REPUBLIC OF KENYA

MINISTRY OF EDUCATION

JUNIOR SECONDARY SCHOOL CURRICULUM DESIGN

GRADE 7

COMPUTER SCIENCE

DRAFT

KENYA INSTITUTE OF CURRICULUM DEVELOPMENT
2021

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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, Grades 4 and 5. The roll out for Grade 6 and Junior Secondary (Grade 7-9) will subsequently follow.

It is my hope that the curriculum designs for 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 reorganization 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 twenty first century competencies. Ultimately, this will lead to the realization 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 realization 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 the Grade 7 curriculum designs taking cognisance 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 also provide opportunities for learners to develop the core competencies as well as engage in Community Service Learning. The designs present assessment rubrics 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 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 of the designs. I also appreciate the contribution of the Semi-Autonomous Government

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Agencies (SAGAs) and representatives of various stakeholders for their various roles in the development 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 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 and Pre vocational Education	5
7.	Social Studies	3
8.	Religious Education (CRE/IRE/HRE)	2
9.	Business Studies	3
10.	Agriculture	3
11.	Life Skills Education	1
12.	Sports and Physical Education	2
13.	Optional Subject	3
14.	Optional Subject	3
	Total	**45**

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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.

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iii) Promote individual development and self-fulfillment

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 instill 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.

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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 attitudes towards environmental development and conservation. It should lead the youth of Kenya to appreciate the need for a healthy environment.

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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 co-existence.
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, 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, 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 to develop applicable competencies in computational thinking. The acquired knowledge,

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skills and attitudes will form a strong foundation for development of computational thinking competencies for learners who wish to specialize in 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 OUTCOMES

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

a) Apply computer fundamental knowledge and skills in everyday life.
b) Demonstrate ethical behaviour, security and safety when using computers.
c) Acquire foundational knowledge, skills and positive attitude in computer networks and programming.
d) Exhibit competency in the use of computers for adapting to a fast-changing technological world.
e) Develop positive attitude towards the ever-changing computer technology to cope with the needs of the society.
f) Promote an inquiry-based learning that provokes interest for further education and training in computing disciplines.

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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	**1.1 Computer 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) outline 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 is guided to: • use digital devices to search for and present the definition of the terms; *computer, data and information*, • take turns to list examples of computers (*Notebook, desktop, laptop, tablet, PDA (Personal digital assistant), server, iPad, MacBook, smartphone, smartwatch, workstation*) • in turns discuss the characteristics of a computer, • watch a video clip that shows the functions of a computer, • use computing device to; *perform arithmetic operations such as addition of numbers, search for information on business ideas, draw diagrams, listen for music*, • draw accurately and label	1. Why do computers have different features? 2. How do you use computer in real life situation?

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			correctly the computer processing cycle, • display an illustration that demonstrates a general model of a computer, • in groups, discuss the advantages and disadvantages of using computers in data processing, • share experiences on the application of computers in various areas such as (*Education, Business, Banking, Military, Communication, Government, Home, Insurance, Marketing, Healthcare, Engineering Design, manufacturing*).	

Core competencies:

- Communication and collaboration: learner develops speaking skills when using appropriate language to clearly and effectively share experiences on the applications of computers in various areas.
- Digital literacy: learner interacts with technology when searching for and present the definition of the terms computer, data, processing and information.

Values:

- Unity: learners discuss in groups the advantages and disadvantages of a computer.
- Responsibility when drawing and labelling the computer processing cycle.

Pertinent and Contemporary Issues (PCIs):

- Learner Support programmes: Peer education is enhanced when learners in groups use computing devices to perform

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arithmetic operations such as addition of numbers.

Link to other subjects:

- English: learner uses appropriate language to clearly and effectively share experiences on the use of computers in real life situation.
- Mathematics when using a computing device to perform arithmetic operations such as addition of numbers.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to explain the characteristics of a computer for awareness	Correctly and systematically explains the characteristics of a computer for awareness	Correctly explains the characteristics of a computer for awareness	Correctly explains some of the characteristics of a computer for awareness	Hardly explains the characteristics of a computer for awareness
Ability to use computers to perform daily life activities	Appropriately and confidently uses computers to perform daily life activities	Appropriately uses computers to perform daily life activities	Uses computers to perform some daily life activities	Assisted to use computers to perform some daily life activities
Ability to outline the stages of processing cycle in a computer	Correctly and precisely outlines the stages of processing cycle in a computer	Correctly outlines the stages of processing cycle in a computer	Correctly outlines some of the stages of processing cycle in a computer.	Outlines some of the stages of processing cycle in a computer with assistance
Ability to explore the advantages and disadvantages of a	Appropriately and confidently explores the advantages and	Explores the advantages and disadvantages of a	Explores some advantages and disadvantages of a	Explores some advantages and disadvantages of a

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computer	disadvantages of a computer	computer	computer	computer with assistance
Ability to analyse the application areas of computers	Correctly and accurately analyses the application areas of computers	Correctly analyses the application areas of computers	Correctly analyses some application areas of computers	Analyses some application areas of computers with assistance

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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 from first mechanical device to modern electronic digital devices 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) use computer that existed at different evolution stages to perform tasks e) appreciate examining the sustained development of computers in respect to contemporary technology.	The learner is guided to: • watch a video clip and learn about evolution stages of computers from abacus, mechanical devices electromechanical devices to modern digital computers, • listen keenly to a computer resource person when explaining the tasks performed by computers at different evolution stages of computers (*mechanical device, abacus, electromechanical modern electronic digital computers*), • brainstorm the relationship between the difference engine and the analytical engine in relation to computer development, • turn to discuss the difference	1. What role did the analytical engine play in development of computers? 2. How do you use computer that existed at different evolution stages to perform tasks?

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			engine and the analytical engine in relation to computer development, • share experiences on the use of computer that existed at different evolution stages, • in turns discuss the development of computers in respect to contemporary technology.	

Core competencies:

- Learning to learn: learner listens keenly and learns from a computer resource person when explaining the tasks performed by computers at every stages in evolution of computers.
- Communication and collaboration: learner shares experiences on the development of computers in respect to contemporary technology.

Values:

- Respect : learner shares experiences on the development of computers in respect to contemporary technology.

Pertinent and Contemporary Issues (PCIs):

- Citizenship: learner shares experiences on the use of computer that existed at different evolution stages.

Links to other subjects:

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

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Assessment Rubric				
Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to identify evolution stages of computers from first mechanical device to modern electronic digital devices	Correctly and explicitly identifies evolution stages of computers from first mechanical device to modern electronic digital devices	Correctly identifies evolution stages of computers from first mechanical device to modern electronic digital devices	Correctly identifies some of the evolution stages of computers from first mechanical device to modern electronic digital devices	Attempts to identify evolution stages of computers from first mechanical device to modern electronic digital devices
Ability to explain the tasks performed by computers at different evolution stages	Accurately and clearly explains the tasks performed by computers at different evolution stages	Accurately explains the tasks performed by computers at different evolution stages	Accurately explains some of the tasks performed by computers at different evolution stages correctly	Rarely explains the tasks performed by computers at different evolution stages
Ability to distinguish between the difference engine and the analytical engine in relation to computer development	Correctly and accurately distinguishes between the difference engine and the analytical engine in relation to computer development	Correctly distinguishes between the difference engine and the analytical engine in relation to computer development	Occasionally distinguishes between the difference engine and the analytical engine in relation to computer development	Tries to distinguish between the difference engine and the analytical engine in relation to computer development

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Assessment Rubric				
Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to use computer that existed at different evolution stages to perform tasks	Appropriately and confidently uses computer that existed at different evolution stages to perform tasks	Appropriately uses computer that existed at different evolution stages to perform tasks	Sometimes uses computer that existed at different evolution stages to perform tasks correctly	Assisted to use computer that existed at different evolution stages to perform tasks
Ability to examine the sustained development of computers in respect to contemporary technology	Correctly and keenly examines the sustained development of computers in respect to contemporary technology	Correctly examines the sustained development of computers in respect to contemporary technology	Examines some of the sustained development of computers in respect to contemporary technology	Rarely examines the sustained development of computers in respect to contemporary technology

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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) apply technologies of different computers generations in daily life situation d) match computer generations to their corresponding technologies e) appreciates analysing the technological advancement of computers from one to	The learner is guided to: • search for information on the generations of computers from first to the latest, • visit a computer user environment and find out the year of manufacture of the available computers and map them to their appropriate generation. • share experiences on the characteristics of each generation of computers, • consult a computer technician to discuss technologies used in different generations of computers. • use technologies of different computers generations in daily life situation; *search information on personal hygiene, prepare personal time table,*	1. Why are there different generations of computers? 2. How do you apply different technologies of computers in daily life situation?

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		the next generation.	• take turns to match computer generations to their corresponding technologies, • actively participate in a debate on the technological advancement of computers from one to the next generation, • use computers of different generation to perform a task and compare their efficiency.	

Core competencies:

- Self-efficacy: learner uses computers of different generation to perform a given task and compare their efficiency.
- Creativity and imagination: learner matches computer generations to corresponding technologies.

Values:

- Unity: learner shares experiences on the characteristics of each generation of computers.

