SCHEME OF WORK

Name of teacher **.....** Name of School: **.....**

Year: **.....** TERM: **1 to 2**

Class/Stream: **FORM FOUR** Subject: **BIOLOGY**

COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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i. Students to make appropriate use of Biological knowledge concepts and principle in solving various problem in daily life. ii. Student to perform practical activities in growth processes.	i. Students to acquire basic knowledge, skills, concepts, principles and mechanics of physiological process in plants and animals. ii. Students to develop practical skills in studying growth processes.	JANUARY	3	GROWTH	1.1 Concept of Growth.	2	● To lead students to discuss the meaning and importance of growth. ● To guide students through questions and answers to mention internal and external factors affecting growth in plants and animals. ● To make reflection of the experiments and clarify main points.	●To discuss the meaning and importance of growth in groups. ●To carry out experiment to investigate external and internal factors affecting growth.	●Charts / diagrams/pictures showing developmental stages of plants and animals. ● Real objects.	●Fundamental of Biology form 4, students Book. J.M Mwanikii, G.G Geoffrey Delah Education publishers Ltd. Biology Forms 3 &4 students	● Is the student able to explain the concept of growth 2?. ● Can the student investigate internal and external factors affecting growth in plants and animals?	
			4		1.2 Mitosis and Growth	6	● To guide students in groups to discuss the concept of mitosis. ● To make clarification and conclusion after students presentation.	●To discuss the concepts of mitosis and present their tasks.	● Charts/ models photographs diagrams slides showing stages of mitosis.		● Is the students able to explain the concept of mitosis? ● Illustrate.	

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										Book Tanzania Institute of Education Longman. Biology A frictional Approach 3rd Edition M.B.V Robert Thomas Nelson..		
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		J AN UA R Y		G R O W T H			● To guide students in groups to discuss stages of mitosis. ● To reflect on the drawings and make necessary clarification.	● To discuss in groups and illustrate stages of mitosis diagrams and present their groups tasks plenary discussions.	● Microscope slides of mitosis.	Biology Book. Ritter et al Nelson Canada	● Correctly stages of mitosis? ● Explain significance of mitosis on growth?	
							● To guide the students in groups to discuss the significance the significance of mitosis in growth. ● To reflect on the presentation and make clarifications.	● To present their group tasks in the plenary discussion.				
		F E B RU AR Y	1		1.3 Growth and Developm ent stages in Human	6	● To guide students to discuss the meaning of diffuse growth in groups. ● To culminate the discussion by highlighting the meaning of diffuse growth.	● To discuss the meaning of diffusion growth in groups and present their tasks. ● To use the highlights to deduce the meaning of diffuse growth and distinctive characteristics.	Charts/diagra ms /pictures showing development stages in man.		Is the students able to explain; ● Concept of growth and development in human being? ● In the stages of human post-natal growth and development?	
							● To lead the students in groups to observe the displayed charts and discuss the stages ad changes during human growth and development. ● To clarify on the psychological and physical and behavioural changes associated with each stage of human growth and development.	● To observe the displayed charts and discuss the stages and changes during human growth and development.	● Photogra phs charts showing stages of human growth from infancy to old age.			

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		FEBRUARY		GROWTH			● To guide the students in small groups to discuss physiological , physiological and behavioural changes associated with growth and development in childhood, adolescence, reproductive age, middle and old age. ● To culminate the discussion and clarify the major points.	● To discuss physiological and behavioural changes associated with growth and development in childhood, adolescence reproductive age, middle and old age.	● Charts on nutrition shelter and other basic needs.	●	Is the students able to:- - explain physiological psychological and behavioural changes associated with growth and development?	

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							● To lead students in groups to discuss the factors affecting the rate of physical deterioration of human body and services required to meet the needs of individual at each stage. ● To clarify on the study findings and emphasize that improve to reduce factors which affect the rate of physical deterioration of human body and services required to required to meet the needs of an individual at each stage will enhance the quality of human life.	● To discuss the factors affecting the rate of physical deterioration of human body and services required to meet the needs of individual at each stage.	● Photographs/charts/diagrams showing human developmental stages. ● Charts / pictures of varieties of food. ● A variety of food substances.		Is the student able to outline the factors which affect the rate of physical deterioration of human body? Services required to meet the needs of individual at each stage?	
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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		F E B RU AR Y	2 & 3		Growth in flowering plants	8	●To guide the students to explain the concepts of localized growth in plants. ●To lead the students in groups to experiment and observe the germinating seeds and growing seasons of a plant for 5-7 days. ●To culminate by highlighting the concept of localized in flowering plants.	● To explain the concept of localized growth in plants. ● In groups to experiment and observe the germinating seeds and growing seasons of a plant for 5-7 days.	● Germinate seeds ● Ruler/tape measure. ● Rope /thread ● Indian ink ● Cotton wool ● Petri dishes ● Hand lens ● Young plant		Is the student able to explain the concept of seed of germination?	
							●To lead the students to discuss the changes which occur during seed germination.	● To discuss the changes which occur during seed germination.	● Extract/ texts on the changes which occur during seed germination.		Can the student outline changes which occur during seed germination? How accurately can the student be able to investigate condition necessary for seed germination experimentally? Explain the concept of localized growth and germination?	
							● To guide the students to perform an experiment to investigate the conditions necessary for germination and discuss their findings. ● To guide the students to deduce from the findings the conditions necessary for germination and present their task in a class discussion. ● To reflect on the presentations and point out the conditions necessary for seed germination.	●To perform an experiment to investigate the conditions necessary for germination and discuss their findings. ● To deduce from the findings the conditions necessary for germination and present their task in a class discussion.	● Seeds ● Water ● Cotton wool ● Petri dishes ● Indian ink ● Textual material.			

