities						
Timing and steps	Teacher activities			Learner activities		
Introduction 3 minutes Play "The Numbers Song"	– Play “The number song” Invite every learner to stand up and make sure teacher do the actions with the learners so that they can follow you and copy what you are doing. – Play with learners about numbers counting song counting			– Every learner stands up and do the same actions with teachers so that they copy what you are doing. – Learners sing the song of numbers Song" 1 – 2 then Jump! 3-4 then Jump! 4-5 then jump!		

	<ul style="list-style-type: none"> - Sing song and doing gestures and encourage everyone to do them with teacher. 	<ul style="list-style-type: none"> - Sing song and doing gestures with teacher. They sing and play by turning around, clap hands and jump!
<p>Development of the lesson (25 min)</p>	<p>Counting items (1-4)</p> <ul style="list-style-type: none"> - Invite learners to sit down in 5 groups so that they are facing teacher. - Each group gets 1 box with counters (group 1: A box with bottles, group 2 : A box with pebbles, group 3 : A box with bottle caps, group 4 : A box with pencils, group 5 : A box with blocks) - Invite learners to take from their box, "2 caps/blocks/pebbles/...". Help them to count as they take the objects. Write number 2 on the blackboard while you give the instruction. Let children count the items they took from the box again. - Let the learners put the materials back in the box. - Repeat with number 1, and 3 - Invite learners to take from their box, "4 caps/blocks/pebbles/...". Help them to count as they take the objects. Write number 4 on the blackboard while you give the instruction. <p>Introducing "5"</p> <ul style="list-style-type: none"> - "Now we have counted to 4, but what comes after 4?" Start counting "1...2...3...4....?" Wait if one of the kids can say "5". Write number 5 on the blackboard while you describe how 5 is written. - Invite learners to take from their box, "5 caps/blocks/pebbles/...". Help them to count as they take the objects. - Let children in their groups make piles of 5 items from their box, until all items are used. How many are left? <p>Classroom touch</p>	<p>Counting items (1-4)</p> <ul style="list-style-type: none"> - Learners sit down on the circle facing teacher - Learners take the number indicated by the teacher from the box and count as they do. - Learners count the materials they took out again "1...2" - Learners put materials back in the box. <p>Introducing 5</p> <ul style="list-style-type: none"> - Learners take 5 items by the teacher from the box and count as they do. - Learners make more groups of 5 items. <p>Classroom touch</p> <ul style="list-style-type: none"> - Everyone stands up and touches five books!", "five pencils!" five crayons, five shoes, etc). - Collect and clean up materials - Go and sit in a circle.

	<ul style="list-style-type: none"> - Invite everyone to stand up and then the teacher shouts out classroom objects for the learners to run to and touch (e.g., T: "Five pencils!" five crayons, five shoes, 5 children etc). - Ask children to put all materials back into the box and sit in a circle - This can also be done outside <p>The number 5 poster</p> <ul style="list-style-type: none"> - Take a poster/flip chart and write number 5 in the middle - Ask children if they have examples of things that come in 5s? You could trigger the thinking by showing your hand: how many fingers do I have? 5, so a hand has 5 fingers. Let me draw a hand on our poster? Can you think of other things that have five? (examples: A family of 5, someone just turned 5, a foot with 5 toes, a cow with 5 spots, ... - If some ideas come, draw them on the poster. If children don't have ideas, no problem. Hang the poster on the wall and actively collect ideas with the children in the coming days. <p>Ask everyone questions about learnt numbers (1...2..3...4...5)</p>	<p>The number 5 poster</p> <ul style="list-style-type: none"> - Learners think of examples of 5 in their neighbourhood/environment.
<p>Conclusion 2 minutes</p>	<ul style="list-style-type: none"> - Ask children to keep looking for examples of number 5 - End with the same song, emphasise the number 5 	<ul style="list-style-type: none"> - Learners sing the song of numbers Song" 1 – 2 then Jump! 3-4 then Jump! 4-5 then jump! Learners sing the counting song again from 1 to 5 (with all the actions such as counting, clapping, jumping) to conclude the action part of this lesson topic.
<p>Teacher self-evaluation</p>		

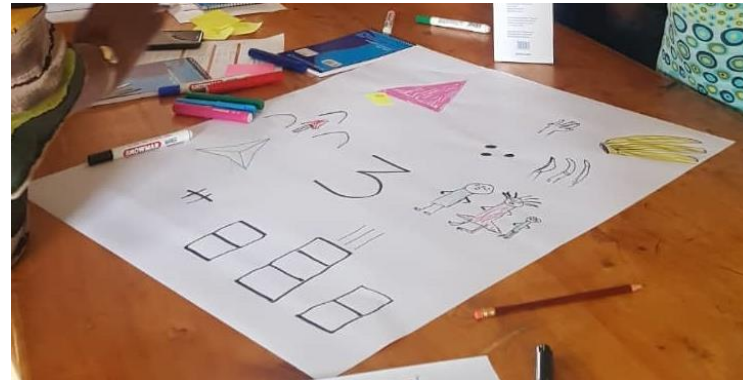
Guidance and further ideas for this lesson:

1. Keep activating the thinking of children about things of 5. E.g., A car is parked at the school that has a 5 in the registration plate, or the office building has 5 windows, or there are 5 dots on the dice, or 5 leaves on a flower. Collect items and tape them or draw them on the poster.

