CAPS

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GRADE 2 TEACHER'S GUIDE

Platinum

Coding and Robotics

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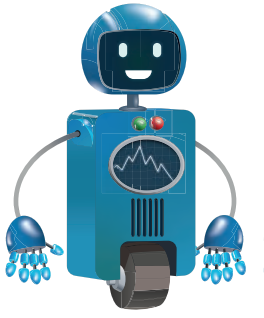

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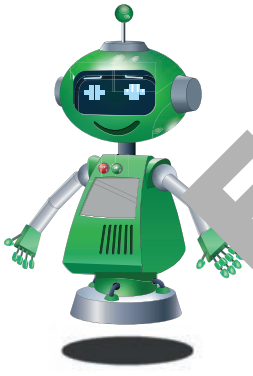


Introduction

Dear Teacher

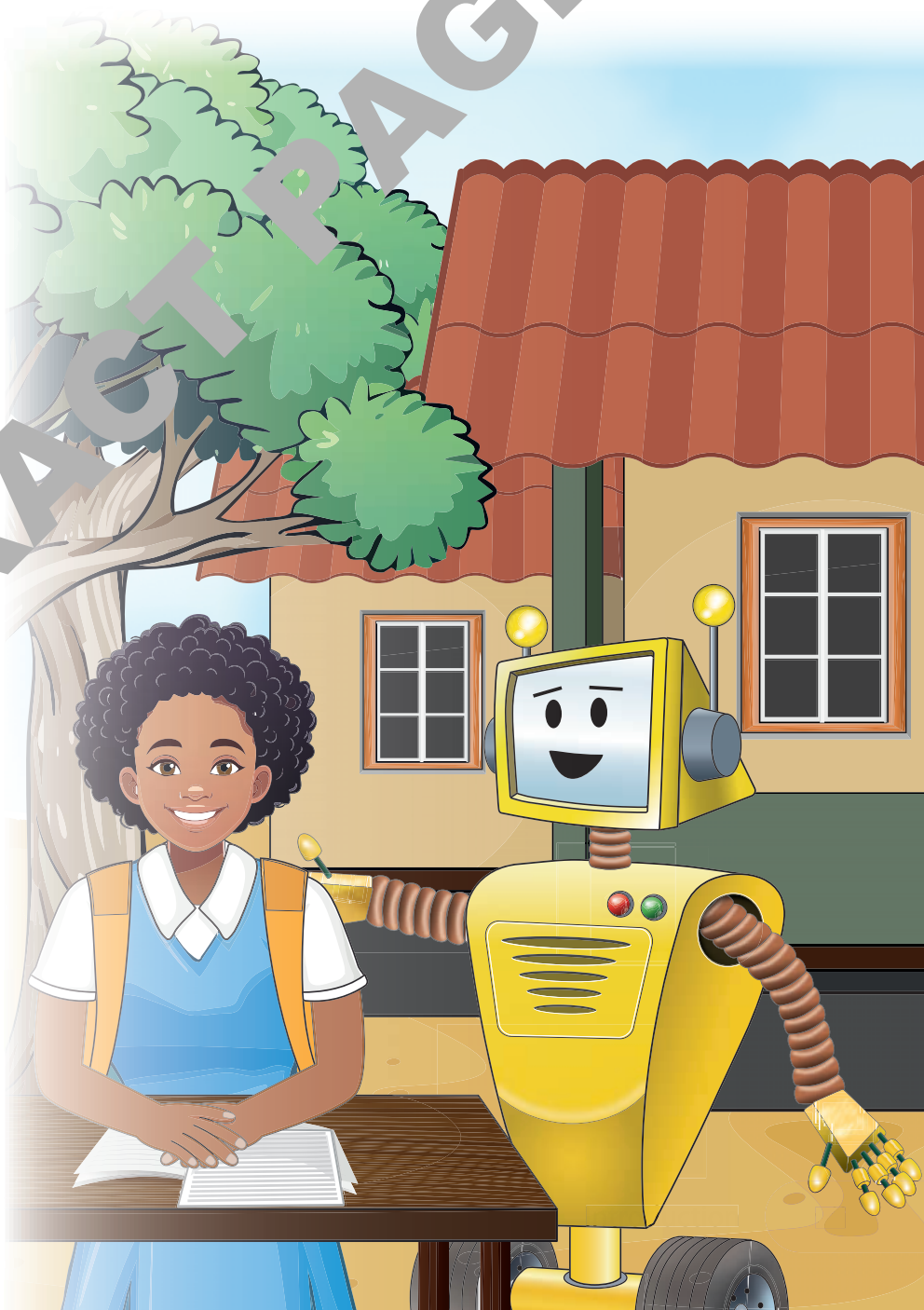
Welcome to an incredible adventure in teaching and learning! This is not just another subject, but a great experience in your career! You are at the forefront as both a guide and a lifelong learner! Get ready to dive into a journey where discovery happens daily. You will learn right alongside your learners, and every day brings fresh excitement and curiosity!

As a mediator, you will help learners navigate the information-rich world where the Internet of Things (IoT) and other technologies add new dimensions to teaching and learning.
Your openness to learning alongside your learners will create a powerful example, showing them that learning is a lifelong journey and that adaptation and curiosity are key in our ever-evolving world.

Thank you for stepping into this role with such dedication and a willingness to grow together with your learners. Your journey as a teacher-learner will undoubtedly inspire and empower each learner in your classroom.

Imagine a World without Digital Technology!

In a village called Lombard, there were no computers, internet, smartphones, or robots. Life moved slowly. Messages were delivered by hand, and learning was limited to books and teacher explanations.



In school, learners used chalkboards for every subject while others used to sit under the trees and sing songs and storytelling as part of learning. They could not watch videos or look up information online. For Katlego, who loved animals, learning about kangaroos or polar bears meant reading descriptions and looking at drawings, no real-life videos or images were available. After school, there was no digital homework portal or quick research tools, just books.

One day the village ladies imagined a new world where they could communicate instantly, explore new places through screens, and make daily life easier, and connect with people in the global village!

Eight-year-old Katlego, feeling unwell, imagined a robot friend named Renata. In her imagination, Renata was kind, helpful, and made her and her friends smile. Each day, her imagination gave her strength, and soon, Katlego began to feel better, knowing her dreams were helping her to heal

2. A whole new game changer!

4IR – 4th Industrial Revolution in teaching and learning

Ms Nomonde is thrilled to receive a laptop from the department, a tool she plans to use to enhance her teaching and better support her learners. Together with her colleagues from Lombard's Village, she's diving into digital learning, guided by an experienced coder called the Digital Ranger. They explore the Internet of Things (IoT) and learn how coding and other subjects connect, eagerly sharing their discoveries.

As she prepares her class, Ms Nomonde looks forward to using unplugged activities, hands-on exercises without devices to introduce learners to coding. With her laptop and newfound digital insight, she's ready to guide her learners into this exciting new world.

Two robots named Robo and Chip decided to play a game of chess. They moved their pieces on the board, thinking carefully about each turn.

Coding means creating simple instructions to help computers or devices do tasks.

Robotics uses simple, programmable toys to help children learn basic commands and movement. It teaches problem-solving and sequencing through fun, hands-on activities.

Digital concepts: are simple ideas about how technology works, including basic things like, icons, and safe use, to build early digital literacy.

3. How to use this series

3.1. Features of the Learner's Book

The Learner Book contains a recurring theme that runs through each week's activities, creating a cohesive and engaging learning experience.

Each week presents a new scenario that challenges learners to apply their knowledge in practical situations.

The "Let Us Begin" section serves as a starting point to assess learners' initial knowledge and connects directly to the material they need to learn.

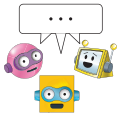
At the end of each week, the "Self-Assessment" section provides learners with an opportunity to reflect on their work, encouraging a thoughtful approach to learning. Ask learners to draw one of the four icons in their books or show one to four fingers to rate their effort in the activity.

Additionally, there is a "New Word" section dedicated to explaining unfamiliar words found in the lessons, helping learners expand their vocabulary in a meaningful way.

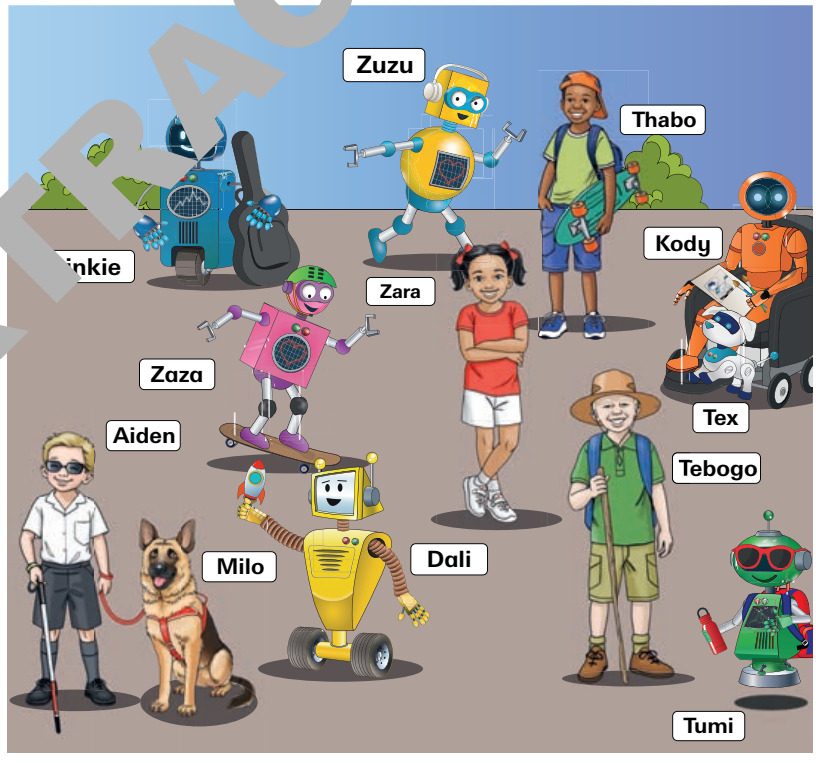
Self-assessment grid

How do you feel about the work you did?

