TOPIC	LEARNING OBJECTIVES				CONTENT	MATERIALS	METHOD/ STRATEGIES	EVALUATION	AREA(S) OF INTEGRATION
	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Local Agricultural Institutions in Guyana	Collect data and report on local agricultural institutions	The five major groups of agricultural institutions in Guyana. Agricultural institutions in each of the major groups The contribution of local agricultural institutions to the development of agriculture in the respective regions	The importance of local agricultural institutions to the agricultural sector	Appreciate that the agricultural sector needs institutional support	The agricultural sector in Guyana consists of five major types of institutions namely: - develop-mental institutions - training institutions - research and extension institutions -producing and marketing institutions -financial institutions	Agricultural Science for Secondary Schools in Guyana BK III Chapter 6. pp 125-136	Research on local agricultural institutions Discussion of research findings Report on research	Assessment of students' report on the importance of the local agricultural institutions to the agricultural sector	**Social Studies** Agriculture institutions in Guyana

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Local Agricultural Institutions in Guyana (cont'd)	Draw an organizational chart for the Ministry of Agriculture to show the five major types of institutions	The names of five major Agricultural developmental institutions in Guyana Each arm of the *Ministry of Agriculture* is a developmental institution The roles of each of the five institutions	How the five main areas of operation of the Ministry of Agriculture offer institutional support to the agricultural development drive	Appreciates the work of the Ministry of Agriculture	Developmental Institutions: - Crop and live stock - Fisheries - Hydraulic section - Land and surveys - Forestry	Agricultural Science for Secondary Schools in Guyana BK III ch. 6 pp 125-126	- Field trips to the Central Ministry of Agriculture and the various sections/departments - Diagrammatic representation of the Ministry of Agriculture shows the major areas of operation	Assessment of student's group write reports on the structure and function of each of the five main areas of operation of the *Ministry of Agriculture*	**Social Studies** Organizational chart **Geography** Location of Agricultural Institutions

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Local Agricultural Institutions in Guyana (cont'd)	Illustrate the organisational structure of Guyana School of Agriculture and the Faculty of Agriculture, UG	The two main Local Agricultural Training Institutions in Guyana The position in the organizational structure of each training institution	How the training programmes benefit graduates and their contribution to the overall development of agriculture in Guyana	Appreciates the vale of training in the agricultural sector	Local Training Institution - Guyana School of Agriculture - Faculty of Agriculture University of Guyana	Agricultural Science for the Secondary Schools in Guyana BK III ch. 6 pp. 126-130	-Visits to the Faculty of Agriculture and Guyana School of Agriculture -Discussion of visits to training institutions -Reports of visits	Assessment of students' report on the function of one training institution in Guyana How it is organized and how it contributes to agriculture	**Social Studies** Role of training institutions

TOPIC	LEARNING OBJECTIVES				CONTENT	MATERIALS	METHOD/ STRATEGIES	EVALUATION	AREA(S) OF INTEGRATION
	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Local Agricultural Institutions in Guyana (cont'd)	Observe and record types of agricultural activities performed at N.A.R.I Write report on visit to N.A.R.I. in their farm diaries	The local research institution and its mission The three branches of the operations of N.A.R.I The sections of the branches of N.A.R.I.	How the local research institution contributes to the improvement of crops and livestock production in Guyana	Appreciates the importance of Science and Technology in sustaining improvement in crop and livestock production in Guyana	Research Institutions - The National Agricultural Research Institution N.A.R.I. -N.A.R.I'S Three main Branches Mon Repos Burma Ebini	Agricultural Science for the Secondary Schools in Guyana BK III ch. 6 pp 130-131	Field trips to the various branches of The National Research Institute - Visit to NARI'S demonstrations on privately owned farms - Observing and reporting on observations	Assessment of students' reports on visits on the importance and function of one of the laboratories of NARI	**Social Studies** The role of N.A.R.I

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Local Agricultural Institutions in Guyana (cont'd)	Conduct an interview with New Guyana Marketing Corporation official	State the name of the Local market Institutions Outline the functions of the local marketing Institution	Evaluate the need for and the importance of the new Guyana Marketing Corporation	Appreciate Government's role in agricultural marketing in terms of marketing intelligence, technology transfer and commercial market policy	Local Marketing Institution - The new Guyana Corporation - Small Business Associations - The Guyana Agricultural & Industrial Development Bank (GAIBANK)	Agricultural Science for Secondary Schools in Guyana BK III 131-132	- Resource persons - Visit to the new Guyana Marketing Corporation -Interview of marketing officials at the Guyana Marketing Corporation - Lecture/ discussion - Observation and report writing	Write report of visit to the New Guyana Marketing Corporation In not more than 150 words write on the role of the New Guyana Marketing Corporation in local and Foreign Marketing of Agricultural produces	**Social Studies** **Business Education** **Geography**