Ideas for following lessons

2. Once children have a good number sense up to 5, organise your shop corner as in Chapter 4: 4.1.5. Playing in the shop corner with the money as described in 4.1.5. Will help children to further develop their number sense.

Example of the materials: Example of a number 5 and number 3 poster: The poster represents items from real life that connect to “5” (or “3”). The poster for “5” uses pictures, but the teacher and children can also draw the items by hand, see example below for “3”.



2. Sample lesson plan 2: Numbers: matching quantities and numeral (number symbols)

Class	Academic year	Term	Week	Date	Duration	Class size
Grade 2-3						
Learning area	Numeracy					
Theme of the week	Food and drinks from plants and animals					
Unit title	Grade 2: Unit 1: Numbers from 1 to 5 Grade 3: Unit 1: Numbers from 1 to 10					
Key unit competence	Children should be able to read and write numbers from 1 to 5. Children should be able to count, read and write numbers from 1 to 10.					
Lesson title	Matching different representations of quantities (pictures of real objects, pictorial representation and numerals)					
Generic competences and cross cutting issues	<ul style="list-style-type: none"> • Critical thinking through relating objects of the same number through number memory game. • Peace and value education through making agreement on the same matching cards of the same equal numbers in value. • Gender equality and equity through having equal opportunity of playing the game and same role both girls and boys. 					
Instructional objective	Memory game approach. Children will find the matching pairs. Each pair consist out of a picture of real objects and a numeral or pictorial representation of the same quantity. E.g., 1 pair: card A has 4 chickens, card b has 4 dots and the number 4 written on it.					
Learning materials	Memory card game : A set of cards in the theme of animals. Numerous pairs. Each pair consist out of a picture of real objects and a numeral or pictorial representation of the same quantity. E.g., 1 pair: card A has 4 chickens, card b has 4 dots and the number 4 written on it. <ul style="list-style-type: none"> • Each set needs to be made on durable material (cardboard or laminated cards). Each card must have the exact same size and shape and must have the same neutral back side. • There must be a full set for each group. • See under “differentiation” for different levels of difficulty. • See below for examples. 					

Type of Special Educational Needs to be catered for in this lesson and number of learners in each category	Adjust to specific class context. Differentiation: Memory card sets can be easier or more difficult depending on: <ul style="list-style-type: none"> - Number of pairs in the set (less sets is easier) - Maximum number of quantities: for younger learners only use up to number 5 - Symbols used: dot representation combined with numeral or only numeral (more difficult) 	
Teaching and learning activities		
Timing and steps	Teacher activities	Learner activities
Introduction 5 min	Mingle mingle game: “When I say mingle mingle, you walk around the room and say hi to your friends for a short while . Keep moving! Then I will say a number and you will have to get into groups of that number as quickly as you can ! instructions can be mingle mingle by 2,3,4,5,...”	Play the game by moving in room and follow instructions of the teacher. Forming different groups by standing together depending the followed instructions like two, three, four...
Development of the lesson 10 min	<ul style="list-style-type: none"> - In the groups they have formed, learners are each given a space in the classroom. - Teacher demonstrates how the game goes: <ul style="list-style-type: none"> o hang 4 cards on the black board. 1 picture representation (e.g., chicken) and 3 other cards, including the card that represents “4”. The last cards are put face down. o Teacher shows the card with the chickens and hangs them on the blackboard. Ask children what is on the card and how many. o Teacher asks a child to turn one of the other cards on the blackboard: what is this? How many? Is this the same as how many chickens we had? Turn cards until a match can be made. - Each group gets a set of cards. They are instructed to turn the cards face down and arrange them on the floor. - Start of the game. Stress the importance of taking turns. - Teacher observes the groups. Groups that need assistance: Teacher goes and plays with the children. Teacher asks one group to help another group. Help groups that have 	<ul style="list-style-type: none"> - Go and sit in groups. - Watch demonstration - Mix the set of cards and put them face down on the floor. - Play the game. Each child takes turn to pick two cards and check if it is a match. They name the number of objects on the card. - The player that has found a matching pair, can keep the set. The child that has picked the last pair can shout : “game is over”. - The cards are collected again, mixed well and put face down again. They start a new game.