	**Pair programming:** time to work with my friend
	**Cooperative learning:** time to work as a group

	**Coding cards:** time to code
	**Unplugged coding:** coding through play
	**Practical:** time to use my hands and my brain
	**Draw:** time to draw and write
	**Speak:** time to talk about things
	**Think:** time to use my brain and imagination
	**Body movement:** time to move my body
	**Class discussion:** time to share

3.2. Meet the team

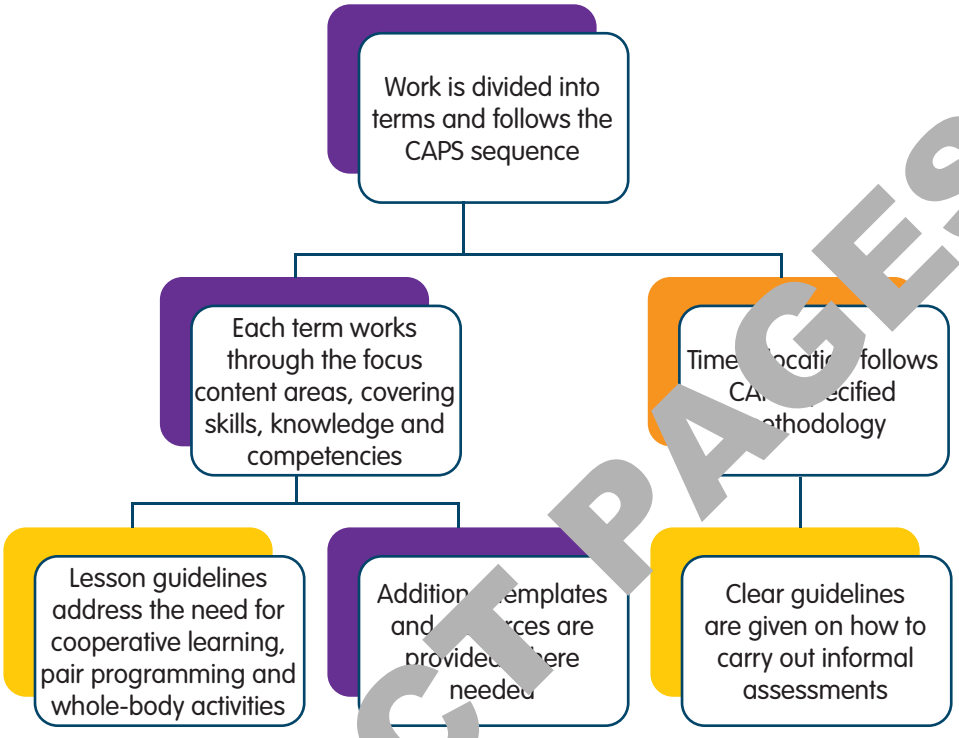


3.3. Coding cards

Coding Card	Label	Description (action)	Coding Card	Label	Description (action)
	Forward	Move one step forward.		Repeat five times	Repeat the action five times.
	Up	Move one step up.			
	Down	Move one step down.		Loop	The loop [illegible] you to repeat a sequence [illegible]
	Left	Move one step to the left.		Wait	The [illegible] icon tells you to pause for two seconds.
	Right	Move one step to the right.		Sound	The sound icon tells you to listen for a sound.
	Turn left	Turn to the left.		Dance	The dance icon tells you to do one dance move.
	Turn right	Turn to the right.		Speak	The speak icon tells you to say a word.
	If/then	If (stop this) then do this (perform an action).		Turn around	The turn around icon tells you to turn around once. (Do a complete turn).
	Tilt forward	Tilt your body forward.		Draw	The draw icon tells you to draw.
	Tilt backwards	Tilt your body backwards.		Clap	The clap icon tells you to clap once.
	Tilt left	Tilt your body to the left.		High-five	The high-five icon tells you to give a high-five.
	Tilt right	Tilt your body to the right.		Follow	The follow icon tells you to follow along.

	Pick up	Pick up the object.		Push	The push icon tells you to push.
	Put down	Put down the object.		Pull	The pull icon tells you to pull.
	Start	The start icon shows you where the starting point is.		Thumbs up	The thumbs up icon is used to say yes.
	Go	The go icon shows you when to begin.		Thumbs down	The thumbs down icon is used to say no.
	Stop	The stop icon shows you when to stop.		Think	The think icon tells you to: • think of something. • be creative (idea); • make a plan
	Repeat twice	Repeat the action two times.		Jump	The jump icon tells you to jump once.
	Repeat three times	Repeat the action three times.		Jump over	The jump over icon tells you to jump over something.
	Repeat four times	Repeat the action four times.			

4. Features of the Teacher's Guide



5. Overview

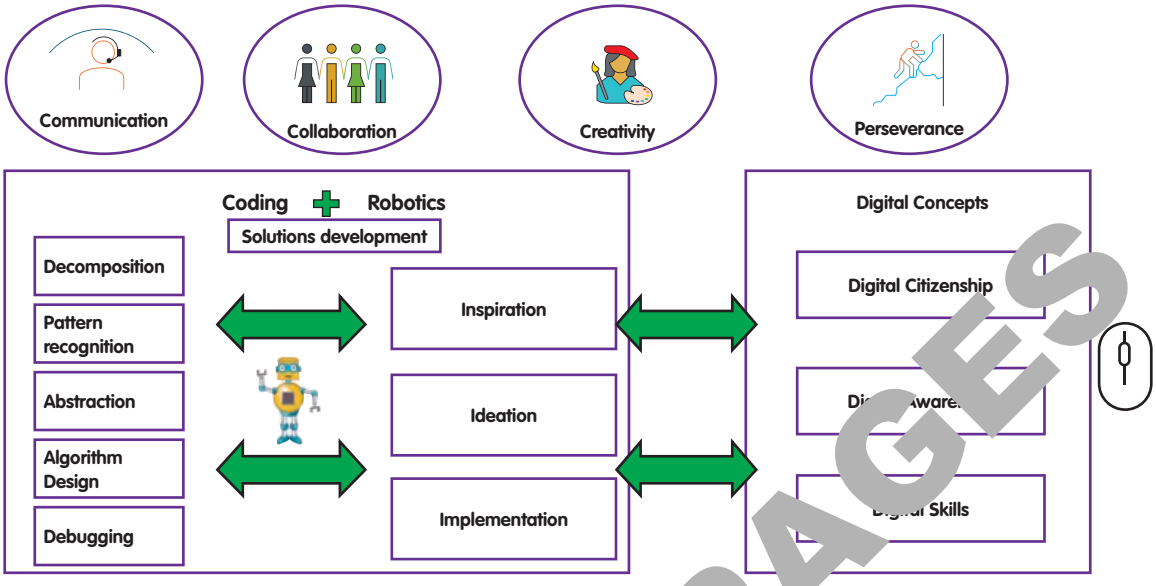
5.1. What is Coding and Robotics?

Coding and robotics combine programming principles with robot design, construction and operation.

Programming concepts, practices, and perspectives are applied to control robots to perform specific tasks.

It includes digital concepts that refer to various ideas, principles, and processes associated with digital technologies and their uses.

The Coding and Robotics curriculum is based on the following pillars, as depicted in the figure below:



The Coding and Robotics curriculum is based on the following concepts:

Coding is the process of writing instructions that a computer can understand and follow. It's how people tell computers what to do, step by step, to make them perform different tasks.

Robotics combines science and engineering to create machines that can perceive their surroundings, make decisions, and carry out tasks independently. It offers learners a hands-on practice to explore, experiment, and develop their own designs. Robotics focuses on the creation, operation, and application of robots.

Digital concepts include a wide range of skills and understanding that help learners use technology effectively and responsibly.

5.2. Specific Aims

Develop problem-solving skills through computational thinking.

Improve design thinking to create innovative and people-focused solutions.

Become part of a generation of creative thinkers who use coding, robotics, and digital skills to express ideas.

Encourage creativity, critical thinking, teamwork, communication, and innovation.

Act responsibly and effectively in a digital world.

Understand how technology impacts society.

Build confidence to handle challenges using computational and design thinking.

6. Specific Skills

6.1. Computational Thinking

Computational thinking is a problem-solving process that involves breaking down complex problems into smaller, manageable parts.

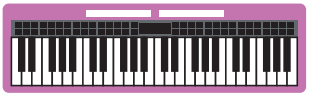
It helps learners improve their problem-solving skills in coding and robotics. These skills can also be used to solve everyday problems.

It is a way of thinking and a set of skills that uses techniques to solve problems and complete tasks effectively.

Computational thinking helps people find solutions that both humans and computers can understand.

Computational thinking is not just for computer science; it can be applied to various fields and everyday situations, helping individuals think logically and systematically.

It includes the following components:

 Abstraction: To focus on the important and relevant information and ignoring the unimportant and irrelevant information	 Decomposition: To solve a complex problem by breaking it into small, manageable parts
 Pattern Recognition: To identify similarities and differences. Recognising the same patterns in other problems helps you in solving a new problem.	 Algorithm: To define a precise sequence of steps or instructions to perform a task.

In robotics, learners use computational thinking to design, build, and program a robot. The robot's performance shows how well they applied this thinking as they test and fix their code.

6.2. Design Thinking

Design thinking focuses on people and fosters creativity and innovation.

It follows the following three-step process:

Design thinking is a problem-solving approach that blends creativity with structure and focuses on understanding and addressing challenges.

The following describes the design process:

Empathise: understanding who the end user is within a particular context.

Define: detailing the users' needs, including their skills, goals, and core principles.

