basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

PROPOSED AMENDMENTS TO THE CURRICULUM AND ASSESSMENT POLICY STATEMENT (CAPS) TO MAKE PROVISION FOR CODING AND ROBOTICS GRADES R- 9

Curriculum and Assessment Policy Statement

Grades R-3

CODING AND ROBOTICS

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FOREWORD BY THE MINISTER

In the last twenty-five years, our National Curriculum Statement (NCS) has been focused on transforming Education in South Africa. The democratic values enshrined in our Constitution (Act 108 of 1996) have inspired the development of the National Curriculum. The Preamble to the Constitution states that the aims of the Constitution are to:

- *heal the divisions of the past and establish a society based on democratic values, social justice and fundamental human rights;*
- *improve the quality of life of all citizens and free the potential of each person;*
- *lay the foundations for a democratic and open society in which government is based on the will of the people and every citizen is equally protected by law; and*
- *build a united and democratic South Africa able to take its rightful place as a sovereign state in the family of nations.*

Education and the Curriculum have an important role to play in realising these aims. In 1997 Outcomes Based Education was introduced to overcome the Curricular divisions of the past and was reviewed in 2000. This led to the first Curriculum revision: the Revised National Curriculum Statement Grades R-9 and the National Curriculum Statement Grades 10-12 (2002).

In 2009 the Revised National Curriculum Statement (2002) was revised due to implementation challenges. The National Curriculum Statement Grade R-12 was developed in 2012 which combined the 2002 Curricula for Grade R-9 and Grades 10-12. The National Curriculum Statement for Grades R-12 builds on the previous curriculum but also updates it and aims to provide clearer specification of what is to be taught and learnt on a term-by-term basis.

The Curriculum has been developed encompassing the vision of the National Development Plan (NDP) aligning the Skills, Knowledge and Values required for the Technological Developments in the workplace. The NDP goals are aligned to the Sustainable Development Goals (SDG) and the African Union Agenda 2063. The Modern workplace requires learners that can adapt to a fast-changing home and work environments through empowering learners with the skills they develop through the Three Stream Model. These goals will be achieved through Differentiated Pathways and Multi-Certification levels.

The National Curriculum Statement Grades R-12 accordingly replaces the Subject Statements, Learning Programme Guidelines and Subject Assessment Guidelines with the

(a) Curriculum and Assessment Policy Statements (CAPS) for all approved subjects listed in this document;

(b) National Policy Pertaining to the Programme and Promotion requirements of the National Curriculum Statement Grades R-12 (N4PR Revised); and

(c) National Protocol for Assessment Grades R-12 (NPA).

Mrs Angie Motshekga,
MP Minister of Basic Education

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SECTION 1: INTRODUCTION TO THE CURRICULUM AND ASSESSMENT POLICY

1.1 Background

The *National Curriculum Statement Grades R-12 (NCS)* stipulates policy on curriculum and assessment in the schooling sector. To improve implementation, the National Curriculum Statement was amended, with the amendments coming into effect in January 2012. A single comprehensive Curriculum and Assessment Policy document was developed for each subject to replace Subject Statements, Learning Programme Guidelines and Subject Assessment Guidelines in Grades R-12.

1.2 Overview

(a) The National Curriculum Statement Grades R-12 (January 2012) represents a policy statement for learning, teaching and assessment in South African schools and comprises the following:

(i) Curriculum and Assessment Policy Statements for each approved school subject,

(ii) The policy document, National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12; and

(iii) The policy document, National Protocol for Assessment Grades R-12 (January 2012).

(b) The National Curriculum Statement Grades R-12 (January 2012) replaces the two current national curricula statements, namely the

(i) Revised National Curriculum Statement Grades R-9, Government Gazette No. 23406 of 31 May 2002, and

(ii) National Curriculum Statement Grades 10-12 Government Gazettes, No. 25545 of 6 October 2003 and No. 27594 of 17 May 2005.

(c) The national curriculum statements contemplated in subparagraphs b (i) and (ii) comprise the following policy documents which will be incrementally repealed by the National Curriculum Statement Grades R-12 (January 2012) during the period 2012-2014:

(i) The Subject Statements, Learning Programme Guidelines and Subject Assessment Guidelines for Grades R-9 and Grades 10 – 12,

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(ii) The policy document, National Policy on assessment and qualifications for schools in the General Education and Training Band, promulgated in Government Notice No. 124 in Government Gazette No. 29626 of 12 February 2007,

(iii) The policy document, the National Senior Certificate: A qualification at Level 4 on the National Qualifications Framework (NQF), promulgated in Government Gazette No.27819 of 20 July 2005,

(iv) The policy document, An addendum to the policy document, the National Senior Certificate:

A qualification at Level 4 on the National Qualifications Framework (NQF), regarding learners with special needs, published in Government Gazette, No.29466 of 11 December 2006, is incorporated in the policy document, National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12; and

(v) The policy document, An addendum to the policy document, the National Senior Certificate:

A qualification at Level 4 on the National Qualifications Framework (NQF), regarding the National Protocol for Assessment (Grades R-12), promulgated in Government Notice No.1267 in Government Gazette No. 29467 of 11 December 2006.

(d) The policy document, *National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12*, and the sections on the Curriculum and Assessment Policy as contemplated in Chapters 2, 3 and 4 of this document constitute the norms and standards of the *National Curriculum Statement Grades R-12.* It will therefore, in terms of *section 6A* of the *South African Schools Act, 1996 (Act No. 84 of 1996,)* form the basis for the Minister of Basic Education to determine minimum outcomes and standards, as well as the processes and procedures for the assessment of learner achievement to be applicable to public and independent schools.

1.3 General aims of the South African Curriculum

(a) The *National Curriculum Statement Grades R-12* gives expression to the knowledge, skills and values worth learning in South African schools. This curriculum aims to

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ensure that children acquire and apply knowledge and skills in ways that are meaningful to their own lives. In this regard, the curriculum promotes knowledge in local contexts, while being sensitive to global imperatives.

(b) The National Curriculum Statement Grades R-12 serves the purposes of:

- equipping learners, irrespective of their socio-economic background, race, gender, physical ability or intellectual ability, with the knowledge, skills and values necessary for self-fulfillment, and meaningful participation in society as citizens of a free country,
- through the process of multi-certification in the GET phase,
- providing access to higher education,
- facilitating the transition of learners from education institutions to the workplace; and
- providing employers with enough profile of a learner's competences.

(c) The National Curriculum Statement Grades R-12 is based on the following principles:

- **Social transformation:** ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sections of the population,
- **Active and critical learning:** encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths,
- **High knowledge and high skills:** the minimum standards of knowledge and skills to be achieved at each grade are specified and set high, achievable standards in all subjects,
- **Progression:** content and context of each grade shows progression from simple to complex,
- **Human rights, inclusivity, environmental and social justice:** infusing the principles and practices of social and environmental justice and human rights as defined in the Constitution of the Republic of South Africa.
- The National Curriculum Statement Grades R-12 is sensitive to issues of diversity such as poverty, inequality, race, gender, language, age, disability and other factors,

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- Valuing indigenous knowledge systems: acknowledging the rich history and heritage of this country as important contributors to nurturing the values contained in the Constitution; and
- Credibility, quality and efficiency: providing an education that is comparable in quality, breadth and depth to those of other countries.

(d) The National Curriculum Statement Grades R-12 aims to produce learners that are able to:

- identify and solve problems and make decisions using computer skills, critical and creative thinking,
- work effectively as individuals and with others as members of a team,
- organise and manage themselves and their activities responsibly and effectively,
- collect, analyse, organise and critically evaluate information,
- communicate effectively using visual, symbolic, digital and/or language skills in various modes,
- use science, technology, coding and robotics effectively and critically showing responsibility towards the environment and the health of others,
- demonstrate an understanding of the world as a set of related systems by recognising that problem solving contexts do not exist in isolation, and
- having the ability to adapt to a changing world and workplace.

(e) Inclusivity should become a central part of the organisation, planning, teaching and assessment at each school. This can only happen if all teachers have a sound understanding of how to recognise and address barriers to learning, and how to plan for diversity.

The key to managing inclusivity is ensuring that barriers are identified and addressed by all the relevant support structures at an institutional level, the School Assessment Team (SAT) and School Based Support Team (SBST), at District level the District-Based Support Teams (DBST), parents and Special Schools as Resource Centers. To address barriers in the classroom, teachers should *use various curriculum differentiation strategies* such as those included in the Department of Basic Education's *Guidelines for Inclusive Teaching and Learning* (2010).

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1.4. Subjects and Time Allocation

1.4.1 Foundation Phase

(a) The instructional time in the Foundation Phase is as follows:

SUBJECT	GRADE R (HOURS)	GRADE 1-2 (HOURS)	GRADE 3 (HOURS)
Home Language	10	8/7	8/7
First Additional Language		2/3	3/4
Mathematics	7	7	7
Coding and Robotics	1	1	2
Life Skills: • Beginning Knowledge • Creative Arts • Physical Education • Personal and Social Well-being	6 (1) (2) (2) (1)	6 (1) 2 2 (1)	7 (2) (2) (2) (1)
TOTAL	**(24)**	**(24)**	**(27)**

(b) Instructional time for Grades R, 1 and 2 is 24 hours and for Grade 3 is 27 hours.

(c) Ten hours are allocated for languages in Grades R-2 and 11 hours in Grade 3. A maximum of 8 hours and a minimum of 7 hours are allocated for Home Language and a minimum of 2 hours and a maximum of 3 hours for Additional Language in Grades 1-2. In Grade 3 a maximum of 8 hours and a minimum of 7 hours are allocated for Home Language and a minimum of 3 hours and a maximum of 4 hours for First Additional Language.

(d) In Life Skills Beginning Knowledge is allocated 1 hour in Grades R – 2 and 2 hours as indicated by the hours in brackets for Grade 3.

1.4.2 Intermediate Phase

(a) The instructional time in the Intermediate Phase is as follows:

SUBJECTS	HOURS
Home Language	6
First Additional Language	5
Mathematics	6
Natural Sciences and Technology	3.5

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Occupational Subjects: A minimum of any three subjects selected from Group____ *Annexure ____, Tables _____* of the policy document, *National Policy Pertaining to the Programme and Promotion requirements of the National Curriculum Statement Grades R-12,* subject to the provisos stipulated in paragraph _____ of the said policy document.	As per Cir S1 of 2018 (note subject lists)
Coding and Robotics	2
Social Sciences	3
Life Skills • Creative Arts • Physical Education • Personal and Social Well-being	**4** (1.5) (1) (1.5)
TOTALS	**29.5**

1.4.3 Senior Phase

(a) The instructional time in the Senior Phase is as follows:

SUBJECTS	HOURS
Home Language	6
First Additional Language	5
Mathematics	6
Natural Sciences	3.5
Social Sciences	3
Life Orientation	2
Schools to replace any of the TWO (2) from the Occupational subjects:	
Technology	2
Economic Management Sciences	2
Creative Arts	2
Occupational Subjects: A minimum of any three subjects selected from **Group**_____ *Annexure ____, Tables _____* of the policy document, *National Policy Pertaining to the Programme and Promotion Requirements of the National Curriculum Statement Grades R-12,* subject to the provisos stipulated in paragraph _____of the said policy document.	As per Cir S1 of 2018 (note subject lists)
Coding and Robotics	2
TOTALS	**29.5**

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1.4.4 Further Education and Training Phase

(a) The instructional time in Grades 10-12 is as follows:

SUBJECTS	HOURS
Home Language	6
First Additional Language	5
Mathematics	6
Life Orientation	3.5
A minimum of any three subjects selected from **Group B** *Annexure B, Tables B1-B8* of the policy document, *National Policy Pertaining to the Programme and Promotion Requirements of the National Curriculum Statement Grades R-12,* subject to the provisos stipulated in paragraph 28 of the said policy document.	12 (3x4h)
TOTALS	**27.5**

The allocated time per week may be utilised only for the minimum required NCS subjects as specified above and may not be used for any additional subjects added to the list of minimum subjects. Should a learner wish to offer additional subjects, additional time must be allocated for the offering of these subjects.

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SECTION 2: INTRODUCTION TO CODING AND ROBOTICS

2.1 What is Coding and Robotics?

The Coding and Robotics subject is central to function in a digital and information-driven world; apply digital ICT skills and transfer these skills to solve everyday problems in the development of learners. It is concerned with the various inter-related areas of Information Technology and Engineering. The subject studies the activities that deal with the solution of problems through logical and computational thinking.

In the Curriculum and Assessment Policy Statement (CAPS) the subject Coding and Robotics in Foundation Phase (Grades R-3) has been organised into five study areas: Pattern Recognition, Algorithms and Coding, Robotics Skills, Internet and e-communicating and Application Skills has been organised in this way in order to ensure that the foundational skills, values and concepts of early childhood development and of the subjects offered in Grades 4 - 9 are taught and developed in Grades R-3. Beginning Knowledge and Personal and Social relationships are integrated in the topics. Coding and Robotics is a subject that transverses across the other core Foundation Phase subjects namely Languages (home and First Additional) and Mathematics that ultimately strengthens and supports them.

2.2 Specific Aims:

The Coding and Robotics subject is aimed at guiding and preparing learners to solve problems, think critically, work collaboratively and creatively, function in a digital and information-driven world, apply digital and ICT skills and to transfer these skills to solve everyday problems and its possibilities, including equipping learners for meaningful and successful living in a rapidly changing and transforming society.

Through Coding and Robotics learners are exposed to a range of knowledge, skills and values that strengthen their:

- aesthetic, creative skills and cognitive development, knowledge through engaging in dance, music, drama and visual art activities
- knowledge of digital and ICT skills supported by the technological process and computational thinking skills;

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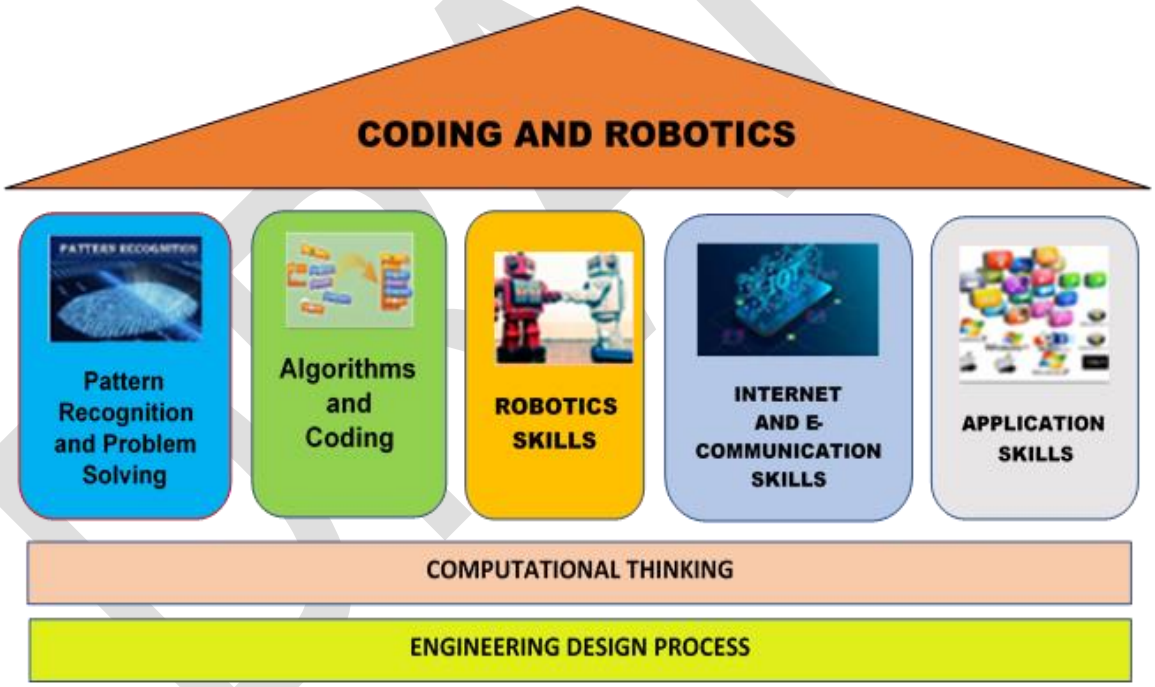
- understanding of the relationship between people and the environment, awareness of social relationships, and elementary science;
- physical, social, personal and emotional development.