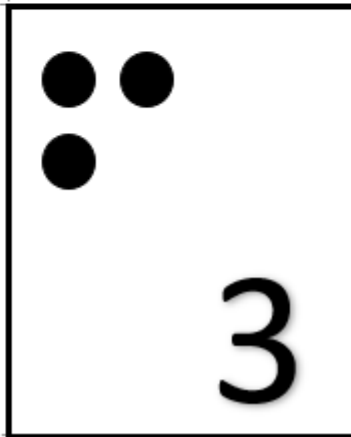
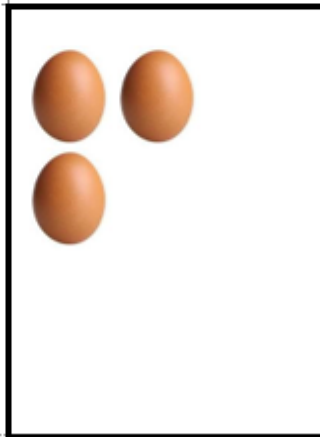
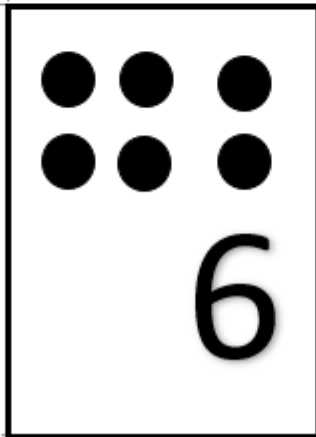
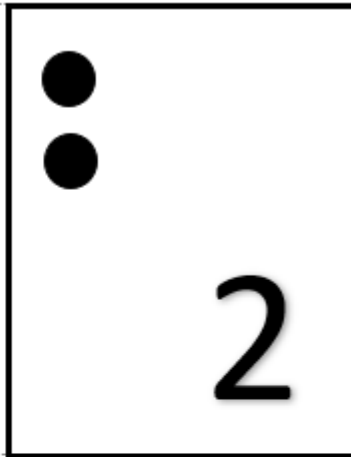
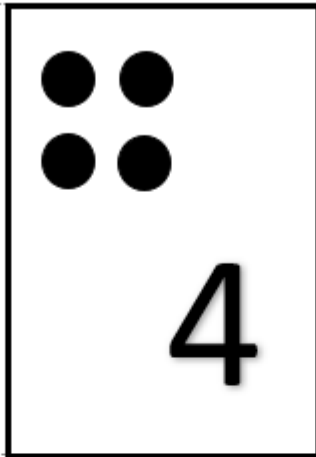
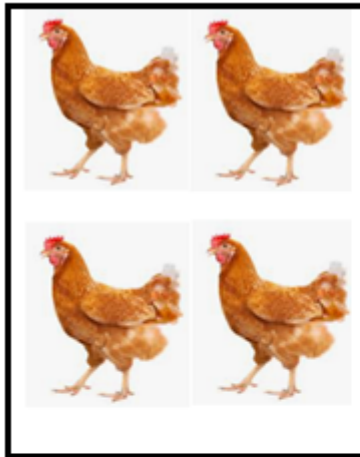
	<p>finished playing to start again by mixing the card and putting them on the floor again.</p> <ul style="list-style-type: none"> - Differentiation: If the game is too easy for a group: <ul style="list-style-type: none"> o Increase number of pairs o Only use numeral and pictures o Introduce higher numbers (from 0-5, to 0-10, to beyond 10) o Rearrange groups 	
Summary and Conclusion 5 min	<p>In a circle, ask the learners</p> <ul style="list-style-type: none"> - What did you learn today? - What was difficult? What was easy? - Who won the game? How did that happen? 	Circle conversation
Teacher self-evaluation		

Guidance and further ideas for this lesson:

1. The same approach, memory game, can be done for matching shapes, colours etc.

Examples of the materials:

1. The set below is an example of combining pictures of real life objects with dot representation and numerals (the number symbols).
2. One step easier would be to remove the number symbols. One step more difficult would be to use more abstract pictures or drawings instead of real life objects.



