

**REPUBLIC OF CAMEROON**  
**Peace – Work – Fatherland**

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**MINISTRY OF SECONDARY EDUCATION**  
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**INSPECTORATE GENERAL OF EDUCATION**  
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**INSPECTORATE OF PEDAGOGY / SCIENCES**

**REPUBLIQUE DU CAMEROUN**  
**Paix – Travail – Patrie**

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**MINISTERE DES ENSEIGNEMENTS SECONDAIRES**  
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**INSPECTION GENERALE DES ENSEIGNEMENTS**  
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**INSPECTION DE PEDAGOGIE / SCIENCES**

**LEARNING AREA: SCIENCE AND TECHNOLOGY**

**SUB – CYCLE: OBSERVATION**

**CLASSES: FORMS ONE & TWO**

**SUBJECTS: BIOLOGY, CHEMISTRY, PHYSICS & TECHNOLOGY**

**TOTAL ANNUAL HOURS: 150 (50 HOURS PER SUBJECT)**

**WEEKLY WORKLOAD: 02 PERIODS OF 50 MINUTES PER**

**SUBJECT**

**COEFFICIENT: 02 PER SUBJECT**

# 1. GENERAL INTRODUCTION

**Science and Technology** plays an important role in Cameroon, which is in the full process of development. The training of the Cameroonian citizen in this learning area is intended to equip him/her with the relevant knowledge needed to understand and manage in a competent manner the new challenges that affect him/her: make informed decisions, foresee and make provisions for the future.

In the observation sub-cycle, this learning area is expected to be a continuation, deepening of the knowledge (scientific notions), know-how (improved methods and techniques) and further development of attitudes acquired in the primary school. Science and Technology is a learning area that encompasses Biology, Chemistry, Physics, and Technology.

It has as main aim to inculcate (promote) in the learner responsible behaviour, knowledge and competencies, which should enable him/her to be able to:

- explain natural phenomena ;
- meet with the challenges of life, through the use of scientific approach in problem solving;
- manage the environment in a sustainable manner;
- safeguard his/her health and that of all others in his/her surrounding;
- imbibe the scientific method;
- use process skills to acquire knowledge;
- read security notices;
- communicate his/her results.

The design and teaching of the present Science and Technology programme is centred on the Competency-Based Approach (CBA) which should begin from the identification of a real life situation or problem and proceed through the definition of the competencies (skills) required to transform, modify or improve the situation to the mobilisation of the appropriate resources necessary for transforming, modifying or improving the situation. This approach ensures the appropriation of scientific knowledge and methods by involving the learner in the active construction of his/her own knowledge. It equally goes beyond the amassing of scientific knowledge to the application of such knowledge to seek solutions to real life problems in different contexts. The knowledge and skills that the learner acquires in school should therefore be seen as a means to an end and not as an end in itself. This approach is therefore carefully selected to fulfil the prescriptions of the 1998 educational policy framework of Cameroon which calls for the training of a citizen who is autonomous, self-reliant and imbued with the appropriate tools to face the challenges of a rapidly changing socio-economic and technological world.

This programme consists of three syllabuses and will be taught in 300 hours spread over two consecutive school years. There are a total of six (06) modules divided as follows:

**PRESENTATION OF THE LEVEL, MODULE AND RELATIVE DURATION OF THE SCIENCE AND TECHNOLOGY SYLLABUS**

CLASS	TITLE OF MODULE	DURATION
Form 1 / First year	1. The Living World	150 hours
	2. Matter: Properties and transformation	
	3. Energy: Some applications and uses	
	4. Health Education	
	5. Technology	
	6. Environmental Education	
Form 2 / Second year	1. The Living World	150 hours
	2. Matter: Properties and transformation	
	3. Energy: Some applications and uses	
	4. Health Education	
	5. Technology	
	6. Environmental Education	

## **2. COMPETENCIES THAT THE SCIENCE AND TECHNOLOGY PROGRAMME WOULD DEVELOP IN THE LEARNER**

### **2.1. PLACE OF THE SYLLABUS IN THE CURRICULUM**

This programme would contribute to:

- enabling the learner acquire a scientific and technological culture in doing things;
- enabling the learner acquire the knowledge to explain the laws that govern natural phenomena;
- providing the learner with the ability to utilise technological instruments and tools;
- developing his/her capabilities of observation, integration, creativity and autonomy;
- developing in the learner the skills to seek solutions to daily problems in different contexts (life situations);
- building in the learner the spirit of research and team work.

### **2.2. CONTRIBUTION OF THE PROGRAMME TO LEARNING**

Science and Technology should be the crucible for experimentation; an experimental practice that will enable learners to acquire:

- process skills (observation, investigation, manipulation and problem-solving);
- creative skills ;
- critical, inferential and scientific thinking skills; and
- the spirit of autonomy, self-reliance and team work.

It constitutes the domain of experimentation and the application of the simple theoretical results of research.

## 2.3. CONTRIBUTION OF THE SYLLABUS TO REAL LIFE SITUATIONS

**In the fields of social and family life:** The programme seeks to inculcate in the learner competencies for the improvement of the standard of living as well as transforming him/her into a responsible citizen.

**In the economic domain:** It will enable the learner to acquire competencies in the production of consumer goods necessary for good health, wellbeing and comfort.

**In the field of environmental education:** It will enable the learner to reinvest the knowledge acquired about the consequences of overexploitation and natural resources depletion in proposing appropriate remedies for the sustainable management of the environment and its resources.

**In the media landscape:** It will contribute to the understanding, mastery of use and maintenance of the tools that facilitate information transfer and exchange such as computers, satellites, telephones, televisions, paper, ink, photocopiers, etc.

## 3. PRESENTATION OF THE FAMILIES OF SITUATIONS COVERED BY THE PROGRAMME

N°	MODULES	FAMILIES OF SITUATIONS
1	The living world	Provision of Mans needs in terms of animal and plant resources
2	Matter: Properties and transformation	Utilisation of products and consumer goods.
III	Energy: Some applications and uses	Utilisation of energy in daily life.
IV	Health Education	Personal and environment hygiene: Improvement in reproductive health, nutrition, sensitivity and movement.
V	Technology (Elementary Engineering)	Inaccessibility and the malfunctioning of common tools
VI	Environmental Education	Management of water, air and soils (natural resources management)

## 4. PRESENTATION OF THE PROGRAMME MATRIX

The programme matrix is a table made up of three major columns:

- The first column is the **Contextual Framework** which is sub-divided into *families of situations* and *examples of real life situations* where the knowledge and skills (competencies) can be applied.
- The second column is the **Competencies**, made up of *categories of actions* and *examples of actions*: These are groups of some actions which are related to the mastery of the competencies expected for each module.
- The third column is the **Resources** and consists of the *essential or core knowledge* which gives all the set of cognitive and affective resources which the learner needs to mobilise to successfully treat a family of situations. It is divided into four components: the *subject content*, the

*aptitude* (skills or know-how), *attitudes* to be disposed or displayed as well as *other resources* (material, human, finances, etc.) necessary for the acquisition of the competencies.

The table appears as below.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
Families of Situations	Examples of Situations	Categories of Actions	Examples of Actions	Content (Core Knowledge)	Aptitude (Skills)	Attitudes	Other Resources

## 5. ASSESSMENT OF THE SCIENCE AND TECHNOLOGY PROGRAMME

The overall goal of this programme is to assess the ability of the learner to integrate scientific knowledge and methods in the different subject areas to seek solutions to real life situations in their local environments and in different contexts.

Assessment will therefore aim to test the knowledge and competencies (skills, abilities) in different areas including the:

- ability to apply scientific knowledge and methods in problem-solving; which should involve the ability to sort, organise, classify and analyse scientific data and information; to interpret phenomena and find solutions to problems;
- ability to organise material and present ideas in a clear and logical manner;
- ability to handle patterns in scientific knowledge and show critical, imaginative and inferential thinking skills;

Practical skills will be assessed with respect to the:

- use of and care for equipment;
- design and use of experiments;
- quantitative and/or qualitative analyses.

Integrative skills will be assessed with respect to the ability of the learner to identify locally specific (real life) problems and design projects to solve such problems which should integrate knowledge, skills and methods acquired in all the subject areas making up the Science and Technology programme.

All forms of evaluation will place emphasis on the specified competencies/aptitudes outlined at the beginning of each module in each subject area.

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# **BIOLOGY TEACHING SYLLABUS**

## **FORMS I & 2**

**ANNUAL WORKLOAD: 50 HOURS (60 PERIODS)**

**WEEKLY WORKLOAD: 02 PERIODS**

**COEFFICIENT: 02**

## INTRODUCTION TO THE BIOLOGY SYLLABUS

The biology syllabus as a component of the Science and Technology learning programme take into consideration the close interrelationship that exists between biology and the other science subjects particularly Chemistry, Physics and Technology. This is so because life problems are complex and complicated issues that require transversal and integrative competencies to handle. Teachers and learners are therefore called upon to develop a working knowledge of aspects of Chemistry, Physics, Technology and Mathematics which are necessary for a proper understanding and appropriation of the biological concepts required for seeking solutions to daily life problems including those that are of a personal, social, economic and technological nature. The three modules included in the biology syllabus therefore are not expected to be taught as isolated packets of knowledge but as integral parts of a broader area of learning that seeks to develop the competencies necessary for facing life challenges in the learner's immediate and distant environments as well as the world at large.

### OVERVIEW OF THE MODULES

This syllabus will be taught in 100 hours distributed as follows:

- 50 hours in Form 1; and
- 50 hours in Form 2.

The 50 hours in each class will give a total of 60 periods of 50 minutes each per year. It is estimated that two lessons would be taught per week making a total of thirty (30) effective teaching weeks. The three modules that make up the biology syllabus and the relative duration for teaching each are as presented in the table below:

#### PRESENTATION OF THE MODULES AND RELATIVE DURATION/PERIOD OF TEACHING OF EACH MODULE

CLASS	TITLE OF MODULE	RELATIVE DURATION PER MODULE (Hours and/or Periods)
Form 1	I. The Living World	20 hours (24 periods)
	IV. Health Education	15 hours (18 periods)
	VI. Environmental Education	15 hours (18 periods)
Form 2	I. The Living World	20 hours (24 periods)
	IV. Health Education	15 hours (18 periods)
	VI. Environmental Education	15 hours (18 periods)



# BRIEF PRESENTATION OF THE MODULES

## MODULE ONE: *THE LIVING WORLD*

**TIME ALLOCATION: 20H (24 PERIODS)**

### INTRODUCTION TO THE MODULE

Man is an integral part of the living world. Man therefore has to provide his needs (air, food and shelter, etc) which are obtained from plant and animal resources by exploiting the natural world through the practice of agriculture, animal husbandry, and the transformation of products in such a way as to maintain the delicate ecological equilibrium.

It is therefore, necessary for man to discover and identify the different ecosystems as well as the nutritional relationships between the living organisms and their conditions of adaptability to the different milieu in order to better invest in the sustainable exploitation and proper utilisation of various resources. This is so because family, social and economic life, the environment, wellbeing and health all depend on man's behaviour in the living world.

From this point of view the learner ought to be guided to acquire a set of notions, methods, techniques, and attitudes linked to life and interrelationships.

This module therefore enables learner to:

- acquire general and basic notions of:
  - biology, life and its characteristics, the scientific way of constructing knowledge, solving problems and communicating information;
  - the ecosystem components, interrelationships in ecosystems (living, non-living, nutritional, parasitic, symbiotic and commensalistic relationships and climatic factors affecting organisms in their environment, etc.);
  - environmental protection and conservation;
  - reproduction in plants and animals;
- develop and appropriate basic skills and acquire knowledge of the general methods, techniques and attitudes in the:
  - steps in cultivating common food crops;
  - steps in animal breeding;
  - poultry farming;
  - medicinal plant cultivation;
  - improvement of common food crop yields,
  - improvement of animal production; and
  - improvement of medicinal plant conservation;
  - transformation of plant and animal resources; and
  - transformation of medicinal resources to improve on their storage and conservation;
- develop abilities for improved and sustainable management of the environment.

## **CONTRIBUTION OF THE MODULE TO THE GOALS OF THE CURRICULUM**

The competencies that the learner will develop from this module will enable him/her:

- acquire knowledge of the basic concepts of life and life forms, the scientific way of constructing knowledge and solving problems; the ecosystems; ecosystem interrelationships and factors influencing such relationships; plant and animal production; medicinal plant cultivation and conservation and skills in general agricultural and animal breeding methods, techniques, and practices;
- clarify, consolidate and organise the learning acquired at the primary school level in order to better exploit them in the latter cycles of study and to better manage his/her environment.

This module could provide future career in the fields of biomedicines, agronomy, environmental education, teaching, etc

## **CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO LIFE**

- This module enables learners to develop in them the scientific spirit of self-reliance and team work. These skills are indispensable in scientific disciplines as well as in those linked to other fields of study.
- At the same time it provides the learner with the indispensable resources for a better appropriation of the natural resource management and subsequent modules.

## **MODULE FOUR: HEALTH EDUCATION**

### **TIME ALLOCATION: 15H (18 PERIODS)**

### **INTRODUCTION TO THE MODULE**

This module consists of two parts:

- reproductive health;
- nutritional health.

Reproduction and nutrition are necessary and indispensable functions for the continuity of the human species. It is therefore necessary to help the learner to construct knowledge and develop essential resources (concept, techniques, and methods) and attitudes linked to the proper functioning of these vital life functions. This would enable the learner to appreciate the importance and the fragility of life in order to adopt behaviours that would safeguard, protect, conserve and perpetuate the human species.

Through the learning activities and life situations, this module will also:

- reinforce the basic elements of experimentation in the learner;
- develop skills linked to the conservation of physical, physiological and mental health of the individual and his/her environment; and
- help him/her find solutions to daily life health problems and nutritional challenges.

### **CONTRIBUTION OF THE MODULE TO THE GOAL AND OBJECTIVES OF THE CURRICULUM**

- The competences acquired would enable the learner to be well equipped for latter cycles of life and the improved management of his/her environment (health and nutritional problems);
- This module could invoke vocations in the fields of agronomy and food sciences, biomedical sciences, teaching, etc.

### **CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO LIFE**

- This module will develop in the learner skills in communication and interpersonal relationship, decision making, critical and scientific spirit, and self esteem;
- These skills are important for the effective study of the rest of the science subjects and even other learning areas.

At the same time it provides important resources for a more efficient and global solving of daily life problems.

## **MODULE SIX: ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT**

**TIME ALLOCATION: 15H (18 PERIODS)**

### **INTRODUCTION TO THE MODULE**

This module takes into consideration the management of the following three components of the environment: water, air and land. These three elements are the physical and natural resources of the immediate environment of the learner.

Considering the importance of these resources in the maintenance of life, it is necessary to create awareness in learners as to their values and interdependence, as well as to sensitise them on the challenges of their sustainable management.

The proposed strands to be treated in this module should help learners acquire investigative skills, refine their observation skills, implement techniques of data collection and organisation, as well as methods of quantitative and qualitative data analysis, to help them adopt responsible behaviour concerning the protection of their environment.. This module should also help learners to take note of the evolving character of solutions related to the challenges faced in our environment.

### **CONTRIBUTION OF THE MODULE TO THE GOAL AND OBJECTIVES OF THE CURRICULUM**

- The skills the learner will acquire in this module will better equip him/her for the sustainable management of his/her environment.
- This module would also invoke the love for careers like conservation, environmental engineering, agronomy, teaching and environmental education, etc.

### **CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO LIFE**

This module will develop in the learner skills linked to:

- the three “Rs” – reduce, recycle and reuse wastes;
- communication and interpersonal relationships;
- decision making, critical thinking, scientific mindedness and self esteem;
- identification needs and definition of values.

These skills are indispensable in appropriating knowledge in the other sciences as well as other areas of learning.

This module also provides essential resources for the appropriation of the content on environmental education, sustainable development, and health education.

The importance of this module resides in the fact that the learner who lives permanently in a more or less hostile environment, ought to understand her/his milieu in order to exploit it in a sustainable way for his/her needs and survival without wasting and rupturing its delicate equilibrium.

