

| TOPIC  | LEARNING OBJECTIVES  |  |  |   | CONTENT  | MATERIALS  | METHOD/<br>STRATEGIES   | EVALUATION  | AREA(S) OF<br>INTEGRATION  |
|--|--|--|--|---|--|--|---|---|--|
|  | SKILLS   | KNOWLEDGE  | UNDERSTANDING  | ATTITUDE  |  |  |   |   |  |
| <b>Local Agricultural Institutions in Guyana</b> | Collect data and report on local agricultural institutions | <p>The five major groups of agricultural institutions in Guyana.</p> <p>Agricultural institutions in each of the major groups</p> <p>The contribution of local agricultural institutions to the development of agriculture in the respective regions</p> | The importance of local agricultural institutions to the agricultural sector | Appreciate that the agricultural sector needs institutional support | <p>The agricultural sector in Guyana consists of five major types of institutions namely:</p> <ul style="list-style-type: none"> <li>- developmental institutions</li> <li>- training institutions</li> <li>- research and extension institutions</li> <li>-producing and marketing institutions</li> <li>-financial institutions</li> </ul> | <p>Agricultural Science for Secondary Schools in Guyana BK III Chapter 6. pp 125-136</p> | <p>Research on local agricultural institutions</p> <p>Discussion of research findings</p> <p>Report on research</p> | <p>Assessment of students' report on the importance of the local agricultural institutions to the agricultural sector</p> | <p><b>Social Studies</b></p> <p>Agriculture institutions in Guyana</p> |

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| <b>Local Agricultural Institutions in Guyana (cont'd)</b> | Draw an organizational chart for the Ministry of Agriculture to show the five major types of institutions | <p>The names of five major Agricultural developmental institutions in Guyana</p> <p>Each arm of the <i>Ministry of Agriculture</i> is a developmental institution</p> <p>The roles of each of the five institutions</p> | How the five main areas of operation of the Ministry of Agriculture offer institutional support to the agricultural development drive | <p>Appreciate the work of the Ministry of Agriculture</p> | <p>Developmental Institutions:</p> <ul style="list-style-type: none"> <li>- Crop and live stock</li> <li>- Fisheries</li> <li>- Hydraulic section</li> <li>- Land and surveys</li> <li>- Forestry</li> </ul> | <p>Agricultural Science for Secondary Schools in Guyana BK III ch. 6 pp 125-126</p> | <ul style="list-style-type: none"> <li>- Field trips to the Central Ministry of Agriculture and the various sections/departments</li> <li>- Diagrammatic representation of the Ministry of Agriculture shows the major areas of operation</li> </ul> | <p>Assessment of student's group write reports on the structure and function of each of the five main areas of operation of the <i>Ministry of Agriculture</i></p> | <p><b>Social Studies</b></p> <p>Organizational chart</p> <p><b>Geography</b></p> <p>Location of Agricultural Institutions</p> |

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| <b>Local Agricultural Institutions in Guyana (cont'd)</b> | Illustrate the organisational structure of Guyana School of Agriculture and the Faculty of Agriculture, UG | The two main Local Agricultural Training Institutions in Guyana<br><br>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 value of training in the agricultural sector | Local Training Institution<br>- Guyana School of Agriculture<br><br>- 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<br><br>-Discussion of visits to training institutions<br><br>-Reports of visits | Assessment of students' report on the function of one training institution in Guyana<br><br>How it is organized and how it contributes to agriculture | <b>Social Studies</b><br><br>Role of training institutions |