3. Sample lesson plan 3: Measurement: Comparing size, weight and length

Class	Academic year	Term	Week	Date	Duration	Class size
Grade 2 and 3						
Learning area	Numeracy					
Theme of the week	Measurement					
Unit title	Unit 2: Sorting, pairing and ordering a variety of objects					
Key unit competence	Children should be able to sort similar objects according to at least two criteria of their choice.					
Lesson title	Comparing and classifying: Big and small (corner 1 and 2), long and short (corner 3 and 4), heavy and light (corner 5 and 6)					
Generic competences and cross- cutting issues	<ul style="list-style-type: none"> • Communication skills; through to the sharing ideas. • Critical thinking skills; through to the analysing before answering. • Gender Education; boys and girls share ideas together with the same opportunities. • Cooperation skills; everybody contributes in a given task for having harmonised ideas/solutions • Peace and value Education; they share ideas in respect each other without conflicts. • Inclusive education as all children can participate. 					
Instructional objective	Given local-familiar materials, children will be able to compare materials correctly.					
Learning materials	<p>There will be 6 corners. In each corner materials are needed.</p> <p>Corner 1 and 2: size: Pairs of big and small objects (e.g., A big bottle and a small bottle, a big chair and a small chair), 2 boxes (a big and a small box)</p> <p>Corner 3 and 4: Length: pairs of long and short objects (e.g., A long ruler and a short ruler, a long shoe lace and a short shoe lace....), 2 boxes (a big and a small box)</p> <p>Corner 5 and 6 : Weight: pairs of heavy and light objects (e.g., A milkbox full of water and one empty, a heavy book and a lighter book, a heavy bag of corn, a light bag of corn, 2 boxes (a big and a small box)</p>					
Type of Special Educational Needs to be catered for in this lesson and number of learners in each category	<p>Adjust to specific class context.</p> <p>Differentiation: Instruction in the corner can become more difficult by:</p>					

	<ul style="list-style-type: none"> - Making the difference between the provided pairs smaller. Introduce the question: “How can we know which one is the heaviest/longest/biggest?”, introduce the idea of measuring (use natural measuring tools like a shoe or a hand) - Extending the instruction e.g., By asking learners to find who in the corner is the shortest/longest. 											
Teaching and learning process												
Timing and steps	Teacher activities	Learner activities										
<p>Introduction 5 min</p>	<ul style="list-style-type: none"> - Classroom set up: Set up the room as in the table below. Draw a line in the middle of the room to divide the left and the right side. <table border="1" data-bbox="810 593 1133 783" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2" style="text-align: center;">Front</td> </tr> <tr> <td style="text-align: center;">Corner 1</td> <td style="text-align: center;">Corner 2</td> </tr> <tr> <td style="text-align: center;">Corner 3</td> <td style="text-align: center;">Corner 4</td> </tr> <tr> <td style="text-align: center;">Corner5</td> <td style="text-align: center;">Corner 6</td> </tr> <tr> <td colspan="2" style="text-align: center;">back</td> </tr> </table> <ul style="list-style-type: none"> - As start of the activity; sing with children a song that they know. - “Today I need your help. Can you help me? Look, we have materials here, and they are all mixed up (take the children to Corner 1 and 2). Can you help me to sort it out? I want you to put all the big things in this box and all the small things in this box. (Take them to corner 3 and 4): And here, we have long and short things, but they are also on a big pile. Can you help me? Put the long things in this box and the short things in this box. (Take them to corner 5 and 6) And here, everything is so mixed up. Look this is heavy, and this is light. But we should sort it out. The heavy things must go in this box and the light things in that box.” 	Front		Corner 1	Corner 2	Corner 3	Corner 4	Corner5	Corner 6	back		<ul style="list-style-type: none"> - Singing with the teacher; - Observe carefully the corners shown by the teacher.
Front												
Corner 1	Corner 2											
Corner 3	Corner 4											
Corner5	Corner 6											
back												

<p>Development of the lesson 20 min</p>	<ul style="list-style-type: none"> - “Do you think you can help? Let’s first make groups. You can choose in which group you want to help, but in each corner only 5 children can play (adjust the number on total class size: class size divided by 6 corners = max number of groups). - Observe and facilitate them to sort the materials in the corner. Make sure all children get a chance. Both boys and girls; impaired child they will share ideas together. - Trigger thinking of children, by asking questions like “how do you know? Do you also think so? What could help us?” Encourage conversation and dialogue. Repeat the key words: Compare, heavy, light, long, short, big, small. Name objects of which children don’t know the words yet. - After 10 minutes clap your hands. Ask children to take the materials out of the sorting boxes and make a big pile, so the other children can play again. - Children will now rotate. They can choose another corner at their side of the room (so not crossing the thick line). So, children from corner 1 can now join corner 3 or 5. - Observe and facilitate them to sort the materials in the corner. Make sure all children get a chance. - Observe which groups need differentiation: Instruction in the corner can become more difficult by: <ul style="list-style-type: none"> • Making the difference between the provided pairs smaller. Introduce the question: “how can we know which one is the heaviest/longest/biggest?”, introduce the idea of measuring (use natural measuring tools like a shoe or a hand) • Extending the instruction e.g., by asking learners to find who in the corner is the shortest/longest. 	<ul style="list-style-type: none"> - Children divide in groups - In small groups or individually, children observe, measure, manipulate materials and decide in which box they belong. - Children bring all materials on 1 pile again before they choose another corner. - In small groups or individually, children observe, measure, manipulate materials and decide in which box they belong.
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Conclusion 5 min	In a circle, ask the learners <ul style="list-style-type: none"> - Let's think, who would be the shortest child in this class? And what would be the heaviest thing in our class? And what is the biggest thing? Is the biggest thing also the heaviest? - What did you learn today? - Which corner did you like most? 	Circle conversation
Teacher self-evaluation		