# FORM I: SYNOPSIS OF THE MODULES, CATEGORIES OF ACTION, EXAMPLES OF ACTIONS AND RELATIVE DURATION/PERIODS

CYCLE	SUB-CYCLE	TITLE OF MODULE	CATEGORIES OF ACTION/EXAMPLES OF ACTIONS	DURATION/PERIOD
FIRST	OBSERVATION	THE LIVING WORLD	Appropriating knowledge of life and life forms <ul style="list-style-type: none"> <li>– distinguishing between living and none living things;</li> <li>– describing and explaining the scientific way of acquiring knowledge and solving problems;</li> <li>– creating observation charts and nature's calendars;</li> <li>– constructing simple vivaria;</li> <li>– communicating scientific information.</li> </ul>	06 PERIODS
			Practicing agriculture and animal husbandry <ul style="list-style-type: none"> <li>– explaining the influence of the environment on plant and animal production;</li> <li>– planting crops and breeding animals in function of the characteristics of the environment;</li> <li>– identifying the steps in cultivating some common crops in Cameroon.</li> </ul>	07 PERIODS
			Using the soil in the production of consumable resources <ul style="list-style-type: none"> <li>– improving/restoring soil quality by using manure, fertilizers, crop rotation and association, irrigation, drainage, contour farming, terracing, etc.</li> </ul>	03 PERIODS
			Preventing soil degradation <ul style="list-style-type: none"> <li>– preventing bush fires;</li> <li>– planting trees;</li> <li>– preventing erosion by practising terrace farming, cover cropping, etc;</li> <li>– improving/restoring soil quality by using manure, fertilizers, crop rotation and association, irrigation, drainage, contour farming, terracing, etc.</li> </ul>	03 PERIODS
			Conserving natural resources (food and medicinal plants) <ul style="list-style-type: none"> <li>– finding out about locally available:               <ul style="list-style-type: none"> <li>○ edible species;</li> <li>○ endangered species;</li> </ul> </li> <li>– classifying the species identified (summary);</li> <li>– practising sustainable hunting, fishing and harvesting;</li> <li>– cultivating medicinal plants;</li> </ul>	05 PERIODS

FIRST	OBSERVATION	HEALTH EDUCATION	Preventing/Avoiding early pregnancies <ul style="list-style-type: none"> <li>– identifying signs of puberty;</li> <li>– practising abstinence;</li> <li>– using contraceptives during sexual intercourse;</li> <li>– avoiding sexual promiscuity;</li> <li>– raising awareness through writing of slogans;</li> <li>– participating in talks on health education.</li> </ul>	05 PERIODS
			Preventing/avoiding STIs and HIV/AIDS <ul style="list-style-type: none"> <li>– practising personal hygiene rules;</li> <li>– accepting voluntary screening with and/or without a sex partner(s);</li> <li>– seeking medical attention with and/or without sex partner(s);</li> <li>– respecting medical prescriptions and getting complete treatment when sick.</li> </ul>	05 PERIODS
			Preventing/eliminating deficiency and overfeeding diseases <ul style="list-style-type: none"> <li>– planning balanced diets;</li> <li>– adopting good feeding habits and practices</li> <li>– eating sufficient and balanced meals (or appropriate quantities/types of food to prevent/treat deficiency diseases);</li> <li>– determining the calorific value of different food types and meals.</li> </ul>	05 PERIODS
			Preventing/avoiding food poisoning <ul style="list-style-type: none"> <li>– practising food and environmental hygiene rules;</li> <li>– preserving food properly;</li> <li>– reading, interpreting, understanding and applying knowledge of information on labels of packaged foods to distinguish expired from unexpired foods; determine nutritional values and composition.</li> </ul>	03 PERIODS
FIRST	OBSERVATION	ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT	Preventing water pollution <ul style="list-style-type: none"> <li>– identifying and protecting water sources;</li> <li>– constructing and using latrines, septic tanks, etc.;</li> <li>– advocating, educating, raising awareness and sensitising people on the location of factories, waste and refuse management sites, etc;</li> <li>– purifying/recycling used or polluted water, wastes and refuse;</li> <li>– practising the three “Rs” – Reducing, Reusing and Recycling.</li> </ul>	06 PERIODS
			Preventing air pollution <ul style="list-style-type: none"> <li>– advocating for stricter control of the emission of toxic substances into the atmosphere;</li> <li>– educating, raising awareness and sensitising on the harmful effects of the emission of toxic and radioactive substances into the atmosphere;</li> <li>– planting trees.</li> </ul>	04 PERIODS

			<p>Preventing land pollution</p> <ul style="list-style-type: none"> <li>– educating, raising awareness and sensitising on the consequences of land pollution;</li> <li>– educating on the importance of using refuse cans for disposal of wastes and refuse;</li> <li>– using chemical products such as pesticides, fertilisers, etc, rationally;</li> <li>– sorting and recycling all wastes and refuse;</li> <li>– removing non-biodegradable objects from the soil.</li> </ul>	04 PERIODS
			<p>Conserving biodiversity</p> <ul style="list-style-type: none"> <li>– identifying the role of biodiversity in the ecosystem and to the economy;</li> <li>– educating, raising awareness and sensitising on the consequences of biodiversity loss;</li> <li>– developing civic responsibility and respecting legislation on poaching, over fishing and over exploitation of forest and forest resources;</li> <li>– designing and implementing projects on biodiversity conservation and protection.</li> </ul>	04 PERIODS

## FORM TWO: SYNOPSIS OF THE MODULES, CATEGORIES OF ACTION, EXAMPLES OF ACTIONS AND RELATIVE DURATION/PERIODS

CYCLE	SUB-CYCLE	TITLE OF MODULE	CATEGORIES/EXAMPLES OF ACTIONS	DURATION/PERIOD
FIRST	OBSERVATION	THE LIVING WORLD	Practicing agriculture and animal husbandry <ul style="list-style-type: none"> <li>– planting crops &amp; breeding animals in function of the characteristics of the environment;</li> <li>– cultivating plants for their fruits, seeds, leaves, roots;</li> <li>– breeding birds, fish, small ruminants;</li> <li>– selecting good varieties and disseminating the seeds.</li> </ul>	10 PERIODS
FIRST	OBSERVATION	THE LIVING WORLD	Preventing/treating animal and plant diseases <ul style="list-style-type: none"> <li>– vaccinating animals to prevent diseases;</li> <li>– removing infected and affected plants and animals from the rest;</li> <li>– quarantining newly acquired stock of animals and those with contagious diseases for observation;</li> <li>– identifying cause(s) of plant and animal diseases;</li> <li>– providing appropriate treatment.</li> </ul>	04 PERIODS
			Preserving consumable resources (food of plant and animal origin) <ul style="list-style-type: none"> <li>– transforming products of animal and plant origin into flour, puff-puff, cake, bread, yogurt, cheese, butter, extraction of palm oil, shear nut oil etc.;</li> <li>– preserving food by drying, salting, smoking, icing, freezing, canning, pasteurising, irradiating, curing, etc.</li> </ul>	10 PERIODS
		HEALTH EDUCATION	Preventing/eliminating deficiency and overfeeding diseases <ul style="list-style-type: none"> <li>– estimating Body Mass Index (BMI) to control weight and prevent nutritional diseases;</li> <li>– doing sports to keep fit;</li> <li>– reading, interpreting, understanding and applying knowledge of information on labels of packaged foods to determine nutritional values, composition and select the type of food to consume;</li> <li>– designing projects to solve a deficiency disease or nutritional disease in the local community.</li> </ul>	06 PERIODS
			Preventing/avoiding food poisoning <ul style="list-style-type: none"> <li>– practising food and environmental hygiene rules;</li> <li>– preparing and preserving food properly;</li> <li>– reading, interpreting, understanding and applying knowledge of information on labels of packaged foods to distinguish expired from unexpired foods.</li> </ul>	02 PERIODS
			Caring for and maintaining reproductive organs in good health <ul style="list-style-type: none"> <li>– practising personal hygiene regularly.</li> </ul>	2 PERIODS

			<p>Advocating to stop the harmful cultural practices and harmful emergent behaviours</p> <ul style="list-style-type: none"> <li>– identifying the problem;</li> <li>– preparing advocacy messages and slogans aimed at solving the problem;</li> <li>– identifying target policy makers;</li> <li>– developing strategy for communication with policy makers;</li> <li>– giving advocacy messages widest publicity possible.</li> </ul>	04 PERIODS
			<p>Preventing/avoiding STIs and HIV/AIDS</p> <ul style="list-style-type: none"> <li>– practising personal hygiene rules;</li> <li>– accepting voluntary screening with and/or without sex partner(s);</li> <li>– seeking medical attention with and/or without sex partner(s);</li> <li>– respecting medical prescriptions and getting complete treatment when sick.</li> </ul>	04 PERIODS
FIRST	OBSERVATION	ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT	<p>Reducing/mitigating effects of global warming</p> <ul style="list-style-type: none"> <li>– identifying sources, consequences of greenhouse gases and advocate against their emission;</li> <li>– participating in campaigns and educative talks on the effects of greenhouse gases and respecting rules for minimising their discharges into the atmosphere;</li> <li>– planting trees.</li> </ul>	04 PERIODS
			<p>Reducing/mitigating the effects of ozone layer destruction</p> <ul style="list-style-type: none"> <li>– identifying causes of ozone layer depletion and advocating against their emission;</li> <li>– identify consequences of ozone layer depletion and designing sensitisation and educational campaign talks on their consequences;</li> <li>– respecting rules for minimising the discharges of ozone depleting substances into the atmosphere;</li> <li>– planting trees.</li> </ul>	04 PERIODS
			<p>Conserving biodiversity</p> <ul style="list-style-type: none"> <li>– identifying the role of biodiversity in the ecosystem and to the economy;</li> <li>– educating, raising awareness and sensitising on the consequences of biodiversity loss;</li> <li>– developing civic responsibility and respecting legislation on poaching, over-fishing and over-exploitation of forest and forest resources;</li> <li>– designing and implementing projects on biodiversity conservation and protection.</li> </ul>	04 PERIODS
			<p>Preventing the impact of natural disaster/restoring the environment to its natural state</p> <ul style="list-style-type: none"> <li>– identifying disaster occurrence cycle;</li> <li>– monitoring disaster cycle;</li> <li>– developing locally specific early warning systems to mitigate impact of disaster;</li> <li>– developing simple disaster management systems.</li> </ul>	06 PERIODS



## FORM ONE (FIRST YEAR OBSERVATION SUB-CYCLE)

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Examples of situations	Category of actions	Examples of Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
THE LIVING WORLD	SUPPLY OF MAN'S NEEDS IN ANIMAL AND PLANT RESOURCES	Understanding life and life forms	Appropriating knowledge of life and life forms	*distinguishing between living and none living things; *describing and explaining the scientific way of acquiring knowledge and solving problems; *Creating observation charts and nature's calendars; *constructing simple vivaria; *communicating scientific information; *describing the differences between plant and animal cells; *distinguishing different types of cells as the origin and building blocks of life.	<b>I. Introduction to biology</b> <b>I.1.</b> Definition and branches <b>I.2.</b> Relationship with other science subjects <b>I.3.</b> Relevance to daily life <b>I.4.</b> Characteristics of living things and differences between living and non-living things <b>I.5.</b> Differences between plants and animals <b>I.5.</b> Studying living things <b>I.5.1.</b> The scientific approach <b>I.5.2.</b> Observing living organisms (in their habitats and in the laboratory) <b>I.5.2.1.</b> Equipment/tools for observation (lens, microscope, the five senses, etc.) <b>I.5.2.2.</b> Describing and reporting observations in biology <b>I.5.3.</b> The cell as the basic structural and functional unit of life. This should be strictly limited to the cell as seen with the light microscope (cell membrane, cytoplasm and nucleus only). <b>I.5.3.1.</b> Examples of types of cells to include plant and animal cells; reproductive and growth cells; bacterial and protocist cells.	-define biology and branches; -explain the relationship between biology and the other sciences; -describe and distinguish between biology related careers; -the role of biological knowledge in solving daily life problems; -differentiate between living and non-living things (animal/plant versus motor car/robots... etc.); -how scientists investigate nature and/or solve problems; -protect nature, life and life forms; -observe, describe and appreciate the beauty of organisms in their natural milieu; -communicate scientific information; -distinguish plant and animal cells; -appreciate the cell as the origin and building blocks of life.	Curiosity and sense of observation -Respect of others opinions -Interest in scientific advancement -Open-mindedness -Patience -Love for nature -Team spirit and cooperation -Decision making and critical spirit -Creative thinking -Logical reasoning -Methodological action -Problem solving -Management and respect for the environment -Effective communication	-Didactic materials – charts, models, microscope, etc.;  biology related fields, institutions, companies, Professionals

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
THE LIVING WORLD	SUPPLY OF MAN'S NEEDS IN ANIMAL AND PLANT RESOURCES	Insufficient consumable resources	Practicing agriculture and animal husbandry	*explaining the influence of the environment on plant and animal production; *planting crops and breeding animals in function of the characteristics of the environment; *identifying the steps in cultivating some common crops in Cameroon.	<b>2. Environment and habitat;</b> <b>2.1.</b> Definitions <b>2.2.</b> Environmental factors affecting plant and animal growth; <b>2.3.</b> Effects of day and night on organisms; <b>2.4.</b> Effects of changing seasons on organisms; <b>2.5.</b> Influence of climatic factors (sunlight, rainfall, wind, CO <sub>2</sub> and O <sub>2</sub> content); <b>2.6.</b> Influence of edaphic factors (soil water content, mineral salts, organic matter & soil microorganisms); <b>2.7.</b> Influence of other living organisms (biotic): competition for light, soil nutrients, CO <sub>2</sub> , O <sub>2</sub> food & reproductive mates).	*Choice of crops and animals according to seasons or out of season and soil types	-Curiosity and sense of observation -Respect of others opinions -Interest in scientific advancement -Open-mindedness -Patience -Love for nature -Team spirit and cooperation -Decision making and critical spirit -Creative thinking -Logical reasoning -Methodological action -Problem solving -Management and respect for the environment -Effective communication	Didactic Materials Farm inputs

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
THE LIVING WORLD	SUPPLY OF MAN'S NEEDS IN ANIMAL AND PLANT RESOURCES	Insufficient consumable resources	Using the soil in the production of consumable resources	<ul style="list-style-type: none"> <li>*preventing bush fires;</li> <li>*planting trees;</li> <li>*preventing erosion by practising terrace farming, cover cropping, etc</li> <li>*improving/restoring soil quality by using manure, fertilizers, crop rotation and association, irrigation, drainage, contour farming, terracing, etc.</li> </ul>	<b>3. Improving Soil Quality</b> <b>3.1.</b> Qualities of a good soil <b>3.2.</b> Responsible farming practices (crop rotation and association, irrigation, drainage, contour farming, terracing....) <b>3.3.</b> Planting techniques	-Careful choice of chemical fertilizers	-Curiosity and sense of observation -Respect of others opinions -Interest in scientific advancement -Open-mindedness -Patience -Love for nature -Team spirit and cooperation -Decision making and critical spirit -Creative thinking -Logical reasoning -Methodological action -Problem solving -Management and respect for the environment -Effective communication	Agricultural technicians
		Soil degradation	Preventing soil degradation	<ul style="list-style-type: none"> <li>*preventing bush fires;</li> <li>*planting trees;</li> <li>*preventing erosion by practising terrace farming, cover cropping, tree planting etc;</li> <li>*improving/restoring soil quality by using manure, fertilizers, crop rotation and association, irrigation, drainage, contour farming, terracing, etc.</li> </ul>	<b>4. Soil erosion</b> <b>4.1.</b> Different types of erosion and their causes (water & wind erosion, human activities...) <b>4.2.</b> Effects of erosion <b>4.3.</b> prevention of erosion	-Practice of soil conservation	-Awareness in the protection of the soil -Respect for the environment	

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
THE LIVING WORLD	SUPPLY OF MAN'S NEEDS IN ANIMAL AND PLANT RESOURCES	Insufficient consumable resources	Conserving natural resources (food and medicinal plants)	*finding out about locally available: <ul style="list-style-type: none"> <li>o edible species;</li> <li>o endangered species;</li> </ul> *classifying the species identified (summary); *practising sustainable hunting, fishing and harvesting;	<b>5. Hunting, Fishing, Harvesting and Gardening</b> <b>5.1.</b> Identification of edible and endangered species of our environment <b>5.2.</b> Census of edible species of our environment <b>5.3.</b> Census of endangered species <b>5.4.</b> Classification of identified species <b>5.5.</b> Types/techniques of gardening	Practising sustainable exploitation of natural resources	-Curiosity and sense of observation -Respect of others opinions -Interest in scientific advancement -Open-mindedness -Patience -Love for nature -Team spirit and cooperation -Decision making and critical spirit -Creative thinking -Logical reasoning -Methodological action -Problem solving -Management and respect for the environment -Effective communication	Personnel from Forestry department, Ministry of Agriculture and Rural Development, Fisheries and Animal Breeding, etc.  Herbalists, traditional healers,
				*cultivating medicinal plants;	<b>6.Role of some local medicinal plants</b>	Growing and use of some local medicinal plants		

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
HEALTH EDUCATION	IMPROVEMENT OF REPRODUCTIVE HEALTH	Early Pregnancies	Preventing/avoiding early pregnancies	*identifying signs of puberty;  *practising abstinence; *using contraceptives during sexual intercourse; *avoiding sexual promiscuity; *raising awareness through writing of slogans; *participating in talks on health education.	<b>1. Reproductive health</b> <b>1.1. Puberty</b> 1.1.1. Primary and secondary sexual characteristics 1.1.2. Fertilization and pregnancy	-Recognition and description of signs of puberty; -Dissection of a small mammal to observe and describe the reproductive organs.	-Self respect and respect for others. -Respect of different opinions. -Interest in scientific progress	-Personnel from the medical corps. -Social workers -Dissecting kit
					<b>2. Consequences of early pregnancies</b>  <b>3. Prevention of early pregnancies</b>	Choice and correct use of contraceptives	- Practice abstinence -Self respect and respect for others. -Respect for the opinion of others -Develop interest in scientific and technological advancements	-Personnel from the medical corps. -Social workers
		Prevalence of STIs and HIV/AIDS	Preventing/avoiding STIs and HIV/AIDS	*practising personal hygiene rules; *accepting voluntary screening with and/or without a partner(s); *seeking medical attention with and/or without sex partner(s); *respecting medical prescriptions and getting complete treatment when sick.	<b>4. STI, HIV/AIDS</b> <b>4.1.</b> Gonorrhoea, syphilis, Chlamydia, hepatitis B  <b>4.2.</b> HIV/AIDS  <b>4.3.</b> Prevention of STI, HIV/AIDS <b>4.4.</b> Hygiene of the reproductive organs.	-Practice hygiene rules -Screen for serological status.  -Seek medical treatment if sick. -Stick to one partner	Respect of hygiene rules  -Respect medical prescriptions	-Social workers  - medical personnel