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

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| <b>Local Agricultural Institutions in Guyana (cont'd)</b> | Conduct an interview with New Guyana Marketing Corporation official | State the name of the Local market Institutions<br><br>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<br><br>- The new Guyana Corporation<br><br>- Small Business Associations<br><br>- The Guyana Agricultural & Industrial Development Bank (GAIBANK) | Agricultural Science for Secondary Schools in Guyana BK III 131-132 | - Resource persons<br><br>- Visit to the new Guyana Marketing Corporation<br><br>- Interview of marketing officials at the Guyana Marketing Corporation<br><br>- Lecture/ discussion<br><br>- Observation and report writing | Write report of visit to the New Guyana Marketing Corporation<br><br>In not more than 150 words write on the role of the New Guyana Marketing Corporation in local and Foreign Marketing of Agricultural produces | <b>Social Studies</b><br><br><b>Business Education</b><br><br><b>Geography</b> |

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| <b>Local Agricultural Institutions in Guyana (cont'd)</b> | Carry out research on a regional agricultural institution by field tour to CARICOM Secretariat | The major groups of regional agricultural institutions<br><br>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<br><br>The Guyana Agricultural & Industrial Development Bank (GAIBANK)<br><br>Regional Agricultural Institutions<br><br>The main agricultural institutions in the Caribbean:<br><br>-Regional Financial Institutions | Agricultural Science For Secondary Schools in Guyana<br>Bk. 3<br>Chapter 6 pp 134-137 | Discussion<br><br>Resource person<br><br>Research by visit to CARICOM Secretariat and its Library | Assessment of students' research on importance of three types of Regional Agricultural Institutions | <b>Social Studies</b><br><br>Caricom Administration<br>Marketing<br>Finance<br>Agriculture<br>Development |

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

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



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| <b>Machinery, Implements, Tools and Soil Type in Sugar and Rice Cultivation</b> | <p>Identify machinery, implements and tools used in land preparation in rice and sugar cane cultivation</p> <p>Draw labelled diagrams to show parts of various implements and tools used in rice and sugar cultivations</p> <p>Apply the various steps in sequence in caring equipment and tools for long life</p> | <p>The machinery, implements and tools used in rice and sugar cultivation for:</p> <ul style="list-style-type: none"> <li>-Land preparation</li> <li>-Ploughing</li> <li>-Harrowing</li> <li>-Levelling</li> <li>-Inter-cultivation</li> <li>-Digging drains</li> <li>-Plant protection</li> <li>-Harvesting</li> </ul> <p>The care of equipment tools for long life</p> | <p>The importance of relevant and suitable implements and tools necessary for various operations in rice and sugar cane cultivation</p> | <p>Ensure that implements and tools are used with care for intended purposes</p> | <p>Tools used for:</p> <ul style="list-style-type: none"> <li>-Land preparation</li> <li>-Ploughing</li> <li>-Harrowing</li> <li>-Puddling (in rice)</li> <li>-Levelling</li> <li>-Digging drains</li> <li>-Inter-cultivation</li> <li>-Irrigation</li> <li>-Plant protection</li> <li>-Harvesting</li> </ul> | <p>Appropriate implements and tools.</p> <p>Film strips</p> <p>Pictures</p> <p>Drawing</p> | <p>Examination of equipment implements and tools.</p> <p>Observe demonstrations in field trips workshops.</p> <p>Tractors attachment in use.</p> | <p>Assessment of students' drawings of implement and tools</p> | <p><b>Industrial Arts</b></p> <ul style="list-style-type: none"> <li>-Assembling</li> <li>-Dismantling</li> <li>-Servicing of implements and tools</li> </ul> |

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

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

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

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| <b>Structure of the Plant, Varieties, Planting Materials</b><br><br><b>Preparation of planting materials for sowing or planting (cont'd)</b> |                     | How sets (stem cuttings are selected from sugarcane stems for planting in the field |               |          |         |           |                       |            |                           |