2.3 Focus Content Areas:

The Coding and Robotics Foundation Phase subject consist of the following Knowledge Strands:

- Pattern Recognition and Problem Solving
- Algorithms and Coding
- Robotic Skills
- Internet and E-Communication skills
- Application Skills

The Strands co-exist and overlap in their application, knowledge and skill levels. The Subject methodology is based on Computational Thinking and the Engineering Design Process**.**



Topics links and overlap

Throughout the Subject of Coding and Robotics it is important to note that there will always be a degree of overlap between topics. The fundamentals of each Topic are taught in its strand but is also reinforced in other strands. Pattern recognition and Problem solving is a skill set that needs to be developed, but forms the foundation for Algorithms and Coding.

Algorithms and Coding are used to program the logic sequence that Robotics uses and the Application skills teach learners how to interact with different digital devices. Internet and e-communications relies on the use of Digital Devices that are taught in Application skills and uses the same skills to send and create messages.

Pattern Recognition and Problem Solving

Learning to identify abstract and geometric patterns as an integral part of the Design and Computational Thinking process which will assist learners in solving problems. The following skills and concepts are taught in Pattern Recognition and Problem solving strand:

- Identification and analysis of regularities, repetitions and change in patterns that increases in size and number consisting of physical objects, drawings and symbolic forms to make predictions and solve problems.
- Description of patterns and relationships using symbolic expressions and grids.
- The identification of code patterns through the sequences of lines, shapes and objects in the world.

Algorithms and Coding

Fundamental programming principles and constructs in Foundation Phase are introduced for Grade R learners through physical Coding activities which progress from Grade 1 to digital platforms that are easy-to-learn and fun for learners to engage with. The Programming Platforms introduce learners to important computational skills and concepts:

- Identifying and analyse solutions for specific basic problems.
- Converting simple algorithms to block based code.

Robotic Skills

Robotics consist of two merging fields that including Coding and Engineering. Learners are introduced to the fundamental Mechanical and Electrical engineering systems and circuits that are used in Robotics. The Robotics strand primarily uses the Engineering Design Process and infuses the Concepts of Computational Thinking into the process. The Concepts and Skills taught are as follows:

- Creating logical steps that robots can follow.
- Basic Mechanical systems including pulleys, gears and linkages.
- Basic Electrical Circuits

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Internet and e-Communication Skills

The strand of Internet and e-Communications skills prepares learners to interact safely in a digital online and offline world. The following Concepts and skills are taught in the strand:

- Their Digital Identity and Security.
- Safety around the use of Digital platforms.
- Various types of basic e-communication technologies or platforms.
- The basic networks and the Internet.
- The safe use of Web browsers to search for information.

Application Skills

Application Skills comprises of end-user skills that are used on different digital platforms. Learners in Foundation Phase are introduced to different digital platforms and taught about the various user interfaces and functions of application on the devices. The Application skills strand teaches the following skills and content:

- The use of Digital Devices.
- The use of Applications and User Interfaces.
- Text Editing Applications.
- Spreadsheet Applications.

2.4 Requirements for Coding and Robotics

2.4.1 Time Allocation

Strands ***Grade R – 2 = 1 hour per week.*** ***Grade 3 = 2 hours per week.***	**Term 1** Hours per week				**Term 2** Hours per week				**Term 3** Hours per week				**Term 4** Hours per week			
	R	**1**	**2**	**3**	**R**	**1**	**2**	**3**	**R**	**1**	**2**	**3**	**R**	**1**	**2**	**3**
Pattern Recognition and Problem Solving	3	2.5	1.5	2	3	2.5	1.5	2	3	2.5	1.5	2	3	2.5	1.5	2
Algorithms and Coding	2	2	2.5	4	2	2	2.5	4	2	2	2.5	4	2	2	2.5	4
Robotic Skills	1	1.5	2	7	1	1.5	2	7	1	1.5	2	7	1	1.5	2	7
Internet and e-Communication Skills	1	1	1	3	1	1	1	3	1	1	1	3	1	1	1	3
Application Skills	3	3	3	4	3	3	3	4	3	3	3	4	3	3	3	4
Total	**10 weeks**				**10 weeks**				**10 weeks**				**10 weeks**			

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The Coding and Robotics Subject is practically orientated and includes practical's which are recorded as formal assessments which needs to be included during teaching time. Informal Assessments continues during lessons when learners are not doing PAT's.

2.4.2 Resources

- Each learner must have a textbook / workbook / e-book. Schools must utilise book retrieval policy where applicable.
- Schools are required to ensure that the necessary tools, devices, materials and consumables be available for teaching, learning and assessment. These resources should be indexed and checked each term.
- The school should subscribe to a minimum of two or more subject related magazines for the teacher to keep abreast with the latest developments in the industrial environment. These magazines could also be lent out to learners (in the same way as library books). These resources must be readily available in the classroom or in the library.
- Schools offering Coding and Robotics must have a well-equipped Coding and Robotics lab for learners to complete the Practical Assessment Tasks. The Coding and Robotics lab needs to be secured with enough storage space for resources.
- The teacher should have a variety of reference books / e-books, charts and brochures in the classroom to stimulate the learners' interest in the subject.
- The teacher should have access to the internet to be able to source, download and print relevant and new information, as the industry environment is a dynamic industry continuously incorporating new trends and developments. The teacher should also have an e-mail, cloud storage facilities, as new information from subject advisors and other sources can be shared on digital platforms.
- The teacher needs to be trained in the context, content and pedagogy of the subject.
- Resources to offer Coding and Robotics as a subject are the responsibility of the school. The school should build up a collection of models, e.g. by asking learners, parents or mechanical, electrical and electronic repair workshops and suppliers to donate models.

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- All resources should be captured in the LTSM inventory list and audited on a term basis; however, these resources should always be readily available for internal/external audits.
- Sustainable Support - Robotics and coding is a subject that requires sustained support. The Coding and Robotics lab requires regular resourcing for the purpose of completion of practical tasks and as well as maintenance.

2.4.2.1. Coding and Robotics Resources

The School Management Team (SMT) should take note of the implications that Coding and Robotics lab has on the budget of the school. Whilst it is common practice to provide a working budget, it is imperative to note that the budget should be structured not only to cater for completion of practical tasks by the learners, but should also allow for the teacher to replenish tools and acquire consumables for experiments, demonstrations and simulations. The budget that schools develop should make provision for the following:

- Software licenses
- Cartridges, paper and storage media
- Breakage and maintenance
- Insurance
- Internet Connectivity
- Sustainability plan.

The teacher must also be allowed to supplement the teaching and learning support material in the form of posters, models, videos, periodicals and many more. Preventative maintenance of training kits/equipment on a regular basis, as well as provisioning for the inevitable failure of equipment should not be disregarded. The SMT should have a plan in place to regular phase out and replace obsolete tool, consumables and equipment.

2.4.2.1.1. Coding Requirements

- Free open source Software for block-based coding
- Code Cards with basic Coding instructions.

2.4.2.1.2. Robotics Requirements

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- Basic Electrical Components
    - Switches
    - Batteries
    - Wires
    - Breadboards
    - LED's
    - Resistors
    - DC Motors
    - Lightbulbs
    - Buzzer

- Basic Mechanical Components
    - Wheels and Axles
    - Pulleys
    - Linkages
    - Gears
    - Plastic/ Cardboard Fans
    - Elastic Bands
    - Fasteners
- The components may be made from recyclable materials.

2.4.2.1.3. Infrastructure, Equipment and Finances

- Workspace in Coding and Robotic Labs for learners should be enough for team and individual work.
- A dedicated Coding and Robotics lab should be used.
- The school must procure basic robotics components which will include a selection of basic Electronic and Mechanical components etc. Procurement of LTSM resources should be based on needs analyses from the updated inventory list. Evidence of procurements should be kept for 5 years in line with the Public Finance Management Act (PMFA).
- Schools to provide secure storage space for LTSM.

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2.4.2.1.4. Computer Hardware

Coding and Robotics require learners to work in pairs and individually on computers during contact time. The Coding and Robotics Laboratory should provide for the following minimum hardware specs for Computers:

- **Computers should have a lifespan of 5 years. This will ensure that the Department receives value for money on the investments made.**

- 2.0 GHz 64-bit processor (Core I5 CPU minimum)
- 8 GB RAM /4GB RAM + 2GB Graphics card
- 500 GB secondary storage
- Keyboard and mouse
- Monitor with a resolution of 1024x768 or higher
- DVD-ROM drive
- Data projector or demonstrating software (LED Lens with 3000 lumens)
- One high-speed printer per Coding and Robotics Lab
- Internet Access
- Network

2.4.2.1.5. Software Requirements:

- Antivirus and Internet Security
- Cloud Storage Services
- Operating System
- Office Suite (Text editing and Spreadsheets)
- Application Software for Block based Coding and Drawing
- Screen Control

2.5. Teaching Coding and Robotics in Foundation Phase

Coding and Robotics in the Foundation Phase applies the Engineering Design Process and Computational thinking process throughout the Subject. The Subject in Foundation Phase is further supported by the National Early Learning Development Standards (NELDS) document for planning, teaching and learning. There are important skills that very young learners need to master and understand before they go to Grade 1 and Grade R should help them, acquiring

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those skills. One of the most important roles of the Grade R teacher is to provide learners with an environment that is safe, clean and caring, with adequate opportunities to play and explore the world under the careful guidance of their teacher.

The teacher should provide:

- routine, structured and free play Coding and Robotic activities for learners that are enjoyable and manageable;
- a range of resources for routine, structured and free play Coding and Robotics activities;

Generally, the Foundation Phase timetable consists of routine activities, free play activities indoors and outdoors, and structured activities. Routine and free play activities have been built into the Coding and Robotics CAPS document because they usually involve learners in physical education.

2.5.1. Engineering Design Process (IDMEC)

Coding and Robotics develop valuable problem-solving skills that will benefit every learner in many life contexts for the 4IR and beyond. As learners' progress through a task, they must be taught the associated knowledge and the skills needed to design and create a solution. Knowledge is important and the learners must show that they can use the knowledge.

The Engineering Design Process (Investigate, Design, Make, Evaluate, Communicate – IDMEC) forms the backbone of the subject and should be used to structure the delivery of all learning aims. Learners should be exposed to a problem, need or opportunity as a starting point. They should then engage in a systematic process that allows them to develop solutions that solve problems, rectify design issues and satisfy needs.

Investigation in this subject involves finding out about contexts of the problem, investigating or evaluating existing products in relation to key design aspects and performing practical tests to develop understanding of aspects of the content areas or

Criteria for teaching and assessing design features:

- Originality and aesthetics
- Value for money/cost effectiveness
- Fit-for-purpose and suitability of materials
- Ease of manufacture
- Safety and ergonomics
- Environmental impact
- Bias towards or against a group

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determining a product's fitness-for-purpose. While investigating, learners should be provided with opportunities to explore values, attitudes and indigenous knowledge to develop informed opinions that can help them to make compromises and value judgements. Investigation can happen at any point in the Design Process. It should not be something that must be completed before design begins.

Designing, making and evaluating. These skills should not be separate – they are inter-related. Part of the modernisation of **Design and Making**. Designs can be drafted, virtually assembled and evaluated before they are produced.

Evaluation skills, for example, are used to choose ideas.
At this level, learners should be introduced to key aspects of design. These should be used to evaluate both existing and designed products against predetermined criteria. When making, learners should be encouraged to continue to reflect on their progress against these criteria and to modify their solutions based on problems encountered. As learner's progress, they should be able to demonstrate increasing accuracy and skill, better organisation and safer working practices.

Communication should also be integral to the overall process. Learners should be recording and presenting progress in written and graphical forms on an on-going basis. Their presentations should show increasing use of media, levels of formality and conventions as they progress through the phase.

2.5.2. Computational Thinking

In education, Computational Thinking is a set of problem-solving methods that involve expressing problems and their solutions in ways that a computer could also execute.

This is a dynamic process consisting of four steps, that are outlined below:

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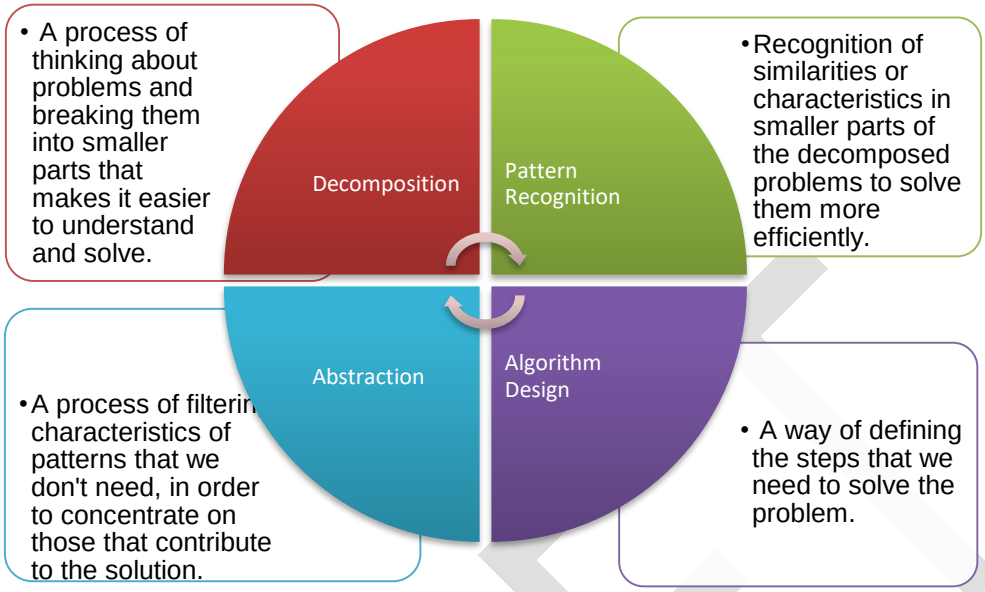

2.5.3. Routine activities

Routine activities should be centred on Coding and Robotics principles in the subject and can be based on some of the following generic routines:

- arrival and departure greetings;
- toilet routine;
- birthday chart;
- date chart;
- health chart;
- tidying up time after Coding and Robotics free play.

2.5.4. Free play Coding and Robotics activities indoors and outdoors

Free play Coding and Robotics activities can take place indoors or outdoors or both. Examples of free play activities include:

Free play inside	Free play outside
Gr R – 1 Pattern recognition game	Robot Control Games
Digital Devices Game	Role Play with ID Cards to access the playground
Robot Control Game	Racing miniature cars
Play with different types of robot toys	Dance Bot Game
Role Play with ID cards and Password Games	Code Cards Game – Simon says, Fruit picking Robot
Play with Digital Devices – Applications (Drawing, Digital Keyboards and mouse skills games)	Password Games

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Code Cards (Directional Movements)	Playground Obstacle Course Control games
Dance Bot Game (Body movements)	Maze Activities
Maze Activities	
Swapping and Sorting Games	
Keyboard Games	

2.5.5. Structured activities

Structured activities are short teaching and learning activities, often guided by the teacher. They can be done with individual learners, in small teams or class, depending on the nature of the lesson. The concepts, content and skills for structured activities are specified in the Coding and Robotics Strands in the curriculum document.