Pertinent and Contemporary Issues (PCIs):

- Learner Support programmes: Peer Education, is promoted as learners assist one another on how to use computers of different generation to perform a task and compare their efficiency.

Links to other subjects:

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

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Assessment Rubric				
Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to identify the generations of computers from first to the latest	Appropriately and specifically identifies the generations of computers from first to the latest	Appropriately dentifies the generations of computers from first to the latest	Appropriately identifies some of the generations of computers from first to the latest	Helped in identifying the generations of computers from first to the latest
Ability to describe the characteristics of different computer generations for awareness	Correctly and clearly describes the characteristics of different computer generations for awareness	Correctly describes the characteristics of different computer generations for awareness	Correctly describes some of the characteristics of different computer generations for awareness	Tries to describe the characteristics of different computer generations for awarenes
Ability to apply technologies of different computers generations in daily life situation	Appropriately and confidently applies technologies of different computers generations in daily life situation	Appropriately applies technologies of different computers generations in daily life situation	Appropriately applies some of the technologies of different computers generations in daily life situation	Assisted to apply technologies of different computers generations in daily life situation.
Ability to match computer generations to their corresponding technologies	Accurately and intelligently matches computer generations to their corresponding technologies	Accurately matches computer generations to their corresponding technologies	Accurately matches some computer generations to their corresponding technologies	Attempts to match computer generations to their corresponding technologies

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Assessment Rubric				
Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to analyse the technological advancement of computers from one to the next generation	Correctly and briefly analyses the technological advancement of computers from one to the next generation	Correctly analyses the technological advancement of computers from one to the next generation.	Correctly analyses some technological advancement of computers from one to the next generation	Hardly analyses the technological advancement of computers from one to the next generation

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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.	The learner is guided to: • participate actively in discussing and listing different types of computers in a computer user environment, • discuss with the resource person the criteria used to classify computers, • take turns to match different types of computers to their respective classes, • intelligently assess user computing needs and select appropriate computers for different situations *(a user on a fixed budget, a home business user, a gaming enthusiast, a photographer, a home video enthusiast, a distance education user, a human resources manager, an accountant)*. • confidently share experiences on the use of embedded	1. How are different types of computers used? 2. Why do you use embedded computers?

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			computers (*ATM machines, MP3 players, DVD players, Drones, Anti-lock braking system, Airbag control system, Digital watches, Microwaves),* • in groups, use different types of computers to perform tasks (*draw images, write a letter, play games).*	

Core competencies:

- Critical thinking and Problem solving: learner intelligently assesses user computing needs and selects appropriate computers for different situations.
- Communication and collaboration: learner discusses engagingly with the resource person the criteria to use when classifying computers.

Values:

- Peace when taking turns to match different types of computers to their respective classes.

Pertinent and Contemporary Issues (PCIs):

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

Link to other subjects:

- Music: learner shares experiences on the use of embedded computers such as MP3 and DVD players.

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Assessment Rubric				
Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to explain the types of computers in a computer user environment	Correctly and systematically explains the types of computers in a computer user environment	Correctly explains the types of computers in a computer user environment	Explains correctly some of the types of computers in a computer user environment	Assisted to explain correctly some of the types of computers in a computer user environment
Ability to apply appropriate criteria to classify computers	Appropriately and confidently applies appropriate criteria to classify computers	Applies appropriate criteria to classify computers	Sometimes applies appropriate criteria to classify computers	Helped in applying appropriate criteria to classify computers
Ability to select appropriate types of computers for different situations	Exactly and accurately selects appropriate types of computers for different situations	Selects appropriate type of computes for different situations	Selects some of the appropriate types of computers for different situations	Assisted to select appropriate type of computers for different situations
Ability to describe uses of embedded computers in daily life activities	Correctly and concisely describes uses of embedded computers in daily life activities	Correctly describes uses of embedded computers in daily life activities	Correctly describes some uses of embedded computers in daily life activities	Describes uses of embedded computers in daily life activities with assistance
Ability use different types of computers in performing tasks	Perfectly and confidently uses different types of computers in performing tasks	Perfectly uses different types of computers in performing tasks	Sometimes uses different types of computers in performing tasks	Helped to use different types of computer in performing tasks

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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 a computer user environment c) observe safety precautions and practices in the computer user environment d) appreciate examining emerging trends in computer user environment.	The learner is guided to: • watch a video about different computer user environments, • brainstorm on the factors to consider when setting up a computer user environment, • search for the resources required when setting up a computer user environment and list them, • in groups, set rules to follow in a computer user environment, • practice observing safety precautions when in the computer user environment, • participate actively in setting up a computer user environment, • share ideas on emerging trends in computer user environment.	1. Why do you set up a computer user environment? 2. How do you take care of a computer?
Core competencies: • Critical Thinking and Problem Solving: learner sets rules to follow in a computer user environment. • Creativity and Imagination: learner intelligently sets up a computer user environment.				

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Values:

- Integrity: learner genuinely identifies appropriate resources for a computer user environment.

Pertinent and Contemporary Issues (PCIs):

- Safety education when observing 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.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to explain factors to consider when setting up a computer user environment	Correctly and clearly explains factors to consider when setting up a computer user environment	Correctly explains factors to consider when setting up a computer user environment	Correctly explains some of the factors to consider when setting up a computer user environment	Rarely explains factors to consider when setting up a computer user environment
Ability to identify resources for a computer user environment	Accurately and explicitly identifies resources for a computer user environment	Accurately identifies resources for a computer user environment	Accurately identifies some of the resources for a computer user environment	Attempts to identify resources for a computer user environment
Ability to observe safety precautions and practices in the computer user environment.	Perfectly and confidently observes safety precautions and practices in the computer user environment	Perfectly observes safety precautions and practices in the computer user environment	Perfectly observes some safety precautions and practices in the computer user environment	Tries to observe safety precautions and practices in the computer user environment

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Ability to examine emerging trends in computer user environment	Creatively and precisely examines emerging trends in computer user environment	Creatively examines emerging trends in computer user environment	Creatively examines some of the emerging trends in computer user environment	Attempts to examine emerging trends in computer user environment

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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) utilise physical parts of a computer to minimise wastage e) appreciate interacting with physical parts of a computer.	The learner is guided to: • visit a computer user environment and observe, identify and then list various physical parts of a computer including the peripheral, • take turns to match the physical parts of a computer to their respective functions, • in groups connect physical parts of a computer for use, • take part in modelling interlinked physical parts of a computer, • take turns to talk about reusing or recycling the physical parts of a computer that are in good working condition to minimise wastage, • in groups interact with physical parts of a computer.	1. What are the physical parts of a computer? 2. How do you connect physical parts of a computer?
Core competencies: • Self-efficacy: learner connects physical parts of a computer appropriately and confidently. • Creativity and Imagination: learner takes part in modelling interlinked physical parts of a computer.				

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Values:

- Responsibility: learner participates actively in connecting physical parts of a computer.
- Respect: learner takes turn to match the physical parts of a computer to their respective functions.

Pertinent and Contemporary Issues (PCIs):

- Environmental Education as learners practice reusing or recycling the physical parts of a computer that are in good working condition.

Link to other subjects:

- Visual Arts: learner takes part in modelling interlinked physical parts of a computer.

Assessment Rubric

Indicators	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to identify the physical parts of a computer	Accurately and specifically identifies the physical parts of a computer	Accurately identifies the physical parts of a computer	Accurately identifies some of the physical parts of a computer	Rarely identifies the physical parts of a computer
Ability to explain the functions of the physical parts of a computer	Correctly and systematically explains the functions of the physical parts of a computer	Correctly explains the functions of the physical parts of a computer	Correctly explains some of the functions of the physical parts of a computer	Hardly explains the functions of the physical parts of a computer
Ability to connect the physical parts of a computer for use	Accurately and confidently connects the physical parts of a computer for use	Accurately connects the physical parts of a computer for use	Accurately connects some of the physical parts of a computer for use	Assisted to connect the physical parts of a computer for use

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Ability to utilise physical parts of a computer to minimise wastage	Properly and correctly utilise physical parts of a computer to minimise wastage	Properly utilises physical parts of a computer to minimise wastage	Properly utilises physical some parts of a computer to minimise wastage	Hardly utilises physical parts of a computer to minimise wastage
Ability to interact with physical parts of a computer	Appropriately and confidently interacts with physical parts of a computer	Appropriately interacts with physical parts of a computer	Occasionally interacts with physical parts of a computer	Attempts to interact with physical parts of a computer

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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)**	By the end of the sub strand the learner should be able to: a) apply the appropriate procedure to start and shut down a computer b) explain the functions of the keys in a computer keyboard c) categorize the keys in a computer keyboard d) use pointing devices to manipulate objects in the computer e) appreciate interacting with the keyboard and the pointing devices of a computer.	The learner is guided to: • take part in starting and shutting down a computer using appropriate procedure, • take turns to locate different keys on the computer keyboards and demonstrate their functions, • in groups model or draw different categories of the keys on the computer keyboard, • take part in manipulating objects in the computer using pointing devices skills, • practice different ways of using the computer keyboard; *typing a simple text, multiplying numbers, drawing diagrams,* • practice typing using the home keys on the computer keyboard, • in groups, use computer keyboard and pointing devices to; *scroll up pages of a document, make corrections in a text document, draw diagrams,*	1. Why are there different keys in a computer keyboard? 2. How do you use a computer keyboard?