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

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

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



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| <b>Disease and Control Measures (cont'd)</b> | Produce line drawing of a combine/sugar cane mill<br><br>Identify equipment used for post harvest and marketing activities | Procedures involved in:<br><br>-Processing<br>-Grading, -Packing,<br>-Storing<br>-Marketing the products obtained from rice and sugar<br><br>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<br><br>Rice:<br><br>-Threshing<br>-Winnowing<br>-Grading<br>-Bagging<br>-Marketing<br><br>Sugarcane:<br><br>-Crushing<br>-Concentrating<br>-Crushing crystal<br>-Packing<br>-Storing/<br>-Marketing | Jute bags | Field trips to rice fields at harvesting time and visits to sugar factories while processing sugarcane<br><br>Discussion<br><br>Demonstrations<br><br>Demonstrations<br>-operation of combine<br><br>-cutting canes<br><br>-discussion | Assessment of students' reports of field trips | <b>Industrial Arts</b><br><br>Servicing machinery |

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

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

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

| TOPIC                   | LEARNING OBJECTIVES                                   |  |   |          | CONTENT  | MATERIALS   | METHOD/<br>STRATEGIES   | EVALUATION   | AREA(S) OF<br>INTEGRATION  |
|-------------------------|---|--|---|----------|--|---|---|--|--|
|                         | SKILLS  | KNOWLEDGE  | UNDERSTANDING   | ATTITUDE |  |   |   |  |  |
| <b>Sources of Foods</b> | Prepare animal feed<br><br>Identify feeding materials | Define "feed".<br><br>The names of the main groups of feeds<br><br>The general uses of feeds<br><br>Classifying feeding materials<br><br>The nutrients found in animal feed<br><br>The sources of animal feeds and the types | The importance of the different types of animal feeds<br><br>The need for animals to be fed with suitable rations |          | Feed refers to any material fed to livestock whether natural or artificial<br>The main feed groups:<br><br>-Basal feeds<br><br>-Supplements<br><br>-Concentrates<br>Forages<br>Additives<br><br>Description and functions of each type of group. | Samples of feed and feeding materials<br>Ibid<br>i)pp-46-47<br><br>ii)Ibid pp 118-119<br>case studies | Examining feedstuffs<br><br>Observing and recording information about feeds<br><br>Field trip to a farm to observe feed preparation<br><br>Preparing food charts<br><br>Analyse situations and make recommendations | Assessment of students' report on the preparation of feed for farm animals | <b>Science</b><br><br>Observation<br>Interpretation<br>Reporting |

| TOPIC                    | LEARNING OBJECTIVES  |   |  |  | CONTENT   | MATERIALS  | METHOD/<br>STRATEGIES   | EVALUATION   | AREA(S) OF<br>INTEGRATION  |
|--------------------------|--|---|--|--|---|--|---|--|--|
|                          | SKILLS   | KNOWLEDGE   | UNDERSTANDING  | ATTITUDE   |   |  |   |  |  |
| <b>Livestock Rations</b> | <p>Identify rations</p> <p>Classify rations for different classes of livestock</p> <p>Record observation using tables</p> <p>Prepare ration for livestock</p> <p>Calculate amounts of ingredients for ration</p> | <p>The characteristics of ration</p> <p>Different types of ration</p> <p>The uses of rations</p> <p>Selecting the appropriate ration for the class of livestock</p> | <p>The relationship between of each type of ration and the class of livestock re: pig, cattle, poultry</p> | <p>Willingness to use rations</p> <p>Using correct measures in ration preparation</p> <p>Appreciate that only the required amounts of substances must be used in an activity to avoid waste</p> <p>Observe rules on field trip</p> | <p>Ration for livestock must be balanced as well as have these qualities:</p> <ul style="list-style-type: none"> <li>-Bulk</li> <li>-Palatability</li> <li>-Binding</li> <li>-laxative effect</li> <li>-Flavours and tints</li> </ul> <p>Table indicating class and the kinds of ration fed at different stages of growth</p> | <p>Textbooks</p> <p>Agricultural Science For Secondary Schools in Guyana Bk 3pp 48-50</p> <p>Samples of the rations</p> <p>Ration charts</p> | <p>Field trips to neighbouring farm, Bounty Farms</p> <p>Examination of different observations of the effects of rations on farm animals</p> <p>Researching</p> <p>Experimenting</p> <p>Group presentations</p> | <p>Assessment of students':</p> <ul style="list-style-type: none"> <li>-Observation and group participation on Field trips and reports of visits to farms</li> </ul> | <p><b>Language Arts</b></p> <p>-Discussion and descriptions of visits to animal farms</p> <p><b>Home Economics</b></p> <p>Weighing ingredients for rations</p> <p><b>Mathematics</b></p> <p>Calculating amounts of ingredients for rations</p> |