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							● To lead students in groups to carry out experiments on equal and hypogeal germination and report their experiment findings in plenary discussion. ● To reflect on students responses and make necessary clarifications.	●To carry out experiments one pigeal and hypogeal germination and report on their experiment findings in plenary discussion.	● Diagrams / drawings on seed germination.	●	● Carry out practical activities to demonstrate on epigeal and hypogeal germination. ● Examine growing regions of a root and a shoot experimentally?	

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							● To lead students in groups to perform experiments to examine the growing regions of a radical and a plumule (most and shoot spices) ● To lea students to take measurement of the growing shoot and root periodically and discuss their findings.	●To take measurement of the growing shoot and root periodically and discuss findings. ●To make reflection of the experiment and clarify main points.	● Germating seeds. ● Petri dishes ● Water ● Thread/rope ● Ruler ● Indian ink	●		
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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• Students to make appropriate use of biological knowledge concepts and principle in solving various problem in daily life. • Perform practical activities in genetic. • Demonstrate appropriate use of genitio principle to improve animal, reproduction and resolve socio -cultural conflicts.	• Acquire basic knowledge skills, concepts, principles and mechanism of physiological success in plants and animals. • Develop practical skills in studying genetics. • Apply knowledge skills and principles of genetics in improving plant and animal seeds as well as solving socio cultural conflicts (e.g. Marital conflicts and child rejection)	F E B R U A R Y	4	2.0 G E N E T I C S	2.1 Concept of Genetics	2	• To lead the students in groups to discuss the meaning of genetics, variations and resemblance which exists among members of the same family. • To give conclusion by formulating definitions of interface and genetics.	•To discuss the meaning of genetics, variations and resemblance which exists among members of the same family.	• Photocopy / pictures showing members of the same family.	• Fundamental of Biology Form 4 students Book J.M Mwaniki, G.G. Geoffrey Delah Educational Publishers Ltd. Biology forms 3&4 students Book TIE –Longman	• Is the students able to explain the concept if genetics. • How correctly can the student state common terms used in genetics?	

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							● To display all common terms used in genetics. ● To lea students to discuss on the meaning of each term. ● To make clarification and conclusion on the common terms used in genetics.	●To discuss on the meaning of each terms.	Charts showing common terms used in genetics.	.. Biology – A fundamental approach 3rd edition M.B V. Roberts Thomas Nelson.		
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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					2.2 Genetics materials.	4	● To lead students to discuss on the meaning of genetic material. ● To make clarification and conclusion. ● To lead students in groups to observe models/pictures/photographs of DNA and RNA molecules and discuss its structure and composition. ● To lead students to and label the structure of DNA and RNA molecule. ● To lead a class discussion on the structure of DNA and RNA molecules and clarify the students responses.	●To discuss on the meaning of genetic materials. ●To observe Models/pictures/photographs of DNA and RNA molecules and discuss its structure and composition. ●To draw and label the structure of DNA and RNA molecules. ●To discuss on the structure of DNA and RNA molecules.	● Models/ charts pictures showing genetic materials. ● Models/diagrams/pictures/photographs of DNA molecules. ● Plasticise / day soil leads for moulding DNA molecule model ● Zip	● Biology Bob. Rutter al Nelson Canada Illustrate Human and soil Biology B.S Beckett Oxford University Press.	The student able to explain the concept of genetic materials? Can the student describe the structure and composition of genetic materials?
							● To lead students in groups to observe models/pictures/diagrams of DNA and RNA and discuss their differences. ● To clarify on the differences between DNA and RNA and make conclusions.	●To observe models/pictures / diagrams of DNA and RNA and discuss their differences.	● Models / Pictures / diagrams of RNA and DNA molecule.		Is the student able to differentiate DNA from RNA?	

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					2.3 Principles of Inheritance 2.3.1 Concept of inheritance	2	● To lead students in groups to discuss observable features of members of the same family.	●To discuss observable features of members of the same family.	● Pictures / photographs of members of the same family. ● Flowers and leaves of plants of the same family. E.g. Okra, Hibiscus, Cotton ,bean.	●	Can the student explain the concept of inheritance?	