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Local Agricultural Institutions in Guyana (cont'd)	Carry out research on a regional agricultural institution by field tour to CARICOM Secretariat	The major groups of regional agricultural institutions The need for regional institutional support in the CARICOM region	The need for regional institutions in the development of marketing strategies and integration of the nations in CARICOM	Appreciate the value of regional co-operation in agriculture in Caricom	Small Business Associations The Guyana Agricultural & Industrial Development Bank (GAIBANK) Regional Agricultural Institutions The main agricultural institutions in the Caribbean: -Regional Financial Institutions	Agricultural Science For Secondary Schools in Guyana Bk. 3 Chapter 6 pp 134-137	Discussion Resource person Research by visit to CARICOM Secretariat and its Library	Assessment of students' research on importance of three types of Regional Agricultural Institutions	**Social Studies** Caricom Administration Marketing Finance Agriculture Development

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Local Agricultural Institutions in Guyana (cont'd)					-Regional Research Institutions -Regional Training Institutions -Regional Marketing & Administrative Institutions				

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Crop Protection	Identify diseases of crop plants based on symptoms Grouping diseases according to their causative agent eg. viral	The names of common diseases of crop plants Classification of diseases of crop plants based on their causative agents	Diseases are harmful to crop plants and can reduce yield or even kill plants		Abnormal condition in the growth and development of a named crop plant They are different types of plant diseases which are caused by different organisms a) fungi b) bacteria c) viruses d) nemato-des	Pictures of healthy and unhealthy crop plants Pictures of diseases of different stages during plant growth. Live specimen of diseases of crop plants Samples/specimen of insects with biting and chewing mouth parts Piercing and sucking mouth parts	Research to collect specimen of healthy and unhealthy crop plants Group plants according to sign and symptoms Identifying names of diseases and writing the causative agent	Writing report on research findings Completing charts/tables Laboratory exercises	**Chemistry** **Biology** **Integrated Science**

TOPIC	LEARNING OBJECTIVES				CONTENT	MATERIALS	METHOD/ STRATEGIES	EVALUATION	AREA(S) OF INTEGRATION
	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Machinery, Implements, Tools and Soil Type in Sugar and Rice Cultivation	Identify machinery, implements and tools used in land preparation in rice and sugar cane cultivation Draw labelled diagrams to show parts of various implements and tools used in rice and sugar cultivations Apply the various steps in sequence in caring equipment and tools for long life	The machinery, implements and tools used in rice and sugar cultivation for: -Land preparation -Ploughing -Harrowing -Levelling -Inter-cultivation -Digging drains -Plant protection -Harvesting The care of equipment tools for long life	The importance of relevant and suitable implements and tools necessary for various operations in rice and sugar cane cultivation	Ensure that implements and tools are used with care for intended purposes	Tools used for: -Land preparation -Ploughing -Harrowing -Puddling (in rice) -Levelling -Digging drains -Inter-cultivation -Irrigation -Plant protection -Harvesting	Appropriate implements and tools. Film strips Pictures Drawing	Examination of equipment implements and tools. Observe demonstrations in field trips workshops. Tractors attachment in use.	Assessment of students' drawings of implement and tools	**Industrial Arts** -Assembling -Dismantling -Servicing of implements and tools

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Machinery, Implements, Tools and Soil Type in Sugar and Rice Cultivation (cont'd)	Apply the various steps in sequence in caring equipment and tools for long life		The need: -to avoid damage to equipment and tools while using them -prevent rusting during storage -have tools well sharpened for efficient performance in the field	Ensure that caring procedures are always practiced	Care of equipment and tools: -Clean -Wash -Dry -Oil/Grease -Store in well protected place	-Equipment -Tools -Lubricating oil -Grease -Oil Pump -Repair Kits -Rag	Demonstrations: -Dismantling and re-assembling implement(s) -Cleaning -Washing -Oiling/Greasing	Assessment of students performance in caring and storing equipment and tools	**Integrated Science** Oxidation reaction

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	SKILLS	**KNOWLEDGE**	**UNDERSTANDING**	**ATTITUDE**					
Structure of the Plant, Varieties, Planting Materials **Preparation of planting materials for sowing or planting**	Identify the different parts of the plant (rice and sugar cane) Draw line diagrams and label the different parts of the plants mentioned above Identify suitable/ recommended varieties for planting rice and sugarcane	The different parts of the plants and their functions The external parts of the plant The characteristics of recommended varieties for rice and sugar cane cultivation	The structure of the plant in relation to it's importance The need to cultivate high yielding, disease and pest resistant varieties	Appreciate the need to: -Have a clear understanding of the different parts of the plants and their functions -Select high yielding pest and disease resistant varieties for better performance	Parts of a plant: -Rice and sugar cane -Shoot system -Root system -The functions of the shoot and root systems Characteristics of recommended varieties	Agricultural Science for Secondary Schools in Guyana BK 3 Recommended varieties	Different parts of a plant -rice and sugar plants. Drawing those parts	Assessment of students' Drawings of parts of named plants	**Science** Parts of plants and their functions Genetics