2.5.6. Perceptual skills

Coding and Robotics contributes to the development of learner's perceptual skill through the free play and coding cards. The relevant perceptual skills used in Coding and Robotics are as follow:

- **Visual perception** - acquiring and interpreting information through the eyes - accurate visual perception enables the learner to read, write and do mathematics;
- **Visual discrimination** - the ability to see similarities, differences and details of objects accurately;
- **Visual memory** - the ability to remember what the eyes have seen and the correct sequence in which things have been perceived;
- **Auditory perception** - acquiring and interpreting information through the ears - accurate auditory perception enables the learner to give meaning to what is heard;
- **Auditory discrimination** - the ability to hear similarities and differences in sounds;
- **Auditory memory** - the ability to remember what the ears have heard and the correct sequence in which sounds have been perceived;
- **Hand-eye co-ordination** - the hands and eyes working together when performing a movement, e.g. throwing or catching a ball;
- **Body image** – a complete awareness of one's own body, i.e. how it moves and how it functions;
- **Laterality** - showing an awareness of each side of the body, e.g. which hand is waving;
- **Dominance** - preferring to use one hand or side of the body, i.e. either right or left dominant;

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- **Crossing the mid-line** - being able to work across the vertical mid-line of the body, e.g. being able to draw a line from one side of the page to the other without changing the tool from one hand to the other;
- **Figure-ground perception** - being able to focus attention on a specific object or aspect while ignoring all other stimuli, the object of the attention is therefore in the foreground of the perceptual field while all the rest is in the background e.g. being able to read one word in a sentence;
- **Form perception** - the ability to recognise forms, shapes, symbols, letters, etc. regardless of position, size, background, e.g. can recognise a circle because of its unique shape;
- **Spatial orientation** - the ability to understand the space around the body, or the relationship between the object and the observer, e.g. the hat is on my head;

2.5.7. Topics

In the Coding and Robotics, curriculum is organised in strands. The use of strands integrates the content from the different subjects' areas where possible and appropriate. Teachers are encouraged to adapt the topics so that they are suitable for their school contexts. Teachers are also encouraged to choose their own topics should they judge these to be more appropriate.

2.5.8. Weighting of Strands and Topics

The Coding and Robotics curriculum is designed across 40 weeks of the year. Approximate time allocations are given for each topic during each term, indicating the weighting that each topic should receive. Routine activities and indoor and outdoor Coding and Robotics free play also need to be incorporated into the teaching schedule.

2.5.9 Sequencing and Progression

A suggested order for the topics is provided as one of the important principles of early childhood education is to begin with what is familiar to the learner and introduce less familiar topics and skills later. Therefore, sequencing and progression have been built into the design of the topics. The sequence of the topics can be changed, but teachers should pay attention to the progression and level at which the topic is addressed.

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SECTION 3: OVERVIEW OF TOPICS AND ANNUAL TEACHING PLANS

3.1 Overview of Topics

Listed below are the topics per grade with a short explanation of the focus. Note that some topics are continued from Grade R to 3 showing progression and increasing in complexity from year to year, whilst other topics cease at some stage. This is not due to its importance diminishing, but rather due to the integration thereof.

TERM 1				
Topics	**Grade R**	**Grade 1**	**Grade 2**	**Grade 3**
Pattern Recognition and Problem Solving	• Identify different patterns • Pattern Recognition - patterns repeating up to 2 times. • Complete a Pattern - Minimum of 2 repetitions.	• Pattern Recognition - patterns repeating up to 3 times. • Complete a Pattern - Minimum of 3 repetitions • Debugging in a sequence - 2 patterns and 3 repetitions • creating patterns	• Creating patterns	• Continue with Encode and Decode from Grade 2. - 2 Sentences consisting of 7 -words.
Algorithms and Coding	• Introduction of what Computers are. • Identify Computing devices • Decomposition. • Sequences	• Block-based programming interface • Introduce block movement: ○ forward, ○ back, ○ right, ○ left	• Introduce the Basic features of programming interface: ○ Create a project ○ Move blocks into the scripting area ○ Select a block category ○ Selecting character/agent or objects. ○ Looks Block ○ Use blocks in scripting area as buttons ○ Changing the size of the Characters/Agent or object. ○ Save a project ○ Close the Application • Continue with sequences	• Introduce basic coding terms. • Introduce the Basic features of programming interface: ○ Selecting Characters/Agents or objects. ○ Loading a program ○ Create a customised object ○ Right Click to get information from a block. ○ Motion (movement / turning) ○ Move blocks into the code area ○ Select a block category ○ Looks Block ○ Use blocks in scripting area as buttons • Sequences • Introduction to algorithms

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TERM 1				
Topics	**Grade R**	**Grade 1**	**Grade 2**	**Grade 3**

Robotics	• Introduction of Robots.
	• Introduction of input and output allowing the control of robots.
		• Making a robot mask using patterns
		• Programming a Robot
		• Basic Colour identification
			• Introduction of mechanical components
			  ○ basic chassis
			  ○ basic fasteners
			  ○ axles
			  ○ wheels
				• Introduction to breadboards using
				  ○ buzzer
				  ○ lightbulb
				  ○ DC motor
				• Introduction to
				  ○ basic structures
				  ○ joining techniques
				  ○ 2D and 3D shapes

Internet and E-Communications	• Introduction to Privacy
	• Introduction to Personal details
	• Introduction to Identification Cards
		• Introduce the concept of connectivity.
		• Internet – Working online and offline.
		• Logging in Online.
		• Introduction to websites.
			• Digital Communication – Different methods of communication.	• Introduction to Computer networks.
				• Introduction to how a network works.
				• Introduction of the following network terminology:
				  ○ Sender
				  ○ Receiver
				  ○ Switch
				  ○ Cables

Application Skills	• Switch a device on and off.
	• Introduction and use of user interfaces on digital devices.
	• Introduction and working on a digital device.
	• What is an Application?
	• What do Applications do?
		• Introduce a Drawing or Graphics Application.
		• Introduce the user interface of the Drawings / Graphics Application
		• Introduce and use basic drawing and colouring tools
			• Physical/Virtual keyboards
			  ○ Directional Keys (up, down, left and right)
			• Introduction to pointing Devices.
				• Introduction to spreadsheets
				  ○ What is a spread sheet?
				  ○ Introduce learners to a spreadsheet Application.
				  ○ Introduce the user interface for the spreadsheets Application
				  ○ Cell references.
				  ○ Create a file
				  ○ Save a file
				  ○ Close the spreadsheet Application
				  ○ Load a spreadsheet File
				  ○ Rows and Columns
				  ○ Cell colours and fonts

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TERM 2				
Topics	**Grade R**	**Grade 1**	**Grade 2**	**Grade 3**
Pattern Recognition and Problem Solving	• Identify different patterns • Pattern Recognition - patterns repeating up to 2 times. • Complete a Pattern • Minimum of 2 repetitions. • Movement as a Pattern.	• Explain pattern sequences. - patterns of 3 shapes and 3 repetitions. • Complete a pattern - patterns repeating up to 3 times. • Debugging in a sequence - patterns of 3 shapes and 3 repetitions.	• Introduction to Algorithmic thinking • Continue Creating patterns	• Algorithmic Thinking.
Algorithms and Coding	• Decomposition. • Sequences. • Code Cards with the following basic instructions: o Move forward o Go back o Turn left o Turn right	• Introduction to Loop functions (Loop block).	• Introduce new features of the interface: o Changing backgrounds o Event triggers (Begin/End) o Change speed of Character/Agent or Object (Speed block) • Introduce that more than one sequence of programming can take place at once in a single program. • Introduce more than one Character/Agent or Object.	• Introduction to: o Repeat and repeat forever block o Creating a custom object o Use the switch/next costume block o Pen block / stamp block
Robotics	• Introduction of Robots. • Introduction of input and output allowing the control of robots. • moving a robot. o Forward o Back o Left o Right	• Programming a Robot • Basic Shape identification	• Propulsion through an elastic band and a Fan	• Continue with Basic breadboard layout • Connect components using a breadboard. o LED o Resistor o Switch • Mechanical systems o Basic Pulleys o Basic Linkages • Structures that use pulleys or linkages
Internet and E-Communications	• Introduction to Username • Introduction and Passwords (Pattern).	• Introduce Digital Safety • Introduce Online Identity	• Digital Communication –Text	• Introduction to Computer Network Hardware Components. o Connector ports o Cables o Modem o Router o Switch • Introduction to Wired and Wireless networks.
Application Skills	• working on a digital device. • Move an object (drag and drop) • Rotating the display of the user interface	• Continue with using basic drawing and colouring tools. • Introduce learners to o creating a new file. o saving a file	• Introduction to a Text editor Application. • Using and identifying the following keys on a (Physical/virtual) keyboard: o Enter key o Space bar	• Introduction to Data Capture on a spreadsheet application: o Headings for grids o Numbering of Items in a list o Lists

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TERM 2				
Topics	**Grade R**	**Grade 1**	**Grade 2**	**Grade 3**
		○ loading a file	○ Shift key ○ Backspace key ○ Delete key	

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TERM 3				
TOPICS	**Grade R**	**Grade 1**	**Grade 2**	**Grade 3**

Pattern Recognition and Problem Solving	• movement as a pattern
	• Continue Pattern Recognition
	  - patterns repeating up to 2 times.
	• Continue Complete a Pattern
	  - Minimum of 3 repetitions.
		• Pattern Recognition
		  - patterns of 4 objects/shapes and 2 repetitions.
		• Continue to explain pattern sequences.
		  - patterns of 4 objects/shapes and 2 repetitions.
		• Continue to complete pattern sequences.
		  - patterns of 4 objects/shapes and 2 repetitions.
		• Continue to debug pattern sequences.
		  - patterns of 4 objects/shapes and 2 repetitions.
			• Algorithmic thinking
			• Creating number patterns
			• Following instructions to make a pattern according to numbers.
				• Continue with algorithmic thinking
				• Continue with debugging

Algorithms and Coding	• Code Cards
	• Swapping items
		• Introduction to Input events
		• Introduce input events in a block-based interface.
			• Introduce new features of the interface:
			  ○ Pen Block
			  ○ Infinite Loop (Repeat forever block)
			  ○ Speech bubbles
			  ○ Delays (delay block)
			  ○ Counter Control Loop (repeat Block)
			  ○ Insert sound (sound block)
				• Introduction to event driven programming
				  ○ sensory triggers
				  ○ keyboard/mouse triggers

Robotics	• Logic instructions (minimum 8)	• Introduction to basic electric components
		  ○ Battery
		  ○ Wires
		  ○ Switch (Optional)
		  ○ Buzzer/ Light Bulb
		• Robots state of operation (on/off)
			• Continue with Propulsion through a Fan.
			• Continue with building a chassis
				• Continue with Basic breadboard layout
				• Series and Parallel circuits
				• Introduction of
				  ○ polarity change on a DC motor
				  ○ gears

Internet and E-Communications	• Introduction of Digital Security	• Introduction Digital Footprint	• Digital Communication – Voice	• Introduction to the internet and World Wide Web
				  ○ What is the internet?
				  ○ How does the internet work?
				  ○ What is a website?
				  ○ Examples of websites
				• Online Safety
				  ○ protecting personal details

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TERM 3				
TOPICS	**Grade R**	**Grade 1**	**Grade 2**	**Grade 3**
				○ be careful of strangers
Application Skills	• Using an application to sort items by ○ size ○ colour ○ rolling / sliding	• Continue with basic drawing and colouring tools.	• Continue with Physical/Virtual keyboards • Identify ○ Full stop ○ Question mark ○ Comma ○ Exclamation mark	• Introduction to converting Pictogram data on a Grid. • Continue working on the spreadsheets Application. • Introduction to display data in grid using a bar graph. • Continue working on the spreadsheets Application

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TERM 4				
TOPICS	**Grade R**	**Grade 1**	**Grade 2**	**Grade 3**
Pattern Recognition and Problem Solving	• Movement as a pattern • Pattern Recognition - patterns repeating up to 3 times. • Complete a Pattern - Minimum of 3 repetitions.	• Pattern Recognition - patterns of 5 objects/shapes and 3 repetitions. • Explain pattern sequences. - patterns of 5 objects/shapes and 3 repetitions. • Debugging in a sequence - patterns of 5 objects/shapes and 3 repetitions. • Complete a Pattern - patterns of 5 objects/shapes and 3 repetitions	• Encode and Decode - 3 to 4 letter words in 5-word sentence • Continue with Algorithmic thinking	• Continue with Algorithmic Thinking.
Algorithms and Coding	• Code Cards ○ Debugging	• Continue with Debugging • Introduction Pair Programming	Concept that are introduced: • Creating multiple characters • Continue with the following features: ○ Customising characters ○ Looping functions ○ Event triggers ○ Add sounds ○ Change the Background. ○ Pen block	• Introduction to ○ event triggers – Broadcasting ○ sounds
Robotics	• Logic instructions robots follow: ○ Pick up and Drop	• Continue with Programming a Robot	• Continue with electric fan using a basic circuit and using a Fan for propulsion.	• Project using a ○ structure ○ mechanical system ○ electrical system
Internet and E-Communications	• Digital Security – Good password practices	• Continue with Digital Footprint	• Continue with Digital Communication – Video	• Introduction to using a search engine • Introduction to basic browsing and searching techniques. ○ Finding an Image. ○ Finding a video
Application Skills	• Using a keyboard: ○ Virtual Keyboard on a touch screen ○ Physical Keyboard	• Introduce learners to drawing combined shapes	• Continue with a Text editor Application. • Using and identifying the following keys on a (Physical/virtual) keyboard: ○ Numeric Keys	• Continue working on the spreadsheets Application. • Introduction to copying and pasting • Continue working with a text editor

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3.2 Annual Teaching Plans

3.2.1 GRADE R: TERM 1

WEEK	TOPIC	CONTENT
Week 1 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are introduced: • Identify different patterns • Pattern Recognition - patterns repeating up to 2 times. Examples that can be used in class • Give learners a pattern that is repeated up to 2 times
Week 2 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Identifying different patterns • Continue with pattern recognition - patterns repeating up to 2 times. • Complete a Pattern - Minimum of 2 repetitions. Examples that can be used in class • Learners are presented with simple patterns made with physical objects or pictures and they have to create, describe and complete their own patterns. • Give learners a pattern that is repeated up to 2 times
Week 3 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with pattern recognition - patterns repeating up to 2 times. • Complete a Pattern - Minimum of 2 repetitions. Examples that can be used in class • Create a basic pattern and let a friend replicate this pattern. Peer reflection on the design.
Week 4 (1 hour) **Week 5 (1 hour)**	Algorithms and Coding	The following Algorithm and Coding Concepts are introduced: • Introduction of what Computers are. • Identify Computing devices – e.g. phone, tablet, computer Examples that can be used in class • Learners are shown pictures of computing devices where they need to identify the computing device. The following Algorithm and Coding Concepts are introduced: • Introduction to Decomposition. - step by step instructions. • Introduction to sequences Examples that can be used in class • Ask leaners to split up daily activities into step by step instructions, like brushing teeth or getting ready for school.
Week 6 (1 hour)	Robotics Skills	The following Robotics Skills Concepts are introduced: • Introduction of Robots. • Introduction of input and output allowing the control of robots Examples that can be used in class: • Television remote control, motion-sensor light, car alarm, exit gates opening upon exit, doors opening at the mall. • Remote control devices (e.g. car / robot) – learners to understand that a robot is an object that follows instructions/code

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		Activity: • Learners to explain in their own words what a robot is. • Learners can draw and/or create simple robots and can be asked to explain what their robots can do.
Week 7 (1 hour)	Internet and E-communication	The following Internet and E-communication concepts are introduced: • Introduction to Privacy • Introduction to Personal details • Introduction to Identification Cards Example that can be used in class: • Learners complete a template of Identification Card.
Week 8 (1 hour)	Application Skills	The following Application Skills Concept are introduced: • Switch a device on and off. • Introduction to user interfaces on digital devices. • Introduction to working on a digital device. Examples that can be used in class: • Learners should be able to switch devices on and off, open and close applications and interact with the user interfaces of digital devices through play. • Use an app (or a game) to Mouse skills: point/move the cursor on the screen using the mouse, left click, right click, scroll, click and drag • Learners should be able to interact with UI on digital devices: play, explore, develop hand-eye co-ordination and look for basic patterns / similarities.
Week 9 (1 hour)	Application Skills	The following Application Skills Concept are introduced: • Continue using user interfaces on digital devices. • Continue working on a digital device. Examples that can be used in class: • Use an app (or a game) to Mouse skills: point/move the cursor on the screen using the mouse, left click, right click, scroll, click and drag • Touch screen skills/gestures: tap, double tap, swipe, drag, drop, stretch/zoom, pinch/shrink, flick, rotate • Learners should be able to interact with UI on digital devices: play, explore, develop hand-eye co-ordination and look for basic patterns / similarities.
Week 10 (1 hour)	Application Skills	The following Application Skills Concept are introduced: • What is an Application? • What do Applications do? • Continue using user interfaces on digital devices. • Continue working on a digital device. Examples that can be used in class: • Identify 3 different Applications and what they are used for. • Use mouse/keyboard/touchscreen skills within an application.