Ideate: involves creating ideas and solutions using different methods.

Prototype: involves creating one or more solutions to solve the problem.

Test: to evaluate the efficacy of the solution.

7. Synergising Coding and Robotics in Foundation Phase

Algorithms In literacy, sequencing and summarizing play an important role In mathematics, breaking down complex problems into smaller, easier steps is an important way to solve problems	**Modularity** In computer science and mathematics, breaking tasks into smaller, manageable parts makes them easier to handle and solve	**Control structures** In coding, determine the order in which a set of instructions runs in a program In mathematics, exploratory thinking means using logic and trying different methods to solve problems
Coding and natural language The process of learning to code is frequently compared to acquiring a new language	**Design** Designing robotic artifacts connects to elements of the Creative Arts and integrates parts of Life Skills	**Digital concepts** Aspects such as the effects of technology and being a digital citizen are related to Life Skills (Personal and Social well-being)

8. Time allocation

According to the Curriculum and Assessment Policy Statement (CAPS), the teaching of Coding and Robotics is structured as follows for Grades R to 3:

Grades R, 1, and 2	
Weekly allocation	1 hour
Term total	10 hours

Grade 3	
Weekly allocation	2 hours
Term total	20 hours

The following table provides the time allocation across the strands in Coding and Robotics for Foundation Phase:

Time allocation across the strands for Foundation Phase Coding and Robotics			
Strands	**% time per week**	**Grade R - 2**	**Grade 3**
Pattern Recognition	15%	9 minutes	18 minutes
Coding	50%	30 minutes	60 minutes
Robotics	30%	18 minutes	36 minutes
Digital Concepts	5%	3 minutes	6 minutes
Total	**100%**	**60 minutes**	**120 minutes**

Because the concepts are interconnected across strands, the time spent on pattern recognition can be combined with coding (algorithm design and coding), robotics, and digital concepts content.

9. Diversity, Equity and Inclusion

Table 1: Types of diversity

Diversity category	Definition	Coverage in the book
1. Cognitive and Learning Diversity	This refers to addressing different learning styles, abilities, and cognitive differences, such as neurodiversity.	We have embraced cognitive and learning diversity by incorporating varied teaching methods that cater to different learning styles. Activities are designed to accommodate a wide range of learning needs, promoting an inclusive learning environment. We have also added quick pre-assessments for you to consider.
2. Disability and Accessibility	This focuses on the representation of people with disabilities and addressing barriers to accessibility.	Characters with disabilities have been included, ensuring their representation in stories and activities. We also discuss issues of accessibility, whether physical, technological, or societal, and use inclusive, person-first language. This creates a more accepting environment for all learners and encourages empathy and understanding.
3. Cultural and Ethnic Diversity	This refers to representing various cultural and ethnic backgrounds, ensuring learners are exposed to different perspectives and traditions.	We have included robot characters from diverse backgrounds. Stories and examples incorporate a range of traditions, customs, and languages. This helps learners appreciate cultural richness and discourages stereotypes by offering balanced views on historical and contemporary issues.
4. Gender Diversity	Gender diversity refers to the representation of all genders and includes discussions around gender roles, non-binary identities, and gender fluidity.	You will notice equal representation of all genders in text, illustrations, and examples. We've included non-binary and gender-fluid characters, along with activities that challenge traditional gender roles. For instance, both boys and girls are shown engaging in diverse career paths, from helping in the kitchen to science and arts, promoting gender equality.
5. Socioeconomic Diversity	It involves representing people from different economic backgrounds and discussing issues of economic inequality.	We feature characters from a variety of socioeconomic contexts, highlighting challenges like access to education, healthcare, and resources. This allows learners to engage with real-life examples and discussions that reflect diverse economic situations, making the content relatable to all.
6. Linguistic Diversity	Linguistic diversity means including multiple languages and respecting the various dialects spoken by different communities.	You will find content that features multiple languages and encourages learners to respect different dialects. We've also included examples that highlight the importance of translation and interpretation, especially in a global village, preparing learners to be more inclusive in their communication.

7. Sexual Orientation and LGBTQ+ Inclusion	LGBTQ+ stands for Lesbian, Gay, Bisexual, Transgender, Queer or Questioning, and others. The "+" represents inclusivity of other sexual orientations, gender identities, and expressions beyond those explicitly listed, such as non-binary, pansexual, asexual, and gender-fluid individuals. This term is used to encompass a broad spectrum of sexual and gender identities, promoting acceptance and inclusion for all.	LGBTQ+ family structures are represented throughout the books, offering a diverse perspective. We've included examples and scenarios that explore LGBTQ+ issues and rights, as well as discussions on anti-discrimination, helping learners understand and respect diversity in sexual orientation.
8. Religious and Spiritual Diversity	This involves representing a variety of religious beliefs and promoting respect for different spiritual practices.	Our books contain co[illegible]t th[illegible] introduces learners to various religi[illegible]nd spiritual practices. We've also encourag[illegible]in[illegible]n dialogue to help foster respect[illegible]und[illegible]anding across different belief syste[illegible]. S[illegible]ular perspectives are included as well, e[illegible]ng all belief systems are respected and represen[illegible]fairly.
9. Age Diversity	Age diversity involves includin[illegible] people from different age groups and discussing i[illegible]s related to aging.	In the books, you'll find characters and examples [illegible]nging from young children to the elderly. We've [illegible]lighted the importance of intergenerational relationships, as well as discussed age-related topics like retirement and ageism. This helps learners understand the value of every age group in society.
10. Geographic Diversity	Geograph[illegible]dive[illegible] represents people[illegible]nd[illegible]ssues[illegible]om various regio[illegible]onments, both [illegible]bal a[illegible]ocal.	The books include content from different regions around the world, addressing both global issues and local contexts that are relevant to learners. We've also balanced examples from urban and rural settings, showcasing the unique challenges and benefits of each environment.

10. Creating an inclusive and diverse classroom environment

10.1. Diversity in the classroom

Strategies 1 – 10: Building a positive and inclusive classroom environment

1. **Create a safe space:**
   Make sure your classroom is a place where learners feel physically, emotionally, and mentally secure. Encourage them to ask questions, be curious, and support each other through peer learning. Do not give answers or hints. Allow learners to be creative and think of different answers.

2. **Set clear, respectful rules:**
   Foster an environment of mutual respect and trust by setting clear classroom rules. When everyone knows what's expected, the classroom becomes a positive space for all.

3. **Celebrate good behaviour:**
   Focus on positive behaviour by praising learners whenever possible. Sharing the coding and robotics resources, and giving each one a chance in the group.

4. **No teasing or bullying:**
   Ensure that your classroom is a bullying-free zone, where every learner's voice matters, and they feel valued and included.

5. **Respectful communication:**
   Set the standard for respectful listening and speaking. Only one person speaks at a time, and everyone listens carefully. It's about teamwork! Reinforce this when learners are taking part in Paired Programming and Cooperative Learning activities

6. **Encourage shared laughter:**
   Let learners laugh together but not at each other. Building a sense of community through shared joy strengthens the classroom dynamic.

7. **Build team relationships:**
   Create strong connections between you and the learners and their guardians/parents. Teach learners to participate in group tasks respectfully considering each other's needs. Everyone working together leads to the best outcomes for your learners.

8. **Embrace different learning styles:**
   Be mindful that every learner has their own way of learning. Produce and include learning tasks for learners' individual learning differences. Support and nurture these differences. Allow different answers. Discuss and let learners test if it is correct.

9. **Promote peer learning:**
   Encourage learners to learn from one another, as learners c omplete Paired Programming and Cooperative Learning tasks. This builds confidence and cooperation in your classroom.

10. **Introduce peer tutoring:**
    Help learners become tutors themselves by guiding them in peer tutoring. It's a fun and effective way to reinforce knowledge and leadership.

10.2. Celebrate every learner's uniqueness

Learners should be able to see themselves and their diverse experiences reflected in the classroom. This means showing diversity in physical appearance, languages, identities, cultures, religion, gender, sexual orientation (including LGBTQ+), ages, and cognitive abilities. Our books feature characters from different backgrounds to reflect these varied experiences. We carefully select images, artwork, and content that represent the different people, environments, and realities that make up South Africa and beyond.

We encourage you to do the same in your classroom. Use storytelling to highlight diverse backgrounds, show images of rural and urban settings, and talk about people with different physical abilities, cognitive abilities, and identities, including LGBTQ+. Discuss various religions, ages, and gender diversity, and explore the different economic situations your learners may encounter. Take time to teach about our connections with other countries and people across Africa and the world. By doing this, you help every learner feel seen, valued, and part of the larger global community.

11. Pedagogical Approach

Variation theory is a pedagogical approach that focuses on how learners discern and understand critical aspects of a concept by experiencing **variations** in what is being taught. The core idea is that learners grasp a concept more deeply when they are exposed to multiple examples and non-examples that highlight the differences and similarities within a particular subject.

The basic idea of **Variation Theory** is that learners learn better when they see differences and similarities in what is being taught. It suggests that learners cannot fully understand something unless they see it in different ways or situations. By showing both what the concept is and what it is not, learners can focus on what really matters.

In simple terms, **to learn a concept well, the learner needs to see what changes and what stays the same. This helps them notice the important parts of the idea.** As teachers, we can help by showing different examples that highlight these differences, making it easier for learners to understand deeply.

Key aspects of variation theory in teaching and learning include:

11.1. Focus on Critical Features: The teacher identifies the essential characteristics of the concept and presents variations that emphasise those features.

11.2. Patterns of Variation: The teacher uses different patterns to help learners see what varies and what remains constant. These patterns include:

- **Contrast:** Presenting opposing examples to highlight differences.
- **Generalisation:** Showing variations within the concept to grasp the broader application.
- **Separation:** Presenting each feature in isolation to focus on its importance.
- **Fusion:** Combining critical features to see how they interact within the concept.

