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Central School

Home School Package

Year :13

Ministry of Education and Training/Ministère de l'Education et de la Formation
Republic of Vanuatu/République du Vanuatu

LESSON Plan

Teacher 	Name : Eunice Kalsuak Subject : AGRICULTURE
 Week/ Lesson	**Wk - 6** Lesson number : 1/2
	Strand : **PRODUCTION MANAGEMENT** Sub-Strand 3.1 : Schedule of Operations in Primary Production ➢ **Site Selection**
 Learning outcomes	1.State the factors to be considered in site selection 2. List the process of site selection as a step in the schedule of operations 3. Outline the desired outcomes in site selection within the schedule of operations 4. Explain how a selected site meets the requirements for site selection within the schedule of operations 5. Discuss the significance of site selection as a step in the schedule of operations and suggest ways of improving a selected site that does not meet particular requirements
 Introduction	**Production management** also deals with decision-making regarding the quality, quantity, cost, etc., of production. It applies management principles to production. Production management is part of business management. It is also called "Production Function." **Schedule of operation** Schedule of operation is a management plan that involves the planning, scheduling, coordinating and the control of the activities in the production process to produce a product in a given time or time allocated. Planning may be done to ensure that the activities are carried out throughout the year so production is throughout the year.

During the planning of crop and animal production, the factors below are considered:

- ***Pre-establishment***
- ***Establishment***
- ***Management***
- ***Growth***
- ***Harvest/Slaughter***
- ***Post-harvest or Posts slaughter***

Production is a scientific process which involves transformation of raw material (input) into desired product or service (output) by adding economic value.

Learners notes

Schedule of operation for crops and animals:
Pre-Establishment:

SITE SELECTION:

- Land acreage
- Proper drainage
- Far away from housing and industrial area
- Far away from other forms of animal farming
- Easy access to the main road and easy supply of water and electricity
- Near to marketing areas

Description of selected site:

SITE SELECTION	
CROPS	***ANIMALS***
Coconut: ▪ *Open land, sandy loam friable soil* ***Vanilla:*** ▪ *Fertile, moist soil, shady* ***Cocoa:*** ▪ *Fertile, friable soil* ***Taro:*** ▪ *Open fertile land* ***Squash pumpkin:*** ▪ *Open newly cultivated land* ***Kava:*** ▪ *Less open fertile land*	***Cattle:*** ▪ *Good flat or hilly land - where good pasture can grow well for a long time.* ***Goats:*** ▪ *Good dry, hilly shady land – not swampy* ***Pigs:*** ▪ *Not too close to where people live – because pigs can make too much noise and produce bad odour for neighbours* ***Chickens:*** ▪ *Have shades-because chickens are susceptible to wind and rain*

Example of Schedule of Operation

Chinese Cabbages Production

Pre-Establishment	*Establishment*	*Management*	*Harvest*	*Post-harvest*
Chinese Cabbage				
▪ ***Site Selection***	*Nursery*	*Watering/Irrigation*	*Time*	*Cleaning*
▪ ***Clearing***	*Sowing*	*Mulching*	*Tools used*	*Washing*
▪ ***Varietal Selection***	*Management*	*Fertilising*	*Maturity*	*Packaging*
	Pricking	*Observation/control of pests and diseases*		
▪ ***Marking Out***	*Management*			
▪ ***Soil preparation***	*Transplanting*			

Example of calendar of Operations.

Chinese cabbage Production

Steps of management practices in the order they are carried out	***Time***											
	Jan	***Feb***	***Mar***	***Apr***	***May***	***Jun***	***Jul***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***
Site selection												
Clearing												
Sowing												
Pricking												
Bed preparation												
Transplanting												
Watering												
Weeding												
Fertilising												
Harvesting												
Cleaning												
Washing												
Grading												
Packaging												
Labeling												
Marketing												

Example of a calendar of Operations.

The **production of pigs** can be divided into six life stages:

1. **Breeding/mating:** gilts (female pigs that have not previously farrowed or given birth) are usually introduced to boars around 25–28 weeks old. The boar will often have daily exposure to young gilt's to ensure they begin their reproductive cycling, with the gilts typically reaching puberty 10–30 days after commencing boar contact. Hormones can be used to stimulate puberty in gilts, but are rarely used. Boar exposure is the preferred and most effective means of bringing a gilt onto heat. Gilts will then usually be mated at their second cycle (when they go on heat for the second time) or around 30–34 weeks. Sows, or female pigs who have already farrowed, will have boar exposure to determine if they are on heat. Female pigs will either be mated with a boar naturally or will be artificially inseminated. The objective is to ensure the breeding females will have a long and productive life in the breeding herd, which means responsible for animal welfare and treatment.
2. **Gestating or dry sows:** after the sows and gilts are mated, they are moved into the dry sow or gestation area of the breeder sheds or paddocks. They will remain there during most of their pregnancy (approximately 116 days).
3. **Farrowing or birth:** about a week before giving birth, they are moved into the farrowing or birthing sheds or paddocks.
4. **Lactation:** sows remain in the farrowing area, nursing their piglets for about 3–5 weeks until the piglets are weaned.
5. **Weaning:** after weaning, the sows are returned to the breeding area. The piglets are moved to weaner accommodation. The pigs can only be moved into the weaner facilities once the pens or sheds have been emptied of pigs by the producers moving these pigs to the next suitable area or to sale. Generally, the sheds are cleaned, sterilised and rested for 24 hours, before the next group of pigs arrive.
6. **Growing/finishing:** depending on the farm, the growing pigs may be moved to other grower accommodation either on the same farm or a different facility. This is where the pig will live until it reaches 'sale' weight.