Guidance and further ideas for this lesson:

1. Note that not all children have played with all materials/corners. Organise this lesson again in the same week, so all children get the chance to explore all objects and skills.

Ideas for follow up lessons:

1. A next step in this learning could be to bring in more variation in weight, size, length. Instead of comparing 2 items, children can start ordering 3 or more items from big to small, from long to short, from heavy to light.

4. Sample lesson plan 4: Geometry and coding

Class	Academic year	Term	Week	Date	Duration	Class size
Grade 3						40
Learning area	Numeracy: Shapes and directions					
Theme of the week	Robot					
Unit title	Unit 8: Locating objects and Unit 9: Patterns					
Key unit competence	<p>Children should be able to use appropriate prepositions to identify where things or people are located and use prepositions and directions in reading and writing activities and in their daily life.</p> <p>Children should be able to make patterns of their choice from simple to complex patterns or follow the teacher's example; find patterns in their daily life: day/night, daily schedules, colors in the clothes, etc.</p>					
Lesson title	Marty the Robot					
Generic competences and cross cutting issues	<ul style="list-style-type: none"> • Problem solving skills • Collaboration • Creativity • Interpersonal management • ICT literacy (Scratch) 					
Instructional objective	Through this activity children will first follow specific instructions regarding direction (left, right, forward, backward), then by using the arrows they will start making their own patterns of instructions which their peers will follow. By doing so, they will understand and apply basic coding skills.					
Learning materials	<ul style="list-style-type: none"> • Square Flashcards with arrows (minimum 50) which will be used to indicate 'left, right, forward, backward' (Provide enough additional empty cards which can be used by children if they need more cards or commands. See "Increasing difficulty" other command cards can be used/developed such as "turn around", "jump"  <ul style="list-style-type: none"> • A robot made of local available materials 					



- Chalk or something else to make an 4x4 grid (tape, ropes, tiles...)
- Visual instructions can be accompanied by spoken instructions
- Arrow cards can be made in relief so visual impaired learners can feel them.
- The activity description shows different levels of difficulty that can be brought into the activity to differentiate.

Type of Special Educational Needs to be catered for in this lesson and number of learners in each category

Teaching and learning activities

Timing and steps	Teacher activities	Learner activities
<p>Introduction 7 min</p>	<p>Sitting in a circle, ask the learners:</p> <ul style="list-style-type: none"> - Who knows what a robot is? <p>If yes:</p> <ul style="list-style-type: none"> ○ What is a robot? ○ How does a robot look like? ○ How does a robot move? ○ What sound makes a robot? <p>Link the ideas of the children to basic understanding. Speak about Sophia robots in the streets: they are programmed to take pictures of cars that are speeding.</p> <ul style="list-style-type: none"> - Introduce your self-made robot Marty. Or show pictures/drawings of different looking robots - How do robots work? Guide children to answer, such as: <ul style="list-style-type: none"> ○ Robots cannot think, they can only do what the computer tells them to do. (let children try out: act like a robot, now “raise your hand”, “close your eyes” ○ Giving instructions to robots is also called “programming” 	<ul style="list-style-type: none"> - Circle conversation: All children’s contributions are welcomed - Learners pretend to be a robot (they move like a robot and make robot noises) - How do robots work: Children move their hands when teachers instructs them to do so.

	<p>with other commands (they can make their own cards if they need other command or if they need more of the same) and be creative.</p> <ul style="list-style-type: none"> - Differentiation: how to make it more challenging for groups that manage well? <ul style="list-style-type: none"> o Ask them to build patterns (repetitions of some commands) o Add other commands, such as “jump” or “turn around” o Let them develop more command cards 	
Conclusion 5 min	<p>In a circle, ask the learners</p> <ul style="list-style-type: none"> - What did you learn about robots today? - How does a robot work? - What do computers do? - What was difficult? What was easy? 	Learners reflect on the activities
Teacher self-evaluation		

Guidance and further ideas for this lesson:

1. Consider splitting this lesson up into 2 lessons: The first lesson focuses on full all class activity. In the second lesson, children work in smaller groups and get more time to come up with their own patterns and commands.