11.3. Discernment: By experiencing varied examples, learners can discern what aspects are important and develop a deeper understanding of the concept.

12. Approach to teaching Coding and Robotics

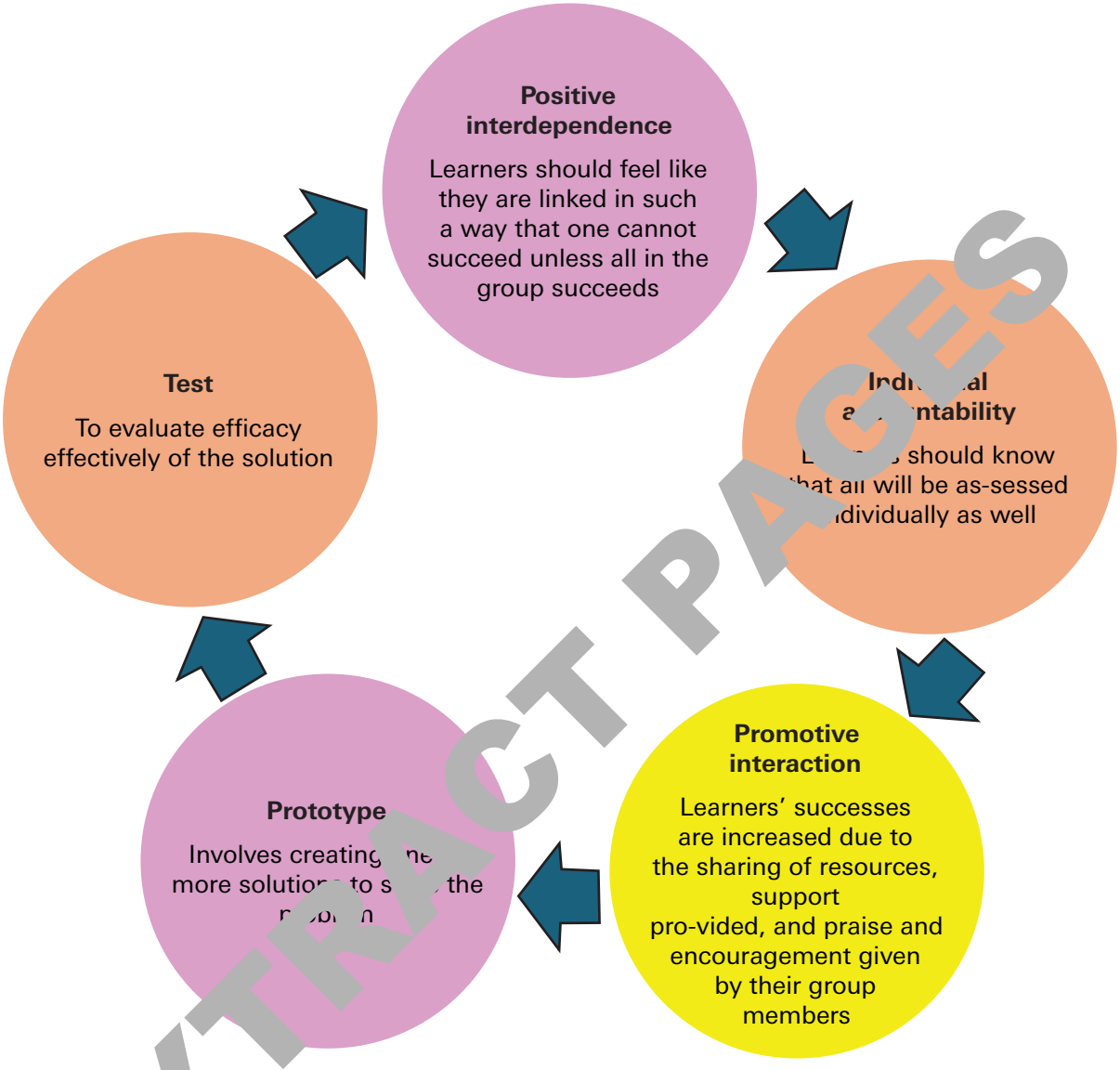
Teaching and learning will adopt a problem-based learning strategy, emphasizing an active, learner-centred approach.

Problem-Based Learning VS Traditional Learning	
Learners work in groups to solve real-world problems. Develop teamwork, communication and research skills. Enhanced critical thinking and problem-solving abilities.	Teachers deliver instructions. Learners are given information without much effort on their part. Relies on rote learning and memorisation.

12.1. Cooperative Learning

Cooperative learning is a teaching method where learners work together in small groups, helping each other learn. This makes learning more enjoyable and helps them improve their skills.

Learning activities and roles are structured and overseen by the teacher, and each member of the group oversees the academic performance of the others. To successfully implement cooperative learning, leading authors in the field (David Johnson and Rodger Johnson) emphasise the intentional stimulation of five basic elements (Johnson & Johnson, 2021:55-56).



12.2 Pair Programming

Pair programming is a teaching method where two learners work together to complete a shared task or goal. Pair programming comes from the programming industry. In the schooling context, one learner will fulfill the role of "driver", and the other learner is the "navigator".

Driver = operates the keyboard or writes on paper.

Navigator = uses resources and reviews the driver's work.

In this series, many grid activities will involve one student acting as the "coder," who will program the "robot." The other student will take on the role of the "robot," following the coder's instructions.

12.3. Deliberate Practice

Coding and robotics require critical thinking, focus, and regular practice. This practice should be purposeful, well-planned, and gradually build on existing knowledge. Deliberate practice involves setting specific goals, getting feedback, and making focused efforts to enhance skills.

12.4. Science of Learning

The curriculum is guided by the science of learning, which identifies the best teaching strategies based on evidence that improves long-term retention and enhances learning outcomes.

Science of Learning

The Science of Learning is an interdisciplinary field that draws on cognitive psychology, neuroscience, and education to understand how people learn. Key principles include:

- **Active Recall:** Retrieving information from memory strengthens learning. In coding, this means learners shouldn't just passively observe; they should actively try to write code, solve problems, and explain their solutions.
- **Spaced Practice:** Distributing learning over time leads to better long-term retention. In coding curriculum, this suggests revisiting concepts regularly, rather than cramming everything into one session.
- **Interleaving:** Mixing different concepts during practice enhances learning. For coding, this involves alternating between different types of coding tasks or robotics challenges.
- **Feedback:** Providing timely and specific feedback helps learners identify and correct errors. In coding, this could involve debugging code, receiving constructive criticism on projects, or reflecting on their problem-solving process.
- **Metacognition:** Encouraging learners to think about their own thinking helps them become more effective learners. In coding, this could involve asking learners to explain their strategies, reflect on their successes and failures, and identify areas for improvement.

- **Cognitive Load:** Teachers should be mindful of the amount of information presented to the learners. Lessons should be broken down into smaller, more manageable sections.

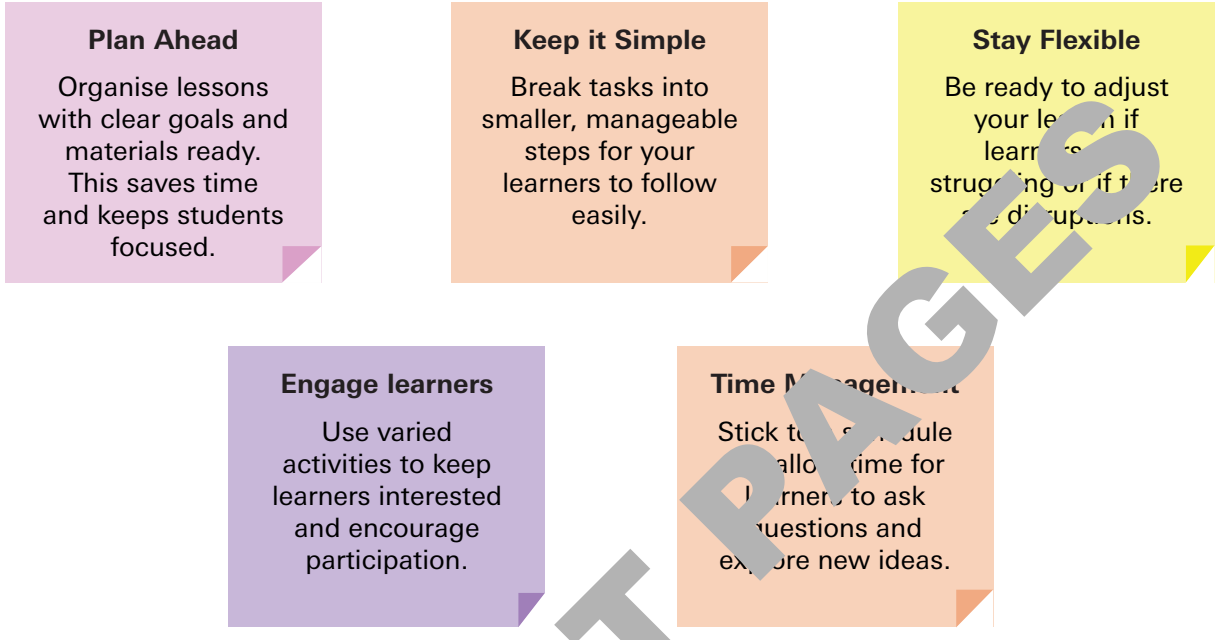
Relating the Science of Learning to Foundation Phase Coding and Robotics

In the Foundation Phase, these principles are particularly crucial:

1. **Concrete experiences:** Young learners benefit from hands-on activities. Unplugged coding activities (e.g., using coding cards to represent code) and building simple robots provide concrete experiences that support abstract concepts.
2. **Play-Based Learning:** Play is a powerful tool for learning in early childhood. Coding and robotics activities can be designed as games and challenges that engage learners' natural curiosity and creativity.
3. **Visual and Kinesthetic Learning:** Young children often learn best through visual and kinesthetic experiences. Coding cards with colourful visual designs and robotics activities that involve physical movement cater to these learning styles.
4. **Pattern Recognition:** A large part of early coding skills is the ability to recognise patterns. The Foundation Phase heavily focuses on this skill.
5. **Problem Solving:** Coding and robotics naturally lend themselves to problem solving. When a code does not work, children are forced to solve problems. Always start with a problem statement.