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					2.3.2 Mendelian inheritance.	8	● To organize a study visit at school form a nearby peas/bean farm. ● To lead students in groups to observe and discuss different parts of the plant (i.e steam length flower colour, pod colour and shape) ● To use students findings to lead a class discussion on the characteristics features used to investigate members first law of inheritance.	●To visit a school farm or nearby peas/bean farm. ●To observe and discuss different parts of the plant. ●To summarize major points and state Mendel's first law of inheritance.	● Mature pea or bean plant.		Is the student able to state the Mendel's first law of inheritance?	
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		MARCH	1 & 2				● To lead students to discuss the meaning of monohybrid crosses and ratios. ● To guide the students to illustrate using generic diagrams the monohybrid crosses and ratios.	●To discuss the meaning of monohybrid crosses and rations. ●To illustrate using genetic diagrams the monohybrid crosses and rations.	● Pods of fresh green peas beans. ● Pictures / Photographs .		How accurately can ● The student illustrate monohybrid crosses and ratios. ● Can the student accurately to interpreted monohybrid cross (and ratios? ● Can the student to interpret data from monohybrid experiment to demonstrate Mendel's first law of inheritance experimentally?	
							● To lead the students in group using guidelines to interpreted data from monohybrid experiments to demonstrate Mendel's first law of inheritance and discuss that interpretation findings. ● To use students findings to make clarifications and conclusion.	●In groups using guidelines to interpret data from monohybrid experiments to demonstrate Mendel's firs law of inheritance and discuss their interpretation findings.	● Peas / bean seeds ● Beads of two different colours ● Beakers			

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		MARCH					● To guide students in groups to discuss the patterns of inheritance of albinism, tongue rolling, ABO and Rhesus factors, blood grouping and sickle cell anaemia. ● To reflect on the presentation and make clarification.	●In groups to discuss the patterns of inheritance of albinism tongue rolling, ABO an Rhesus factors, blood grouping and sickle cell anaemia. ●To present group tasks in a plenary discussions.	● 250gm of bean or pea seeds. ● 50-100 of two different colours. ● Beakers.		Inheritance experimentally? Is the student able to illustrate patterns of inheritance that follow Mendel's first law of inheritance?	
		APRIL	1	**MID TERM TESTS**								

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			2	MIDTERM BREAK MARKING AND COMPILLING OF MARKS OF MIDTERM TESTS								
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		A P R I L	3		2.3.3 Non-Mendelian inheritance.	6	● To lead the students to discuss in groups the meaning of incomplete dominance and co-dominance . ● To use students responses to clarify on the meaning of incomplete dominance and co-dominance.	●To discuss in groups the meaning of incomplete dominance and co-dominance.	● Charts/ pictures and photographs showing members of the same family. ● Pictures/ Photographs showing animals with different colours black, white brown and dotted cow, cat, goat, or hen. ●Chart, / pictures photograph. ●Beads of different colours. ●Beakers.	●	Is the student able to explain incomplete dominance and co-dominance? How well can the student illustrate – patterns of inheritance that deviates from Mendel's first law f inheritance?	
							● To lead the students to discuss on the patterns of inheritance that deviates from Mendel's first law of inheritance. ● To organize students responses and use to describe using genetic diagrams the patient of inheritance that deviates from the Mendel's first law of inheritance.	●To discuss on the pattern of inheritance that deviates from Mendel's first law of inheritance. ● To describe the patterns of inheritance using genetic diagrams.				

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		APRIL	4		2.4 Sex determination and inheritance.	8	● To lead students in groups using genetic diagrams to describe the mechanisms of sex – determination and inheritance. ● To make clarification and conclusion on the mechanism of sex determination and inheritance.	● In groups using genetics diagrams to describe the mechanisms of sex determination and inheritance.	● Photographs / pictures showing different animals.		Can the students describe the mechanism of sex determination and inheritance?	

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		MAY	1 & 2				● To lead the students in groups to discuss the meaning of sex linked sex limited and sex influenced characters. ● To lead the students in groups to discuss the observable features of animals of different sex (e.g long hair of lion, big comb and plumage of hen, long horns of goat and cow. ● To make clarifications and conclusion on the concepts of sex linked, sex limited and sex influenced characters.	● In groups to discuss the meaning of sex linked, sex limited and sex influenced characters. ● In groups to discuss the observable features of animals of different sex (eg. Long hair of lion, big comb and plumage of hen)	● Charts /pictures photographs showing animals of different sex.		Is the student able to explain the concept of sex linked sex limited and sex influenced characters? Is the students able to explain consequence of sex preference and selection?	
							● To lead the students to discuss on the consequences of sex preference and sex selection.	● To discuss on the Consequences of sex preference and sex selection.	● Samples of study report on socio-cultural factors			
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		M A Y	3				● To invite a guest speaker to table on sex preference and sex selection and its consequences.	●To make points from the guest speakers presentation that will lead them to explain consequences of sex preference and sex selection.			Is the student able to explain the concept of sex linked sex limited and sex influenced characters?	
					2.5 Variation among organisms		● To lead students in groups to observe discussion record variations existing among members of the same family. ● To lead class discussion and make clarification.	● To observe, discuss and record variations among members of the same family in groups.	● Pictures / photographs of members of the same family. ● Real objects ● Extracts /texts on variations among organism. ● Pictures / photographs of members of the same		Can the students correctly explain the concept of variations. How accurately can the student identify variations among organisms? Is the students able to give the meaning of continuous and discontinuous variations?	
							● To guide students through questions and answers to identify variations among organisms. ● To lead students in groups to carry out simple experiments on variations among organisms and record their findings. ●To lead students in groups to discuss different types of variations.	● To answer and ask questions to identify variations among organisms. ● To carry out simple experiments on variations among organisms and record their findings in groups. ● To discuss the different types of variations.				
							● To lead students to discuss on the meaning of continuous and discontinuous variations.					

