



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

CODING AND ROBOTICS

GRADE R

LESSON PLANS

DEPARTMENT OF BASIC EDUCATION

Contents

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Annexure A – Learning Intentions and Success Criteria

Annexure B – Problem Statements

Annexure C – Assessment – Grade R

Annexure D - Annual Teaching Plan

Annexure E – Competencies and Concepts Clarification

Notes to the teacher:

Annexures are provided as separate documents.

For Grade R, the teacher can read the problem statement, then focus on the part of the problem statement highlighted in bold as problem statement for learners – also refer to Annexure B.

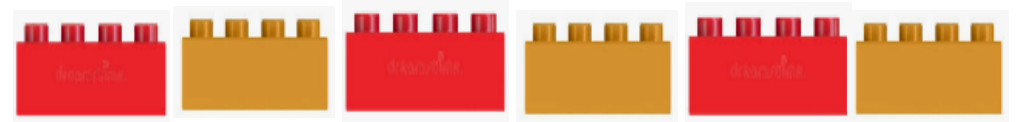
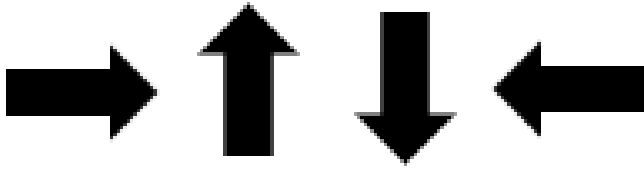
GRADE R TERM 1 CODING & ROBOTICS WEEK 1

2 x 30-minute lessons per week

TERM 1 WEEK 1	COMPETENCIES	TEACHER GUIDELINES FOR PRACTICAL ACTIVITY	RETRIEVAL PRACTICE
Learning Intentions: Learners will learn to ... - Respond to basic directional vocabulary (forward, backward, left, right) - Follow a sequence of simple directional instructions to navigate classroom spaces - Recognize that instructions must be followed in a specific order to reach a destination	C3	<u>Problem Statement:</u> "Welcome to Grade R! There's a new friend joining our class today named Thembi, and she doesn't know where anything is yet. Can you be a helpful friend and guide Thembi around our classroom? We need to show her where to find the blocks, the books, the art supplies, and all the special places in our room. Let's use our bodies to point and walk in the right direction to help Thembi find her way!" <u>Do it in the following way:</u> The teacher stretches out his/her arm in the direction in which they will walk, saying which area they will be walking to. Learners stretch out their arms in the same direction and walk forward towards the area following their arm. Only forward, left, right or back (Only 90degree turns, not diagonal 45 degrees) Do not use the degrees with the learners <u>Resources:</u> The teacher will instruct the learners verbally to move in or outside the classroom without a grid. The classroom (forward towards the board, the table, the door, the fantasy area, reading area, block corner, etc.) Outside (towards the jungle gym, toilets, office) Teacher can say left, right	Activity: Teacher guided activity remains the same, but the order of the instruction will change. Whole group activity 
	COMPETENCIES	TEACHER GUIDELINES for THEORY	
		No theory competencies to be addressed	
Success Criteria: I can:	- Move in the correct direction (forward, backward, left, right) when given verbal instructions - Follow 2-3 directional instructions in sequence to reach a specific location - Turn 90 degrees when instructed to turn left or right - Explain which direction I moved in simple terms		

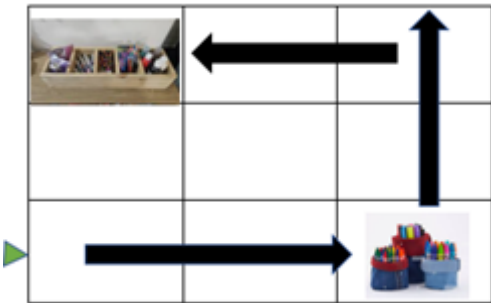
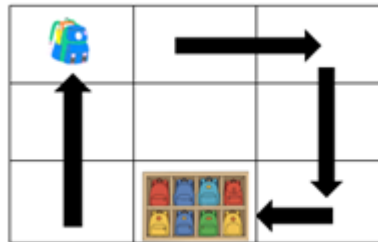
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- Explain what a robot is
- Say in my own words that a robot can only do what it is told to do
- Give an example of something a robot might do (one specific task)