| TOPIC                      | LEARNING OBJECTIVES |           |               |          | CONTENT  | MATERIALS | METHOD/<br>STRATEGIES           | EVALUATION | AREA(S) OF<br>INTEGRATION |
|----------------------------|---------------------|-----------|---------------|----------|--|-----------|---------------------------------|------------|---------------------------|
|                            | SKILLS              | KNOWLEDGE | UNDERSTANDING | ATTITUDE |  |           |                                 |            |                           |
| Livestock Rations (cont'd) |                     |           |               |          | <p>Ration is the amount of feed that will supply nutrients needs daily by animals for body maintenance and production</p> <p>Types of ration:</p> <ul style="list-style-type: none"> <li>-Balanced</li> <li>-Maintenance</li> <li>-Production</li> </ul> |           | Nutritional analysis of rations |            |                           |

| TOPIC         | LEARNING OBJECTIVES  |  |   |   | CONTENT  | MATERIALS  | METHOD/<br>STRATEGIES  | EVALUATION  | AREA(S) OF<br>INTEGRATION  |
|---------------|--|--|---|---|--|--|--|---|--|
|               | SKILLS   | KNOWLEDGE  | UNDERSTANDING   | ATTITUDE  |  |  |  |   |  |
| <b>Silage</b> | <p>Identify materials used in silage making</p> <p>Combine materials to produce silage</p> <p>Make model of soils</p> <p>Collecting materials and data on silage</p> | <p>Definition of silage</p> <p>The steps in the preparation of silage</p> <p>The functions of silage</p> <p>The types of silos</p> | <p>The importance of grass and technology in the livestock industry</p> | <p>Appreciates the role of technology in the livestock industry</p> | <p>Definition of the terms “Silage and “Silos”</p> <p>The process of making silage</p> <p>Types of silos</p> <p>The importance of silage</p> | <p>Caribbean Agricultural Science Bk. 1 pp 124-126</p> <p>Junior Secondary Agriculture for the Caribbean pp 132</p> <p>Agricultural Science for Secondary Schools in Guyana Bk. 3 pp 59.</p> <p>Cardboard, paste, grass, Molasses, formaldehyde plastic etc.</p> | <p>Visits to farms to view the process of silage making</p> <p>Demonstration of silage making</p> <p>Experimenting with various grasses</p> <p>Project assignment on silage</p> <p>Group presentation on project reports</p> | <p>Assessment of students’:</p> <p>-Participation in project models</p> <p>-Conclusions and recommendations</p> <p>-Attempts at silage making</p> | <p><b>Language Arts</b></p> <p>Discussion Report Writing</p> <p><b>Mathematics</b></p> <p>Measurement</p> <p><b>Home Economics</b></p> <p>Preservation of foods</p> <p><b>Science</b></p> <p>Electrical circuits</p> |



