APPLIED SCIENCES

Junior Secondary Curriculum

Agriculture
Home science
Health Education
Computer Science

April, 2022

SESSION OUTCOMES

By end of the session, the participants should be able to:

1. Conceptualize the applied science subjects in the Junior secondary curriculum,
2. Explain the general outline of the applied science subjects in junior secondary curriculum,
3. Appreciate the pedagogical approaches applicable to the applied science subject in Junior secondary curriculum.

KWL

- 1. What *I know* about ……
- 2. What *I want to know* about ……

APPLIED SCIENCE SUBJECTS AND TIME ALLOCATION

No	Subject	No. of lessons (per week) Each lesson has 40 minutes
1	Health Education	2 lessons
2	Agriculture	3 lessons
3	Computer science (optional subject)	3 lessons
4	Home science (optional subject)	3 lessons

LEVEL LEARNING OUTCOMES

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

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

AGRICULTURE

Grade 7 Curriculum

ESSENCE STATEMENT

- Kenya Vision 2030 recognizes Agriculture as a core factor to development of the country's economy.
- The vision resonates with the United Nations Sustainable Development Goal No. 2 which aims *to end hunger, achieve food security, improve nutrition and promote sustainable agriculture.*
- The vision is further aligned to the Comprehensive Africa Agriculture Development Programme (CAADP) which aim to achieve sustainable food production systems through resilient agricultural practices for food security and nutrition.

ESSENCE STATEMENT

- Agriculture for junior secondary level will build on competencies introduced in upper primary curriculum contributing to human capacity development.

- The learning experiences will involve active learner participation conducted through practical, project and Community Service Learning (CSL) activities to develop applicable competencies for sustainable agriculture.

ESSENCE STATEMENT

- The curriculum will focus on developing knowledge, skills and attitudes for conservation of agricultural environment, crop production, and animal production through innovative agricultural technologies using limited resources to enhance food security.

- The acquired knowledge, skills and attitudes will form a broad-spectrum foundation for development of agricultural competencies for senior school and beyond.

General Learning Outcomes

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

1. Participate actively in activities for conservation of agricultural environment.
2. Use scarce agricultural resources through innovative practices to contribute towards health, nutrition and food security.
3. Grow crops and rear animals as profitable agricultural enterprises through sustainable and ethical practices for self-reliance and economic development.
4. Apply existing and emerging technology in agriculture, digital and media resources to enhance sustainable agricultural practices.
5. Appreciate agriculture as a worthy niche for hobby, career development, further education and training.

Agriculture Strands and Sub Strands

Agriculture Grade 7 Curriculum Design has FOUR strands and several sub strands as presented below:

Strand	Sub Strands
Strand 1.0 **Conserving Agricultural Environment**	1.1 Soil pollution control 1.2 Water conservation measures 1.3 Agroforestry
Strand 2.0 **Crop Production**	2.1 Preparation of planting site 2.2 Crop establishment 2.3 Crop management

Agriculture Strands and Sub Strands

Agriculture Grade 7 Curriculum Design has FOUR strands and several sub strands as presented below:

Strand	Sub Strands
Strand 3.0 **Animal Production**	3.1 Animal handling 3.2 General management of pets 3.3 Preparation of Animal Products
Strand 4.0 **Agriculture and Technology**	4.1 Off-season Cropping Techniques 4.2 Framed Suspended Gardens 4.3 Value Addition Techniques

Unique Features of Agriculture Design

The designs comprises learning activities that promote Agriculture as appealing to the target generation and meets diverse society needs

1. Care for the environment while conducting agricultural activities.
    - Advocacy on agricultural environment
    - Simple and innovative water conservation practices in agriculture
2. Learning activities that promote agriculture beyond conventional culture.
    - Innovative planting sites to cater for social diversity (*ground sites, container sites, on walls, along the fence or along the driveways)*

Unique Features of Agriculture Design

3. Simple Age-appropriate Technology in Agriculture

- Promotes use of technology in agricultural production practices (*search for information, use of digital apps*).
- Simple impacting innovative farming approaches: Framed Suspended Gardens *at School.*

Agriculture Time Allocation = 3 Lessons Per Week

Unique Features of Agriculture Design

Simple, affordable, age-appropriate impacting ideas that can influence how, who, where and when we grow crops for *"What"* aesthetics, food nutrition and security.