GRADE R TERM 1 CODING & ROBOTICS WEEK 3

2 x 30-minute lessons per week

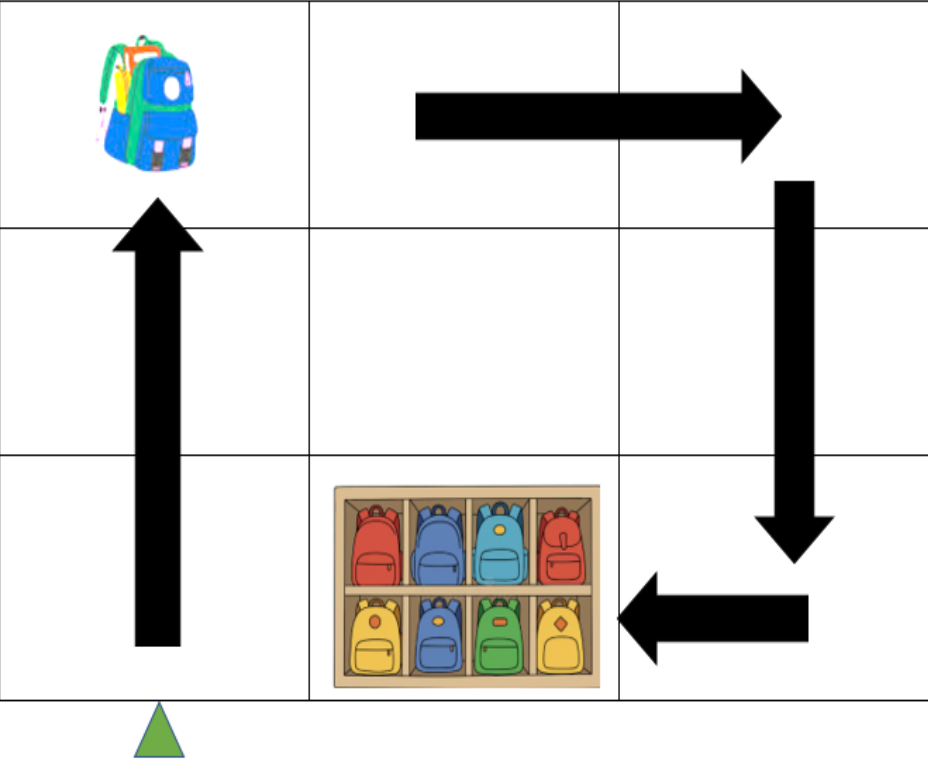
TERM 1 WEEK 3	COMPETENCIES	TEACHER GUIDELINES for PRACTICAL ACTIVITY	RETRIEVAL PRACTICE
Learning Intentions: Learners will learn to... • Interpret directional arrow symbols and translate them into physical movements • Create their own simple patterns using directional arrows • Explain that robots have specific capabilities (senses and muscles) but need instructions • Explain that robots can only perform one task at a time • Describe a digital citizen	C3	Problem Statement: "Sam the Snail is moving into our classroom today, and he needs to get to his new home in the Creative Corner! But Sam is a special snail - he can only move when we give him pattern instructions with arrows. Should Sam go forward-forward-right, or forward-left-forward? Let's use our arrow cards to create a coding solution that will help Sam reach the Creative Corner safely. Remember, Sam follows arrows exactly, so we need to plan the pattern carefully!" The learners will follow the arrows on the grid to get to the creative corner.  Extension: Pack the arrows below the grid and see if learners can help each other to reach the creative corner 	This will be an added activity with different pictures that can be placed on the grid to change the problem statement, if the learners work through the first activity faster than expected. The teacher will give the learners coding solutions. The learners will be taking turns executing it. (Individual / Small Group Activity). Problems statement: Tshepo can't find his locker. Can you help him to get his school bag to his locker?  
	COMPETENCIES	TEACHER GUIDELINES for THEORY	
	D2	• Digital citizenship • What is a citizen? (a person that belongs to a specific country. You might have been born there. You have legal rights and responsibilities as a member of that country and/or nation, state or town) • What is a digital citizen? (We live in a world where everyone uses digital tools) • Do you know what a digital tool or device is? (It could be a cell phone)	This will relate to life skills where you talk about ID, birth certificates, etc
Success Criteria: I can:	• Read a sequence of arrows • Move my body in the direction of the arrows • Arrange arrows to create a simple coding solution (if you see a pattern, e.g., forward-right-forward-right, they must tell you which part repeats) • Recognize an existing arrow pattern		

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	• Continue an existing pattern • List at least two things a robot can do (following instructions, completing specific tasks) • Explain that a robot cannot think for itself and must be told what to do • Explain what a digital citizen is

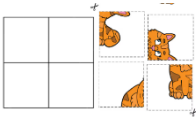
Week 3 Resources



GRADE R TERM 1 CODING & ROBOTICS WEEK 4

2 x 30-minute lessons per week

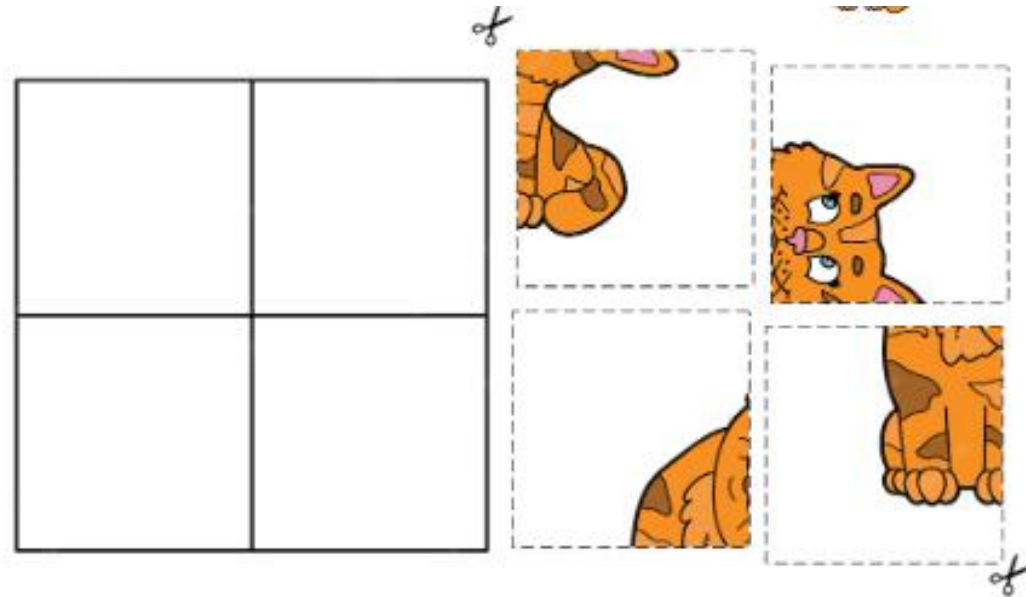
TERM 1: WEEK 4	COMPETENCIES	TEACHER GUIDELINES for PRACTICAL ACTIVITY	RETRIEVAL PRACTICE
Learning Intentions: Learners will learn to ... • Decompose a story into its key events (beginning, middle, end) and arrange them in logical sequence • Use problem-solving skills to reconstruct a visual puzzle • Identify a cell phone as a computing device • Explain that computing devices store information (data) like photos and numbers • Recognize that computing devices follow instructions	C1 Decomposition	<u>Problem Statement:</u> "Luna the Kitten loves to explore, but today she wandered too far from home and got lost in the big garden! Luna needs to remember the path back home in the correct order. First, she must go past the flower garden, then around the big tree, and finally through the gate to reach her house. But Luna's memory isn't very good - can you help Luna by drawing or showing the three most important steps in order? We can use pictures to help Luna remember the sequence, just like how a phone uses pictures and data to help us remember things!" Learners draw 3 pictures that explain what happened in the story. The teacher must not assist the learners. The teacher will ask questions as to how and why the learners drew their specific pictures. Learners pack their pictures in the order of the story. Resources: Pictures of the story that are drawn by the learners.	Extra Activity: (pattern recognition)  Spot the difference in the two pictures Learners look at the puzzle pieces rebuild the puzzle. 
	COMPETENCIES	TEACHER GUIDELINES for THEORY	
	D3	What is a computing device? It is an electronic device It can store data like photos and numbers It can follow a set of instructions 	Teacher can show photos on phone and the numbers Ask questions: e.g. You also follow instructions. Are you a computing device? Is a recipe a computing device? Whole group activity
Success Criteria: I can....	• Draw or identify 3 pictures showing the main events of a story • Put story events in the correct order from beginning to end • Complete a simple jigsaw puzzle by matching pieces • Point out a cell phone and say it is a computing device • Name at least 2 types of information a phone can store (photos, numbers, messages) • Say that a computing device can follow instructions		