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							● To assign group tasks to students to observe and discuss different types of variation existing on organisms around the school surroundings. ● To lead students to discuss the differences between continuous and discontinuous variations. ● To clarify on the differences between continuous and discontinuous variations.	● To observe and discuss different types of variations existing in organisms around the school surrounding. ● To discuss the differences between continuous and discontinuous variation.	● Variety of organisms around the school surroundings.		Can the student differentiate continuous from discontinuous variations?	

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							● To lead students to discuss and suggest the possible causes of variation among organisms. ● To jot down the students response on the chalk – bond and give comments on the causes of v variations among organisms.	● To discuss and suggest the possible causes of variations among organisms.	● Variety of organisms showing different variations.		Is the student able to explain causes of variations among organisms?	
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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		M A Y	4		2.6 Genetic Disorders	8	● To lead students in groups to observe the DNA molecules model and discuss the arrangement of bases. ● To guide students to the sequence of bases of the DNA molecule model and discuss its consequences.(genotypically and phenotypically) ● To summarize students responses and guide them to formulate proper meaning of genetic disorders.	●To observe the DNA molecules model and discuss the arrangement of bases in groups.	● Models of DNA molecule ● Picture/ photographs showing individuals with different genetic disorders.	●	Can the student give the meaning of genetic disorders?	

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		J U NE	1				● To lead students in groups to discuss various types of genetic disorders. (e.g. turner's syndrome, Down's syndrome an Mongolia) ● To lead plenary discussion on the various types of genetic disorders. ● To lead students in groups to discuss causes and effects of genetic disorders. ● To lead plenary discussion and give comments and clarification on the causes and effects of genetic disorders.	● To discuss various types of genetic disorders (Turners syndrome, down's syndrome and Mongolia) ● to discuss causes and effects of genetic disorders in groups and present their groups tasks for plenary discussion.	● Charts / photographs /sickled red blood cells ● Pictures photographs showing people with different types of genetic disorders (eg. Turner's syndrome, Down's syndrome Mongolia) super males, super females haemophilia and colour blindness ● Sa mples of chemicals such as caffeine, nicotine.	●	● Is the students able to cite examples of genetic disorders? How accurately can the student explain the causes, and effects of genetic disorders?	

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									●Sadrugs. ●Food preservative ●Charts / ● pictures showing the effect of x-rays germa valleys and ultra v video light to organisms . ● Heavy metal e.g mercury			

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					2.7 Application of genetics	6	● To lea students in groups to discuss on the application of genetics in livestock and crop production. ● To organise students responses and use them to lead a class discussion on the application of genetics in livestock and crop production.	● To discuss on the application of genetics in livestock and crop production in groups.	● Pictures/ photographs/ charts showing crops and livestock hybrids. ● Pictures/ photographs showing genetically modified organism. ● A sample of genetically modified food.		Is the student able to explain the importance of genetics in biological science and related fields?	
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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							● To lead students in groups to discuss the importance of genetics in biological science and related fields. ● To use student responses to discuss and make clarification on the importance of genetics in biological science related fields.	● To discuss the importance of genetics in biological science and related fields in groups.	● Pictures /photographs and charts showing crop and livestock hybrid. ● Pictures/ Photographs showing genetically modified organisms. ● Samples of genetically modified food.		Is the student able to explain the importance of genetics in biological science and related fields?	
03/6 – 08/06/2013							TERMINAL EXAMINATIONS.					
08/06 – 15/07/2013							VACATIONS					
		JULY	2				MARKING AND COMPLING OF MARKS					

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● Make appropriate use of biological knowledge concept and principles in solving various problem in daily life. ● Perform practical activities in classification of living things.	● Acquire basic knowledge skills, aspects, principles and mechanism of physiological processes in plants and animals. ● Classify organisms in their respective kingdoms, phylum and class.	J U L Y	3	CLASSIFICATION OF LIVING THINGS.	3.1 Kingdom Animalia.	2	● To display live/preserved animal specimens and lead students to group according to their similarities and differences. ● To give guiding questions to students to observe the collect and displayed organisms identify and record their common characteristics. ● To lead students in a class discussion on the general and distinctive features of the kingdom animalia and make clarifications. ● To guide students to observe and group organisms according to their similarities and differences. ● To clarify on students microrceptions.	● To group live/preserved animal specimens and group then according to their similarities and differences. ● To observe the collected and displayed organisms, identify and record their common characteristics. ● To discuss on the general and distinctive. ● Features of the kingdom Animalia. ● To classify organisms to their respective phyla.	● A variety of animals. ● Pictures and charts of organisms in the kingdom Animalia. ● Charts of characteristics of kingdom Animalia.	● Fundamental of Biology Form 4 students Book J.M Mwaniki, G.G Geoffrey DEP ● Biology Form 3&4 students Book TIE Longman ● Biology of fundamental approach 3rd edition M.B V. Roberts THOMA Nelson.	Is the student able to explain correctly the general and distinctive features of the kingdom Animalia?	