Pig Production

Pre-Establishment	*Establishment*	*Management*	*Harvest*	*Post-harvest*
Pig • ***Site Selection*** • ***Clearing*** • ***Breed Selection*** • ***Marking Out shed building*** • ***Shed construction***	• *build* • *waterers* • *Feeders* • *Weaner pens* • *Farrowing pens* • *Finishing pens* • *Breeders*	• *Water* • *Feeding* • *Lighting* • *Observation/ control of pests and diseases* • *Identification* • *Eyeteeth clipping*	• *Time* • *Tools used*	• *Cleaning* • *Washing* • *Packaging*

Timing of steps of management practices

- Selection of house location – Jan to Dec
- Mating – Jan week 2 & 2
- Rearing young – Apr – May
- Weaning – May – June
- Disease control – Jan to Dec
- Pest control – Jan to Dec
- Supplementary feeding – April to June
- Slaughtering – June to Dec
- Post harvesting – June to Dec
- Marketing – Mar to Dec

Selection of house location
Enough appropriate space that is close to owner's home and well sheltered.

Mating
Mate male and female animals that have been selected appropriately, and attributes accuracy of timing depends on selected animals.

Rearing young
Timely weaning and feeding young animals with adequate quality feeds for fast growth, accuracy of timing and type of feeds depend on selected animals.

Weaning
Separating of young animals from their mother, accuracy of timing depends on selected animals.

Disease control
Methods of controlling of any important economic disease of the selected animal and accuracy of controlling disease depends on selected animal and name of pest.

Pest control
Methods of controlling of any important economic pest of the selected animal and accuracy of controlling pest depends on selected animal and name of pest.

Supplementary feeding
Using of artificial feeds such as fish and bone meals, starter finisher, etc, and accuracy of timing depends on selected animals.

Slaughtering
Humanely killing of animals, proper handling is needed because it affects the quality of meat produced when animals are under stress and accuracy of timing depends on selected animals and the needs of the intended market.

Post-harvest grading
Sorting/classifying meat according to parts of animal's body (e.g. fillet steak, ham steak, brisket steak, shank leg, chicken nibbles, chicken wings, chicken thighs etc.), sizes and types of cuts (small, medium, large) and market.

Post-harvest packing
Packing of sorted/classified meat.

Marketing
Supply meet the need of buyers in terms of quantity and quality.

Example of calendar of Operations.

Steps of management practices in the order they are carried out	***Time***											
	Jan	***Feb***	***Mar***	***Apr***	***May***	***Jun***	***Jul***	***Aug***	***Sept***	***Oct***	***Nov***	***Dec***
Selection of house												
Mating												
Rearing of young												
Weaning												
Disease control												
Pest control												
Supplementary feeding												
Slaughter												
Post-harvest grading												
marketing												

Factors that influence the schedule of operations for crops and livestock	
Land Availability:	In any agricultural production land is the foremost factor needed to be considered. There has to be land available for the production of the product. Where land is not available the producer has to see how he/she could obtain land for the purpose. The producer must consider the land tenure system so he could negotiate for a land. The land tenure systems are: - Lease system - Freehold title - Rent If the land does not belong to the farmer and the farmer is leasing the land, the land tenure system change may affect the operation involved in the schedule of operation of the product.
Capital:	Capital refers to money that can be used to start production and operate the production. If the farmer does not have the money to start or operate the production he has to find money either by borrowing from a friend or get a loan from a commercial bank for the purpose them he has to pay back the money maybe with some interest. If there is not enough or no money to start all farms scheduled activities will be held up.

Market Demand	If there is an increase in demand of the product then it means production could be increased which will increase the schedule of operation to meet the demand however this will depend on the available resources and funds. If there Is no demand of the product it could mean the supply will decrease and this will affect production, schedule of operation and all related costs.
Yield	Variation in yield will either meet or not meet the market demand. Good production will result in a surplus and finding ways and means of selling the surplus. A bad production with low yields will not meet market demand or contracts. Therefore farmers may need to find replacements, pay penalties and renegotiated loan repayments. This will affect the schedule of operation. The farmer must re-schedule his or her operations or activities to meet the demand or yield required in the market.
Labour Availability	All farm activities are all time-consuming. Sometimes labourers may not be enough to do and complete a certain task(s) in a given time therefore more may be needed. He may either ask family members, community or hire more people to do the task. It is important that the labourers must have some skills or experience of the task given or they have to be trained for the task(s) Farm operations require labour to carry out and manage the farm activities. Farm activities will determine the number of labourers and skills required. Unavailability of labour and skills could hinder farm operation schedules. Prioritisation of activities may take place as a result.
Technical Assistance/ Advice/Technical information	Technical assistance in terms of human resources, advanced information technology, meeting with experts will assist improved farm productivity, profitability, training of staff and cost. Produces must seek advice and technical information from resourceful people on how to produce and market the product. Most of the information may be taken from technical people, internet other producers, etc. Most activities are time-consuming and need a lot of labour and are very expensive. Nowadays the use of technology is very high. New advanced farm, processing machines and technology may be used to minimise the above. Eg. A tractor may be used for clearing and ploughing a large area of land within a few hours and can be operated by one person only instead of hiring one hundred people to do it.
Technology	Technology will lessen the labour requirements, more free time, schedules are met, and more money [capital] needed for equipment and effect on profit. Reducing cost by changing to technology, forgoing some activities,
Profitability	Farm productions must be schedule and operated to minimise cost and to maximise profit. Working smarter will minimises the operational costs, maximising the production, meeting market demand and therefore increases or maximises the profitability.