Ideas for follow up lessons:

1. Art and craft: make your own robot (1h):
 - Let the learners make a robot out of local materials in small groups. If needed, help the learners get started by asking questions. Robots can exist in all different shapes, sizes and colors so there is no right or wrong. All robots look different and are unique (just as people!)
 - When the robot is finished, explain that the learners are the computers and that they are going to program the robot (= tell the robot what s/he must do). Also let them give the robot a name!

2. Programming our self-made robots: robot dancing (30min)

- Use the same cards as in the lesson described above (arrow cards). Give each group 4 cards (later you can give them more to make it more difficult).
- First the learners will place the cards in an order to make the robot dance (= they code/program). E.g., Left - left - forward.
- When the code is ready one learner will 'read' the code and one learner will move the robot. The other learners who are watching make sure the robot makes no mistake.
- Gradually the teacher gives the learners extra cards.
- Observe what happens when you give the learners more cards. Do you see groups making patterns? Showcase the dance of this group to the other learners.

3. Programming our robots: Treasure hunt (30min)

- For every group, draw a maze on the ground of 4x4 (you can do this with chalk, use ropes, place tires next to each other or use a flooring with tiles). Put 1 "treasure" in every maze (for instance a stone) (see picture).
- Let the learners make a code with the cards to move their robot through the maze to the treasure. Give each group 3 cards (with commands 'forward', 'left', 'right'). They do not have to use all cards!
- When the program is ready, one computer reads the command and a learner moves the self-made robot through the maze.
- The robot has now a position in the maze. If it did not reach the treasure yet, the teachers gives the group 3 new cards and so on until they reach the treasure.
- Make this game more difficult by making the maze bigger and adding more commands ('jump over', 'turn around') or by adding obstacles, such as a wall that cannot be crossed.



Annex 5: Observation and self-assessment tool classroom practice

Part 1: General description of the ECE teaching and learning environment

1. Learning environment		1	2	3
1: Yes, this can be observed– 2: It can be observed a bit, but could improve – 3: Not observed		Yes	Yes, but	No
1.1. Preparation of the lessons	1.1.1. The lesson plan is available.			
	1.1.2. Supportive instruction materials are present.			
	1.1.3. Supportive learning materials are present.			
1.2. Effective rules and continuity in follow-up on these rules	1.2.1. Rules are described positively, drawn visibly and from the 'I'-perspective.			
	1.2.2. Children know the rules.			
	1.2.3. Consequences for not following the rules are clear and consistent.			
1.3. Sitting arrangement	1.3.1. Conscious choice: according to age or according to level.			
	1.3.2. Variety in individual, group and class activities.			
	1.3.3. With attention for involvement of each learner at all times.			
1.4. Stimulating and safe environment indoor and outdoor	1.4.1. The indoor and outdoor environment stimulates and challenges holistic development (all development domains, different senses).			
	1.4.2. The indoor and outdoor environment is hygienic (e.g., children might get dirty, but wash hands after the activity).			
	1.4.3. The environment is safe.			
1.5. Daily routines: Pleasant, attractive routines (e.g., songs, discussions, rhymes, dances, games) at fixed moments of the day	1.5.1. Morning circle			
	1.5.2. Cleaning up routine			
	1.5.3. Toilet routine			
	1.5.4. Ending the day			
1.6. Positive and rich learning environment	1.6.1. Children feel safe during learning activities.			
	1.6.2. Children experience joy and fun during learning activities.			
	1.6.3. Children get positive feedback.			
	1.6.4. Children are allowed to make mistakes.			
	1.6.5. Children may use their home language to express themselves.			
	1.6.6. Children feel encouraged to use learning skills in other learning areas.			
	1.6.7. Both girls and boys are encouraged to engage in learning activities.			

	1.6.8. The children's artwork and/or learning products are visibly displayed on the class walls or displaying tables.			
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1.7. Corners and play areas	1	2	3
1.7.1. Types: Numeracy corner, Role play corner, Literacy corner, Book corner, Art and creativity corner, construction corner	4 or more types of corners and play spaces	2 to 3 types of corners and play spaces	1 or less types of corners and play spaces
1.7.2. Conditions: accessible, inviting, clear rules, clearly defined in space, free choice	4 or more conditions met	2 to 3 conditions met	1 or less conditions met

2. Materials		1	2	3
1: Yes, this can be observed– 2: It can be observed a bit, but could improve – 3: Not observed		Yes	Yes, but	No
2.1. Visuals (pictures, drawings or symbols)	2.1.1. Visuals are visible			
	2.1.1.1. Weather chart is visible			
	2.1.1.2. Rules and expectations are visible			
	2.1.1.3. Choice board is visible			
	2.1.1.4. Attendance register is visible			
	2.1.1.5. Task board is visible			
	2.1.2. The visuals are used in a teacher-centred way			
2.1.3. The visuals are used in a learner-centred way				
2.2. Talular materials (Teaching and learning materials made of locally available materials)	2.2.1. Talular materials are available			
	2.2.1.1. Talular teaching materials available			
	2.2.1.2. Talular learning materials available			
	2.2.1.3. Talular play materials available			
	2.2.2. Talular materials are used in a teacher-centred way			
	2.2.3. Talular materials are used in a child-centred way. Children are allowed to take and use supporting materials (e.g., bottle caps to count).			