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					3.1.1 Phylum platyhelmithes	2	● To guide students using hand lenses to observe preserved specimens of flatworms and record their physical features. ● To lead a class discussion on the general and distinctive features of phylum plathelmothes and make clarifications.	● To observe preserved specimens of flatworms and record their physical features using hand lens. ● To discuss on the general and distinctive features of phylum flathelinthes	● preserved specimens preserved tapeworms lives fluke. ● Diagrams /pictures of flatworms e.g. plandria, liver fluke, tapeworms ● Hand lenses.		How accurately can the student describe the structure of tapeworm (Taenia) Is the students able to explain the advantages and disadvantages of Taenia (Tapeworm)	

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							● To lead students using hand lenses to observe the tapeworm Taenia and record its distinctive features. ●To lead a plenary discussion about the structure and general and distinctive features of tapeworm (Taenia) ●To guide students to describe the structure of Taenia (Tapeworm)and give clarifications. ●To guide students to draw a well labelled diagram of a tapeworm.	● To observe the tapeworm Taenia and record its distinctive features. ● To discuss about the structure and general and distinctions feature of tapeworm (Taenia) ● To describe the structure of Taenia (Tapeworm) and give clarifications. ● To draw a well labelled diagram of a tapeworm.	● Pictures of flatworms (Taenia) , liver fluke, plandria ● Charts of the general and distinctive features of phylum platyhelimthes ● Preserved specimen of flatworms ● Charts for the general and distinctive features of Taenia (tapeworm) ● Pictures/ preserve specimen of Tapeworm			
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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							● To lead students to discuss the advantages and disadvantages of flatworms. ● To guide students to outline the advantages and disadvantages of tapeworms.	● Discuss the advantages and disadvantages of flatworms. ● Outline the advantages and disadvantages of tapeworms.			Is the student able to explain correctly the general and distinctive features of the phylum Ascheminthes (Nematoda) Can the student describe accurately the structure of Ascaris (round worms) How correctly can the student outline the advantages and disadvantages of round worms?	
		J U L Y			3.1.2 Phylum Aschelminthes (Nematode)	4	● To lead students in groups to observe preserved round worms or pictures and diagrams of round worms and record their distinctive characteristics. ● To guide students to discuss in a plenary the distinctive features of round worms and give clarifications.	● To observe in groups preserved rounds worms or pictures and diagrams of round worms and record their distinctive characteristics. ● To discuss in a plenary the distinctive features of round worms .	● Preserved specimen of round worms (Ascaris) hookworms ● Hand Lenses ●Pictures, charts or photograph of round worms. ●Preserved specimen of Ascaris. ●Charts, pictures and diagrams of Ascaris. ●Hand lenses. ●Charts of phylum Aschelminthes.			
							● To lead students using hand lenses to observe and identify posterior and anterior ends of a round worms. ●To guide students to identify anterior and posterior ends of Ascaris and describe then distinctive features.	● To observe and identify had lenses anterior and posterior ends of Ascaris and describe their distinctive features. ● To draw and label a diagram of the roundworms (Ascaris).				

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							● To lead students in groups to discuss the advantages and disadvantages of phylum Ascheminthes and present their word in a plenary session. ● To reflect on the presentations giving comment.	● To discuss in groups advantages and disadvantages of phylum Ascheminthes and present their work in a plenary session.	.			

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		AUGUST	1		3.1.3 Phylum Annelida	4	● To lead students to observe organisms under the phylum Annelida (earth worm and leeches) and discuss their characteristics. ● To lead plenary discussion on the general and distinctive features of the phylum Annelida. ● To guide students using hand lens to observe preserved and live specimens of earthworms to identify body parts.	● To observe organisms under the phylum Annelida (earthworm and leeches) and discuss their characteristics. ● To discuss on the general and distinctive features of the phylum Annelida. ● To observe preserved and live specimens of earthworms to identify body parts using had lens. ● Students in groups to discuss advantages and disadvantages of Lubricous (earthworm)	●Diagrams and pictures of leads and earthworm. ●Preserved specimens of annelida. ●Charts to ● show the structure of leeches and earthworm ●Live or preserved earthworm hand lens.		Is the student able to explain accurately the general and distinctive features of the phylum Annelida? Is the student able to explain the advantages & disadvantages of Lubricous (earthworm)?	

MOCK EXAMINATIONS

COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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		AUGUST	2	3.1.4 Phylum Anthropoda	4	● To lead a plenary discussion on general and distinctive features of phylum Arthropoda.	● In groups using guiding questions to observe and record the distinctive and general features of the collected displayed specimens of Arthropods.	● Pictures, diagrams of arthropods. ● Preserved or live specimens of varieties of Arthropods ● Hand lens ● Pictures and photographs of variety of arthropods ● Chart of classes of arthropods ● Hand lens ● Variety of organism of each class of the phylum arthropods.		● How accurately can the student explain the general and distinctive features of the phylum Arthropod? ● Can the student accurately mention the classes of the phylum Arthropoda? ● How accurately can the student cite examples of organism under each class of the phylum Arthropoda?	
						● To lead students in groups to observe variety of arthropods and groups them according to their similarities and differences. ● To lead a plenary discussion and make necessary clarifications.	● To observe variety of arthropods and group them according to their similarities and differences. ● To discuss and make necessary clarification				
						● To guide students to collect variety of organisms belonging to each class of the phylum Arthropoda. ● To led students in groups to discuss the characteristic features of organisms under each class and cite. Example of organisms belonging to each class.	● To collect variety of organisms belonging to each class of the phylum Arthropoda. ● To discuss in groups the characteristic features of organisms under each class and cite examples of organisms belonging to each class.				