In essence, these Foundation Phase coding and robotics books demonstrate how the 'science of learning' can be effectively taught by incorporating these principles through the books' hands-on activities, play-based learning, and visual tools. Educators can, therefore, create a more effective and engaging learning experience for their young learners, fostering their interest in coding and robotics and building a strong foundation for future learning.

13. Effective lesson management



14. Managing large c ss oms

Managing large classrooms mon in many schools, can be challenging. Establishing cooperative cla m guidelines helps foster a respectful, inclusive learning community. l ving earners in setting behavior and learning goals promotes ownership ies and expectations.

Effective clas oom anagement strategies include:

- Setting b ndaries: Clearly communicate rules and boundaries from the start and cont ly reinforce them.
- R ine a d structure: Maintaining consistent routines helps manage large cl s .
- Peer work: Pairing or grouping learners fosters peer teaching, collaboration, and shared responsibility.
- Visual and audio aids: Use visual aids (posters, hand signals) and audio cues (music, clapping) to reinforce instructions.
- Differentiated instruction: Tailor lessons to meet the varying needs of learners in the class.

- It is important to remember that all children are individuals, and it is not possible to generalise understanding and knowledge across all culture and background. Learning is a result of experience. Each learner has their own existing knowledge based on past experiences; each is unique.
- To get the best out of your learners, you need to instil confidence. A confident learner is one who is open to and prepared for challenges and will therefore more easily grasp new concepts.
- Creating a safe environment where learners are willing to take risks and making mistakes is normal and part of the learning process. Allow learners to be successful when they start their journey in learning the core skills included in Foundation Phase English. This means starting at their level, providing scaffolding, and supporting them as they learn new language and literacy concepts.
- BELIEVE IN YOUR LEARNERS! Each learner must know that someone believes in them, and that they will succeed.

15. Using Creative and Sensory Practice in Learning

Incorporating creative activities into daily classroom routines can engage learners and enhance their perception of the learning environment. Music, for example, is used globally to create a positive atmosphere, regulate mood, and support academic development. Research shows that music aids brain processing, speech, and learning retention. If using music, ensure it does not negatively impact learners with sensory or auditory disorders by involving learners in music selection to make it an inclusive experience.

Movement, singing, and chanting can motivate learners and help with retention through repetition, rhyme, and physical activity. These activities add variety to daily routines and make learning enjoyable.

16. Alternative environment

Introducing different environments or changing the classroom setup can stimulate learning. Occasionally holding lessons outside or reconfiguring the classroom space can help. If off-campus excursions are not feasible, simple classroom changes, like altering seating arrangements or displaying new materials can keep the environment dynamic.

Excursions, when possible, provide experiential learning opportunities. Always ensure compliance with your school's guidelines when planning trips. If excursions are not an option, ask parents or the community to contribute objects related to topics being studied to make learning more engaging.

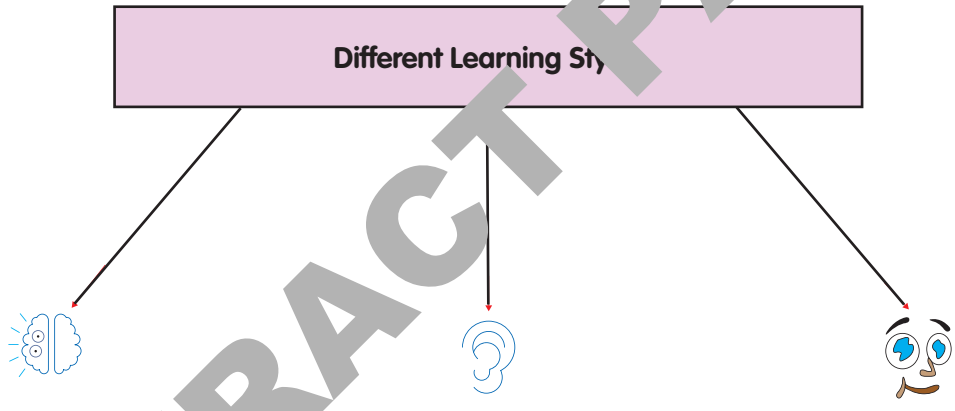
17. Supporting various learning styles

17.1. Realise that different learners learn differently

We all receive information, process and express information differently depending on our learning style. Keep in mind that in your class there will be learners whose learning style is different from yours.

Talk about different learning styles in the classrooms. Some children prefer to see new information, while others learn better from hearing about it.

If you can address these different learning styles, it will maximize the learners' potentials, improve self-confidence and self-esteem.



Logical/ Mathematical:

- Likes to do experiments, figure things out, work with numbers.
- Learns best by categorizing, classifying and working with abstract patterns.
- Examples of activities:
- Problem solving
- Encourage learners to experiment
- Invite them to help you out or
- Organise classroom resources

Linguistic/ Auditory:

- Likes to read, write and tell stories
- Learns best by saying, hearing and seeing words
- Examples of activities:
- Provide written materials
- Read to the learners
- Encourage them to tell you about the story or content they have read or
- To share something they have written
- Encourage them to visit libraries or research the internet
- Provide word games

Visual:

- Likes to draw, build, design and create things
- Learns best by working with colours, pictures and diagrams
- Examples of activities
- Provide visual alternatives to text e.g. displays, posters, mind maps, diagrams, graphs, and illustrations.

17.2. Differentiated tasks in our textbook

Differentiated learning in the foundation phase involves adapting teaching strategies and tasks to cater to diverse learning styles. It includes using various tools like drawings, physical activities (placing on the floor), and mirroring techniques to support all learners. The aim is to ensure every child can engage with and understand the material in a way that suits them best.

Differentiated Learning mindmap

Main Branches:

- Easier Tasks: Specific adaptations for struggling learners
    - Simplified Instructions
    - Visual Cues
    - Step-by-Step Guidance
- Extension Tasks: Specific adaptations for advanced learners
    - Increased difficulty and complexity
    - Problem-Solving
    - Creative Application
- **Creative and Sensory Practice**
- **Alternative environment**
- **Body movement activities**
- **Coding card activities**
- Learning Styles
    - Visual
    - Kinesthetic,
    - Auditory
- **Coding/Robotics Tasks:**
    - Simple Directions
    - Color Coding
    - Pre-Programmed Robots
    - Storytelling with Robots
    - Obstacle Courses
    - Sequencing Commands
    - Using Sensors
    - Robot Stories
    - Coding Challenges
- **Visual Aids:**
    - Icons (Rocket Robie - TG - is diff icon)
    - Color
    - Diagrams

In the foundation phase, children learn in different ways.

Differentiated learning means we change how we teach to help every child.

Ideas for Coding and Robotics Tasks:

Go from concrete to more abstract tasks when teaching a new skill

Easier Tasks:

- Simple Directions: Instead of complex coding, start with simple directions like "move forward two steps" or "turn left." Use physical movement, including coding cards, and large physical boards.
- Colour Coding: Use coloured stickers or blocks to represent different commands. Children can arrange them in a sequence to give instructions to a robot or a peer acting as a robot.
- Storytelling with Robots: Create a simple story and have the robot act it out based on basic directions.

Extension Tasks:

- Creating Obstacle Courses: Have children design and build obstacle courses for the robots to navigate. This involves planning and problem-solving.
- Sequencing Multiple Commands: Introduce longer sequences of commands and have children predict the robot's path.
- Using Sensors: If available, explore robots with sensors (light, sound, touch). Children can program the robot to react to different stimuli.
- Creating Robot Stories: Write or draw stories and then code the robot to act out the story, adding complexity to the movements and interactions.
- Coding Challenges: Set challenges like "Make the robot draw a square" or "Make the robot reach a specific point." This encourages problem-solving and logical thinking.

18. Teacher Wellness

Teaching is a high stress career for many professionals. Not only is it a demanding career, with many resourcing challenges, it can also present many dangers in a country with high levels of crime and violence. For these reasons it is imperative that you have systems in place to take care of yourself, decompress and process their experiences and concerns.

Mindfulness and meditation

Take a few minutes each day to relax by practicing mindfulness. Breathing exercises and calming your thoughts can help reduce stress. Free resources for meditation are available online and can be done in your classroom during quiet moments.

Build supportive communities

Join or create a group of fellow teachers for support and learning. Sharing experiences with others can help you manage the challenges of teaching and offer new perspectives.

Healthy Lifestyle

Maintain a balanced diet, stay physically active, and look after your voice. Simple daily habits like staying hydrated, eating nutritious meals, and exercising regularly will keep your energy levels up and protect your health.

Mental and emotional health

Teaching young, vulnerable children can be emotionally demanding. It's important to have a safe space or outlet where you can talk about your responsibilities and process the mental load of your role.

