REPUBLIC OF KENYA

MINISTRY OF EDUCATION

JUNIOR SECONDARY SCHOOL CURRICULUM DESIGN

COMPUTER SCIENCE
FOR LEARNERS WITH VISUAL IMPAIRMENT

GRADE 7

KENYA INSTITUTE OF CURRICULUM DEVELOPMENT

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FOREWORD

Curriculum is a tool, which a country employs to empower its citizens. The Kenya Institute of Curriculum Development in meeting its core mandate *'to develop curriculum and curriculum support materials'* has spearheaded curriculum reforms in the education sector. The reforms are based on rigorous research, monitoring and evaluation activities conducted on the 8-4-4 system of education to inform the Competency-Based Curriculum through a phase-in phase-out model. The reforms were informed by the Summative Evaluation Survey (2009), Needs Assessment Study (2016) and the Task Force Report on Re-alignment of Education Sector (2012), 21st century learning and approaches, the East Africa Protocol on harmonisation of education, among many others.

The curriculum reforms aim at meeting the needs of the Kenyan society by aligning the curriculum to the Constitution of Kenya 2010, the Kenya Vision 2030 and the East African Protocol, among other policy requirements as documented by the Sessional Paper No. 1 of 2019 on 'Reforming Education and Training in Kenya for Sustainable Development'. The reforms adopted the Competency-Based Curriculum (CBC) to achieve development of requisite knowledge, skills, values and attitudes that will drive the country's future generations as documented by the Basic Education Curriculum Framework (BECF). Towards achieving the mission of the Basic Education, the Ministry of Education has successfully and progressively rolled out curriculum implementation for Early Years Education and Foundation level, Grades 4, 5 and Intermediate Level. The roll out for Grade 6, Junior Secondary (Grade 7-9), and Prevocational Level will subsequently follow.

It is my hope that the curriculum designs for learners with Visual Impairment in Grade 7 will guide the teachers, among other educational stakeholders, for progressive achievement of the curriculum vision, which seeks to have engaged, empowered and ethical citizens.

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PREFACE

The Government of Kenya embarked on the national implementation of the Competency Based Curriculum in January, 2019 for Early Years Education (Pre-Primary 1 and 2, and Lower Primary Grade 1, 2 and 3). The implementation progressed to Upper Primary (Grade 4, 5 and 6) based on the reorganisation of the Basic Education structure. Grade 7 curriculum furthers implementation of the Competency-Based Curriculum to Junior Secondary education level. This level marks the zenith of Middle School education whose main feature is to offer a broad opportunity for the learner to explore talents, interests and abilities before selection of pathways and tracks in Senior Secondary education level.

The Grade 7 curriculum designs for the respective learning areas will enable the development of 21st Century competencies. Ultimately, this will lead to the realisation of the vision and mission of the Competency-Based Curriculum as documented in the Basic Education Curriculum Framework (KICD, 2017).

It is my hope that all Government agencies among other stakeholders in education will use the designs to guide effective and efficient implementation of the learning activities as well as provide relevant feedback on various aspects of the curriculum. Successful implementation of the Grade 7 curriculum will be a significant milestone towards realisation of the curriculum mission 'Nurturing Every Learner's Potential'.

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ACKNOWLEDGEMENT

The Kenya Institute of Curriculum Development (KICD) Act Number 4 of 2013 (Revised 2019) mandates the Institute to develop curricula and curriculum support materials for basic and tertiary education and training, below the university. The curriculum development process for any level involves thorough research, international benchmarking, and robust stakeholder engagement. Through this systematic and consultative process, KICD conceptualised the Competency Based Curriculum (CBC) as captured in the Basic Education Curriculum Framework (BECF). The CBC responds to the demands of the 21st Century and the aspirations captured in the Constitution of Kenya 2010, Kenya Vision 2030, East African Commission Protocol and the United Nations Sustainable Development Goals.

The Kenya Institute of Curriculum Development has developed and adapted the Grade 7 curriculum designs for learners with Visual Impairment taking cognizance of the tenets of the CBC, key among them being the need to ensure that learners are provided with learning experiences that call for higher order thinking, thereby ensuring they become engaged, empowered and ethical citizens as articulated in the BECF Vision. The Grade 7 designs for learners with Visual Impairment also provide opportunities for learners to develop the core competencies as well as engage in Community Service Learning. The designs present assessment rubric linked to sub strands in the individual subjects. Teachers are encouraged to use varied assessment tools when assessing learners.

KICD obtains its funding from the Government of Kenya to enable the achievement of its mandate and implementation of the Government and Sector (Ministry of Education (MoE) plans. The Institute also receives support from development partners targeting specific programmes. The Grade 7 curriculum designs have been developed and adapted with the support of the World Bank through the Kenya Secondary Education Quality Improvement Program (SEQIP) commissioned by the MoE. The Institute is grateful for the support accorded to the process by the Government of Kenya, through the MoE and the development partners for the policy, resource, and logistical support.

I acknowledge the KICD curriculum developers and other staff, teachers and all the educators who participated, as panelists, in the development and adaption of the designs. I also appreciate the contribution of the Semi-Autonomous Government Agencies (SAGAs) and representatives of various stakeholders for their various roles in the development and adaptation of the Grade 7 curriculum designs.

My special thanks to the Cabinet Secretary, Ministry of Education; the Principal Secretary State Department of Early Learning and Basic Education; the Secretary, Teachers' Service Commission (TSC) and the Chief Executive Officer, Kenya National Examinations Council (KNEC) for their support in the process. Finally, I am grateful to the KICD Governing Council for their consistent guidance during the development and adaptation of the curriculum designs. The Institute assures all curriculum implementers, parents, and other stakeholders that the designs will ensure effective implementation of the CBC at Grade 7.

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TIME ALLOCATION

	Subject	**Number of Lessons Per Week (40 minutes per lesson)**
1.	English	5
2.	Kiswahili/KSL	4
3.	Mathematics	5
4.	Integrated Science	4
5.	Health Education	2
6.	Pre-Technical Studies	4
7.	Social Studies	3
8.	Religious Education (CRE/IRE/HRE)	3
9.	Business Studies	3
10.	Agriculture	3
11.	Life Skills Education	1
12.	Physical Education and Sports	2
13.	Optional Subject including Braille skills	3
14.	Optional Subject	3
	Total	**45**

NATIONAL GOALS OF EDUCATION

Education in Kenya should:

i) **Foster nationalism and patriotism and promote national unity.**

Kenya's people belong to different communities, races and religions, but these differences need not divide them. They must be able to live and interact as Kenyans. It is a paramount duty of education to help young people acquire this sense of nationhood by removing conflicts and promoting positive attitudes of mutual respect, which enable them to live together in harmony and foster patriotism in order to make a positive contribution to the life of the nation.

ii) **Promote the social, economic, technological and industrial needs for national development.**

Education should prepare the youth of the country to play an effective and productive role in the life of the nation.

a) Social Needs

Education in Kenya must prepare children for changes in attitudes and relationships, which are necessary for the smooth progress of a rapidly developing modern economy. There is bound to be a silent social revolution following in the wake of rapid modernization. Education should assist our youth to adapt to this change.

b) Economic Needs

Education in Kenya should produce citizens with the skills, knowledge, expertise and personal qualities that are required to support a growing economy. Kenya is building up a modern and independent economy, which is in need of an adequate and relevant domestic workforce.

c) Technological and Industrial Needs

Education in Kenya should provide learners with the necessary skills and attitudes for industrial development. Kenya recognizes the rapid industrial and technological changes taking place, especially in the developed world. We can only be part of this development if our education system is deliberately focused on the knowledge, skills and attitudes that will prepare our young people for these changing global trends

iii) **Promote individual development and self-fulfilment**

Education should provide opportunities for the fullest development of individual talents and personality. It should help children to develop their potential interests and abilities. A vital aspect of individual development is the building of character.

iv) **Promote sound moral and religious values.**

Education should provide for the development of knowledge, skills and attitudes that will enhance the acquisition of sound moral values and help children to grow up into self-disciplined, self-reliant and integrated citizens.

v) **Promote social equality and responsibility.**
Education should promote social equality and foster a sense of social responsibility within an education system, which provides equal educational opportunities for all. It should give all children varied and challenging opportunities for collective activities and corporate social service irrespective of gender, ability or geographical environment.

vi) **Promote respect for and development of Kenya's rich and varied cultures.**
Education should instil in the youth of Kenya an understanding of past and present cultures and their valid place in contemporary society. Children should be able to blend the best of traditional values with the changing requirements that must follow rapid development in order to build a stable and modern society.

vii) **Promote international consciousness and foster positive attitudes towards other nations.**
Kenya is part of the international community. It is part of the complicated and interdependent network of peoples and nations. Education should therefore lead the youth of the country to accept membership of this international community with all the obligations and responsibilities, rights and benefits that this membership entails.

viii. **Promote positive attitudes towards good health and environmental protection.**
Education should inculcate in young people the value of good health in order for them to avoid indulging in activities that will lead to physical or mental ill health. It should foster positive attitude towards environmental development and conservation. It should lead the youth of Kenya to appreciate the need for a healthy environment.

LEARNING OUTCOMES FOR MIDDLE SCHOOL

By the end of Middle School, the learner should be able to:
1. Apply literacy, numeracy and logical thinking skills for appropriate self-expression.
2. Communicate effectively, verbally and non-verbally, in diverse contexts.
3. Demonstrate social skills, spiritual and moral values for peaceful co-existence.
4. Explore, manipulate, manage and conserve the environment effectively for learning and sustainable development.
5. Practise relevant hygiene, sanitation and nutrition skills to promote health.
6. Demonstrate ethical behaviour and exhibit good citizenship as a civic responsibility.
7. Appreciate the country's rich and diverse cultural heritage for harmonious coexistence.
8. Manage pertinent and contemporary issues in society effectively.
9. Apply digital literacy skills for communication and learning.

ESSENCE STATEMENT

Computer science is the study of computers and algorithmic processes, including their principles, hardware and software designs, applications and their impact on society. This discipline is deeply concerned with how computer systems work, and how they are designed and programmed. Computer science as a subject will equip learners with knowledge, assistive technology skills, attitudes, values and 21st century skills that are necessary in the attainment of Vision 2030. The curriculum will focus on developing computing skills as well as preparing future experts with blindness and low vision, engineers and specialists in computer related fields by equipping them with relevant and modern computing competencies through up-to-date technologies and learning experiences. The learning experiences will involve active learner participation conducted through practical and experiential learning activities using assistive technology to develop applicable competencies in computational thinking. The acquired knowledge, skills and attitudes will form a strong foundation for development of computational thinking competencies for learners who wish to specialize in the STEM pathway. The curriculum for computer science responds to the demands of the 21st Century and the aspirations captured in the Constitution of Kenya 2010, Kenya Vision 2030 and National ICT policy of Kenya 2016 (revised 2020).

GENERAL SUBJECT LEARNING OUTCOMES

By the end of Junior Secondary School, the learner should be able to:

a) Apply computer fundamental knowledge and skills in everyday life using assistive technologies.
b) Demonstrate ethical behaviour, security and safety when using computers.
c) Acquire foundational knowledge and basic skills in computer networking, database administration and programming using assistive technologies.
d) Exhibit competency in the use of computers through assistive technologies to adapt to the fast-changing technological world.
e) appreciate the use of computers in managing pertinent and contemporary issues in society.
f) Promote an inquiry-based learning that provokes interest for further education and training in computing disciplines.