3. Interactions		1	2	3
1: Yes, this can be observed– 2: It can be observed a bit, but could improve – 3: Not observed		Yes	Yes, but	No
3.1. Teacher uses appropriate communication	3.1.1. Interaction at children' level			
	3.1.2. Appropriate intonation			
	3.1.3. Verbal communication supported with gestures			
3.2. Teacher creates a good atmosphere	3.2.1. Songs			
	3.2.2. Appealing to the children' feelings			
	3.2.3. Asking about the children' families			
	3.2.4. Making jokes			
	3.2.5. Cuddles, hugs, embraces			
3.3. Teacher uses positive discipline	3.3.1. Positive language			
	3.3.2. Focus on accomplishments, effort, and helpfulness			
	3.3.3. Investigating needs and feelings			
	3.3.4. Offering positive alternative in case of negative behaviour			
	3.3.5. Warm respective interactions			

Part 2: Playful teaching and learning in activities with curriculum objectives

4. Characteristics of Learning through play				
1: Yes, this can be observed– 2: It can be observed a bit, but could improve – 3: Not observed		Yes	Yes, but	No
4.1. Learning is Joyful	4.1.1. The children experience pleasure, motivation, surprise, thrill, etc... (Evidence of joy, smiling, laughter, being silly, celebrating, dancing ...) during numeracy activities			
	4.1.2. The teacher integrates moments of fun and pride in the activity.			
	4.1.3. The children show a relaxed, open, friendly, positive behaviour.			
	4.1.4. Children experience joy through success after overcoming challenges themselves.			
4.2. Learning is actively engaging	4.2.1. The learning activities attract learner’s interest; children are curious to see what happens.			
	4.2.2. The children are involved with and absorbed by what they are doing, and they can persist despite distractions. Children are thinking along, they are focused on the activity (not staring out of the window).			
	4.2.3. The learning activities hold learner’s interest; children are concentrated for a long time and not easily disturbed.			
	4.2.4. The teacher uses activities with different levels of challenge for children.			
	4.2.5. The teacher motivates children to engage at the beginning and during tasks and activities.			
4.3. Learning is iterative	4.3.1. The children repeatedly try out new possibilities, revise hypotheses and explore other ways to do things. Student(s) started the task again or adjusted when they thought of a better idea/approach.			
	4.3.2. The teacher motivates children to experiment and try out by themselves.			
	4.3.3. The teacher responds positively to making mistakes.			
4.4. Learning is socially interactive	4.4.1. The children share ideas, have interactions, collaborate and communicate. Children work in pairs or groups; children develop and share ideas with other classmates.			
	4.4.2. The teacher allows and encourages children to speak out during interaction moments and activities, and responds positively to ideas expressed by the children.			
	4.4.3. The teacher allows and encourages children to interact with each other.			
4.5. Learning is meaningful	4.5.1. The teacher harvests and uses the interests, ideas and initiatives of the children to expand the theme or activities.			
	4.5.2. Children are given the opportunity to interact with concrete, real life materials. They can manipulate and transform materials.			
	4.5.3. The teacher responds to observed needs and interests of children with meaningful impulses (e.g., child is playing with blocks, building a tower, and teacher asks “Which tower is highest? What will happen when we add this big block on top?”)			
	4.5.4. The learning activities relate to something that is already known by the individual children. The teacher starts from what individual children can already do and challenges them to take the next learning step.			
	4.5.5. Learning activities (such as numeracy) are integrated in meaningful activities such as corner play and free play, are linked to the theme of the week/month and the context of the child.			

5. Role of the teacher in Learning through play		1	2	3
1: Yes, this can be observed– 2: It can be observed a bit, but could improve – 3: Not observed		Yes	Yes, but	No
5.1. Planning and preparing lessons	5.1.1. The teacher combines multiple goals. Activities show an integration of different competencies and development domains (e.g., children feel encouraged to use numeracy skills in other activities)			
	5.1.2. The teacher designs exciting playful activities			
5.2. The teacher as observer	5.2.1. The teacher observes wellbeing, involvement, interests and needs			
	5.2.2. The teacher responds with meaningful impulses			
	5.2.3. The teacher observes developmental progress of all children.			
5.3. The teacher as facilitator	5.3.1. The teacher creates a safe environment			
	5.3.2. The teacher creates learning opportunities			
	5.3.3. The teacher supports and starts from child initiative			
	5.3.4. The teacher differentiates activities and supports to the needs/levels of children			
5.4. The teacher as documenter	5.4.1. The teacher documents for differentiation and lesson preparation			
	5.4.2. The teacher documents together with children			
	5.4.3. The teacher documents with and for parents			
	5.4.4. The teacher shares documentation with other teachers for reflective learning.			