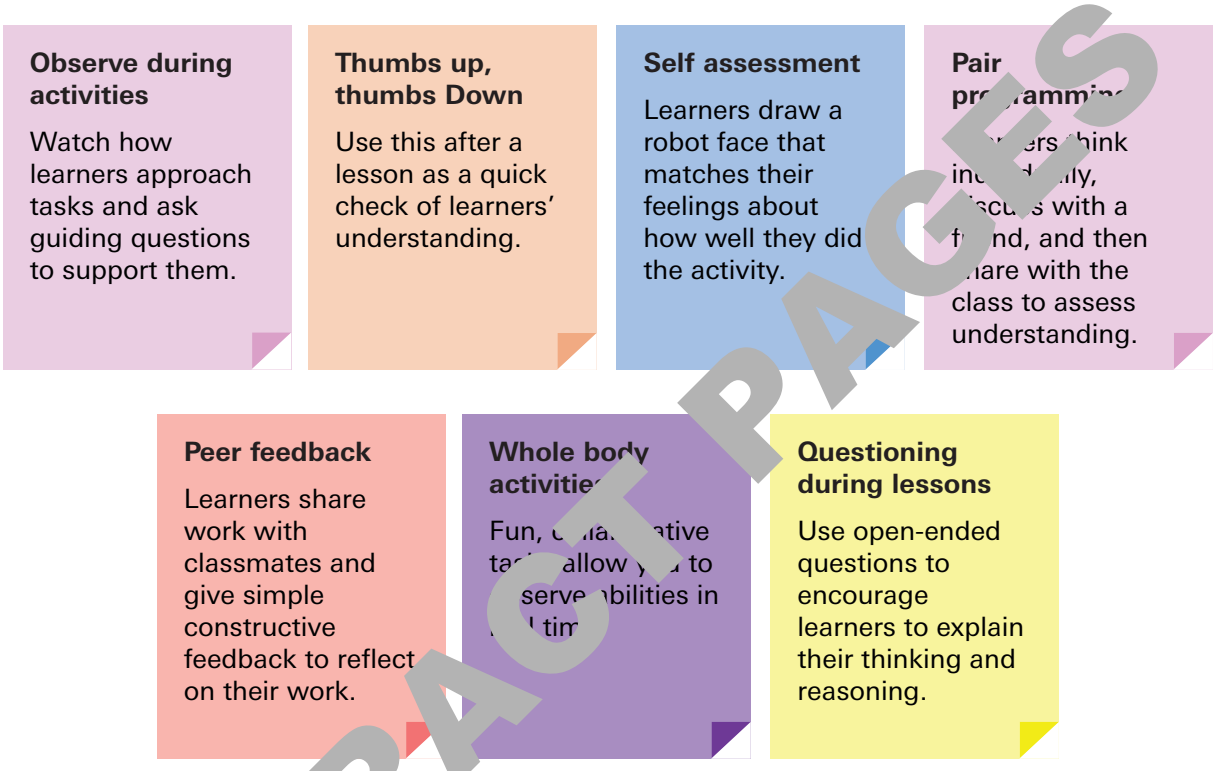
19. Assessment

Assessment encompasses a variety of methods used to gauge learner progress and understanding in math It's not just about tests—it's about exploring how well learners grasp concepts and apply their skills. Continuous assessment of foundation phase learners facilitates ongoing monitoring of learner progress and teaching outputs. It allows you to evaluate your methods and learner progression and make appropriate, daily instructional decisions. Assessments should be naturally integrated into the teaching and learning process using engaging, fun and encouraging methods to elicit active participation from learners.

Assessment includes various methods to measure learners progress and understanding. Regular assessments help you see how well learners grasp concepts and apply their skills. In the foundation phase, continuous assessment allows for ongoing monitoring of learner progress and teaching effectiveness. This enables you to evaluate your teaching methods and learner growth, helping you make informed, daily instructional decisions.

19.1. Assessment for learning

Assessment for learning is naturally integrated into your teaching process, where fun, engaging, and supportive methods encourage active participation from learners. It helps identify where learners need more support and guides your instruction to meet their needs.



19.2. Assessment as learning

Assessment as learning involves learners reflecting on their progress, encouraging them to take responsibility for their own learning. Through this, they actively assess their own understanding, which promotes deeper learning and self-awareness.

19.3. Assessment of learning

Assessment of learning provides you with evidence of learner achievement at specific points in time, helping you gauge overall progress and make informed decisions about their progression.

19.4. Guidelines for Assessment

Guidelines for assessing skills and competencies in Coding and Robotics for the Foundation Phase are provided. The guidelines for evaluating practical and theoretical competencies for each term are included in the endlims on page 174.

20. Rating code

RATING CODE	DESCRIPTION OF COMPETENCE	PERCENTAGE
7	Outstanding achievement	80 – 100
6	Meritorious achievement	70 – 79
5	Substantial achievement	60 –
4	Adequate achievement	5 – 9
3	Moderate achievement	0 – 49
2	Elementary achievement	30 – 39
1	Not achieved	0 – 29

21. Suggested Teaching Plan:

Grade 2

Term 1:		
Week	**Topic**	**Competencies**
1.	We need water to live	C3 - Execute a set of commands physically, on paper, with an educational tool
		C6 - Identify and explain patterns in data sets or visualizations.
		D3 - Explain what a computing device is and provide examples.
2.	Healthy snacks are better	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
3.	Shelters keep us safe and dry	C3 - Execute a set of commands physically, on paper, or with an educational tool.
		C6 - Identify and explain patterns in data sets or visualizations.
4.	Technology is useful	C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		D1 - Explain what technology is and its purpose.
5.	Everyone is special	C3 - Execute a set of commands physically, on paper, or with an educational tool.
		C5 - Reflect on and suggest improvements for a given solution.
		R5 - Create simple artefacts representing robots using various materials.
6.	We live in a digital world	D2 - Understand the digital world and the safe use of electronic devices.
7.	Choose the route	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		C6 - Identify and explain patterns in data sets or visualizations.
8.	Interesting sequences and patterns	C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		C6 - Identify and explain patterns in data sets or visualizations.
9.	Healthy sequences	C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
10.	A moving robot for Tumi	R1 - Explain what a robot is, including its purpose and mode of operation.
		R2 - Identify different types of robots and their uses.
		R5 - Create simple artefacts representing robots using various materials.

Term 2:		
Week	**Topic**	**Competencies**
1.	Spring is here	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		R3 - Understand that robots comprise different com[illegible]like sensors, power sources, and motors.
2.	Be a good friend	C2 - Use symbols or written statements to re[illegible] sequences of commands, including repetition and co[illegible]onstructs.
		D2 - Understand the digital world and [illegible] safe [illegible]of electronic devices.
3.	Code the robot	C1 - Order, arrange, or search picture[illegible]ols, characters, and numbers to solve problem[illegible]
		C3 - Execute a set of comman[illegible]ically, on paper, or with an educational tool.
		R1 - Explain what a r[illegible], including its purpose and mode of operation.
		R2 - Identif[illegible]ferent types of robots and their uses.
4.	What are seasons	C1 - Ord[illegible], a[illegible]ge, or search pictures, symbols, characters, and n[illegible]bers to s[illegible]e problems.
		C[illegible] Use [illegible]mbols or written statements to represent sequences [illegible]om[illegible]ands, including repetition and conditional constructs.
		[illegible]3 - Execute a set of commands physically, on paper, or with an [illegible]ucational tool.
		R6 - Perform tasks mimicking robot operations based on given instructions.
5.	My paper [illegible]ma[illegible]	R5 - Create simple artefacts representing robots using various materials.
6.	My [illegible]igital de[illegible]s	C3 - Execute a set of commands physically, on paper, or with an educational tool.
		R6 - Perform tasks mimicking robot operations based on given instructions.
		D1 - Explain what technology is and its purpose.
		D3 - Explain what a computing device is and provide examples.
7.	How technology has changed	C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		D1 - Explain what technology is and its purpose.
		D3 - Explain what a computing device is and provide examples.

8.	Starfish rescue	C3 - Execute a set of commands physically, on paper, or with an educational tool.
		D1 - Explain what technology is and its purpose.
		R6 - Perform tasks mimicking robot operations based on given instructions.
9.	Make a paper rabbit	R5 - Create simple artefacts representing robots using various materials.
10.	Help the animals get home	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		C6 - Identify and explain patterns in data sets or visualizations.
Term 3:		
Week	**Topic**	**Competencies**
1.	Fun on the farm	C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		R1 - Explain what a robot is, including its purpose and mode of operation.
		R2 - Identify different types of robots and their uses.
2.	Pretty pot plants	C4 - Inspect and correct errors in a given set of instructions.
		C6 - Identify and explain patterns in data sets or visualizations.
		C7 - Create or complete patterns to represent data.
		D1 - Explain what technology is and its purpose.
		D2 - Understand the digital world and the safe use of electronic devices.
		D3 - Explain what a computing device is and provide examples.
3.	Fix the robot	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		R3 - Understand that robots comprise different components like sensors, power sources, and motors.
		R4 - Explain how robots affect the world, including their use in dangerous and repetitive tasks.

4.	Find shapes on the farm	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		C2 – Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		D4 - Identify common uses of ICT in the real world.
		D5 - Differentiate between hardware and software.
		R6 - Perform tasks mimicking robot operation[illegible] based [illegible]ven instructions.
5.	Write secret messages	C4 - Inspect and correct errors in a giv[illegible]et o[illegible]ctions.
		D7 - Understand the concept of inpu[illegible] pro[illegible]ng, and output.
		D8 - Interpret patterns to communica[illegible]ages or images.
6.	Solve secret codes	C1 - Order, arrange, or searc[illegible] symbols, characters, and numbers to solve problems.
		C2 - Use symbols or [illegible] sta[illegible]ents to represent sequences of commands, inc[illegible]g repetition and conditional constructs.
		C3 - Execute a set of co[illegible]ands physically, on paper, or with an educati[illegible] tool.
		C6 - Ide[illegible] explain patterns in data sets or visualizations.
		C7 [illegible]eate or complete patterns to represent data.
7.	Fans are cool	R[illegible] Crea[illegible] simple artefacts representing robots using various [illegible]s.
		[illegible]Perform tasks mimicking robot operations based on given instructions.
		R7 - Create, test, and execute a set of robotic instructions.
8.	Get the right he[illegible]	C4 - Inspect and correct errors in a given set of instructions.
		R1 - Explain what a robot is, including its purpose and mode of operation.
		R2 - Identify different types of robots and their uses.
		R3 - Understand that robots comprise different components like sensors, power sources, and motors.
		R4 - Explain how robots affect the world, including their use in dangerous and repetitive tasks.
9.	Find the route	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		D5 - Differentiate between hardware and software.