STRAND 1.0: FOUNDATION OF COMPUTER SCIENCE

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Foundation of Computer Science	**1.1Computer Concepts (3 Lessons)**	By the end of the sub strand the learner should be able to: a) explain the characteristics of a computer for awareness b) use computers to perform daily life activities c) explain the stages of processing cycle in a computer d) explore the advantages and disadvantages of using computers in data processing e) appreciate analysing the application areas of computers.	• The learner uses assistive technology to search for and present the definition of the terms; *computer, data and information.*in the available resources. • The learners use their tactile skills to explore the available computer to understand the general model of a computer. • Learners discuss the characteristics of a computer and take turns to list examples of computers (*Notebook, desktop, laptop, tablet, PDA (Personal digital assistant), server, iPad, MacBook, smartphone, smartwatch, workstation.* • Learners with blindness use appropriate keyboard key strokes while learners with low vision use magnification to open and use an application on the computer. *(paint, calculator, notepad, games)* • Learners outline and discuss the computer processing cycle. • Learners listen or watch an audio described video and in groups discuss the advantages and disadvantages of using computers in data processing.	1. Why do computers have different features? 2. How do you use a computer in a real life situation?

			• The learners share experiences on the application of computers in various areas in life.	

Core competencies to be developed:

- Communication and collaboration: as the learner uses appropriate language to share experiences on the applications of computers in various areas.
- Digital literacy: as the learner interacts with technology when searching for and presenting the definition of the terms computer, data, processing and information.

Values:

- **Unity:** is promoted as the learners discuss in groups the advantages and disadvantages of a computer.
- **Responsibility:** is achieved as the learner handles the computing devices at their disposal with care.

Pertinent and Contemporary Issues (PCIs):

- Learner Support Programmes: peer education is enhanced as learners use computing devices to perform arithmetic operations in pairs.

Link to Other Subjects:

- English: the learner uses appropriate language to share experiences on the use of computers in real life situations.
- Mathematics: as the learner uses a calculator application on the computer to perform arithmetic operations.

Non-formal activities to support learning:

- Learners discuss the application areas of computers in their clubs.

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Tactile drawings
- Internet
- Audio visual clips
- Screen readers
- Magnifiers

Suggested mode of assessment:

- written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric

Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Explaining the characteristics of a computer	Explain the characteristics of a computer citing relevant examples	Explain the characteristics of a computer	Outline of the characteristics of a computer	State the characteristics of a computer
Using computers to perform daily life activities	use the computers to perform various daily life activities and do a simple project	use computers to perform daily life activities	explain how to use computers to perform some daily life activities	Identify daily activities performed by computers
explaining the stages of processing cycle in a computer	explain the stages of processing cycle in a computer citing relevant examples	explain the stages of processing cycle in a computer	Outline the stages of the processing cycle in a computer.	identify the stages of processing cycle in a computer
Exploring the advantages and disadvantages of a computer	Explore the advantages and disadvantages of a computer citing appropriate examples.	Explores the advantages and disadvantages of a computer	list the advantages and disadvantages of a computer	State the advantages and disadvantages of a computer with
Analyse the application areas of computers	Analyse application areas of computers citing relevant examples	Analyses the application areas of computers	summarise application areas of computers	List the application areas of computers.

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Foundation of Computer Science	**1.2 Evolution of Computers** **(3 Lessons)**	By the end of the sub strand, the learner should be able to: a) identify evolution stages of computers b) explain the tasks performed by computers at different evolution stages c) distinguish between the difference engine and the analytical engine in relation to computer development d) appreciate examining the sustained development of computers in respect to modern technology.	• Learners listen or watch an audio described video to learn about the evolution stages of computers (*abacus, mechanical devices, and electromechanical devices to modern digital computers*). • Learners consult a computer resource person to discuss the tasks performed by computers at different stages of evolution (*mechanical device, abacus, electromechanical modern electronic digital computers*). • Learners brainstorm the relationship between the difference engine and the analytical engine in relation to computer development. • Learners take turns to discuss the difference engine and the analytical engine in relation to computer development. • Learners share knowledge learnt on the use of computers that existed at different evolutionary stages, and in turns discuss the development of computers in respect to modern technology.	1. What role did the analytical engine play in the development of computers? 2. How do you use computers that existed at different evolutionary stages?

Core competencies to be developed:

- Learning to learn: as the learner listens to a computer resource person, gaining knowledge on the tasks performed by computers at every evolutionary stage.
- Communication and collaboration: as the learners discuss in turns the development of computers in respect to modern technology.

Values:

- Respect: achieved when the learned listen keenly to the resource person on the development of computers in respect to contemporary technology.
- Peace: this is promoted as learners debate and accommodate each other's ideas during discussions.

Pertinent and Contemporary Issues (PCIs):

- Value Education: this is demonstrated as the learner shares knowledge on the use of computers that existed at different evolutionary stages.

Link to other subjects:

- Social Studies: as the learner identifies the evolution stages of computers from the first mechanical device to the modern electronic digital devices

Non- formal Activities to Support Learning:

- The learners discuss the development of computers in respect to modern technology in clubs.

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Tactile drawings
- Internet
- Audio visual clips
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying evolution stages of computers from first mechanical device to modern electronic digital devices	Identifies and explains evolution stages of computers from first mechanical device to modern electronic digital devices	Identifies evolution stages of computers from first mechanical device to modern electronic digital devices	state the evolution stages of computers from first mechanical device to modern electronic digital devices	recall evolution stages of computers from first mechanical device to modern electronic digital devices
Explain the tasks performed by computers at different evolution stages	Explains and compare the tasks performed by computers at different evolution stages	Explains the tasks performed by computers at different evolution stages	Outline the tasks performed by computers at different evolution stages correctly	state the tasks performed by computers at different evolution stages
Distinguish between the difference engine and the analytical engine in relation to computer development	Distinguish between the difference engine and the analytical engine in relation to computer development giving examples	Distinguish between the difference engine and the analytical engine in relation to computer development	identify the difference engine and the analytical engine in relation to computer development	state the distinction between difference engine and the analytical engine in relation to computer development
Examine the sustained development of computers in respect to modern technology	Examines citing examples on the sustained development of computers in respect to modern technology	Examines the sustained development of computers in respect to modern technology	Outlines the sustained development of computers in respect to on technology	Name the sustained development of computers in respect modern technology

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Foundation of Computer Science	**1.3 Generations of Computers** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) identify the generations of computers from first to the latest b) describe the characteristics of different computer generations for awareness c) match computer generations to their corresponding technologies d) appreciates analysing the technological advancement of computers from one to the next generation.	• Learners search for information on the generations of computers from first to the latest using assistive technologies in the available resource • Learners list and discuss the characteristics of each generation of computers. • Learners consult computer resource persons to discuss technologies used in different generations of computers. • Take turns to identify the computer generations and their corresponding technologies. • Learners debate on the technological advancement and efficiency of computers of different generations.	1. Why are there different generations of computers? 2. What are the key differences in the technologies used by different computers from one generation to the next?
Core competencies to be developed: • Self-efficacy: as the learner uses computers of different generations to perform a given task and compare their efficiency. • Communication and collaboration: as learners debate on the technological advancement of computers from one to the next generation.				
Values: • Respect: Achieved when the learners listen to a computer resource person to discuss technologies used in different generations of computers.				

Pertinent and Contemporary Issues (PCIs):

- Learner Support Programmes: peer education, is promoted as learners debate on the technological advancement and efficiency of computers of different generations.

Link to other subjects:

- Integrated Science: as the learner distinguishes, the technologies used in different generations of computers.

Non-formal Activities to Support Learning:

- Learners discuss trends in the development of computers during group activities.
- Learners prepare charts showing comparisons of technologies used in different computer generations and display in the learning environment

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Audio visual clips
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying the generations of computers from first to the latest	Identifies and explains the generations of computers from first to the latest	Identifies the generations of computers from first to the latest	Outline the generations of computers.	state the generations of computers
Describing the characteristics of different computer generations for awareness	Describes the characteristics of different computer generations for awareness giving relevant examples	describes the characteristics of different computer generations for awareness	identify the characteristics of different computer generations for awareness	recall the characteristics of different computer generations for awareness
applying technologies of different computers generations	Apply and compare the technologies of different computers generations	Apply technologies of different computers generations	explain the technologies of different computers generations	identify the technologies of different computer generations
match computer generations to their corresponding technologies	match and compare computer generations to their corresponding technologies	match computer generations to their corresponding technologies	identify computer generations and their corresponding technologies	list computer generations and their corresponding technologies
Analysing the technological advancement of computers from one to the next generation	Analyses the technological advancement of computers from one to the next generation citing relevant examples	Analysing the technological advancement of computers from one to the next generation.	classify technological advancement of computers from one to the next generation	identify the technological advancement of computers from one to the next generation

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Foundation of Computer Science	**1.4 Classification of Computers** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) explain the types of computers in a computer user environment b) apply appropriate criteria to classify computers c) select appropriate types of computers for use in different situations d) describe the use of embedded computers in daily life activities e) appreciate the use of different types of computers in performing tasks.	• Learners list and discuss different types of computers. • Learners discuss with the resource person the criteria used to classify computers and in turns match different types of computers to their respective classes. • Learner assesses user-computing needs and selects appropriate computers for different situations *(a user on a fixed budget, a home business user, a gaming enthusiast, a photographer, a home audiovisual enthusiast, a distance education user, a human resources manager, an accountant)*. • Learners listen or watch audio-described video clips explaining the use of embedded computers (*ATM machines, MP3 players, DVD players, Drones, Anti-lock braking system, Airbag control system, Digital watches, Microwaves).* • Learners with blindness use appropriate keyboard key strokes while learners with low vision use magnification to use different types of computers to perform tasks (*draw images, write a letter, play games)*.	1. How are different types of computers used? 2. Why do you use embedded computers?
Core competencies to be developed: • Critical thinking and Problem solving: as the learner assesses user-computing needs and selects appropriate computers for different situations. • Communication and collaboration: as the learner discusses with the resource person the criteria to use when classifying computers.				
Values: • Respect: this is promoted when the learners accommodate others' opinions when discussing the different types of computer classes and their characteristics.				

Pertinent and Contemporary Issues (PCIs):

- Financial Literacy: learner assesses user-computing needs and selects appropriate computers for different situations.

Link to other subjects:

- Music: as the learner shares experiences on the use of embedded computers such as MP3 and DVD players.
- Business Studies: as the learner assesses user computing needs.

Non-formal Activities to Support Learning:

- The learner demonstrates how to use embedded computers in school clubs.

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Audio visual clips
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Explaining the types of computers in a computer user environment	Explains the types of computers in a computer user environment citing examples	Explains the types of computers in a computer user environment	Outline of the types of computers in a computer user environment	State some of the types of computers in a computer user environment
Applying appropriate criteria to classify computers	Apply and compare appropriate criteria to classify computers	Apply appropriate criteria to classify computers	Explain criteria to classify computers	outline criteria to classify computers
Select appropriate types of computers for different situations	Selects and explain appropriate types of computers for different situations	Selects appropriate type of computers for different situations	identify some of the appropriate types of computers for different situations	list types of computers for different situations
Describe uses of embedded computers in daily life activities	Describes uses of embedded computers in daily life activities citing examples.	Describes uses of embedded computers in daily life activities	Outline uses of embedded computers in daily life activities	state uses of embedded computers in daily life activities with assistance
Use different types of computers in performing tasks	Use and demonstrate different types of computers in performing tasks	Uses different types of computers in performing tasks	explain types of computers used in performing various tasks	state types of computer used in performing various tasks

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Foundation of Computer Science	**1.5 Computer user Environment (3 Lessons)**	By the end of the sub strand the learner should be able to: a) explain factors to consider when setting up a computer user environment b) identify appropriate resources for computer user environment c) observe safety precautions and practices in the computer user environment d) appreciate examining emerging trends in the computer user environment.	• Learners brainstorm on the factors to consider when setting up a computer user environment. • The learner uses appropriate assistive technology to search for the resources required when setting up a computer user environment in the available resources, and list them. • Learners set rules to follow in a computer user environment, and practice observing them. • Learners share ideas on emerging trends in the computer user environment. • ***PROJECT***: Learners participate in setting up a computer user environment, the learner with blindness is paired with the sighted peer to guide them on the mobility around the area of learning.	1. Why do you set up a computer user environment? 2. How do you take care of computers?
Core competencies to be developed: • Critical Thinking and Problem Solving: as the learner sets rules to follow in a computer user environment. • Creativity and Imagination: as the learner sets up a computer user environment.				
Values: • **Integrity:** is promoted as the learner observes rules set to be followed in a computer environment.				
Pertinent and Contemporary Issues (PCIs): • Health education: as the learner observes safety precautions and practices in the computer user environment.				