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Core competencies:

- Digital Literacy: learner uses the computer keyboard and a pointing device to type simple text and manipulate objects on the screen.
- Learning to learn: learner practices typing using the home keys on the computer keyboard.

Values:

- Love: learner cheerfully shares experiences on the use of the computer keyboard and pointing devices.
- Responsibility: learner shuts down a computer appropriately.

Pertinent and Contemporary Issues (PCIs):

- Learner Support Programmes: peer education, as learners assist one another on how to use pointing devices to manipulate objects in the computer.

Links to other subjects:

- Visual Arts: as a learner creatively and correctly models or draws a well labelled computer keyboard showing the categories of the keys

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to apply the appropriate procedure to start and shut down a computer	Perfectly and confidently applies the appropriate procedure to start and shut down a computer	Perfectly applies the appropriate procedure to start and shut down a computer	Sometimes applies the appropriate procedure to start and shut down a computer	Assisted to apply the appropriate procedure to start and shut down a computer
Ability to explain the functions of the keys in a computer keyboard	Correctly and systematically explains the functions of the keys in a computer keyboard	Correctly explains the functions of the keys in a computer keyboard	Correctly explains some of the functions of the keys in a computer keyboard	Attempts to explain the functions of the keys in a computer keyboard

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Ability to categorize the keys in a computer keyboard	Correctly and accurately categorizes the keys in a computer keyboard	Correctly categorizes the keys in a computer keyboard	Correctly categorizes some of the keys in a computer keyboard	Hardly categorizes the keys in a computer keyboard
Ability to use pointing devices to manipulate objects in the computer	Appropriately and confidently uses pointing devices to manipulate objects in the computer	Appropriately uses pointing devices to manipulate objects in the computer	Appropriately uses some pointing devices to manipulate objects in the computer	Makes effort to use pointing devices to manipulate objects in the computer
Ability to interact with the keyboard and pointing devices of a computer	Appropriately and creatively interacts with the keyboard and pointing devices of a computer	Appropriately interacts with the keyboard and pointing devices of a computer	Occasionally appropriately interacts with the keyboard and pointing device of a computer	Attempts to interact with the keyboard and pointing devices of a computer

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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 the society.	The learner is guided to: • search for the meaning of the terms system and computer system, and share the findings with peers, • discuss engagingly the components of a computer system (*hardware, software, liveware*) and list them, • take turns to match components of computer system to their functions, • in groups use computer system components to perform a task; *draw diagrams, search for learning materials*, • take part in creating an illustration of the linkage among the components of a computer system, • shares experiences on the importance of computer systems in the society.	1. Why do you use computer systems? 2. How do computer system components interact?
Core competencies: • Learning to Learn: learner confidently shares experiences on the importance of computer systems in the society. • Creativity and Imagination: learner creates an illustration of the linkage among the components of a computer system.				
Values: • Peace: learner remains calm when creating an illustration of the linkage among the components of a computer system.				

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Pertinent and Contemporary Issues (PCIs):

- Learner Support programmes as learners take turns in matching components of computer system to their corresponding functions during clubs

Link to other subjects:

- Visual Arts: learner creates an illustration of the linkage among the components of a computer system.

Assessment Rubric

Indicators	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to identify the components of a computer system in a computer user environment	Accurately and explicitly identifies the components of a computer system in a computer user environment	Accurately identifies the components of a computer system in a computer user environment	Accurately identifies some of the components of a computer system in a computer user environment	Attempts to identify the components of a computer system in a computer user environment
Ability to relate computer system components to their functions	Correctly and creatively relates computer system components to their functions	Correctly relates computer system components to their functions	Correctly relates some computer system components to their functions	Tries to relate computer system components to their functions
Ability to use computer system components to perform tasks	Appropriately and confidently uses computer system components to perform tasks	Appropriately uses computer system components to perform tasks	Occasionally uses computer system components to perform tasks	Assisted to use computer system components to perform tasks

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Ability to describe the linkage among the components of a computer system	Accurately and expansively describes the linkage among the components of a computer system	Accurately describes the linkage among the components of a computer system	Occasionally describes the linkage among the components of a computer system	Tries to describe the linkage among the components of a computer system
Ability to analyse the importance of computer systems in the society	Accurately and concisely analyses the importance of computer systems in the society	Accurately analyses the importance of computer systems in the society	Accurately analyses some of the importance of computer systems in the society	Rarely analyses the importance of computer systems in the society

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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	The learner is guided to: • visit a computer user environment and list the hardware devices in use, • engage actively in a discussion on the categories of computer hardware (*input devices, central processing unit, output devices and storage devices*), • search for the functions of computer hardware and make a presentation, • take turns to match categories of hardware to their functions, • accurately assess user computing needs and select appropriate computer hardware for different situations, • in groups, use different elements of computer hardware to input data, store, and output information.	1. Why do you categorize computer hardware? 2. How do you use different elements of computer hardware?

Core competencies:

- Critical Thinking: learner assesses user computing needs and select appropriate hardware for different situations.
- Communication and collaboration: as learner engages actively in a discussion on the categories of a computer hardware.

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Values:

- Integrity: learner appropriately assesses user computing needs and select appropriate computer hardware for different situations.
- Unity as learners engages actively in a discussion on the categories of a computer hardware.

Pertinent and Contemporary Issues (PCIs):

- Financial Literacy: learner assesses user computing needs and select appropriate hardware for different situations.

Link to other subjects

- Life Skills Education: learner uses different hardware of a computer to input data, store, and output information.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to identify categories of hardware in a computer system	Correctly and predominantly identifies categories of hardware in a computer system	Correctly identifies categories of hardware in a computer system	Correctly identifies some categories of hardware in a computer system	Attempts to identify categories of hardware in a computer system
Ability to relate categories of hardware to their functions	Appropriately and confidently relates categories of hardware to their functions.	Appropriately relates categories of hardware to their functions	Correctly relates some categories of hardware to their functions.	Hardly relates categories of hardware to their functions
Ability to select appropriate hardware for different situations	Appropriately and creatively selects appropriate hardware for different situations	Selects appropriate hardware for different situations	Sometimes selects appropriate hardware for different situations	Has difficulty in selecting appropriate hardware for different situations
Ability to use different elements of	Appropriately and confidently uses different	Appropriately uses different elements of	Appropriately uses some different	Assisted to use different elements of

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computer hardware in performing daily life activities	elements of computer hardware in performing daily life activities	computer hardware in performing daily life activities	elements of computer hardware in performing daily life activities	computer hardware in performing daily life activities
Ability to examine the role of hardware elements in a computer	Correctly and keenly examines the role of hardware elements in a computer	Correctly examines the role of hardware elements in a computer	Correctly examines some of the role of hardware elements in a computer	Tries to examine the role of hardware elements in a computer

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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) categorize input devices based on their functionality c) select appropriate input devices for different situations d) use input devices to perform tasks e) appreciate reusing input devices to minimise wastage	The learner is guided 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),* • consult a computer specialist to demonstrate how different categories of input devices operate, • match 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,* • in turns discuss factors to consider when selecting an input device, • assess user computing needs and	1. Why are there input devices in a computer system? 2. How are input device used?

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			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*), • use available input devices to perform tasks assigned by the facilitator, • creatively reuse input devices which are still in good condition to minimise wastage.	

Core competencies:

- Critical Thinking and Problem Solving: learner assesses user computing needs and selects appropriate input devices for different situations.
- Communication and Collaboration: learner listens keenly as they discusses on the factors considered when selecting an input device.

Values:

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

Pertinent and Contemporary Issues (PCIs):

- Environmental Education is promoted as learners practice reusing input devices which are still in good condition to minimise wastage.

Link to other subjects:

- Integrated Science when categorizing input devices based on their functionality.

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Assessment Rubric				
Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to identify input devices in a computer system	Correctly and explicitly identifies various input devices in a computer system	Correctly identifies various input devices in a computer system	Correctly identifies some of the input devices in a computer system	Tries to identify various input devices in a computer system
Ability to categorize input devices based on their functionality	Accurately and keenly relates input devices to their functions	Accurately relates input devices to their functions	Accurately relates some input devices to their functions	Attempts to relate input devices to their functions
Ability to select input devices for different situations	Correctly and confidently selects input devices for different situations	Correctly selects input devices for different situations	Correctly selects some input devices for different situations	Tries to select input devices for different situations
Ability to use input device to perform tasks	Appropriately and creatively uses input device to perform tasks	Appropriately uses input device to perform tasks	Appropriately uses some of the input device to perform tasks	Attempts to use input device to perform tasks
Ability to reuse input devices to minimise wastage	Correctly and innovatively reuses input devices to minimise wastage	Correctly reuses input devices to minimise wastage	Correctly reuses some of the input devices to minimise wastage	Assisted to reuse input devices to minimise wastage

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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 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 e) appreciate analysing the role of processors in computers	The learner is guided to: • search for the meaning of the term CPU and motherboard, • in groups watch a video that shows the location of the CPU in a computer, • watch a video simulation of the functional organisation of the CPU, • consult a computer specialist to discuss the functional elements of a CPU (*arithmetic and logic unit, control unit and the special memory*), • in turns navigate computer system specifications to determine the type of processor in a computer and list them, • use computers with different types of processors to perform tasks; *draw diagrams, type words, add numbers,* • In groups discuss the role of processors in computers	1. How does a computer system use the CPU? 2. Why do computers have processors?