Week 4 Resources

Spot 6 differences in the 2 pictures.

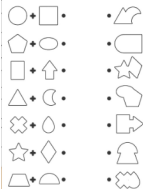
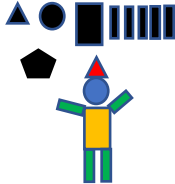


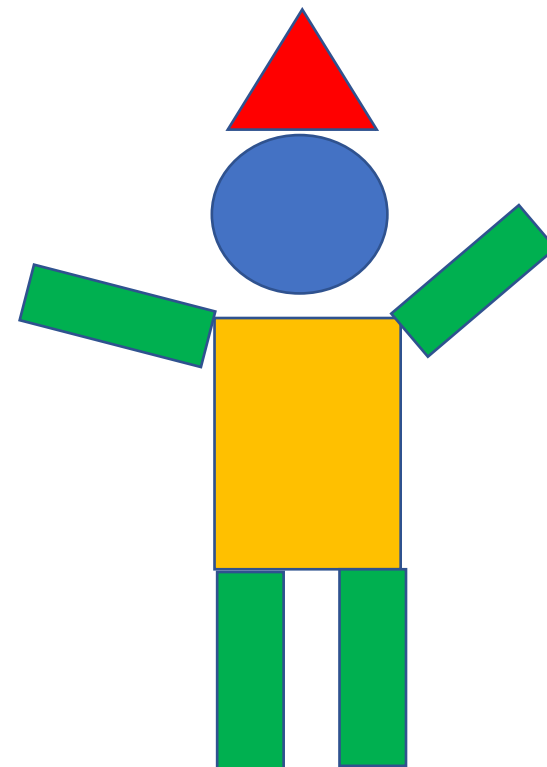
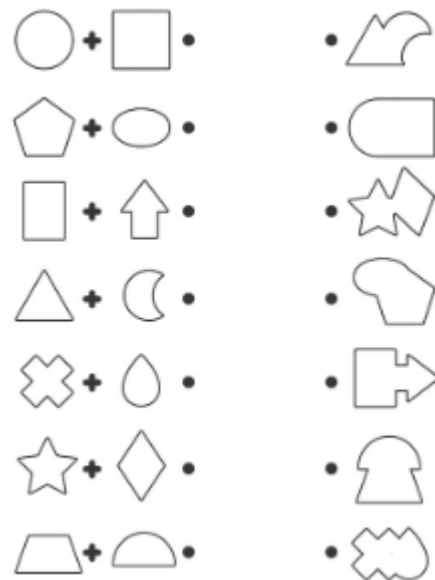
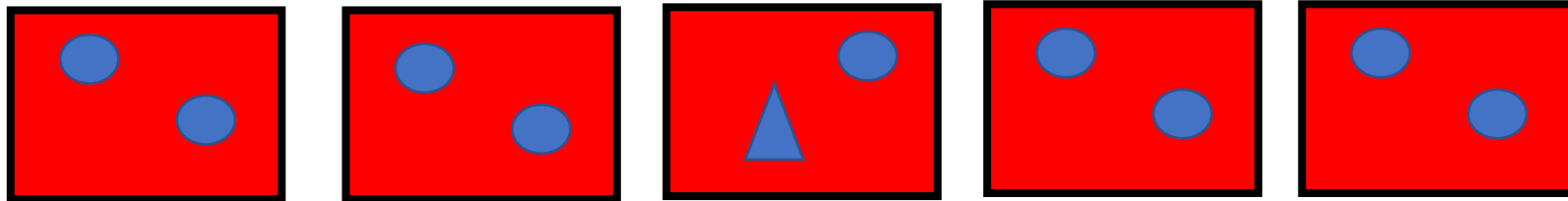
Cut out the pieces and build the puzzle