Link to other subjects:

- Life Skills Education when setting up a computer user environment.
- Health Education when observing safety precautions and practices in the computer user environment.

Non-formal Activities to Support Learning:

- The learner sensitise club members on how to observe safety precautions using computers

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Audio visual clips
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Explaining factors to consider when setting up a computer user environment	Explains factors to consider when setting up a computer user environment and cites relevant examples.	Explains factors to consider when setting up a computer user environment	outlines factors to consider when setting up a computer user environment	name factors to consider when setting up a computer user environment
Identifying resources for a computer user environment	Identifies and explain resources for a computer user environment	Identifies resources for a computer user environment	Outlines of the resources for a computer user environment	State resources for a computer user environment

Observing safety precautions and practices in the computer user environment.	Observes and apply safety precautions and practices in the computer user environment	Observes safety precautions and practices in the computer user environment	lists some safety precautions and practices in the computer user environment	state safety precautions and practices in the computer user environment
Examining emerging trends in computer user environment	Examines emerging trends in computer user environment giving relevant examples.	examines emerging trends in computer user environment	explains emerging trends in computer user environment	outline emerging trends in computer user environment

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
1.0 Foundation of Computer Science	**1.6 Physical Parts of a Computer (3 Lessons)**	By the end of the sub strand the learner should be able to: a) identify the physical parts of a computer b) explain the functions of the physical parts of a computer c) connect the physical parts of a computer for use d) appreciate interacting with the physical parts of a computer.	• The learners use their tactile skills to identify and list various physical parts of a computer including the peripheral. • Learner identifies and explains the functions of the physical parts of a computer. • The learner uses their tactile skills to connect physical parts of a computer for use, *the learner with blindness is paired with sighted or low vision peers to guide them and help them navigate easily in the laboratory during the learning process.* • Learners with blindness use appropriate keyboard key strokes while learners with low vision use magnification to interact with computers to perform a task.	1. What are the physical parts of a computer? 2. How do you connect physical parts of a computer?

Core competencies to be developed: • Self-efficacy: as the learner connects physical parts of a computer appropriately. • Digital Literacy: as the learner interacts with a computer to perform tasks.
Values: • Responsibility: this is enhanced as the learner handles the physical parts of a computer with care.
Pertinent and Contemporary Issues (PCIs): • Life Skills: as learners connect different elements of a computer. • Health education: as learners connect the physical parts of a computer with caution.
Link to other subjects: • Pre-tech and pre-career: as the learners acquire skills on connecting physical parts of a computer for use.
Non-formal Activities to support learning: • The learners visit a computer laboratory and assist in connecting physical parts of newly purchased computer
Suggested Learning Resources: • Computers • Computer software (OS. Utility programmes and Application Program) • Reference materials • Computer hardware • Internet • Audio visual clips • Screen readers • Magnifiers
Suggested Mode of Assessment: • written assignment in braille or print (with appropriate colour contrast, font type and size) • Projects • Observations • Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying the physical parts of a computer	Identify and explain the physical parts of a computer	Identify the physical parts of a computer	Outline of the physical parts of a computer	State the physical parts of a computer
Explaining the functions of the physical parts of a computer	Explains the functions of the physical parts of a computer and give relevant examples	Explains the functions of the physical parts of a computer	Outline the functions of the physical parts of a computer	State the functions of the physical parts of a computer
Connecting the physical parts of a computer for use	Connects and explain the physical parts of a computer for use	Connects the physical parts of a computer for use	Explain how to connect the physical parts of a computer for use	Outline the physical parts of a computer for use
Interacting with physical parts of a computer	Interacts with and explain physical parts of a computer	Interacts with physical parts of a computer	Identify physical parts of a computer	Name the physical parts of a computer

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
1.0 Foundation of Computer Science	**1.7 Hands on skills concepts** **(6 Lessons)**	a) By the end of the sub strand the learner should be able to: b) explain the functions of the keys in a computer keyboard c) categorize the keys in a computer keyboard d) use pointing devices/keyboard to manipulate objects in the computer e) apply the appropriate procedure to start and shut down a computer	• Learners with blindness use appropriate keyboard key strokes while learners with low vision use magnification to locate different keys on the computer keyboards and demonstrate their functions. • Learners use their tactile skills to locate and categorize different parts of the computer keyboard. • Learners with blindness use appropriate keyboard key strokes while learners with low vision use pointing	1. Why are there different keys in a computer keyboard? 2. How do you use a computer keyboard?

		f) appreciate interacting with the keyboard and the pointing devices of a computer.	devices and magnification to manipulate objects in the computer. • Learners with blindness use appropriate keyboard key strokes while learners with low vision use pointing devices and magnification to start and shut down a computer. • Learners with blindness use appropriate keyboard key strokes while learners with low vision use pointing devices and magnification to practice interacting with the computer.	
Core competencies to be developed: • Digital Literacy: as the learner uses the computer keyboard and a pointing device to type simple text and manipulate objects on the screen. • Learning to learn: as the learner practices typing and interacting with the computer.				
Values: • Responsibility: as the learner shuts down a computer appropriately after use.				
Pertinent and Contemporary Issues (PCIs): • Learner Support Programmes: peer education as learners assist one another on how to use input devices to manipulate objects in the computer.				
Links to other subjects: • Pre-tech and pre - career: as a learner gains skills on how to operate a computer.				
Non-formal Activities to Support Learning • Learners create a programme to be used during school events. • Learner participate in a competition involving the use of a computer keyboard and pointing devices: *typing a simple text, multiplying numbers.*				
Suggested Learning Resources • Computers • Computer software (OS. Utility programmes and Application Program) • Reference materials • Computer hardware				

- Internet
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- Written Assignment in Braille or Print (With Appropriate Colour Contrast, Font Type And Size)
- Projects,
- Observations,
- Oral Questioning,

Assessment Rubric

Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Explaining the functions of the keys in a computer keyboard	Explains the functions of the keys in a computer keyboard giving relevant examples	Explains the functions of the keys in a computer keyboard	Outline the functions of the keys in a computer keyboard	State the functions of the keys in a computer keyboard
Categorizing the keys in a computer keyboard	Categorizes and compare the keys in a computer keyboard	Categorizes the keys in a computer keyboard	Outline the keys in a computer keyboard	State the keys in a computer keyboard
Using pointing devices or keyboard to manipulate objects in the computer	Uses and explains how pointing devices or keyboard are used to manipulate objects in the computer	Uses pointing devices to manipulate objects in the computer	Explain how the pointing devices or keyboard are used to manipulate objects in the computer	state how the pointing devices or keyboard are to manipulate objects in the computer
Applying the appropriate procedure to start and shut down a computer	Applies and explain the appropriate procedure to start and shut down a computer	Applies the appropriate procedure to start and shut down a computer	Explain the appropriate procedure to start and shut down a computer	Outline the appropriate procedure to start and shut down a computer
Interacting with the keyboard and pointing devices of a computer	Interact with and apply the use of the keyboard and pointing devices of a computer	Interacts with the keyboard and pointing devices of a computer	Explain the keyboard and pointing device of a computer	Recognize the keyboard and pointing devices of a computer

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Foundation of Computer Science	**1.8 Computer Systems Overview** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) identify the components of a computer system in a computer user environment b) relate computer system components to their functions c) use computer system components to perform tasks d) describe the linkage among the components of a computer system e) appreciate analysing the importance of computer systems in society.	• The learner uses appropriate assistive technology to search for the meaning of the terms system and computer system, and share the findings with peers in the available resources. • Learners discuss the components of a computer system (*hardware, software)* and match components to their function. • Learners with blindness use appropriate keyboard key strokes while learners with low vision use magnification and use computer system components to perform tasks. • The learners discuss and illustrate the linkage among the components of a computer system. • Learners share experience with peers on the importance of computer systems in society.	1. Why do you use computer systems? 2. How do computer system components interact?
Core competencies to be developed: • Learning to Learn: as the learner shares experiences on the importance of computer systems in the society. • Creativity and Imagination: as the learner illustrates the linkage among computer components.				
Values: • Respect: Learners accommodate each other's opinion as they discuss the components of a computer system.				
Pertinent and Contemporary Issues (PCIs): • Learner Support Programmes as learners in-group, take turns in identifying and explaining the functions of the components of a computer system.				
Link to other subjects: • Creative Arts: as the learner illustrates the linkage among the components of a computer system.				

Non-formal Activities to Support Learning:

- Learners discuss the importance of computer systems in the school

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects,
- Observations,
- Oral Assessment

Assessment Rubric

criteria	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Identifying the components of a computer system in a computer user environment	Identifies and classify the components of a computer system in a computer user environment	Identifies the components of a computer system in a computer user environment	outline components of a computer system in a computer user environment	Recall the components of a computer system in a computer user environment
Matching computer system components to their functions	Matches and explain computer system components to their functions	Matches computer system components to their functions	Outline computer system components and their functions	Identify computer system components
Using computer system components to perform tasks	Uses and explain computer system components to perform tasks	Uses computer system components to perform tasks	Explain computer system components used to perform task	Outline the computer system components used to perform tasks

Describing the linkage among the components of a computer system	describes the linkage among the components of a computer system and give relevant examples	Describes the linkage among the components of a computer system	identify the linkage among the components of a computer system	Recall the linkage among the components of a computer system
Analysing the importance of computer systems in the society	analyses the importance of computer systems in the society and give relevant examples	Analyses the importance of computer systems in the society	Explain the importance of computer systems in the society	Outline the importance of computer systems in the society

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
1.0 Foundation of Computer Science	**1.9 Computer Hardware Concepts** **(3 lessons)**	By the end of the sub strand the learner should be able to: a) identify categories of hardware in a computer system b) relate categories of computer hardware to their functions c) select appropriate hardware for different situations d) use different elements of computer hardware in performing daily life activities e) appreciate examining the role of hardware elements in a computer	• Learner uses appropriate Assistive Technology to search for the meaning of the term Hardware as used in Computing and identify their categories, in the available resources. • Learners discuss and match categories of computer hardware to their function (*input devices, central processing unit, output devices and storage devices*). • In groups, learners access user computing needs and select appropriate computer hardware for different functions, (*processor, input devices, output devices, primary and secondary storage devices)* • Learners with blindness use appropriate keyboard key strokes while learners with low vision use	1. Why do you categorize computer hardware? 2. How do you use different elements of computer hardware?

			magnification to interact with a computer system. • Learners with blindness use appropriate keyboard key strokes while learners with low vision use magnification to operate a computer (*to input data, store, and output information*.)	
Core competencies to be developed: • Critical Thinking: as the learner assesses user-computing needs and selects appropriate hardware for different situations. • Communication and collaboration: as the learner engages in a discussion on the categories of computer hardware.				
Values: • Integrity: as the learner assesses user-computing needs and select appropriate computer hardware for different situations. • Unity: as the learner engages in a discussion on the categories of a computer hardware.				
Pertinent and Contemporary Issues (PCIs): • Socio-Economic: learner assesses user-computing needs and select appropriate hardware for different situations.				
Link to other subjects Business Studies: learner uses different hardware of a computer to input data, store, and output information.				
Non-formal Activities to Support Learning: • Learners sensitise club members on the uses of computer hardware.				
Suggested Learning Resources: • Computers • Computer software (OS. Utility programmes and Application Program) • Reference materials • Computer hardware • Internet • Screen readers • Magnifiers				

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying categories of hardware in a computer system	Identifies and explain categories of hardware in a computer system	Identifies categories of hardware in a computer system	Outline categories of hardware in a computer system	List categories of hardware in a computer system
Relating categories of hardware to their functions	Relates and explains categories of hardware to their functions.	Relates categories of hardware to their functions	Identify categories of hardware and their functions.	State the categories of hardware and their functions
Selecting appropriate hardware for different function	Selects and use appropriate hardware for different functions	Selects appropriate hardware for different functions	Select four computer hardware for different functions	Select two computer hardware for different functions
Using different elements of computer hardware in performing daily life activities	Uses and explain different elements of computer hardware in performing daily life activities	Uses different elements of computer hardware in performing daily life activities	Explain different elements of computer hardware in performing daily life activities	Outline different elements of computer hardware in performing daily life activities
Examining the role of hardware elements in a computer	Examine and analyse the role of hardware elements in a computer	Examines the role of hardware elements in a computer	Explain the role of hardware elements in a computer	List the role of hardware elements in a computer

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Foundation of Computer Science	**1.10 Input Devices** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) identify input devices in a computer system b) categorise input devices based on their functionality c) select appropriate input devices for different situations d) use input devices to perform tasks	• The learners brainstorm to identify and list input devices available in a computer user environment (*barcode scanner, digital camera, keyboard, microphone, optical mouse, touch screen (resistive, capacitive and infra-red), two-dimensional (2d) and three-dimensional (3d) scanners),* • The learners consult a computer resource person to demonstrate how different categories of input devices operate and match the input devices to their respective categories such as: *keying devices, pointing devices, scanning devices, voice input devices, touch screen, digitizer, digital cameras and other data capture devices.* • The learner takes turns to discuss factors to consider when selecting an input device. • The learners assess user computing needs and select appropriate input devices for different situations (*such as user on a fixed budget, a home user, business user, a gaming enthusiast, a photographer, a distance education user, a human resources manager, an accountant*). • Learner identify and select appropriate input devices to perform tasks assigned by the facilitator.(Learners with blindness use appropriate keyboard key strokes while learners with low vision use pointing device and magnification)	1. Why do computers have input devices? 2. How are input devices used?