Home Science

ESSENCE STATEMENT

Home Science is an applied and integrated science which aims at improving the quality of life for the individual, family and community. It is also anchored on Kenya Vision 2030's social pillar which promotes education, health, environmental awareness, gender, youth, children, housing, water and sanitation. National Education Sector Plan (NESP) 2015 has shown that Home Science is among other learning areas that expose a learner's abilities in life. Further, respondents in the Needs Assessment Survey (KICD, 2016) indicated that Home Science should be emphasised in the curriculum reforms.

Home Science is an optional subject in the lower secondary curriculum. As a discipline, it covers aspects of caring for self and the family, foods, nutrition, textiles, clothing, housing the family, home care, laundrywork, maternal health care and consumer education.

It forms the foundation for learners who want to pursue related subjects and careers at senior secondary and tertiary levels.

General Learning Outcomes for Home Science

By the end of Junior secondary education, the learner should be able to:

1. Adopt healthy lifestyle through nutritional habits for wellness of self and others.
2. Apply the principles of consumer education for personal financial management.
3. Develop skills in fabric choice for construction of garments and household articles.
4. Adopt healthy hygienic practices at personal and household level.
5. Build a foundation for further education, career and training.
6. Appreciate the importance of a healthy environment for the wellbeing of self and others.

Organisation of the strands, sub strands and time allocation

Grade 7 Home Science curriculum design has **4 strands** namely:

i. Foods and Nutrition
ii. Consumer Education
iii. Clothing and Laundrywork
iv. Caring for the Family

Strand	Grade 7-Sub strands	8-4-4 CLASS 8 topics
1.0 FOODS AND NUTRITION	1.1 Conservation of Food Nutrients	Class 7 -Nutritional deficiency diseases(kwarshiokor, marasmus, anaemia) -
	1.2 Small Kitchen Tools and Equipment	Class 6 -Selection and use of correct cooking equipment
	1.3 Cooking Food	Class 6 Different cooking methods for different foods Methods of cooking

Strand	Grade 7 Sub strands	8-4-4 class 8 topics
2.0 CONSUMER EDUCATION	**3.1 Buying Goods and Services**	**Class 7** **Consumer spending** **-Sources of family and personal income** **-Simple budgeting for personal and family income**
3.0 TEXTILES AND CLOTHING	**3.1 Natural Textile Fibres**	**-Properties of common fabrics(cotton blends, snythetics, wool and wollen fabrics)**
	3.2 Sewing Machine	
	3.3 Seams (plain and open seams) ***(making a pillow case, lap bag or a cushion cover or skirt or shorts with elastic or tie strings)***	**Class 7** **Clothing and textiles** **-F**lat seams -French and open seams (class 6) -Construction of a flat household article such as a table cloth, tray cloth, bed or cot cover etc

Strand	Grade 7 Sub starnds	8-4-4-Class 7 topics
4.0 CARING FOR THE FAMILY	4.1 Household Cleaning Agents	Class 7 -Choice and use of cleaning detergents and bleaching agents
	4.2 Special Treatments in Laundrywork (*spotting, sponging, starching-Homemade starch, home dry-cleaning* *(Soap Making using natural ingredients) handmade soap*	Class 7 -Laundry processes -Stain removal -Simple home dry-cleaning or valeting -Simple soap making
	3 lessons per week =90 Lessons	4 lessons per week=120 lessons