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
HEALTH EDUCATION	IMPROVEMENT OF NUTRITIONAL HEALTH	Prevalence of nutritional diseases	Preventing/eliminating deficiency and overfeeding diseases	<ul style="list-style-type: none"> <li>*planning balanced diets;</li> <li>*adopting good feeding habits and practices</li> <li>*eating sufficient and balanced meals (or appropriate quantities/types of food to prevent/treat deficiency diseases);</li> </ul>	<b>6. Quality Nutrition</b> 6.1. Types and sources of foods; 6.2. Nutritional diseases due to deficiency; (kwashiorkor, rickets...) <b>6.3.</b> Balanced diet and choosing the right type of food; <b>6.4.</b> Dietary requirements and eating habits.	-Draw up appropriate menu to prevent deficiencies and excess/over feeding diseases.	-Adopt good feeding habits;  -Observe hygiene rules for feeding	-Dieticians  -Medical personnel  -Social workers
		Food poisoning	Preventing/avoiding food poisoning	<ul style="list-style-type: none"> <li>*practising food and environmental hygiene rules;</li> <li>*preparing and preserving food properly;</li> <li>*reading, interpreting, understanding and applying knowledge of information on labels of packaged foods to distinguish expired from unexpired foods.</li> </ul>	<b>7.Food Hygiene</b> 7.1. Food preparation and preservation; 7.2. Social health (smoking, alcoholism, exercise and rest).	-Practice some methods of food preservation -Practice good eating water  -Do regular sports or physical exercises	Observe hygiene of food and digestion	

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT	SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES: WATER, AIR, SOIL	Water pollution	Preventing water pollution	<ul style="list-style-type: none"> <li>*identifying and protecting water sources;</li> <li>*constructing and using latrines, septic tanks, etc.;</li> <li>*advocating, educating, raising awareness and sensitising people on the location of factories, waste and refuse management sites, etc.;</li> <li>*purifying/recycling used or polluted water, wastes and refuse;</li> <li>*practising the three “Rs” – Reduce, Recycle, Reuse</li> </ul>	<b>1. Water Management</b> <b>1.1</b> Natural water sources <b>1.2.</b> Water pollution <b>1.2.1.</b> Different type and sources of water pollutants <b>1.2.2.</b> Effects of polluted water on human health: water borne diseases <b>1.2.3.</b> Effects of water pollution on aquatic life <b>1.2.4.</b> Purification of used water <b>1.2.5.</b> Water filters/Maintenance	<ul style="list-style-type: none"> <li>-Techniques of treatment of used or polluted water</li> <li>-Practice hygiene in relation with water</li> <li>-Contribution to aforestation</li> <li>-Contribution to the proper management of waste / toxic products</li> </ul>	-Daily practices  -Respect of hygiene rules	- Technicians in sustainable rural development, hygiene and sanitary personnel  -
		Air pollution	Preventing air pollution	<ul style="list-style-type: none"> <li>*advocating for stricter control of the emission of toxic substances into the atmosphere;</li> <li>*educating, raising awareness and sensitising on the harmful effects of the emission of toxic and radioactive substances into the atmosphere;</li> <li>*planting trees.</li> </ul>	<b>2. Air</b> <b>2.1.</b> Composition of air <b>2.2.</b> Uses of natural and artificial air <b>2.3.</b> Air pollution <b>2.3.1.</b> Some air pollutants <b>2.3.2.</b> Effects of air pollution		-Respect for the environment (prohibition in burning tyres, plastic materials, throwing pollutants in nature, sensitize the population on dangers of bush fires...)	Technicians in sustainable development  Personnel from the Ministry of Environment and Nature Protection

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT	SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES: WATER, AIR, SOIL	Land pollution	Preventing land pollution	*educating, raising awareness and sensitising on the consequences of land pollution; *educating on the importance of using refuse cans for disposal of wastes and refuse; *using chemical products such as pesticides, fertilisers, etc, rationally; *sorting and recycling all wastes and refuse; *removing non-biodegradable objects from the soil	<b>3. Land pollution</b>  <b>3.1.</b> Land pollutants and definition (agricultural and chemical waste: fertilizers, pesticides and sewage discharges...)  <b>3.2.</b> Effects of land pollution  <b>3.3.</b> Preventing land pollution	-Use of bins  -Recycling of household waste  -Selecting household waste  -Rational use of chemicals	Awareness in protection of land	Resource persons on environmental conservation.
		Rupture of ecological equilibrium	Conserving biodiversity	*identifying the role of biodiversity in the ecosystem and to the economy; *educating, raising awareness and sensitising on the consequences of biodiversity loss; *developing civic responsibility and respecting legislation on poaching, over fishing and over exploitation of forest and forest resources; *designing and implementing projects on biodiversity conservation and protection.	<b>4. Conservation of Biodiversity</b> <b>4.1.</b> Definition <b>4.2.</b> Concept of interdependence of living organisms (producer, consumer, decomposer, parasites, commensals...)  <b>4.2.</b> Legislation on poaching, fishing and forest exploitation  <b>4.3.</b> Sensitisation and education	-Responsible farming technique  -Choice of adapted species - Conservation techniques  -Communication techniques	-Respect of the law or legislation  -Open-mindedness  -Life skills	-Technicians in agriculture  -Resource persons in wildlife and forestry  -Specialist on management



## FORM TWO (SECOND YEAR OBSERVATION SUB-CYCLE)

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
THE LIVING WORLD	SUPPLY OF MAN'S NEEDS IN ANIMAL AND PLANT RESOURCES	Insufficient consumable resources	Practicing agriculture and animal husbandry	*planting crops & breeding animals in function of the characteristics of the environment; *cultivating plants for their fruits, seeds, leaves, roots; *breeding birds, fish, small ruminants; *selecting good varieties and disseminate the seeds.	<b>1. Need for Reproduction</b> <b>1.1. Reproduction in plants</b> <b>1.2.</b> Sexual reproduction in plants; from the flower to the seed and fruit ; qualities of a good grain: germination <b>1.3.</b> Vegetative multiplication as the basis for cloning: * natural (plantains, sugar cane, onion, potato, cocoyam, etc * artificial ( grafting, marcotting, cutting layering.); <b>1.4.</b> Other forms of asexual reproduction: budding in brewer's yeast, fission in bacteria. <b>2.1. Reproduction in animals:</b> <b>2.2.</b> Sexual reproduction: – fertilisation – development <b>2.3.</b> Rearing techniques/Animal husbandry (a few cycles of development - change of form/ morphology in animals, metamorphosis in insects & amphibians - Impact of larval forms on plant yield).	*Dissection of a flower or grain  *Use of the hand lens  *Choice of seeds *Grow selected plants using one or a combination of vegetative propagation techniques *Observation of food reserves (tubers, fruits, grain...)  *Choice of animal varieties for breeding *Knowledge of breeding conditions  *Incubation techniques	Mastery of improved reproductive techniques in plants and animals	Didactic materials  Farm inputs  Veterinary personnel  Agricultural extension staff

MOODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
THE LIVING WORLD	SUPPLY OF MAN'S NEEDS IN ANIMAL AND PLANT RESOURCES	Insufficient consumable resources	Preventing/treating animal and plant diseases	*vaccinating animals to prevent diseases; *removing infected and affected plants and animals from the rest; *quarantining newly acquired stock of animals and those with contagious diseases for observation; *identifying cause(s) of plant and animal diseases; *providing appropriate treatment.	<b>3. Improving the Quality and Quantity of Production</b> <b>3.1.</b> Treatment of animals and plants <b>3.2.</b> Prevention/elimination of parasites: <ul style="list-style-type: none"> <li>– animal parasites- (ecto - parasites- lice, ticks, jiggers);</li> <li>– endo-parasites- intestinal worms; plant parasites: (semi parasites-African mistletoe;</li> <li>– complete parasites-mildew, rust, corn smut)</li> </ul> <b>3.3.</b> Biological and chemical control	-Identification and destruction of animal and plant parasites.  -Identification and treatment of animal and plant diseases  -Prevention of animal and plant diseases (vaccination of animals, use of pesticides on plants) -Choice of predator species/plant and animal products for biological control.	-Curiosity and sense of observation -Respect of others opinions -Interest in scientific advancement -Open-mindedness -Patience -Love for nature -Team spirit and cooperation -Decision making and critical spirit -Creative thinking -Logical reasoning -Methodological action -Problem solving -Management and respect for the environment -Effective communication	Agriculture technician   Animal breeding technician  Veterinarians

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
THE LIVING WORLD	SUPPLY OF MAN'S NEEDS IN ANIMAL AND PLANT RESOURCES	Insufficient consumable resources	Preserving consumable resources (food of plant and animal origin)	*transforming products of animal and plant origin into flour, puff-puff, cake, bread, yogurt, cheese, butter, extraction of palm oil, shear nut oil etc.; *preserving food by drying, salting, smoking, icing, freezing, canning, pasteurising, irradiating, curing, etc.	<b>4. Transformation of foodstuffs</b> <b>4.1.</b> Role of microorganism in the transformation of foods: fermentation (alcohol, lactic and butyric acid), <b>4.2.</b> Principle of animal and plant products preservation	- Techniques of transformation and conservation of plant and animal products - Conservation techniques of foodstuff	-Transformation and preservation of common perishable foodstuffs of plant and animal origin -Creative critical thinking skills -Process skills - Problem solving skills -Management and respect for the environment -Effective communication	Food processing technicians, Dieticians
HEALTH EDUCATION	IMPROVEMENT OF NUTRITION	Prevalence of nutritional diseases	Preventing/eliminating deficiency and overfeeding diseases	*estimating Body Mass Index (BMI) to control weight and prevent nutritional diseases; *doing sports to keep fit; *reading, interpreting, understanding and applying knowledge of information on labels of packaged foods to select the type of food to consume; *determining the calorific value of different food types and meals. *designing a project to solve a deficiency disease or nutritional disease in the local community.	<b>5. Quality Nutrition</b> <b>5.1. Nutritional diseases:</b> <b>5.1.1</b> due to overfeeding (obesity) <b>5.1.2</b> others (diabetes, hypertension, etc) <b>5.2. Calorific values of foods</b>	-Draw up appropriate menus to prevent deficiencies and excess/over feeding. -Do regular sports or physical exercises	-Adopt good feeding habits; -Observe hygiene rules for feeding	-Dieticians -Medical personnel -Social workers

HEALTH EDUCATION		Food poisoning	Preventing/avoiding food poisoning	*practising food and environmental hygiene rules; *preserving food properly; *reading, interpreting, understanding and applying knowledge of information on labels of packaged foods to distinguish expired from unexpired foods.	<b>6. Food Hygiene</b>	-Practice some methods of food preservation -Practice good eating water	Observe hygiene of food and digestion	
	IMPROVEMENT OF REPRODUCTIVE HEALTH	Cultural practices harmful to reproductive health (taboos, sex mutilation, ironing of breasts, rape...)	-Caring for and maintaining the reproductive organs in good health  -Advocating to stop harmful emergent behaviour	*practising personal hygiene rules; *identifying the problem; *preparing advocacy messages and slogans in the form of solutions to the problem; *identifying target policy makers;	<b>7. Practices Harmful to adolescent reproductive health</b>	-Writing out advocacy messages and slogans and posters -Preparation of session of educative talks -Healthy courtship -Avoiding deviant sexual practices which are against nature.	Communication, sensitization and influencing policy change  Distinguishing values	
		Emergent harmful behaviour to reproductive health	-Caring for and maintaining the reproductive organs in good health  -Advocating to stop harmful emergent behaviour	*developing strategy for communication with policy makers; *giving advocacy messages the widest publicity possible.	<b>8. Emergent behaviour harmful to reproductive health</b> (homosexuality, zoophily, pornography...)	-Writing out advocacy messages and slogans and posters -Preparation of session of educative talks -Healthy courtship -Avoiding deviant sexual practices which are against nature.	Communication, sensitization and influencing policy change  Identifying needs and distinguishing values	

HEALTH EDUCATION	IMPROVEMENT OF REPRODUCTIVE HEALTH	Prevalence of STIs and HIV/AIDS	Preventing/avoiding STIs and HIV/AIDS	<ul style="list-style-type: none"> <li>*practising of personal hygiene rules;</li> <li>*accepting voluntary screening with and/or without sex partner(s);</li> <li>*seeking medical attention with or without sex partner(s);</li> <li>*respecting medical prescriptions and getting complete treatment if sick.</li> </ul>	<b>9. STI, HIV/AIDS (as consequences of emergent harmful sexual behaviour)</b> <b>9.1.</b> Gonorrhoea, syphilis, Chlamydia, hepatitis B <b>9.2.</b> HIV/AIDS <b>9.3.</b> Prevention of STI, HIV/AIDS <b>9.4.</b> Hygiene of the reproductive organs.	<ul style="list-style-type: none"> <li>-Practice hygiene rules</li> <li>-Seek the serological status.</li> <li>-Seek medical treatment if sick.</li> <li>-Stick to one partner</li> </ul>	Respect of hygiene rules  -Respect medical prescriptions	-Social workers  - medical personnel
ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT	SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES: WATER, AIR, SOIL	Global warming and climate change	Reducing/mitigating the effects of global warming	<ul style="list-style-type: none"> <li>*identifying sources, consequences of greenhouse gases and advocate against their emission;</li> <li>*participating in campaigns and educative talks on the effects of greenhouse gases and respect rules for minimising their discharges into the atmosphere;</li> <li>*planting trees.</li> </ul>	<b>10.Greenhouse effect and climate change</b> <b>10.1.</b> Definition <b>10.2.</b> Causes <b>10.3.</b> Effects <b>10.4.</b> Indicators of climate change and global warming	-Indigenous techniques of adaptation to global warming and climate change	-Respect for the environment -aforestation -Recycling and reduction in greenhouse gas emission	Personnel from the Ministry of Environment and Nature Protection  Agricultural technicians  Environmentalists;  Conservationists
		Destruction of the ozone layer	Reducing/mitigating the effects of ozone layer destruction	<ul style="list-style-type: none"> <li>*identifying causes of ozone layer depletion and advocating against their emission;</li> <li>*identify consequences of ozone layer depletion and designing sensitisation and educational campaign talks on these consequences</li> <li>*respecting rules for minimising the discharges of ozone depleting substances into the atmosphere;</li> <li>*planting trees.</li> </ul>	<b>11.The ozone layer</b> <b>11.1.</b> Definition <b>11.2.</b> Role of the ozone layer <b>11.3.</b> Causes of destruction <b>11.4.</b> Prevention of destruction	-Choice of appropriate household apparatus, aerosols with no CFCs	-Respect for the environment -Recycling and reduction in ozone depleting substances	

MODULE	CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
	Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Abilities (Aptitudes)	Life Skills (Practice)	Other resources
ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT	SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES: WATER, AIR, SOIL	Rupture of ecological equilibrium	Conserving biodiversity	<ul style="list-style-type: none"> <li>*identifying the role of biodiversity in the ecosystem and to the economy;</li> <li>*educating, raising awareness and sensitising on the consequences of biodiversity loss;</li> <li>*developing civic responsibility and respecting legislation on poaching, over-fishing and over-exploitation of forest and forest resources;</li> <li>*designing and implementing projects on biodiversity conservation and protection.</li> </ul>	<b>12.Conservation of Biodiversity</b>  <b>12.1.</b> Effects of civil engineering works, forest exploitation and intensive agriculture on biodiversity  <b>12.2.</b> Gardening (lawns, horticulture, Green Spaces...)	-Responsible farming technique  -Choice of adapted species  - Conservation techniques  -Communication techniques	-Respect of the law or legislation  -Open-mindedness  -Life skills	-Technicians in agriculture  -Resources persons in wildlife and forestry  -Specialist on management
		Natural disasters	Preventing/mitigating the impact of natural disaster/restoring the environment to its natural state	<ul style="list-style-type: none"> <li>*identifying disaster occurrence cycle;</li> <li>*monitoring disaster cycle;</li> <li>*developing locally specific early warning systems to mitigate impact of disaster;</li> <li>*developing simple disaster management systems.</li> </ul>	<b>13. Common natural disaster in Cameroon</b> <b>13.1.</b> Causes <b>13.2.</b> Effects/impact <b>13.3.</b> Prevention	-disaster monitoring and early warning systems techniques; -Evacuation techniques; -rescue techniques; -Aid provision; -care for the old, young, disabled and weak...	Humanitarian response practices	-Red Cross & Red Crescent Society; -National fire brigade Corps; -Civil Protection Department of the Ministry of Territorial Administration and decentralisation; -International Aid Agencies

# **CHEMISTRY TEACHING SYLLABUS**

## **FORMS 1 & 2**

**ANNUAL WORKLOAD : 50 HOURS (60 PERIODS)**

**WEEKLY WORKLOAD : 02 PERIODS**

**COEFFICIENT : 02**

# GENERAL PRESENTATION OF THE MODULES

## MODULE II: MATTER: PROPERTIES AND TRANSFORMATION

### 1. TIME ALLOCATION: 100 (52 + 48) PERIODS

### 2. GENERAL PRESENTATION:

Most of the core content of Chemistry in the Observation Sub-cycle comprises matter, its characteristics and some basic reactions (i.e. transformation). This module consists of the following topics:

- Introduction to Chemistry.
- Action of heat on substances.
- Simple classification of substances.
- Acids and bases (alkalis).
- Water and Solutions.
- Chemical elements.
- Chemical symbols, formulae and valency.
- Chemical reactions and equations.
- Reactions with oxygen of air.
- The Atom.
- Periodic Table: Families of elements and Relative reactivity.
- States of matter.

This module introduces the learner to develop an awareness of the types of matter in his/her immediate material environment and for him/her to explore the useful relationship that exist between him/her and the physical world. To achieve this, the teacher has to sharpen the curiosity of the learner of the Observation Sub-cycle in such a way as to permit the learner to recognise, describe and interpret labels and symbols on objects and tools with which the learner is in contact on a daily basis; and also to carryout, observe and interpret simple chemical reactions.

### 3. CONTRIBUTION OF THE MODULE TO THE GOALS AND OBJECTIVES OF THE CURRICULUM

This module seeks to help learners improve their relationship with and knowledge of the material world by deepening the learner's knowledge acquired in the primary school.