			• In groups learners share experience on how to use input devices which are still in good condition to minimise wastage.	

Core competencies to be developed:

- Critical Thinking and Problem Solving: as the learner assesses user-computing needs and selects appropriate input devices for different situations.
- Communication and Collaboration: as the learner pays attention during group discussions.

Values:

- Responsibility: as the learner uses available input devices to perform tasks.

Pertinent and Contemporary Issues (PCIs):

- Value Education: is promoted as learners assess user Computer needs.

Link to other subjects:

- Business Studies: as the learners assess user Computer needs.

Non-formal Activities to Support Learning:

- Learners deliberate on the factors to consider when selecting an input device considering the user computing needs.

Suggested Learning Resources

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying input devices in a computer system	Identifies and explain various input devices in a computer system	Identifies input devices in a computer system	Identifies eight input devices in a computer system	Identify four various input devices in a computer system
Categorising input devices based on their functionality	Categorise input devices to their functions citing relevant examples	Categorise input devices to their functions	Identify input devices and their functions	State input devices and their functions
Selecting input devices for different situations	Selects and categorise input devices for different situations	Selects input devices for different situations	Explain input devices for different situations	Recall input devices for different situations
Using input device to perform tasks	Uses and demonstrate how input devices perform tasks	Uses input device to perform tasks	Uses six input device to perform tasks	Use three input device to perform tasks

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
1.0 Foundation of Computer Science	**1.11 Central Processing Unit (CPU)** **(4 Lessons)**	By the end of the sub strand the learner with should be able to: a) locate the CPU in a computer system b) explain functional elements of the CPU in a computer system c) explore different types of processors used in computing devices d) use computers with different types of processors to perform tasks	• Leaner uses Assistive technology to search for the meaning of the term CPU and motherboard in the available resources. • Learners use their tactile skills to locate the CPU in a computer motherboard. • Learners list and discuss the functional elements of the CPU (*arithmetic and logic unit, control unit and the special memory*). • Learners consult a computer resource person to discuss and determine the type of processor in a computer.	1. How does a computer system use the CPU? 2. Why do computers have processors?

		e) appreciate analysing the role of processors in computers	• Learner uses computers with different types of processors to perform tasks *(type words, add numbers).* • In groups, learners share experience on the role of processors in computers.	
Core competencies to be developed: • Self-efficacy: as the learner independently and navigates through computer system specifications to determine the type of processor. • Communication and collaboration: as the learner explains the functional elements of the CPU.				
Values: • Respect: this is achieved as the learners accommodate each other's opinion during group discussions..				
Pertinent and Contemporary Issues (PCIs): • Life skills: as the learner navigates through computer system specifications to determine the type of processor.				
Link to other subjects: • Mathematics: as the learner use computers with different types of processors to add numbers • Life Skills Education: as the learner confidently navigates through computer system specifications to determine the type of processor.				
Non-formal Activities to Support Learning: • Learner shares an audio described video simulation of the functional organisation of the CPU during computer club activities.				
Suggested Learning Resources: • Computers • Computer software (OS. Utility programmes and Application Program) • Reference materials • Computer hardware • Internet • Computer motherboard • Screen readers • Magnifiers				
Suggested Mode of Assessment: • Written assignment in braille or print (with appropriate colour contrast, font type and size) • Projects				

• Observations • Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Locating the CPU in a computer system	Locates and examine the CPU in a computer system	Locates the CPU in a computer system	Names the locates of the CPU in a computer system	Fails to locate the CPU in a computer system
Explaining functional elements of CPU in a computer system	Explains functional units of CPU in a computer system and categorise them	Explains functional units of CPU in a computer system	Identify functional units of CPU in a computer system.	Recall functional units of CPU in a computer system
Exploring different types of processors used in computing devices	explores different types of processors used in computing devices and give characteristics	Explores different types of processors used in computing devices	Document the processors used in computing devices	Define different types of processors used in computing devices
Using computers with different types of processors to perform tasks	Uses and compare computers with different types of processors to perform tasks	Uses computers with different types of processors to perform tasks	Identify computers with different types of processors	Name computers with different types of processors
Analysing the role of processors in computers	Analyses and compile the role of processors in computers	Analyses the role of processors in computers	Discuss the role of processors in computers	State the role of processors in computers

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Foundation of Computer Science	**1.12 Output Devices** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) identify output devices of a computer system b) describe the functions of output devices in a computer system c) categorise computer output devices based on the output generated d) select appropriate output devices for different situations e) use output devices to perform daily life activities f) appreciate examining the technological trends in the development of output devices.	• Learners use their tactile skills to observe and list available output devices in the computer user environment, such as (*printers, monitors, speakers, projectors, plotters, actuator)* • Learner uses assistive technology to search and discuss the functions of output devices, in the available resources. • Learner classifies output devices into their appropriate categories and match them with their output product (hardcopy, sound and softcopy) • The learners discuss the factors considered when selecting an output device and use their tactile skills to select appropriate output devices for different situations, • Learners use their tactile skills to perform a task assigned by the facilitator using available output devices. (Learners with blindness use appropriate keyboard key strokes while learners with low vision use pointing device and magnification) • Learners Share experiences on safe use and care of output devices.	1. Why are there different output devices? 2. How do you use the output device?
Core competencies to be developed: • Critical Thinking and Problem Solving: as the learner develops evaluation and decision making skills as they compare softcopy and hardcopy output. • Communication and collaboration: as the learner participates in a discussion on the factors considered when selecting the output device.				
Values: • **Responsibility:** this is exhibited as the learner practices safe use and care of output devices. • **Unity:** this is promoted as the learner participates engagingly in a discussion on the factors considered when selecting the output device.				

Pertinent and Contemporary Issues (PCIs): • **Safety and security**: as the learner practices safe use and care of output devices.
Link to other subjects: • Health Education: the learner practices safe use and care of output devices.
Non-formal Activities to Support Learning: • During club forums, the learner shares ideas on how to assess user-computing needs and select appropriate input devices for different types of data.
Suggested learning Resources: • Computers • Computer software (OS. Utility programmes and Application Program) • Reference materials • Computer hardware • Internet • Computer motherboard • Screen readers • Magnifiers • Printers
Suggested Modes of Assessment: • Written assignment in braille or print (with appropriate colour contrast, font type and size) • Projects • Observations • Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying output devices of a computer system	Identifies and classify output devices of a computer system	Identifies output devices of a computer system	Identifies five output devices of a computer system	Identifies two output devices of a computer system
Describing the functions of output devices in a computer system	Describes the functions of output devices in a computer system and classify accordingly	Describes the functions of output devices in a computer system	Outline functions of output devices in a computer system	Name the functions of output devices of a computer system
Categorizing computer output devices based on the output generated	categorizes and summarise computer output devices based on the output generated	Categorizes computer output devices based on the output generated	Categorize four computer output devices based on the output generated	Categorize one computer output device based on the output generated
Selecting appropriate output devices for different situations	selects and categorise appropriate output devices for different situations	Selects appropriates output devices for different situations	Explain output devices for different situations	Recall output devices for different situations
Using output devices to perform daily life activities	Uses and compare output devices to perform daily life activities	Uses output devices to perform daily life activities	Identify output devices used to perform daily life activities	Name output devices used to perform daily life activities
Examining the technological trends in the development of output devices	Examines and analyse technological trends in the development of output devices	Examines the technological trends in the development of output devices	Identify technological trends in the development of output devices	List the technological trends in the development of output devices

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Foundation of Computer Science	**1.13 Ports and Cables** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) identify cables and ports in computer systems b) explain the types of cables used in computer systems c) relate cables to their corresponding ports in computer systems d) connect cables to ports in computer systems e) appreciate the use of cables and ports in computer systems.	• Learner uses assistive technology to search for information on different cables and ports used in computer systems in the available resources. • Learners consult a computer resource person to discuss the types of cables and ports used in computer systems. • Learners use their tactile skills to identify and discuss the types of ports and their corresponding cables. • Learners use their tactile skills to connect cables to their corresponding ports in the computer system.(the learner with blindness is paired with the sighted/low-vision peers to guide them on connecting the cables to their corresponding ports) • Learner practices working with different cables in a computer user environment and participates in communal activities, which deal with reusing or recycling the cables to minimise wastage.	1. Why do computer systems have ports? 2. How do you use cables?

Core competencies to be developed:

- Self-efficacy: as the learner takes turns to identify the different types of ports and their corresponding cables.
- Communication and collaboration: as the learner consults a computer specialist to engage in a discussion and demonstration on the types of cables and ports used in a computer.
- Citizenship: as a learner participates in communal activities which deals with reusing or recycling cables to minimize wastage.

Values:

- Patriotism: This is achieved as the learner participates actively in communal activities, which deals with reusing or recycling of cables to minimise wastage.

• Responsibility: This is enhanced as the Learner practices working with different cables in a computer user environment and participates in communal activities, which deal with reusing or recycling the cables to minimise wastage.
Pertinent and Contemporary Issues (PCIs): • Learner Support Programmes: peer education is enhanced as learners in groups discuss and demonstrate how to use cables and ports appropriately during clubs.
Link to other subjects: • Integrated Science: learner relates ports to their corresponding cables.
Non-formal Activities to Support Learning: • Learners demonstrate to peers how to connect cables to their respective ports.
Suggested Learning Resources: • Computers • Computer software (OS. Utility programmes and Application Program) • Reference materials • Computer hardware • Internet • Computer motherboard • Screen readers • Magnifiers • Connection cables
Suggested Mode of Assessment: • Written assignment in braille or print (with appropriate colour contrast, font type and size) • Projects, • Observations, • Oral questioning,

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying cables and ports in computer systems	Identifies cables and ports in computer systems and relates them to their functions.	Identifies cables and ports in computer systems	List cables and ports in computer systems	Name cables or ports in computer systems
Explaining the types of cables used in computer systems	Explains and categorise the types of cables used in computer systems	Explains the types of cables used in computer systems	Identify types of cables used in computer systems.	Name a type of cables used in computer to computer connection
Relating ports to their corresponding cables in computer systems	Relates and connect ports to their corresponding cables in computer systems	Relates the ports to their corresponding cables in computer systems	Pair ports to their corresponding cables in a computer	Identify ports and cables in computer systems
Connecting cables to ports in computer systems	Connects cables to ports in computer systems and use the computer	Connects cables to ports in computer systems	Identify cables and ports in computer systems	List cables or ports in computer systems
Using cables and ports in computer systems	Uses and organise cables and ports in computer systems	Uses cables and ports in computer systems	Connect cables and ports in computer systems	Identify cables and ports in computer systems

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
1.0 Foundation of Computer Science	**1.14 Computer Setup (3 Lessons)**	By the end of the project the learner should be able to: a) identify problems experienced when setting up computers b) describe different ways of setting up computers c) apply appropriate instructions to set up computers d) set up computers for use	• Learners brainstorm on the challenges experienced when setting up computers, • In groups, learners use assistive technology to search for different ways of setting up computers, in the available resources. • Learners use their tactile skills to connect computer elements following appropriate instructions from the	1. How do you set up a computer? 2. Why are safety precautions observed when setting up a computer?

		e) discuss ways to overcome the challenges experienced when setting up computers f) appreciate booting computers successfully for use.	setup manual, and share experiences on precautions to follow when setting up computers. • The learners consult a computer resource person to guide on tools and requirements needed when setting up computers, and to demonstrate how to setup computers, • Learners use their tactile skills to set up computers, (the learner with blindness is paired with the sighted/low-vision peers to guide them on connecting the cables to their corresponding ports) • the learners device ways to overcome the challenges experienced when setting up computers, • The learners use their tactile skills to boot computers successfully for use, • PROJECT: In groups, learners participate in communal activities, which involve setting up computers.	