Unique features of the Grade 7 Home Science Curriculum design

- Home Science Grade 7 curriculum design is broad-based and gives more guidance enabling any Home Science teacher to use it simply to guide learners in learning to acquire competencies and values.
- Vast course concepts can be learnt alongside well planned and strategically organized project activities such as in stitching using the sewing machine and construction of a simple garment (***making a pillow case or lap bag or a cushion cover or skirt or shorts with elastic or tie strings***).
- The design has quite a clear link to concepts learnt in the Primary school curriculum from Grade 1-3 in Hygiene Nutrition Activities as well as what they have acquired in Home Science from Grade 4-6 for continual upgrading of competencies and values.They are as well linked to sub strands learnt in grade 7.
- Project work and practical activities linked to self exploration in terms of **nurturing and developing talents and abilities in sub strands such as gardening ideas-G8, cooking methods-G8.**

UNIQUE FEATURES

- It has several opportunities for experiential learning in problem solving for instance in improvisation using safe, locally and sustainable resources.
- It encompasses business ideas and entrepreneurial skills including *financial literacy e.g clothing construction, where the learners make clothings or household articles for enjoyment and entrepreneurial skills.*
- It offers a basis for further learning at other Grades Grade 8 & 9 & Grade 10-12 of education in Home Science related subjects.

SAMPLE PROJECTS IDEAS:

1. HOMEMADE SOAP(Handmade soap)

2. Conservation of nutrients in vegetables

Food fortification, Food Enrichment and Nutrient Supplementation

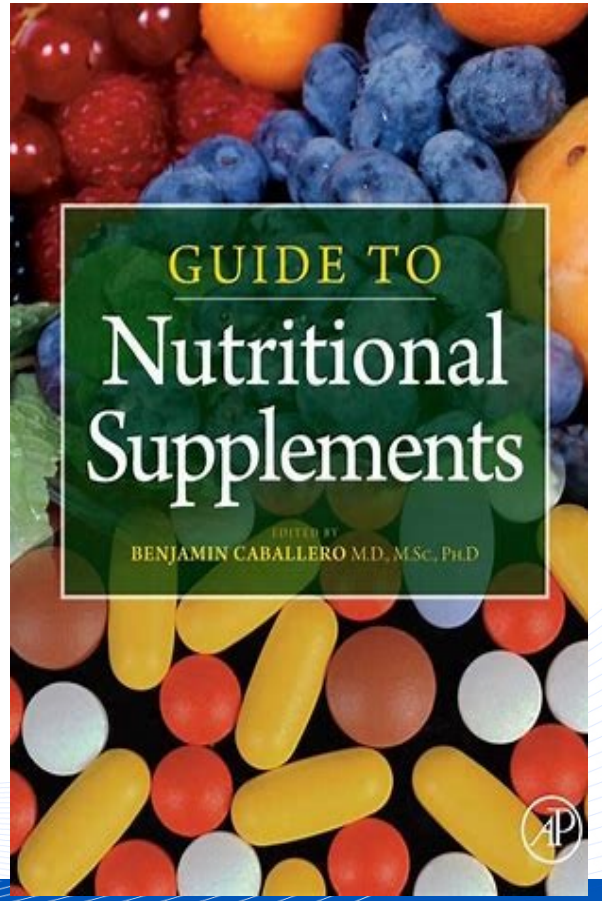
Fortified

- Nutrients are:
- **Absent** originally
- ***Added*** to prevent deficiencies in a community

Improve the *nutrient profile* of foods

Enriched

- *Nutrients are:*
- ***Present*** *originally*
- *Lost during processing*
- ***Put back in!*** *to maintain nutrient profile*