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		AUGUST					● To lead students in groups to discuss the general and distinctive characteristics of one of the five classes of phylum Arthropoda . ● To guide the students in their groups to discuss and came up with the correct general and distinctive characteristics of the respective class.	● To discuss in groups the general and distinctive characteristics of one of the five classes of phylum Arthropoda. ● To discuss in groups and come up with the correct general and distinctive characteristics of the respective class.	● A variety of Arthropods (live or preserved specimens) ● Charts, pictures, photographs showing variety of Arthropods.		● Is the student able to explain distinctive features of each class of phylum Arthropoda? ● Can the students describe the structures of representative organisms under each class?	

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							● To guide the students in groups to observe organism of each of the phylum Arthropoda and discuss their characteristic features. ● To guide students to draw well labelled diagrams of representative organisms under each class of the phylum Arthropoda. ● To lead a plenary discussion and reflect on students responses to make general comments and clarifications.	● To observe organisms of each of the phylum Arthropoda and discuss their characteristic features. ● Students to draw well labelled diagrams of representative organisms under each class of the phylum Arthropoda.	●			
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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		AUGUST	3 & 4				● To guide students in groups to discuss the advantages and disadvantages of each class of the phylum Arthropoda. ● To lead students to present their group tasks in a plenary session and reflect on the students responses and give clarification.	● Students in groups to discuss the advantages and disadvantages of each class of the phylum Arthropoda ● To prevent group tasks in a plenary session.	●Chart showing advantage and disadvantages of each class of phylum arthropods. ●A variety of arthropods (live or preserved species)		● How accurately can the student explain the advantage and disadvantages of each class of the phylum Arthropoda?	

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					3.1.5 Phylum Chordata	8	● To guide students to observe a variety of common chordates and record their observations. ● To guide students in a class discussion to outline the general and distinctive features of phylum chordata.	● To observe a variety of common chordate and record their observations. ● To present their in plenary to outline the general and distinctive features of phylum chordata.	● Pictures, charts, photographs showing varieties of common chordate. E.g mice, frog, hazard, buds, fish, snake, mouse and rats. Live a preserved specimens of chordates eg. Frog, fish, lizard, rats & birds		Is the students able to explain the general and distinctive characteristics features of the phylum chordate?	

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							● To lead students using questions and answers to identify different groups within the phylum chordata. ● To lead students in groups to discuss on different classes of the phylum chordata. ● To lead plenary discussion and give necessary clarifications.	● To identify different groups within the phylum chordata. ● To discuss on different classes of the phylum chordata.	● Charts/ pictures/ photographs of different chordates in their respective classes. ● Varieties of chordates (live in preserved specimen)		Can the student mention the classes of the phylum chordata?	

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							● To organize students into groups and assign each group a task of collecting information from relevant textual materials about classes of phylum chordata. ● To guide students to describe the features of some common chordates draw and label them to show their external features.	● To collect information from relevant textural materials about classes of phylum chordata. ● To present their findings in a plenary session. ● To describe the features of some common chordates draw and label them to show their external features.	● Charts/pictures/photographs of different chordates in their respective classes. ● Varieties of chordates (live in preserved specimen) ● Live on preserved specimens of different chordates, e.g birds, frog/toad & lizard.		Can the student correctly explain the distinctive characteristics of each class of phylum chordata.	
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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							● To guide students to discuss in groups the advantages of each class of the phylum chordata and tabulate for each class of phylum chordata.	● To discuss in groups the advantages of the phylum chordata. ● To tabulate the advantages and disadvantages of each class of phylum chordata.	● Live a preserved specimen of different chordates. ● Charts/pictures/photographs showing different chordates.			
		SEPTEMBER	1	4.0 EVOLUTION	4.1 Concept of Organic Evolution		● To lead students through questions and answers to give the meaning of organic evolution. ● To lead students to discuss the meaning of organic evolution.	● To give the meaning of organic evolution. ● To discuss the meaning of organic evolution.	● VIPP cards on the concept of organic evolution.	● Fundamentals of Biology form 4 students Book. J.M Mwaniki, G.G Geoffrey Delah Education Publishers LTD. & Biology Form 3&4 students Book Tanzania Institute of Education Longman. Biology of functional Approach 3re edition BV Roberts Thomas	Is the student able to explain the concept of organic evolution?	
					4.2 Theories of the origin of life.		● To prepare cards on texts on the basic ideas about origin of life. ● To lead a class discussion, give general comments and make conclusion.	● To discuss in small groups the basic ideas about the origin of life and present their task using the prepared cards or texts.	● VIPP cards ● Texts excreted from various sources on the basic ideas about the origin of life.		To what extent can the student outline the basic ideas about the origin of line.	