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GRADE R: TERM 2

WEEK	TOPIC	CONTENT
Week 1 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns The following Concepts for Pattern Recognition and Problem Solving are introduced: • Movement as a Pattern. Examples that can be used in class • Learners as a group have to participate in an activity led by the teacher leading them with physical movements creating a pattern.
Week 2 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Movement as a Pattern. • Continue Pattern Recognition - patterns repeating up to 2 times. Examples that can be used in class • Learners as a group have to participate in an activity led by the teacher leading them with physical movements creating a pattern of a minimum of 2 physical movements and 2 repetitions. • Learners are presented with simple patterns made with physical objects, drawings of line and shapes and they have to create, describe and complete their own patterns.
Week 3 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Movement as a Pattern. • Continue Pattern Recognition - patterns repeating up to 2 times. • Continue Complete a Pattern - Minimum of 2 repetitions. Examples that can be used in class • Complete a basic pattern and let a friend replicate this pattern. Peer reflection on the design.
Week 4 (1 hour)	Algorithms and Coding	The following Concepts have to be revised: • Decomposition • Sequences. The following Algorithm and Coding Concepts are introduced: • Continue with Decomposition. • Continue with Sequences. Examples that can be used in class • Learners arrange pictures in a sequence to plant a tree. • Learners are given pictures of daily activities that they need to arrange these in a logical order.
Week 5 (1 hour)		The following Algorithm and Coding Concepts are introduced: • Continue with Decomposition. • Continue with Sequences. • Continue with Code Cards with the following basic instructions: o Move forward o Go back o Turn left o Turn right

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		Examples that can be used in class
		• Teachers use code card instructions:
		  ○ for students to move forward, turn left, turn right, go back.
		  ○ for games and other activities that involve bodily movement of learners.

Week 6 (1 hour)	Robotics Skills	The following Robotics Skills Concepts are revised:
		• Introduction of Robots.
		• Introduction of input and output allowing the control of robots
		
		The following Robotics Skills Concepts are introduced:
		• Computer/Robot can only follow instructions.
		  ○ Minimum of 4 instructions.
		• Basic instructions for moving a robot.
		  ○ Forward
		  ○ Back
		  ○ Left
		  ○ Right
		
		Examples that can be used in class:
		(Instructions are to be Verbal and Visual):
		• Dance bots / teacher says Kids follow / like Simon says. There should be a minimum of 4 dance moves. The routine needs to be repeated a minimum of 2 times.
		• Learners Guide a Robot mouse through a simple grid to get to the cheese. There should be a minimum of 4 instructions.

Week 7 (1 hour)	Internet and E-Communication	The following Internet and E-communication concepts are revised: • Introduction to Privacy • Introduction to Personal details • Introduction to Identification Cards The following Internet and E-communication concepts are introduced: • Introduction to Username • Introduction and Passwords (Pattern). Example that can be used in class: • Learners complete a worksheet where they need to insert their username and complete a pattern for a password. • Learners need to complete a password of a minimum of 4 patterns or shapes.
Week 8 (1 hour)	Application Skills	The following Application Skills Concepts are revised: • User interfaces on digital devices. • What is an Application? • What do Applications do? • Switch a device on and off. • Opening and closing of applications. The following Application Skills Concepts introduced: • Continue working on a digital device. Examples that can be used in class: • Learners should be able to switch digital devices on and off, open and close applications and interact with the user interfaces of digital devices through play.
Week 9 (1 hour)		The following Application Skills Concepts introduced: • Continue working on a digital device. • Move an object to a certain position in an Application (drag and drop).

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Week 10 (1 hour)		Examples that can be used in class: • Learners should be able to move an object on the screen to a specific position on the screen. The following Application Skills Concepts introduced: • Continue working on a digital device. • Continue with drag and drop activities. • Rotating the display of the user interface on a digital device. Examples: • Recognise Shapes and pictures on the screen of a digital device Interact with the digital device. • Learners can rotate the display of the user interface on a digital device • Learners should be able to move an object on the screen to a specific position on the screen.

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GRADE R: TERM 3

<table>
<tr><th>WEEK</th><th>TOPIC</th><th>CONTENT</th></tr>
<tr><td>Week 1
(1 hour)</td><td rowspan="3">Pattern Recognition and Problem Solving</td><td>The following Concepts for Pattern Recognition and Problem Solving are revised:
• Identify different Patterns
• Movement as a Pattern.

The following Concepts for Pattern Recognition and Problem Solving are introduced:
• Continue with movement as a pattern
• Continue Pattern Recognition
- patterns repeating up to 2 times.
• Continue Complete a Pattern
- Minimum of 3 repetitions.

Examples that can be used in class:
• Learners as a group have to participate in an activity led by the teacher leading them with physical movements creating a pattern of a minimum of 2 physical movements and 3 repetitions.</td></tr>
<tr><td>Week 2
(1 hour)</td><td>The following Concepts for Pattern Recognition and Problem Solving are introduced:
• Continue Pattern Recognition
- patterns repeating up to 2 times.
• Continue Complete a Pattern
- Minimum of 3 repetitions.

Examples that can be used in class:
• Learners are presented with simple patterns made with physical objects, drawings of line and shapes and they have to create, describe and complete their own patterns.</td></tr>
<tr><td>Week 3
(1 hour)</td><td>The following Concepts for Pattern Recognition and Problem Solving are introduced:
• Continue Pattern Recognition
- patterns repeating up to 2 times.
• Continue Complete a Pattern
- Minimum of 3 repetitions.

Examples that can be used in class:
• Create a basic pattern with at least two steps/ components and let a friend replicate this pattern. Peer reflection on the design.</td></tr>
<tr><td>Week 4
(1 hour)</td><td rowspan="2">Algorithms and Coding</td><td>The following Concepts have to be revised:
• Code Cards
o Move forward
o Turn left
o Turn right
o Go back

The following Algorithm and Coding Concepts are introduced:
• Continue with Code Cards.

Examples that can be used in class

• Learners complete maze activities where they create their own algorithm using given code cards.</td></tr>
<tr><td>Week 5
(1 hour)</td><td>The following Algorithm and Coding Concepts are introduced:
• Introduction to Swapping items.</td></tr>
</table>

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		Examples that can be used in class • Learners are provided with 3 containers. Two have items in them and the third is empty. Learners need to Swap the contents of two containers (A and B), using a third container (C). Put the contents of container A in container C. Put the contents of container B into container A. Put the contents of container C into B.
Week 6 (1 hour)	Robotics Skills	The following Robotics Skills Concepts are revised: • Computer/robot can only follow instructions. • Computers/robots require instructions to operate • Basic instructions for moving a robot. The following Robotics Skills Concepts are introduced: • Continue Logic instructions robots follow o Minimum of 8 instructions. Examples that can be used in class: *Instruction are to be mainly Verbal* • Dance bots / teacher says Kids follow / like Simon says. There should be a minimum of 8 dance moves. The routine needs to be repeated a minimum of 2 times. • Guide a Robot mouse through a simple grid to get the cheese. There should be a minimum of 8 instructions.
Week 7 (1 hour)	Internet and E-Communication	The following Internet and E-communication concepts are revised: • Introduction to Username • Introduction and Passwords (Pattern). The following Internet and E-communication concepts are introduced: • Introduction of Digital Security Example that can be used in class: • Learners log into an application on a Digital Device. • Play a physical game where the Learners need to provide an ID in order to get a reward. The learner can only get a reward if they present the correct password.
Week 8 (1 hour)	Application Skills	The following Application Skills Concepts to be revised: • User interfaces on digital devices. • Switch a device on and off. • Open and closing of Applications Concepts to be introduced: • Use an Application on a Digital devices to sort objects according to: o size Example that can be used in class: • Recognise and sort objects according to size on the screen of a digital device Interact with the digital device.
Week 9 (1 hour)		Concepts to be introduced: • Use an Application on a Digital devices to sort objects according to: o colour Example that can be used in class:

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Week 10 (1 hour)		• Recognise and sort objects according to colour on the screen of a digital device Interact with the digital device. Concepts to be introduced: • Use an Application on a Digital devices to sort objects according to: o objects that roll. o objects that slide. Example that can be used in class: • Recognise and sort objects according to one that roll and slide on the screen of a digital device Interact with the digital device.

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GRADE R: TERM 4

WEEK	TOPIC	CONTENT
Week 1 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns • Movement as a Pattern. The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with movement as a pattern • Continue Pattern Recognition - patterns repeating up to 3 times. • Continue Complete a Pattern - Minimum of 3 repetitions. Examples that can be used in class: • Learners as a group have to participate in an activity led by the teacher leading them with physical movements creating a pattern of a minimum of 3 physical movements and 3 repetitions.
Week 2 (1 hour)		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue Pattern Recognition - patterns repeating up to 3 times. • Continue Complete a Pattern - Minimum of 3 repetitions. Examples that can be used in class: • Learners are presented with simple patterns made with physical objects, drawings of line and shapes and they have to create, describe and complete their own patterns using their own worksheet.
Week 3 (1 hour)		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue Pattern Recognition - patterns repeating up to 3 times. • Continue Complete a Pattern - Minimum of 3 repetitions. Examples that can be used in class: • Create a basic pattern with at least three steps/ components and let a friend replicate this pattern. Peer reflection on the design
Week 4 (1 hour)	Algorithms and Coding	The following Concepts have to be revised: • Code Cards ○ Move forward ○ Turn left ○ Turn right ○ Go back • Swapping Items The following Algorithm and Coding Concepts are introduced: • Continue with Code Cards. ○ Debugging Examples that can be used in class • Learners are given multiple solution to a maze activity and they need to determine which one is the correct one. They need to identify which step is the incorrect step. A minimum of two solutions.
Week 5 (1 hour)		The following Algorithm and Coding Concepts are introduced: • Continue with Code Cards. ○ Debugging Examples that can be used in class

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		• Learners are provided with a worksheet with a code sequences for a maze activity. Some are correct and some are wrong, and learners need to determine where the error in the sequence lies and make the correction. The minimum number of steps in the code is 6.
Week 6 (1 hour)	Robotics Skills	The following Robotics Skills Concepts are revised: • Computer/robot can only follow instructions. • Computers/robots require instructions to operate • Basic instructions for a robot. The following Robotics Skills Concepts are introduced: • Continue Logic instructions robots follow: ○ Pick up and Drop Examples that can be used in class: • Learners have to give instructions to Fruit picking robot. • First the learners need to plot the path and then give the instructions to the robot using directional code cards (Forward, back, turn left, turn right, pickup and drop). • The robot needs to be taken through a maze to pick and drop fruits in a basket with a minimum of 2 of the same fruits.
Week 7 (1 hour)	Internet and E-Communication	The following Internet and E-communication concepts are revised: • Username • Passwords (Pattern). • Digital Security concept The following Internet and E-communication concepts are introduced: • Digital Security – Good password practices. Examples that can be used in class: • Learners create their own password (by arranging objects) that they give to the teacher. Before they can go to the playground, they need to give the teacher their password. (as a class or individual) • Learners are given basic shapes (triangle, square, circle) and they have to find the correct 3- or 4-object combination to guess the correct password.

Week 8 (1 hour)
 	
Week 9 (1 hour)
 	
Week 10 (1 hour)
	Application Skills	The following Application Skills Concepts are revised:
		• User interfaces on digital devices.
		
		Concepts to be introduced:
		• Using a keyboard:
		  ○ Virtual Keyboard on a touch screen
		  ○ Physical Keyboard
		
		Examples:
		• Play a game on a digital device that uses a keyboard (physical/virtual).
		
		Concepts to be introduced:
		• Continue with using a physical or virtual keyboard
		• Open a typing Application and interact with the Application.
		
		Examples:
		• Learners should open a typing application and complete different task or objectives in the application.
		
		Concepts to be introduced:
		• Refine hand and eye coordination through playing on a virtual/physical keyboard.
		
		Examples:
		• Play a game on a digital device that uses a keyboard (physical/virtual).

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3.2.2 GRADE 1: TERM 1

WEEK	TOPIC	CONTENT
Week 1 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue Pattern Recognition - patterns repeating up to 3 times. • Continue Complete a Pattern - Minimum of 3 repetitions. Examples that can be used in class: • Learners are given a worksheet with sequences consisting of two complete sets and they need to complete the third set. • Learners are presented with simple patterns made with physical objects, drawings of line and shapes and they have to create, describe and complete their own patterns using their own worksheet.
Week 2 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are introduced: • Debugging in a sequence - 2 patterns and 3 repetitions. • Continue Pattern Recognition - patterns repeating up to 3 times. • Continue Complete a Pattern - Minimum of 3 repetitions. Examples that can be used in class: • Learners are given a set of sequences on a worksheet that are the same, but there is one that is incorrect. They need to identify the incorrect sequence. • Learners are given a worksheet with sequences consisting of two complete sets and they need to complete the third set.
Week 3 (30 min)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are introduced: • Introduction to creating patterns • Continue Pattern Recognition - patterns repeating up to 3 times. • Continue Complete a Pattern - Minimum of 3 repetitions. Examples that can be used in class: • Create a basic own pattern with at least three steps/ components and let a friend replicate this pattern. Peer reflection on the design
Week 3 (30 min)	Robotics	The following Robotics Skills Concepts are introduced: • Making a robot mask using patterns Example that can be used in class: • Colour in a colour by number mask. *The mask will be used in Week 6 for the Robotics Activity.*
Week 4 (1 hour)	Algorithms and Coding	The following Concepts have to be revised: • Sequences The following Algorithm and Coding Concepts are introduced: • Block-based programming interface • Introduce block movement: o forward, o back, • Construct a program using forward- and back-blocks

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		Examples that can be used in class • Learners complete a basic code sequencing activity on an online Application. The Activity needs to increase in difficulty from a minimum of 3 to 10 maximum. The basic number of instructional blocks used should start with a minimum of 1 and then progress to 4 instructional blocks. The activity must only include forward and backward movement.

Week 5 (1 hour)		The following Algorithm and Coding Concepts are introduced:
		• Introduce block movement:
		  ○ turn right
		  ○ turn left.
		• Construct a program using movement blocks
		
		Examples that can be used in class
		
		• Learners complete a basic code sequencing activity on an online Application. The Activity needs to increase in difficulty from a minimum of 3 to 10 maximum. The basic number of instructional blocks used should start with a minimum of 1 and then progress to 4 instructional blocks. The activity must include all (left/right/forward/back) blocks.

Week 6 (1 hour)	Robotics Skills	The following Robotics Skills Concepts are revised: • Basic instructions and commands for a robot (movement, pickup and drop). The following Robotics Skills Concepts are introduced: • Programming a Robot • Basic Colour identification. Examples that can be used in class: • Learners have to give instructions to a Toy collecting robot. • First the learners need to plot the path and then give the instructions to the robot using directional code cards (Forward, back, turn left, turn right, pickup and drop). • The robot needs to be taken through a maze to pick and drop toy of the same colour in a basket with a minimum of 3 toys.
Week 7 (1 hour)	Internet and E-Communication	The following Internet and E-communication concepts are revised: • Digital Security The following Internet and E-communication concepts are introduced: • Introduce the concept of connectivity. • Internet – Working online and offline. • Logging in Online. • Introduction to websites. Example that can be used in class: • Learners Login on a Digital Device to access an Application. • Show learners' different signs use that shows devices are connected.
Week 8 (1 hour)	Application Skills	The following Application Skills Concepts are revised: • Switching digital devices on and off. • User interfaces on digital devices. • Opening an Application on a digital device. The following Application Skills Concepts are introduced: • Introduce a Drawing or Graphics Application. • Introduce the user interface of the Drawings / Graphics Application. Example that can be used in class:

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		• Learners engage with the Graphics or Drawings Application and draw a picture using a pencil or brush.
Week 9 (1 hour)		The following Application Skills Concepts are introduced: • Introduce and use basic drawing and colouring tools Example that can be used in class: • Learners engage with the Graphics or Drawings Application and draw different shapes and fill them with colour.
Week 10 (1 hour)		The following Application Skills Concepts are introduced: • Continue with basic drawing and colouring tools Examples: • Learners use the line tool to draw basic shapes.