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Structure of the Plant, Varieties, Planting Materials **Preparation of planting materials for sowing or planting (cont'd)**	Identify suitable planting materials for cultivating rice and sugar cane Prepare planting materials for sowing (rice) and planting (sugar cane)	List the characteristics of suitable planting materials (rice and sugar cane) The procedures involved in preparing seeds for broadcast sowing in puddle fields (Sprouting)	The selection of plumb, well matured, non-infested planting materials Paddy needs to germinate (be sprouted) before sowing in puddle (swampy) fields so as to help the germinated seeds to sink in the mud and to be established quickly	Appreciate the need to select suitable planting materials to get high production Ensure that planting materials are properly treated. before sowing or planting in the field	Selection of suitable planting materials Plumb disease free seeds Young cane stems Procedures involved in: -Obtaining sprouted seeds for sowing in swampy fields (rice)	Specimen of planting materials Agricultural Science For Secondary Schools in Guyana BK. 3 Jute bags Water to soak seeds brick to put weight over soaked seeds while sprouting Cane stems Sharp knife	Demonstrations: -Obtaining sprouted seeds. -Selecting cane stems at the right stage of growth for preparing "setts" -Preparing "setts" for planting	Assessment of students' Practical Skills	**Science** Germination and sprouting

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Structure of the Plant, Varieties, Planting Materials **Preparation of planting materials for sowing or planting (cont'd)**		How sets (stem cuttings are selected from sugarcane stems for planting in the field							

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Care & Management – Weed and Weed Control, Irrigation and Drainage	Identify common weeds seen in paddy fields and sugar estates Collect common weeds seen in paddy fields and sugarcane estates press, pressure and display in weed albums Carry out control measures for weeds in rice and sugar estates	The common weeds seen in rice fields and sugar estates The common names, scientific names and few identifying characteristics of common weeds The different methods of controlling weeds in rice fields and sugar estates	The differences between broad leaf weeds, grasses and sedge seen in rice fields and sugar estates The use of appropriate control measures for different types of weeds	Appreciate the importance weed free plots to avoid the ill effects of weeds	Common weeds in rice fields and sugar estates List of common names and scientific names and identifying characteristics Different methods of weeds control -Manual -Mechanical -Use of weedicides	Rice fields Sugar estates Plough Harrow Rotavabor Weedicides Contact Selective Agricultural Science for Secondary Schools in Guyana BK 3	Field trips Demonstrations Discussions Collection and preservation of common weeds	Assessment of students' weed album	**Science** Weeds and their distinguishing characteristics

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Disease and Control Measures	Identify major diseases that affect rice and sugarcane plants Carry out necessary control measures suited for each disease	Major diseases that affect rice and sugarcane crops Symptoms by which disease could be identified. Appropriate control measures for each diseases The timing of the application of disease control measure	Associate crop diseases with symptoms seen on affected plants.	Appreciate the importance of disease free crops	Major disease affecting rice and sugarcane **Rice** -Blasts **Sugarcane** -lead scald -smut -casual agents of diseases -symptoms by which one could identify the above named disease -methods of control	Diseased specimens Pictures of diseased crops Agricultural Science For Secondary Schools in Guyana BK 3	Field trips to observe affected plants Discussions of observations		**Science** Fungus virus structure of the plant **Mathematics** Calculate quantities of pesticides to be used Ratio and proportion

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Disease and Control Measures (cont'd)	Identify the part(s) of the plant to be harvested to be harvested in rice and sugarcane Identify the right stage of growth for harvesting Selecting appropriate machinery/tools needed to harvest the above named crops	The parts that are harvested in rice and sugarcane The signs by which one could decided whether the crop is ready for harvest or not Harvesting Procedures that need to be followed for each crop	The need to harvest crops at appropriate times The procedures involved in harvesting and processing rice and sugarcane	Appreciate the importance of the right time to harvest each crop	Harvesting Description of right stage to harvest crops List of appropriate machinery/tools to harvest crops Rice Combine sickle Sugarcane Cutlass Mechanical harvesters	Combine/sickle for rice harvesting. Cutlass mechanical harvester for sugarcane. Agricultural Science For Secondary Schools in Guyana BK 3.	Demonstrations of harvesting: -Operation of combine -Cutting cane		**Science** Part(s) of the plant for harvesting