Core competencies to be developed:

- Communication and Collaboration: as the learner contributes to group discussions and participates in setting up computers.
- Creativity and Imagination: as the learner devises ways to overcome the challenges experienced when setting up computers.

Values:

- **Unity:** This is achieved learner teams up with others in setting up computers.
- **Respect:** this is promoted as the learner recognises the input of every member of the team when connecting the devices to the system unit.

Pertinent and Contemporary Issues (PCIs):

- Learner Support Programmes: as learners share experiences on precautions to follow when setting up computers during society and clubs.

Link to other subjects:

- Pre-Technical and Pre-Career Education: learner demonstrates ability to apply appropriate instructions when setting up computers.

Non-formal Activities to Support Learning:

- Learner educate school members on how to setup computers.

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Computer motherboard
- Screen readers
- Magnifiers
- Connection cables

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral questioning,

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying challenges experienced when setting up computers	Identify and explain challenges experienced when setting up computers	Identifies challenges experienced when setting up computers	List the challenges experienced when setting up computers	Recall challenges experienced when setting up computers
Applying appropriate instructions to set up computers	applies and elaborate appropriate instructions to set up computers	Applies appropriate instructions to set up computers	Explain appropriate instructions to set up computers	Identify appropriate instructions to set up computers
Setting up computers for use	Sets up and use computers to perform arithmetic operation	Sets up computers for use	Explain how to set up computers for use	Recall how set up computers for use
Discussing ways to overcome the challenges experienced when setting up a computer	Discuss ways to overcome the challenges experienced when setting up a computer and cite examples	Discuss ways to overcome the challenges experienced when setting up a computer	Identify ways to overcome the challenges experienced when setting up a computer	List ways to overcome the challenges experienced when setting up a computer
Booting computers successfully for use	Boots computers and explain the procedures	Boots computers successfully for use	Explain the process of booting up a computers	List the steps followed when booting up computers

STRAND 2.0: COMPUTER AND SOCIETY

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Computer and Society	2.1 **Physical Safety of Computers (2 Lessons)**	By the end of the sub strand the learner should be able to: a) identify physical threats to computers b) explain ways of mitigating physical threats to computers c) discuss appropriate control measures to minimise physical threats to computers d) use computers in a physically secured computer user environment.	• Learner brainstorms physical threats to computers (*theft, natural disasters, hardware failure)* in a computer user environment. • The learners consult a computer resource person to discuss ways of mitigating physical threats to computers in a computer user environment. • The learners discuss appropriate control measures to minimise physical threats to computers in a computer user environment. • Learners with blindness use appropriate keyboard key strokes while learners with low vision use magnification to use computers in a physically secured user environment using the assistive technology.	1. What physical threats have you encountered when using computers? 2. How do you secure computers from physical threats?
• **Core competencies to be developed:** • Critical Thinking and Problem Solving: as the learner explores ways of mitigating physical threats to computers in a computer user environment.				
Values: • **Responsibility:** this is enhanced as the learner participates in securing computers in a computer user environment. • **Respect:** this is promoted as a learner to accommodate others' opinions during group discussions.				
Pertinent and Contemporary Issues (PCIs): • Safety and security: as the learner applies physical mitigation measures to secure computers in a computer user environment.				
Link to other subjects: • Health Education: the learner applies physical mitigation measures to secure a computer user environment.				

Non-formal Activities to Support Learning:

- Learner to make posters to create awareness on how to secure computers in a computer user environment in school forum

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Computer motherboard
- Screen readers
- Magnifiers
- Connection cables

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral questioning

Assessment Rubric

criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying physical threats to computers	Identifies and explains physical threats to computers citing relevant examples	Identifies physical threats to computers	Identifies two physical threats to computers	State one threat to computers with
Explaining ways of mitigating physical threats to computers	Explain ways of mitigating physical threats to computers citing example	Explains ways of mitigating physical threats to computers	Outline ways of mitigating physical threats to computers	Recall ways of mitigating physical threats to computers
Discussing appropriate control measures to	Discuss appropriate control measures to minimise physical	Discuss appropriate control measures to	Outline appropriate control measures to minimise	State appropriate control measures to minimise

minimise physical threats to computers	threats to computers citing examples	minimise physical threats to computers	physical threats to computers	physical threats to computers
Using computers in a physically secured computer user environment	Uses computers in a physically secured computer user environment and observes the rules of the laboratory	Uses computers in a physically secured computer user environment	Use computers in a classroom setup	Uses computers in a playing ground

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Computer and Society	2.2 **Health and Safety** **(2 Lessons)**	By the end of the sub strand the learner should be able to: a) identify health complications associated with the use of computers, b) discuss appropriate techniques to mitigate health complications associated with the use of computers, c) demonstrate in organised workstations on how to minimise health complications when using computers.	• Learners identify and discuss in groups health complications associated with the use of computers. • Watch or listen to an audio described video explaining the techniques to mitigate health complications associated with the use of computers. • Learners share experiences on the safety practices to be observed when using computers. • Learners, in groups, demonstrate how to minimise health complications when using computers. ***PROJECT***: In groups organise an awareness forum to educate the members of the community on how to minimise health complications when using computers	1. Why is your health at risk when using a computer? 2. How do you minimise health complications associated with the use of computers?

Core competencies to be developed:

- **Critical Thinking and Problem Solving:** as the learner explores techniques to mitigate health complications associated with the use of computers.
- **Communication and Collaboration:** as the learner shares experiences on the safety practices to be observed when using a computer.

Values:

- Respect: this is enhanced as the learner accommodates others opinion when discussing techniques to mitigate health complications associated with the use of computers in a computer user environment.

Pertinent and Contemporary Issues (PCIs):

- Health issues: as the learner observes safe use and best practices when using a computer in a computer user environment.

Links to other subjects:

- Health Education: learner observes safe use and best practice when using computers in a computer user environment.

Non-formal Activities to Support learning:

- Learner participate in club activities which educates other learners on health and safety of computer use

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Computer motherboard
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral questioning

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying health complications associated with the use of computers	Identifies and explain health complications associated with the use of computers	Identifies health complications associated with the use of computers	Outlines the health complications associated with the use of computers	States health complications associated with the use of computers
Discussing appropriate techniques to mitigate health complications associated with the use of computers	Discusses appropriate techniques to mitigate health complications associated with the use of computers giving relevant examples	Discusses appropriate techniques to mitigate health complications associated with the use of computers	Identifies the appropriate techniques to mitigate health complications associated with the use of computers	Lists appropriate techniques to mitigate health complications associated with the use of computers
Demonstrating how to minimise health complications when using computers.	Demonstrates and explains how to minimise health complications when using computers.	Demonstrates how to minimise health complications when using computers.	Explains how to minimise health complications when using computers.	States ways of minimising health complications when using computers.

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
2.0 Computer and Society	**2.3 Repetitive Strain Injury (RSI)** **(2 Lessons)**	By the end of the sub strand the learner should be able to: a) identify the symptoms of repetitive strain injury for awareness b) explain the causes of repetitive strain injury for consciousness when using a computer c) describe appropriate strategies to prevent	• Learners brainstorm to identify and discuss common symptoms of repetitive strain injury (*upper limb disorders, eyestrain, stress and fatigue*) for awareness. • Learners consult a resource person to discuss the causes of repetitive strain injury, • Learners listen to an audio-described video explaining about the causes of repetitive strain injury and list them.	1. What are the consequences of prolonged use of a computer? 2. How does repetitive strain injury affect your health?

		repetitive strain injury when using a computer d) demonstrate how to use computers safely to minimise the repetitive strain injury.	• In groups, learners discuss the strategies for preventing repetitive strain injury when using a computer. • Learners practice observing safe ways when using computers for a longer period*(ergonomics)*	
Core competencies to be developed: • Critical Thinking and Problem Solving: as the learners brainstorm on the causes of repetitive strain injury. • Communication and collaboration: as the learner shares experiences on the symptoms of repetitive strain injury.				
Values: • Responsibility: this is promoted as the learner observes safe use and best practices when using a computer for a longer period.				
Pertinent and Contemporary Issues (PCIs): • Health issues: learner observes safe use and best practices when using a computer for a longer period.				
Link to other subjects: • **Health Education:** as the learners observe safe use and best practice when using computers.				
Non-formal Activities to Support Learning: • As the as the Learner sensitise peers on the appropriate strategies of preventing repetitive strain injury when using a computer				
Suggested Learning Resources: • Computers • Computer software (OS. Utility programmes and Application Program) • Reference materials • Computer hardware • Internet • Audio clip • Computer motherboard • Screen readers • Magnifiers				

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying the symptoms of repetitive strain injury	Identifies and explains the symptoms of repetitive strain injury	Identifies the symptoms of repetitive strain injury	outline the symptoms of repetitive strain injury	state the symptoms of repetitive strain injury
Explaining the causes of repetitive strain injury	Explains citing relevant examples the causes of repetitive strain injury	Explains the causes of repetitive strain injury	list causes of repetitive strain injury	state the causes of repetitive strain injury
Describing appropriate strategies to prevent repetitive strain injury when using a computer	describe appropriate strategies to prevent repetitive strain injury when using a computer giving relevant examples	describe appropriate strategies to prevent repetitive strain injury when using a computer	identify the appropriate strategies to prevent repetitive strain injury when using a computer	list appropriate strategies to prevent repetitive strain injury when using a computer
Demonstrating on how to use computers safely to minimising the repetitive strain injury	demonstrate and gives explanation on how to use computers safely to minimising the repetitive strain injury	demonstrate on how to use computers safely to minimising the repetitive strain injury	explain how to use computers safely to minimising the repetitive strain injury	state ways to use computers safely to minimising the repetitive strain injury

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Computer And Society	**2.3 Data Safety in Computers** **(2 Lessons)**	By the end of the sub strand the learner should be able to: a) explain threats to data in a computer b) identify the control measures for securing data in a computer c) discuss the control measures to secure data in a computer d) analyse ways of securing data in a computer.	• Learners brainstorm on the meaning of the terms data safety, data privacy, and data threats and identify and discuss threats to data in a computer • Learners consult a computer resource person to identify and discuss data threats and their control measures. • Learners discuss ways of securing data stored in a computer (*use of passwords, backup, anti-viruses, user access level, user logs*). • Learners explore and share ideas on how to secure data in a computer.	1. How is data in a computer exposed to threats? 2. Why do you secure data in a computer?
Core competencies to be developed: • **Communication and Collaboration:** as the learner discusses ways of securing data stored in a computer. • **Critical Thinking and Problem Solving:** as the learner applies the control measures to secure data in a computer.				
Values: • Respect: this is promoted as the learners listens to a resource person explaining data threats and their control measures.				
Pertinent and Contemporary Issues (PCIs): • Safety and Security: as the learner uses data safety measures to secure data in a computer.				
Link to other subjects: • Life Skills Education: as the learner uses appropriate data safety measures to secure data in a computer.				
Non-formal Activities to Support learning: • Learner creates posters outlining various safety practises to sensitise school members on data safety and best practices that ensures security of data in a computer.				
Suggested Learning Resources: • Computers				

- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Explaining threats to data in a computer	Explains threats to data in a computer and categorise them	Explains threats to data in a computer	Outline the threats to data in a computer	State threats to data in a computer
Identifying the control measures for securing data in a computer	Identifies and explain the control measures for securing data in a computer	Identifies the control measures for securing data in a computer	Outline control measures for securing data in a computer	Recall the control measures for securing data in a computer
Discussing the control measures to secure data in a computer	Discuss citing relevant examples the control measures to secure data in a computer	Discusses the control measures to secure data in a computer	Identify the control measures correctly to secure data in a computer	List the control measures to secure data in a computer
Analysing ways of securing data in a computer	Analyse and summarise ways of securing data in a computer	Analyse ways of securing data in a computer	Identify ways of securing data in a computer	State ways of securing data in a computer

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Computer and Society	2.3 **Online Safety Concepts** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) explain online threats to a computer user b) identify online safety measures to observe when using a computer c) Analyse online safety measures when using a computer d) examine the importance of online safety when using a computer.	• Learners brainstorm on the meaning of the terms online safety, and online safety risks. • Learners consult a computer resource person to discuss online threats *(such as cyber bullying, phishing, online fraud, friend requests from unknown people)* to a computer user, • Learners listen or watch an audio described video to identify online safety measures to observe when online *(not sharing pictures, location, securing profiles*). • The learner discusses with a resource person how to solve online safety issues (*cyber bullying, phishing, online fraud, friend requests from unknown people)* and practice observing online safety measures when using a computer. • Learners share experiences about the importance of online safety when using a computer.	1. What data do you share when online? 2. How do you protect yourself from cyberbullying?
Core competencies to be developed: • **Communication and Collaboration:** as the learner take turns to share the online threats experienced when using a computer • **Learning to Learn:** as the learner shares experiences about online safety.				
Values: • Responsibility: this promoted as the learner applies safety measures when online.				
Pertinent and Contemporary Issues (PCIs): • Security Issues: as the learner applies safety measures when online.				
Link to other subjects: • **Life Skills Education:** as the learners always practise observing online safety measures when using a computer.				

Non-formal Activities to Support Learning:

- Learner discusses in a school forum, the safety measures to observe when online *(not sharing, pictures, location, securing profiles*)

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Explaining online threats to a computer user	Explains online threats to a computer user and give relevant examples	Explains online threats to a computer user	Outline online threats to a computer user	List online threats to a computer user
Identifying online safety measures to observe when using a computer	Identifies and explains online safety measures to observe when using a computer.	Identifies online safety measures to observe when using a computer	Outline online safety measures to observe when using a computer	List online safety measures to observe when using a computer
Analysing online safety measures when using a computer	Analyse and summarise online safety measures when using a computer	Analyse online safety measures when using a computer	Explain online safety measures appropriately when using a computer	Identify online safety measures when using a computer

Examining the importance of online safety when using a computer	Examines the importance of online safety when using a computer citing relevant examples	Examines the importance of online safety when using a computer	Explain importance of online safety when using a computer	Identify the importance of online safety when using a computer

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Computer and Society	**2.6 Online Identity Safety** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) identify the characteristics of personal data for protection from online identity theft b) describe techniques that protect personal data from online disclosure c) analyse appropriate methods to protect personal data from online disclosure d) adhere to rules associated with online etiquette when interacting with computers e) appreciate the use of computers responsibly to safeguard digital footprint.	• The learner uses the assistive technology to search for the meaning of the term online identity as used in computing. • Learners discuss the characteristics of personal and sensitive data (*personal name, address, family details, images, date of birth, a photograph in school uniform, medical history*). • Learners brainstorm and list the techniques that protect personal data from online disclosure • The learner explores different methods to protect personal data from online disclosure • Learner outlines rules associated with online etiquette (*avoid distribution of inappropriate images, avoid use of inappropriate language, respecting confidentiality of personal data of other people)* and applies them when using a computer.	1. Why do you post personal information online? 2. How is online identity theft protected?

			• Learners share experiences on responsible use of computers when online to safeguard digital footprint. • **PROJECT:** Learners create a forum to discuss and create awareness on the potential dangers of meeting an online contact face to face.	
Core competencies to be developed: • **Learning to Learn:** as the learner takes turns to elaborate on rules associated with online etiquette. • **Communication and Collaboration** as the Learner shares experiences on responsible use of computers to safeguard digital footprint.				
Values: • Integrity: is promoted as the learner uses computers responsibly to safeguard digital footprint. • Respect: is cultivated as the learner takes turns to elaborate on rules associated with online etiquette.				
Pertinent and Contemporary Issues (PCIs): • Safety issues: as the learner shares experiences about online identity safety.				
Links to other subjects: • Social Studies: as the learner shares experiences on responsible use of computers to safeguard digital footprint.				
Non-Formal Activities to Support Learning: • Learner educates club members on how to keep personal and sensitive data from public when online,				
Suggested Learning Resources: • Computers • Computer software (OS. Utility programmes and Application Program) • Reference materials • Computer hardware • Internet • Screen readers • Magnifiers				
Suggested Mode of Assessment: • Written assignment in braille or print (with appropriate colour contrast, font type and size)				

- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Analysing the characteristics of personal and sensitive data for protection	Analyses the characteristics of personal and sensitive data for protection citing relevant examples	Analyses the characteristics of personal and sensitive data for protection	Explain the characteristics of personal and sensitive data for protection	Identify the characteristics of personal and sensitive data for protection
Describing the techniques of protecting personal data from online disclosure	Describes the techniques of protecting personal data from online disclosure and cite examples	Describes the techniques of protecting personal data from online disclosure	Identify the techniques of protecting personal data from online disclosure	Recall techniques of protecting personal data from online disclosure
Analysing methods to protect personal data from online disclosure	Analyse and summarise the methods to protect personal data from online disclosure	Analyse methods to protect personal data from online disclosure	Explain methods to protect personal data from online disclosure	Identify the methods to protect personal data from online disclosure
Applying rules associated with online etiquette when interacting with computers	Apply and document rules associated with online etiquette when interacting with computers	Apply the rules associated with online etiquette when interacting with computers	Explain the rules associated with online etiquette when interacting with computers	Identify the rules associated with online etiquette when interacting with computers
Using computers responsibly when online to safeguard digital footprint	Uses and compile ways of using computer responsibly when online to safeguard digital footprint	Uses computers responsibly when online to safeguard digital footprint	Describe how to use computers when online to safeguard digital footprint	Recall ways of using computers responsibly when online to safeguard digital footprint

STRAND 3.0 COMPUTER NETWORKS

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 Computer Networks	**3.1 Computer Network Concepts (3 Lessons)**	By the end of the sub strand the learner should be able to: a) relate computer networks to available types of networks in the society b) use locally available materials to model computer networks c) explain the benefits of computer networks in the society d) identify the challenges of computer networks in the society e) appreciate examining the purpose of computer networks in society.	• Learner uses assistive technology to search for the definition of the term network and computer network in the available resources. • Learners share ideas on available networks in the society such *as road networks* and then relate them to computer networks. • in groups, learners use locally available materials to model computer networks using assistive technology • Learners identify the benefits of computer networks in society. • The learners discuss the challenges of computer networks in the society, • In turn, Learners discuss the purpose of computer networks in society.	1. Why do you use computer networks? 2. How do you form computer networks?
Core competencies to be developed: • **Self-efficacy:** as the learner shares ideas on available networks in the society. • **Creativity and Imagination:** as the learner creatively and innovatively uses locally available materials to model a computer network. • **Effective communication:** as the learners debate on the benefits of computer networks in the society.				
Values: • Respect: this is cultivated as the learner accommodates others ideas on available networks in the society.				
Pertinent and Contemporary Issues (PCIs): • Value education: learner debates on the benefits of computer networks in the society.				
Link to other subjects: • Creative Arts: learner uses locally available materials to model computer networks.				

Non-formal Activities to Support Learning:

- Learner sensitise school members the benefits of computer networks in the society

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers
- Locally available adaptable materials

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric

Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Relating computer networks to available types of networks in the society	Relates computer networks to available types of networks citing relevant examples	Relates computer networks to available types of networks	Identify computer network and available types of networks	Name a computer networks or types of networks
Using locally available materials to model computer networks	Uses and document locally available materials to model computer networks	Uses locally available materials to model computer networks	Identify locally available materials to model computer networks	List locally available materials to model computer networks

Explaining the benefits of computer networks	Explains benefits of computer networks in the society citing relevant examples	Explains the benefits of computer networks	Outline benefits of computer networks	Recall benefits of computer networks
Identifying the challenges of computer networks in the society	Identifies and explain challenges of computer networks in society	Identifies the challenges of computer networks in the society	Outline the challenges of computer networks	Recall the challenges of computer networks

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 Computer Networks	**3.2 Connecting to a Computer Network (3 Lessons)**	By the end of the sub strand the learner should be able to: a) identify available computer networks in the immediate environment b) connect to the available computer networks in the immediate environment c) use the available computer network in the immediate environment d) appreciate sharing resources through computer networks in the immediate environment.	• The learner uses assistive technology to identify and list the type of available computer network *(wireless or cabled networks)* • Learners watch an audio-described video simulating how to connect to an available computer network in the immediate environment *(wireless or cabled network).* • Learners with blindness use appropriate keyboard keystrokes while learners with low vision use magnification to connect to a computer network in the immediate environment. • Learners with blindness use appropriate keyboard keystrokes while learners with low vision use magnification to operate digital devices such as phones, tablets and computers. • Learners share data files, photos with peers through computer networks in the immediate environment.	1. Why do you connect to a computer network? 2. What is the purpose of connecting to a computer network?

Core competencies to be developed:

- **Digital Literacy:** as the learner connects to a computer network in the immediate environment.
- **Self-efficacy:** as the learner connects to computer networks in the immediate environment and shares resources with peers.

Values:

- Unity: this is achieved as the learner shares resources with peers through computer networks in the immediate environment.

Pertinent and Contemporary Issues (PCIs):

- Life Skills: learner connects to and uses available computer networks in the immediate environment to share resources with peers.