GRADE R TERM 1 CODING & ROBOTICS WEEK 5

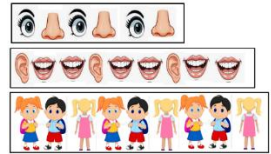
2 x 30-minute lessons per week

TERM 1 WEEK 5	COMPETENCIES	TEACHER GUIDELINES for PRACTICAL ACTIVITY	RETRIEVAL PRACTICE
Learning Intentions: Learners will learn to ... - Identify common features within a group of objects (abstraction) - Determine which items belong or don't belong to a set based on shared characteristics - Recognize that patterns help us predict what comes next - Explain that robots can have different forms but all follow instructions	C1 Abstraction	Problem statement: "Robot Rosie is trying to sort blocks to build different things, but someone mixed up all her blocks! Rosie's robot brain can only understand groups where everything is the same in one special way (same color, same shape, or same size). Look at each group of blocks - can you find the one block that doesn't belong? Help Rosie remove the odd block so she can start building! After we help Rosie sort, we'll build our own shape-robot using only the blocks that match!" The learners receive different sets of blocks and need to identify the shapes that do not belong in the set. This is just an example. The teacher can create more sets.  Learners need to explain their thinking and reasoning for identifying certain shapes in the sets. Learners look at the shapes provided and match the images with the shapes. 	Activity: Small group/Individual activity (Revise decomposition and pattern recognition) Learners will build the man using the shapes.  The learners will have the shadow pictures and will put all the shapes that does not belong to the shape man into a container. Build the same man by using the shapes that are left. The teacher must allow the learners to do the whole process and then ask them to explain it.
	COMPETENCIES	TEACHER GUIDELINES for THEORY	
	R1	Use puppet or drawing again. Ask questions: Who built the puppet? Can this puppet think? People build robots and code them for a specific job	Play a game when going to, e.g. desks. Learners are robots. They may only leave the mat when you tell them. Stand and no talking / only walk / stand behind desk / Sit
Success Criteria: I can...	- Look at a group of shapes or objects and identify what they have in common - Find the one item that doesn't belong and explain why (using simple reasoning) - Match shapes correctly to complete a pattern or picture - Say that robots can look different but they all need to be told what to do - Give examples of different types of robots (toy robot, vacuum cleaner robot, etc.)		



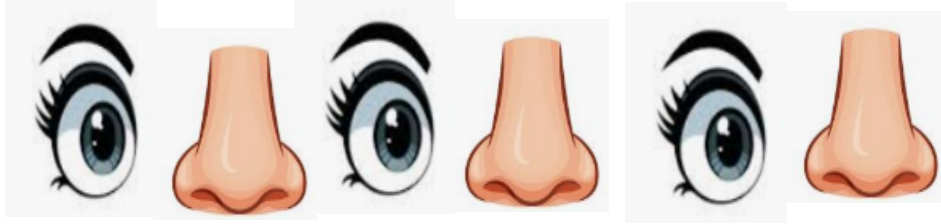
GRADE R TERM 1 CODING & ROBOTICS WEEK 6

2 x 30-minute lessons per week

TERM 1 WEEK 6	COMPETENCIES	TEACHER GUIDELINES for PRACTICAL ACTIVITY	RETRIEVAL PRACTICE
Learning Intentions: Learners will learn to ... • Recognize increasingly complex patterns • Create increasingly complex patterns • Follow multi-step instructions in the correct sequence to complete a task • Explain the importance of balanced screen-time for health • Identify alternative activities that don't involve screens	C6	<u>Problem statement:</u> "It's Craft Time! Today we're making beautiful friendship cards to give to people we care about. But we need to follow a special pattern to make them just right! The pattern is: fold-cut-glue-fold-cut-glue. Maya started making her card but she's not sure what comes next in the pattern. Can you help Maya figure out the pattern so she can finish her card? After we make our cards, let's talk about other activities we love doing with our hands (like crafts!) instead of spending all our time on screens." Practical activities will be done with the whole class: jump, clap, jump, clap, jump, clap, sit, stand, hop, sit, stand, hop, sit, stand, hop girl sit, boy stand, girl sit, boy stand, girl sit, boy stand Ask questions: (Do this with each of the patterns) Is it a pattern? Why do you think it is a pattern? What actions are happening in this pattern? What repeats? (That part is called the sequence) Now that the learners are acquainted with the patterns the teacher will do the following: (The learners can discuss each pattern in their small groups) 	Activity: Whole Group Activity: This is an extra activity that could be done if learners are done early. Learners must follow the teacher's instruction and do and say Which action does not belong: jump, clap, jump, clap, jump, hop, sit, stand, sit, turn, sit, stand girl, boy, girl, girl, girl, boy -This activity can also be done in a smaller group
	COMPETENCIES	TEACHER GUIDELINES for THEORY	
	D2	Discuss with the learners: How should we use our digital devices? Screen time: Can we use our devices the whole day? Why not? When we speak on a phone, may we scream, use rude words?	Discuss how we speak with respect, even if we do not know who the other person is. We must always be kind and respectful

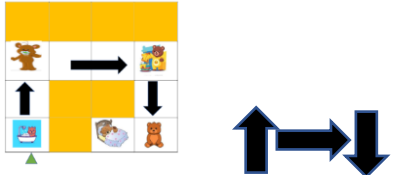
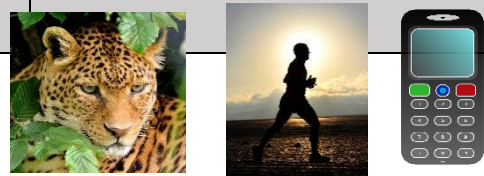
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Success Criteria: I can...	• Identify a pattern • Describe a pattern by saying what repeats • Follow 4-5 sequential instructions to complete a craft activity • Say at least 2 reasons why too much screen-time is not healthy • Name at least 3 activities I can do instead of being on a screen • Explain that we should balance screen-time with other activities