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		SEPTEMBER	2				● To lead student discuss in small groups the theories of the origins of life. ● To guide the students in summarizing the major ideas.	● To discuss in small groups the theories of the origins of life such as special creation, spontaneous generation and steady state theories using guiding questions. ● To present group tasks in plenary discussion.	● Texts extracted from various sources explaining theories of the origin of life.	● Biology of Ritten et. Al Nelson Canada.	Can the student state the theories of the origin of life?	
					4.3.1 Lamarck's	2	● To lead a class discussion on the major ideas of the Lamarck's theory of evolution.	● Discussion on the major ideas of the Lamarck's theory of evolution. ● To summarize the major ideas of Lamarck's theory of evolution.	● VIPP cards on the major idea of Lamarck's theory		How correctly can the student state Lamarck's theory of evolution.	

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							● To lead students using questions and answers to point out the Lamarck's observation and deduction.	● To joint out the Lamarck's observation and deductions. ● To summarize their responses on the Lamarck's observations and deductions.	● Chart on the Lamarck's observation and deductions.		Is the student able to explain Lamarck's observation and deductions?	
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS
							● To guide students to brainstorm on the merits and demerits of Lamarck's theory of evolution. ● To guide students to organize and summarize their responses on the merits and demerits of Lamarck's theory of evolution.	● To brainstorm on the merits and demerits of Lamarck's theory of evolution.			Can the student outline the merits and demerits of Lamarck's theory of evolution?	

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			3		4.3.2 Darwin's		● To lead a class discussion on the major idea of Darwin's theory of evaluation.	● To discuss on the major idea of Darwin's theory of evolution. ● To summarize the major ideas in order to state Darwin's theory of evolution.	● VIPP Cards on the Darwin's theory of evolution.		Is the student able to state Darwin's theory of evolution?	
							● To guide students in groups to discuss Darwin's observations and deductions using guiding questions. ● To guide students to summarize their responses and make conclusion.	● To discuss Darwin's observations and deductions using guiding questions. ● To present group tasks in plenary discussion.	● A chart showing summary of Darwin's observation and deductions.		To what extent is the student able to outline Darwin's observation and deductions?	
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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							● To lead students to discuss in groups and make presentations on the major ideas in the theory of natural selection in relation to the mechanisms of evaluation.	● To discuss in groups and make presentation on the major ideas in the theory of natural selection in relation to the mechanics of evolution.	● A chart showing major ideas of the theory of natural selection.	●	How accurately can the student explain the theory of natural selection in relation to the mechanisms ?	
							● To lead plenary discussion and guide students to summarize major ideas, make discussions and conclusion.					
							● To lead students to discuss in groups the merits and demerits of Darwin's theory of evolution using guiding questions. ● To guide them to summarize and record major points on merits and demerits of Darwin's theory of evolution.	● To discuss in groups the merits and demerits of Darwin's theory of revolution using guiding questions. ● To present in plenary their groups tasks.	● A manila sheet showing tabulation of merits and demerits of Darwin's theory of evolution.		Is the student able to explain the merits and demerits of Darwin's theory of evolution?	

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					4.4 Evidence of organic Evolution	6	● To guide students through questions and answers to list down sources of evidence of organic evolution.	● To list down sources of evidence of organic evolution.	● Phot ographs of remains of plants and animals in rocks.		Can the student mention sources of evidence which support organic evolution?	
							● To lead a class discussion on the sources of evidence of organic evolution.	● To discuss on the source of evidence of organic evolution.				
							● To guide students in groups to observe pictures or photographs and discuss the evidences of organic evolution. ● To guide students to summarize major points and make clarifications.	● To observe pictures or photographs and discuss the evidences of organic evolution. ● To present group tasks in plenary discussion.	● Photocopy pictures of fossils in the rock strata.		Can the student adequately explain the evidence of organic evolution?	

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							● To organize a study tour to the archives historical sites which show the evidence of organics evolution? ● To lead plenary discussion guide students to summarize their findings and make conclusion.	● To make a study tour to the archives historical sites which show the evidence of organic evolution. ● To discus in groups the major findings from the study tour, prepare a report and present in plenary discussion.	● Photocopy pictures of follies in the rocks		How correctly can the student investigate evidences and application of organic evolution in real life situation?	
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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		OCTOBER	1 & 2	5.0 HUMAN IMMUNO DEFFICIENCY VIRUS (HIV) ACQUIRED IMMUNE DEFFICIENCY SYNDROME (AIDS) AND SEVUALLY TRANSMITTTED INFECTINS (STIs)	5.1 RELATION BETWEEN HIV, AIDS AND STI S	6	● To guide students to brainstorm on the differences between HIV, AIDS and STIs. ● To guide students to record the correct responses and tabulate the differences between HIV, AIDS and STIs.	● To brainstorm on the difference between HIV, AIDS and STDs. ● To record the correct responses and tabulate the differences between HIV, AIDS and STIs.	● Reports from UNAIDS, NACP and TACAIDS. ● Charts on AIDS in Africa.	Biology form 3 & 4 students book TIE Longman.	Is the student able to distinguish between HIV/AIDS and STIs?	
							● To lead a class discussion on relationship between HIV and STIs focusing on similarities, differences, Mode of transmission and effects. ● To guide students to record and summarize major ideas on the relationship between HIV and STIs.	● To discuss on relationship between HIV and STIs focusing on similarities, differences, mode of transmission and effects. ● To record and summarize major ideas on the relationship between HIV and STIs.	● Reports on HIV/AIDS and STIs. ● Charts on AIDS in Africa would /Tanzania.		Is the student able to explain the relationship between HIV and STIs?	