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GRADE 1: TERM 2

WEEK	TOPIC	CONTENT
Week 1 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns The following Concepts for Pattern Recognition and Problem Solving are introduced: • Explain pattern sequences. - patterns of 3 shapes and 3 repetitions. • Continue Pattern Recognition - patterns repeating up to 3 times. Examples that can be used in class: • Learners are given a worksheet with a set of patterns that they need to analyse and explain verbally.
Week 2 (1 hour)		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue Pattern Recognition - patterns repeating up to 3 times. • Continue Complete a Pattern - Minimum of 3 repetitions. Examples that can be used in class: • Learners are given a worksheet with sequences consisting of two complete sets and they need to complete the third set.
Week 3 (30 min)		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Debugging in a sequence - patterns of 3 shapes and 3 repetitions. • Continue Pattern Recognition - patterns repeating up to 3 times. Examples that can be used in class: • Learners are given a set of sequences on a worksheet that are the same, but there is one that is incorrect. They need to identify the incorrect sequence.
Week 3 (30 min)	Robotics	The following Robotics Skills Concepts are introduced: • Making a robot mask completing a pattern on a box. Examples that can be used in class: Learners create a robot body by completing a pattern on a box. The box needs to be coloured using colour by numbers. The body should have space for legs and arms to come out. *The mask and the body will be used in Term 2 Week 6 for the Robotics Activity.*
Week 4 (1 hour)	Algorithms and Coding	The following Concepts have to be revised: • Structure of a program. • Sequences • Block movement: o forward, o back, o turn right o turn left. The following Algorithm and Coding Concepts are introduced: • Introduction to Loop functions (Loop block). Examples that can be used in class • Learners are provided with a worksheet/code where they identify repeating code and shorten multiple actions into a single loop.
Week 5		The following Algorithm and Coding Concepts are introduced:

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(1 hour)		• Continue with Loop functions (Loop block). Examples that can be used in class . • Learners complete a basic code sequencing activity on an online Application. The Activity needs to increase in difficulty from a minimum of 3 to 10 maximum. The basic number of instructional blocks used should start with a minimum of 1 and then progress to 4 instructional blocks
Week 6 **(1 hour)**	Robotics Skills	The following Robotics Skills Concepts are revised: • Basic instructions and commands for a robot (movement, pickup and drop). • Basic Colour identification The following Robotics Skills Concepts are introduced: • Continuing with Programming a Robot • Basic Shape identification. Examples that can be used in class: • Learners build a robot, to be played by one of the learners using the mask and body piece. This will be the Toy Collector Robot. • Learners have to give instructions to a Toy collecting robot. • First the learners need to plot the path and then give the instructions to the robot using directional code cards (Forward, back, turn left, turn right, pickup and drop). • The robot needs to be taken through a maze to pick and drop toy of the same shape in a basket with a minimum of 5 toys.
Week 7 **(1 hour)**	Internet and E-Communication	The following Internet and E-communication concepts are revised: • Connectivity • Internet • Logging in online. • Websites The following Internet and E-communication concepts are introduced: • Introduce Digital Safety • Introduce Online Identity Example that can be used in class: • Learners play a game where they need to create and name an avatar without adding any personal details. Learners in the rest of the class need to guess the owner of the avatar.
Week 8 **(1 hour)**	Application Skills	Concepts to be revised: • User interfaces of a Drawing or Graphics Application on a digital device. • Use of basic drawing and colouring tools. The following Application Skills Concepts are introduced: • Continue with using basic drawing and colouring tools. Examples that can be used in class: • Learners create a shapes pattern using three objects. • Learners can colour the 2-dimensional drawings made on the Drawing or Graphics Application.
Week 9 **(1 hour)**		The following Application Skills Concepts are introduced: • Continue with using basic drawing and colouring tools. • Introduce learners to creating a new file. • Introduce learners to naming and saving a file. Example that can be used in class:

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Week 10 (1 hour)		• Learners engage with the Graphics or Drawings Application to create a new file, draw different two-dimensional shapes and save their work using their names. The following Application Skills Concepts are introduced: • Continue with using basic drawing and colouring tools. • Continue with saving and creating new files • Loading a saved file. Examples that can be used in class: • Learners are given a file with their name and continue a drawing. • Learners are given a file with various shapes and they need to draw the line of symmetry for each object.

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GRADE 1: TERM 3

WEEK	TOPIC	CONTENT
Week 1 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns • Debugging in a sequence • Explain pattern sequences The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue Pattern Recognition - patterns of 4 objects/shapes and 2 repetitions. • Continue to explain pattern sequences. - patterns of 4 objects/shapes and 2 repetitions. Examples that can be used in class: • Learners are given a worksheet with a set of patterns that they need to analyse and explain verbally.
Week 2 (1 hour)		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue Pattern Recognition - patterns of 4 objects/shapes and 2 repetitions. • Continue Complete a Pattern - patterns of 4 objects/shapes and 2 repetitions. Examples that can be used in class: • Learners are given a worksheet with sequences consisting of two complete sets and they need to complete the third set.
Week 3 (30 min		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue Pattern Recognition - patterns of 4 objects/shapes and 2 repetitions. • Continue with Debugging in a sequence - patterns of 4 objects/shapes and 2 repetitions. Examples that can be used in class: • Learners are given a set of sequences on a worksheet that are the same, but there is one that is incorrect. They need to identify the incorrect sequence.
Week 3 (30 min)	Robotics	The following Robotics Skills Concepts are introduced: • Basic electric components ○ Battery ○ Wires ○ Switch (Optional) ○ Buzzer/ Light Bulb Examples that can be used in class: • Learners are introduced to basic circuits consisting of the following components: ○ Battery ○ Wires ○ Switch (Optional) ○ Buzzer/ Light Bulb
Week 4 (1 hour)	Algorithms and Coding	The following Concepts have to be revised: • Structure of a program. • Sequences • Block movement: ○ forward, ○ back, ○ turn right ○ turn left. ○ For Loops

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		The following Algorithm and Coding Concept are introduced: • Introduction to Input events. Examples that can be used in class • Learners engage in a class activity where the teacher has three shapes. Each shape requires the learners to perform a certain movement. When the teacher presses a shape or shows a shape the learners need to perform an associated movement. • Learners are provided with a worksheet where they identify an Input event to start a sequence.

Week 5 (1 hour)		The following Algorithm and Coding Concept are introduced:
		• Continue with input events.
		• Introduce input events in a block-based interface.
		
		Examples that can be used in class
		
		• Learners engage with an Application where they need to use the following Code Blocks:
		  ○ Forward,
		  ○ Back,
		  ○ Turn right
		  ○ Turn left.
		  ○ For Loops
		  ○ Input event.

Week 6 (1 hour)	Robotics Skills	The following Robotics Skills Concepts are revised:
		• Basic electric components
		  ○ Battery
		  ○ Wires
		  ○ Switch (Optional)
		  ○ Buzzer/ Light Bulb
		
		The following Robotics Skills Concepts are introduced:
		• Robots state of operation (on/off)
		• Continue Basic electronic component identification.
		
		Examples that can be used in class:
		• Learners add a basic circuit to their Body piece to show the robot is switched on.
		• Build the circuit using a battery, switch, wires, and bulb or a buzzer.

Week 7 (1 hour)	Internet and E-Communication	The following Internet and E-communication concepts are revised: • Digital Safety • Online Identity The following Internet and E-communication concepts are introduced: • Introduce Digital Footprint (Internet History, Internet Trace) Example that can be used in class: • Create a Poster of things the learners have done on the internet. Learners can use little footprints to create a trail of the websites they visited. • Learners talk about the different websites they have visited and what they did on the website.
Week 8 (1 hour)	Application Skills	Concepts to be revised: • Opening and saving a file. • User interfaces of a Drawing or Graphics Application on a digital device. • Use of basic drawing and colouring tools.

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		The following Application Skills Concepts are introduced: • Continue with using basic drawing and colouring tools. Examples: • Learners are provided with a topic that needs to be drawn using a drawing Application on a Digital Device.
Week 9 (1 hour)		The following Application Skills Concepts are introduced: • Continue with using basic drawing and colouring tools. Examples: • Learners use drawing tools to draw a pattern with four objects. • Learners are provided with a topic that needs to be drawn using a drawing Application on a Digital Device.
Week 10 (1 hour)		The following Application Skills Concepts are introduced: • Continue with using basic drawing and colouring tools. Examples: • Learners are provided with a topic that needs to be drawn using a drawing Application on a Digital Device.

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GRADE 1: TERM 4

WEEK	TOPIC	CONTENT
Week 1 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns • Debugging in a sequence • Explain pattern sequences The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue Pattern Recognition - patterns of 5 objects/shapes and 3 repetitions. • Continue to explain pattern sequences. - patterns of 5 objects/shapes and 3 repetitions. Examples that can be used in class: • Learners are given a worksheet with a set of patterns that they need to analyse and explain verbally. • Patterns are extended to nature, every-day life and cultural heritage.
Week 2 (1 hour)		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue Pattern Recognition - patterns of 5 objects/shapes and 3 repetitions. • Continue with Debugging in a sequence - patterns of 5 objects/shapes and 3 repetitions. Examples that can be used in class: • Learners are given a set of sequences on a worksheet that are the same, but there is one that is incorrect. They need to identify the incorrect sequence.
Week 3 (30 min)		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue Pattern Recognition - patterns of 5 objects/shapes and 3 repetitions. • Continue Complete a Pattern - patterns of 5 objects/shapes and 3 repetitions. Examples that can be used in class: • Learners are given a worksheet with sequences consisting of two complete sets and they need to complete the third set.
Week 3 (30 min)	Robotics	The following Robotics Skills Concepts are revised: • Basic electric components ○ Battery ○ Wires ○ Switch (Optional) ○ Buzzer/ Light Bulb
Week 4 (1 hour)	Algorithms and Coding	The following Concepts have to be revised: • Structure of a program. • Sequences • Block movements • Debugging • Input events The following Algorithm and Coding Concept are introduced: • Continue with Debugging. Examples that can be used in class • Learners are provided with a worksheet with a code sequences for a maze activity. Some are correct and some are wrong, and learners need to determine where the error in the instruction are and swap the steps around to correct the sequence. The minimum number of steps in the code is 10.

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Week 5 (1 hour)		• Learners are given multiple solution to a maze activity and they need to determine which one is the correct one. They need to identify which step is the incorrect step. A minimum of three solutions. The following Algorithm and Coding Concept are introduced: • Introduction Pair Programming • Continue with Debugging. Examples that can be used in class • Learners work in pairs to colour in a maze. They both have the same maze where one learner has to instruct the other learner which blocks to colour in using the code block instructions. • Learners engage with an Application where they code in pairs using the following Code Blocks: o Forward, o Back, o Turn right o Turn left. o For Loops o Input event.
Week 6 (1 hour)	Robotics Skills	The following Robotics Skills Concepts are revised: • Basic instructions and commands for a robot (movement, pickup and drop). • Basic component identification. The following Robotics Skills Concepts are introduced: • Continue with Programming a Robot Examples that can be used in class: • Learners build a robot, to be played by one of the learners using the mask and body piece. This will be the Collector Robot. • Learners have to give instructions to the Collector robot. • First the learners need to plot the path and then give the instructions to the robot using directional code cards (Forward, back, turn left, turn right, pickup and drop). • The robot needs to be taken through an obstacle course to pick and drop Items in a basket with a minimum of 5 items. • Every time an Item is picked up, the buzzer or light bulb needs to be switched on.
Week 7 (1 hour)	Internet and E-communication	The following Internet and E-communication concepts are revised: • Digital Footprint The following Internet and E-communication concepts are introduced: • Continue with Digital Footprint (Internet History, Internet Trace) Example that can be used in class: • Learners complete an activity where they follow different animal tracks.
Week 8 (1 hour)	Application Skills	Concepts to be revised: • Opening and saving a file. • User interfaces of a Drawing or Graphics Application on a digital device. • Use of basic drawing and colouring tools. • Box and round shapes. The following Application Skills Concepts are introduced: • Introduce learners to drawing combined Shapes to form a specific picture on the Drawing or Graphics Application.

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Week 9 (1 hour)		Example that can be used in class: • Learners engage with the Graphics or Drawings Application and draw different combined 2-dimensional shapes meeting a pre-set requirement. The following Application Skills Concepts are introduced: • Continue with drawing combined Shapes to form a specific picture on the Drawing or Graphics Application. Example that can be used in class: • Learners can colour their combined shapes 2-dimensional drawings made on the Drawing or Graphics Application according to the colour scheme provided.
Week 10 (1 hour)		The following Application Skills Concepts are introduced: • Continue with drawing combined Shapes to form a specific picture on the Drawing or Graphics Application. Example that can be used in class: • Learners create and colour their own drawings using more than two shapes.

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3.2.3 GRADE 2: TERM 1

<table>
<tr><th>WEEK</th><th>TOPIC</th><th>CONTENT</th></tr>
<tr><td>Week 1
(1 hour)</td><td rowspan="2">Pattern Recognition and Problem Solving</td><td>The following Concepts for Pattern Recognition and Problem Solving are revised:
• Identify different Patterns
• Debugging in a sequence
• Explain pattern sequences

The following Concepts for Pattern Recognition and Problem Solving are introduced:

• Creating patterns
• Follow instructions to make a pattern according to the sequence, pictures, shapes, colours, events in a story, keyboard characters, words and numbers.
- Analyse the pattern
- Discuss the pattern
- Follow and complete a pattern
- Create your own pattern
- Debug a given pattern
Examples that can be used in class:
• Learners use their own patterns to create a beaded bracelet.</td></tr>
<tr><td>Week 2
(30 min)</td><td>The following Concepts for Pattern Recognition and Problem Solving are introduced:

• Continue with creating patterns
• Continue with instructions to make a pattern according to the sequence, pictures, shapes, colours, events in a story, keyboard characters, words and numbers.
- Analyse the pattern
- Discuss the pattern
- Follow and complete a pattern
- Create your own pattern
- Debug a given pattern

Examples that can be used in class:
• Learners can create their own clap pattern; which other learners can replicate.</td></tr>
<tr><td>Week 2
(30 min)</td><td rowspan="2">Internet and E-Communication</td><td>The following Internet and E-communication concepts are revised:
• Digital Safety
• Online Identity

The following Internet and E-communication concept are introduced:
• Digital Communication – Different methods of communication.

Example that can be used in class:
• Teacher discusses different forms of digital communication.</td></tr>
<tr><td>Week 3
(30 min)</td><td>The following Internet and E-communication concept are introduced:
• Continue with Digital Communication– Different methods of communication.