GRADE R TERM 1 CODING & ROBOTICS WEEK 7

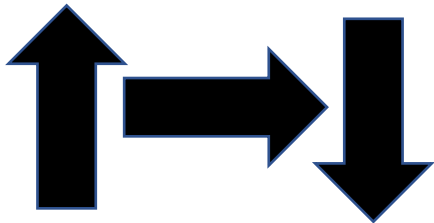
2 x 30-minute lessons per week

TERM 1 WEEK 7	COMPETENCIES	TEACHER GUIDELINES for PRACTICAL ACTIVITY	RETRIEVAL PRACTICE
Learning Intentions: Learners will learn to... - Identify errors in patterns (finding what doesn't belong) - Apply pattern knowledge to correct sequences - Explain that technology users must be respectful when communicating - Recognize healthy limits for screen-time	C1	Problem statement: "Little Teddy Bear is very sleepy after a long day of playing, but he can't remember all the steps to get ready for bed! Teddy's mom made a special picture grid to help him remember: first bath, then brush teeth, put on pyjamas, say prayers, and finally get into bed. Can you follow the arrow path on our classroom grid to help Teddy complete each bedtime step in the right order? If we mix up the order, Teddy might forget to brush his teeth or put on pyjamas! Just like how Teddy needs to follow steps to get ready for bed, when we use phones or tablets to talk to people, we need to follow rules to be kind and respectful!" (you can pack the arrows below the grid and the learners must see if they can help each other to get Teddy to bed)  Here are the steps according to the grid to assist the teacher: - Bath - Brush teeth - Put on pajamas - Pray - Get to bed	Whole/small group activity: Learners use the pictures from the grid to pack out the pictures in the correct sequence. If you use other pictures, their sequence may be different from yours if they can explain it logically. 
	COMPETENCIES	TEACHER GUIDELINES for THEORY	
	D3	Computing devices Have pictures of person, cell phone, animal, etc. Learners must identify the computing device Discuss personal information and good manners.	

C&R Grade R Lesson Plans

		Personal photos and information is stored on phones. May you use someone's phone without permission?	
Success Criteria: I can:	• Look at a pattern and find which element breaks the repeating sequence • Explain why an element doesn't belong in a pattern • Say at least 2 examples of kind behavior when using technology • Describe what 'too much screen-time' means (e.g., using devices all day) • Suggest activities that are healthier than excessive screen-time		



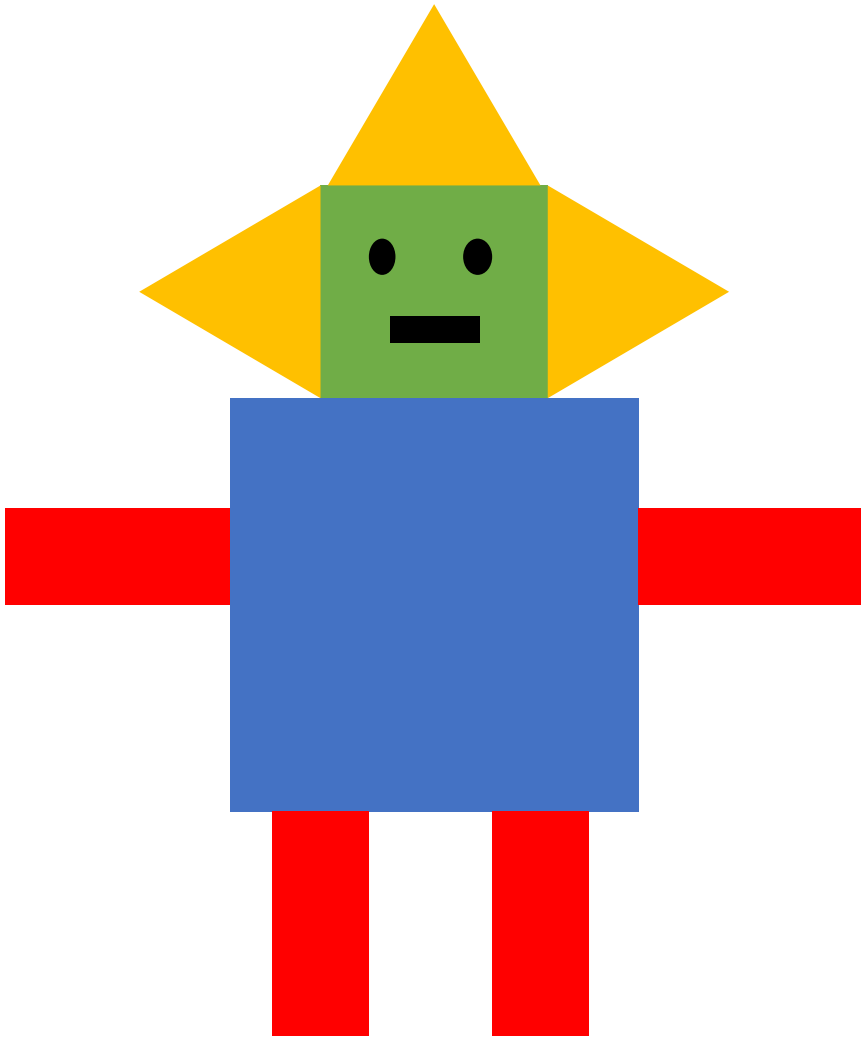




GRADE R TERM 1 CODING & ROBOTICS WEEK 8

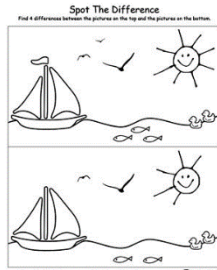
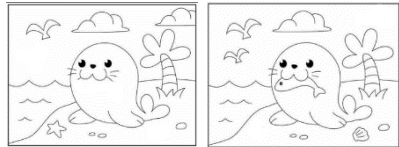
2 x 30-minute lessons per week