### 4. CONTRIBUTION OF THE MODULE TO THE CURRICULUM AND TO AREAS OF LIFE.

To enable learners improve on their relationship with the material world, the teacher should stimulate the learner so as to tap from him/her the ability to read, calculate, manipulate, estimate and interpret.

To achieve this, the learner needs skills in languages (English and French), Mathematics, Chemistry, Physics, Technology and Biology.

In this module, the learner is required to take decisions that affect his/her health, physical and social environments.



## **MODULE III: ENERGY: APPLICATIONS AND USES**

### **1. TIME ALLOCATION: 18 PERIODS**

### **2. GENERAL PRESENTATION:**

This module presents basic concepts in energy already introduced at the primary school level, with emphasis on heat and electricity. It is subdivided into two topics as follows:

- Action of heat on materials.
- Action of electricity on materials.

### **3. CONTRIBUTION OF THE MODULE TO THE GOALS AND OBJECTIVES OF THE CURRICULUM**

The study of energy helps in the construction of reasoning and familiarity with resources around us. The study of energy will enable the learner to develop the ability to visualize, interpret, justify, classify, clarify, appreciate, quantify, project, and describe the world through the availability of the different energy resources, their location, and relationships. This will also develop in the learner the spirit of initiative, creativity and enterprise. All these competencies enable the learner to become autonomous and independent to carryout different activities in the environment.

### **4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO THE AREAS OF LIFE.**

The content of this module has as objective to reinforce the capacity of the learner in carrying research and integrating himself/herself into the social milieu. On the other hand, this module initiates the learner into project development and enables him/her to acquire knowledge of technological and methodological approaches. The acquisition of this scientific knowledge will need aspects of Mathematics, Geography, Information / Computer technology, etc.

In this module the basic notions of energy are given, how it is handled and used. This calls on the learner to make reference to daily actions vis-a- vis the energy in the following areas of life: media and communication, social and family life, citizenship, health care, environmental protection, welfare and economic life.

## **MODULE VI: ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT**

### **1. TIME ALLOCATION: 18 PERIODS**

### **2. GENERAL PRESENTATION:**

This module takes into consideration the management of two of the three components of the environment: water, air and soil. These three elements are the physical and natural resources of the immediate environment of the learner. The module treats the two topics.

- Water
- Air

Considering the importance of these resources in the maintenance of life, it is necessary to create awareness in learners as to their values and interdependence, as well as to sensitize them on the challenges of their sustainable management.

The treatment of the proposed family of situations in this module should help learners acquire investigative skills, refine their observation skills, implement techniques of data collection and organization, as well as methods of quantitative and qualitative data analysis, to help them adopt

responsible behaviour concerning the protection of their environment.. The treatment of the families of situations also ought to help learners to take note of the evolving nature of solutions related to the challenges faced in our environment.

### **3. CONTRIBUTION OF THE MODULE TO THE GOAL AND OBJECTIVES OF THE CURRICULUM:**

The skills the learner will acquire in this module will better equip him/her to sustainably manage his/her environment. This module would also invoke the love for careers like medicine, agronomy, teaching environmental education etc.

### **4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO AREAS OF LIFE.**

This module will develop in the learner skills linked to communication and interpersonal relations, decision making, critical thinking, scientific mind, self esteem. These skills are indispensable in all the science subjects and other areas of learning.

This module also provides essential resources for the appropriation of the content on environmental education and sustainable development, and health education.

The importance of this module lies in the fact that the learner who permanently lives in a more or less hostile environment whereby the different natural resources are a source of socio-economic challenges, should know that only sustainable management of these resources can lead not only to a comfortable life but also to social peace. The family, social and economic life, the environment, well-being and health depend on man's behaviour in his environment.

#### **General Statement**

This Chemistry Teaching Syllabus is a statement of a defined course work to educate young Cameroonians in the Observation Sub-cycle, i.e. the first two years of Chemistry in Secondary Education. It has been developed as an integrated course which aims to contribute towards a mixing of new and old materials so that the new concepts permeate the whole.

This syllabus also aims at creating awareness in the student of the importance of chemistry in the society in which he lives. It is conceived to provide a smooth transition from the daily realities of chemistry in the student's life to more concrete concepts without creating a barrier.

It caters for the pupil whose previous education in Chemistry is based on the aspects of science studied in the primary school and prepares the student to continue with Chemistry in the Orientation Sub-cycle leading to the acquisition of the Ordinary Level Certificate and/or vocational training. It thus introduces the learner to the requirements of the Cameroon G.C.E. Board Examination Syllabuses.

#### **The Goals**

The general aims and objectives for the whole Chemistry course are broken down to specific goals and aims which are progressive. For the first two years they are as follows:

1. Help the student discover and understand the order of the physical environment;
2. Discover the composition and changes in material (both physical and chemical) in his environment;
3. Encourage students to observe, make simple conclusions of experimental work and handle simple apparatus;
4. Recall safety procedures and follow the scientific method;
5. Enable students write chemical symbols of elements, formulae of compounds and equations for simple chemical reactions.

The entire syllabus is done based on the Competency-Based Approach with daily life situations as the focal point, using the student-centred experimental approach to the teaching of the subject in each of the classes. The experimental resources to be used at all levels of the teaching syllabus include:

- simple material in the environment;
- conventional laboratory chemicals and equipment;
- microchemistry equipment.

### Time allocation

To cover this syllabus, the recommended **weekly** time allocation for Forms I & II is:

CLASS	TIME ALLOCATION (A period is 50 minutes)	Theory, demonstrations, experiments.
FORM I	Two single periods	50 min. x 2
FORM II	Two single periods	50 min. x 2

### Evaluation

The evaluation of this syllabus will aim to test the knowledge and competencies (skills, abilities) in different areas:

- Ability to apply the understanding in solving problems, the ability to use the scientific information given, for example in graphical or tabular form.
- Ability to organize material and present ideas in a clear and logical manner.
- Ability to handle patterns in chemical knowledge and show critical, imaginative and inferential thinking skills.
- Practical skills will be evaluated with respect to:
  - Use of and care for equipment
  - Design and use of experiments
  - Quantitative and/or qualitative analyses.
- By the end of the Sub-cycle, the learner will be required to have shown proof of the acquisition of a specified number of competencies. See Table on minimum expected competencies below to guide you.

All forms of evaluation will place emphasis on the specified competencies/aptitudes outlined for each topic/module.

## COMPREHENSIVE TABLE SHOWING THE MODULES FOR THIS SUB-CYCLE

The Competency-Based Approach (CBA) paradigm requires that the syllabus be written in modules. The syllabus for the first two years of Secondary Education in Chemistry comprises three of the six modules in Science and Technology (Matter: Properties and Transformation, Energy and Environmental Education); having sixteen topics: eight topics in Form 1 and eight topics in Form 2.

### a) The modules.

Sub-cycle	Level	Title of module	Topic	Family of situations	Duration/ (Periods)
Observation	Form 1	Matter: Properties and Transformation	1. Introduction to Chemistry	Measuring quantities, identifying laboratory equipment and mastering common hazard signs.	06
			2. Action of heat on substances	Effect of heat on substances.	08
			3. Simple classification of substances	Classification and separation of mixed substances.	12
		Environmental Education	4. Water	Water management.	06
			5. Air	Air management.	12
		Matter: Properties and Transformation	6. Acids and bases (alkalis)	Identification of substances in daily life that contain acids or bases; and reactions of acids.	10
			7. Water and solutions	Solubility of substances in water and crystallisation.	10
			8. Chemical elements	Classification of elements as metals and non-metals.	06
	Form 2	Matter: Properties and Transformation	1. Chemical symbols, formulae and valency	Symbols and formulae of chemical substances	04
			2. Chemical reactions and equations	Chemical changes and their representation	12
			3. Reactions with oxygen of air	Chemical changes in the burning of substances in air and rusting.	10
			4. The Atom	Identification of the smallest particles of matter.	12
			5. Periodic table: Families of elements and Relative reactivity	Classification of elements into families and their relative reactivity.	04
			6. States of matter	Separation of mixtures and identification of pure substances.	06
		Energy	7. Action of heat on materials	Sources of energy. Effect of heat on chemical substances.	06
			8. Action of electricity on materials	Effect of electric current on substances.	12

### b) The matrix : The table is made up of three major columns:

- The **Contextual framework** embodies the families of situations and examples of real life situations where the knowledge and skills (competencies) can be applied.
- The **Competencies** are made up of categories of actions and examples of actions: These are groups of some actions which are related to the mastery of the competencies expected for the module.
- The **Resources** have the essential or core knowledge which gives all the set of cognitive and affective resources which the learner needs to mobilize to successfully treat a family of situations. It is divided into four components: the subject content, the aptitude (skills or know-how), attitudes to be disposed or displayed as well as other resources (material, human, finances, etc.) necessary for the acquisition of the competencies

**c) Competencies:** The table below shows the various competencies to be acquired at the end of each topic and consequently by the end of the Sub-cycle. The teacher is expected to use the resources available in his/her local environments to impact these competencies onto the learners.

Sub-cycle	Level	Title of module	Topic	COMPETENCIES
Observation	Form 1	Matter: Properties and Transformation	1 Introduction to Chemistry	Measure quantities using appropriate instruments. Identify common laboratory equipment. Master common hazard signs. Observe laboratory safety rules.
			2 Action of heat on substances	Carry out permanent (chemical) and non-permanent (physical) changes.
			3 Simple classification of substances	Prepare/recognise different types of mixtures. Separate various types of mixtures. Differentiate compounds from mixtures.
		Environmental Education	4 Water	Sources of water and uses. Methods of purification of water. Test for water.
			5 Air	Quantitative determination of active and inactive parts of air. Air pollution, its causes and consequences
		Matter: Properties and Transformation	6 Acids and bases (alkalis)	Identify substances in daily life that contain acids or bases. Prepare indicators from plant extracts. Use indicators to identify acids and bases. Carry out reactions of acids with bases and carbonates.
			7 Water and solutions	Dissolve different substances in water. Prepare a solution, suspension, saturated solution. Demonstrate the effect of heating on solubility of a substance.
			8 Chemical elements	Classify some common elements as metals and non-metals. Demonstrate some physical properties of metals.
	Form 2	Matter: Properties and Transformation	1 Chemical symbols, formulae and valency	Know the symbols of the first 20 elements of the Periodic Table. Write formulae of simple compounds from table of valencies of atoms and/or radicals.
			2 Chemical reactions and equations	Carryout some simple chemical reactions. Write simple balanced equations of chemical reactions in words and symbols.
			3 Reactions with oxygen of air	Burn some common elements in air and write their balanced equations in words and symbols. Experiment to show the rusting of iron and conditions necessary for rusting. Methods to prevent rusting.
			4 The Atom	Identify the three subatomic particles and their characteristics. Know the simple structure of the atom (Bohr's model). Relate atomic number to number of protons or electrons. Calculate mass number of an atom from numbers of protons and neutrons.
			5 Periodic table: Families of elements and Relative reactivity	Classify the first 20 elements of the Periodic Table into periods and groups. Know the different families of elements and their relative reactivity.
			6 States of matter	Further techniques for separation of mixtures. Criteria for identification of pure substances, exemplified
		Energy	7 Action of heat on materials	Know the common sources and uses of energy to man. Effect of heat on some chemical substances. Establish reversibility of reactions using copper (II) sulphate pentahydrate.
			8 Action of electricity on materials	Effect of electric current on substances. Carry out experiments to classify substances as conductors and non-conductors; and also as electrolytes and non-electrolytes.

# FORM I

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE )	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
Measurement of quantities.  Identification of laboratory equipment.  Mastery of common hazard signs.	-Measuring specified quantities of substances in the laboratory, market, home etc.. -Distinguishing harmful from non-harmful chemicals.	-Identify and use basic laboratory apparatus.  -Measurements of mass, volume, temperature and time using laboratory apparatus. -Practice and respect laboratory safety rules. -Master and recognise hazard signs.	-Use of balance to measure mass of solids. -Use of measuring cylinder to measure volume of liquids. -Use of thermometer to measure temperature. -Use of time piece to measure time. -Read and interpret labels on reagent bottles and food products. - Read, interpret and appropriate hazard signs.	<b>Topic 1: Introduction to Chemistry</b> 1.1 Chemistry and its importance in everyday life 1.2 Some basic equipment used in the study of Chemistry: glassware, Bunsen burner (parts of a Bunsen burner, how to use it, parts of the Bunsen flame and the other apparatus) 1.3 Safety rules for working in a Chemistry laboratory including signs and symbols on reagent bottles and the meanings.	-Discuss importance of Chemistry. -Measure mass, volume, time and temperature in their appropriate units. -Read, identify and understand labels on product containers. -Identify and use basic laboratory apparatus. -Set-up and operate basic equipment.	-Great care when handling glassware. -Observe laboratory safety rules. -Care in handling doubtful products -Respect hazard signs.	-Glass ware -Bunsen burner -Balance(s) -Stopwatches -Thermometer -Labeling tags -Reagent bottles -Wash bottles -Hazard signs -Other basic apparatus -etc.
Effect of heat on substances	Non-permanent changes. Permanent changes	Heating substances which produce non-permanent changes. Heating substances which produce permanent changes.	-Heat ice, candle wax, water, camphor balls and observe. -Freeze water. -Condense steam -Heat hydrated copper sulphate, lead nitrate; zinc carbonate. -Burn paper or wood  -Burning a candle and cooking (permanent and non-permanent changes)	<b>Topic 2: Action of heat on substances</b> 2.1 Physical and chemical changes: Action of heat on ice as an example of a physical change; and action of heat on copper sulphate pentahydrate as an example of a permanent chemical change; lead nitrate; zinc carbonate. 2.2 States of matter: solid, liquid, gas phases and the interchange between these i.e. change in state; including the processes involved. 2.3 Simple kinetic theory : Changes in state explained in terms of the simple kinetic theory.	-Heat a substance. -Observe reactions. -Differentiate a chemical change from a physical change. -Identify the states of matter. Convert water to ice or steam and vice versa. -Explain changes of state in terms of the simple kinetic theory.	-Care in handling heat source, chemicals and heated matter.	-Heat source -Ice -water -Copper sulphate pentahydrate -Lead nitrate -Zinc carbonate -Refrigerator. -Candle -Camphor -Match -Paper -Wood, etc.
Classification and separation of mixed substances.	Mixing substances (at home, in the laboratory. and the market).	Mix substances to get various types of mixtures. Classify mixtures into the various types.	-Mix (corn & beans, salt & water, water & kerosene, sulphur & iron fillings, a Fanta drink etc.) -Dissolve sugar or table salt in water.	<b>Topic 3: Simple classification of substances</b> 3.1 Mixtures and pure substances: definitions of a mixture and a pure substance. Classification of matter as a pure substance or a mixture.	-Define mixture and pure substance. -Classify matter as either a pure substance or a mixture.	Care when handling glassware, during mixing & separating mixtures.	- Heat source -water -distillation apparatus, iron fillings, corn, beans, maize,

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE )	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
	Classifying substances.  Separating mixed substances.  -Identification of pure and impure substances, homogeneous and heterogeneous mixtures.	Carry out simple experiments to obtain pure substances from mixtures. Distinguish between mixtures and compounds.  -Determining purity of substances -Differentiating pure substances from mixtures.	-infect a balloon or uncork a fanta bottle -Classify the mixtures under the various types. -Prepare a flour mixture for cake. -Prepare a common salt solution for rehydration. -Use appropriate techniques to separate the various mixtures -Sieving e.g. corn flour/corn bran, fine sand/pebbles, -Filtration e.g. Muddy water, corn beer/chaffs -Distillation e.g. salty water, ethanol/water, Petroleum or Crude oil -Magnetization e.g. iron filings/sand -Winnowing e.g. patched groundnut/groundnut husk, rice/bran -Sublimation e.g. Ammonium chloride/common salt, -Separating funnel e.g. kerosene/water -Chromatography e.g. green leaf pigments, components of ink. -Centrifugation e.g. blood components, Decantation, etc -Use boiling & melting points to distinguish between pure substances and mixtures.	3.2 Types of mixtures: Examples of solid/solid, solid/liquid, liquid/liquid and gas/liquid mixtures  3.3 Methods of separating mixtures. Methods of separating solid/solid, solid/liquid, liquid/liquid and gas/liquid mixtures.  3.4 Pure substances. Differences between mixtures and pure substances.  3.5 Matter and its constituents: Matter as a pure substance or a mixture. Pure substances as either elements or compounds. Composition of elements (same type of particles: atoms); composition of compounds (different types of atoms); simple definition of an atom.  3.6 Differences between compounds and mixtures.	-State the differences between pure substances and a mixture. -Identify the various types of mixtures. -Use appropriate separating techniques to separate different mixtures. -Classify pure substances as either elements or compounds. - State the composition of matter. -Define an atom. -Differentiate between compounds and mixtures.	Care when heating volatile liquids during the separation of liquid mixtures.	magnet, table salt, pure substances, ethanol kerosene, - separating funnel, a sieve. -Gases e. g water vapour, air, bromine gas, -fanta drink -balloon , -fume cupboard -sulphur -beakers -clamp and stand. etc.
Water management	-Identifying natural sources of water. -Protection of	-Identify various sources of water.  -Identify water	-Allow water collected in bucket, jar etc. to stand for solid particles to settle, then decant.	<b>Topic 4: Water</b> 4.1 Natural sources of water and the water cycle: rain, springs, streams, wells, rivers, seas, oceans;	-Enumerate sources of natural water. -Describe and draw the water cycle.	-Care when collecting water from the various	-Gravel of various sizes, sand, charcoal -transparent



CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE )	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
	natural sources of water -Pollution of water, sources of pollution and pollutants. -Physical and chemical treatment of polluted water.	pollutants and their sources. -Testing physically and chemically for pure water. -State the uses of water. -Prevention of water pollution -Treatment of water for domestic use -Purification of water for laboratory / industrial use	-Use clean white cloth to filter water collected -Construct and use sand filters. -Measure specific quantities of chemicals: NaOCl, (Ca(ClO) <sub>2</sub> ), etc to add to water for treatment. -Carry out simple distillation of impure water to get pure water. -Draw the water cycle. - State physical properties (colour, taste, smell) of pure water. -Chemical test for pure water. -Re-cycling of refuse -Disposal of garbage in appropriate sites -Construction of latrines far from water sources -Boil, cool and filter water for domestic use. -Chlorinate water for drinking. -Purify water by distillation for laboratory use	4.2 Methods of purification of water for domestic use and laboratory use: water treatment work for domestic use, distillation to obtain pure water for laboratory use; 4.3 Test for water. Anhydrous copper sulphate used to test for water. 4.4 Uses of water in the home and in the laboratory. 4.5 Water pollution. Definition of pollution; sources of pollution: industry, agriculture and sewage.	-Construct and use of local sand filter. -Weighing chemicals and measuring volumes. -Purify water for domestic and laboratory use. -Use Cobalt(II) Chloride paper, anhydrous copper(II) sulphate and other physical methods(b.pt. and m.pt., taste, smell) to test for water. -State water pollutant sources. -List uses of water. -Define pollution, identify sources of pollution and name some pollutants. -Planting of water friendly trees around water catchment areas. - Skills in water purification.	sources. - care when heating and distilling. -Use a clean white piece of cloth. -Care when constructing the sand filter. -Care when handling chemicals. -Care when handling a thermometer -Respect of personal Hygiene rules, -Avoid discarding refuse and waste in natural sources of water.	plastic container -Source of heat. -Chemicals ( la croix, NaOCl, Ca(ClO) <sub>2</sub> , Ca(OH) <sub>2</sub> etc. -Bucket, or jar. -Water from the various natural sources. -White piece of cloth (filter paper) -Distillation apparatus. -Thermometer. -Wall charts showing large scale water treatment plant and uses of water. -Balance -Rivers, Streams, lakes, rain, etc -Chlorine -Sand filter -anhydrous Copper sulphate, etc.
Air management	Demonstrating that air is a form of matter. Identifying the gases in air.	Carry out experiments to show that air is a form of matter, that oxygen is the active part of air,	-Measure the mass of air using an inflated balloon. - Push an empty bottle beneath water in a bucket.	<b>Topic 5: Air</b> 5.1 Composition of air: active and inactive parts. 5.2 Active part of air: oxygen (burning, rusting; rusting to be mentioned only).	- Conduct simple experiments to show that air is made of active and inactive parts. -Conduct simple	-Care when handling and setting up of equipments. -Care when lighting and	-Water -Beaker -Measuring cylinder -Candle -Match



CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE )	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
	<p>Quantitative determination of active and inactive parts of air.</p> <p>Identifying sources of air pollution and pollutants.</p> <p>Burning substances in air.</p> <p>-Global warming and climate change, destruction of the ozone layer (depletion).</p>	<p>to determine the percentage of oxygen in air. State the percentage composition of air by volume. Identify air pollutants.</p> <p>-Fight against air pollution, -Limitation of global warming to conserve the ozone layer</p> <p>-Burning of substances in air</p> <p>-Breathing</p> <p>-Prevention of air pollution.</p>	<p>-Place a lighted candle in water and cover it with a measuring cylinder or beaker.</p> <p>-State causes of air pollution and name some pollutants.</p> <p>-Burn grass and identify the air pollutants (solid particles and gases).</p> <p>-Limit the discharge of toxic substances into the air. Construct industries away from residences. Oblige industries to properly manage toxic products.</p> <p>-Limit the emission of greenhouse gases and use of fossil fuels. Limit the discharge of CFCs. Plant trees; limit the use of bush fires.</p> <p>-Use refrigerators and aerosols free of CFCs.</p> <p>-burning of wood</p> <p>-Inflating balloons</p>	<p>5.3 Inactive part of air: nitrogen;</p> <p>5.4 Air as a mixture: oxygen, nitrogen, carbon dioxide, water vapour, rare gases.</p> <p>5.5 Air pollution: pollutants: solid particles and gases, effects on the environment.</p>	<p>experiment to show that the active part of air is that responsible for combustion.</p> <p>- List the other gases in air or percentage composition of air.</p> <p>-Discuss air pollution and its causes and ways of reducing it.</p> <p>-Identify the factors that influence rusting.</p> <p>-Contribute to proper management of toxic and waste products. Choice of house-hold apparatus, aerosols with no CFCs.</p> <p>-Waste management</p>	<p>handling flame from match.</p> <p>- Control the inflation of balloon.</p> <p>- care when handling the balance.</p> <p>-Avoid burning of tyres, plastics, bush fires, etc.</p> <p>-Plant trees and flowers for purification of air.</p>	<p>-bottle</p> <p>-Nail or iron sponge</p> <p>-Test tubes</p> <p>-Grease.</p> <p>-Personnel from the ministry of environment, nature protection and agricultural protection.</p>
Identification of substances in daily life that contain acids or bases; and some reactions of acids.	<p>Identification using plant extracts as acid-base indicators.</p> <p>Identification using traditional acid-base indicators</p> <p>Classification of solutions as</p>	<p>Investigate the natural as well as industrial sources of acids and bases</p> <p>Extracting and preparing indicators from plants extract.</p> <p>Preparing and using plant</p>	<p>Purchase lemon, lime, lime stone, soap, sour milk, vinegar, car battery acid, aqueous NaOH, Dil. HCl etc. and test for their acidity and alkalinity using a familiar indicator.</p> <p>-Harvest plant leaves (red cabbage), crush and extract the juice.</p> <p>-Add red cabbage extract, to vinegar, lemon or lime juice, salt solution, soapy</p>	<p><b>Topic 6: Acids and bases (alkalis)</b></p> <p>6.1 Acids in everyday life: citrus fruits, sour fruits, vinegar, car battery acid</p> <p>6.2 Bases in everyday life: baking powder, “kanwa”, wood ash extract, anti-acid tablet or powder</p> <p>6.3 Test for acids and bases with familiar indicators</p> <p>6.4 Extraction of indicators: from flowers, red cabbage and use to classify solutions as acids, bases or</p>	<p>-Know some common acids and bases in everyday life.</p> <p>-Use familiar indicators to identify and classify substances as acidic, basic, and neutral.</p> <p>-Extract and prepare</p>	<p>-Follow instructor’s advice strictly.</p> <p>-Avoid tasting substances with the mouth.</p> <p>-Avoid substances from dropping on the skin.</p>	<p>-Red cabbage,</p> <p>- Stigma of okra flower,</p> <p>-Coloured flower &amp; leaves.</p> <p>-Mortar and pestle.(crusher)</p> <p>-Water, Beaker</p> <p>-Test-tubes</p> <p>-Citrus fruits</p> <p>-Vinegar</p> <p>-Caustic soda</p> <p>-Car battery</p>

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE )	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
	acidic, basic or neutral.	extracts as indicator.  Using indicators to identify and classify substances (at home, in the market and in the laboratory etc.) as acidic, basic, or neutral.	water, baking powder, water, “kanwa”, sour milk, rain water, dilute sulphuric acid, dilute hydrochloric acid, aqueous sodium hydroxide etc and classify the solutions as either acids, bases or neutral. - Use universal indicator to classify substances on a pH scale. -Mix equal volumes and concentrations of any acid with any base and then test the resulting solution with an indicator.	neutral. 6.5 pH scale: use of universal indicator to classify solutions as acids, neutral or bases (car battery acid, vinegar, lime juice, salt solutions, rain water, soapy water, kanwa, baking powder). pH scale as series of numbers that indicate whether a substance is acidic, neutral or basic. 6.6 Reactions of acids with bases (neutralization) and acids with carbonates.	plant extracts for use as indicators. -Classify substances as being strong acid, weak acid, neutral, weak base or strong base and therefore establish a pH scale. - Define neutralization and give examples.	Great care in handling chemicals.  -Know whether a fruit is acidic or basic	acid -Soapy water -“Kanwa” -pH meter -Litmus paper -Universal indicator -pH scale -Wood ash solution -dilute (HCl and H <sub>2</sub> SO <sub>4</sub> ) - NaOH(aq) -Indicator (phenolphthalein or methyl orange) -piece of clean cloth. -various fruits.
Solubility of substances in water.  Crystallization	Preparing different types of solutions: homogeneous, heterogeneous and colloidal. Determining the solubility and the insolubility of substances in water. Subjecting saturated solutions to different conditions ( e .g temperature.) Crystallizing substances. Prepare saturated	Dissolving solutes in solvents.  Identify soluble and insoluble substances.  Stating the effect of heating on solubility.  Crystallizing salts from solutions. Define terms related to solutions (aqueous, saturated, unsaturated, homogenous,	Dissolve table salt, sugar and potassium nitrate in water. Dissolve powdered chalk in water. Dissolve table salt in water until some of it remains undissolved. Dissolve sugar in hot and cold water and observe. Heat a saturated salt solution, observe and add more salt. Evaporate a copper (II) sulphate solution to dryness. Cool a saturated solution of table salt progressively and	<b>Topic 7: Water and solutions</b> 7.1 Solutions: Preparation of solutions of sugar and table salt in water (aqueous solutions). Homogeneous nature of solutions. Preparation of saturated solutions. Definitions of solution, solvent, solute. 7.2 Solubility in water: soluble and insoluble substances. Effect of heating on solubility. 7.3 Crystallisation: The procedure of crystallisation. Crystallisation as a method of purifying solids.	-Water as universal solvent. -Define solute, solvent, solution, suspension. -Homogeneous and heterogeneous solutions. -Prepare solutions, saturated solutions and suspensions. -Identify soluble and insoluble substances. -State the effect of heating on solubility of substances. -Crystallize salts from solutions.	-Care when stirring solution. -Care when measuring salts. Care when heating solutions and handling flame. -Care when handling the thermometer and other glassware. Never taste any salt.	-Stirrer -Thermometer. -Water - Heat source -NaCl, Sugar, KCl, CuSO <sub>4</sub> , CaCO <sub>3</sub> , KNO <sub>3</sub> etc. -Beakers - Test-tubes, -Chalk powder -Spatula

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE )	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
	solutions. Solubility in water and factors that affect solubility.	crystallization, solubility, etc.). -Diluting a saturated solution	observe. Verify factors that affect solubility: temperature, amount of solvent and amount of solute.		-Gentle cooling of hot solution during crystallization.		
Classification of elements as metals and non-metals.	Physical properties of metals and non-metals. Uses of metals and non-metals.  Definition of elements and compounds with examples.	Distinguish metals from non-metals. Discuss physical properties of metals and non-metals ( conductivity, malleability, ductility, etc.) Know examples of metals and non-metals and their respective uses.	Heat a piece of copper wire and wood and handle for some time. Put hot water in a plastic cup and in a silver cup and hold. Let a piece of paper and a nail fall simultaneously. Complete an electrical circuit using a nail and then a piece of paper in turn. Place the substances tested above as metal or non-metal. Twist or beat a copper wire into various forms and shapes. Explain uses of metals as in: knife, coin, pot, thermometer, overhead electric cables, etc.	<b>Topic 8: Chemical elements</b> 8.1 Elements and compounds: examples from substances met so far. 8.2 Metals and non-metals: physical properties (electrical conductivity, malleability, heat conductivity, etc.).	-Recall the definition of elements and compounds with examples. -Distinguish between metals and non-metals. -State properties of metals and non-metals. -State uses of metals and non-metals.	-Care when heating metal and non-metal objects. - Care when handling an electric circuit. - Curiosity. -Should demonstratepr actically the differences between metals and non-metals, i.e. conductivity, malleability, ductility, etc.	-water. -Copper wire. -piece of paper and wood. -Aluminum foil. -Heat source. -Thermometer. Knife, coin, -An electric circuit.  -Periodic table chart. -etc.