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Core competencies:

- Self-efficacy: learner independently and confidently navigates through computer system specifications to determine the type of processor.
- Creativity and imagination: learner creates illustrations showing the functional elements of the CPU and display in the learning environment.

Values:

- Unity as learners work together to achieve a common goal when searching for the technological trends in the development of the CPU.

Pertinent and Contemporary Issues (PCIs):

- Life skills as learners navigate through computer system specifications to determine the type of processor.

Link to other subjects:

- Life Skills Education: learner confidently navigates through computer system specifications to determine the type of processor.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to locate the CPU in a computer	Accurately and creatively locates the CPU in a computer system	Accurately locates the CPU in a computer system	Sometimes locates the CPU in a computer system	Assisted to locate the CPU in a computer system
Ability to explain functional elements of CPU in a computer system	Correctly and explicitly explains functional units of CPU in a computer system	Correctly explains functional units of CPU in a computer system	Correctly explains some functional units of CPU in a computer system.	Rarely explains functional units of CPU in a computer system
Ability to explore different types of	Appropriately and creatively explores	Appropriately explores different	Appropriately explores some types	Assisted to explore different types of

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processors used in computing devices	different types of processors used in computing devices	types of processors used in computing devices	of processors used in computing devices	processors used in computing devices
Ability to use computers with different types of processors to perform tasks	Correctly and confidently uses computers with different types of processors to perform tasks	Correctly uses computers with different types of processors to perform tasks	Sometimes uses computers with different types of processors to perform tasks	Assisted to use computers with different types of processors to perform tasks
Ability to analyse the role of processors in computers	Correctly and creatively analyses the role of processors in computers	Correctly analyses the role of processors in computers	Correctly analyses some role of processors in computers	Attempts analyse the role of processors in computers

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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) categorize 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.	The learner is guided to: • observe and list available output devices in the computer user environment, such as (*printers, monitors, speakers, projectors, plotters, actuator),* • consult a computer specialist to discuss and demonstrate the various functions of output devices, • watch a video clip on categories of output devices and a list them, • in turns participate in matching output devices into their appropriate categories, • in groups, compare hardcopy output and softcopy output outlining their advantages and disadvantages, • in turns discuss the factors considered when selecting output device, • take turns in selecting appropriate output devices for different situations, • share experiences on safe use and care of output devices, • in groups perform a task assigned by	1. Why are there different output devices? 2. How do you use output device?

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			the facilitator using available output device.	

Core competencies:

- Critical Thinking and Problem Solving: learner develops evaluation and decision making skills as they compare softcopy and hardcopy output.
- Citizenship: learner participates engagingly in a discussion on the factors considered when selecting output device.

Values:

- Responsibility: learner practices safe use and care of output devices.
- Unity: learner participates engagingly in a discussion on the factors considered when selecting output device.

Pertinent and Contemporary Issues (PCIs):

- Safety and security: learner practices safe use and care of output devices.

Link to other subjects:

- Health Education: learner practices safe use and care of output devices.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to identify output devices of a computer system	Accurately and predominantly identifies output devices of a computer system	Accurately identifies output devices of a computer system	Accurately identifies some output devices of a computer system	Hardly identifies output devices of a computer system
Ability to describe the functions of output devices in a computer system	Correctly and concisely describes the functions of output devices in a computer system	Correctly describes the functions of output devices in a computer system	Correctly describes some of the functions of output devices in a computer system	Tries to describe the functions of output devices of a computer system

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Ability to categorize computer output devices based on the output generated	Correctly and keenly categorizes computer output devices based on the output generated	Correctly categorizes computer output devices based on the output generated	Attempts to categorize computer output devices based on the output generated	Has difficulty in categorizing computer output devices based on the output generated
Ability to select appropriate output devices for different situations	Predominantly and accurately selects output devices for different situations	Accurately selects appropriates output devices for different situations	Accurately selects some output devices for different situations	Attempts to select appropriates output devices for different situations
Ability to use output devices to perform daily life activities	Creatively and confidently uses output devices to perform daily life activities	Creatively uses output devices to perform daily life activities	Occasionally uses output devices to perform daily life activities creatively	Assisted to use output devices to perform daily life activities
Ability to examine the technological trends in the development of output devices	Appropriately and precisely examines the technological trends in the development of output devices	Appropriately examines the technological trends in the development of output devices	Appropriately examines some technological trends in the development of output devices	Rarely examines the technological trends in the development of output devices

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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.	**The learner is guided to:** • search for information on different cables and ports used in computer systems, • consult a computer specialist to engage in a discussion on the types of cables and ports used in computer systems, • take turns to match ports to their corresponding cables, • participate actively in communal activities which deal with reusing or recycling the cables to minimize wastage, • consult a computer user to discuss and demonstrate how to use cables and ports appropriately, • in groups connect cables to their corresponding ports in computer systems.	1. Why do computer systems have ports? 2. How do you use cables?
Core competencies: • Self-efficacy: learner takes turns to match ports to their corresponding cables. • Communication and collaboration: learner consults a computer specialist to engage in a discussion and demonstration on the types of cables and ports used in a computer.				

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- Citizenship: learner participates in communal activities which deals with reusing or recycling cables to minimize wastage.

Values:

- Patriotism: learner participates actively in communal activities which deals with reusing or recycling of cables to minimize 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.

Assessment Rubric

Indicators	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to identify cables and ports in computer systems	Appropriately and accurately identifies cables and ports in computer systems	Appropriately identifies cables and ports in computer systems	Correctly identifies some cables and ports in computer systems	Rarely identifies cables and ports in computer systems
Ability to explain the types of cables used in computer systems	Correctly and expansively explains the types of cables used in computer systems	Correctly explains the types of cables used in computer systems	Correctly explains some types of cables used in computer systems.	Hardly explains the types of cables used in computer systems
Ability to relate ports to their corresponding cables in computer systems	Accurately and keenly relates ports to their corresponding cables in computer systems	Accurately relates the ports to their corresponding cables in computer systems	Accurately relate some of the ports to their corresponding cables in a computer	Attempts to relate ports to their corresponding cables in computer systems

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Ability to connect cables to ports in computer systems	Correctly and confidently connects cables to ports in computer systems	Correctly connects cables to ports in computer systems	Occasionally connects cables to ports in computer systems	Assisted to connects cables to ports in computer systems
Ability to use cables and ports in computer systems	Appropriately and creatively uses cables and ports in computer systems	Appropriately uses cables and ports in computer systems	Sometimes uses cables and ports in computer systems appropriately	Tries to use cables and ports in computer systems

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COMMUNITY SERVICE LEARNING PROJECT

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
1.0 Foundation of Computer Science	**1.14 Computer Setup** **(CSL Project)**	By the end of the project the learner should be able to: a) identify the problems experienced in the society when setting up a computer b) describe different ways of setting up a computer c) apply appropriate instructions to set up a computer d) set up a computer for use e) explore ways to overcome the challenges experienced when setting up a computer f) enjoy booting a computer successfully for use.	The learner is guided to: • visit a computer user environment, discuss engagingly with the users in the community and list the challenges they experience when setting up a computer, • keenly search for different ways of setting up a computer, • share experiences on precautions to follow when setting up a computer, • consult a computer specialist to guide on tools and requirements needed when setting up a computer, and to demonstrate how to setup a computer, • intelligently use knowledge, skills and attitudes acquired to setup a computer appropriately, • take turns to share the benefits	1. How do you set up a computer? 2. Why are safety precautions observed when setting up a computer?

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			and challenges experienced when setting up a computer, • creatively device ways to overcome the challenges experienced when setting up a computer, • eagerly enjoy booting a computer successfully for use, • participate actively in communal activities which involve setting up computers, • consult a computer technician to assist in identification of computers which are not functioning, select the parts which are still in good condition and are suitable to be reused or recycled, and make use of them when setting up a computer. • keenly follow the appropriate instructions when setting up a computer: *1. identify its port and interface cable,* *2. gently and carefully connect*	

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			the interface cable of each device to the correct port and to the device if it is not already fixed permanently, 3. *connect the computer to the power source and switch it on,* 4. *observe boot up information on the screen to see whether power on-self test (POST) displays any error message,* 5. *boot a computer successfully to show that it was properly setup,* 6. *if the computer is completely new, programs have to be copied or installed on the hard disk.*	

Core competencies:

- Communication and Collaboration: learner actively contributes to group discussions and participates in setting up a computer.
- Citizenship: learner discusses engagingly with the users in the community and list the challenges they experience when setting up a computer.
- Creativity and Imagination: learner creatively devices ways to overcome the challenges experienced when setting up a computer.

Values:

- Unity: learner teams up with others in setting up a computer.