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Disease and Control Measures (cont'd)	Produce line drawing of a combine/sugar cane mill Identify equipment used for post harvest and marketing activities	Procedures involved in: -Processing -Grading, -Packing, -Storing -Marketing the products obtained from rice and sugar Use correct metric units to determine quantities	The need to process, grade, pack and store harvested products	Appreciate the value of high quality product	Processing and marketing of harvested product Rice: -Threshing -Winnowing -Grading -Bagging -Marketing Sugarcane: -Crushing -Concentra-ting -Crushing crystal -Packing -Storing/ -Marketing	Jute bags	Field trips to rice fields at harvesting time and visits to sugar factories while processing sugarcane Discussion Demonstrations Demonstrations -operation of combine -cutting canes -discussion	Assessment of students' reports of field trips	**Industrial Arts** Servicing machinery

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Preparation of Meat	Identify meat preparation techniques Identify the stages in meat preparation Prepare meat for marketing Record data using tables Apply the correct slaughtering technique for the related class of livestock Manipulate slaughtering devices (supervised activities)	The stages in meat preparation for different classes of livestock The reasons for the preparation and marketing of livestock produce The methods of slaughtering Comparing slaughtering methods The evaluation of slaughtering methods	The stages of preparation The importance of reducing animal feed before slaughtering	The care of animals for slaughtering Observing the safety rules involved in the operations/ activities	The main objective for the preparation and marketing of produce Preparation of meat table of popular meats on the market The process of preparation: - before slaughtering - at time of slaughtering for different classes of livestock -after slaughter dressing chilling	Textbooks: -Agricultural Science for Secondary Schools in Guyana Bk 3 pp 110-112 -Junior Secondary Agriculture for the Caribbean BK 3 pp 116 -Caribbean Agricultural Science pp 153-155 Slaughtering devices if available Pictures of slaughtering devices	Field trips to neighbouring farms to view meat preparation Bounty farm, Abattoirs Writing reports. Recording data Viewing film strips Discussing reports Group presentations Making recommendations and discuss the 'pros' and 'cons' of methods of meat preparation Prepare a scrapbook on meat preparation	Assessment of students' reports on: -The meat preparation processes -Slaughter of animals	**Home Economics** Meat preparation **Science** Dissection of specimens **Language Arts** -reporting -questioning -discussing

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Preparation of Meat (cont'd)	Identify cuts of meat Draw diagrams with solid lines showing positions where cuts should be made Recognise the different cuts of meat Identify wholesale cuts from which retail cuts are made	The names of the different cuts of meat, beef and pork The differences between wholesale and retail cuts of beef	The different cuts of meat and their related purposes	Selecting meat that is well packaged	The different cuts of meat, beef and pork Wholesale cuts and retail cuts Table showing the main wholesale cuts with corresponding retail cuts	Resource personnel Film strips Agricultural Science for Secondary Schools in Guyana pp 110-117 Charts showing cuts of meat Samples of cuts of meats	Filed trips to the butcher Observing the different cuts of meat Drawing cuts from samples Examining discussing and recording data from observations Reporting observations	Assessment of students' report on the different cuts of meat	**Home Economics** Cuts of meat

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Nutrient Requirements Of Livestock	Classify nutrients Identify the different food stuffs animals need to stay healthy Conduct food tests for: -Starch, -Proteins -Fats	The types and functions of nutrients Associate foods with nutrients The effects of imbalanced diets to farm animals	The inclusion of certain foods in animal diet The link between animal behaviour and its nutrient intake	Appreciate the value of nutrition in animals Willingness to feed animals the correct diet	There are five chemical group substances in foods. i) Carbohy-drates -sugar -starches -cellulose ii) Proteins are body builders -amino acids iii) Fats and oils -components and sources iv) Minerals -macro -micro -sources and deficiencies v) Vitamins functions, sources and deficiencies of A B C D E and K.	Textbooks: i) Agricultural Science for Secondary Schools in Guyana BK 3 pp 36-45 and pp 134-137 ii) A. I.Henry Bk 1 pp 109-114. Samples of foods Animal Nutritionist	Discussions on ways of improving animal diet Experiments -tests for starch foods. Reporting Recording Observing Questioning Group presentations	Assessment of students' oral and written reports on dietary deficiencies on farm animals	**Science** Food nutrients

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Sources of Foods	Prepare animal feed Identify feeding materials	Define "feed". The names of the main groups of feeds The general uses of feeds Classifying feeding materials The nutrients found in animal feed The sources of animal feeds and the types	The importance of the different types of animal feeds The need for animals to be fed with suitable rations		Feed refers to any material fed to livestock whether natural or artificial The main feed groups: -Basal feeds -Supple-ments -Concen-trates Forages Additives Description and functions of each type of group.	Samples of feed and feeding materials Ibid i)pp-46-47 ii)Ibid pp 118-119 case studies	Examining feedstuffs Observing and recording information about feeds Field trip to a farm to observe feed preparation Preparing food charts Analyse situations and make recommendations	Assessment of students' report on the preparation of feed for farm animals	**Science** Observation Interpretation Reporting