TERM 1 WEEK 8	COMPETENCIES	TEACHER GUIDELINES for PRACTICAL ACTIVITY	RETRIEVAL PRACTICE
Learning Intentions: Learners will learn to... - Follow a sequence of step-by-step instructions in the correct order - Navigate a simple grid using directional arrows to reach a goal - Explain that following instructions in sequence leads to a specific result (output) - Recognize that everyday routines (like bedtime) are sequences of steps	R5	Problem statement: "Sipho wants to enter the Robot Building Contest, but his instruction manual got ripped! Now he can't remember which shapes to use or what order to put them in. Sipho has all the shapes ready: triangles, squares, circles, and rectangles, but without the instructions, his robot won't look right. Can you help Sipho by following the shape instructions from top to bottom to build his robot? Then, we'll practice telling a friend the exact steps to make the same robot - just like a real instruction manual! Remember: 1 yellow triangle for antenna, 1 green square for head, 2 black circles for eyes..."	Activity: Use their artefact (robot that they made). The teacher shows arrows and the learners move their robot in the same direction. NB: Mirror image when showing the arrows. DBE Workbook 1 activities for consolidation: P 12-13 and P 16-17 Extension: the teacher can ask the following questions, and the learners can answer using their fingers: - How many rectangles are there? - How many squares are there? - How many triangles are there? - How many circles are there?
	R6		
	COMPETENCIES	TEACHER GUIDELINES for THEORY	
		None	
Success Criteria: I can...	- Follow directional arrows on a grid to move from start to finish - Complete each step of a sequence in the correct order - Identify the result (output) when instructions are followed correctly - Explain that if steps are done in order, we get the result we want - Name the steps in a familiar routine (like getting ready for bed) in the correct order		