10.	Write the code	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		C4 - Inspect and correct errors in a given set of instructions.
Term 4:		
Week	**Topic**	**Competencies**
1.	If this, then what?	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		D6 - Explain how technology impacts society.
2.	Robots in South Africa	C4 - Inspect and correct errors in a given set of instructions.
		R1 - Explain what a robot is, including its purpose and mode of operation.
		R2 - Identify different types of robots and their uses.
		R3 - Understand that robots comprise different components like sensors, power sources, and motors.
		R4 - Explain how robots affect the world, including their use in dangerous and repetitive tasks.
3.	All about our country	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		R5 - Create simple artefacts representing robots using various materials.
4.	Make-believe games	R5 - Create simple artefacts representing robots using various materials.
		R6 - Perform tasks mimicking robot operations based on given instructions.
5.	I am a digital citizen	C5 - Reflect on and suggest improvements for a given solution.
		C6 - Identify and explain patterns in data sets or visualizations.
		C7 - Identify and explain patterns in data sets or visualizations.
		R7 - Create, test, and execute a set of robotic instructions
		D6 - Explain how technology impacts society.
6.	Communicating then and now	C5 - Reflect on and suggest improvements for a given solution.
		C6 - Identify and explain patterns in data sets or visualizations.
		C7 - Create or complete patterns to represent data.
		R7 - Create, test, and execute a set of robotic instructions
		D6 - Explain how technology impacts society.

7.	What is the code?	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		C4 - Inspect and correct errors in a given set of instructions.
		R6 - Perform tasks mimicking robot operations based on given instructions.
8.	Move the box	C1 - Order, arrange, or search pictures, symbols, characters, and numbers to solve problems.
		C2 - Use symbols or written statements to represent sequences of commands, including repetition and conditional constructs.
		C3 - Execute a set of commands physically, on paper, or with an educational tool.
		C4 - Inspect and correct errors in a given set of instructions.
9.	Master the maze	C5 - Reflect on and suggest improvements for a given solution.
		D1 - Explain what technology is and its purpose.
		D2 - Understand the digital world and the safe use of electronic devices.
		D3 - Explain what a computing device is and provide examples.
		D4 - Identify common uses of ICT in the real world.
10.	Technology around us	C5 - Reflect on and suggest improvements for a given solution.
		C5 - Reflect on and suggest improvements for a given solution.
		D2 - Understand the digital world and the safe use of electronic devices.
		D3 - Explain what a computing device is and provide examples.
		D4 - Identify common uses of ICT in the real world.

22. Suggested Intervention Strategies

Coding and Robotics are best introduced through unplugged, hands-on activities that make learning fun and engaging. The first "rule" for teaching Coding and Robotics is to ensure both you and the learners enjoy the experience. Research shows that people retain information more effectively when they learn in a fun, interactive, and iterative way. Whole-body activities make learning enjoyable and are essential for retention. If children aren't having fun, they're less likely to remember what they've learned.

Unplugged coding:

- Unplugged coding involves facilitating lessons in a fun and interactive manner without relying on digital devices.
- Since Coding and Robotics heavily emphasise directionality, incorporating whole-body movements is highly recommended to reinforce learning.
- Start by having learners create their own rocket using the template provided at the back of their book. Encourage them to keep this rocket safe, as it will be their "coding companion" for the entire year—a tool they'll use regularly to practice and reinforce directionality skills.

How to colour the rocket:

Instructions:

- Trace the rocket
- Cut out the rocket
- Colour your rocket
- Up – red
- Down – blue
- Right – orange
- Left - yellow
- Paste your rocket on a piece of cardboard

How to use the rocket:

- Before starting any grid activity, especially in Grade 1 and at the start of a new term, have the learners stand with the rocket in their hands.
- Red facing forward, instruct them to move in the direction that you are instructing them to go.
- Later in the year, or in a higher grade, learners can also do the task of being the "coder" by instructing the rest of the class in which direction to go.
- This should be a short practice of about 2 minutes.

TIP: Do as many grid activities as possible on the playground or tarmac by creating big grids with masking tape or chalk. If this is not possible, create a grid on the classroom mat.

TIP: Introduce the "Flying My Rocket" activity by encouraging learners to "fly" their imaginary rockets. Have them hold their "rocket" high with one hand and guide it around in large, sweeping motions. After a few moments, prompt them to switch hands and continue. This exercise adds fun and promotes midline crossing, enhancing coordination skills.

- To reinforce directionality, tie a string around each learner's right wrist.
- This simple tool helps them identify their right side, supporting their ability to distinguish left from right over time.

TIP: Use a yellow string to tie to their right wrist; this will help with remembering the directional arrows.

Dance!

Dancing is a fantastic way to introduce concepts like algorithms, loops, sequences, and even debugging!

- Look for songs with step-by-step instructions in the lyrics or try line dancing activities.
- This approach energises learners, making the lesson socially interactive, enjoyable, iterative and inclusive for everyone, including you, the teacher!

Games!

Playing simple games with rules is a valuable tool when teaching Coding and Robotics.

- "Simon says"
- Hopscotch
- Wheelbarrow walking
- Diketo
- Drie Stokkies

Prior knowledge:

When introducing a new concept, start with what learners already know. This helps them connect familiar ideas to new concepts. Here are some activity ideas:

- For transportation, start with examples like taxis, cars, buses, and trains.
- To introduce algorithms and coding, use everyday tasks like cooking, washing clothes, or brushing teeth.
- When using cooking examples, choose familiar South African foods, like making vetkoek (amagwinya) or samp and beans (umgqusho).

Authentic connections:

When learners learn through real-life scenarios, they experience authentic connections. This means that they will find it easier to recognise how Coding and Robotics are relevant to their daily lives. When they travel from home to school, they use an algorithm, a code to get from point A to point B.

Here are some examples of possible activities:

- Code a friend
- Making tea
- Walking to school
- Taking public transport to school/home
- Making porridge
- Sweeping with a broom

Concrete – Pictorial – Abstract:

When teaching a new concept, start with real, concrete examples. Next, use pictures or photos and move on to more abstract ideas.

Examples:

- **Pattern Recognition:** Show learners real-life patterns in the classroom, playground, or community.
- Provide them with objects to create patterns, like bottle tops, counters, beads, paper strips, playdough, or even fruits and vegetables.
- Let them make patterns with their bodies (like boy, girl, boy, girl) or with clothing items, like socks or shoes.

Scaffolding:

Allowing learners to progress at their own pace reduces anxiety, fostering a confident and relaxed classroom environment. Implementing the "I do, We do, You do" strategy effectively supports learners who face challenges.

To ease learners into working with grids, begin with a smaller grid, such as 2 x 2 or 3 x 3.

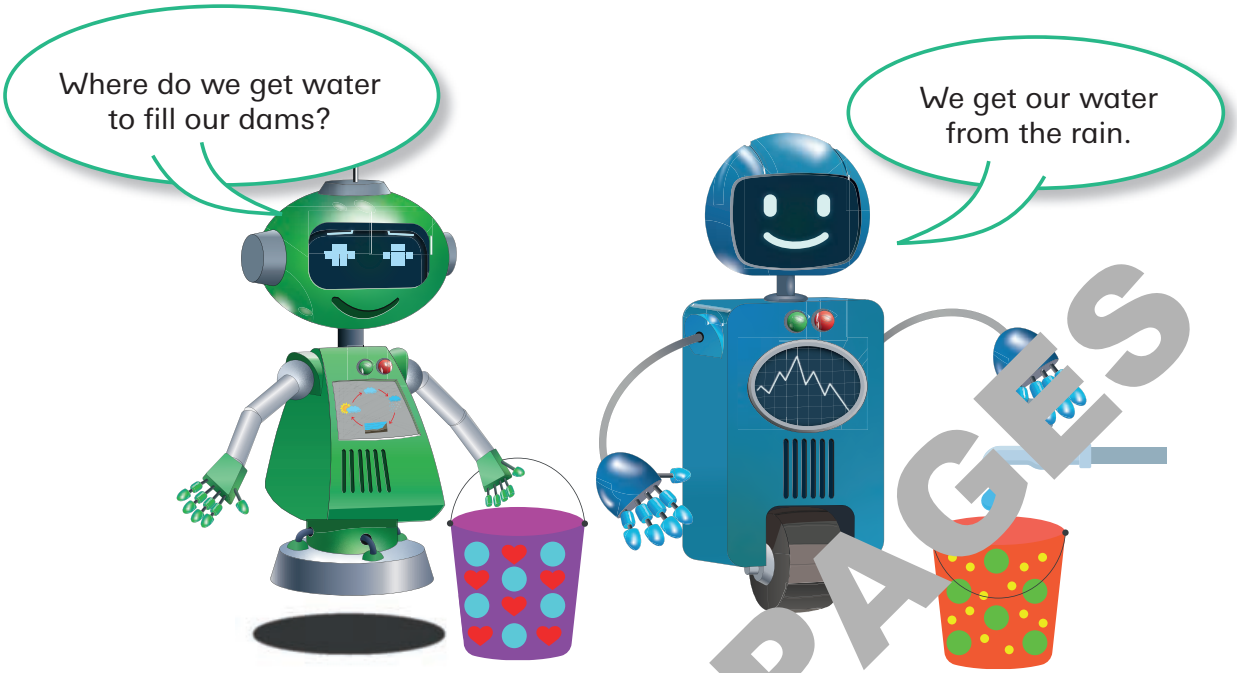
Furthermore, activities such as drawing with your finger using paint from the left side to the right side of an A3 or A4 page and from the bottom to the top of the page will assist learners with directionality as well as midline crossing.

Find the directionality template at the back of the learner's book.