Visual aids	
Exercises	1.State the factors to be considered in site selection 2. List the process of site selection as a step in the schedule of operations 3. Outline the desired outcomes in site selection within the schedule of operations 4. Explain how a selected site meets the requirements for site selection within the schedule of operations 5. Discuss the significance of site selection as a step in the schedule of operations and suggest ways of improving a selected site that does not meet particular requirements
Assignment	

Assessment	
References	➢ https://eqap.moodle.school/

Lesson 2

 Week / Lesson	**Wk - 6** Lesson number : 3/4
	Strand : **PRODUCTION MANAGEMENT** Sub-Strand 3.1 : Schedule of Operations in Primary Production (cont…) ➢ **Cultivar and breed selection**
 Learning outcomes	1. *State the main factor in cultivar or breed selection in the schedule of operations* 2. *Describe what cultivar or breed selection is as a step in the schedule of operations* 3. *Explain the significance of cultivar or breed selection in production management* 4. *Discuss the effect of cultivar or breed selection on the biodiversity of plants or animals concerned and recommend appropriate strategies for minimising the negative impacts*
 Introduction	Cultivar - a plant variety that has been produced in cultivation by selective breeding Breed – a stock of animals or plants within a species having a distinctive appearance and typically having been developed by deliberate selection Breeding and selection is important to develop cultivars with increased yield, improved quality, improved nutritional and health characteristics, resistance to diseases and pests, and tolerance to environmental stresses
	Selecting the right soybean cultivars to plant is a very important decision a farmer has to make. In order to deliver a 20% higher yield in the farm.
	**Breed selection** **This is based on the following:** - Health. - Body Conformation. - Temperament or Behaviour. - Quality of products. - Mothering Ability. - Adaptability. - Prolificacy.

Learners notes	Chickens that produce large eggs. Cows that produced a lot of milk. **Cultivar selection** **This is based on the following:** Fast growth rate. High yield. Pest/disease resistance. Adaptable to climatic conditions Within any plant or animal species, some individuals do better than others. The principal is used in selective breeding. Best selected plants or animals are used to improve productions such as those done in crossbreeding, inbreeding, outbreeding, artificial insemination, etc. **<u>Crop Diversity: Why it Matters</u>** The six key areas where crop diversity is essential. **Ensuring Food Security** The concept of food security is complex. It involves not only the production and processing of nutritious food but also access by individuals to the full range of nutrients needed to maintain an active and healthy life. Crop diversity is central to food security. It underpins today's production and provides the raw material needed for ensuring continuing supplies tomorrow, in the face of a rapidly changing world. The fight to achieve food security and end hunger is one of the greatest challenges facing the world. Rising populations, diminishing resources and deteriorating environments only raise the stakes. **Adapting to Climate Change** Climate change scientists widely recognise the need for new and improved crop varieties that can withstand these challenges. These improved crops are essential not only to reduce hunger but also to strengthen global food security in the medium and long term. The development of crop varieties that can cope with heat, drought, flood and other weather extremes may well be the single most important step we can take to adapt to climate change. **Reducing environmental degradation** The wise use of crop genetic diversity in developing improved crops can contribute significantly to protecting the environment. Crop varieties that are resistant to pests and diseases can reduce the need to apply harmful pesticides. More vigorous varieties can better compete with weeds, reducing the need for applying herbicides. Drought-resistant plants can help save water by reducing the need for irrigation. Deeper rooting varieties can help

	stabilise soils; and varieties that are more efficient in their use of nutrients require less fertiliser. **Protecting Nutritional Security** Crop diversity helps ensure not only a stable and sustainable supply of sufficient quantities of food – of energy and protein – but also plays a major role in ensuring its quality. Dietary diversity – a direct product of crop diversity – is itself considered desirable by nutritionists. And the supply of vital nutrients – of vitamins and minerals – can be enhanced through the judicious use of genetic diversity. New varieties can be developed with improved nutritional quality: with higher levels of vitamins, more readily available iron and other essential elements, better quality protein or with reduced anti-nutritional or toxic factors. **Reducing Poverty** Agriculture is the economic driver of most countries, and for developing countries economic growth is dependent on agricultural growth. Growth in agriculture, although beneficial for the wider economy, benefits the poor most. Agricultural growth can lead to providing affordable food for the 70% of the world's poorest people who live in rural areas and who depend on agriculture. Crop diversity is fundamental to agricultural growth. Crop diversity enables farmers and plant breeders to develop higher yielding, more productive varieties that have the improved quality characteristics required by farmers and desired by consumers. They can breed varieties that are better suited to particular processing methods or that store longer or that can be transported with less loss. They can produce varieties that resist pests and diseases and are drought tolerant, providing more protection against crop failure and better insulating poor farmers from risk. **Ensuring Sustainable Agriculture** The use of a greater diversity of available crops is a strategy that farmers can apply to develop their own agricultural systems with minimal environmental impacts. While this is a big task to undertake, the global community is already recognising the importance of protecting agricultural biodiversity.
 Exercises	1. State the main factor in cultivar or breed selection in the schedule of operations 2. Describe what cultivar or breed selection is as a step in the schedule of operations 3. Explain the significance of cultivar or breed selection in production management 4. Discuss the effect of cultivar or breed selection on the biodiversity of plants or animals concerned and recommend appropriate strategies for minimising the negative impacts