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							● To prepare guideline for students to investigate the impact of HIV/AIDS and STIs in the community. ● To guide students to analyze their findings and present study reports in a plenary session and clarify where necessary	● To investigate the impact of HIV/AIDS and STIs in the community. ● To carry out an investigation on the impact of HIV/AIDS and STIs in the community to analyze findings and present study reports in a plenary session.	● Real objects ● Samples of study reports on impacts of HIV/AIDS/STIs.		Can the student investigate the impact of HIV/AIDS and STIs in the community?	

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					5.2 Management and control of HIV/AIDS and STIs.	6	● To lead students to discuss ways of management and control of HIV/AIDS and STIs in the community. ● To guide student to present their tasks in plenary discussion and make necessary clarification.	● To discuss ways of management and control of HIV, AIDS and STIs in the community. ● To present task in a plenary discussion.	● Manual on management HIV/AIDS and STIs. ● Reports on HIV/AIDS and STIs. ● Extracts texts on HIV/AIDS and STIs.		Is the student able to outline ways of managing and controlling HIV/AIDS and STIs?	
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

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							● To prepare extracts/texts from magazine on books on the management of HIV/AIDs/STIs. ● To guide students in groups to role play how to use different life skills in the management and control of HIV/AIDS and STIs. ● To lead students to reflect on role plays and summarize major ideas in the management and control of HIV/AIDS/STIs.	● To discuss in groups life skills needed for management and control of HIV/AIDS and STIs. ● To role play how to use different life skills in the management and control of HIV/AIDS and STIs. ● To reflect on role plays on the management on the HIV/AIDS /STIs.		● Life skill manual. Extra ts/texts on life skills for managem ent of HIV/AIDS and STIs. FLE Biology Teachers guide Form 3&4	Can the student mention the appropriate life skill needed for home based care for PLWHA	
							● To guide student to discuss on the necessary precautions when handling HIV infected people and those with STIs/STDs.	● Discuss on the necessary precautions when handling HIV infected people and those with STIs/STDs. ● To share group work in a plenary session.		● Brochur es and fliers on method of handling people living with HIV/AIDS. Charts on HIV/AID/S TIs in Africa/Wo rld /Tanzania.	Can the student mention the appropriate the life skills needed for management and control of HIV/AIDS and STIs.	

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							● To guide students to prioritize the mentioned precautions for handling people with STIs and those living with HIV/AIDS.	● To prioritize the mentioned precautions for handling people with STIs and those living with HIV/AIDS	● FLE Biology Teachers Guide for Form 3&4			
					5.3 Counselling and voluntary Testing (CVT)		● To lead students in groups to discuss the meaning and importance of CVT. ● To give clarifications where necessary of the presentation.	● To discuss the meaning and importance of counselling and Voluntary Testing. ● To present group tasks in a plenary discussion.	● CVT manual. ● Reports on HIV/AIDS/STIs.		Is the student able to explain the concept of CVT?	

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Class/Stream: **FORM FOUR**

Subject: **BIOLOGY**

							● To lead students through questions and answers to outline the significance of CVT in the control of HIV/AIDS/STIs. ● To lead student to discuss in groups the significance of CVT in the control and prevention of HIV and STIs. ● To give clarifications on the presentations.	● To outline the significance of CVT in the control of HIV/AIDS/STIs. ● To discuss in groups the significance of CVT in the control and preventation of HIV and STIs. ● To present their tasks in plenary session.	● manual on CVT. . ● Reports on CVT		Can the student outline the significance of CVT in control and prevention of HIV and STIs?	
COMPETENCE	GENERAL OBJECTIVES	MONTH	WEEK	MAIN TOPIC	SUB-TOPIC	PERIODS	TEACHING ACTIVITIES	LEARNING ACTIVITIES	T/L MATERIAS	REFERENCES	ASSESSMENT	REMARKS

SCHEME OF WORK

Name of teacher **……**

Name of School: **……**

Year: **……**

TERM: **1 to 2**

Class/Stream: **FORM FOUR**

Subject: **BIOLOGY**

							● To provide guidelines on the procedures and techniques of CVT. ● To guide students in the discussion and make a clarification of the findings and observations in the plenary discussion.	● To discuss in groups the procedures and techniques of CVT and record the main ideas. ● To share findings and observations in plenary session.	● Manuals on CVT for HIV/AIDS/STIs. ● Extracts /texts on procedures and techniques of CVT.		Is the students able to explain the procedures for CVT?	