## FORM II

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE )	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
Symbols and formulae of chemical substances.	Writing symbols of elements. Writing the formulae of compounds.	-Using some letters of the alphabet to represent symbols. -Combining some symbols of atoms to represent compounds. -Use Dalton's theory and valencies to explain how formulae of simple compounds are derived. -Know elements and compounds from their symbols and formulae respectively. -Read, identify and interpret some labels on farm and market products, drugs, beverages, etc.	-Write and recognise symbols of the first twenty elements on the Periodic Table. -Understand the use of Latin names for some elements e.g. sodium, potassium, iron, etc. -Use tables of valencies of atoms and radicals to write the formulae of simple compounds such as sodium chloride, sodium hydroxide, copper sulphate, water, calcium carbonate, hydrochloric acid, sulphuric acid, etc. -Identify simple compounds from their formulae. List elements found on a label.	<b>Topic 1: Chemical symbols, formulae and valency.</b> 1.1 Dalton's atomic theory: brief history of John Dalton and Dalton's atomic theory. Statement of the theory. 1.2 Chemical symbols, formulae and valency: Need for symbols, how to derive symbols of elements, definition of symbols, formulae, distinguishing between symbols and formulae; definition of valency, construction of tables of: a) Symbols and valency of some elements b) Name, formula and valency of some groups of atoms (radicals: hydroxide, carbonate, sulphate, nitrate, phosphate, ammonium) 1.3 Use of tables to derive the formulae of compounds.	-State Dalton's atomic theory. -Combine letters of the alphabet to form symbols of elements. -Combine symbols of elements to form formulae of compounds. -Read and identify symbols and formulae of compounds on labels of farm or agricultural products, pharmaceutical products, market products, beverages etc,	-Curiosity. -Handle the periodic chart with care. -Respect prescription labels on food products and drugs	-Picture of John Dalton. -Periodic Table chart -Water -Laboratory chemicals containers. -drug containers. -empty fertilizer bags. -Empty market product containers. -etc.
Chemical changes and their representation	-Converting substances into others. -Proving that matter is conserved when substances are converted to others substances.	-Heating and burning substances. -Putting two or more substances together and making them to react. -Using words equations, symbols and formulae to represent simple chemical changes.	-React iron with sulphur. -Heat calcium and copper carbonates. -Prepare salts by precipitation. -Weigh masses of reacting substances before and after reactions. -React dilute acid with carbonate and alkali. -Write simple balanced	<b>Topic 2: Chemical reactions and equations.</b> 2.1 Chemical changes: revision with examples of chemical changes. Reactions of iron with sulphur, heating of calcium carbonate, heating of copper carbonate, reaction of acid with carbonate, reaction of acid with alkali. 2.2 Equations: representation of chemical reactions by means of	-Briefly recall the definition of chemical change and some examples. -Write balanced equations for chemical reactions. -State the law of conservation of mass -Demonstrate, with some common reactions, the	-Care when handling flame, test-tubes, and when using the balance. -Be careful when mixing substances.	-Chemical balances. -Test-tubes and the holders. -Matches -source of heat -Paper, sugar -Conical flask. -Beaker. -Carbonates of copper and calcium.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE )	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
		-Balancing chemical equations. -State the law of conservation of mass.	equations of chemical reactions in words and symbols.	balanced equations in words and symbols. 2.3 Law of conservation of mass. Simple experiments to illustrate the law.	conservation of mass when substances react.		-Dilute acid and alkali. -etc.
Chemical changes in the burning of substances in air and rusting.	-Listing the various components of air. -Burning substances at home, in the laboratory and in the industry. -Rusting of iron.	-Separate air into its various components. -Burn substances in air. -Exposure of iron (fillings, sponge, nail) to air and moisture. -Preventing rusting.	-Use fractional distillation apparatus to separate liquid air into its various components. -Burn Ca, Mg, Cu, C, S, etc. in air. - Use iron (nails or sponge) to show conditions necessary for rusting. -Leave iron sponge/nail in moist air for three days and observe. -Write balanced equations for the above reactions. -Rub iron or material made of metals with oil, grease or paint.	<b>Topic 3: Reactions with oxygen of air</b> 3.1 Composition of air: determination of percentage by volume of oxygen and nitrogen of air. Separation of the components of air by fractional distillation. 3.2 Reactions of substances with oxygen of air (burning): calcium, magnesium, iron, carbon, copper, sulphur, town gas (cooking gas), hydrogen. 3.3 Rusting (iron): conditions, composition and prevention.	-Mount and use set-up for fractional distillation to separate air into its various components. -Use the active part of air to burn substances. -State conditions necessary for rusting to occur. -Methods used to prevent rusting.	-Care when handling glassware. -Care when burning substances. -Care when handling oil, grease and paint.	-Source of heat. -Material for carrying fractional distillation. -Ca, Mg, Cu S, C, cooking gas -Safety glasses. -Test-tubes and boiling tubes. -Water, oil, grease, petroleum jelly and paint. -iron fillings, -cotton wool. -Beakers. - etc.
Identification of the smallest particles of matter.	- Limitation of Dalton's atomic theory. -Identification, characteristics and location of subatomic particles in an atom.	-Identifying subatomic particles and locating them in an atom. -Explaining the property of each particle in an atom. -Relating atomic number to number of protons and calculating mass number.	-Identify protons, neutrons, and electrons. -Discuss properties of each particle in an atom. -Draw circle to depict energy shells and arrange electrons on them. -Relate atomic number to number of protons or electrons. -Calculate mass number of an atom from numbers of protons and neutrons.	<b>Topic 4: The Atom</b> 4.1 Composition of the atom: subatomic particles (electrons, protons and neutrons); nucleus and electrons. 4.2 Simple structure (Bohr's model) of the atom.	-Review the first statement of Dalton's atomic theory, to show divisibility of the atom. -Identify and state properties of subatomic particles in an atom (mass, charge and location). -Relationships between mass number, atomic number and numbers of protons, neutrons and electrons. -Describe simple structure of the atom.	-Curiosity	Picture, model or chart of an atom. -manila paper -Bold maker. -Models, charts and pictures showing the atomic numbers of elements.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE)	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
Classification of elements into families and their relative reactivity.	<ul style="list-style-type: none"> <li>-Historical development and contributions towards modern periodic table.</li> <li>-Identify the position of metals and non-metals on the periodic table.</li> <li>-Relate reactivity to the families of elements.</li> </ul>	<ul style="list-style-type: none"> <li>-Grouping elements into families.</li> <li>-Naming some families.</li> <li>-Stating some scientists who contributed to the development of the periodic table.</li> <li>-Showing the positions of metals and non-metals on the periodic table.</li> <li>-State changes in properties (general trends) of elements across the period and down the group.</li> </ul>	<ul style="list-style-type: none"> <li>-Place the first 20 elements into groups and periods in a table.</li> <li>-Group the elements into metals, metalloids and non-metals.</li> <li>-Give names to some families of elements (alkali metals, alkaline-earth metals, halogens, noble gases.)</li> <li>-State the contributions of Dobereiner, Newlands, Meyer, and Mendeleev leading to development of the modern periodic table.</li> <li>-Discuss physical properties and relative reactivity of families.</li> </ul>	<b>Topic 5: Periodic Table: Families of elements &amp; Relative reactivity.</b> 5.1 The periodic table: the need to classify elements. Brief history: Dobereiner, Newlands, Meyer, Mendeleev leading to the modern periodic table. Metals and non-metals in the table. Periods and groups. 5.2 Families of elements: alkali, alkaline-earth, halogens and noble gases. Reactivity of families. Limit to first 20 elements of the Periodic Table.	<ul style="list-style-type: none"> <li>-The purpose of classifying elements.</li> <li>-Classify elements on a table.</li> <li>-Give a brief historical background development of the Periodic Table.</li> <li>-State the modern periodic law.</li> <li>-Identify positions of metals, metalloids and non-metals on the Periodic Table.</li> <li>-Discuss physical properties and relative reactivity of families of elements.</li> </ul>	<ul style="list-style-type: none"> <li>-Care when handling members of some groups. E.g. sodium, potassium, Fluorine etc</li> </ul>	<ul style="list-style-type: none"> <li>-The modern Periodic Table.</li> <li>-Element cards.</li> <li>-paraffin oil.</li> <li>-sodium and potassium.</li> <li>-Spatula,</li> <li>-water.</li> <li>-Beaker,</li> <li>-gloves.</li> <li>Pictures of the first contributors and their versions of the Periodic Table.</li> </ul>
Separation of mixtures and identification of pure substances	<ul style="list-style-type: none"> <li>-Separating miscible liquids.</li> <li>-Separating solid/solid mixture by heating.</li> <li>-Separating solutes from solution.</li> <li>-Testing the purity of substances.</li> </ul>	<ul style="list-style-type: none"> <li>-Using a simple distillation apparatus.</li> <li>-Using a fractional distillation column.</li> <li>-Using a chromatography paper or column.</li> <li>-Heating solid/solid mixture.</li> <li>-Know the criteria for purity of liquids and solids.</li> </ul>	<ul style="list-style-type: none"> <li>-Use a distillation apparatus to separate liquid mixtures.</li> <li>-Produce distilled water.</li> <li>-Use paper or column chromatography to separate pigments and ink.</li> <li>-Heat a mixture of NaCl and NH<sub>4</sub>Cl or iodine and sand.</li> <li>-Determine the boiling point of distilled water.</li> <li>-Determine the melting point of ice.</li> <li>-Mount and dismount distillation apparatus</li> </ul>	<b>Topic 6: States of matter.</b> 6.1 States of matter: revision of states of matter, pure substances, and mixtures. 6.2 Techniques for separation: distillation (simple and fractional), paper chromatography. 6.3 Definitions: sublimation, melting point and boiling point. 6.4 Simple criteria for purity: melting and boiling points.	<ul style="list-style-type: none"> <li>-Recall the states of matter and their inter-conversion.</li> <li>-Recall techniques for separation of mixtures already seen</li> <li>-Use distillation apparatus to separate miscible liquid mixtures.</li> <li>-Define sublimation, melting and boiling points.</li> <li>-Determine the purity of liquid and solid substances.</li> </ul>	<ul style="list-style-type: none"> <li>-Care when handling the thermometer, test-tubes and beakers.</li> <li>-Care when heating substances.</li> <li>-Care when mounting &amp; dismantling distillation apparatus.</li> </ul>	<ul style="list-style-type: none"> <li>-Simple and fractional distillation apparatus.</li> <li>-Sand, iodine, NaCl, NH<sub>4</sub>Cl.</li> <li>-Thermometer.</li> <li>-Test tubes, beakers,</li> <li>-Source of heat.</li> <li>-Coloured leaves /flowers.</li> <li>-Ink, dyes.</li> <li>-Chromatography paper and column.</li> <li>-etc.</li> </ul>
Sources of energy. Effect of heat	<ul style="list-style-type: none"> <li>-Types, sources and uses of energy</li> </ul>	<ul style="list-style-type: none"> <li>-Burn some fossil or non-fossil substance to</li> </ul>	<ul style="list-style-type: none"> <li>-Measure given mass of CaCO<sub>3</sub> or BaCO<sub>3</sub>, in crucibles and heat.</li> </ul>	<b>Topic 7: Action of heat on materials.</b> 7.1 Sources of energy (fossil and non-fossil) and their uses.	<ul style="list-style-type: none"> <li>-Name examples of fossil fuels (coal, lignite, natural gas,</li> </ul>	<ul style="list-style-type: none"> <li>-Care when handling chemical</li> </ul>	<ul style="list-style-type: none"> <li>-Chemical balance.</li> <li>-Boiling tubes,</li> </ul>



CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE )	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
on chemical substances.	-Fossil and non-fossil sources of energy. -Action of heat on inorganic and organic substances. -Change in mass that occurs when substances are heated. -Representing chemical changes by equations.	produce heat energy. -Heat an inorganic substance. - Heat an organic substance. -Determine the difference in mass of a substance after heating. -Observe chemical reactions and make conclusions. -Represent observations by words and chemical equations.	-Test any gas evolved. -Weigh the mass of the substances after heating. -Represent observations by word and chemical equations. -Heat $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ and represent what happens by an equation. -Add water to the product of heated $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ and represent the effect by an equation. -Link the equation of action of heat on $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ to that of water on its product after heating to bring out the concept of reversibility. -Heat a sugar cube.	Traditional fuels (fuelwood, crop wastes, dung and nuclear fuels) and the various non-traditional renewable energy sources (hydro, modern biomass, solar, wind, ocean, and geothermal) as non-fossil sources. 7.2 Action of heat on hydrates, oxides, carbonates and sugar: copper (II) sulphate pentahydrate, lead (IV) oxide, calcium carbonate, sugar, sodium carbonate. Balanced equations of these chemical reactions. 7.3 Experimental study of change in mass resulting from the action of heat on calcium carbonate or copper carbonate. 7.4 The concept of reversibility introduced with the action of heat on copper (II) sulphate pentahydrate.	oils, etc.) -Non-fossil fuels (traditional and non-traditional), examples and their uses. -General uses of heat energy include heating, cooling, cooking, lighting, mobility, and motive power. -Weigh out masses of chemical substances. -Predict the effect of heat on substances. -Write balanced equations to represent effect of heat on chemical substances. -Carryout experiments to show change of mass when substances are heated. -Explain the concept of reversibility.	balance. -Care when heating chemical substances. -Awareness that chemical substances change in composition when they are heated.	pyrex test-tubes. -Crucibles and crucible lids. -Source of heat. -Pair of tongs. -Desiccators. -water. -Droppers -Tripod -Gauze - $\text{CaCO}_3$ . - $\text{PbO}_2$ $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ - $\text{CuCO}_3$ . - $\text{MgCO}_3$ . - $\text{Li}_2\text{CO}_3$ . -Sugar. -etc.
Effect of electric current on substances.	-Action of electric current on metals and non-metals. -Action of electric current on electrolytes, non-electrolytes and fused salts. -Classification	-Complete an electrical circuit using a metallic object and then replace with a non-metallic object. -Insert the electrodes of an electrical circuit into an electrolyte	-Complete an electric circuit having a bulb with a nail, copper wire, piece of zinc, sulphur, chalk, piece of wood etc. Observe what happens to the bulb in each case. Classify the substances as conductors or as non-conductors.	<b>Topic 8: Action of electricity on materials.</b> 8.1 Action of electricity on metals (copper, zinc), non-metals (sulphur), plastic, wood, ethanol, water, sugar; solutions: sodium chloride solution, fused salts (lead bromide, potassium bromide). Classification as conductors	-Define and distinguish between conductors and non-conductors (insulators). -Define and distinguish between electrolytes and non-electrolytes. -Know the particles	-Care when handling electric circuits. -Select good electrodes and take care of the electrodes. -Care when	-batteries(dry) -Daniel cell. -Bulbs. -Solution of copper sulphate. -Nail, wood , - Broom stick or bamboo, -Sulphur. -Copper wire.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES OF ACTIONS	CONTENT (CORE KNOWLEDGE )	APTITUDE (SKILLS)	ATTITUDES	OTHER RESOURCES
	of substances as conductors and non-conductors; and solutions as electrolytes and non-electrolytes.	and then into a non-electrolyte. -Complete an electrical circuit with a crystalline salt and then with the fused salt. -Record your observations in each case.	-Insert the electrodes of a circuit into ethanol, sugar solution, sodium chloride solution, fused lead bromide and sodium chloride, etc. -Observe their respective effect on the bulb. -Classify them as electrolytes or non-electrolytes.	and non-conductors; Definition of conductors and non-conductors. 8.2 Electrolytes and non-electrolytes. Ions as particles in electrolyte solutions and fused electrolytes Molecules as particles in non-electrolytes.	involved when substances conduct and when they do not conduct electricity. -Classify substances as conductors and non-conductors; as electrolytes and non-electrolytes.	connecting metal to circuits.	-crocodile clips -connecting wires -Graphite rod or platinum rod. -Sugar cubes. -Water, -Beakers. -Plastic cups. -Rubber bands. -NaCl, PbBr <sub>2</sub> -piece of Chalk. -Stirrer. -heat source. -crucible/lid



REPUBLIQUE DU CAMEROUN  
Paix- Travail – Patrie

.....  
MINISTERE DES ENSEIGNEMENTS SECONDAIRES

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INSPECTION GENERALE DES ENSEIGNEMENTS

.....  
INSPECTION DE PEDAGOGIE / SCIENCES  
.....

REPUBLIC OF CAMEROON  
Peace- Work – Fatherland

.....  
MINISTRY OF SECONDARY EDUCATION

.....  
INSPECTORATE GENERAL OF EDUCATION

.....  
INSPECTORATE OF PEDAGOGY / SCIENCES  
.....

# **PHYSICS AND TECHNOLOGY TEACHING SYLLABUS**

## **FORMS 1 AND 2**

**ANNUAL WORKLOAD: 50 HOURS (60 PERIODS)**

**WEEKLY WORKLOAD: 02 PERIODS**

## 1. GENERAL INTRODUCTION

**Physics and Technology** will cover all six modules.

Successful learners of the content of the syllabus will gain lifelong skills, including:

- confidence in a technological world, with an informed interest in scientific matters
- an understanding of how physics theories and methods have developed, and continue to develop, as a result of groups and individuals working together
- an understanding that the study and practice of physics are affected and limited by social, economic, technological, ethical and cultural factors
- an awareness that the application of physics in everyday life may be both helpful and harmful to the individual, the community and the environment
- knowledge that physics overcomes national boundaries and that the language of physics, used correctly and thoroughly, is universal
- a concern for accuracy and precision
- an understanding of the importance of safe practice
- improved awareness of the importance of objectivity, integrity, enquiry, initiative and inventiveness
- an interest in, and care for, the environment

**This syllabus which will be done in 100 hours (120 periods) and in two consecutive school years consists of six (06) modules divided as follows:**

CLASS	TITLE OF MODULE	DURATION
Form 1	1. The world of science	8
	2. Matter: Properties and transformation	12
	3. Energy: some applications and uses	16
	4. Health Education	4
	5. Environmental Education	4
	6. Technology	6
Form 2	1 The world of science	8
	2 Matter: Properties and transformation	12
	3 Energy: some applications and uses	16
	4 Health Education	4
	5 Environmental Education	4
	6 Technology	6

**The Physics Syllabus in general follows the general introduction spelt out under science above. that is:**

- **PLACE OF THIS SYLLABUS IN THE CURRICULUM**
- **CONTRIBUTION OF THE SYLLABUS TO LEARNING**
- **CONTRIBUTION OF THE SYLLABUS TO REAL LIFE SITUATIONS**

### **PRESENTATION OF THE FAMILIES OF SITUATIONS COVERED BY THE SYLLABUS**

N°	Module	FAMILIES OF SITUATIONS
I	The world of science	Understanding what science is all about
II	Matter: Properties and transformation	Utilization of products and consumer goods.
III	Energy: some applications and uses	Utilization of energy in daily life.
IV	Health Education	Care of somebody organs: Medical devices
V	Environmental Education	Climate change: Management of water, Atmosphere,(hydrology) Use of satellite. Air movement. Waste disposal
VI	Technology (Elementary Engineering)	Inaccessibility and the malfunctioning of common tools

## COMPREHENSIVE TABLE SHOWING THE MODULES FOR THE OBSERVATORY SUB - CYCLE

This paradigm requires that the syllabus be written in modules. The syllabus covers all six modules both in Form 1 and Form 2.

### a) The modules.

Sub-cycle	Level	Title of module	Topic	Duration/ (hours)
Observatory	Form 1	The world of science	Basic equipment in a science laboratory.	08
			1 Safety rules.	
			2 Some scientific skills and attitudes	
		Matter : Properties and Transformation	3 Physical state of matter	12
			4 Measurements	
			5 Using services wisely	
			6 Thermal and electrical insulation	
		Energy	7 Energy needs of human beings	16
			8 The types, sources and usage	
			9 Transmission of energy	
			10 Force	
			11 Motion	
		Health Education	12 Sound	04
			13 Thermometer	
			14 Sport and physics	
		Environmental Education	15 Radiation	04
			16 Global warning	
			17 Climate change	
		Technology	18 Machine	06
			19 Care and maintenance	
			20 Technical drawing	
	Form 2	The world of science	1 Scientific Method Part 2	08
			2 Simple application of measurements	
		Matter : Properties and Transformation	3 Temperature	12
			4 Change of state	
			5 Thermal and electrical insulation	
			6 Physical states	
			7 Action of heat on materials	
			8 Action of electricity on materials	
		Energy	9 Energy needs of human beings	16
			10 Renewable energy	
			11 Electricity	
			12 Light	
			13 Energy exchange	
			14 Motion	
		Health Education	15 Distribution of Pressure in a liquid	4

			16 Muscles stress	
			17 Types of lenses and their application	
		Environmental Education	18 Understand the effect of cosmic radiation from the sun	4
			19 The Ionosphere	
			20 Greenhouse effect	
			21 Variation of rainfall in Cameroon	
		Technology	22 Project	6
			23 Care and Maintenance	
			24 Repairs	
			25 Technical drawing	
			26 Basic telecommunication devices	

**b) The matrix :** The table is made up of three major columns:

- The **contextual framework** embodies the families of situations and examples of real life situations where the knowledge and skills (competencies) can be applied.
- **Competence** made up of categories of actions and examples of actions: These are groups of some actions which are related to the mastery of the competencies expected for the module.
- The **Resources** have the essential or core knowledge which gives all the set of cognitive and affective resources which the learner needs to mobilize to successfully treat a family of situations. It is divided into four components: the subject content, the aptitude (skills or know-how), attitudes to be disposed or displayed as well as other resources (material, human, finances, etc.) necessary for the acquisition of the competencies.

**c) Competencies expected to be obtained at the end of the observatory year.**

It is expected that at the end of the course three components of competency would have been acquired by the learner. These are their personal attributes, skills and knowledge.

1. Personal attributes are the underlying characteristics that are deep and enduring parts of an individual, expressed most of the time. They are one's personal style or personal effectiveness such as feeling, attitudes, self – image, values, motives, habits and traits. These attributes are hidden and it is expected to be uncovered and improved upon in the learner.
2. Skills can be observed. They are acquired through practice and experience. This includes the ability to understand and apply procedures to complete specific tasks and respond to inquiries.
3. Knowledge is a baseline of information that allows a person to perform from an informed perspective. This information consists of theories, facts and principles. This information may be acquired through formal and/or informal learning and experiences.

Therefore the competencies to be evaluated at the end of the course will be;

- Any element that is critical to successful and effective performance
- Measuring, observing and performance oriented skills (process skills)
- Skills related to life activities from the immediate environment
- Consistent in similar activities
- Checking and controlling validity
- Objectiveness
- Positive view of life.
- Communication
- Team Leadership
- Self Aware
- Resourcefulness
- Humility
- Motivation
- Creativity
- Independent

# FORM 1

## FIRST YEAR OF OBSERVATION

### MODULE I: THE WORLD OF SCIENCE

**1. TIME ALLOCATION:** HOURS 2 hours per week. Total hours 8.

#### 2. INTRODUCTION TO THE MODULE

Man is an integral part of the living world. Man therefore has to provide his needs (food, shelter and energy) which are obtained from resources found around him by exploiting the natural world through the implementation of scientific practices and the transformation of products in such a way as to maintain the delicate ecological equilibrium.