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Livestock Rations	Identify rations Classify rations for different classes of livestock Record observation using tables Prepare ration for livestock Calculate amounts of ingredients for ration	The characteristics of ration Different types of ration The uses of rations Selecting the appropriate ration for the class of livestock	The relationship between of each type of ration and the class of livestock re: pig, cattle, poultry	Willingness to use rations Using correct measures in ration preparation Appreciate that only the required amounts of substances must be used in an activity to avoid waste Observe rules on field trip	Ration for livestock must be balanced as well as have these qualities: -Bulk -Palatability -Binding -laxative effect -Flavours and tints Table indicating class and the kinds of ration fed at different stages of growth	Textbooks Agricultural Science For Secondary Schools in Guyana Bk 3pp 48-50 Samples of the rations Ration charts	Field trips to neighbouring farm, Bounty Farms Examination of different observations of the effects of rations on farm animals Researching Experimenting Group presentations	Assessment of students': -Observation and group participation on Field trips and reports of visits to farms	**Language Arts** -Discussion and descriptions of visits to animal farms **Home Economics** Weighing ingredients for rations **Mathematics** Calculating amounts of ingredients for rations

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Livestock Rations (cont'd)					Ration is the amount of feed that will supply nutrients needs daily by animals for body maintenance and production Types of ration: -Balanced -Maintenance -Production		Nutritional analysis of rations		

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Silage	Identify materials used in silage making Combine materials to produce silage Make model of soils Collecting materials and data on silage	Definition of silage The steps in the preparation of silage The functions of silage The types of silos	The importance of grass and technology in the livestock industry	Appreciates the role of technology in the livestock industry	Definition of the terms "Silage and "Silos" The process of making silage Types of silos The importance of silage	Caribbean Agricultural Science Bk. 1 pp 124-126 Junior Secondary Agriculture for the Caribbean pp 132 Agricultural Science for Secondary Schools in Guyana Bk. 3 pp 59. Cardboard, paste, grass, Molasses, formaldehyde plastic etc.	Visits to farms to view the process of silage making Demonstration of silage making Experimenting with various grasses Project assignment on silage Group presentation on project reports	Assessment of students': -Participation in project models -Conclusions and recommendations -Attempts at silage making	**Language Arts** Discussion Report Writing **Mathematics** Measurement **Home Economics** Preservation of foods **Science** Electrical circuits

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Sheep and Goat	Identify the terms used to describe sheep and goats.	The terms used in goats an sheep production		Appreciate the need to be aware of terms and definitions used in sheep and goats production	Terms and definitions used in sheep and goats production e.g. Ewe- a female sheep. Ram-an uncastrated male sheep/goat Lamb - a young sheep Kid – a young goat	Visit to school and community farms. Video tapes Television programmes Photographs and clippings from magazines Resource persons	Observation of sheep and goat Discussion of observations Reporting observations Collection of photographs and clippings from magazines Match terms associated with correct definition Select correct terms and definitions to place in blank spaces in sentences or in matching term with definitions	Assessment of students: - Definitions of the terms used in sheep and goat production Matching terms with farmers	**Language Arts** Definitions, Report writing

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
External positions and parts of sheep and goats	Identify the external parts of a sheep and a goat Draw line diagrams and label the external parts of sheep and goats Outline the external positions of a sheep's/goat's body	The external parts of sheep and goat The positions of an animal's body The functions of parts of the body listed The relationship the external parts with their functions The relationship of the external parts to the position on the body e.g. the liver dorsally positioned	The importance of each part of the body	Appreciate the importance of naming the external parts correctly	Parts of a sheep, and goat External parts: 1. poll 2. face 3. loin 4. shoulder 5. breast	Video recording on sheep and goats Drawings to show the external positions of sheep and goats -dorsal -ventral -anterior Charts showing external parts e.g. neck, flank, knee, elbow Agricultural Science For Secondary Schools in Guyana	Observation of body parts Discussion of observations Collection of pictures and clippings Interviews with farmers Drawings and labelling a sheep and a goat	Assessment of students': -Labelled drawings of a sheep and a goat sharing the external body parts Relate the external parts to the position of the body e.g. liver is dorsally positioned	**English Language** Naming body parts of sheep and goat **Art** Drawing sheep and goat