References	➢ https://eqap.moodle.school/

Week / Lesson	**Wk - 6** Lesson number : 5
	Strand : **PRODUCTION MANAGEMENT** Sub-Strand 3.1 : Schedule of Operations in Primary Production (cont…)
Learning outcomes	*1.State the factors to be considered in site selection* *2. List the process of site selection as a step in the schedule of operations* *3. Outline the desired outcomes in site selection within the schedule of operations* *4. Explain how a selected site meets the requirements for site selection within the schedule of operations* *5. Discuss the significance of site selection as a step in the schedule of operations and suggest ways of improving a selected site that does not meet particular requirements* 5. *State the main factor in cultivar or breed selection in the schedule of operations* 6. *Describe what cultivar or breed selection is as a step in the schedule of operations* 7. *Explain the significance of cultivar or breed selection in production management* 8. *Discuss the effect of cultivar or breed selection on the biodiversity of plants or animals concerned and recommend appropriate strategies for minimising the negative impacts*

Assessment

SECTION C: PRODUCTION MANAGEMENT

PART A: FARM ANIMAL PRODUCTION MANAGEMENT

Select a locally produced farm animal product and its specific market that you have studied to answer the given questions.

Locally produced farm animal: _____

Specific market for the produced farm animal: _____

C7 Schedule of Operations

Farmers follow a sequence of management practices in order to produce a farm animal product that meets the requirements of specific market opportunities.

Listed in the box below are eleven management practices carried out in a calendar of operations in the production of your chosen animal.

- supplementary feeding
- post-harvesting grading
- disease control
- breed selection
- slaughtering
- pest control
- mating
- culling
- post harvesting packing
- marketing
- rearing young

C7a Describe **TWO** significant but distinctly different **SITES** where your selected animal could be raised. You can include the actual site where your selected animal had been raised and another site you think you could have used.

Assessor's use only

C7ai Description of **SITE** 1: _____

Skill Level 1	
Basic	
Weak	
NR	

C7aii Description of **SITE** 2: _____

Skill Level 1	
Basic	
Weak	
NR	

Assessor's use only

C7aiii Of the TWO sites you have described in **C7ai - C7aii** above, recommend the site that is better for raising your farm animal.

Recommended site: ____________________

Discuss why one site is better for raising your locally produced animals than the other site. Give reasons and examples to support your answer.

Skill Level 3	
Advanced	
Proficient	
Basic	
Weak	
NR	

	Describe the characteristics of **TWO** significant but distinctly different **BREEDS** of your selected animal. You can include the actual breed you have studied and another breed that you think you could have raised.	*Assessor's use only*
C7aiv	Description of **BREED** 1: _____	**Skill Level 1** Basic ☐ Weak ☐ NR ☐
C7av	Description of **BREED** 2: _____	**Skill Level 1** Basic ☐ Weak ☐ NR ☐
C7avi	Describe how your selected animal was reared or could have reared. In your description.	**Skill Level 1** Basic ☐ Weak ☐ NR ☐

References	➢ https://eqap.moodle.school/

Week / Lesson	**Wk - 7** Lesson number : 1
	Strand : **PRODUCTION MANAGEMENT** Sub-Strand 3.1 : Schedule of Operations in Primary Production (cont…) ➢ **Planting Material**
Learning outcomes	1. *Name the types of planting material available in primary production* 2. *Explain the significance of planting material availability as a step in the schedule of operations* 3. *Discuss the impact of the availability of planting material and suggest optimal conditions for the production*
Introduction	Planting materials include seeds from sexual reproduction in plants and vegetative propagation.
	Plant propagation is the process which grows new plants from a variety of sources: seeds, cuttings, and other plant parts. Plant propagation can also re to the man-made or natural dispersal of seeds.
	• **Sexual reproduction in plants** **Seeds** In flowering **plants**, the female reproductive structures that produce **seeds** are contained within the carpels of the **flower**. A carpal consists of the stigma, style and ovary. The ovary **contains** ovules (eggs) that become **seeds** once they are fertilized. **Asexual reproduction in plants** Asexual reproduction produces individuals that are genetically identical to the parent plant. Roots such as corms, stem tubers, rhizomes, and stolon undergo vegetative reproduction. • Fission. In fission, unicellular organism splits to form new organisms. ... • Budding. The word bud means small outgrowth.

Learners notes	• Spore formation. The method of spore formation occurs in both unicellular and multi- cellular organisms. ... • Fragmentation. ... • Cuttings. ... • Layering. ... • Grafting. **Natural means** Natural vegetative propagation is mostly a process found in herbaceous and woody perennial plants, and typically involves structural modifications of the stem, although any horizontal, underground part of a plant (whether stem, leaf, or root) can contribute to vegetative reproduction of a plant. The most common modified stems, leaves and roots that allow for vegetative propagation are:[18] **Runners** Also known as stolons, runners are modified stems that, unlike rhizomes, grow from existing stems just below the soil surface. As they are propagated, the buds on the modified stems produce roots and stems. Those buds are more separated than the ones found on the rhizome.[19] Examples of plants that use runners are strawberries and currants. **Bulbs** Bulbs are inflated parts of the stem within which lie the central shoots of new plants. They are typically underground and are surrounded by plump and layered leaves that provide nutrients to the new plant.[20] Examples of plants that use bulbs are shallots, lilies and tulips. **Tubers** Tubers develop from either the stem or the root. Stem tubers grow from rhizomes or runners that swell from storing nutrients while root tubers propagate from roots that are modified to store nutrients and get too large and produce a new plant.[19] Examples of stem tubers are potatoes and yams and examples of root tubers are sweet potatoes and dahlias. **Corms** Corms are solid enlarged underground stems that store nutrients in their fleshy and solid stem tissue and are surrounded by papery leaves. Corms differ from bulbs in that their centers consists of solid tissue while bulbs consist of layered leaves.[21] Examples of plants that use corms are gladiolus and taro. **Suckers**