It is therefore, important for man to discover and identify the different scientific methods through which he can use to improve on his environment, improve on his standard of living and conditions to adapt to the different milieu in order to better invest in the proper utilization of various resources..

From this point of view the learner ought to be guided to acquire a set of notions, methods, techniques, and attitudes linked to life, life related resources and their interrelationships.

This module therefore enables learner to develop basic scientific skills in life situations and through teaching / learning activities to:

- reinforce the fundamentals of the scientific processes;
- develop abilities on improved and sustainable management of the environment,
- discovering the world around them more intimately.

#### 3. CONTRIBUTION OF THE MODULE TO THE GOALS OF THE CURRICULUM:

- The competencies that the learner will develop from this module will enable her/him clarify, consolidate and organize the learning acquired towards a systematic methods being aware of the society in which man finds himself.
- This module could provide future career in the any fields such as engineering, agronomy, environmental education, teaching , etce...

#### 4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO LIFE:

- This module develops in the learner the scientific spirit, self-reliance and team work. These skills are indispensable in scientific disciplines as well as in those linked to other fields of study.
- At the same time it provides the learner with the indispensable resources for a better appropriation of investigating, analyzing and concluding about happenings around him.
- The importance of this module resides in the fact that the learner who lives permanently in a changing environment, ought to understand her/his milieu in order to exploit it in a sustainable way for her/his needs and survival without rupturing its delicate equilibrium and wasting. Family, social and economic life, the environment, wellbeing and health all depend on man's behaviour in the living world.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Aptitudes	Attitudes	Other resources
Investigating science	Knowing how things are and how they work	Practice of scientific methods	-Explain how to observe things in the environment - Why should measurement be done	<b>Introduction to science.</b> - Definition of science - Branches of science and scientist. <b>General:</b> Basic equipment in a science laboratory. -Safety rules for working in a science laboratory. Careers in science <b>Scientific Methods Part 1:</b> Method of investigation in science. 1. Observing: 2. Measuring using ruler, tape, thermometer, protractor, stop watch and balance: know how to read values (scale), positions of measuring instruments and the eye when reading 3. SI units .	Be able to recognize and identify basic science equipment and things around us..  Think and act scientifically	-Curiosity and sense of observation -Respect of others opinions -Interest in scientific advancement -Open-mindedness -Patience -Love for nature -Team spirit and cooperation -Creative thinking --Effective communication	30 cm rule Metre rule Tape Measuring cylinder Thermometer Balance Protractor Stop watch Burner Lighter Match Visit to the market Visit to the hospital Sport

## MODULE II: MATTER, ITS PROPERTIES AND ITS TRANSFORMATION

**1. TIME ALLOCATION: 2 hours per week. Total hours: 12**

### 2. GENERAL PRESENTATION:

This module consists of three parts:

- Characteristics of matter.
- Properties of matter
- Transformation of matter

This module introduces the learner to develop an awareness of the types of matter in his/her immediate material environment and for him/her to explore the useful relationship that exist between him/her and the physical world. To achieve this, the teacher has to sharpen the curiosity of the learner of the observatory sub-cycle in such a way as to permit the learner to recognize, describe and interpret labels and symbols on objects and tools with which the learner is in contact on a daily basis.

### 3. CONTRIBUTION OF THE MODULE TO THE GOALS AND OBJECTIVES OF THE CURRICULUM

This module seeks to help learners improve their relationship with and knowledge of the material world by deepening the learner's knowledge acquired in the primary school.

### 4. CONTRIBUTION OF THE MODULE TO THE CURRICULUM AND TO AREAS OF LIFE.

To enable learners improve on their relationship with the material world, the teacher should stimulate the learner so as to tap from him/her the ability to read, calculate, manipulate, estimate and interpret.

To achieve this, the learner need skills in languages (English and French), Mathematics, Chemistry, Physics, Technology and Biology.

In this module, the learner is required to take informed decisions that affect his/her health, physical and social environments (i.e. the consumption and production of consumer goods).

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES	ESSENTIAL KNOWLEDGE	APTITUDE	ATTITUDES	OTHER RESOURCES
Commonly consumed and used products.	-Buying and selling of consumable materials -Buying and selling of grains and liquids. -Buying of domestic gas - Communication and information on consumptions.	Characteristics of matter. Application of measurement - Determination of the mass of a body - Determine the weight of a body - Determination of the volume of a body - Determine the temperature of a body	-Read and respect the prescription on the labels of materials products. -Use of balance -Measure and calculate the volume of a given object.	- <b>Properties of matter and their characteristics</b> Materials come in different forms (states). As a basic for understanding this concept: - know that solids, liquids and gases have different properties . - know that the properties of substances can change when the substances are mixed, cooled or heated. <b>MEASUREMENT: Techniques of measurement.</b> <b>Measure:</b> • Temperature • Volume • Mass • weight • density In each case above use simple local market / house whole examples. <b>Using Services Wisely:</b> Safety measures Using information.	• Measurement and calculation of the mass and volume of an object. • Understand the difference between mass and weight • Show practically that the temperature of melting ice is constant. • How bodies can be kept cold in warm areas. • Be able to recognize faulty instruments.	-Great care should be taken when handling doubtful products. -usefulness of density. • Always think of reading the information and labels on the bodies of materials before using them.	-Balance - Meters -Bathroom scale -- Glassware (beaker, flask, measuring cylinder, test tube, etc.) - glass ware test tubes beakers Volumetric flasks measuring cylinders.
		Interpret and exploit the inscriptions on the body of consumed products. Safety measures when using these common objects.	-Interpret and exploit enclosed leaflet. - Read and interpret diagram.				

### MODULE III: ENERGY, VALUE AND USES

#### 1. TIME ALLOCATION: 2 hours per week. Total 16 HOURS

#### 2. GENERAL PRESENTATION:

This module presents energy concepts studied already at the primary school level. It is subdivided into two units as follows:

Unit one consists of:

- Types, sources and uses of energy; for consolidation of concepts;
- Energy exchanges.

Unit two consists of:

- Heat as a means of transmitting energy from one area to another. (conduction, convection)
- Electricity as a means of transferring energy within systems by electrical generators
- Sound and light as a common mode of propagation of energy. (Sources of sound and light, vision and light, the path of light).
- Forces and their effects: introduce the relationship between force, work and energy.
- Motion: State some direct and indirect applications of energy.

#### 3. CONTRIBUTION OF THE MODULE TO THE GOALS AND OBJECTIVES OF THE CURRICULUM

The study of energy helps in the construction of reasoning and familiarity with resources around us. The study of energy will enable the learner to develop the ability to visualize, interpret, justify, classify, clarify, appreciate, quantify, project, and describe the world through the availability of the different energy resources, their location, and relationships. This will also develop in the learner the spirit of initiative, creativity and enterprise. All these competences contribute in the learner becoming autonomous and independent to carry out different activities in the environment.

#### 4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO THE AREAS OF LIFE.

The content of this module has as objective to reinforce the capacity of the learner in carrying research and integrating himself/herself into the social milieu. On the other hand, this module initiates the learner into project development and enables him/her to acquire knowledge of technological and methodological approaches. The acquisition of this scientific knowledge will need aspects of Mathematics, Geography, Information / Computer technology, etc.

In this module the basic knowledge of energy are handled, how it is handled and used. This calls on the learner to make reference to daily actions vis-à-vis the energy in the following areas of life: media and communication, social and family life, citizenship, health care, environmental protection, welfare and economic life.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	SITUATIONS	CATEGORIES OF ACTIONS	ACTIONS	ESSENTIAL KNOWLEDGE	APTITUDE	ATTITUDES	OTHER RESOURCES
Everyday use of energy	-Functioning of a radio using batteries. -cooking with fire wood. -cooking with gas. -cooking with kerosene cooker.	Use of electrical energy.	<b>Types of energy used by human beings:</b> -Feed a radio with a battery. –Exploit the characteristics of a lighted lamp. -Feed and light an electrical lamp. -Protection from risks connected with the use electricity. -Read and respect	<b>-Energy needs of human beings:</b> State human needs of energy and availability. <b>The types, the sources, the usage of energy.</b> <ul style="list-style-type: none"><li>• Types of energy: heat, electrical, mechanical, chemical.</li><li>• Sources of energy: solar, wood, fossil (petrol, gas, charcoal).</li><li>• Daily use of energy</li><li>• Safety roles</li></ul>	<ul style="list-style-type: none"><li>• Identification of a conductor, an electrical and thermal insulator.</li><li>• Product thermal and electrical insulation.</li><li>• Protection of persons against electrical hazards.</li></ul>	-Respect of roles and security majors including schedules. - Be economically conscious when using energy.	-Home electrician  -Lighting a cinema hall or Stage management of light.





## MODULE IV: HEALTH EDUCATION

### 1. TIME ALLOCATION: 2 hours per week. Total 4 HOURS

### 2. INTRODUCTION TO THE MODULE

This module deals with the proper functioning of vital organs of the human being.

It is aimed at helping the learner to construct knowledge and develop essential resources (concept, techniques, and methods) and attitudes linked to the proper functioning these vital life organs. This would enable the learner to appreciate the importance and the fragility of certain human organs in order to adopt behaviours that would safeguard, protect, conserve and perpetuate the human species

Through the learning activities and taking into consideration real life situations, this module will also

- reinforce the basic elements of experimentation in the learner,
- develop skills linked to the conservation of physical, physiological and mental health of the individual and her/his environment, and
- help her/him find solutions to daily life health challenges.

### 3. CONTRIBUTION OF THE MODULE TO THE GOAL AND OBJECTIVES OF THE CURRICULUM:

- The competences acquired would enable the learner to be well equipped for latter cycles and better manage her/his environment.
- This module could invoke vocations in the fields of agronomy, biomedical sciences, teaching, etc...

### 4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO LIFE:

- This module will develop in the learner skills in communication and interpersonal relationship, decision making critical and scientific spirit, self esteem. These skills are important for the rest of the science subjects and even other learning areas.
- At the same time it provides important resources for a more efficient and global solving of daily life problems.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Aptitudes	Attitudes	Other resources
Healthy Living	Ear as an organ Noise and their effect on your health	Use of ear phones and sound level	- Useful noise level - Ear defects identification	-Know how sound is produced. - Characteristic of sound - Musical instruments -Essential parts of the ear and their functions: curvature of the external ear, etc; -Noise levels	- Responsible use of and identification of sound instrument - Being able to produce local musical instrument	-Observe rule on acoustic at home and public places.	Clinical thermometre lenses guitar
	Body temperature	Use of clinical thermometer	- Know the normal body temperature	- Reading a clinical thermometer - Relate reading on thermometer on health situation - Understand when to take in hot / cold substances.	- Be able to read and interpret correctly	- Give health advise	Medical personnel. Visit to hospital/Disc otheque.
	Body Awareness/ Movement	How does my body move	- How do we sit/stand/ walk /sleep	- Correct postures: - Sport and physics: Explain why the body needs sport.	- Responsible method of using the body	- Be able to advise on standing, sitting, walking and sleeping position	Posters, charts

## MODULE V: ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT

### 1. TIME ALLOCATION: 2 hours per week. Total 4 hours

### 2. INTRODUCTION TO THE MODULE

This module takes into consideration the management of the following three components of the environment: water, air and soil. These three elements are the physical and natural resources of the immediate environment of the learner.

Considering the importance of these resources in the maintenance of life, it is necessary to create awareness in learners as to their values and interdependence, as well as to sensitize them on the challenges of their sustainable management.

The proposed strands to be treated in this module should help learners acquire investigative skills, refine their observation skills, implement techniques of data collection and organization, as well as methods of quantitative and qualitative data analysis, to help them adopt responsible behavior concerning the protection of their environment.. The strands should also help learners to take note of the evolving character of solutions related to the challenges faced in our environment.

### 3. CONTRIBUTION OF THE MODULE TO THE GOAL AND OBJECTIVES OF THE CURRICULUM:

- The skills the learner will acquired in this module will better equip her/him to sustainably manage their environment.
- This module would also invoke the love for careers like medicine, agronomy, teaching environmental education etc.

### 4.CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO LIFE

- This module will develop in the learner skills linked to communication and interpersonal relations, decision making, critical thinking, scientific mind, self esteem. These skills are indispensable in all the science subjects and other areas of learning.
- This module also provides essential resources for the appropriation of the content on environmental education and sustainable development, and health education.
- The importance of this module lies in the fact that the learner who permanently lives in a more or less hostile environment whereby the different natural resources are a source of socio-economic challenges , should know that only sustainable management of these resources can lead not only to a comfortable life but also to social peace. The family, social and economic life, the environment, well-being and health depend on man's behavior in his environment.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
Family of situations	Situations	Category of actions	Actions	Essential Knowledge	Aptitudes	Attitudes	Other resources
Climate change	Radiation level	Types of Toxic waste  -	Where is it found.	What is toxic waste? Background radiation. Useful dose. Harmful nature		-Daily practices  -Respect of hygiene rules  -  -Respect for the	-Technicians in sustainable rural development, hygiene and sanitary personnel   -Technicians in sustainable development

	-Global warming and climate change	-Limitation of global warming or reduction in global warming	-Obliged industries to properly manage toxic products -Limit the emission of green house gases and use of fossil fuels	3.Greenhouse effect 3.1-Causes 3.2-Effects	-Choice of household apparatus,	environment (prohibition in burning tyres, plastic materials, throwing pollutants in nature, sensitize the population on dangers of bush fires..)	Personnel from the Ministry of Environment and Nature Protection  Agricultural technicians
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## MODULE VI: TECHNOLOGY

### 1. TIME ALLOCATION: 6 HOURS

### 2. GENERAL PRESENTATION:

This module consists of three parts. The fabrication and use of some common tools; concepts involved in projects; repairs and maintenance. The introduction of the learner to the use of the tools prescribed in the module, that would help him/her in the realization of project conceived as well as in the repairs and maintenance of objects obtained in the physical environment found in everyday life.

### 3. CONTRIBUTION OF THE MODULE TO THE GOALS AND OBJECTIVES OF THE CURRICULUM

The mastery of basic concepts and techniques that this module provides the learner, helps in the production or in ameliorating and regulating house whole consumption and services or a better life style. Furthermore, it permits the learner to have the prerequisites to better orientate his/her self towards secondary general education or secondary technical education.

### 4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO AREAS OF LIFE.

The module helps to reinforce the technological education started at the primary level by the learner and their eventual preparation to realize economic or technical projects. It reinforces on the other hand his/her analytical capacities and the ability to produce the objects prescribed in the other modules of this syllabus.

This module would enable the learner to take informed decisions as a producer /consumer of goods and services in his/her environment and to open up to the world of work.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	SITUATIONS	CATEGORIES OF ACTIONS	ACTIONS	ESSENTIAL KNOWLEDGE	Aptitude	ATTITUDES	OTHER RESOURCES
Amelioration of living condition. Tools and common appliances;	- Fabrication and maintenance	-Maintenance of simple mechanical systems. -Maintenance of simple objects.	-Identification of needs; -Seek solutions to the needs -Conception: -Make a case study of the problem -Choose suitable materials for the fabrication of an object and properly use. -Choose the right tools to realize a given task and properly use.	<b>Application of some common tools. Machine:</b> Identify point of application of effort and load. How tools function. Appreciate distance covered by effort and load. Application of simple screw drivers and guide tracks, saws, glue, hammer, pincers, pliers, spirit level, ramp gear systems, pulley and glasses. <b>Care and maintenance.</b> -Lubrication; -Cleaning <b>Technical drawing.</b>	Use of the following tools: screwdriver and tester, Wood and Metal saws, glue, hammer, pliers, sand papers, millimeter. -Look for a fault on a simple object. -Repair a simple object: example a touch light. -Techniques of fishing, hunting and harvesting. -Fabrication of a water filter -Techniques of producing natural gas from house garbage.	-Team spirit -Sense of direction -Curiosity -Act with rigour -Patience -Perseverance -Preservation of the environment -Respect of the principle of operation of an appliance.	-Screwdriver -Saw -Hammer -Pliers -Glue -Sand paper -Scissors - Spade -Matchets -Hoe -Binding paper -Computer -Internet -Other material or materials necessary to realize a project. - Technician to realize the project. -Lubricants. -Touch light

## **FORM 2**

### **SECOND YEAR OBSERVATORY**

#### **MODULE I: THE WORLD OF SCIENCE**

##### **1. TIME ALLOCATION: Total hours: 8**

##### **2. INTRODUCTION TO THE MODULE**

Man is an integral part of the living world. Man therefore has to provide his needs (food, shelter and energy) which are obtained from resources found around him by exploiting the natural world through the implementation of scientific practices and the transformation of products in such a way as to maintain the delicate ecological equilibrium.

It is therefore, important for man to discover and identify the different scientific methods through which he can use to improve on his environment, improve on his standard of living and conditions to adapt to the different milieu in order to better invest in the proper utilization of various resources..

From this point of view the learner ought to be guided to acquire a set of notions, methods, techniques, and attitudes linked to life, life related resources and their interrelationships.

This module therefore enables learner to develop basic scientific skills in life situations and through teaching / learning activities to:

- reinforce the fundamentals of the scientific processes;
- develop abilities on improved and sustainable management of the environment,
- discovering the world around them more intimately.

##### **3. CONTRIBUTION OF THE MODULE TO THE GOALS OF THE CURRICULUM:**

- The competencies that the learner will develop from this module will enable her/him clarify, consolidate and organize the learning acquired towards a systematic methods being aware of the society in which man finds himself.
- This module could provide future career in the any fields such as engineering, agronomy, environmental education, teaching , etce...