SMALL KITCHEN TOOLS AND EQUIPMENT

1. Pots and pans

2. Shaping and moulding and tools

3. Cutting tools

4. Measuring and weighing tools

5. Mixing tools and equipment

6. Scooping tools

8.TRADITIONAL TOOLS AND EQUIPMENT

9. Separating tools

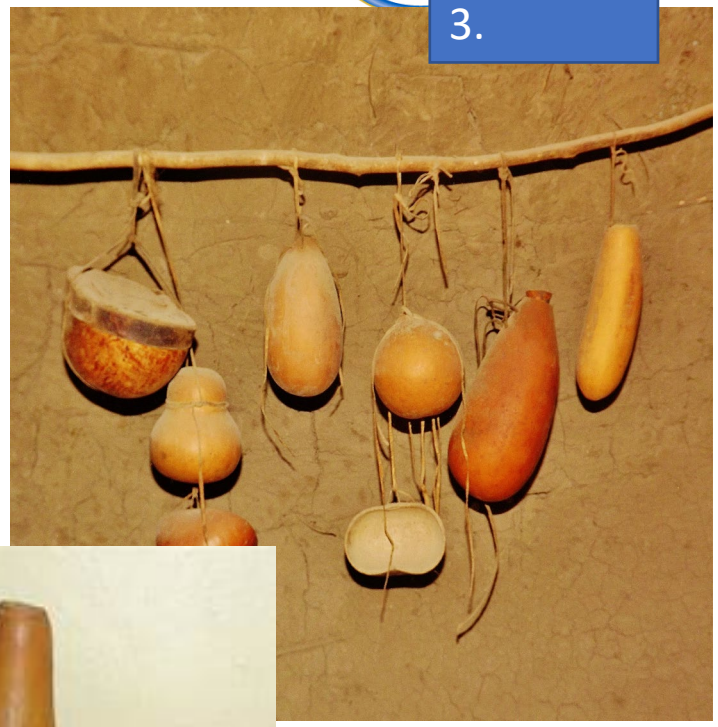
8. Turning and Lifting tools

IDENTIFY USES OF THESE TRADITIONAL UTENCILS

1.

2.

3.



6.

7.

4.

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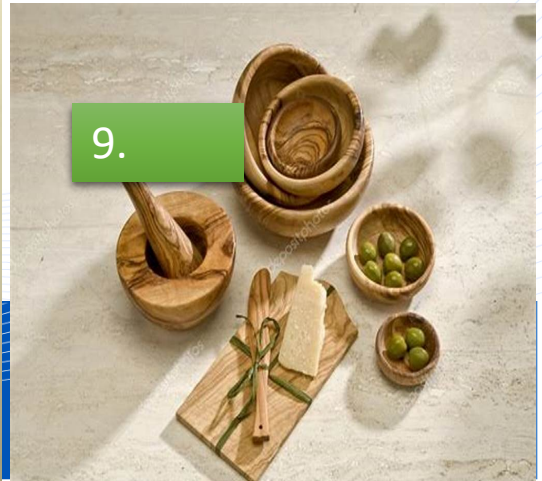


PROJECTWORK:

Making a pillow case, lap bag or a cushion cover or skirt or shorts with elastic or tie strings

END

HEALTH EDUCATION

ESSENCE STATEMENT

- The Government of Kenya is committed to the improvement of the health and welfare of its citizens. This is demonstrated through its commitment to implement the 17 Sustainable Development Goals (SDGs) of 2015 in which health is a cross cutting issue.
- The SDGs numbers 2,3 and 6 aims at addressing zero hunger, good health and well being, clean water and sanitation, which are a key focus in the curriculum. Several government policy documents such the Kenya Demographic Health Survey (2014), the social pillar of the Vision 2030, the constitution of Kenya 2010, Kenya Mental Health Policy (2015-2030) and the Kenya School Health policy (2018) among others, aim at achieving optimal health status and capacity of all citizens through provision of legal frameworks for ensuring comprehensive health service delivery
- The introduction of Health education in the curriculum was also highlighted by many respondents as indicated in the Needs Assessment Survey (KICD, 2016).

Essence Statement…cont…

The health education curriculum is aimed at equipping learners with information on health and instilling positive attitudes towards the promotion of health and prevention of illnesses to enable them contribute to and participate in nation building. Health education will therefore focus on promoting healthy living practices and preventing diseases and disorders in the society.