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
The Importance of Sheep and Goats Production in Guyana and the Caribbean	Recognise the products that come from the production of sheep and goats	The importance of sheep and goats the production of meat, wool, milk and manure	State the importance of sheep and goats in Guyana and in the Caribbean re: production of meat, wool, milk.	Appreciate the need to rear livestock for economical reasons as well as to satisfy local demand	Sheep belong to a group of animals known as Ovine Goats belong to the group known as Capra. These animals are reared for: -meat -milk -wool -manure	Visits to school farms or community farms Interviews with farmers Agricultural Science for Secondary Schools BK 3 pp 95-97	Observation of sheep and goats. Discussion of observations with resource persons and of clippings from magazines and relevant video recordings Compiling scrap book on sheep and goats	Assessment of students: Report on sheep and goats	**Language Arts** Report Writing

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Types of Sheep and Goat	Identify the goats and sheep reared in Guyana and in the Caribbean Recognise the differences and similarities between the two groups of livestock Identify types of sheep reared in Guyana Identify types of goats reared in Guyana	The features associated with each type of sheep and goats The differences between sheep and goats	The types of sheep and goats reared in Guyana and in the Caribbean The importance of treating animals according to their needs		Types of sheep reared: i) Barbados Black Belly ii) West Africa – Marino iii) Black-head Persian iv) Brazilian Wool Legs	Television Video recordings Agricultural Science for Secondary Schools in Guyana BK 3 pp 96-99 Question sheets for interviews with resource persons	Using pictures video, aids to demonstrate types of sheep and goats Discussion of observations Field trip to school farms and farms in the community Interviews with resource persons Completion of a scrapbook	Assessment of students: Report on the differences	**Language Arts** Report Writings

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Types of Sheep and Goat (cont'd)	Identify types of sheep reared in the Caribbean Identify types of goats reared in the Caribbean	The similarities between sheep and goats	The differences and similarities of each type of sheep and goats			Goats reared: -Anglo Nubian -Toggenburg -Saanen -Alphine	Discuss the differences and similarities of each type of sheep and goats		

TOPIC	LEARNING OBJECTIVES				CONTENT	MATERIALS	METHOD/ STRATEGIES	EVALUATION	AREA(S) OF INTEGRATION
	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Breeds of Sheep and Goats	Identify breeds of sheep and goats in Guyana and the Caribbean	The breeds of sheep and goats in Guyana and the Caribbean The outstanding features of sheep and goat in Guyana compared to those in the Caribbean The locations of breeds of goats in Guyana and the Caribbean	The outstanding features of these livestock animals	Appreciate the diversity of breeds introduced in Guyana	Breeds of sheep: -Barbados Black Belly -West African -Marino -Black-head Persian -Brazilian Wool Legs Breeds of Goats: -Anglo Nubian -Toggenburg -Saanen -Alpine	Video recording Sheep and Goats in the community farmers Agricultural Science For Secondary Schools in Guyana Bk. 3 pp 96-99 Collection of relevant pictures and clippings Questionnaire for interviews with resource persons	Observation on video and recordings Interview with resource persons Collection of pictures of animals for display Preparation of scrapbook	Assessment of students reports on interviews	**Language Arts** Interviewing report writing

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
System of Managing Sheep and Goats Extensive, Intensive, Semi-Intensive	Identify the systems of managing sheep and goats Recognise differences of the systems Maintain animals and surroundings in hygienic conditions	The systems for managing sheep and goats The similarities and differences of the system used to rear sheep and goats.	The systems for managing sheep and goats Compare the management systems used to rear sheep and goats.	Appreciate the need to treat animals according to their needs	Management systems Extensive Intensive Semi-intensive	Farm visit in the community or schools Sketches of management systems Demonstration of different types of management systems	Visit to livestock farm Discussion on different types of management systems Demonstration of different types of management systems Compilation of scrapbook	Assessment of students-reports	**Language Arts** Report writing

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Common disease and pests which affect Sheep and Goats	Identify common disease and pests which affect Sheep and Goats	Common diseases and pests which affect sheep and goats production The symptoms of diseases and pests Two or three common diseases or pests in each class of livestock The methods of control of diseases and pests The use of medication against internal parasites and spray for external parasites	The causative agents of diseases and pests affecting sheep and goats	Appreciate the importance of rearing and caring sheep and goats	Disease and pests which affect sheep and goats. Diseases includes: -Mastitis -Foot rot -Scouring Pests include: -Tape worms -Round worms -Lung worms -Ticks -Mites -Screw worms	School and community farms Agricultural Science for Secondary Schools in Guyana BK. 3 pp 104-108 Collection of relevant pictures Questionnaire for interviews	TV video Farms visits noting healthy livestock Discussion on keeping animals healthy Sanitation methods disinfecting farm structures Interviews with resource persons Preparation of scrapbook on diseases and pests which affect sheep and goats	Assessment of students': -Scrapbook - Reports	**Language Arts** Report Writing