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- Respect: 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 is promoted as learners share experiences on precautions to follow when setting up a computer during society and clubs

Link to other subjects:

- Pre-Technical and Pre-Career Education: learner demonstrates ability to apply appropriate instructions to set up a computer.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to identify challenges experienced when setting up a computer	Appropriately and accurately identifies challenges experienced when setting up a computer	Correctly identifies challenges experienced when setting up a computer	Correctly identifies some of the challenges experienced when setting up a computer	Rarely identifies challenges experienced when setting up a computer
Ability to apply appropriate instructions to set up a computer	Correctly and confidently applies appropriate instructions to set up a computer	Applies appropriate instructions to set up a computer	Sometimes applies appropriate instructions to set up a computer	Assisted to apply appropriate instructions to set up a computer.
Ability to set up a computer for use	Confidently and appropriately sets up a computer for use	Appropriately sets up a computer for use	Sometimes sets up a computer for use	Assisted to set up a computer for use
Ability to explore ways to overcome the challenges experienced when	Intelligently and creatively explores ways to overcome the challenges experienced	Creatively explores ways to overcome the challenges experienced when	Creatively explores some ways to overcome the challenges	Attempts to explore ways to overcome the challenges experienced when

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setting up a computer	when setting up a computer	setting up a computer	experienced when setting up a computer	setting up a computer
Ability to boot a computer successfully for use	Keenly and correctly boots a computer successfully for use	Correctly boots a computer successfully for use	Sometimes boots computer successfully for use	Assisted to boot computer successfully for use

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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 in a computer user environment b) explore ways of mitigating physical threats to computers in a computer user environment c) apply appropriate control measures to minimise physical threats to computers in a computer user environment d) appreciate using computers in a physically secured computer user environment.	The learner is guided to: • engagingly discuss physical threats to computers (*theft, natural disasters, hardware failure)* in a computer user environment, • consult a computer specialist to discuss ways of mitigating physical threats to computers in a computer user environment, • participate in using appropriate control measures to minimise physical threats to computers in a computer user environment, • in groups use computers in a physically secured user environment.	1. What physical threats have encountered when using computers? 2. How do you secure computers from physical threats?
Core competencies: • Critical Thinking and Problem Solving: learner explores ways of mitigating physical threats to computers in a computer user environment.				

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Values:

- Responsibility: learner participate in securing computers in a computer user environment.

Pertinent and Contemporary Issues (PCIs):

- Safety and security: learner applies physical mitigation measures to secure computers in a computer user environment.

Link to other subjects:

- Health Education: learner applies physical mitigation measures to secure a computer user environment.

Assessment Rubric

Indicators	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to identify physical threats to computers in a computer user environment	Correctly and specifically identifies physical threats to computers in a computer user environment	Correctly identifies physical threats to computers in a computer user environment	Correctly identifies some of the physical threats to computers in a computer user environment	Tries to identify physical threats to computers in a computer user environment
Ability to explore ways of mitigating physical threats to computers in a computer user environment	Appropriately and intelligently explores ways of mitigating physical threats to computers in a computer user environment	Appropriately explores ways of mitigating physical threats to computers in a computer user environment	Appropriately explores some ways of mitigating physical threats to computers in a computer user environment	Hardly explores ways of mitigating physical threats to computers in a computer user environment
Ability to apply appropriate control	Correctly and confidently applies	Correctly applies appropriate control	Correctly applies appropriate control	Assisted to apply appropriate control

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measures to minimise physical threats to computers in a computer user environment	appropriate control measures to minimise physical threats to computers in a computer user environment	measures to minimise physical threats to computers in a computer user environment	measures to minimise physical threats to computers in a computer user environment	measures to minimise physical threats to computers in a computer user environment
Ability to use computers in a physically secured computer user environment	Appropriately and creatively uses computers in a physically secured computer user environment	Appropriately uses computers in a physically secured computer user environment	Sometimes uses computers in a physically secured computer user environment appropriately	Rarely uses computers in a physically secured computer user environment

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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 in a computer user environment b) apply appropriate techniques to mitigate health complications associated with the use of computers c) observe safe use and best practices when using computers d) appreciate organising workstation to minimise health complications when using computers.	The learner is guided to: • discuss in groups health complications associated with the use of computers, • engagingly discuss techniques to mitigate health complications associated with the use of computers, • independently use appropriate techniques to mitigate health complications • share experiences on the safety practices to be observed when using computers • always observe safety precautions and best practices when using computer, • take turns to organise workstation 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: • Critical Thinking and Problem Solving: learner explores techniques to mitigate health complications associated with the use of computers.				

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- Communication and Collaboration: learner shares experiences on the safety practices to be observed when using a computer.

Values:

- Respect: 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: learner observes safe use and best practices when using a computer in a computer user environment.

Links to other subjects:

- Health Education as learners observe safe use and best practice when using computers in a computer user environment.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to identify health complications associated with the use of computers in a computer user environment	Appropriately and specifically identifies health complications associated with the use of computers in a computer user environment	Appropriately identifies health complications associated with the use of computers in a computer user environment	Appropriately identifies some of the health complications associated with the use of computers in a computer user environment	Tries to identify health complications associated with the use of computers in a computer user environment
Ability to apply appropriate techniques to mitigate health complications	Accurately and confidently applies appropriate techniques to mitigate health complications	Accurately applies appropriate techniques to mitigate health complications	Accurately applies some of the appropriate techniques to mitigate health complications	Hardly applies appropriate techniques to mitigate health complications

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associated with the use of computers	associated with the use of computers	associated with the use of computers	associated with the use of computers	associated with the use of computers
Ability to observe safe use and best practices when using computers	Correctly and carefully observes safe use and best practices when using computers	Correctly observes safe use and best practices when using computers	Sometimes observes safe use and best practices when using computers correctly	Rarely observes safe use and best practices when using computers
Ability to organise workstation to minimise health complications when using computers	Appropriately and securely organises workstation to minimise health complications when using computers	Correctly organises workstation to minimise health complications when using computers	Occasionally organises workstation to minimise health complications when using computers correctly	Assisted to organise workstation to minimise health complications when using computers

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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) apply appropriate strategies to prevent repetitive strain injury when using a computer d) appreciate using computers safely to minimising the repetitive strain injury.	The learner is guided to: • share experiences on common symptoms of repetitive strain injury (*upper limb disorders, eye strain, stress and fatigue*) for awareness, • consult a resource person and ask questions for clarity on the causes of repetitive strain injury, • watch a video about the causes of repetitive strain injury and list them, • in groups discuss the strategies for preventing repetitive strain injury when using a computer, • use the appropriate strategies to prevent repetitive strain injury when using a computer • practice observing safe ways when using computers for a longer period.	1. What are the consequences of prolonged use of a computer? 2. How does repetitive strain injury affect your health?
Core competencies: • Critical Thinking and Problem Solving as a learner asks questions for clarity on the causes of repetitive strain injury. • Communication and collaboration as a learner shares experiences on the symptoms of repetitive strain injury.				

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Values:

- Responsibility as a learner observes safe use and best practices when using a computer for a longer period.

Pertinent and Contemporary Issues (PCIs):

- Health issues as a learner observe safe use and best practices when using a computer for a longer period.

Link to other subjects:

- Health Education as learners observe safe use and best practice when using computers.

Assessment Rubric

Indicators	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to identify the symptoms of repetitive strain injury for awareness	Consciously and appropriately identifies the symptoms of repetitive strain injury for awareness	Appropriately identifies the symptoms of repetitive strain injury for awareness	Appropriately identifies some of the symptoms of repetitive strain injury for awareness	Rarely identifies the symptoms of repetitive strain injury for awareness
Ability to explain the causes of repetitive strain injury for consciousness when using a computer	Correctly and systematically explains the causes of repetitive strain injury for consciousness when using a computer	Correctly explains the causes of repetitive strain injury for consciousness when using a computer	Correctly explains some causes of repetitive strain injury for consciousness when using a computer	Hardly explains the causes of repetitive strain injury for consciousness when using a computer
Ability to apply appropriate strategies to prevent repetitive strain injury when using a	Intelligently and frequently applies appropriate strategies to prevent repetitive strain injury when using a computer	Intelligently applies appropriate strategies to prevent repetitive strain injury when using a	Intelligently applies some of the appropriate strategies to prevent repetitive strain injury when	Attempts to apply appropriate strategies to prevent repetitive strain injury when using a

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computer		computer	using a computer	computer
Ability to use computers safely to minimising the repetitive strain injury	Correctly and confidently uses computers safely to minimising the repetitive strain injury	Correctly uses computers safely to minimising the repetitive strain injury	Sometimes uses computers safely to minimising the repetitive strain injury	Assisted to use computers safely to minimising the repetitive strain injury

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Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Computer And Society	**2.4 Data Safety in Computers** **(2 Lessons)**	By the end of the sub strand the learner should be able to: a) explain threats to data stored in a computer b) identify the control measures for securing data in a computer c) apply the control measures to secure data in a computer d) appreciate the use best practices to secure data in a computer.	The learner is guided to: • brainstorm on the meaning of the terms data safety, data privacy, and data threats, • consult a computer specialist to discuss data threats and their control measures, • in groups watch a video on control measures for securing data in a computer, • in turns discuss ways of securing data stored in a computer (*use of passwords, backup, anti-viruses, user access level, user logs*), • practice using best practices 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: • Communication and Collaboration: learner discusses ways of securing data stored in a computer. • Critical Thinking and Problem Solving: learner intelligently applies the control measures to secure data in a computer.				
Values: • Peace: learner calmly watches a video on control measures for securing data in a computer.				