As a learning area at the junior secondary, Health Education covers;

- Health and nutrition;
- Diseases and disorders affecting various body systems;
- Mental and emotional health;
- Drug and substance use and abuse;
- Safety and first aid;
- Environmental health and sanitation and
- Human reproductive health.

General learning outcomes

By the end of junior secondary, the learner should be able to:

1. Adopt healthy eating habits and food safety practices to promote health and wellness for self and others.
2. Apply the knowledge and principles of prevention and control of diseases and disorders to promote health.
3. Promote mental and emotional health for wellness.
4. Apply safety and first aid skills to prevent accidents and handle injuries in the community.
5. Adopt proper use of medicine and drugs for wellbeing of self and community.
6. Practice proper waste management to prevent pollution in the environment.
7. Utilize knowledge on growth and development to build healthy relationships
8. Apply digital literacy in promoting practices that enhance health and wellness.

INTERRELATIONSHIP TO NATIONAL GOALS OF EDUCATION

NATIONAL GOAL OF EDUCATION	Promote positive attitudes towards good health and environmental protection
LEVEL LEARNING OUTCOME	Practise relevant hygiene, sanitation and nutrition skills to promote health
SUBJECT GENERAL LEARNING OUTCOME	Adopt healthy eating habits and food safety practices to promote health and wellness for self and others
SPECIFIC LEARNING OUTCOME	Determine ways of promoting wellness in individuals and the community

ORGANISATION OF STRANDS & SUB STRANDS

STRAND	SUBSTRAND
1.0 HEALTH AND NUTRITION	1.1 Introduction to Health Education (2 Lessons) 1.2 Health promotion (3 Lessons) 1.3 Nutrients and their functions in the body (4 Lessons)
2.0 HUMAN BODY SYSTEMS	2.1Digestive system (4 Lessons) 2.2 Excretory system (4 Lessons) 2.3 Circulatory system (4 Lessons)
3.0 MENTAL AND EMOTIONAL HEALTH	3.1 Mental health (4 Lessons) 3.2 Mental health in the community (3 Lessons)

4.0 USE OF MEDICINE	4.1 Safe use of medicine (5 Lessons)
5.0 FIRST AID AND BASIC LIFE SUPPORT	5.1 First Aid (3 Lessons) 5.2 First aid for common accidents and injuries (4 Lessons) 5.4 Road safety (3 Lessons)
6.0 ENVIRONMENTAL HEALTH AND SANITATION	6.1 Environmental Health(3 Lessons) 6.2 Environmental contaminants (3 Lessons) 6.3 Infection prevention and control (5 Lessons)

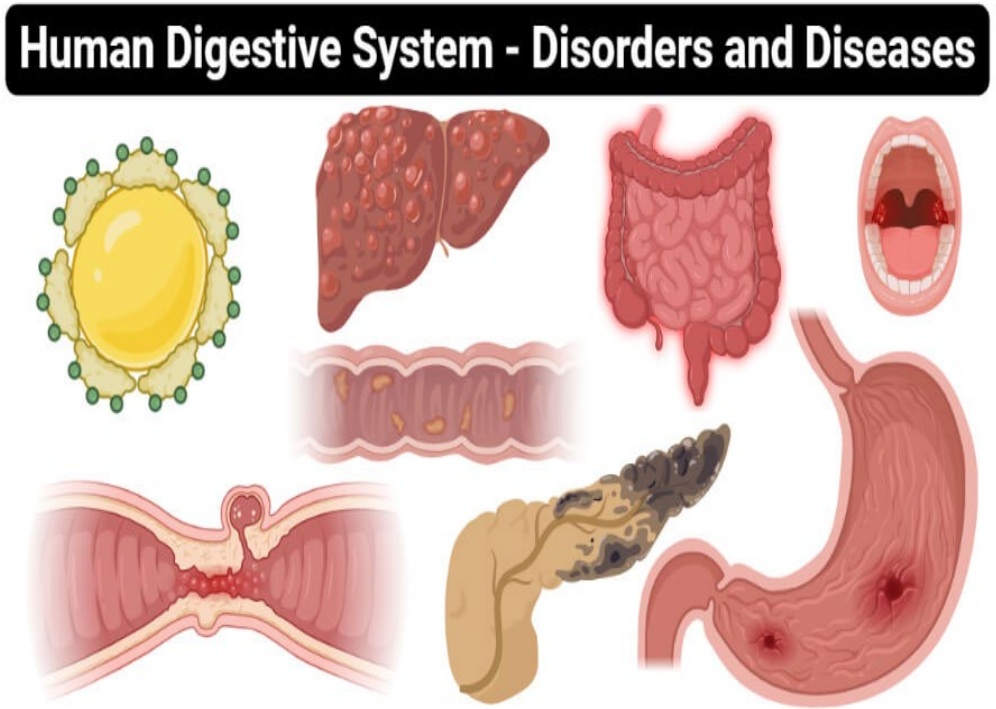
7.0 HUMAN REPRODUCTIVE HEALTH	7.1 Pubertal growth and development (3 Lessons) 7.2 Practices associated with reproductive health (3 Lessons) **TOTAL NUMBER OF LESSONS ALLOCATED: 60** **2 LESSONS PER WEEK**