Example that can be used in class:
• Learners complete a work sheet with the basic examples of e-communication and they need to match their appropriate methods of communication.</td></tr>
<tr><td>Week 3
(30 min)</td><td>Algorithms and Coding</td><td>The following Algorithm and Coding Concepts have to be revised:
• Structure of a program.
• Sequences
• Block movements

The following Algorithm and Coding Concept are introduced:
• Introduce the Basic features of programming interface:
o Create a project
o Introduce and selecting character/agent or objects.
o Looks Block</td></tr>
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		○ Save a project ○ Close the Application Examples that can be used in class • Learners have to create a project where they have to: ○ Choose or insert a Character/Agent or object
Week 4 (1 hour)		The following Algorithm and Coding Concept are introduced: • Continue with the Basic features of the programming interface: ○ Create a project ○ Move blocks into the scripting area ○ Select a block category ○ Selecting character/agent or objects. ○ Looks Block ○ Use blocks in scripting area as buttons ○ Save a project ○ Close the Application • Continue with Sequences Examples that can be used in class • Learners have to create a project where they have to: ○ Choose or insert a Character/Agent or object ○ Change the look of their Character/ Agent or Object. ○ Make the Character/Agent or object move a minimum of 3 movements using a minimum of 3 blocks
Week 5 (1 hour)		The following Algorithm and Coding Concept are introduced: • Continue with Basic features of programming interface: ○ Create a project ○ Move blocks into the scripting area ○ Select a block category ○ Selecting character/agent or objects. ○ Looks Block ○ Use blocks in scripting area as buttons ○ Changing the size of the Characters/Agent or object. ○ Save a project ○ Close the Application • Continue with Sequences Examples that can be used in class • Learners have to create a project where they have to: ○ Choose or insert a Character/Agent or object ○ Change the look of their Character/ Agent or Object. ○ Change the size and colour of their Character/Agent or object ○ Make the Character/Agent or object move a minimum of 3 movements using a minimum of 3 blocks
Week 6 (1 hour)	Robotics Skills	The following Robotics Skills Concepts are introduced: • Mechanical Components: ○ Basic chassis, ○ Basic fasteners Examples that can be used in class: • Learners construct the body of a car made from recycled materials using basic fasteners.
Week 7 (1 hour)		The following Robotics Skills Concepts are introduced: • Mechanical Components: ○ axles ○ wheels • Continue with ○ basic chassis

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		○ basic fasteners Examples that can be used in class: • Learners construct the body of a car made from recycled materials. The car should consist of the following: ○ Body ○ 2 axles ○ 4 wheels
Week 8 (1 hour)	Application Skills	Concepts to be revised: • User interfaces on digital devices. The following Application Skills Concepts are introduced: • Using and identifying the following keys on a (Physical/virtual) keyboard: ○ Directional Keys (up, down, left and right) • Continue to refine hand and eye coordination through playing on a virtual/physical keyboard. Examples: • Play a game on a digital device that uses a keyboard (physical/virtual) to make sounds. • Learners play a game using Directional keys.
Week 9 (1 hour)		The following Application Skills Concepts are introduced: • Introduce pointing Devices. • Continue using the following keys on a (Physical/virtual) keyboard: ○ Directional Keys (up, down, left and right) • Continue to refine hand and eye coordination through playing on a virtual/physical keyboard. Examples: • Play a game on a digital device that uses a keyboard (physical/virtual) to make sounds. • Learners play a game using Directional keys and a pointing device.
Week 10 (1 hour)		The following Application Skills Concepts are introduced: • Continue with pointing Devices. • Continue using the following keys on a (Physical/virtual) keyboard: ○ Directional Keys (up, down, left and right) • Continue to refine hand and eye coordination through playing on a virtual/physical keyboard. Examples: • Play a game on a digital device that uses a keyboard (physical/virtual) to make sounds. • Learners play a game using Directional keys and a pointing device.

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GRADE 2: TERM 2

WEEK	TOPIC	CONTENT
Week 1 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns • Debugging in a sequence • Explain pattern sequences The following Concepts for Pattern Recognition and Problem Solving are introduced: • Introduce Algorithmic thinking • Continue Creating patterns • Continue Following instructions to make a pattern according to the sequence, pictures, shapes, colours, events in a story, keyboard characters, words and numbers. - Analyse the pattern - Discuss the pattern - Follow and complete a pattern - Create your own pattern - Debug a given pattern Examples that can be used in class: • Learners are presented with a broken bracelet and have to fix a bracelet by recognising the correct pattern from a provided set of patterns.
Week 2 (30 min)		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Algorithmic thinking • Continue Creating patterns • Continue Following instructions to make a pattern according to the sequence, pictures, shapes, colours, events in a story, keyboard characters, words and numbers. - Analyse the pattern - Discuss the pattern - Follow and complete a pattern - Create your own pattern - Debug a given pattern Examples that can be used in class: • Learners participate in an activity where the teacher gives instructions to learners to walk out a square. Teacher clarify the pattern (move forward, turn right) and further explains that if you repeat the pattern four times it will draw a square. Learners are requested to find the pattern in the instruction.
Week 2 (30 min)	Internet and E-Communication	The following Internet and E-communication concept are introduced: • Digital Communication –Text Example that can be used in class: • Unplugged/Plugged – Learners write a Mock email to a family member telling them about their day.
Week 3 (30 min)		The following Internet and E-communication concept are introduced: • Continue with Digital Communication –Text Example that can be used in class: • Learners can join an online chat platform and communicate with one another – their real identities remain hidden and learners should see if they can guess the identity of the person they are communicating with.

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<table>
<tr><td>Week 3
(30 min)</td><td rowspan="3">Algorithms and Coding</td><td>The following Concepts have to be revised:
Structure of a program.
Sequences
Block movements
The Basic features of programming interface.
Changing object sizes and colours.
The following Algorithm and Coding Concept are introduced:
Introduce new features of the interface:
Change Background of the project
Examples that can be used in class
Learners have to create a project where they have to:
Change the Background of the project.</td></tr>
<tr><td>Week 4
(1 hour)</td><td>The following Algorithm and Coding Concept are introduced:
Introduce new features of the interface:
event triggers (Begin and End Blocks)
Continue with features of the interface:
Change Background of the project
Examples that can be used in class
Learners have to create a project where they have to:
Make the Character/Agent or object move a minimum of 3 movements using a minimum of 3 blocks using event triggers and have a custom background.</td></tr>
<tr><td>Week 5
(1 hour)</td><td>The following Algorithm and Coding Concept are introduced:
Introduce that more than one sequence of programming can take place at once in a single program.
Introduce new features of the interface:
Change speed of Character/Agent or Object (Speed block)
Introduce more than one Character/Agent or Object.
Continue with event triggers.
Examples that can be used in class
Learners have to create a project where they have to:
Change the Background of the project.
Choose or insert a minimum of 3 Character/Agent or Objects.
Change the size and colour of their Characters/Agents or Objects.
Change the speed of the Characters/ Agents or Objects.
Make the Character/Agent or object move a minimum of 3 movements using a minimum of 3 blocks.</td></tr>
<tr><td>Week 6
(1 hour)</td><td>Robotics Skills</td><td>The following Robotics Skills Concepts are revised:
Mechanical Components:
Basic chassis,
axles
wheels.
Basic fasteners
The following Robotics Skills Concepts are introduced:
Propulsion through an elastic band and a Fan.
Examples that can be used in class:
Learners construct the body of a car made from recycled materials. The car should consist of the following:
Body
2 axles
4 wheels</td></tr>
</table>

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Week 7 (1 hour)		○ Basic fasteners The following Robotics Skills Concepts are introduced: • Continue with Propulsion through an elastic band and a Fan. Examples that can be used in class: • Learners modify car construction to add a fan driven by an elastic band.
Week 8 (1 hour)	Application Skills	Concepts to be revised: • User interfaces on digital devices. • Revise keyboard keys: ○ Directional Keys (up, down, left and right) The following Application Skills Concepts are introduced: • Introduction to a Text editor Application. • Using and identifying the following keys on a (Physical/virtual) keyboard: ○ Enter key ○ Space bar • Open a typing Application and interact with the Application. Examples: • Play a game on a digital device that uses a keyboard (physical/virtual) to make sounds. • Learners Play a game using directional and other additional keys.
Week 9 (1 hour)		The following Application Skills Concepts are introduced: • Continue using a typing Application and interact with the Application. • Using and identifying the following keys on a (Physical/virtual) keyboard: ○ Shift key ○ Backspace key • Continue using the following keys on a (Physical/virtual) keyboard: ○ Enter key ○ Space bar Examples: • Learners should open a typing application and retype words provided to them task in the application. • Learners Play a game using directional and other additional keys.
Week 10 (1 hour)		The following Application Skills Concepts are introduced: • Continue using a typing Application and interact with the Application. • Using and identifying the following keys on a (Physical/virtual) keyboard: ○ Delete key • Continue using the following keys on a (Physical/virtual) keyboard: ○ Enter key ○ Space bar ○ Shift key ○ Backspace key Examples: • Learners should open a typing application and retype words provided to them task in the application. • Learners Play a game using directional and other additional keys.

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GRADE 2: TERM 3

WEEK	TOPIC	CONTENT
Week 1 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns • Debugging in a sequence • Explain pattern sequences The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Algorithmic thinking • Creating number patterns • Continue Following instructions to make a pattern according to numbers. - Analyse the pattern - Discuss the pattern - Follow and complete a pattern - Create your own pattern - Debug a given pattern Examples that can be used in class: • Learners are provided with a worksheet consisting of number patterns and have to identify the missing number from the sequences. Number systems with multiples of 2,3,4,5 and 10 as base number can be used. e.g. 2,4, _, 8,10. • Learners create their own number patterns using different multiples of numbers 2 and 3.
Week 2 (30 min)		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Algorithmic thinking • Continue creating number patterns • Continue Following instructions to make a pattern according to numbers. - Analyse the pattern - Discuss the pattern - Follow and complete a pattern - Create your own pattern - Debug a given pattern Examples that can be used in class: • Learners create their own number patterns using different multiples of numbers 2,3,4,5 and 10.
Week 2 (30 min)	Internet and E-Communication	The following Internet and E-communication concept are introduced: • Digital Communication – Voice Example that can be used in class: • The Teacher explain the process on how to make a voice call to a family member.
Week 3 (30 min)		The following Internet and E-communication concept are introduced: • Continue with Digital Communication – Voice Example that can be used in class: • Learners explain the process on how to make a voice call to a family member.
Week 3 (30min)	Algorithms and Coding	The following Concepts have to be revised: • Structure of a program. • Sequences • Block movements • The features of programming interface. The following Algorithm and Coding Concept are introduced: • Introduce new features of the interface: o Pen Block

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		Examples that can be used in class • Learners create a project using a pen block.
Week 4 (1 hour)		The following Algorithm and Coding Concept are introduced: • Introduce new features of the interface: o Infinite Loop (Repeat forever block) o Speech bubbles o Delays (delay block) • Continue with the following features o Pen block Examples that can be used in class • Learners use the pen block to create a repeatable output pattern. • Learners create a pattern using an object with o pen block o infinite loop o delay o Speech bubble
Week 5 (1 hour)		The following Algorithm and Coding Concept are introduced: • Introduce new features of the interface: o Counter Control Loop (repeat Block) o Insert sound (sound block) • Continue with the following features o Pen block o Speech bubbles o Infinite Loop (Repeat forever block) o Delays (delay block) Examples that can be used in class • Learners create a pattern using an object with following features o counter loop o pen block o delay o speech bubble o sound
Week 6 (1 hour)	Robotics Skills	The following Robotics Skills Concepts are revised: • Mechanical Components: o Basic chassis, o axles o wheels o Basic fasteners The following Robotics Skills Concepts are introduced: • Continue with Propulsion through a Fan. Examples that can be used in class: • Learners make the chassis using recycled materials and basic fasteners.
Week 7 (1 hour)		The following Robotics Skills Concepts are introduced: • Continue with building a chassis. Examples that can be used in class: • The car should consist of the following: o Body o 2 axles o 4 wheels. o Basic fasteners

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<table>
<tr><td>Week 8
(1 hour)</td><td rowspan="3">Application Skills</td><td rowspan="3">Concepts to be revised:
• User interfaces on digital devices.
• Revise keyboard keys:
  ○ Directional Keys (up, down, left and right)
  ○ Enter key
  ○ Space bar
  ○ Delete key
  ○ Shift key
  ○ Backspace key

The following Application Skills Concepts are introduced:
• Continue typing on a text editor Application and interact with the Application.
• Using and identifying the following keys on a (Physical/virtual) keyboard:
  ○ Full stop
  ○ Question mark

Examples that can be used in class:
• Learners should open a typing application and copy sentences provided by the teacher containing full stops and questions marks.
• Learners start typing their own word banks with a minimum of 5 words.</td></tr>
<tr><td>Week 9
(1 hour)</td></tr>
<tr><td>Week 10
(1 hour)</td></tr>
</table>

The following Application Skills Concepts are introduced:
- Continue typing on a text editor Application and interact with the Application.
- Using and identifying the following keys on a (Physical/virtual) keyboard:
  - Exclamation mark
- Continue using the following keys:
  - Full stop
  - Question mark

Examples that can be used in class:
- Learners should open a typing application and copy sentences provided by the teacher containing full stops, questions marks and exclamations marks.
- Learners should be able to write a sentence with a minimum of 5 words.

The following Application Skills Concepts are introduced:
- Continue typing on a text editor Application and interact with the Application.
- Using and identifying the following keys on a (Physical/virtual) keyboard:
  - Comma
- Continue using the following keys:
  - Exclamation mark
  - Full stop
  - Question mark

Examples that can be used in class:
- Learners should open a typing application and copy sentences provided by the teacher containing:
  - full stops,
  - questions marks
  - exclamations marks.
  - and commas.
- Learners should be able to write a sentence with a minimum of 10 words using a comma.

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GRADE 2: TERM 4

WEEK	TOPIC	CONTENT
Week 1 (1 hour)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns • Debugging in a sequence • Explain pattern sequences The following Concepts for Pattern Recognition and Problem Solving are introduced: • Encode and Decode - 3 to 4 letter words in 5-word sentence. • Continue with Algorithmic thinking • Continue Following instructions to make a pattern using alphabet and numbers. - Analyse the pattern - Discuss the pattern - Follow and complete a pattern - Debug a given pattern Examples that can be used in class: • Learners are given a worksheet where they need to identify the corresponding alphabet letter and number. • Learners are provided worksheet where they need to decode a secret message.
Week 2 (30 min)		The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Encoding and Decoding - 3 to 4 letter words in 5-word sentence. • Continue with Algorithmic thinking • Continue Following instructions to make a pattern the alphabet and numbers. - Analyse the pattern - Discuss the pattern - Follow and complete a pattern - Debug a given pattern Examples that can be used in class: • Learners have to create their own secret message by encoding it with numbers.
Week 2 (30 min)	Internet and E-Communication	The following Internet and E-communication concept are introduced: • Digital Communication – Video Example that can be used in class: • Learners have to make a video as a class about the different forms of E-Communication.
Week 3 (30 min)		The following Internet and E-communication concept are introduced: • Continue with Digital Communication – Video Example that can be used in class: • Learners can make a tutorial video on how to make something giving step by step instructions.
Week 3 (30min)	Algorithms and Coding	The following Concepts have to be revised: • Counter Control Loop (repeat Block) • Infinite Loop (Repeat forever block) The following Algorithm and Coding Concept are introduced: • Creating multiple characters • Continue with the following features: o Customising characters Examples that can be used in class

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		• Learners have to create a project where they use the following features in their project:
		  ○ Two Characters/ Agents or Object.
		  ○ Customise their Characters/ Agents or objects.

Week 4 (1 hour)		The following Algorithm and Coding Concept are introduced:
		• Continue with the following features:
		  ○ Looping functions
		  ○ Event triggers
		
		Examples that can be used in class
		• Learners continue working with project from previous week, where they add the following features in their project:
		  ○ Looping functions
		  ○ Event triggers

Week 5 (1 hour)		The following Algorithm and Coding Concept are introduced:
		• Continue with the following features:
		  ○ Add sounds
		  ○ Change the Background.
		  ○ Pen block
		
		Examples that can be used in class
		• Learners continue working with project from previous week, where they add the following features in their project:
		  ○ Add sounds
		  ○ Change the Background.
		  ○ Pen block

Week 6 (1 hour)	Robotics Skills	The following Robotics Skills Concepts are revised: • Mechanical Components: • Electrical circuits and components • Propulsion through a Fan. The following Robotics Skills Concepts are introduced: • Electric fan using a basic circuit and using a Fan for propulsion. Examples that can be used in class: • Learners make the circuit to power a fan using a small dc motor, battery, wires and switch.
Week 7 (1 hour)		The following Robotics Skills Concepts are introduced: • Continue with Electric fan using a basic circuit and using a Fan for propulsion. Examples that can be used in class: • Learners modify car construction to add a fan driven by a small dc electric motor. The car body from Term3 should be used to add the Fan to the car.