| TOPIC                 | LEARNING OBJECTIVES                                  |   |               |   | CONTENT   | MATERIALS   | METHOD/<br>STRATEGIES   | EVALUATION  | AREA(S) OF<br>INTEGRATION                                      |
|-----------------------|--|---|---------------|---|---|---|---|---|--|
|                       | SKILLS   | KNOWLEDGE                                   | UNDERSTANDING | ATTITUDE  |   |   |   |   |  |
| <b>Sheep and Goat</b> | 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 | <p>Terms and definitions used in sheep and goats production e.g. Ewe- a female sheep.</p> <p>Ram-an uncastrated male sheep/goat</p> <p>Lamb - a young sheep</p> <p>Kid – a young goat</p> | <p>Visit to school and community farms.</p> <p>Video tapes</p> <p>Television programmes</p> <p>Photographs and clippings from magazines</p> <p>Resource persons</p> | <p>Observation of sheep and goat</p> <p>Discussion of observations</p> <p>Reporting observations</p> <p>Collection of photographs and clippings from magazines</p> <p>Match terms associated with correct definition</p> <p>Select correct terms and definitions to place in blank spaces in sentences or in matching term with definitions</p> | <p>Assessment of students:</p> <p>- Definitions of the terms used in sheep and goat production</p> <p>Matching terms with farmers</p> | <p><b>Language Arts</b></p> <p>Definitions, Report writing</p> |

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

| TOPIC   | LEARNING OBJECTIVES   |   |  |   | CONTENT   | MATERIALS   | METHOD/<br>STRATEGIES   | EVALUATION  | AREA(S) OF<br>INTEGRATION                         |
|---|---|---|--|---|---|---|---|---|---|
|   | SKILLS  | KNOWLEDGE   | UNDERSTANDING  | ATTITUDE  |   |   |   |   |   |
| <b>The Importance of Sheep and Goats Production in Guyana and the Caribbean</b> | 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 | <p>Sheep belong to a group of animals known as Ovine</p> <p>Goats belong to the group known as Capra.</p> <p>These animals are reared for:</p> <ul style="list-style-type: none"> <li>-meat</li> <li>-milk</li> <li>-wool</li> <li>-manure</li> </ul> | <p>Visits to school farms or community farms</p> <p>Interviews with farmers</p> <p>Agricultural Science for Secondary Schools<br/>BK 3 pp 95-97</p> | <p>Observation of sheep and goats.</p> <p>Discussion of observations with resource persons and of clippings from magazines and relevant video recordings</p> <p>Compiling scrap book on sheep and goats</p> | <p>Assessment of students:</p> <p>Report on sheep and goats</p> | <p><b>Language Arts</b></p> <p>Report Writing</p> |

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

| TOPIC                                   | LEARNING OBJECTIVES  |  |  |          | CONTENT | MATERIALS  | METHOD/<br>STRATEGIES  | EVALUATION | AREA(S) OF<br>INTEGRATION |
|---|--|--|--|----------|---------|--|--|------------|---------------------------|
|   | SKILLS   | KNOWLEDGE                                | UNDERSTANDING  | ATTITUDE |         |  |  |            |                           |
| <b>Types of Sheep and Goat (cont'd)</b> | Identify types of sheep reared in the Caribbean<br><br>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:<br>-Anglo Nubian<br>-Toggenburg<br>-Saanen<br>-Alphine | Discuss the differences and similarities of each type of sheep and goats |            |                           |

| TOPIC                            | LEARNING OBJECTIVES  |   |   |   | CONTENT   | MATERIALS  | METHOD/<br>STRATEGIES  | EVALUATION                                   | AREA(S) OF<br>INTEGRATION                                      |
|----------------------------------|--|---|---|---|---|--|--|--|--|
|                                  | SKILLS   | KNOWLEDGE   | UNDERSTANDING                                       | ATTITUDE  |   |  |  |  |  |
| <b>Breeds of Sheep and Goats</b> | Identify breeds of sheep and goats in Guyana and the Caribbean | <p>The breeds of sheep and goats in Guyana and the Caribbean</p> <p>The outstanding features of sheep and goat in Guyana compared to those in the Caribbean</p> <p>The locations of breeds of goats in Guyana and the Caribbean</p> | The outstanding features of these livestock animals | Appreciate the diversity of breeds introduced in Guyana | <p>Breeds of sheep:</p> <ul style="list-style-type: none"> <li>-Barbados Black Belly</li> <li>-West African</li> <li>-Marino</li> <li>-Black-head Persian</li> <li>-Brazilian Wool Legs</li> </ul> <p>Breeds of Goats:</p> <ul style="list-style-type: none"> <li>-Anglo Nubian</li> <li>-Toggenburg</li> <li>-Saanen</li> <li>-Alpine</li> </ul> | <p>Video recording</p> <p>Sheep and Goats in the community farmers</p> <p>Agricultural Science For Secondary Schools in Guyana Bk. 3 pp 96-99</p> <p>Collection of relevant pictures and clippings</p> <p>Questionnaire for interviews with resource persons</p> | <p>Observation on video and recordings</p> <p>Interview with resource persons</p> <p>Collection of pictures of animals for display</p> <p>Preparation of scrapbook</p> | Assessment of students reports on interviews | <p><b>Language Arts</b></p> <p>Interviewing report writing</p> |