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Pertinent and Contemporary Issues (PCIs):

- Safety and Security: learner uses data safety measures to secure data in a computer.

Link to other subjects:

- Life Skills Education as a leaner uses appropriate data safety measures to secure data in a computer.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to explain threats to data stored in a computer	Correctly and clearly explains threats to data stored in a computer	Correctly explains threats to data stored in a computer	Correctly explains some of the threats to data stored in a computer	Rarely explains threats to data stored in a computer
Ability to identify the control measures for securing data in a computer	Appropriately and creatively identifies the control measures for securing data in a computer	Appropriately identifies the control measures for securing data in a computer	Appropriately identifies some control measures for securing data in a computer	Hardly identifies the control measures for securing data in a computer
Ability to apply the control measures to secure data in a computer	Correctly and confidently applies the control measures to secure data in a computer	Correctly applies the control measures to secure data in a computer	Sometimes applies the control measures correctly to secure data in a computer	Attempts to apply the control measures to secure data in a computer
Ability to use the best safety practices to secure data in a computer	Appropriately and creatively uses best practices to secure data in a computer	Correctly uses the best practices to secure data in a computer	Sometimes uses best practices to secure data in a computer	Assisted to use best practices to secure data in a computer

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Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
2.0 Computer and Society	**2.5 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) apply online safety measures when using a computer d) appreciate examining the importance of online safety when using a computer.	The learner is guided to: • brainstorm on the meaning of the terms online safety, and online safety risks, • take turns to share the online threats experienced when using a computer, • consult a computer specialist to discuss online threats *(such as cyber bullying, phishing, online fraud, friend requests from unknown people)* to a computer user, • watch a video on safety measures to observe when online *(not sharing pictures, location, securing profiles*), • engagingly discuss with a resource person how to solve online safety issues (*cyber bullying, phishing, online fraud, friend requests from unknown people),*	1. What data do you share when online? 2. How do you protect yourself from cyber bulling?

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			• always practice observing online safety measures when using a computer, • share experiences about the importance of online safety when using a computer.	

Core competencies:

- Communication and collaboration: learner take turns to share the online threats experienced when using a computer
- Learning to learn: learner shares experiences about online safety.

Values:

- Responsibility: learner applies safety measures when online.

Pertinent and Contemporary Issues (PCIs):

- Security issues: learner applies safety measures when online.

Link to other subjects:

- Life Skills Education: learner always practice observing online safety measures when using a computer.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to explain online threats to a computer user	Correctly and expansively explains online threats to a computer user	Correctly explains online threats to a computer user	Correctly explains some of the online threats to a computer user	Rarely explains online threats to a computer user
Ability to identify online safety measures to observe	Appropriately and creatively identifies online safety	Appropriately identifies online safety measures to	Appropriately identifies some online safety	Hardly identifies online safety measures to

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when using a computer	measures to observe when using a computer.	observe when using a computer	measures to observe when using a computer	observe when using a computer
Ability to apply online safety measures when using a computer	Appropriately and confidently applies online safety measures when using a computer	Appropriately applies online safety measures when using a computer	Sometimes applies online safety measures appropriately when using a computer	Assisted to apply online safety measures when using a computer
Ability to examine the importance of online safety when using a computer	Correctly and keenly examines the importance of online safety when using a computer	Correctly examines the importance of online safety when using a computer	Correctly examines some of the importance of online safety when using a computer	Rarely examines the importance of online safety when using a computer

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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) analyse the characteristics of personal data for protection from online identity theft b) describe techniques that protect personal data from online disclosure c) apply 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 is guided to: • share the online identity threats experienced when using a computer, • engagingly discuss the characteristics of personal and sensitive data (*personal name, address, family details, images, date of birth, a photograph in school uniform, medical history*), • take turns to share ideas and illustrations on how to keep personal and sensitive data from public when online, • consult a resource person to discuss the use of social media including knowing how to block and report unwanted users, • discuss awareness of potential dangers of meeting an online contact face to face, • Take turns to elaborate on rules associated with online etiquette (*avoid distribution of inappropriate*	1. Why do you post personal information online? 2. How is online identity theft protected?

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			images, avoid use of inappropriate language, respecting confidentiality of personal data of other people), • share experiences on responsible use of computers when online to safeguard digital footprint.	

Core competencies:

- Communication and collaboration when taking turns to elaborate on rules associated with online etiquette.
- Learning to learn when sharing experiences on responsible use of computers to safeguard digital footprint.

Values:

- Integrity: learner uses computers responsibly to safeguard digital footprint.
- Respect when taking turns to elaborate on rules associated with online etiquette.
- Love as a learner share experiences on responsible use of computers to safeguard digital footprint.

Pertinent and Contemporary Issues (PCIs):

- Safety issues: learner shares experiences about online identity safety.

Links to other subjects:

- Social Studies as a learner shares experiences on responsible use of computers to safeguard digital footprint.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to analyse the characteristics of personal and sensitive data for	Correctly and concisely analyses the characteristics of personal and sensitive	Correctly analyses the characteristics of personal and sensitive data for	Correctly analyses some of the characteristics of personal and	Hardly analyses the characteristics of personal and sensitive data for

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protection from online identity theft	data for protection from online identity theft	protection from online identity theft	sensitive data for protection from online identity theft	protection from online identity theft
Ability to describe the techniques of protecting personal data from online disclosure	Systematically and briefly describes the techniques of protecting personal data from online disclosure	Systematically describes the techniques of protecting personal data from online disclosure	Correctly describes some of the techniques of protecting personal data from online disclosure	Rarely describes the techniques of protecting personal data from online disclosure
Ability to apply appropriate methods to protect personal data from online disclosure	Correctly and confidently applies appropriate methods to protect personal data from online disclosure	Correctly applies appropriate methods to protect personal data from online disclosure	Occasionally applies appropriate methods to protect personal data from online disclosure	Attempts to apply appropriate methods to protect personal data from online disclosure
Ability to adhere to rules associated with online etiquette when interacting with computers	Cautiously and correctly adheres to rules associated with online etiquette when interacting with computers	Correctly adheres to rules associated with online etiquette when interacting with computers	Correctly adheres to some rules associated with online etiquette when interacting with computers	Tries to adhere to rules associated with online etiquette when interacting with computers
Ability to use computers responsibly when online to safeguard digital footprint	Appropriately and confidently uses computers responsibly when online to safeguard digital footprint	Appropriately uses computers responsibly when online to safeguard digital footprint	Sometimes uses computers responsibly when online to safeguard digital footprint	Rarely uses computers responsibly when online to safeguard digital footprint

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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 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 the society.	The learner is guided to: • watch a video clip simulating a computer network, • brainstorm the definition of the term network and computer network, • share ideas on available networks in the society such as road network and then relate them to computer networks, • in groups use locally available materials to model computer networks, • debate on the benefits of computer networks in the society, • share experiences on the challenges of computer networks in the society, • in turns discuss the purpose of computer networks in the society.	1. Why do you use computer networks? 2. How do you form computer networks?

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Core competencies:

- Self-efficacy: learner shares ideas on available networks in the society.
- Creativity and Imagination: learner creatively and innovatively uses locally available materials to model a computer network.
- Effective communication: learner debates on the benefits of computer networks in the society.

Values:

- Respect: learner accommodates others ideas on available networks in the society.

Pertinent and Contemporary Issues (PCIs):

- Life skills: learner debates on the benefits of computer networks in the society.

Link to other subjects:

- Visual Arts: learner uses locally available materials to model computer networks.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to relate computer networks to available types of networks	Correctly and intelligently relates computer networks to available types of networks	Correctly relates computer networks to available types of networks	Sometimes relates computer networks to available types of networks	Rarely relates computer networks to available types of networks
Ability to use locally available materials to model computer networks	Creatively and innovatively uses locally available materials to model computer networks	Creatively uses locally available materials to model computer networks	Sometimes uses locally available materials to model computer networks	Assisted to use locally available materials to model computer networks
Ability to explain the benefits of	Correctly and clearly explains benefits of	Correctly explains the benefits of computer	Correctly explains some of the benefits of	Hardly explains the benefits of

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computer networks in the society	computer networks in the society	networks in the society	computer networks in the society	computer networks in the society
Ability to identify the challenges of computer networks in the society	Appropriately and concisely identifies challenges of computer networks in society	Appropriately identifies the challenges of computer networks in the society	Appropriately identifies some challenges of computer networks in the society	Hardly identifies the challenges of computer networks in the society
Ability to examine the purpose of computer networks in the society	Correctly and keenly examines purpose of computer networks in the society	Correctly examines the purpose of computer networks in the society	Correctly examines some purpose of computer networks in the society.	Rarely examines the purpose of computer networks in the society

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Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
3.0 Computer Networks	**3.2 Connecting to 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 is guided to: • visit a computer user environment and list the type of available computer network *(wireless or cabled networks)*, • watch a video clip simulating how to connect to available computer network in the immediate environment *(wireless or cabled network)*, • in groups, connect to a computer network in the immediate environment, • use digital devices such a phones, tablets, computers to share a 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: • Digital literacy: learner connects to a computer network in the immediate environment. • Self-efficacy: learner connects to and uses computer networks in the immediate environment to share resources with peers.				
Values:				