Week 8 (1 hour)	Application Skills	Concepts to be revised:
		• User interfaces on digital devices.
		• Revise keyboard keys:
		  ○ Directional Keys (up, down, left and right)
		  ○ Enter key
		  ○ Space bar
		  ○ Delete key
		  ○ Shift key
		  ○ Backspace key
		  ○ Full stop
		  ○ Comma
		  ○ Question mark

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		○ Exclamation mark ○ Punctuation marks The following Application Skills Concepts are introduced: • Continue with a Text editor Application. • Introduce learners to a digital crossword puzzle with rows and columns. • Continue to refine hand and eye coordination through playing on a virtual/physical keyboard. Examples that can be used in class: • Play a game on a digital device that uses a keyboard (physical/virtual) to complete a digital crossword puzzle.
Week 9 (1 hour)		The following Application Skills Concepts are introduced: • Continue with a Text editor Application. • Using and identifying the following keys on a (Physical/virtual) keyboard: ○ Numeric Keys • Continue to refine hand and eye coordination through playing on a virtual/physical keyboard. Examples that can be used in class: • Learners should be able to type 3 full sentences, including numbers.
Week 10 (1 hour)		The following Application Skills Concepts are introduced: • Continue with a Text editor Application. • Cut, Copy and Paste • Continue using the following keys on a (Physical/virtual) keyboard: ○ Numeric Keys • Continue to refine hand and eye coordination through playing on a virtual/physical keyboard. Examples that can be used in class: • Learners' can Cut, Copy and Paste words or sentences including numbers in a text editor Application.

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3.2.4. GRADE 3: TERM 1

WEEK	TOPIC	CONTENT
Week 1 (2 hours)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns • Debugging in a sequence • Explain pattern sequences • Algorithmic thinking The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Encode and Decode from Grade 2. - 2 Sentences consisting of 7 -words. • Continue Following instructions to make a pattern the alphabet, numbers and symbols: - Analyse the pattern - Discuss the pattern - Follow and complete a pattern - Debug a given pattern Examples that can be used in class: • Learners are given a worksheet where they need to identify the corresponding alphabet letters, numbers and symbols. • Learners are provided worksheet where they need to decode a secret message. • Learners have to create their own secret message by encoding it with alphabet, numbers and symbols.
Week 2 (2 hours)	Algorithms and Coding	The following Concepts have to be revised: • Structure of a Program. • Create a project • Introduce and selecting character/agent or objects. • Save a project • Close the Application • Using Multiple Characters/ Agents or Objects. • Changing the size of the Characters/Agent or objects. The following Algorithm and Coding Concept are introduced: • Introduce basic coding terms. • Introduce the Basic features of programming interface: o Selecting Characters/Agents or objects. o Loading a program o Create a customised object • Introduction to Right Click to get information from a block. Examples that can be used in class • Learners have to create a project where they use the following features in their project: o Create their own Character/ Agent or Object. o Change the Background.
Week 3 (2 hours)		The following Algorithm and Coding Concept are introduced: • Continue with basic coding terms. • Continue with the Basic features of programming interface: o Motion (movement / turning) o Move blocks into the code area o Select a block category o Looks Block o Use blocks in scripting area as buttons • Continue with Sequences • Introduction to algorithms Examples that can be used in class • Learners have to create a project where they use the following features in their project:

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		○ Develop an algorithm to get a character/agent or object through a given maze. ○ Create their own Character/ Agent or Object. ○ Add code to their Character/ Agent or Object. • Move forward • Move back • Turn left • Turn right
Week 4 (2 hours)	Robotics Skills	The following Robotics Skills Concepts are revised: • Electrical circuits and components The following Robotics Skills Concepts are introduced: • Electric components: ○ Basic breadboard layout • How to connect components using a breadboard ○ Buzzer ○ Lightbulb ○ DC Motor Examples that can be used in class: • Learners build a basic circuit consisting of wires, battery and Buzzer/Lightbulb/ DC motor.
Week 5 (2 hours)		The following Robotics Skills Concepts are introduced: • Basic Structures • Joining techniques • Different 2D and 3D shapes. Examples that can be used in class: • Learners build primitive 2D and 3D shapes using recycled materials • 2D shapes – Triangle, Square, Rectangle • 3D shapes – Cube, Pyramid and Rectangular Prism.
Week 6 (2 hours)		The following Robotics Skills Concepts are revised: • Basic Structures • Different 2D and 3D shapes. The following Robotics Skills Concepts are introduced: • Continue with Basic Structures • Continue with Joining techniques • Strengthening techniques using primitive shapes (cross-bracing) Examples that can be used in class: • Learners build a structure such as a tower or a bridge using recycled materials and use primitive shapes to ensure that their structure is as rigid as possible. ○ The bridge must have a minimum span of 20cm and maximum span of 30cm. ○ Towers should have a minimum height of 20cm and maximum height of 30cm.
Week 7 (1 hour)		The following Robotics Skills Concepts are continued: • Basic Structures • Joining techniques • Strengthening techniques using primitive shapes (cross-bracing) Examples that can be used in class: • Learners present the structure they build to the class and answer questions from the teacher about their structure.

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Week 7 (1 hour)
 	
Week 8 (2 hours)
	Internet and E-communications	The following Internet and E-communication concepts are revised:
		• Offline and Online
		
		The following Internet and E-communication concepts are introduced:
		• Introduction to Computer networks.
		• Introduction to how a network works.
		• Introduction of the following network terminology:
		  ○ Sender
		  ○ Receiver
		  ○ Switch
		  ○ Cables
		
		Example that can be used in class:
		• Learners complete a worksheet where they identify different network components.
		
		Continue with the following concepts of Networking:
		  ○ Sender
		  ○ Receiver
		  ○ Switch
		  ○ Cables
		
		Example that can be used in class:
		• Learners learn about networks by looking at road networks where they have to identify the:
		  ○ Sender (point of departure)
		  ○ Cables (Road)
		  ○ Switch (Traffic Lights)
		  ○ Receiver (End Destination)
		• Learners write a simple set of instructions using a Text Editor to explain the path that a vehicle would need to take using the terms that are associated to networks.
		• Learners draw a simple network illustrating the Sender, Receiver, Switch and Cables

Week 9 (2 hours)
 	
Week 10 (2 hours)
	Application Skills	The following Application Skills concepts to be revised:
		• Crossword puzzle layout focusing on grid rows and columns.
		• User interfaces on digital devices.
		
		The following Application Skills Concepts are introduced:
		• What is a spread sheet?
		• Introduce learners to a spreadsheet Application.
		• Introduce the user interface for the spreadsheets Application
		• Cell references.
		• Create a file
		• Save a file
		• Close the spreadsheet Application.
		Examples to be used in class:
		• Learners should open a spreadsheet application, create a file, copy an example provided by the teacher, save a file and close the application.
		
		The following Application Skills Concepts are introduced:
		• Load a spreadsheet File
		• Rows and Columns in spreadsheets.
		The following Application Skills Concepts are continued:
		• Using the user interface for the spreadsheets Application and the following tools:
		  ○ Cell colours
		  ○ Font type and size.
		• Create a file
		• Save a file
		• Close the spreadsheet Application.

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		Examples to be used in class: • Learners should open a spreadsheet application, load a file, copy an example provided by the teacher, save a file and close the application. The examples that can be used are: o Learners are provided with an activity using cell references which leads them to decipher a message while exploring the layout of row and columns in a grid. o Learners draw the South African flag, a robot or any picture provided by colouring the cells on a spreadsheet.

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GRADE 3: TERM 2

WEEK	TOPIC	CONTENT
Week 1 (2 hours)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns • Algorithmic thinking The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Algorithmic Thinking. o Read, understand and explain the problem. o Devise a plan o Implement the plan o Reflect - Did it work Examples that can be used in class: • Learners are given a worksheet where they have to solve an algorithm given is symbolic language. The problem should consist of the following requirements: - 4 directional symbols - 1 action symbol - a 4 x 4 grid - a set of instruction with a minimum of 9 steps.
Week 2 (2 hours)	Algorithms and Coding	The following Concepts have to be revised: • Using Multiple Characters / Agents or Objects • Changing the size of the Characters/Agent or objects • Basic features of programming interface • Motion (positive integer movement / turning) • Creating a custom object. • Algorithms The following Algorithm and Coding Concept are introduced: • Repeat and repeat forever block • Creating a custom object • Use the switch/next costume block Examples that can be used in class • Create a character with multiple costumes. Use the costumes of characters / agents / objects and add code give the illusion of animation when moving.
Week 3 (2 hours)		The following Algorithm and Coding Concept are introduced: • Continue with Repeat and repeat forever block • Pen block / stamp block Examples that can be used in class • Learners have to create a project where they use the following features in their project: o Create their own Character/ Agent or Object. o Add code to their Character/ Agent or Object. o Develop an algorithm to get a character/agent or object to draw repeatable shapes using loops. • Learners create their own algorithm to create an object and use repetition and stamps to create patterns.
Week 4 (2 hours)	Robotics Skills	The following Robotics Skills Concepts are revised: • Electrical circuits and components The following Robotics Skills Concepts are introduced: • Electric components: o Continue with Basic breadboard layout • How to connect components using a breadboard o LED o Resistor

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		○ Switch Examples that can be used in class: • Learners build a basic circuit consisting of a switch, wires, battery and Buzzer/Lightbulb/ DC motor/ LED & Resistor.
Week 5 (2 hours)		The following Robotics Skills Concepts are revised: • Electrical circuits and components The following Robotics Skills Concepts are introduced: • Mechanical systems: ○ Basic Pulleys ○ Basic Linkages Examples that can be used in class: • Learners build basic pulley system using 2 pulleys. • Learners build a basic linkage system using 2 links.
Week 6 (2 hours)		The following Robotics Skills Concepts are revised: • Joining techniques • Pulleys and Linkages The following Robotics Skills Concepts are introduced: • Structure that uses pulleys and/or linkages Examples that can be used in class: • Learners add a pulley or linkage system to the structure made in Term1. • The Pulley system should have a minimum of 2 pulleys. • The linkages system should have a minimum of 2 links. *Add the linkages or pulley system to the structures built in Term1.*
Week 7 (1 hour)		The following Robotics Skills Concepts are introduced: • Continue with structure that uses pulleys and/or linkages Examples that can be used in class: • Learners present the structure they build to the class and answer questions from the teacher about their structure.
Week 7 (1 hour)	Internet and E-communication	The following Internet and E-communication concepts are revised: • Computer networks. • Introduction of the following network terminology: ○ Sender ○ Receiver ○ Switch ○ Cables
Week 8 (2 hours)		The following Internet and E-communication concepts are introduced: • Introduction to Computer Network Hardware Components. ○ Connector ports ○ Cables ○ Modem ○ Router ○ Switch Example that can be used in class: • Learners complete a worksheet where they identify different network components. The following Internet and E-communication concepts are introduced: • Continue with Computer Network Hardware Components. ○ Connector ports

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		○ Cables ○ Modem ○ Router ○ Switch • Introduction to Wired and Wireless networks. Example that can be used in class: • Learners play the Network Game where the play the role of different hardware components. • Learners can explain how people communicate through smart devices/computers over a long distance.
Week 9 (2 hours)	Application Skills	Concepts to be revised: • Grid layout with Rows and Columns • User interfaces of the spreadsheet Application. • Creating, Loading and Saving a file. • Cell references. The following Application Skills Concepts are introduced: • Introduction to Data Capture on grids: ○ Headings for grid ○ Numbering of Items in a list ○ Lists • Continue working on the spreadsheets Application. Examples: • Learners should open a spreadsheet application and do the following: ○ create a file, ○ copy a list provided by the Teacher ○ save a file and ○ close the application.
Week 10 (2 hours)		The following Application Skills Concepts are continued: • Data Capture on grids. • How the present directions and positions using a grid • working on the spreadsheets Application. Examples: • Learners should open a spreadsheet application and do the following: ○ create a file, ○ create their own list ○ save a file and ○ close the application.

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GRADE 3: TERM 3

WEEK	TOPIC	CONTENT
Week 1 (2 hours)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Debugging • Identify different Patterns • Algorithmic thinking The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Algorithmic Thinking. o Read, understand and explain the problem. o Devise a plan o Implement the plan o Reflect - Did it work • Continue with Debugging Examples that can be used in class: • Learners are presented with three grid patterns and the sequence of symbols required to recreate the given patterns. Learners must identify the errors within the symbol code sequence. The worksheet should consist of the following requirements: - 3 4x4 grid patterns - 4 directional symbols - 1 action symbol
Week 2 (2 hours)	Algorithms and Coding	The following Concepts have to be revised: • Using Multiple Characters / Agents or Objects • Motion (positive integer movement / turning) • Creating a custom object. • Algorithms • Repeat and repeat forever block • Pen block / stamp block • Costume creation following Algorithm and Coding Concept are introduced: • Event-driven programming - Sensory triggers Examples that can be used in class • Learners have to create a project where they use the following features in their project: o Create their own Character/ Agent or Object. o Develop an algorithm to get a character/agent or object to perform movement on event triggers (sensory triggers).
Week 3 (2 hours)		The following Algorithm and Coding Concept are introduced: • Continue with Event-driven programming -Sensory triggers • Introduce Event-driven programming – Keyboard/Mouse triggers Examples that can be used in class • Learners have to create a project where they use the following features in their project: o Create their own Character/ Agent or Object. o Develop an algorithm to get a character/agent or object to perform movement on event triggers (keyboard/mouse triggers).
Week 4 (2 hours)	Robotics Skills	The following Robotics Skills Concepts are revised: • Electrical circuits and components The following Robotics Skills Concepts are introduced: • Electric components: o Continue with Basic breadboard layout • Series and Parallel circuits

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		Examples that can be used in class: • Learners build a basic circuit consisting of a switch, wires, single 1.5v battery and a Lightbulb. • A series circuit using 2 and 3 light bulbs. • A parallel circuit using 2 and 3 light bulbs.

Week 5 (2 hours)		The following Robotics Skills Concepts are revised:
		• Basic breadboard layout
		• DC motors
		
		The following Robotics Skills Concepts are introduced:
		• Electrical Components:
		  ○ polarity change on a dc motor.
		• Mechanical systems:
		  ○ Introduce Gears
		
		Examples that can be used in class:
		• Learners build a basic Electric Fan consisting of a switch, wires, single 1.5v battery, DC motor and Plastic / Cardboard Fan.
		• The Fan should be driven using a minimum of 2 gears.

Week 6 (2 hours)		The following Robotics Skills Concepts are revised:
		• Electrical Components:
		  ○ polarity change on a dc motor.
		• Mechanical systems:
		  ○ Introduce Gears
		
		The following Robotics Skills Concepts are introduced:
		• Continue with structure that uses gears and Electric Fans
		Examples that can be used in class:
		• Learners add an electric Fan and gear system to the structure made in Term1.
		• The Gear system should have a minimum of 2 gears.
		Add gears and an electric Fan system to the structures built in Term1.

Week 7 (1 hour)		The following Robotics Skills Concepts are introduced: • Continue with structure that uses gears and Electric Fans Examples that can be used in class: • Learners present the structure they build to the class and answer questions from the teacher about their structure.
Week 7 (1 hour)	Internet and E-communication	The following Internet and E-communication concepts are introduced: • What is the internet • How does the internet work? Example that can be used in class: • Learners complete a worksheet focused on showing how e-communications is connected using the internet. The worksheet could include diagrams or illustrations on how the communication works. • Learners make a poster on different ways to connect to the internet.

Week 8 (2 hours)		The following Internet and E-communication concepts are introduced:
		• What is a Website?
		• Example of websites
		• Online Safety
		  ○ protecting your personal details
		  ○ be careful of strangers

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		Example that can be used in class: • Learners complete a worksheet of a list of websites they can use to find information. • Learners are shown a series of websites and they must identify their favourite websites and state why they like them. • Learners create a poster about online safety.
Week 9 (2 hours)	Application Skills	Concepts to be revised: • Rows and Columns. • Grids and Data Capture • Creating, loading and Saving a file. • Creating Lists The following Application Skills Concepts are introduced: • Introduction to converting Pictogram data on a Grid. • Continue working on the spreadsheets Application. Examples: • Learners create a file to capture the number of items/objects on a Pictogram provided by the Teacher and capture the numbers on a table. • Learners complete their own Pictogram and transfer the number of items to table in a Spreadsheet Application.
Week 10 (2 hours	Application Skills	The following Application Skills Concepts are introduced: • Introduction to display data in grid using a bar graph. • Continue working on the spreadsheets Application. Examples: • Learners use the data provided in a table (based on a Pictogram) to draw a Bar Graph to represent the data.