TOPIC	LEARNING OBJECTIVES				CONTENT	MATERIALS	METHOD/ STRATEGIES	EVALUATION	AREA(S) OF INTEGRATION
	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Introduction of Cattle in Guyana	Identify the location of early cattle production areas Outline the path of cattle trails on a map of Guyana	The origin of cattle The cattle products marketed in Guyana The indigenous type of cattle in Guyana and how cattle was reared Areas/reasons for financial loss in marketing cattle	Discuss the advantages and disadvantages or rearing cattle in Guyana Describe processing production from marketing	Appreciate the need for diversification in farming	Origin of cattle Domestication of cattle in Guyana	Cattle farms Reference materials Agricultural Science Caribbean Bk. 3 pp81 Labels of cattle products marketed in Guyana Table of cattle products with country of origin	Discussion after visits to cattle farm Collection of related photographs and clipping Field trip to cattle pastures/pens Research notes made in notebook	Assessment of students': -Reports on cattle rearing in Guyana	**English Language** Report Writing **Geography** Cattle trails in Guyana

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
External parts of Cattle	**Identify the extended part of a cow** **Identify features of a healthy cow** **Identify features of a sick cow**	The external parts of a cow e.g. mouth, hind leg, dew claw. The external parts of the body that are located in the dorsal position The function(s) of each part listed	The relationship of the external parts with its function The relationship of the external parts to the position on the body e.g. the loin is dorsally positioned	Appreciate the importance of naming the external parts correctly	Parts of cow External parts e.g. mouth, ear, horn, hind leg, dew-claw	Video tapes Drawing of a cow showing the external positions -Dorsal -Ventral -Anterior -Posterior Chart showing external parts as follows: Neck, hind leg, etc.	Observation of external parts of cattle Discussion of observation Collection of features and clippings Interviews with farmers Drawing and labelling the sketch of a cow	Assessment of students' drawing of a cow showing the external parts	**Language Arts** **Art** Drawing the external parts of a cow

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Types of Cattle Reared in Guyana	Identify types of cattle reared in Guyana Identify some of the similarities and differences in rearing practices	The features associated wit different types of cattle The differences and similarities in rearing practices The importance of cattle reared in Guyana	The similarities and differences of cattle rearing practices	Appreciate the need to treat animals according to their specific needs.	Types of cattle reared in Guyana -Beef type: Large heavy animals more rectangular in shape. -Diary type Smaller animals that are triangular in shape Dual purpose: These are capable of producing well in both beef and milk Practices that vary w	Video, TV Community Farm School farms Resource person Agricultural Science for the Caribbean Bk 3 pp 66-69 Relevant pictures	Observing cattle on the farm Interviews with resource persons Discussion on observations, pictures and related information Completing a scrapbook	Assessment of students' reports on the types of cattle	**Language Arts** **Social Studies** Written formal expression **Social Studies** Uses of different types of cattle

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Breeds of Cattle	Recognise breeds of cattle seen in Guyana Critical observation of breeds of cattle	The outstanding features of the different breeds of cattle reared in Guyana	The diversity introduced by the different breeds in Guyana		Breeds of Cattle: -Tropical breeds of cattle include: -Santa Gertrudis -America Brahman -Creole Temperate -Holstein -Jersey Knowing the features of the breeds help in the selection of animals for the purposes intended	Video recording or cattle found on farm/community farms Resource persons Agricultural Science for the Caribbean Bk. 3 pp 61-66 Collection of relevant pictures and clippings Questionnaire for interviews	Observing cattle on farms in Community video, TV Discussion on observations, pictures and clippings Interviews with farmers	Assessment of students' scrapbook	**Language Arts** **Social Studies** Cattle farming in communities

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
External Housing	Identify types of cattle houses	The features associated with each type of house The differences and similarities of each type of house The space requirement of different classes of cattle Comparison of the cattle houses in Guyana with those of the Caribbean	The principles that govern the housing requirements	Appreciate the need to protect cattle from the weather	Types of housing for cattle found in Guyana	Community farms Resource persons Questionnaire on cattle housing Video recordings Related TV programmes Agricultural Science for Secondary Schools BK. 4 pp 69-73	Observations of cattle houses Discussions of observations Research on cattle houses in Guyana Collecting clippings and photographs Interviews with farmers Completing scrapbook on cattle houses	Assessment of students' report on cattle housing	**Language Arts** Oral/Written expression **Social Studies** Types of cattle houses **Industrial Arts** Construction of cattle house

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Systems in Cattle Production: **Extensive, Intensive, Semi-Intensive**	Identify the features of the different systems used to rear cattle Recognise the differences of the systems Identify collect and collect six large plants	The systems used to rear cattle The features of each system	The differences between the various systems user for cattle production	Appreciate the need to use the system appropriate to the farmer and type of cattle reared	Management of cattle: -extensive -intensive -semi-intensive	School and community farms Resource persons Questionnaire for interviews with farmers Videos recordings Related TV programmes Agricultural Science for the Caribbean School Bk. 3 pp 70-71	Observation of cattle production Discussion of observations listing the system used in the management of cattle Collection of photographs and clippings Compilation of scrapbook	Assessment of students' report on The features and differences of the systems used for cattle production	**Language Arts** Report Writing