Link to other subjects:

- Social Studies: learner uses digital devices such as phones, tablets, computers to share a data files, photos with peers through computer networks in the immediate environment

Non-formal Activities to Support Learning:

- Learner demonstrate to social gatherings how to connect to computer network

Suggested Learning Resources:

- Computers
- Computer software (OS. Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers
- ISP
- Router

Suggested Modes of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying available computer networks in the immediate environment	Identifies and explain available computer networks in the immediate environment	Identifies available computer networks in the immediate environment	List the available computer networks in the immediate environment	Name available computer networks in the immediate environment
Connecting to the available computer networks	Connects to the available computer networks and explain	Connects to the available computer networks	Explain how to connects correctly to the available computer networks	Recall how to connect to the available computer networks
Use the available computer network in the immediate environment	Uses and categorise the available computer network in the immediate environment	Uses the available computer network in the immediate environment	Access the available computer network in the immediate environment	Identify the available computer network in the immediate environment
Sharing resources through computer networks in the immediate environment	Shares and classify resources through computer networks in the immediate environment	Shares resources through computer networks in the immediate environment	Access resources through computer networks in the immediate environment	Identify the resources through computer networks in the immediate environment

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
3.0 Computer Networks	**3.3 Internet Concepts** **(4 Lessons)**	By the end of the sub strand the learner should be able to: a) describe the internet as a resource that runs on a global network of computers b) explain benefits and challenges of internet in the immediate environment	• Learners search for the meaning of the term internet and present to peers. • Learners list and debate on the benefits and challenges of the internet. • In groups, learners discuss ways of overcoming challenges of the internet in the immediate environment.	1. Why do you use the internet? 2. How do you connect to the internet?

		c) explore ways of overcoming challenges of internet in the immediate environment d) identify basic requirements for internet connectivity e) connect to the internet to search for a topical issue f) appreciate the use of the internet as a computer network resource.	• Learners discuss with a resource person the basic requirements for internet connectivity *(Internet Service Provider (ISP), Internet software, communication media, communication device).* • Learner uses the appropriate assistive technology to connect to the internet and selects service available in the internet and use it to search for a relevant topical issue, • Learners use the appropriate assistive technology to search for a topical issue on the internet and share experience with peers.	
Core competencies to be developed: • Digital Literacy: as learners access the internet and search for a relevant topical issue.				
Values: • Respect: this is achieved as the learners accommodate others' views when debating on the benefits and challenges of the internet.				
Pertinent and Contemporary Issues (PCIs): • Life Skills Education: learner shares experience on the use of the internet to search for a topical issue.				
Link to other subjects: • Pre-technical and Pre-career: as the learner connects to and uses the internet to search for a relevant topical issue.				
Non-formal Activities to Support Learning:				

- Learners discuss the uses of internet during clubs

Suggested Learning Resources:

- Computers
- Computer software (OS, Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers
- ISP
- Router

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric

Criteria	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Describe the internet as a resource that runs on a global network of computers	Describes and illustrate the internet as a resource that runs on a global network of computers	Describes the internet as a resource that runs on a global network of computers	Identify how the internet can be used as a resource that runs on a global network of computers	Recall how the internet can be used as a resource that runs on a global network of computers
Explaining benefits and challenges of internet in the immediate environment	Explains benefits and challenges of internet in the immediate environment and give relevant examples	Explains benefits and challenges of internet in the immediate environment	Identify the benefits and challenges of internet in the immediate environment	Outline the benefits and challenges of internet in the immediate environment

Identifying basic requirements for internet connectivity	Identifies and explain basic requirements for internet connectivity	Identifies basic requirements for internet connectivity	Outline the basic requirements for internet connectivity	State basic requirements for internet connectivity
Explore ways of overcoming challenges of internet	Explore and analyse ways of overcoming challenges of internet in the immediate environment	Explores ways of overcoming challenges of internet	Identify of the ways of overcoming challenges of internet	List ways of overcoming challenges of internet
Connecting the internet to search for a topical issue	connects the internet to search for a topical issue and do a presentation	Connects the internet to search for a topical issue	Explain how to connect the internet correctly to search for a topical issue	Recall how to the internet to search for a topical issue
Ability to use the internet as a computer network resource	Use and analyse the internet as a computer network resource	Uses the internet as a computer network resource	Explain how to use the internet appropriately as a computer network resources	Recall how to use the internet as a computer network resources

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
3.0 Computer Networks	**3.4 World Wide Web (WWW)** **(5 Lessons)**	By the end of the sub strand the learner should be able to: a) explain the importance of WWW as used in computer networks b) identify the features of a web browser c) describe the components of a uniform resource locator (URL) used to access resources in the internet	• Learner uses assistive technology to search for the meaning of the terms World Wide Web (WWW), web browsers, uniform resource locator (URL) and discuss the importance of WWW as used in computer networks. • In turn, learners discuss the features of web browsers and list their examples (*explorer, Firefox, Chrome, Netscape, Opera, Safari*). • Learners list and discuss the components of a URL used to access resources on the	1. How do you access internet resources? 2. Why do you use a web browser?

		d) use a web browser to locate resources in the WWW e) appreciate the use of WWW as a repository of information.	internet: (protocol://hostname/other information (*protocol, domain name, path),* giving examples of URL. • Learners with blindness use appropriate keyboard keystrokes while learners with low vision use magnification to access and use a resource in the WWW. • Learners with blindness use appropriate keyboard keystrokes while learners with low vision use magnification to practice using a web browser and locate relevant internet resources. **PROJECT:** • Using appropriate assistive technology, launch and navigate a web browser to identify its features.	
Core competencies to be developed: ● **Learning to Learn:** as the learner wisely uses the acquired knowledge, skills and attitude to search for relevant resources using a web browser. ● **Digital Literacy:** as the learner develops connecting skills when using a web browser to search for and share information.				
Values ● Respect: this is enhanced as the learner accepts each other's opinion when discussing the components of a URL used to access resources on the internet				
Pertinent and Contemporary Issues (PCIs): ● Citizenship: learner connects to the rest of the world through WWW.				
Link to other subjects: ● Life Skills Education: learner uses a web browser to search for relevant topical issues.				
Non-formal Activities to Support Learning: ● Learners demonstrate how web browsers work to members of the club during club activities.				

Suggested Learning Resources:

- Computers
- Computer software (OS, Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers
- ISP
- Router

Suggested Mode of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Explaining the importance of WWW as used in computer networks	Explains the importance of WWW as used in computer networks and give relevant examples	Explains the importance of WWW as used in computer networks	Outlines the importance of WWW as used in computer networks	Define the term WWW as used in computer networks
Identifying the features of a web browser	Identifies and describe the features of a web browser	Identifies the features of a web browser	Outline the features of a web browser	Recall the features of a web browser
Describe the components of a URL	Describes the components of a URL and open a web page.(*https://education.go.ke)*	Describes the components of a URL	Describes two components of a URL	Identify one component of a URL

Using a web browser to locate resources in the WWW	Uses a web browser to locate resources in the WWW and document.	Uses a web browser to locate resources in the WWW	Explains how to uses a web browser to locate resources in the WWW	Recall how to use a web browser to locate resources in the WWW
Using WWW as a repository of information	Uses and document the WWW as a repository of information	Uses the WWW as a repository of information	Explain how to use the WWW correctly as a repository of information	List ways in which the WWW can be used as a repository of information

STRAND 4.0: COMPUTER PROGRAMMING

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Basic Computer Programming	**4.1Computer Programming Concepts** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) explain the importance of programming as used in computing b) identify areas where computer programs are used in daily life c) launch and interact with a computer program for awareness d) appreciate using computer programs in performing daily life activities.	• Learner uses assistive technology to search for the meaning of the term programming and programs in the available learning resources. • In groups, learners discuss the importance of computer programming. • Learners take turns to discuss areas where computer programs are used in daily life and list them. • Learners with blindness use appropriate keyboard keystrokes while learners with low vision use magnification to launch and interact with a computer program. • Share experience on performing daily life activities (*playing computer games, listening to music, performing mathematical operations, drawing objects, type text*) using available computer programs and accessories. • **PROJECT:** The learners start and interact with a computer program accessory *such as, a computer game, calculator, paint, snipping tool, media player and notepad*	1. Why do computers have programs? 2. How do you use computer programs?
Core competencies to be developed: • Learning to Learn: as the learner launches and interacts with a computer program for exposure to programming. • Communication and Collaboration: as the learners share ideas on the use of programming in daily life activities.				

Values:

- Unity: this is promoted as a learner shares ideas on the use of programming in daily life.
- **Respect**: this is achieved as the learners accept each other's opinion when sharing their experience on performing daily life activities using available computer programs and accessories.

Pertinent and Contemporary Issues (PCIs):

- Value Education: learner launches and interacts with computer programs.

Link to Other Subjects:

- **Integrated Science**: learner interacts with computer programs.
- **Performing Arts:** learner listening to music, using computer program accessories.

Non-formal Activities to Support Learning:

- Learner share experience with the with their peers during clubs on how to perform daily life activities (*playing computer games, listening to music, performing mathematical operations, drawing objects, type text*) using available computer program and accessories

Suggested Learning Resources:

- Computers
- Computer software (OS, Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers

Suggested Modes of Assessment:

- Written assignment in braille or print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Explaining the importance of programming as used in computing	Explains the importance of programming as used in computing citing relevant examples.	Explains the importance of programming as used in computing	Identify the importance of programming as used in computing	List the importance of programming as used in computing
Identifying areas where computer programs are used in daily life	Identifies areas where computer programs are used in daily life and explains.	Identifies areas where computer programs are used in daily life	Identifies ten areas where computer programs are used in daily life	Identify three areas where computer programs are used in daily life by the assistance of the teacher
Using computer programs to perform daily life activities	Uses a computer program for exposure to programming and come up with a running project	Uses computer programs to perform daily life activities	Interacts with a computer program for exposure to programming	Identify computer programs used to perform daily life activities

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
4.0 Computer Programming	**4.2 Textual Programming Concepts** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) identify types of textual programming applications for use b) explain the procedure of launching a textual programming application c) launch a textual programming application in a computer	• Leaner uses assistive technology to search for the meaning of the term textual programming in the available resources. • Learners discuss and list examples of textual programming applications used in computer programming *(Java, C, C++, HTML)* • In groups discuss the procedure of launching a textual programming application, • consult a computer resource person to demonstrate how to launch textual	1. Why do you use textual programming applications? 2. How do you launch textual programming application?

		d) appreciate navigating a textual programming application interface.	programming applications used in computer programming, • ***PROJECT:*** • ***In*** *groups, launch a textual programming application such as Notepad, Notepad++ ,* • Share experiences on navigating the textual programming application interface with peers.	
Core competencies to be developed: • **Self-efficacy:** as the learner gains the ability to navigate a textual programming application interface. • **Learning to Learn:** as the learner launches and interacts with a textual programming application.				
Values: • Unity: as the learner calmly shares experiences on navigating the textual programming application interface with peers.				
Pertinent and Contemporary Issues (PCIs): • Peer Education: learner consults a computer-programming specialist to demonstrate how to launch textual programming applications used in computer programming.				
Link to other subjects: • Pre-Career and Pre-Technical Education as learners follow instructions when launching textual programming applications used in computer programming				
Non-formal Activities to support learning: Learner demonstrates how to open and navigate the textual programming application interface in computer clubs				
Suggested Learning Resources: • Computers • Computer software (OS, Utility programmes and Application Program) • Reference materials • Computer hardware • Internet				

• Screen readers • Magnifiers
Suggested Modes of Assessment: • Written assignment in braille • Projects • Observations • Oral Assessment

Assessment Rubric				
Criteria	**Exceeding Expectation**	**Meeting Expectation**	**Approaching Expectation**	**Below Expectation**
Identifying types of textual programming applications for use	Identifies and explain types of textual programming applications for use	Identifies types of textual programming applications for use	Identifies five types of textual programming applications for use	Identify three types of textual programming applications for use
Explain the procedure of launching a textual programming application	explains and summarise the procedure of launching a textual programming application	Explains the procedure of launching a textual programming application	outline the procedure of launching a textual programming application	Recall the procedure of launching a textual programming application
Launch a textual programming application in a computer	Launches a textual programming application in a computer and run a simple project	launches a textual programming application in a computer	Explain the process of launching a textual programming application in a computer	name a textual programming application in a computer
Navigating a textual programming application interface	Navigates a textual programming application interface and demonstrate	Navigates a textual programming application interface	Explain how to navigate a textual programming application interface	Recall how to navigate a textual programming application interface

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Computer Programming	**4.3 Textual Programming Features** **(9 Lessons)**	By the end of the sub strand the learner should be able to: a) describe terminologies used in a textual programming application b) explore features of a textual programming application c) relate the features of a textual programming application to their function d) use the features of a textual programming application to create a sequence of instructions	• In turns, learners discuss and list terminologies used in a textual programming application and the use of textual programming terms *(tags, syntax, doctype,)*. • The learners discuss the features of a textual programming application(notepad++) • the learners discuss the functions of the features of a textual programming application and match the features of a textual programming application to their functions • The learner uses appropriate keyboard keystrokes when using the features of a textual programming application (*create a web page)* • The learners share experience on the use of the features of a textual programming application	1. Why is textual programming popular in introducing computer programming? 2. How do you use textual programming application features?
Core competencies to be developed: • **Learning to Learn:** as the learners share experience on the use of the features of a textual programming application. • **Creativity and Imagination**: as the learner creates a webpage using a textual programming application.				
Values: • Respect: is promoted as the learners accommodate each other's opinion as they discuss features of the textual programming application with peers.				
Pertinent and Contemporary Issues (PCIs): • **Peer Learning:** learner uses features of textual programming application to create a webpage.				
Link to other subjects: • Pre-Technical and Pre-Career Education: learner uses the features of textual programming to create a webpage.				
Non-formal Activities to Support Learning: • Learner creates a webpage during club activities				