UNIQUE FEATURES OF THE CONTENT AND PEDAGOGY

Health Education blends knowledge from the biological, environmental, psychological and medical sciences to achieve positive health outcomes in the community for a healthy population.

This will empower the learners to develop competences to enable them maintain their physical, social, mental and emotional health.

Common conditions and diseases affecting the human digestive system



- acid reflux
- ulcers
- constipation
- roundworms

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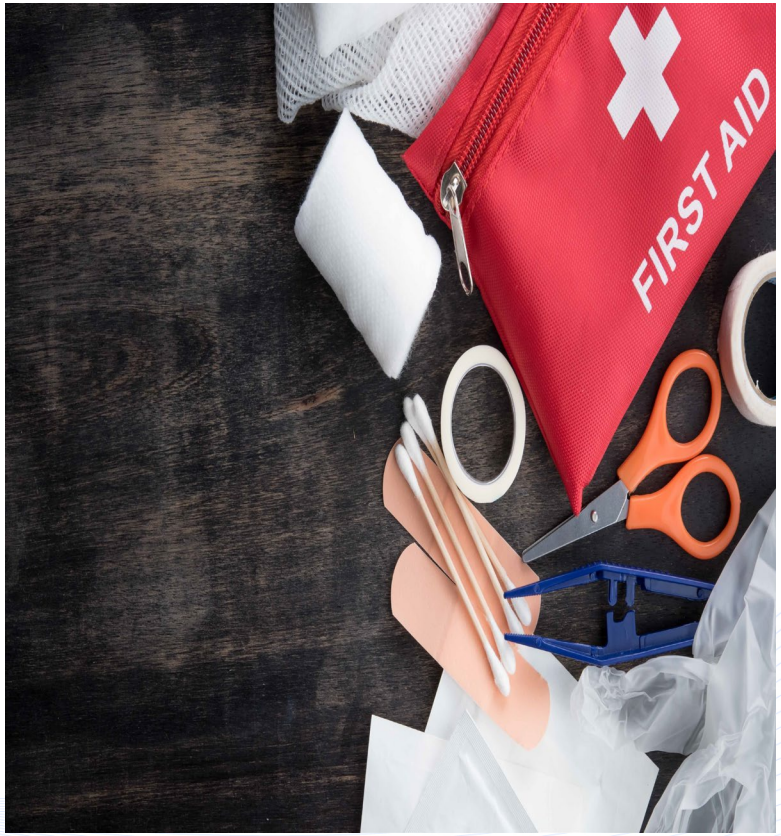
Skin diseases and infections; boils, fungal infections, scabies, allergic skin conditions

April, 2022

How can the environment be free from contamination for healthy living ???

Group activity: Pick any factors in the illustration and suggest lifestyles that minimize mental illnesses and disorders.