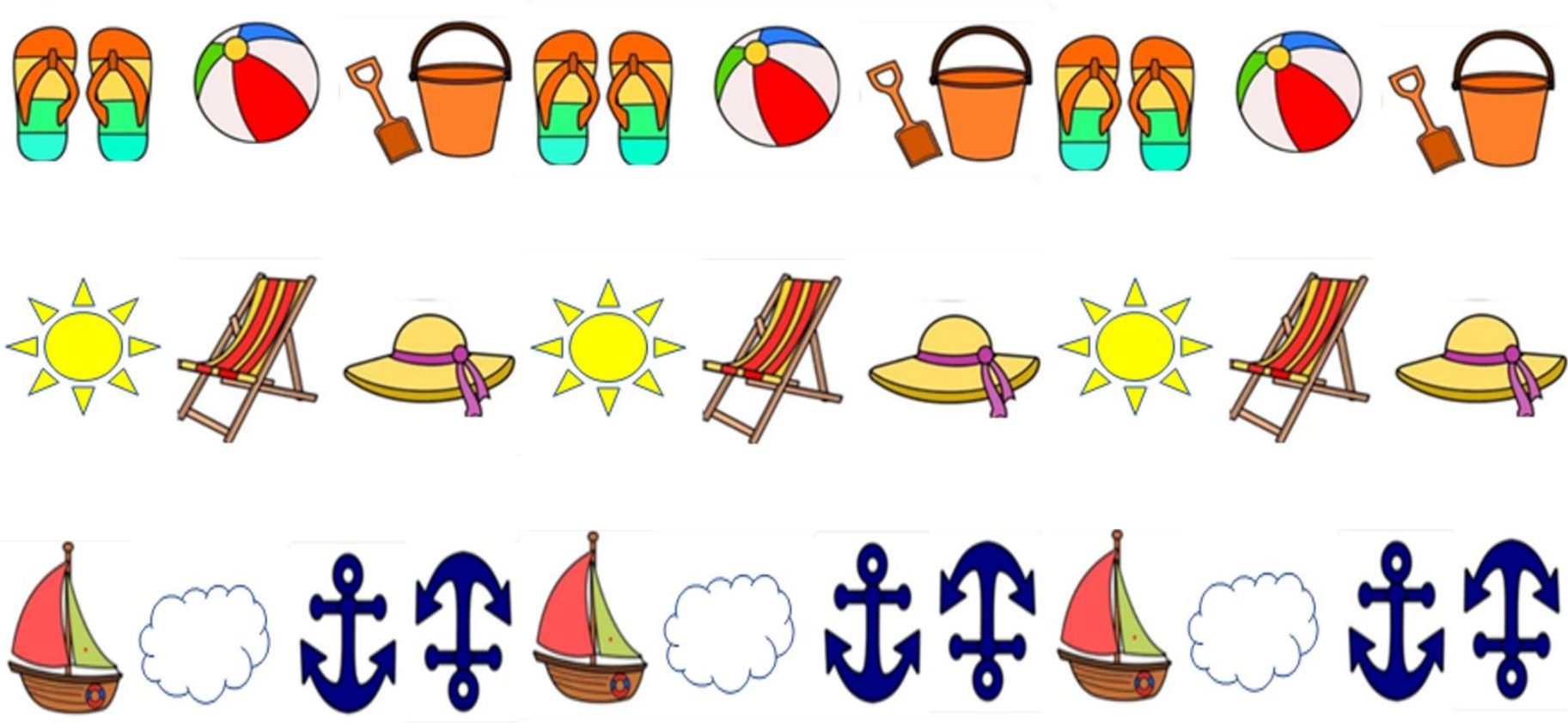
GRADE R TERM 1 CODING & ROBOTICS WEEK 9

2 x 30-minute lessons per week

TERM 1 WEEK 9	COMPETENCIES	TEACHER GUIDELINES for PRACTICAL ACTIVITY	RETRIEVAL PRACTICE
Learning Intentions: Learners will learn to... - Explain that algorithms are precise step-by-step instructions to achieve a goal - Plan a sequence of steps needed to complete a task - Follow detailed instructions where order and accuracy matter - Recognize that skipping steps or doing them out of order affects the outcome	C1 C6	<u>Problem statement:</u> "It's Snack Time! Today we're making our own Rainbow Fruit Kabobs, but we need to follow Chef Palesa's special recipe algorithm. An algorithm is a set of steps we follow in exactly the right order to make something work. Chef Palesa's algorithm is: 1) Wash hands, 2) Get a stick, 3) Add red strawberry, 4) Add yellow pineapple, 5) Add green grape, 6) Red, yellow, green again to make a pattern! But oh no - Chef Palesa's recipe cards got mixed up! Can you help put the steps back in the correct order? What happens if we skip washing hands or put the fruit on before we get our stick? Let's work together to follow the algorithm and make our healthy snacks!" Activity 1: Teacher can use the fruits of her choice. Repeat the patterns and learners must explain: Strawberry pineapple grape strawberry pineapple grape Red yellow green red yellow green Activity 2: Learners must explain the patterns   	Activity: 3 Whole Group Activity: Computational Thinking (Pattern recognition) Learners listen to the teacher's instruction (kinesthetic) e.g. jump, jump, stamp, jump, jump, stamp, jump, jump, stamp Jump, stamp, clap, jump, stamp, clap, jump, stamp, clap Can you explain the difference between the patterns? Extra: Learners recognise and identify the difference.   Small group activity DBE Workbook 1 P 45
	COMPETENCIES	TEACHER GUIDELINES for THEORY	

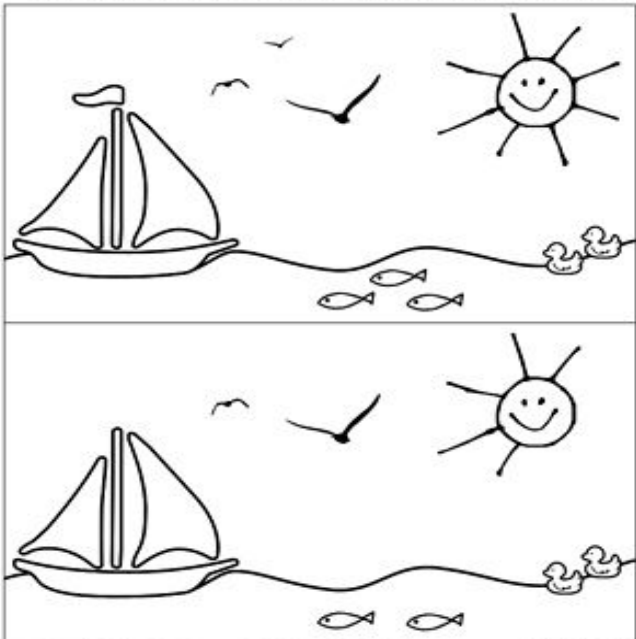
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	R1	What is a robot? If we build a robot to help us in class, what parts will it need. What will we code it to do?	Learners can draw their own robot using crayons and paper. Or they can build a robot with blocks Build a robot with blocks
Success Criteria: I can:	• Follow a series of movement instructions in the exact order given • Arrange picture pieces in the correct sequence to create a complete image • List the steps needed to make a simple snack in the correct order • Follow a recipe or instruction set accurately to create the expected result • Explain what happens if I skip a step or do steps in the wrong order • Name two parts of a robot • Describe what the two parts could do		

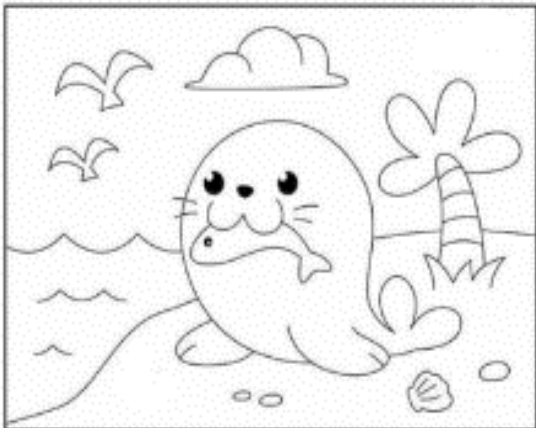


Spot The Difference

Find 4 differences between the pictures on the top and the pictures on the bottom.



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Spot the differences in the bottom pictures.