| TOPIC  | LEARNING OBJECTIVES                                      |  |  |   | CONTENT            | MATERIALS  | METHOD/<br>STRATEGIES                                  | EVALUATION                     | AREA(S) OF<br>INTEGRATION                  |
|--|--|--|--|---|--------------------|--|--|--------------------------------|--|
|  | SKILLS   | KNOWLEDGE  | UNDERSTANDING  | ATTITUDE  |                    |  |  |                                |  |
| <b>System of Managing Sheep and Goats</b><br><b>Extensive, Intensive, Semi-Intensive</b> | Identify the systems of managing sheep and goats         | The systems for managing sheep and goats                                     | The systems for managing sheep and goats                     | Appreciate the need to treat animals according to their needs | Management systems | Farm visit in the community or schools                 | Visit to livestock farm                                | Assessment of students-reports | <b>Language Arts</b><br><br>Report writing |
|  | Recognise differences of the systems                     | The similarities and differences of the system used to rear sheep and goats. | Compare the management systems used to rear sheep and goats. |   | Extensive          | Sketches of management systems                         | Discussion on different types of management systems    |                                |  |
|  | Maintain animals and surroundings in hygienic conditions |  | Intensive  |   | Semi-intensive     | Demonstration of different types of management systems | Demonstration of different types of management systems |                                |  |

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



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

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

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

| TOPIC                   | LEARNING OBJECTIVES   |   |  |          | CONTENT  | MATERIALS   | METHOD/<br>STRATEGIES   | EVALUATION                        | AREA(S) OF<br>INTEGRATION  |
|-------------------------|---|---|--|----------|--|---|---|-----------------------------------|--|
|                         | SKILLS  | KNOWLEDGE   | UNDERSTANDING  | ATTITUDE |  |   |   |                                   |  |
| <b>Breeds of Cattle</b> | Recognise breeds of cattle seen in Guyana<br><br>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:<br>-Tropical breeds of cattle include:<br>-Santa Gertrudis<br>-America Brahman<br>-Creole Temperate<br>-Holstein<br>-Jersey<br><br>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<br><br>Resource persons<br><br>Agricultural Science for the Caribbean Bk. 3 pp 61-66<br><br>Collection of relevant pictures and clippings<br><br>Questionnaire for interviews | Observing cattle on farms in Community video, TV<br><br>Discussion on observations, pictures and clippings<br><br>Interviews with farmers | Assessment of students' scrapbook | <b>Language Arts</b><br><br><b>Social Studies</b><br><br>Cattle farming in communities |