SAFETY: Road safety, **PPEs**, **first Aid**



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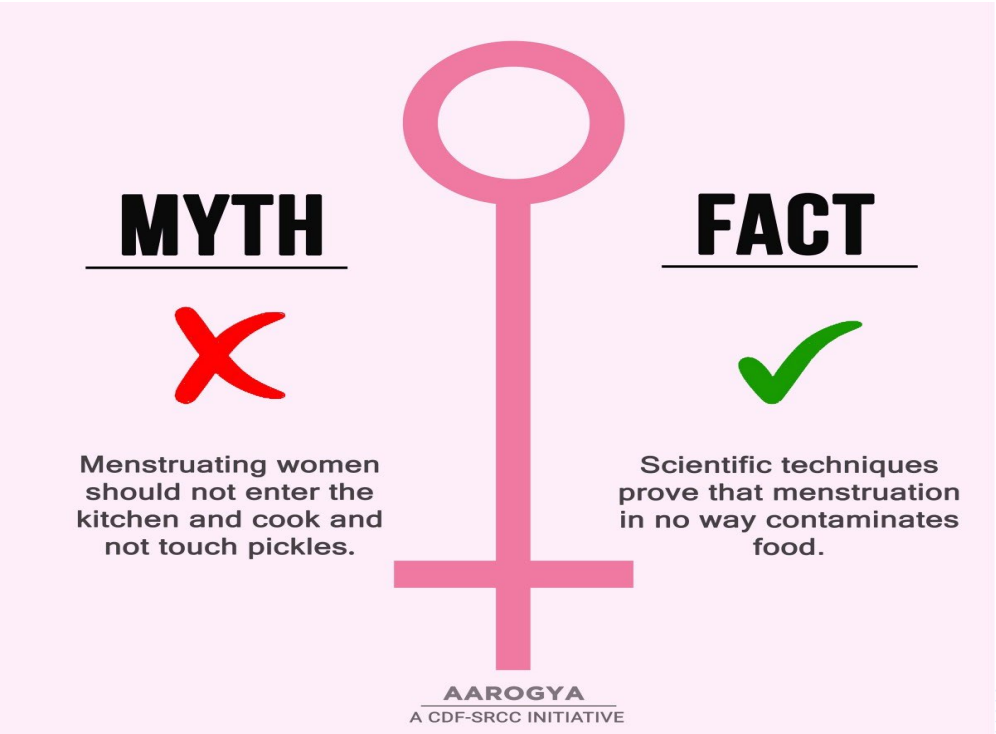
Pubertal growth and development



April, 2022

COMPUTER SCIENCE

ESSENCE STATEMENT

Computer science is concerned with how computer systems work, and how they are designed and programmed.
The curriculum will focus on developing computing skills as well as preparing future specialists in computer related fields
The learning experiences will involve active learner participation conducted through practical and experiential learning activities.
The acquired knowledge, skills and attitudes will form a strong foundation for development of computational thinking competencies for learners who wish to specialize in STEM pathway.
The curriculum for computer science responds to the demands of the 21st Century and the aspirations captured in the Constitution of Kenya 2010, Kenya Vision 2030 and National ICT policy of Kenya 2016 (revised 2020).

SUBJECT GENERAL LEARNING OUTCOMES

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

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

TIME ALLOCATION

Strands	Number of lessons
1.0 Foundation of Computer Science	43
2.0 Computer and society	14
3.0 Computer Networks	15
4.0 Computer Programming	18
Total	**90**

STRANDS AND SUB STRANDS

Strand	Sub strand	Pedagogical and Content approach
1.0 Foundation of Computer Science	1.1 Computer concepts 1.2 Evolution of computers 1.3 Generations of computers 1.4 Classification of computers 1.5 Computer user environment 1.6 Physical parts of a computer 1.7 Hands on skills concepts 1.8 Computer Systems Overview 1.9 Computer Hardware concepts 1.10 Input devices 1.11 Central Processing Unit (CPU) 1.12 Output devices 1.13 Ports and Cables 1.14 Computer setup	• Inquiry Based Learning • Collaborative • Self-directed learning • Reflective