	Also known as root sprouts, suckers are plant stems that arise from buds on the base of parent plants stems or on roots.[22] Examples of plants that use suckers are apple, elm, and banana trees. **Plantlets** Plantlets are miniature structures that arise from meristem in leaf margins that eventually develops roots and drop from the leaves they grew on.[23] An example of a plant that uses plantlets is the *Bryophyllum daigremontianum* (syn. *Kalanchoe daigremontianum*), which is also known as *mother of thousands* for its many plantlets. **Keikis** Keikis are additional offshoots which develop on vegetative stems or flower stalks of several orchids genera.[12] Examples of plants that use keikis are the *Phalaenopsis*, *Epidendrum*, and *Dendrobium* genera of orchids. **Apomixis** Apomixis is the process of asexual reproduction through seed, in the absence of meiosis and fertilization, generating clonal progeny of maternal origin.[24] **Artificial means** Vegetative propagation of particular cultivars that have desirable characteristics is very common practice. It is used by farmers and horticulturalists to produce better crops with desirable qualities. The most common methods of artificial vegetative propagation are:[18] **Cutting** A cutting is a part of the plant, usually a stem or a leaf, is cut off and planted. Adventitious roots grow from cuttings and a new plant eventually develops. Usually those cuttings are treated with hormones before being planted to induce growth.[25] Example: rose;hibiscus. **Grafting** Grafting involves attaching a scion, or a desired cutting, to the stem of another plant called stock that remains rooted in the ground. Eventually both tissue systems become grafted or integrated and a plant with the characteristics of the grafted plant develops,[26] e.g. mango, guava, etc. **Layering** Layering is a process which includes the bending of plant branches or

	stems so that they touch the ground and are covered with soil. Adventitious roots develops from the underground part of the plant, which is known as the layer. This method of vegetative reproduction also occurs naturally. Another similar method, air layering, involved the scraping and replanting of tree branches which develop into trees.[27] **Suckering** Suckers grow and form a dense compact mat that is attached to the parent plant. Too many suckers can lead to smaller crop size, so excess suckers are pruned, and mature suckers are transplanted to a new area where they develop into new plants.[28] **Tissue culture** In tissue culture, plant cells are taken from various parts of the plant and are cultured and nurtured in a sterilized container. The mass of developed tissue, known as the callus, is then cultured in a hormone-ladened medium and eventually develops into plantlets which are then planted and eventually develop into grown plants.[10][29] **Offset** An offset is the lower part of a single culm with the rhizome axis basal to it and its roots. Planting of these is the most conventional way of propagating bamboo.[30]
 Exercises	1. Name the types of planting material available in primary production 2. Explain the significance of planting material availability as a step in the schedule of operations 3. Discuss the impact of the availability of planting material and suggest optimal conditions for the production
 References	➢ https://eqap.moodle.school/ ➢ https://www.thoughtco.com/vegetative-propagation-4138604 ➢ https://en.wikipedia.org/wiki/Vegetative_reproduction ➢

 Week / Lesson	**Wk - 7** Lesson number : 2/3/4
	Strand : **PRODUCTION MANAGEMENT** Sub-Strand 3.1 : Schedule of Operations in Primary Production (cont…) ➢ **Management Practice**
 Learning outcomes	1. *Identify different management practices in production* 2. *Identify management practices that are carried out thoughout the management period* 3. *Explain how timing of management practices enhances productivity of animal/plant product* 4. *Be able to describe the establishement processes in the schedule of operations* 5. *Descibe the significance of management practices in the schedule of operations*
 Introduction	Crop management the group of agricultural practices used to improve the growth, development, and yield of agricultural crops. The combination, timing, and sequence of the practices used depend on the biological characteristics of the crops (whether winter or spring crops), the harvested form (grains, green feed, and so on), the sowing methods (row, nest, or wide-row), the age of the plants, and the soil, climatic, and weather conditions. The principal crop-managing practices vary according to the class of crops. Winter crops require autumn topdressing with mineral fertilizers to improve winterhardiness of the plants, snow retention, spring topdressing, and harrowing. Solid-planted spring crops call for harrowing and topdressing; in arid regions they additionally need soil packing after planting. For row crops in preemergence, the crust of the soil must be broken up with harrows or rotary hoes; interrow tillage, blocking, thinning of sprouts, and topdressing are also indicated in the postemergence period. Perennial grasses require harrowing in the spring, harrowing after mowing, and topdressing. Special crop-managing practices for individual crops include hilling, suckering, pinching, and chopping. Other field practices include crop irrigation and mechanical, biological, and chemical methods of combating weeds, pests, and diseases.

It is important to remember that part of the rainfall is lost to runoff, drainage, and evaporation. Soil storage capability determines how much moisture can be in reserve to supplement crop-season rainfall.