Provide each learner with blue, red, orange, and yellow paint. They dip their finger in the red paint and draw a line to the top of the arrow, doing this for all directions and colours.

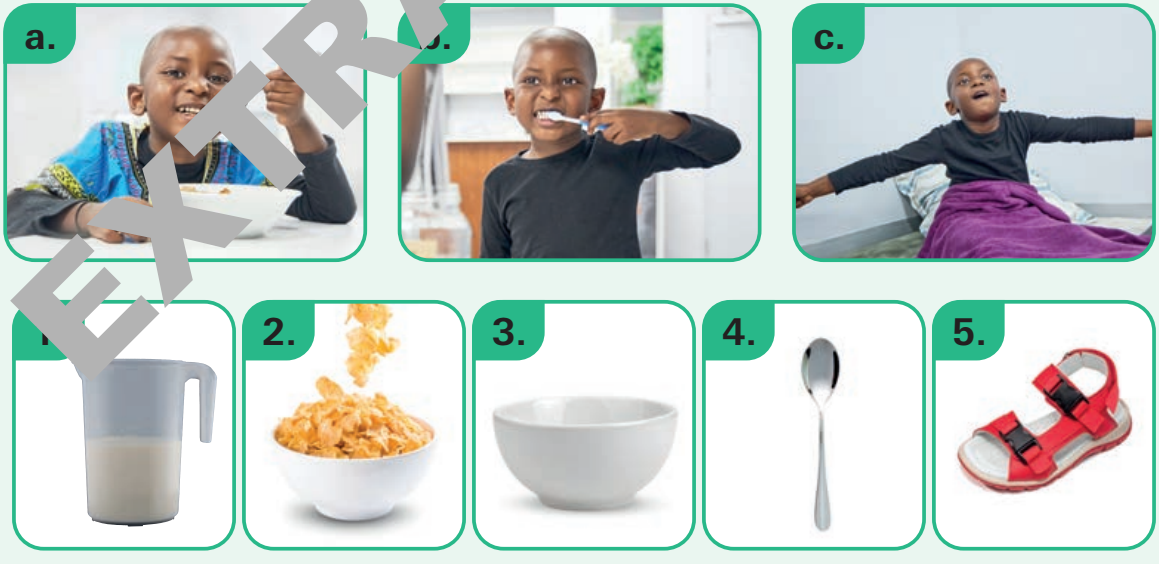
Term 1 Week 1: We need water to live

Focus areas	Coding
Note to the teacher	In this lesson, learners will learn about the water cycle and make their water cycle wheel using Computational Thinking Skills. We recommend you start with "Let us Begin" to have the learners practice the competencies before you introduce the "Problem" and have them complete the activities. At the end of the week, we added a table with simplifie[illegible]s of applying computational thinking concepts that [illegible] with the learners if time allows. **NB.** Learners do not have to be taught the compu[illegible]hinking skills terminology.
Recommended resources	
Let us begin	Practical activity: - Buttons - Pegs - Shapes - learner book - Blocks - Sucker sticks - Bottle tops
Activity 1	- Poster or picture [illegible] the water cycle
Activity 2	Each l[illegible]rner should have: - Dr[illegible]g pi - 2 x A[illegible]es - [illegible]ers - P[illegible]ncil crayons
Activity 3	- [illegible]ode cards
Competencies	**C1** **C2** **C3**
Skills	**Learners will learn to:** • Identify and differentiate between the different stages in the water cycle. • Apply abstraction by removing irrelevant pictures in the sequence.
Know[illegible]ge	**Learners will do this by:** • Displaying an understanding of the water cycle and its effects. • Placing the sequence of the water cycle in the correct order. • Identifying the different stages in a water cycle sequence.



Let us begin

You can do a sequencing activity with learners before doing the activity in the learner book.



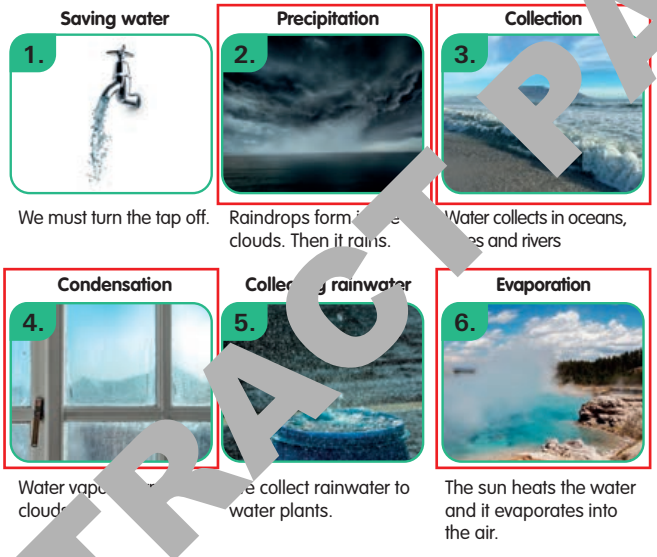
Activity 1

Term 1 LB pg 3

Activity guidance

The water cycle

- Look at the pictures 1 – 6 in the LB.
- In pairs they talk about the pictures and refer to the poster about the wa[illegible] cycle.
- They decide which two pictures do not fit.
- Now they need to discuss and place the water cycle pictures in the r[illegible]rde[illegible]equence) and explain why.
- **Answer:**
  Evaporation, Condensation, Precipitation, Collection



Suggested additional activities

- [illegible]ave the water cycle poster on the board, so that learners can refer to it, when needed.
- [illegible]ach learner has a zip lock bag and a permanent marker.
- [illegible]raw the mountain, ocean, sun, clouds & rain – in the correct order as it happens in the cycle.
- When all have prepared their zip lock bags. Each learner now fills the bag with ¼ water and closes it at the top.
- Draw a line where the water level is.
- Leave the bag in the sun and watch the water cycle happen right in front of you.

Activity 2

Term 1 LB pg 4

Activity guidance

Start the lesson by referring to the poster of the water cycle. Discuss the four stages with the learners and make sure they understand the order of the arrows.

Give the following instructions slowly and clearly. Do not add unnecessary infor...

You will need:

- a split pin,
- scissors,
- Pencil crayons,
- a skewer or sharp pencil,
- 2 large drawn circles on A4 paper.

Alternative materials

- Colour paper
- Paint
- Glue

Instructions:

1.	Fold both circles into four p... like a p...a.	
2.	Take one circle ar... cu... one pizza slice.	
3.	P... the ste...s of how water moves around on t... ircle with all its parts. Make sure they are in o...der: Evaporation, Condensation, Precipitation, Collection.	
4.	Poke a hole in the middle of both circles.	 
5.	Put the circles on each other and use the split pin to hold them together.	

Assist the learner pairs if necessary. In pairs, learners discuss with each other as they create their water cycle.

Ask the learners:

Test your eater cycle wheel

Move the top circle to see each picture of the water cycle.

1. Does the cycle turn easily?
2. Are the pictures colourful?
3. Are the pictures in the correct order?
4. What could you improve?

Suggested additional activities

- Use a paper plate, paper cut into a circle or recycled plastic sleeves
- Give the learners playdough in various colours – yellow, blue, whit[illegible] and [illegible] other colour to depict the arrows for the cycle.
- The learners then create a water cycle as depicted in the p[illegible]
- Ask the learners to label the four stages by writing it on sm[illegible] of paper

Activity 3

Term 1 LB pg 6

Activity guidance

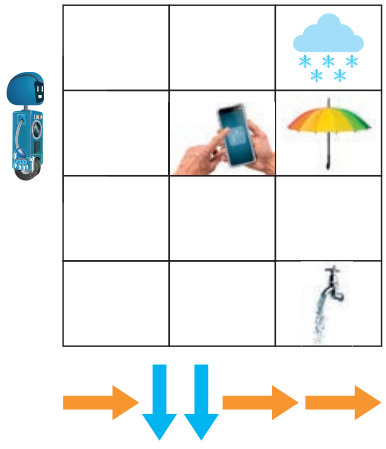
1. **Create a set [illegible]stru[illegible]ons to get Binkie to the tap.**
   - Start t[illegible]les[illegible]by giving each pair a set of coding cards.
   - Le[illegible]ers[illegible]n look at the grid map in the learner book.
   - [illegible]d the se[illegible]ences to the learners.
   - In p[illegible] they create a set of instructions to help Binkie get to the tap. Explain to the learners that the arrows can be used more than once.
   - **[illegible]k:** Did your instructions get Binkie to the person in the tap?

As[illegible]: Learner pairs that are struggling to create instructions.

[illegible]uggested additional activities

- Create a 5 x 5 grid on the mat or outside on the playground.
- Place the four stages of the water cycle in different blocks.
- In pairs, ask the learners to code their friend to the stages as it happens.
- Alternatively, you can code a few learners to the various stages while the rest of the class watches.

Solutions



NB. These examples are meant to be simple and not to be complicated for the learners.

Computational Thinking Skills	
Abstraction	When your parents asks you to sweep the kitchen, you will not do everything at once. You will first get the broom, start sweeping, get a dustpan, sweep the dirt onto the dustpan and then throw the dirt in the bin. You did the task one step at a time.
Decomposition	It is the end of the day, and we are getting to leave. What do we do first? We clean our desks by putting our stationery in our pencil bags. We put our pencil bags in our school bags. Then we look at our books and see what we will need to take home for homework. We pack those books in our bags. The rest of the books we place under our desks. We throw any dirt that is on our desks into the dirt bin.
Pattern recognition	Ask the learners to look around the classroom and find any patterns. Ask them why they say that it is a pattern or what makes it a pattern.
Algorithm	When we make a peanut butter sandwich, we follow an algorithm. We first get what we will need together, i.e. bread, margarine, peanut butter and a knife. We put the bread on a plate, get the knife and margarine and spread it on the bread. Then, we take the knife and spread the peanut butter on the bread. We then put the two slices of bread together and cut the bread.