Part 3: Curriculum emergent numeracy Rwanda

6. Basic competencies Numeracy		1	2
Which curriculum goal(s) were addressed during the lesson you observed?		Yes	No
6.1. Numbers	6.1.1. Classifying: Differentiate and name colours		
	6.1.2. Counting: rhymes and songs		
	6.1.3. Counting: Count items		
	6.1.4. Counting: Match numbers to real objects / quantities		
	6.1.5. Classifying: Compare and sort quantities and size		
	6.1.6. Counting: Read and write numbers via body movements, writing in sand, paint, others		
	6.1.7. Operations: Add, subtract and divide real objects, not exceeding 10.		
6.2. Measurement	6.2.1. Differentiate big / small, short / long, ...		
	6.2.2. Sort out and group (classify) things based on given criteria such as colours, shapes, usages, nature ...		
	6.2.3. Use appropriate terms when comparing things and arranging objects according to their weight, length, volume and size		
	6.2.4. Measure things using traditional methods (e.g., stride, feet, hands) not exceeding 10 times.		
	6.2.5. Money: Types and value of money		
	6.2.6. Time: Name and differentiate days of a week; use a week calendar and timetable		
	6.2.7. Time: List activities in a daily schedule (morning, afternoon, night)		
	6.2.8. Time: Sequence events in their periods of happening. E.g., yesterday we drew a car; today we learned a song; tomorrow we'll play football.		
6.3. Shapes and directions	6.3.1. Explain location, use prepositions and directions. E.g., the crayons are in the box on the bottom shelf; walk to the end of the room.		
	6.3.2. Differentiate shapes (rectangles, triangles, circles)		
	6.3.3. Continue a pattern, following a given example		

7. Generic competencies in Numeracy		1	2	3
1: Yes, this can be observed– 2: It can be observed a bit, but could improve – 3: Not observed		Yes	Yes, but	No
7.1. Critical thinking and problem solving skills	7.1.1. Teacher stimulates the thinking process more than the product.			
	7.1.2. Teacher expresses / describes actions taken by children in language, using a rich mathematical language			
	7.1.3. Children are allowed to make mistakes.			
	7.1.4. Teacher gives children time to find their own solutions			
	7.1.5. Teacher provides supporting concrete materials to support mathematical thinking.			
	7.1.6. Teacher reflects with children about their mathematical actions and thinking, both before, during and after the activity			
	7.1.7. Teacher challenges children by posing problems.			
	7.1.8. Children are allowed to take and use supporting/concrete materials (e.g., bottle caps to count)			
	7.1.9. Teacher encourages learners to reflect about their mistakes and look for other solutions.			
7.2. Creativity and innovation	7.2.1. Teacher allows several problem-solving strategies (not only the one they had in mind)			
	7.2.2. Teacher stimulates alternative problem-solving strategies. E.g., “How would you do this? And you?”, “Let’s see if it works.; “How did it go? What would you do differently next time?”			
7.3. Research	7.3.1. Teacher stimulates curiosity and sharing.			
	7.3.2. Teacher stimulates children to ask questions, e.g., “What would you like to know? How could that work?”; “Who could help us with that?”; “Where could we find an answer to this problem?”			
7.4. Communication	7.4.1. Mathematical language and thinking is used in all daily activities. E.g., Children are building towers: “How many blocks an you still add before the tower falls?”; Children are playing with sand outside: “Can you fill this bottle half with sand?”; “Can you explain to your friend how you did that?”			
7.5. Cooperation, personal and interpersonal management	7.5.1. Teacher stimulates children to collaborate			
	7.5.2. Teacher uses pictograms to stimulate independent work			
	7.5.3. Children are stimulated to take initiative and speak out their thoughts and feelings.			
	7.5.4. Children are given choices, big or small, about learning content and processes.			
7.6. Lifelong learning	7.6.1. Teacher shows sources of information, such as books, newspapers or phones and websites			
	7.6.2. Teacher takes children on excursions in the neighbourhood to support learning objectives in a real-life context.			
	7.6.3. Teacher stimulates curiosity. E.g., “What would you like to learn about this?”; “What would you like to ask the police man?”, “I wonder”			