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	SKILLS	KNOWLEDGE	UNDERSTANDING	ATTITUDE					
Common Disease Affecting Cattle Production **Common Parasites of Cattle** **Round Worms** **Ticks** **Tapeworms**	Recognise two common diseases in cattle production Wash and disinfect farm equipment and structures Wash and sterilize milking equipment	Common diseases that are affecting cattle The symptoms of these diseases The casual agents of the diseases affecting cattle Methods of prevention of diseases affecting cattle	Cattle production is influenced by disease which affect cattle	Appreciate the need to rear and care for animals for increased profits	Common diseases affecting cattle: -Anthrax -Mastitis -Rabies Anaplasomosis (tick fever) Anthrax: Casual Agent is Bacteria Symptoms include: -sudden death -bloody diarrhea -staggering -after death blood oozes from the mouth and anus	School farms Questionnaire for interviews with resource persons	Observation of cattle affected by disease Video recordings Agricultural Science for Secondary School Bk. 3 pp 86-94 Interviews with resource persons Compiling scrapbook	Assessment of students report on diseases affecting cattle	**Language Arts** **Report writing** Disease affecting cattle

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External Parts of the Fish (Tilapia)	Identify the external parts of the fish -Male -Female Separate fingerlings by sex Use parts identified to distinguish the male from the female fish	Name the different external parts of the fish -Male -Female	The functions of the external parts of the fish The importance of each external part of the fish	Appreciate that even though fishes look alike in features there are male and female types of fish	The structure of the fish can be divided into two parts: -Head -Body Head Eye, lip, mouth, face operculum Body scales, Lateral lines, dorsal fin, Pectoral fin Tail, Caudal fin.	Large diagram of the fish Fish showing distinguishing features of male and female organs Flip chart Fingerlings Wordlist on combination of body positions	Discussion of observations Observation of external parts of the fish	Student assessment on: -Labelling line diagrams -Grouping fingerlings by sex. -Using specimen to identify external parts .	**Science** Body parts of the fish

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External parts of the Bee	Identify the external parts of the bee -Queen -Drone -Worker	The different types of bees The external parts of each class of bees The sizes and body structure of each class of bees	The importance of each class of bee to the success of the hive	Appreciate that there are different classes of bee	**Head:** Compound eyes, mouth **Chest** -Three pairs of legs, pollen basket on hind pair of legs (worker bee) -Wings **Abdomen** -Sting, wax gland -Body -Scent gland (queen) -Blunt abdomen (drove)	Diagram of different types of bees Specimen of different types of bees Specimens of different classes of bees Flip charts Flow charts Model of ahive Questionnaires for interviews.	Discuss on: Types of bees Video cassettes Interviews with bee-keepers	Assessment of students' folder on the different types of bees Mount live specimen of types of bees.	**Science** Insect parts

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Systemic Anatomy	Identify position of body structure	The different positions of body structures	Each side or positions of the body has a different name	Appreciate that each side or position of the animal has a different name	Position or sides of the animal: -Doral -Ventral -Anterior -Posterior -Medical -Lateral	Diagrams of an animal showing the different positions of body structures Flip chart with farm animals Wordlist on combinations of body	Demonstration on a live animal Discussion of the position of sides using pictures Completion of a scrapbook with labeled line diagrams of all classes of farm animals		**Science** Body structure

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Feeding and Digestion in Poultry	Identify of parts body which are involved in the process (the alimentary tract)	The parts involved in feeding and digestive process in poultry	A perfect beak is necessary for good feeding	Appreciate the need for care of the beak	The parts of a chicken that are responsible for feeding and digestion are beak oesophagus, crop proventriculus, gizzard	Flip charts of diagram of digestive tract of a chicken Flow charts on the digestive process (physical breakdown, chemical breakdown of food)	Discussion on diagram of digestive system of chicken Demonstration of feeding habits of chicken		**Science** Feeding of chicken/birds

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Respiration	Identify parts of the respiratory system	The parts of the respiratory system The process of respiration The process of respiration helps the body to get rid of toxic gases The energy produced during respiration is required to do work	The importance of respiration to animals		The parts of respiratory system are nostrils trachea, lungs, bronchiole The process of respiration is responsible for the chemical breakdown of simple sugars to produce energy in the body	Large diagram of the respiratory system Video clips Agricultural Science for Secondary Schools Bk 3 pg. 17	Discussion of the process of respiration	Assessment of students report on respiration	**Science** Respiration