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

| TOPIC   | LEARNING OBJECTIVES   |  |  |   | CONTENT  | MATERIALS   | METHOD/<br>STRATEGIES   | EVALUATION   | AREA(S) OF<br>INTEGRATION                  |
|---|---|--|--|---|--|---|---|--|--|
|   | SKILLS  | KNOWLEDGE  | UNDERSTANDING  | ATTITUDE  |  |   |   |  |  |
| <b>Systems in Cattle Production:</b><br><br><b>Extensive, Intensive, Semi-Intensive</b> | Identify the features of the different systems used to rear cattle<br><br>Recognise the differences of the systems<br><br>Identify collect and collect six large plants | The systems used to rear cattle<br><br>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:<br><br>-extensive<br>-intensive<br>-semi-intensive | School and community farms<br><br>Resource persons<br><br>Questionnaire for interviews with farmers<br><br>Videos recordings<br><br>Related TV programmes<br><br>Agricultural Science for the Caribbean School Bk. 3 pp 70-71 | Observation of cattle production<br><br>Discussion of observations listing the system used in the management of cattle<br><br>Collection of photographs and clippings<br><br>Compilation of scrapbook | Assessment of students' report on The features and differences of the systems used for cattle production | <b>Language Arts</b><br><br>Report Writing |

| TOPIC  | LEARNING OBJECTIVES  |   |  |  | CONTENT   | MATERIALS  | METHOD/<br>STRATEGIES  | EVALUATION   | AREA(S) OF<br>INTEGRATION   |
|--|--|---|--|--|---|--|--|--|---|
|  | SKILLS   | KNOWLEDGE   | UNDERSTANDING  | ATTITUDE   |   |  |  |  |   |
| <b>Common Disease Affecting Cattle Production</b><br><br><b>Common Parasites of Cattle</b><br><b>Round Worms</b><br><b>Ticks</b><br><b>Tapeworms</b> | Recognise two common diseases in cattle production<br><br>Wash and disinfect farm equipment and structures<br><br>Wash and sterilize milking equipment | Common diseases that are affecting cattle<br><br>The symptoms of these diseases<br><br>The casual agents of the diseases affecting cattle<br><br>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:<br>-Anthrax<br>-Mastitis<br>-Rabies<br><br>Anaplasomosis (tick fever)<br><br>Anthrax: Casual Agent is Bacteria<br><br>Symptoms include:<br>-sudden death<br>-bloody diarrhea<br>-staggering<br>-after death blood oozes from the mouth and anus | School farms<br><br>Questionnaire for interviews with resource persons | Observation of cattle affected by disease<br><br>Video recordings<br><br>Agricultural Science for Secondary School Bk. 3 pp 86-94<br><br>Interviews with resource persons<br><br>Compiling scrapbook | Assessment of students report on diseases affecting cattle | <b>Language Arts</b><br><br><b>Report writing</b><br><br>Disease affecting cattle |

| TOPIC                                       | LEARNING OBJECTIVES   |   |   |   | CONTENT  | MATERIALS   | METHOD/<br>STRATEGIES   | EVALUATION  | AREA(S) OF<br>INTEGRATION                    |
|---|---|---|---|---|--|---|---|---|--|
|   | SKILLS  | KNOWLEDGE   | UNDERSTANDING   | ATTITUDE  |  |   |   |   |  |
| <b>External Parts of the Fish (Tilapia)</b> | Identify the external parts of the fish<br>-Male<br>-Female<br><br>Separate fingerlings by sex<br><br>Use parts identified to distinguish the male from the female fish | Name the different external parts of the fish<br>-Male<br>-Female | The functions of the external parts of the fish<br><br>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:<br>-Head<br>-Body<br><br>Head<br>Eye, lip, mouth, face operculum<br><br>Body scales, Lateral lines, dorsal fin, Pectoral fin<br>Tail, Caudal fin. | Large diagram of the fish<br><br>Fish showing distinguishing features of male and female organs<br><br>Flip chart<br><br>Fingerlings<br><br>Wordlist on combination of body positions | Discussion of observations<br><br>Observation of external parts of the fish | Student assessment on:<br><br>-Labelling line diagrams<br><br>-Grouping fingerlings by sex.<br><br>-Using specimen to identify external parts | <b>Science</b><br><br>Body parts of the fish |