Learners notes

Crops

Management practices	How management practice is carried out in a sustainable way	How it contributes to maintaining sustainable production
Soil Management Practices **Cultivation** **The process of growing crop plants on arable land.** **Cultivation requires fertile soil, water, and seeds in the appropriate season[s]** **In the process of cultivation the farmer is often required to initially till the land, control weeds and alternately harvest the crop.** **Soil cultivation refers especially to the tilling of soil, such as ploughing to prepare the land for planting and to control weeds.** **Objectives of soil cultivation:** **Seed bed preparation** **Water conservation** **Aeration [availability]** **Weed control** **Utilization and disposal of crop residues.** **Advantages of soil cultivation:** **Cultivation or tillage leaves the soil temporarily looser than it was.** **It increases the size of soil pore thus aid air and water to penetrate.** **Helps to incorporates[include] OM in the soil to increase nutr5ient content and improve soil structure.** **It mixes different layers of the soil.** **It make it easier for crop rooting system to develop.** **It allows seed to germinate and emerges easily.** **Cultivating the land a week**	**Types of cultivation**; **Crop rotation** Growing crops in sequences on the same land. Legume is added frequently **Intercropping** Growing different crop plants on the same piece of land **Alley cropping** Growing crops in between rows of alleys[legume plants or trees] **Fallowing** Leaving the land to grow back into bush **Monoculture** **Mixed cropping** Growing different crop plants on the same piece of land **Agro forestry** Growing drop plants with forest trees **Sustainable practices**	Maintain the fertility of the soil by crops that can use up nutrient and others that can replenish the soil by nutrients [legumes]. Different species of crop are grown together. Usually legumes are intercropped with other crops to supply them with nutrients. Cropping with legume plants which supply nutrients to the soil. Planted on contour serves as erosion control or trees used can serve as fodder for livestock. Land is laid to rest for 1-2 years for the soil to regain its fertility before it can be reused again. Cropping of a single crop on a large area of land. Growing different crops in the same area a t the same time. Avoid depletion of any nutrient because different crop need different soil nutrients. This cultivation of land improves soil fertility, conserves soil, improves micro organisms and reduces weeds. Practices that incorporates OM to: Increase water holding capacity Improve pore sizes Retain moisture Improve soil structure Adds to nutrient content of the soil Digging in animal manure, dead leaves, compost, garden residues green manure. Practices that do not encourage soil erosion to take place

Animal

Systems

Animals can be kept extensively or intensively. Extensive systems involve animals roaming at will, or under the supervision of a herdsman, often for their protection from predators. Ranching in the Western United States involves large herds of cattle grazing widely over public and private lands.[24]

In rural locations, pigs and poultry can obtain much of their nutrition from scavenging, and in African communities, hens may live for months without being fed, and still produce one or two eggs a week.[22]

Pigs confined to a barn in an intensive system, Midwestern United States

Feeding

Cattle around an outdoor feeder

Animals used as livestock are predominantly herbivorous, the main exceptions being the pig and the chicken which are omnivorous. The herbivores can be divided into "concentrate selectors" which selectively feed on seeds, fruits and highly nutritious young foliage, "grazers" which mainly feed on grass, and "intermediate feeders" which choose their diet from the whole range of available plant material. Cattle, sheep, goats, deer and antelopes are ruminants; they digest food in two steps, chewing and swallowing in the normal way, and then regurgitating the semidigested cud to chew it again and thus extract the maximum possible food value

In many climates grass growth is seasonal, for example in the temperate summer or tropical rainy season, so some areas of the crop are set aside to be cut and preserved, either as hay (dried grass), or as silage (fermented grass).[32] Other forage crops are also grown and many of these, as well as crop residues, can be ensiled to fill the gap in the nutritional needs of livestock in the lean season.[33]


Cattle feed pellets of pressed linseed

Extensively reared animals may subsist entirely on forage, but more intensively kept livestock will require energy and protein-rich foods in addition. Energy is mainly derived from cereals and cereal by-products, fats and oils and sugar-rich foods, while protein may come from fish or meat meal, milk products, legumes and other plant foods, often the by-products of vegetable oil extraction.[34] Pigs and poultry are non-ruminants and unable to digest the cellulose in grass and other forages, so they are fed entirely on cereals and other high-energy foodstuffs. The ingredients for the animals' rations can be grown on the farm or can be bought, in the form of pelleted or cubed, compound foodstuffs specially formulated for the different classes of livestock, their growth stages and their specific nutritional requirements. Vitamins and minerals are added to balance the diet.[35] Farmed fish are usually fed pelleted food.[35]

Breeding

Selective breeding has been responsible for large increases in productivity. For example, in 2007, a typical broiler chicken at eight weeks old was 4.8 times as heavy as a bird of similar age in 1957,[36] while in the thirty years to 2007, the average milk yield of a dairy cow in the United States nearly doubled.[36]

Animal health


Vaccinating a goat, Niger

Good husbandry, proper feeding, and hygiene are the main contributors to animal health on the farm, bringing economic benefits through maximised production. When, despite these precautions, animals still become sick, they are treated with veterinary medicines, by the farmer and the veterinarian. In the European Union, when farmers treat their own animals, they are required to follow the guidelines for treatment and to record the treatments given.[38] Animals are susceptible to a number of diseases and conditions that may

affect their health. Some, like classical swine fever[39] and scrapie[40] are specific to one type of stock, while others, like foot-and-mouth disease affect all cloven-hoofed animals.[41]

Where the condition is serious, governments impose regulations on import and export, on the movement of stock, quarantine restrictions and the reporting of suspected cases. Vaccines are available against certain diseases, and antibiotics are widely used where appropriate. At one time, antibiotics were routinely added to certain compound foodstuffs to promote growth, but this practice is now frowned on in many countries because of the risk that it may lead to antibiotic resistance.[42]

Range of species

There is no single universally agreed definition of which species are livestock. Widely agreed types of livestock include cattle for beef and dairy, sheep, goats, pigs, and poultry. Various other species are sometimes considered livestock, such as horses,[47] while poultry birds are sometimes excluded