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GRADE 3: TERM 4

WEEK	TOPIC	CONTENT
Week 1 (2 hours)	Pattern Recognition and Problem Solving	The following Concepts for Pattern Recognition and Problem Solving are revised: • Identify different Patterns • Algorithmic thinking The following Concepts for Pattern Recognition and Problem Solving are introduced: • Continue with Algorithmic Thinking. o Read, understand and explain the problem. o Devise a plan o Implement the plan o Reflect - Did it work Examples that can be used in class: • Learners are presented with various patterns on a 4x4 grid. Learners will need to provide the correct coding sequence to draw the given patterns. The worksheet should consist of the following requirements: - 3 4x4 grid patterns - 4 directional symbol keys - 1 action symbol • Learners must count the number of symbols used in their solution and discuss amongst peers to find the optimal solution.
Week 2 (2 hours)	Algorithms and Coding	The following Concepts have to be revised: • Using Multiple Characters / Agents or Objects • Motion (movement / turning) • Algorithms • Repeat and repeat forever block • Event-triggers (keyboard/mouse triggers) The following Algorithm and Coding Concept are introduced: • Introduction to event triggers - Broadcasting Examples that can be used in class • Learners have to create a project where they use the following features in their project: o Create their own Character/ Agent or Object. o Develop an algorithm to get a character/agent or object to perform movement on event triggers (broadcasting)
Week 3 (2 hours)		The following Algorithm and Coding Concept are introduced: • Sounds • Continue with event triggers - Broadcasting Examples that can be used in class • Learners have to create a project where they use the following features in their project: o Create their own Character/ Agent or Object. o Add code to their Character/ Agent or Object. o Develop an algorithm to get a character/agent or object to perform movement on event triggers. • Learners need to complete a project where they develop, design, plan and program interactive story or game. The project must include: o an algorithm o A minimum of three Characters/ Agents or Objects o two backgrounds o Costume creation o Repeat loops

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		○ Wait and say blocks ○ Move blocks ○ events
Week 4 (2 hours)	Robotics Skills	The following Robotics Skills Concepts are revised: • Electrical circuits and components • Mechanical Systems ○ Pulleys, Gears and Linkages Teachers must provide learners with a project consisting of the following components: • a structure • a minimum of two DC motors • at least one pulley, gear pair or linkages • a mechanism for sound The following Robotics Skills Concepts are introduced: • Continue with Structures Examples that can be used in class • Complete the structure
Week 5 (2 hours)		The following Robotics Skills Concepts are introduced: • Continue with Mechanical systems Examples that can be used in class • Add mechanical system to the existing structure ○ Gears (minimum 2 gears) ○ Pulleys (minimum 2 pulleys) ○ Linkages (minimum 2 linkages)
Week 6 (2 hours)		The following Robotics Skills Concepts are introduced: • Continue with electrical systems Examples that can be used in class • Add the electrical components to the existing structure
Week 7 (1 hour)		The following Robotics Skills Concepts are introduced: • Continue with structures, mechanical and electrical systems Examples that can be used in class: • Learners present the structure they build to the class and answer questions from the teacher about their structure.
Week 7 (1 hour)	Internet and E-communications	The following Internet and E-communication concepts are revised: • What is a Websites • Example of websites • Online Safety **All access to the internet needs to be through child friendly sites and browsers.** The following Internet and E-communication concepts are introduced:

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Week 8 (2 hours)		• Introduction to using a search engine
		
		Examples that can be used in class:
		• Learners complete a worksheet where they need to identify the different search engine tools:
		  ○ search bar
		  ○ image tab
		  ○ video tab
		  ○ safe website symbol.
		
		The following Internet and E-communication concepts are introduced:
		• Continue using a search engine
		• Introduction to basic browsing and searching techniques.
		  ○ Finding an Image.
		  ○ Finding a video.
		
		Examples that can be used in class:
		• Learners are given a worksheet containing a list of topics (a minimum of 5 topics) and they need to find images using a search engine on the topics.
		• Learners are given a worksheet containing a topic and they need to find a video using a search engine.

Week 9 (2 hours)	Application Skills	The following Application Skills concepts to be revised: • Grids and Data Capture • Converting Pictograms to Grid • Display data on a bar graph The following Application Skills Concepts are introduced: • Continue working on the spreadsheets Application. Examples: • Learners create a file to capture the number of objects on a grid and create a cell-based bar graph showing number of units for each object.
Week 10 (2 hours)		The following Application Skills Concepts are introduced: • Introduction Copying and pasting a grid and Bar Graph into a Text Editor. • Continue working on a Text Editor Application. The following Application Skills Concepts are continued: • Working on the spreadsheets Application. Examples: • Learners create a File in a Text Editor and explain their data in 5 Sentences, using a Grid and a Bar Graph. Learner need to copy and paste data from the spread sheet application and insert it into the text editor application.

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SECTION 4: ASSESSMENT IN CODING AND ROBOTICS

4.1 Introduction

Assessment is a continuous planned process of identifying, gathering and interpreting information about the performance of learners, using various forms of assessment.

It involves four steps:

- generating and collecting evidence of achievement;
- evaluating this evidence;
- recording the findings and
- using this information to understand and thereby assist the learner's development to improve the process of learning and teaching.

4.2 Informal (Assessment for Learning) and formal (Assessment of Learning)

Assessment should be both informal (Assessment for Learning) and formal (Assessment of Learning). In both cases, regular feedback should be provided to learners to enhance the learning experience.

In Coding and Robotics, throughout the Foundation Phase, the emphasis in assessment is on observing learners in an ongoing and planned way, during their daily routine, structured and free play activities. This means that learners in the Foundation Phase are assessed through discussion, role-play, interview, oral, presentation, collaboration and demonstration.

Coding and Robotics gives learners an opportunity to explore their Technological and Digital world and begin to understand it. The purpose of assessment of Coding and Robotics throughout the Foundation Phase is to assess the development of knowledge, skills and values that will help to prepare them for more formal assessment during the Intermediate Phase.

Across all five Coding and Robotics Strands, the purpose of assessment is to support and encourage the learners, and to assess the learners' holistic development. We know that learners develop knowledge, skills and values by observing their participation and engagement in activities related to those concepts.

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Informal assessment of Coding and Robotics throughout the Foundation Phase is conducted on an ongoing basis. One good way to do this is to keep an observation book. Anything observed of interest or of concern should be noted in the observation book, and followed up each day. These notes should also be included in planning and preparation for remedial purposes, and can also include future assessments. The forms of assessment should be age and development level appropriate. The design of the tasks should cover the content of the subject and include a variety of tasks designed to achieve the objectives of that specific subject.

Assessments can be conducted individually, in small or large teams during free play and as part of structured activities. Checklists and rubrics may be used to record assessments. Assessments (formal and informal) will enable the teacher to track and monitor the learner's progress throughout the term.

4.3 Programme of Assessment

Assessment in Coding and Robotics in the Foundation Phase is largely informal, and is ongoing.

Learners to be formally assessed each term. The results should formally be recorded.

4.4 Inclusion

The Screening, Identification, Assessment and Support (SIAS) provides a policy framework for the standardisation of the procedures to identify, assess and provide programmes for all learners requiring support to enhance their participation and inclusion in schools. Planning assessment for Intermediate Phase learners requires teachers to be sensitive to learners experiencing barriers to learning that may prevent them from performing at their best.

Learners experiencing barriers to learning must be provided with differentiated opportunities of assessment. These learning barriers may be "contextual", "systemic", "individual", and "pedagogic". They will have had different educational experiences up to that point, and acquired different skills. The teacher needs to identify each learner's needs through formal and informal assessment. It may be necessary to allow some learners to catch up and other learners to do extension activities. Based on on-going assessment, the teacher is expected to accommodate all learners in programmes of learning and assess that.

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Like all teaching and learning, assessment needs to be inclusive in its approach to assessing learners' performance. Inclusivity is a central principle of the NCS (White Paper 6), so it is critical that alternative forms of assessment are planned around the different needs and learning styles displayed by learners.

4.5 Recording and Reporting

Recording is a process in which the teacher documents the level of a learner's performance and progress towards the achievement of the knowledge as prescribed in the Curriculum and Assessment Policy Statements. Records of learner performance should provide evidence of the learner's progression within a grade and her /his readiness to progress to the next grade.

Reporting is a process of communicating learner performance to learners, parents, schools, and other stakeholders. Learner performance can be reported in several ways, including report cards, parents' meetings, school visitation days, parent-teacher conferences, phone calls, letters, class or school newsletters, etc.

Codes and Percentages for Recording and Reporting

Rating code	Description of competence	Percentage
7	Outstanding achievement	80 - 100
6	Meritorious achievement	70 - 79
5	Substantial achievement	60 - 69
4	Adequate achievement	50 - 59
3	Moderate achievement	40 - 49
2	Elementary achievement	30 - 39
1	Not achieved	0 - 29

Note: The seven-point scale should have clear descriptors that give detailed information for each level.

Teachers will record actual marks against the task by using a record sheet; and report percentages against the subject on the learners' report cards.

Assessments are recorded and reported to parents. It is not necessary to keep a formal record of all learner's work. It is useful, however, to keep some work that can show progress over time. Teachers can give learners a choice ofkeeping work that gives a good indication of the

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learner's abilities at a particular time. These can be kept in files, and displayed during parent interviews and evenings. Otherwise, learners' work should be displayed in the classroom. At certain points learners, can take their work home after it has been evaluated so that the classroom does not become cluttered.

Record Keeping

Learner evidence can include;

- class workbooks,
- worksheets,
- posters,
- projects,
- for items, such as practical demonstrations,
- presentations and
- models, etc.

It is important that teachers should record comments in the observation book or assessment record sheets. This collection of evidence, together with other assessment tools such as checklists, observation sheets, etc., will enable the teacher to track and report systematically to the relevant stakeholders on the learner's progress and achievement throughout the year. The collection of learner evidence should be accessible to the relevant stakeholders (School Management Team, parents, guardians, Education Support Services).

All teachers are expected to keep a Portfolio of Evidence. The portfolio may be a file, folder or any other storage system that the school has agreed on. Items that should be kept in the teacher's portfolio are:

- Assessment activities and memoranda
- Programme of Assessment;
- Assessment recording sheets;
- Assessment Tools (checklists, observation sheets, rubrics, etc.)

Assessment Record Sheet

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Teachers' records of learner progress should be kept either electronically (on a computer) or in files, books or folders or any other form the school has agreed on. These record sheets should have the following information.

- Annual Teaching Plans
- Grade and class
- Learners' names
- Date of assessment task
- The form of assessment and short description of the assessment task
- The final rating that has been awarded to the learner

Comments for support purposes when and where appropriate. The final or overall rating which is awarded to a learner for Coding and Robotics should give a holistic picture of the learner's achievement. The final rating is based on all the formal assessment tasks that the learner has been assessed on in a term. Other relevant factors (like the development of the learner over time) should also be considered.

Reporting in Foundation Phase: Grade R to 3

Teachers and the school need to be accountable to learners, parents, the education system and the wider community. Being accountable means that schools are required to give feedback to parents on their children's progress and performance using a formal reporting instrument such as a report card. Report cards should be sent to parents and guardians once a term.

In addition to the report cards, schools are expected to use other reporting mechanisms such as:

- parents' meetings
- school visitation days
- parent-teacher conferences
- phone calls
- letters
- school newsletters

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Different platforms including digital platforms can be used to report to parents and guardians on a regular basis. This will allow parents/ guardians to remain involved and participate in their children's education.

4.6 General

This document should be read in conjunction with:

4.10.1 National policy pertaining to the programme and promotion requirements of the National Curriculum Statement Grades R-12; and

4.10.2 National Protocol for Assessment Grades R-12,

4.10.3 White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (2001),

4.10.4 Guidelines for Responding to Diversity in the Classroom through the Curriculum and Assessment Policy Statements (2011),

4.10.5 Guidelines to Ensure Quality Education and Support in Special Schools and Special School Resource Centres (2013),

4.10.6 Policy on Screening, Identification, Assessment and Support (2014),

4.10.7 Guidelines for Full-service/Inclusive Schools (2010), and

4.10.8 Standard Operating Procedures for Assessment of Learners Who Experience Barriers to Assessment (2016).

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GLOSSARY:

APPLICATION SKILLS

CONCEPTS	DEFINITIONS
Application	An application, or application program, is a software program that runs on your computer. Web browsers, e-mail programs, word processors, games, and utilities are all applications
Column	On a display screen in character mode, a column is a vertical line of characters extending from the top to the bottom of the screen
Computing device	A computer is a. device for working with information. The information can be numbers, words, pictures, movies, or sounds
Desktop	Desktop personal computers, or pcs, are used for tasks at the office, at school, and at home
Difference	Differing from all others; not the same
Digitally compile	To gather together: to compile data digitally
Graphics	A picture, map, or graph used for illustration
Graphics editing application	A program or collection of programs that enable a person to manipulate images or models visually on a computer
Grid/matrix	Rectangular grids, or sheets, that are made up of columns, rows, and cells
Keyboard	A computer keyboard is an input device that allows a person to enter letters, numbers, and other symbols (these are called characters) into a computer.
Programs	A set of step-by-step instructions that tell a computer to do something with data
Row	A series of persons or things arranged in a usually straight line Especially: a horizontal arrangement of items
Sequence	A continuous or connected series
Similarities	When something is the same
User interface (UI)	A program that controls a display for the user (usually on a computer monitor) and that allows the user to interact with the system
Word processing	The means by which information is transformed into a typed or printed page is called word processing. Word processing involves the use of computers, software, and printers to get data into printed form

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CODING AND ROBOTICS

CONCEPT	DEFINITION
Algorithms	A process or set of rules to be followed in calculations or other problem-solving operations, especially by a computer.
Computational abstraction	Once we have recognised patterns in our problems, we use abstraction to gather the general characteristics and to filter out of the details we do not need in order to solve our problem.
Copyright	Copyright is the exclusive right given to the creator of a creative work to reproduce the work, usually for a limited time.
Cyber bullying	Cyberbullying is bullying that takes place over digital devices like cell phones, computers, and tablets. Cyberbullying can occur through SMS, Text, and apps, or online in social media, forums, or gaming where people can view, participate in, or share content. Cyberbullying includes sending, posting, or sharing negative, harmful, false, or mean content about someone else.
Debug	The process of identifying and removing errors from computer hardware or software.
Design principles	Design Principles are fundamental points of advice for making easy-to-use, pleasurable designs as we select, create and organize elements and features in our work.
Digital citizenship	Digital citizenship refers to the responsible use of technology by anyone who uses computers, the Internet, and digital devices to engage with society on any level.
E-communication	E-communication, or electronic communication, refers to the transfer of writing, signals, data, sounds, images, signs or intelligence sent via an electronic device. Some examples of e-communication are email, text messages, social media messaging and image sharing.
Ethical	Relating to moral principles or the branch of knowledge dealing with these.
GUI	Graphical User Interface - A GUI (graphical user interface) is a system of interactive visual components for computer software. A GUI displays objects that convey information and represent actions that can be taken by the user. The objects change colour, size, or visibility when the user interacts with them.
Screen time	Time spent using a device such as a computer, television, or games console.
Sprite/ character	Blocks are puzzle-piece shapes that are used to create code. The blocks connect to each other vertically like a jigsaw puzzle, where each data type has its own shape and a specially shaped slot for it to be inserted into, which prevents syntax errors. Series of connected blocks are called scripts. A few category of blocks: Motion, Looks, Sound, Event, Control, Sensing, Operators, Variables, List, and My Blocks. The list blocks are shown under the Variables Blocks.

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

Acronyms and Abbreviations	Meanings
FOSS	Free Open Source Software
GETC	General Education and Training Certificate
GETC:TO	General Education and Training Certificate: Technical Occupational
GETC:TV	General Education and Training Certificate: Technical Vocational
GUI	Graphical User Interface
I/O	Input-Output
ICT	Information and Communication Technology
IDMEC	Investigation, Design, Make, Evaluate, Communicate
IP	Internet Protocol
IPO	Input-Processing-Output
OHS	Occupational Health and Safety
PAT	Practical Assessment Task
PoA	Programme of Assessment
PoE	Portfolio of Evidence
RAM	Random Access Memory
ROM	Read-Only Memory
SBA	School Based Assessment
SSD	Solid State Hard drive
URL	Uniform Resource Locater
USB	Universal Serial Bus
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
WAN	Wide Area Network
Wi-Fi	Wireless Fidelity
WWW	World Wide Web

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