| TOPIC                            | LEARNING OBJECTIVES   |   |  |  | CONTENT   | MATERIALS   | METHOD/<br>STRATEGIES  | EVALUATION   | AREA(S) OF<br>INTEGRATION          |
|----------------------------------|---|---|--|--|---|---|--|--|------------------------------------|
|                                  | SKILLS  | KNOWLEDGE   | UNDERSTANDING  | ATTITUDE   |   |   |  |  |                                    |
| <b>External parts of the Bee</b> | Identify the external parts of the bee<br>-Queen<br>-Drone<br>-Worker | The different types of bees<br><br>The external parts of each class of bees<br><br>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 | <b>Head:</b><br>Compound eyes, mouth<br><br><b>Chest</b><br>-Three pairs of legs, pollen basket on hind pair of legs (worker bee)<br>-Wings<br><br><b>Abdomen</b><br>-Sting, wax gland<br><br>-Body<br>-Scent gland (queen)<br>-Blunt abdomen (drone) | Diagram of different types of bees<br><br>Specimen of different types of bees<br><br>Specimens of different classes of bees<br><br>Flip charts<br><br>Flow charts<br><br>Model of ahive<br><br>Questionnaires for interviews. | Discuss on:<br>Types of bees<br><br>Video cassettes<br><br>Interviews with bee-keepers | Assessment of students' folder on the different types of bees<br><br>Mount live specimen of types of bees. | <b>Science</b><br><br>Insect parts |

| TOPIC                   | LEARNING OBJECTIVES                 |  |   |  | CONTENT   | MATERIALS  | METHOD/<br>STRATEGIES   | EVALUATION | AREA(S) OF<br>INTEGRATION            |
|-------------------------|-------------------------------------|--|---|--|---|--|---|------------|--------------------------------------|
|                         | SKILLS                              | KNOWLEDGE                                  | UNDERSTANDING   | ATTITUDE   |   |  |   |            |                                      |
| <b>Systemic Anatomy</b> | 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:<br>-Doral<br>-Ventral<br>-Anterior<br>-Posterior<br>-Medical<br>-Lateral | Diagrams of an animal showing the different positions of body structures<br><br>Flip chart with farm animals<br><br>Wordlist on combinations of body | Demonstration on a live animal<br><br>Discussion of the position of sides using pictures<br><br>Completion of a scrapbook with labeled line diagrams of all classes of farm animals |            | <b>Science</b><br><br>Body structure |

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|---|---|--|--|--|---|---|--|------------|--|
|   | SKILLS  | KNOWLEDGE  | UNDERSTANDING                                | ATTITUDE                                 |   |   |  |            |  |
| <b>Feeding and Digestion in Poultry</b> | 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<br><br>Flow charts on the digestive process (physical breakdown, chemical breakdown of food) | Discussion on diagram of digestive system of chicken<br><br>Demonstration of feeding habits of chicken |            | <b>Science</b><br><br>Feeding of chicken/birds |

| TOPIC              | LEARNING OBJECTIVES                      |  |  |          | CONTENT  | MATERIALS   | METHOD/<br>STRATEGIES                    | EVALUATION                                   | AREA(S) OF<br>INTEGRATION                |
|--------------------|--|--|--|----------|--|---|--|--|--|
|                    | SKILLS                                   | KNOWLEDGE  | UNDERSTANDING                            | ATTITUDE |  |   |  |  |  |
| <b>Respiration</b> | Identify parts of the respiratory system | <p>The parts of the respiratory system</p> <p>The process of respiration</p> <p>The process of respiration helps the body to get rid of toxic gases</p> <p>The energy produced during respiration is required to do work</p> | The importance of respiration to animals |          | <p>The parts of respiratory system are nostrils, trachea, lungs, bronchiole</p> <p>The process of respiration is responsible for the chemical breakdown of simple sugars to produce energy in the body</p> | <p>Large diagram of the respiratory system</p> <p>Video clips</p> <p>Agricultural Science for Secondary Schools Bk 3 pg. 17</p> | Discussion of the process of respiration | Assessment of students report on respiration | <p><b>Science</b></p> <p>Respiration</p> |