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

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to identify available computer networks in the immediate environment	Correctly and intelligently identifies available computer networks in the immediate environment	Correctly identifies available computer networks in the immediate environment	Correctly identifies some of the available computer networks in the immediate environment	Rarely identifies available computer networks in the immediate environment
Ability to connect to the available computer networks in the immediate environment	Correctly and confidently connects to the available computer networks in the immediate environment	Correctly connects to the available computer networks in the immediate environment	Sometimes connects correctly to the available computer networks in the immediate environment	Assisted to connect to the available computer networks in the immediate environment
Ability to use the available computer network in the immediate environment	Consciously and creatively uses the available computer network in the	Creatively uses the available computer network in the immediate	Occasionally uses creatively the available computer network in the	Hardly uses the available computer network in the immediate

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	immediate environment	environment	immediate environment	environment
Ability to share resources through computer networks in the immediate environment	Appropriately and intelligently shares resources through computer networks in the immediate environment	Appropriately shares resources through computer networks in the immediate environment	Appropriately shares some resources through computer networks in the immediate environment	Attempts to shares resources through computer networks in the immediate environment

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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 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 learner is guided to: • search for the meaning of the term internet and present to peers, • debate on the benefits and challenges of the internet, • in groups, discuss ways of overcoming challenges of the internet in the immediate environment, • discuss the basic requirements for internet connectivity *(Internet Service Provider (ISP), Internet software, communication media, communication device),* • share experiences on interaction with the internet and list the services available, • in turns select service available in the internet and use it to search for a relevant topical	1. Why do you use internet? 2. How do you connect to internet?

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		internet as a computer network resource.	issue, • use the internet to search for a topical issue.	

Core competencies:
- Citizenship: learner connects and shares ideas worldwide through the internet.
- Digital literacy: learner accesses internet and searches for a relevant topical issue.

Values:
- Respect: learner accommodate others' views when debating on the benefits and challenges of internet.

Pertinent and Contemporary Issues (PCIs):
- Peer Education: learner shares experience on the use of the internet to search for a topical issue.

Link to other subjects:
- Social studies: learner connects to and uses the internet to search for a relevant topical issue.

Assessment Rubric

Indicators	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to describe the internet as a resource that runs on a global network of computers	Correctly and concisely describes the internet as a resource that runs on a global network of computers	Correctly describes the internet as a resource that runs on a global network of computers	Sometimes describes correctly the internet as a resource that runs on a global network of computers	Tries to describe the internet as a resource that runs on a global network of computers

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Ability to explain benefits and challenges of internet in the immediate environment	Appropriately and comprehensively explains benefits and challenges of internet in the immediate environment	Appropriately explains benefits and challenges of internet in the immediate environment	Appropriately explains some of the benefits and challenges of internet in the immediate environment	Hardly explains benefits and challenges of internet in the immediate environment
Ability to identify basic requirements for internet connectivity	Correctly and explicitly identifies basic requirements for internet connectivity	Correctly identifies basic requirements for internet connectivity	Correctly identifies some of the basic requirements for internet connectivity	Rarely identifies basic requirements for internet connectivity
Ability to explore ways of overcoming challenges of internet in the immediate environment	Creatively and intelligently explores ways of overcoming challenges of internet in the immediate environment	Creatively explores ways of overcoming challenges of internet in the immediate environment	Creatively explores some of the ways of overcoming challenges of internet in immediate environment	Attempts to explore ways of overcoming challenges of internet in the immediate environment
Ability to connect the internet to search for a topical issue	Correctly and creatively connects the internet to search for a topical issue	Correctly connects the internet to search for a topical issue	Sometimes connects the internet correctly to search for a topical issue	Assisted to connect the internet to search for a topical issue
Ability to use the internet as a computer network resource	Appropriately and intelligently uses the internet as a computer network resource	Appropriately uses the internet as a computer network resource	Sometimes uses the internet appropriately as a computer network resources	Hardly uses the internet as a computer network resources

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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 d) use a web browser to locate resources in the WWW e) appreciate the use of WWW as a repository of information.	The learner is guided to: • use available learning resources to search for the meaning of the terms World Wide Web (WWW), web browsers, uniform resource locator (URL), • in turns discuss examples of web browsers (*explorer, Firefox, Chrome, Netscape, Opera, Safari*) • launch and navigate a web browser to identify its features, • take turns to write URL format: protocol://hostname/other information • participate in giving examples of URL • type a web resource Uniform Resource Locator (URL), and discuss its components, • take turns to demonstrate how	1. How do you access internet resources? 2. Why do you use a web browser ?

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			web browsers work, • practice using a web browser to locate relevant internet resources.	

Core competencies to be developed:

- Learning to learn: learner wisely uses the acquired knowledge, skills and attitude to search for relevant resources using a web browser.
- Digital Literacy: learner develops connecting skill when using a web browser to search for and share information.

Values

- Peace : learner take turns to demonstrate how web browsers work

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.

Assessment Rubric

Indicators	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to explain the importance of WWW as used in computer networks	Appropriately and clearly explains the importance of WWW as used in computer networks	Appropriately explains the importance of WWW as used in computer networks	Appropriately explains the importance of WWW as used in computer networks	Attempts to explain the importance of WWW as used in computer networks
Ability to identify the features of a web browser	Correctly and explicitly identifies the features of a web browser	Correctly identifies the features of a web browser	Correctly identifies some features of a web browser	Rarely identifies the features of a web browser

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Ability to describe the components of a URL	Correctly and concisely describes the components of a URL	Correctly describes the components of a URL	Correctly describes some of the components of a URL	Attempts to describe the components of a URL
Ability to use a web browser to locate resources in the WWW	Appropriately and confidently uses a web browser to locate resources in the WWW	Appropriately uses a web browser to locate resources in the WWW	Sometimes uses a web browser appropriately to locate resources in the WWW	Rarely uses a web browser to locate resources in the WWW
Ability to the use WWW as a repository of information	Correctly and creatively uses the WWW as a repository of information	Correctly uses the WWW as a repository of information	Sometimes uses the WWW correctly as a repository of information	Hardly uses the WWW as a repository of information

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STRAND 4.0: COMPUTER PROGRAMMING

Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Computer Programming	**4.1 Computer 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.	The learner is guided to: • use available learning resources to search for the meaning of the term programming and programs, • in groups discuss the importance of computer programs, • take turns to discuss areas where computer programs are used in daily life and list them, • share ideas on the use of programming in daily life activities, • in groups, start and interact with a computer program accessory such as, a computer game, calculator, paint, snipping tool, media player and note notepad, • share experience on performing daily life activities (*playing computer games, listening to music, performing mathematical operations, drawing objects, type text*) using available computer	1. Why do computers have programs? 2. How do you use computer programs?

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			programs accessories.	

Core competencies to be developed:

- Learning to Learn: learner launch and interact with a computer program for exposure to programming.
- Communication and collaboration: learner engagingly shares ideas on the use of programming in daily life activities.

Values:

- Unity: learner shares ideas on the use of programming in daily life.

Pertinent and Contemporary Issues (PCIs):

- Self-esteem: learner launches and interacts with computer programs.

Link to other subjects:

- Integrated Science: learner interacts with computer programs.
- Visual Arts: learner plays computer games and draws objects using computer program accessories.

Assessment Rubric

Indicators	**Exceeds Expectation**	**Meets Expectation**	**Approaches Expectation**	**Below Expectation**
Ability to explain the importance of programming as used in computing	Appropriately and systematically explains the importance of programming as used in computing	Appropriately explains the importance of programming as used in computing	Appropriately explains some of the importance of programming as used in computing	Tries to explain the importance of programming as used in computing
Ability to identify areas where computer programs are used in daily life	Correctly and explicitly identifies areas where computer programs are used in daily life	Correctly identifies areas where computer programs are used in daily life	Correctly identifies some areas where computer programs are used in daily life	Attempts to identify areas where computer programs are used in daily life

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Ability to launch and interact with a computer program for exposure to programming	Appropriately and confidently launches and interacts with a computer program for exposure to programming	Appropriately launches and interacts with a computer program for exposure to programming	Occasionally launches and interacts with a computer program for exposure to programming	Assisted to launch and interact with a computer program for exposure to programming
Ability to use computer programs to perform daily life activities	Intelligently and confidently uses computer programs to perform daily life activities	Confidently uses computer programs to perform daily life activities	Sometimes uses computer programs confidently to perform daily life activities	Hardly uses computer programs to perform daily life activities

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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.	The learner is guided to: • use available resources to search for the meaning of the term visual programming, • discuss and list examples of visual programming applications used in computer programming, • in groups discuss the procedure of launching a visual programming application, • consult a computer specialist to demonstrate how to launch visual programming applications used in computer programming, • in groups, launch a visual programming application such as Microsoft MakeCode, 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: • Self-efficacy: learner navigates a visual programming application interface. • Learning to learn: learner launches and interacts with a visual programming application.				