Shearing a Merino sheep for its wool

Animals are raised for a wide variety of products, principally meat, wool, milk, and eggs, but also including tallow, isinglass and rennet.[52][53] Animals are also kept for more specialised purposes, such as to produce vaccines[54] and antiserum (containing antibodies) for medical use.[55] Where fodder or other crops are grown alongside animals, manure can serve as a fertiliser, returning minerals and organic matter to the soil in a semi-closed organic system

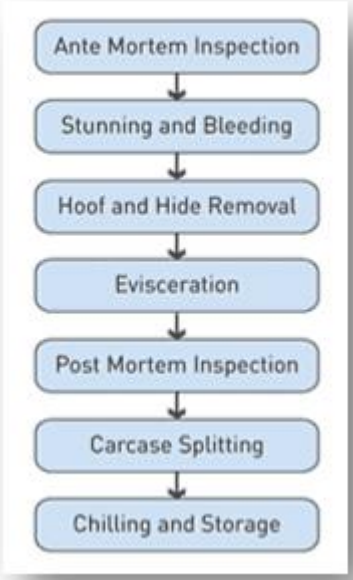
Exercises

1. Name a management practice in production management
2. State the key difference between one management practice from another
3. Identify a particular management practice used in the production process of selected primary product
4. Describe management practices that must be carried out throughout the management period
5. Describe a particular management practice used in the production process of selected primary product
6. Describe the importance of timing in production management
7. Compare different management practices carried out throughout

	the management period in terms of their effectiveness 8. Explain how the timing of management practice enhances productivity in animal/plant product 9. Explain why one management practice contributes more to the production of animal/plant product than another 10. Discuss the effectiveness of management practice and recommend strategies for improvement. Justify your recommendations. 11. Describe the establishment process (soil/crop preparation; planting/rearing) asa step in the schedule of operations 12. Describe the significance of the establishment process (including: soil/crop preparation; planting/rearing) as a step in the schedule of operations 13. Describe management practice (e.g. irrigation/water; pest and disease control; weed control; fertility/nutrition; light/temperature) as a step in the schedule of operations 14. Explain the significance of management (e.g. irrigation/water; pest and disease control; weed control; fertility/nutrition; light/temperature) as a step in the schedule of operations 15. Discuss and recommend optimal conditions for the establishment process (including: soil/crop preparation; planting/rearing) as a step in the schedule of operations
References	➢ https://eqap.moodle.school/ ➢ https://en.wikipedia.org/wiki/Animal_husbandry ➢ https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/crop-management ➢

 Week / Lesson	**Wk - 7** Lesson number : **5**
	Strand : **PRODUCTION MANAGEMENT** Sub-Strand 3.1 : Schedule of Operations in Primary Production ➢ **Harvest/ Slaughter timing**
 Learning outcomes	1. *Understand the importance of timing in slaughtering and harvesting* 2. *Describe harvesting as a step in the schedule of operations* 3. *Be able to discuss and make reccomendations on optimal conditions for management*
 Introduction	The **timing**, techniques and conditions of harvesting/ slaughtering can significantly affect prices. Harvesting early in the season can be carried out to take advantage of opportunities for high prices, e.g. cabbage harvested as spring greens, young carrots sold in bunches, green plums and new potatoes. For animals - The **timing** for these procedures should be established by checking each animal individually for any signs of sensibility rather than by observing a set time frame
	"We know we cannot be kind to animals until we stop exploiting them -- exploiting animals in the name of science, exploiting animals in the name of sport, exploiting animals in the name of fashion, and yes, exploiting animals in the name of food." — Cesar Chavez

 Learners notes	**Harvesting of crops/Slaughtering of animals** **Harvest** is the process or period of gathering crops. You must not harvest your vegetables until they are ready. If you do, they will not be fully grown and they will not taste as good as they should. You must not harvest them too late either, because they become old and tough. It is important to know when they are just ready for use. The best time to harvest crops is during the cool days, especially early in the morning or late in the afternoon. Crops should be harvested and be stored under the shade or shelter to avoid excessive heat of the sun. **Tomatoes** – The fruits are ready for picking when they turn light red in colour. They have to be eaten soon after picking or store them in cool storage if they are not to be used. **Cabbages** –cabbages like head cabbages are ready when the "head" is firm. The head is tightly packed bunch of leaves in the centre. Cut off the stalk close to the ground with a sharp knife. Cabbages have to be eaten within a few days of harvesting unless store in coo storage room if not to be used immediately. **Beans** – can be eaten as a green vegetable or as dry beans. If you like to eat them as green beans, you pick them when they are young about 15cm long, before the seeds have swollen in the pods. The plants will keep on producing more pods, and you can pick them as you need them. Cool storage is best method to use to store them longer. **Animal slaughter** Animal **slaughter** is the killing of **animals**, usually referring to killing domestic **livestock**. In general, the **animals** would be **killed** for food; however, they might also be **slaughtered** for other reasons such as being diseased and unsuitable for consumption. **What is the slaughter process?** Livestock **slaughter** procedures. The **slaughter** of livestock involves three distinct stages: preslaughter handling, stunning, and slaughtering.