Suggested Learning Resources:

- Computers
- Computer software (OS, Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers

Suggested Mode of Assessment:

- Written assignment in braille
- Projects
- Observations
- Oral Assessment

Assessment Rubric

Criteria	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Describing terminologies used in a textual programming application	Describes terminologies used in a textual programming application and cite relevant examples	Describes terminologies used in a textual programming application	Identify four terminologies used in a textual programming application	recall two terminologies used in a textual programming application
Relating the features of a textual programming application to their function	Relates the features of a textual programming application to their function and do simple project	Relates the features of a textual programming application to their function	Identify features of a textual programming application to their function	Mention the features of a textual programming application to their function
Exploring features of a textual programming application	Explores and document features of a textual programming application	Explores features of a textual programming application	Identify features of a textual programming application	Recall the features of a textual programming application

Using the features of a textual programming application to create a sequence of instructions	Use and compare the features of a textual programming application to create a sequence of instructions	Uses the features of a textual programming application to create a sequence of instructions	Explain how to use features of a textual programming application to create a sequence of instructions	Identify features of a textual programming application to create a sequence of instructions

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Computer Programming	**4.2 Visual Programming Concepts** **(3 Lessons)**	By the end of the sub strand the learner should be able to: a) identify types of visual programming applications for use b) explain the procedure of launching a visual programming application c) launch a visual programming application in a computer d) appreciate navigating a visual programming application interface.	• Leaner uses assistive technology to search for the meaning of the term visual programming in the available resources. • Learners discuss and list examples of visual programming applications used in computer programming *(Microsoft Make Code, Scratch, Code.org, Sprite box))* • In groups discuss the procedure of launching a visual programming application, • consult a computer resource person to demonstrate how to launch visual programming applications used in computer programming, ***PROJECT:*** ***In*** *groups, launch a textual programming application such as Microsoft Make Code, Scratch, Code.org, Sprite box,* • Share experiences on navigating the visual programming application interface with peers.	1. Why do you use visual programming applications? 2. How do you launch visual programming application?

Core competencies to be developed:

- **Self-efficacy:** as the learner gains the ability to navigate a visual programming application interface.
- **Learning to Learn:** as the learner launches and interacts with a visual programming application.

Values:

- **Unity:** as the learner calmly shares experiences on navigating the visual programming application interface with peers.

Pertinent and Contemporary Issues (PCIs):

- **Peer Education:** learner consults a computer-programming specialist to demonstrate how to launch visual programming applications used in computer programming.

Link to other subjects:

- Pre-Career and Pre-Technical Education as learners follow instructions when launching visual programming applications used in computer programming

Non-formal Activities to support learning:

- Learner demonstrate how to navigate the visual programming application interface in computer clubs

Suggested Learning Resources:

- Computers
- Computer software (OS, Utility programmes and Application Program)
- Reference materials
- Computer hardware
- Internet
- Screen readers
- Magnifiers

Suggested Modes of Assessment:

- Written assignment in print (with appropriate colour contrast, font type and size)
- Projects
- Observations
- Oral Assessment

Assessment Rubric				
Criteria	**Exceeding Expectation**	**Meeting Expectation**	**Approaching Expectation**	**Below Expectation**
Identifying types of visual programming applications for use	Identifies and explain types of visual programming applications for use	Identifies types of visual programming applications for use	Identifies five types of visual programming applications for use	Identify three types of visual programming applications for use
Explaining the procedure of launching a visual programming application	explains and summarise the procedure of launching a visual programming application	Explains the procedure of launching a visual programming application	outline the procedure of launching a visual programming application	Recall the procedure of launching a visual programming application
Launch a visual programming application in a computer	Launches a visual programming application in a computer and run a simple project	launches a visual programming application in a computer	Explain the process of launching a visual programming application in a computer	name a visual programming application in a computer
Navigating a visual programming application interface	Navigates a visual programming application interface and demonstrate	Navigates a visual programming application interface	Explain how to navigate a visual programming application interface	Recall how to navigate a visual programming application interface

Strand	**Sub Strand**	**Specific Learning Outcomes**	**Suggested Learning Experiences**	**Key Inquiry Questions**
4.0 Computer Programming	**4.3 Visual Programming Features** **(9 Lessons)**	By the end of the sub strand the learner should be able to: a) describe terminologies used in a visual programming application b) explore features of a visual programming application c) relate the features of a visual programming application to their function	• In turns, learners discuss and list terminologies used in a visual programming application and the use of textual programming terms *(reserved words, syntax, variables, input output statements, control structures, variable declarations)*. • The learners discuss the features of a visual programming application	1. Why is visual programming popular in introducing computer programming? 2. How do you use visual programming application features?

		d) use the features of a visual programming application to create a sequence of instructions	• the learners discuss the functions of the features of a visual programming application and match the features of a visual programming application to their functions • The learner uses magnification to create a sequence of actions using the features of a visual programming application (*create a game)* • The learners share experience on the use of the features of a visual programming application	
Core competencies to be developed: • Learning to Learn: as the learners share experience on the use of the features of a t visual programming application. • Creativity and Imagination: as the learner creates a sequence of actions using the features visual programming application.				
Values: • Respect: is promoted as the learners accommodate each other's opinion as they discuss features of the visual programming application with peers.				
Pertinent and Contemporary Issues (PCIs): • Peer Learning: learner uses features of visual programming application to create creates a sequence of actions.				
Link to other subjects: • Pre Technical and Pre Career Education: learner uses the features of visual programming applications to create a sequence of actions.				
Non-formal Activities to Support Learning: • Learner create a sequence of actions using the features of a visual programming application during club activities				
Suggested Learning Resources: • Computers • Computer software (OS, Utility programmes and Application Program) • Reference materials • Computer hardware • Internet				

• Screen readers • Magnifiers
Suggested Mode of Assessment: • Written assignment in print (with appropriate colour contrast, font type and size) • Projects • Observations • Oral Assessment

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Describing terminologies used in a visual programming application	Describes terminologies used in a visual programming application and cite relevant examples	Describes terminologies used in a visual programming application	Identify four terminologies used in a visual programming application	recall two terminologies used in a visual programming application
Relating the features of a visual programming application to their function	Relates the features of a visual programming application to their function and do simple project	Relates the features of a visual programming application to their function	Identify features of a visual programming application to their function	Mention the features of a visual programming application to their function
Exploring features of a visual programming application	Explores and document features of a textual programming application	Explores features of a visual programming application	Identify features of a visual programming application	Recall the features of a visual programming application
Using the features of a visual programming application to create a sequence of instructions	Use and compare the features of a visual programming application to create a sequence of instructions	Uses the features of a visual programming application to create a sequence of instructions	Explain how to use features of a visual programming application to create a sequence of instructions	Identify features of a visual programming application to create a sequence of instructions

COMMUNITY SERVICE-LEARNING CLASS ACTIVITY

Community Service Learning (CSL) is an experiential learning strategy that integrates classroom learning and community service to enable learners reflect, experience and learn from the community. The CSL project is expected to benefit the learner, the school and local community. Knowledge and skills on how to carry out a CSL project have been covered in Life Skills Education (LSE).

All learners with visual impairment in Grade 7 will be expected to participate in a CSL class activity. The activity will give learners an opportunity to practise the CSL Project skills covered under LSE. This activity will be undertaken in groups where learners with blindness will be grouped with those who have sight. Learners will be expected to apply the steps provided to carry out the CSL project.

The activity will take the form of a whole school approach, where the entire school community will be engaged in the learning process. Teachers will guide learners with visual impairment to execute a simple school based CSL class activity. This activity can be done in 4-6 weeks outside the classroom time. The duration may be adjusted accordingly to accommodate learners with blindness who may require more time to implement the CSL project.

CSL Skills to be covered

i) **Research:** Learners will develop research skills as they investigate PCIs to address, ways and tools to use in collecting data, analysing information and presenting their findings.
ii) **Communication:** Learners will develop effective communication skills as they engage with peers and school community members. These will include listening actively, asking questions, and presentation skills using varied modes.
iii) **Citizenship:** Learners will be able to explore opportunities for engagement as members of the school community and provide a service for the common good.
iv) **Leadership**: Learners will develop leadership skills as they take up various roles within the CSL activity.
v) **Financial Literacy Skills:** Learners will consider how to source and utilise resources effectively and efficiently.
vi) **Entrepreneurship**: Learners will consider ways of generating income through innovation for the CSL class activity.

Suggested PCIs	Specific Learning Outcomes	Suggested Learning Experiences (Customise to the focus of the grade)	Key Inquiry Questions
Learners will be guided to consider the various PCIs provided in the subject in Grade 7 and choose one suitable to their context and reality	By the end of the CSL class activity, the learner should be able to: a) identify a problem in the school community through research; b) develop a plan to solve the identified problem in the community; c) design solutions to the identified problem; d) implement solution to the identified problem; e) share the findings to relevant actors f) reflect on own learning and relevance of the project; appreciate the need to belong to a community.	• In groups, learners brainstorm on pertinent and contemporary issues in the community that need attention. • In groups, learners discuss various PCIs within the school community and identify the one that requires immediate attention giving reasons for their choice. • In groups, learners discuss possible solutions to the identified issue and propose the most appropriate solution to the problem. • Learners brainstorm on the resources needed for the activity and source for them. Learners with blindness to be guided in selecting materials that are safe and accessible such as tactile charts, pictures, graphs and braille. Those with low vision to use reference materials with appropriate font size and contrasting colours as well as three-dimensional resources. • In groups, learners discuss different methods and tools of collecting data and determine the ones suitable for the selected project. Learners with visual impairments to be supported in preparation and use of data collection methods and tools such as questionnaires, focus discussions and interviews.	1. How does one determine community needs? 2. Why is it necessary to be part of a community?

		• In groups, learners to develop appropriate tools for collecting data with the guidance of the teacher. • In groups, learners collect data and record findings. Learners with blindness to work with sighted peers when collecting data. The sighted peers would support in explaining or describing aspects that require use of sight. • Learners with blindness use audio recorders to record the responses. • In groups, learners discuss their findings, develop various reporting documents and use them to report on their findings. • Based on the research report, learners implement a project to get solutions to the identified problem. Learners with blindness to work with sighted peers and ensure the project site is free from hazards such as hanging trees, sharp objects and potholes to ensure safe mobility. • Learners use feedback from peers and the school community to improve on the implementation of the project. • In groups, learners discuss the successes, challenges faced while implementing the project activities and lessons learnt; write a report and share through various media to peers and the school community. • Learners reflect on how the project enhanced learning while at the same time facilitating service to the school by providing solutions to the identified issue(s).	

Assessment Rubric				
Criteria	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Identifying a pertinent issue in school and the community to be addressed.	Gives Justification for the identified pertinent issue in the school community to be addressed.	Identifies a pertinent issue in the school community to be addressed.	States a pertinent issue in the school community to be addressed.	Recalls a pertinent issue discussed in class.
Planning to solve the identified issue.	Designs and develops a step-by-step plan of the activities to be carried out in the process of solving the problem.	Develops a plan to solve the identified problem.	Gives an outline of a plan to solve the identified problem.	States some activities to be included in the plan to solve the identified problem.
Designing and implementing solutions to the identified problem.	Designs, implements and solves the identified problem.	Designs and implements solutions to the identified problem.	Designs solutions to the identified problem.	Suggests solutions to the identified problem.
Sharing findings to relevant actors.	Incorporates feedback from relevant actors to the findings.	Share findings to relevant actors.	Gives a brief description of findings to relevant actors.	States some aspects of the findings to relevant actors.