##### **4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO LIFE:**

- This module develops in the learner the scientific spirit, self-reliance and team work. These skills are indispensable in scientific disciplines as well as in those linked to other fields of study.
- At the same time it provides the learner with the indispensable resources for a better appropriation of investigating, analyzing and concluding about happenings around him.
- The importance of this module resides in the fact that the learner who lives permanently in a changing environment, ought to understand her/his milieu in order to exploit it in a sustainable way for her/his needs and survival without rupturing its delicate equilibrium and wasting. Family, social and economic life, the environment, wellbeing and health all depend on man's behaviour in the living world.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Aptitudes	Attitudes	Other resources
Investigating science	Knowing how things are and  Making things work	Practice of scientific methods	-Collecting data - Analyse data - interpreting and concluding	<b>-Scientific Methods Part 2</b> 1. Collecting data: know the importance of collecting data. What are data? 2.. Interpreting and concluding 3. Predicting and evaluating 4. Planning - Simple application of measurement <ul style="list-style-type: none"> <li>➤ Density of house whole things e.g oil, water,</li> <li>➤ Speed e.g student movement in the classroom and/ orduring sport.</li> </ul>	Be able to recognize and identify why oil float in water. The speed of things around us.  Think and act scientifically	-Curiosity and sense of observation -Respect of others opinions -Interest in scientific advancement -Open-mindedness -Patience -Love for nature -Team spirit and cooperation -Decision making and critical spirit -Creative thinking -Logical reasoning -Methodological action -Problem solving -Effective communication	

## MODULE II: MATTER, ITS PROPERTIES AND ITS TRANSFORMATION

### 1. TIME ALLOCATION: 12 HOURS

### 2. GENERAL PRESENTATION:

This module consists of three parts:

- Characteristics of matter.
- Properties of matter
- Transformation of matter

This module introduces the learner to develop an awareness of the types of matter in his/her immediate material environment and for him/her to explore the useful relationship that exist between him/her and the physical world. To achieve this, the teacher has to sharpen the curiosity of the learner of the observatory sub-cycle in such a way as to permit the learner to recognize, describe and interpret labels and symbols on objects and tools with which the learner is in contact on a daily basis.

### 3. CONTRIBUTION OF THE MODULE TO THE GOALS AND OBJECTIVES OF THE CURRICULUM

This module seeks to help learners improve their relationship with and knowledge of the material world by deepening the learner's knowledge acquired in the primary school.

### 4. CONTRIBUTION OF THE MODULE TO THE CURRICULUM AND TO AREAS OF LIFE.

To enable learners improve on their relationship with the material world, the teacher should stimulate the learner so as to tap from him/her the ability to read, calculate, manipulate, estimate and interpret.

To achieve this, the learner need skills in languages (English and French), Mathematics, Chemistry, Physics, Technology and Biology.

In this module, the learner is required to take informed decisions that affect his/her health, physical and social environments (i.e. the consumption and production of consumer goods).

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	EXAMPLES OF SITUATIONS	CATEGORIES OF ACTIONS	EXAMPLES	ESSENTIAL KNOWLEDGE	APTITUDE	ATTITUDES	OTHER RESOURCES
Commonly consumed and used products.	-Buying and selling of consumable materials -Buying and selling of grains and liquids. -Buying of domestic gas - Communication and information on consumptions.	Application of measurement <ul style="list-style-type: none"> <li>• Thermal and electrical insulation</li> </ul> Determine the physical characteristic (properties) of an object.	- Read and respect the prescription on the labels of materials products. - Use of balance - Measure and calculate the volume of a given object.	<b>-Properties of matter and their characteristics</b> <b>Transformation of matter (Change of state)</b> <ul style="list-style-type: none"> <li>• Temperature: melting point; boiling point</li> <li>• Change of state of water. Vaporization, condensation, liquefaction, sublimation. (Indicate that the temperature stays constant during change of state.)</li> <li>• Thermal and electrical insulation</li> </ul>	<ul style="list-style-type: none"> <li>• Show practically that the temperature of melting ice is constant.</li> <li>• Usefulness of thermal and electrical insulation</li> <li>• Three states of matter.</li> <li>• How bodies can be kept cold in warm areas.</li> <li>• Explaining electricity and lightning effect on materialsj</li> </ul>	-Safety rules working with heat and electricity. <ul style="list-style-type: none"> <li>• Always think of reading the information and labels on the bodies of materials before using them.</li> </ul> Ability to visualize Ability to draw Sense of appreciation Ability to reason and justify lightning scientifically.	-Balance - Meters -Bathroom scale -- Glassware (beaker, flask, measuring cylinder, test tube, etc.)  glass ware test tubes beakers Volumetric flasks measuring cylinders.
		Interpret and exploit the inscriptions on the body of consumed products.	-Interpret and exploit enclosed leaflet. - Read and interpret diagram.				
		Safety measures when using these common objects.		<ul style="list-style-type: none"> <li>• Physical states: Permeability, impermeability, solubility.</li> <li>• Action of heat and electricity on materials.</li> </ul>			



### MODULE III: ENERGY, APPLICATIONS AND USES

#### 1. TIME ALLOCATION: 16 HOURS

#### 2. GENERAL PRESENTATION:

This module presents energy concepts studied already at the primary school level. It is subdivided into two units as follows:

Unit one consists of:

- Types, sources and uses of energy; for consolidation of concepts;
- Energy exchanges.

Unit two consists of:

- Heat as a means of transmitting energy from one system to another. (conduction, convection)
- Electricity as a means of transferring energy within systems by electrical generators
- Sound and light as a common mode of propagation of energy. (Sources of sound and light, vision and light, the path of light).
- Forces and their effects: introduce the relationship between force, work and energy.
- Motion: State some direct and indirect applications of energy.

#### 3. CONTRIBUTION OF THE MODULE TO THE GOALS AND OBJECTIVES OF THE CURRICULUM

The study of energy helps in the construction of reasoning and familiarity with resources around us. The study of energy will enable the learner to develop the ability to visualize, interpret, justify, classify, clarify, appreciate, quantify, project, and describe the world through the availability of the different energy resources, their location, and relationships. This will also develop in the learner the spirit of initiative, creativity and enterprise. All these competences contribute in the learner becoming autonomous and independent to carry out different activities in the environment.

#### 4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO THE AREAS OF LIFE.

The content of this module has as an objective to reinforce the capacity of the learner in carrying research and integrating himself/herself into the social milieu. On the other hand, this module initiates the learner into project development and enables him/her to acquire knowledge of technological and methodological approaches. The acquisition of this scientific knowledge will need aspects of Mathematics, Geography, Information / Computer technology, etc.

In this module the basic knowledge of energy is handled, how it is handled and used. This calls on the learner to make reference to daily actions vis-à-vis the energy in the following areas of life: media and communication, social and family life, citizenship, health care, environmental protection, welfare and economic life.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	SITUATIONS	CATEGORIES OF ACTIONS	ACTIONS	ESSENTIAL KNOWLEDGE	APTITUDE	ATTITUDES	OTHER RESOURCES
Everyday use of energy	-Functioning of a radio using batteries. -cooking with fire wood. -cooking with gas. -cooking with kerosene cooker.	Use of electrical energy.	-Feed a radio with a battery. –Exploit the characteristics of a lighted lamp. -Feed and light an electrical lamp. -Protection from risks connected with the use of electricity. -Read and respect the notices on electrical appliances.	-Energy needs of human beings <b>The types, the sources, the usage of energy.</b> <ul style="list-style-type: none"><li>• Renewable energy: Water, wind, geothermal, biomass.</li><li>• Electricity: Sources of electricity. Uses: Basic idea on electrical circuit, electric current, conductor and insulator.</li></ul>	<ul style="list-style-type: none"><li>• Identification of a conductor, an electrical and thermal insulator.</li><li>• Product thermal and electrical insulation.</li><li>• Protection of persons against</li></ul>	-Respect of roles and security majors including schedules. - Be economically conscious when using energy.	-Home electrician  -Lighting a cinema hall or Stage management of light.

				<ul style="list-style-type: none"> <li>Light: sources, receivers, medium of propagation, speed, light beam, light ray, shadows.</li> <li>Energy exchange: chemical to electrical to heat/light, etc. Use of flow chart.</li> </ul>	electrical hazards.		
Everyday use of energy	<ul style="list-style-type: none"> <li>- Cooking with electricity.</li> <li>-Protection against heat.</li> <li>-Ironing</li> <li>-Drying of dresses in air.</li> <li>-Handling of fire.</li> <li>-House lighting.</li> <li>-Regulating the volume of an electrical appliance</li> </ul>	Use of solar energy.	<ul style="list-style-type: none"> <li>-Drying of food in the sun</li> <li>-Self protection or protection of vision from sun rays.</li> <li>-Explain global warming and its consequences.</li> <li>-Use of solar panel/oven.</li> </ul>	<b>Motion</b> <ul style="list-style-type: none"> <li>Movement with respect to space – (distance) and time.</li> <li>Average velocity. Instantaneous velocity. Simple presentation of distance and time (Simple graphs).</li> <li>Action at a distance. Gravitation, Magnetic forces,</li> <li>Contact force Up thrust friction</li> </ul>		<ul style="list-style-type: none"> <li>-Respect of environment.</li> <li>– Responsible attitude toward the use of fire.</li> </ul>	<ul style="list-style-type: none"> <li>-Sound management</li> <li>- Transport agency(CAMR AIL ...)</li> <li>-Material for the production of solar ovens.</li> <li>-Thermal and electrical insulation.</li> </ul>
		Use of chemical energy.	<ul style="list-style-type: none"> <li>-Use of gas cooker, kerosene cooker or firewood.</li> <li>-Use of kerosene lamp.</li> <li>-Protection against combustion risks.</li> <li>-Use of improve cooker.</li> <li>-Use of oven/kiln.</li> </ul>				
		Organize Field trip.	<ul style="list-style-type: none"> <li>- Exploit a road map.</li> <li>-Use of a compass to find one's way.</li> <li>-Read schedules for train, airplane, and express bus services,</li> <li>-Supply of fuel</li> </ul>				

## MODULE IV: HEALTH EDUCATION

### 1. TIME ALLOCATION: 4 HOURS

### 2. INTRODUCTION TO THE MODULE

This module deals with the proper functioning of vital organs of the human being.

It is aimed at helping the learner to construct knowledge and develop essential resources (concept, techniques, and methods) and attitudes linked to the proper functioning these vital life organs. This would enable the learner to appreciate the importance and the fragility of certain human organs in order to adopt behaviours that would safeguard, protect, conserve and perpetuate the human species

Through the learning activities and taking into consideration real life situations, this module will also

- reinforce the basic elements of experimentation in the learner,
- develop skills linked to the conservation of physical, physiological and mental health of the individual and her/his environment, and
- help her/him find solutions to daily life health challenges.

### 3. CONTRIBUTION OF THE MODULE TO THE GOAL AND OBJECTIVES OF THE CURRICULUM:

- The competences acquired would enable the learner to be well equipped for latter cycles and better manage her/his environment.
- This module could invoke vocations in the fields of agronomy, biomedical sciences, teaching, etc...

### 4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO LIFE:

- This module will develop in the learner skills in communication and interpersonal relationship, decision making critical and scientific spirit, self esteem. These skills are important for the rest of the science subjects and even other learning areas.
- At the same time it provides important resources for a more efficient and global solving of daily life problems.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
Family of situations	Examples of situations	Category of actions	Actions	Essential Knowledge	Aptitudes	Attitudes	Other resources
Healthy Living	Body pain/The headache	Pain caused by pressure and stress	- Blood pressure	- Distribution of Pressure in a liquid. - Knowledge of average blood pressure. - Muscle stress	- Know that over 80 % of the body is fluid	- Appreciate that headache may not necessarily come from the head	
	The eye as an organ.	Use of the eye and their defect	- Identifying the type of eye defects - Use of lenses	- Type of lenses and their applications. -The eye as a imaging device.	-be able to select the appropriate lens to any eye condition	-be able to advice on eye problems - respect medical prescription.	

## MODULE V: ENVIRONMENTAL EDUCATION AND SUSTAINABLE DEVELOPMENT

### 1. TIME ALLOCATION: 4 HOURS

### 2. INTRODUCTION TO THE MODULE

This module takes into consideration the management of the following two components of the environment: water, air and soil. These three elements are the physical and natural resources of the immediate environment of the learner.

Considering the importance of these resources in the maintenance of life, it is necessary to create awareness in learners as to their values and interdependence, as well as to sensitize them on the challenges of their sustainable management.

The proposed strands to be treated in this module should help learners acquire investigative skills, refine their observation skills, implement techniques of data collection and organization, as well as methods of quantitative and qualitative data analysis, to help them adopt responsible behavior concerning the protection of their environment.. The strands should also help learners to take note of the evolving character of solutions related to the challenges faced in our environment.

### 3. CONTRIBUTION OF THE MODULE TO THE GOAL AND OBJECTIVES OF THE CURRICULUM:

- The skills the learner will acquire in this module will better equip her/him to sustainably manage their environment.
- This module would also invoke the love for careers like medicine, agronomy, teaching environmental education etc.

### 4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO LIFE

- This module will develop in the learner skills linked to communication and interpersonal relations, decision making, critical thinking, scientific mind, self esteem. These skills are indispensable in all the science subjects and other areas of learning.
- This module also provides essential resources for the appropriation of the content on environmental education and sustainable development, and health education.
- The importance of this module lies in the fact that the learner who permanently lives in a more or less hostile environment whereby the different natural resources are a source of socio-economic challenges, should know that only sustainable management of these resources can lead not only to a comfortable life but also to social peace. The family, social and economic life, the environment, well-being and health depend on man's behavior in his environment.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
Family of situations	Situations	Category of actions	Actions	Essential Knowledge	Aptitudes	Attitudes	Other resources
Climate change	-Radiation level	- Radiation emitted into the atmosphere	-Radiation from the sun and those emitted from by the earth -Communication and education on weather.	2.3-Understand the effect of cosmic radiation from the sun. 2.3.1-Understand the effect of destruction of the ionosphere 2.3.2-Energy waste in destruction of the forest and its consequences.		-Respect for the environment (prohibition in burning tyres, plastic materials, throwing pollutants in nature, sensitize the population on dangers of bush fires..)	Hydrometer Thermometer
	-Global warming and Greenhouse effect	-Limitation of global warming or reduction in global warming	-Obligated industries to properly manage toxic products -Limit the emission of green house gases and use of fossil fuels	3.Greenhouse effect 3.1-Causes 3.2-Effects 3.3 Appreciate air movement over the earth's surface.	-Choice of household apparatus, aerosols with no CFCs		
		Heat content of the soil	- Heat absorbed and released by the soil.	4 Effect of exposing the soil to heat or rain. 4.1 Variation of rainfall in Cameroon.	-choice of building materials and farm land.		

## MODULE VI: TECHNOLOGY

### 1. TIME ALLOCATION: 6 HOURS

### 2. GENERAL PRESENTATION:

This module consists of three parts. The fabrication and use of some common tools; concepts involved in projects; repairs and maintenance. The introduction of the learner to the use of the tools prescribed in the module, that would help him/her in the realization of project conceived as well as in the repairs and maintenance of objects obtained in the physical environment found in everyday life.

### 3. CONTRIBUTION OF THE MODULE TO THE GOALS AND OBJECTIVES OF THE CURRICULUM

The mastery of basic concepts and techniques that this module provides the learner, helps in the production or in ameliorating and regulating house whole consumption and services or a better life style. Furthermore, it permits the learner to have the prerequisites to better orientate his/her self towards secondary general education or secondary technical education.

### 4. CONTRIBUTION OF THE MODULE TO THE PROGRAMME OF STUDY AND TO AREAS OF LIFE.

The module helps to reinforce the technological education started at the primary level by the learner and their eventual preparation to realize economic or technical projects. It reinforces on the other hand his/her analytical capacities and the ability to produce the objects prescribed in the other modules of this syllabus.

This module would enable the learner to take informed decisions as a producer /consumer of goods and services in his/her environment and to open up to the world of work.

CONTEXTUAL FRAMEWORK		COMPETENCIES		RESOURCES			
FAMILIES OF SITUATIONS	SITUATIONS	CATEGORIES OF ACTIONS	ACTIONS	ESSENTIAL KNOWLEDGE	Aptitude	ATTITUDES	OTHER RESOURCES
Amelioration of living condition. Tools and common appliances;	- Fabrication and maintenance	--Fabrication of tools. -Maintenance of simple objects.	-Choose suitable materials for the fabrication of an object and properly use. -Choose the right tools to realize a given task and properly use.	<b>Application of some common tools.</b> <b>Machine: review of Form one.</b> <b>Projects: ( what is a project)</b> -Definition -Levels involved: - identification of the problem/need - Conception: Choosing a solution, study its feasibility (material and human resources, design, realization plan, site plan, financial estimates.....) -Finishing touches. • <b>Example: identifying leakage in the house water system,.</b> Its upkeep and maintenance. <b>Care and maintenance.</b> -Lubrication; -Cleaning The principles of functioning of an appliance. - Bimetallic strip - Thermometers - Expansion of gases. - Electrical meters Repairs of simple objects: methodology. Preventive maintenance. Technical drawing. Basic telecommunication devices: -radio -cell phone	Use of the following tools: screwdriver and tester, Wood and Metal saws, glue, hammer, pliers, sand papers, millimeter. -Look for a fault on a simple object. -Repair a simple object: example a touch light. -Realisation of a project by the learners: -Fabrication and use of tools for rearing and agriculture. -Techniques of fishing, hunting and harvesting.	-Team spirit -Sense of direction -Curiosity -Act with rigour -Patience -Perseverance Preservation of the environment -Respect of the principle of operation of an appliance.	-Screwdriver -Saw -Hammer -Pliers -Glue -Sand paper -Scissors -Binding paper -Computer -Internet -Other material or materials necessary to realize a project. - Technician to realize the project. -Lubricants. -Touch light - radio - cell phone