Strand	Sub Strand	Pedagogical and Content approach
2.0 Computer and society	2.1 Physical Safety of Computers 2.2 Health and Safety 2.3 Repetitive Strain Injury (RSI) 2.4 Data Safety in Computers 2.5 Online Safety concepts 2.6 Online Identity Safety	• Inquiry Based Learning • Collaborative • Self-directed learning • Reflective
3.0 Computer Networks	3.1 Computer Network concepts 3.2 Connecting to a Computer Network 3.3 Internet concepts	• Collaborative • Self-directed learning • Reflective
4.0 Computer Programming	4.1 Computer programming concepts 4.2 Visual Programming Concepts 4.3 Interacting with Visual Programming	• Inquiry Based Learning • Collaborative • Self-directed learning

Unique features of the design

The design for computer science:

- has mainstreamed all the core competencies, values and PCIs which will be developed through engaging learners in formal and non formal activities as specified in the suggested learning experiences across the sub strands.
- provides an opportunity to evaluate the learning process through formative and summative assessment
- offers a broad opportunity for the learner to;
    - develop the 21st Century skills,
    - serve the community by applying what they have learnt
    - explore talents, interests and abilities before the selection of pathways in Senior Secondary.

Difference between the grade 7 design and 8-4-4

- The subject name was computer studies but now is computer science
- The new areas introduced include:-
  - Online Safety concepts
  - Online Identity Safety
  - Connecting to a Computer Network
  - Internet concepts
  - Visual Programming Concepts
  - Interacting with Visual Programming

GENERAL PEDAGOGICAL APPROACHES

For

Applied Science Subjects

GENERAL PEDAGOGY APPROACHES

The learners learn the concepts by themselves and demonstrate what they have learned.

The facilitator explains and demonstrates to make the concept clear and help learners apply in real life situations what they have learned.

Some of the Methodologies applied in applied sciences include;

- Collaborative learning: Group based learning tasks
- Inquiry-based learning: Problem-solving tasks
- Reflective learning : Contemplative learning tasks/reviews
- Self-directed learning : Exploratory tasks/discovery tasks

Collaborative learning. During training, allow small groups to get together and individuals share their learning experiences with others, and apply them in real life situation. The facilitator should join certain groups to listen in and answer questions that may arise. In the learning process the facilitator and learners all participate in discussion. During discussion, the facilitator spends some time listening while the learners spend sometimes talking. This will enable the learners to share experiences, ideas and attitudes with the peers.

Inquiry-based learning: This is may involve the situations and problems the learners will experience in their learning process. It could be case-study based, where a pre-prepared situation is disseminated to small groups who use their experience to work on it, or specific issues and challenges that the learners have proposed. This will enable the learners to imagine themselves in these situations and discuss on the answers. The learners may also set questions or scenarios and ask them to go on-line to search for the answers and report back to the rest of the group later.

- **Reflective learning:** Allow learners to spend at least five minutes reviewing and sharing what they have learned, and discussing the actions they are going to take. As a facilitator reflective time gives you time to contemplate learning points and decide which areas worked well, worked less or did not work, during learning process. This may be achieved through answers provided by learners and the questions they ask. Facilitators can use this information to repeat or modify an explanation to improve learning.
- **Self-directed learning:** learners are able to explore and discover rather than just listen and remember. Interactive online learning may provide learners with opportunities to learn on their own and at their own pace. The technologies that support these activities could include wikis, online quizzes, blogs and discussion boards.

Self-Reflection

1. I learnt…….

2. I need to learn more about…….

3.How I will apply what I have learnt

Suggestions I have for improvement of the session

Upload your responses on

https://forms.office.com/r/7nHVcLMZrt

Facilitators to use this link to View Responses:

https://tinyurl.com/KWL-Facilitators

Thank you