TEACHER: Sign Date



GRADE R TERM 1 CODING & ROBOTICS WEEK 10

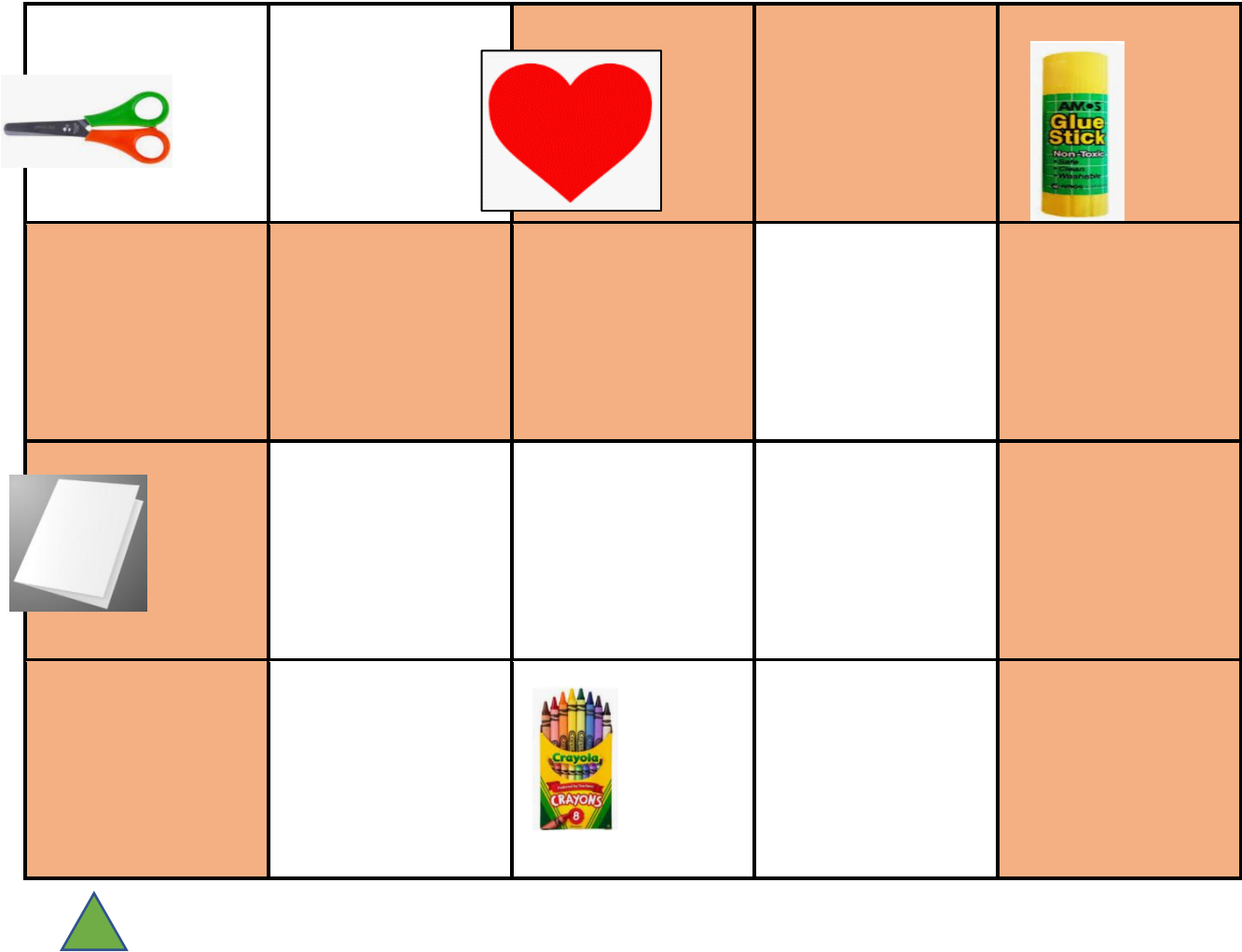
2 x 30-minute lessons per week

TERM 1 WEEK 10	COMPETENCIES	TEACHER GUIDELINES for PRACTICAL ACTIVITY	RETRIEVAL PRACTICE
Learning Intentions: Learners will learn to • Create and follow a multi-step algorithm (procedure) to complete a craft project • Demonstrate understanding of computing devices and their characteristics • Apply knowledge of digital citizenship including screen-time balance • Explain key coding concepts learned in Term 1	C1 Algorithm	Problem statement: "Valentine's Day is here! Today we're going to show our love by making cards for people we care about. Andrew is excited to make a card for his grandma, but he's not sure what order to do things in. Should he glue first or cut first? Should he decorate before or after folding? Let's help Andrew by creating a step-by-step algorithm (a list of instructions in the right order) for making the perfect Valentine's card! First, Andrew needs to gather his supplies by following the grid arrows to find: paper, scissors, glue, hearts, and stickers. Then we'll figure out the exact order of steps together. Just like a computer or phone needs instructions to work, Andrew needs an algorithm to make his card! What should we do first?"	Activity: Learners on the mat Can you remember the steps Andrew must follow to find all the things he needs to make his Valentine's card? What comes first, next, and last?" Yes or No? Game – using thumbs up or thumbs down The teacher gives simple statements and the learners say YES (thumbs up) or NO (thumbs down). Example questions: • "Do we start by finding the paper first?" • "Do we glue the decorations before we cut the shapes?" • "Do we use scissors to cut out the heart shapes?" • "Do we glue the hearts onto the card after cutting them?" • "Do we decorate the card with stickers and glitter after gluing?"
	COMPETENCIES	TEACHER GUIDELINES for THEORY	
	D2 D3	Discuss pictures and complete workbook activity: What is better activities than being on your phone too much? Let's ask some questions: Can too much screen-time be bad for you? What information will you find on a phone? Is a cell phone a computing device/ What is a computing device?	DBE Workbook 2 P 30 only for discussion Make a hop-scotch track with different colour hoops. Write questions on cards of different colours. When a learner throws their beanbag in a certain colour, ask a question from the same colour cards

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		Can a computing device follow instructions?	
Success Criteria: I can:	• Follow a sequence of instructions (algorithm) to create a card correctly • List the steps needed to make the card in the correct order • Identify examples of computing devices • Explain what makes these examples 'computing devices' (they store data and follow instructions) • Answer questions about responsible technology use including screen-time limits • Explain at least 3 key concepts learned this term (e.g., patterns, sequences, instructions, robots)		

Week 10 Resources



5.8  Cut and paste the arrows to help the friends reach the jungle gym.













			
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4  **Safety** 

Term 2 - Week 6-10   Discuss the picture.