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Values:

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

Pertinent and Contemporary Issues (PCIs):

- Peer Education: learner consults a computer 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

Assessment Rubric

Indicators	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to identify types of visual programming applications for use	Appropriately and exactly identifies types of visual programming applications for use	Appropriately identifies types of visual programming applications for use	Occasionally identifies types of visual programming applications for use	Rarely identifies types of visual programming applications for use
Ability to explain the procedure of launching a visual programming application	Correctly and clearly explains the procedure of launching a visual programming application	Correctly explains the procedure of launching a visual programming application	Sometimes explains the procedure of launching a visual programming application	Tries to explain the procedure of launching a visual programming application
Ability to launch a visual programming application in a computer	Correctly and perfectly launches a visual programming application in a computer	Correctly launches a visual programming application in a computer	Sometimes launches a visual programming application in a computer	Hardly launches a visual programming application in a computer

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Ability to navigate a visual programming application interface	Appropriately and confidently navigates a visual programming application interface	Appropriately navigates a visual programming application interface	Attempts to navigate a visual programming application interface	Has difficulty in navigating a visual programming application interface

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Strand	Sub Strand	Specific Learning Outcomes	Suggested Learning Experiences	Key Inquiry Questions
4.0 Computer Programming	**4.3 Visual Programming Features** **(12 Lessons)**	By the end of the sub strand the learner should be able to: a) explore features of a visual programming application b) relate the features of a visual programming application to their function c) describe terminologies used in a visual programming application d) use the features of a visual programming application to create a sequence of instructions to perform a task e) appreciate the application of the features of a visual programming application to create a	The learner is guided to: •in groups discuss the features of a visual programming application •discuss the functions of the features of a visual programming application •match the functions of the features of a visual programming application to their functions •in turns discuss and demonstrate the use of visual programming terms *(reserved words, syntax, variables, input output statements, control structures, variable declarations)*. •in groups, create a sequence of actions using the features of a visual programming application *(animations, sound)* •share experience on the use of 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?

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		sequence of instructions		

Core competencies:

- Learning to Learn: learners shares experience on the use of the features of a visual programming application.
- Creativity and Imagination: learner creates animations and sounds using the features of a visual programming application.

Values:

- Unity: learner discusses the features of the visual programming application with peers.

Pertinent and Contemporary Issues (PCIs):

- Peer Learning: learner uses features of visual programming application to create animations and sound.

Link to other subjects:

- Pre Technical and Pre Career Education: learner uses the features of visual programming applications to creates animations and sounds.

Assessment Rubric

Indicators	Exceeds Expectation	Meets Expectation	Approaches Expectation	Below Expectation
Ability to explore features of a visual programming application	Correctly and confidently explores features of a visual programming application	Correctly explores features of a visual programming application	Correctly explores some features of a visual programming application	Rarely explores features of a visual programming application
Ability to relate the features of a visual programming application to their	Appropriately relates the features of a visual programming application to their	Appropriately relates the features of a visual programming	Appropriately relates some of the features of a visual programming application to their	Relate the features of a visual programming application to their function with

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function	function	application to their function	function	assistance
Ability to describe terminologies used in a visual programming application	Appropriately and clearly describes terminologies used in a visual programming application	Appropriately describes terminologies used in a visual programming application	Appropriately describes some terminologies used in a visual programming application	Attempts to describe terminologies used in a visual programming application
Ability to use the features of a visual programming application to create a sequence of instructions to perform a task	Creatively and correctly uses the features of a visual programming application to create a sequence of instructions to perform a task	Correctly uses the features of a visual programming application to create a sequence of instructions to perform a task	Correctly uses some features of a visual programming application to create a sequence of instructions to perform a task	Assisted to use the features of a visual programming application to create a sequence of instructions to perform a task
Ability to apply the features of a visual programming application to create a sequence of instructions	Appropriately and confidently applies sequence of instructions to create the features of a visual programming application	Appropriately applies the features of a visual programming application to create a sequence of instructions	Applies some of the features of a visual programming application to create a sequence of instructions	Assisted to apply the features of a visual programming application to create a sequence of instructions

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APPENDIX 1: LIST OF ASSESSMENT METHODS, LEARNING RESOURCES AND NON-FORMAL ACTIVITIES

Strand	Sub Strand	Suggested Assessment Methods	Suggested Learning Resources	Suggested Non-Formal Activities
1.0 Foundation of Computer Science	**1.1 Computer concepts**	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, computer hardware, manilla papers, Internet,video, audio clips, models, checklists	Assist members in the community on how to apply computers in various areas such as (*Education, Business, Banking, Military, Communication, Government, Home, Insurance, Marketing, Healthcare, Engineering Design, manufacturing*).
	1.2 Evolution of computers	Rating scales, rubrics, questionnaires, projects,	Digital devices, reference materials,	Discuss the development of

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		journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	productivity tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips,	computers in respect to contemporary technology during clubs
	1.3 Generations of computers	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips,	Educate community members on how to use technologies of different computers generations in daily life situation; *search information on personal hygiene, prepare personal time table,*
	1.4 Classification of computers	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records,	Digital devices, reference materials, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers,	Demonstrate how to use embedded computers (*ATM machines, MP3 players, DVD players, Drones, Anti-lock braking*

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		observation schedules, checklists	Internet,video,	*system, Airbag control system, Digital watches, Microwaves)* during school clubs activities
	1.5 Computer user environment	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	reference materials, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, adaptable locally available materials, models, checklists	Sensitise social gatherings how to observe safety precautions when in the computer user environment
	1.6 Physical parts of a computer	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	Educate community members how to connect physical parts of a computer
	1.7 Hands on skills	Rating scales, rubrics,	Digital devices,	Participate in a

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		questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	reference materials, productivity tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, checklists	competition that involves the use of computer keyboard in different ways; *typing a simple text, multiplying numbers, drawing diagrams,*
	1.8 Computer Systems overview	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video,	Debate on the importance of computer systems in the society during clubs
	1.9 Hardware concepts	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules,	Digital devices, reference materials, productivity tools, computer hardware, manilla papers,	Sensitise community membes on the uses of computer hardware

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		checklists		
	1.10 Input devices	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, computer hardware, manilla papers, Internet,video, audio clips,	Deliberate on the factors to consider when selecting an input device with different forums
2.0 Computer and Society	**1.11Central Processing Unit (CPU)**	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, computer hardware, manilla papers, Internet,video, audio clips,	Join asocial media group and share a video simulation of the functional organisation of the CPU
	1.12 Output devices	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records,	Digital devices, reference materials, computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials,	During social gatherings share ideas on how to assess user computing needs and select appropriate input

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		observation schedules, checklists	checklists	devices for different
	1.13 Ports and Cables	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	Demonstrate to community members how to connect cablesto their respective ports
	1.14 Computer Setup (CSL Project)	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	Educate community members on how to setup computers
	2.1 Physical Safety of	Rating scales, rubrics,	Digital devices,	Demonstrate in a

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	Computers	questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	community forum how to organise workstation to minimise health complications when using computers
	2.2 Health and Safety	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models,	Participate actively in communal activities which educates the society on health and safety of computer use

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			checklists	
	2.3 Repetitive Strain Injury (RSI)	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	Join social media group that shares information on the appropriate strategies of preventing repetitive strain injury when using a computer
	2.4 Data Safety in Computers	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable	Share in a social media forum the best practices of keeping data safely in a computer

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			locally available materials, models, checklists	
	2.5 Online Safety Concepts	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	Discuss in a forum safety measures to observe when online *(not sharing, pictures, location, securing profiles*)
	2.6 Online Identity Safety	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla	Sensitize community members on how to keep personal and sensitive data safety when online,

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			papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	
3.0 Computer Networks	**3.1 Computer Network Concepts**	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	Sensitise community members the on benefits of computer networks in the society
	3.2 Connecting to Computer Network	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records,	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application*	Demonstrate to social gatherings how to connect to computer network. Visit a community data center and assist in connecting

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		observation schedules, checklists	*programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	computers to available networks.
	3.3 Internet Concepts	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software *Operating system* (*OS), Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	Debate on the uses of internet during clubs
	3.4 World Wide Web (WWW)	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules,	Digital devices, reference materials, productivity tools, visual programming tools, compute software	Demonstrate how web browsers work to congregations of community members

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		learner's profile, written tests, anecdotal records, observation schedules, checklists	(*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	
4.0 Computer Programming	**4.1 Computer Programming Concepts**	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	Share experience with the community members on how to perform daily life activities (*playing computer games, listening to music, performing mathematical operations, drawing objects, type text*) using available computer program accessories
	4.2 Visual ProgrammingConcepts	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral	Digital devices, reference materials, productivity tools,	Demonstrate how to navigate the visual programming

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		questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	application interface to peers
	4.3 Visual Programming Features	Rating scales, rubrics, questionnaires, projects, journals, portfolios, oral questions, aural questions, interview schedules, learner's profile, written tests, anecdotal records, observation schedules, checklists	Digital devices, reference materials, productivity tools, visual programming tools, compute software (*OS, Utility software and Application programs*), computer hardware, manilla papers, Internet,video, audio clips, adaptable locally available materials, models, checklists	Create a sequence of actions using the features of a visual programming application *(animations, sound) and share* with peers

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