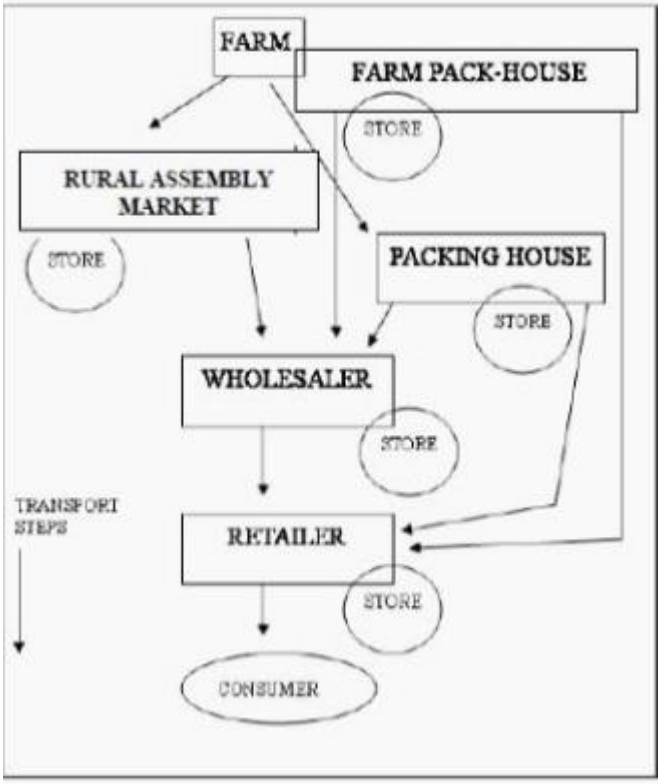
	Slaughter process diagram 
Excercise  Exercises	1. Identify harvest/slaughter timing and method as a step in the schedule of operations 2. Describe harvest/slaughter timing and method as a step in the schedule of operations 3. Explain the significance of harvest/slaughter timing and method as a step in the schedule of operations 4. Discuss and recommend optimal conditions for harvest/slaughter timing and method as a step in the schedule of operations 5. Discuss and recommend optimal conditions for management (e.g. irrigation/water; pest and disease control; weed control; fertility/nutrition; light/temperature) as a step in the schedule of operations
 References	➢ www.fao.org/3/a0185e/a0185e0a.htm ➢ https://eqap.moodle.school/

Week / Lesson	**Wk - 8** Lesson number : 1/2
	Strand : **PRODUCTION MANAGEMENT** Sub-Strand 3.1 : Schedule of Operations in Primary Production ➢ **Post-Harvest**
Learning outcomes	1. What is post-harvest 2. Describe post-harvest processes 3. Explain the significance of post-harvest processes (quality control/grading and sorting; packaging and handling; storage) in the schedule of operations Evaluate the contribution of post-harvest processes (quality control/grading and sorting; packaging and handling; storage) to production quality and suggest ways of minimising negative impacts
Introduction	Postharvest technology constitute and inter-disciplinary science and techniques applied to agricultural commodities after harvest for the purpose of preservation, processing, packaging, quality control, and utilization to meet the food and nutritional requirements of consumers in relation to their needs. Postharvest technology stimulates agricultural production by: Prevents postharvest losses Improves nutrition Adds value to agricultural products Opens new marketing opportunities, and Generates new jobs Postharvest handling specifically involves the movement and the operations that commodities undergo harvest to the time immediately before meal preparation. Its main concern is to keep commodities in an acceptable state from harvest until it reaches the consumer since most commodities are transported to their perishable state.
	Value added tax (VAT) is a tax on sales. It works by being charged on the sale price of new goods and services, whether purchased by intermediate or final consumers.

Learners notes

Crops

Postharvest handling aims to minimize losses at the least possible cost. Poor handling of
agricultural commodities can result in quality deterioration and losses.



Vegetables and fruits are of high value and need to be handled carefully to preserve that value. The vegetable and fruits are living commodities and deteriorate in quality very quickly.

Some causes of postharvest losses

- Rough handling
- Inadequate cooling and temperature maintenance
- Inadequate packaging materials

In general, minimizing rough handling, sorting to remove damaged and diseased produce and effective
temperature management will help toward maintaining a quality product and reducing storage losses.

Animals

There are a variety of products on the market for human and animal consumption that are products produced by animals. Most of these products like hides, meat, fibre, milk and other by-products such as bones and hooves are used widely. Meat as animal product Red meat is the collective name for meat that originates from cattle, sheep and pork. White meat is the collective name for meat that originates from chicken, turkey, duck, pigeon, guinea fowl, etc. Livestock production has developed to supply the world's demand for meat. In order to obtain the final product, it has to go through certain production and processing procedures. The readiness of meat for harvesting Both beef and mutton can be harvested at different stages. Breeding stock is slaughtered only at the end of their productive lives, but their offspring are slaughtered when

	they will produce the best quality meat. Harvesting of meat The following describes the harvesting of meat. Meat goes through many operations before it hangs dressed in cold stores. Skilled workers perform these operations with great speed. The animals are stunned before they are slaughtered and dressed. After slaughtering the carcases are suspended from an overhead rail for the dressing operation, in which the hide and internal organs are removed. Further along the line various trimming procedures are performed. By the time it reaches the end of the chain the carcase is clean, "dressed" and ready for chilling and classification. After slaughtering and dressing, the carcases are inspected by a meat inspector to make sure that it is fit for human consumption. The meat trader then sells it to the consumer in the meat market. The carcases are transported from the abattoir to the meat market by a refrigerator-truck. The carcases are hanged in large cold rooms at the meat market. Processing of the carcase A beef carcase is divided lengthwise because of its large size. Each half of the carcase is then divided into a forequarter and hindquarter. The retail dealer buys beef carcases from the wholesaler, in the form of forequarters and/or hindquarters. Pig, goat and lamb or sheep carcases are kept whole. These carcases are cut up in the meat market according to the consumer's choice. **Slaughterhouse** Slaughterhouse A slaughterhouse, also called an abattoir which means ("to strike down"), is a facility where farm animals are killed and processed into meat products. The animals most commonly slaughtered for food are cattle (beef and veal), sheep (lamb and mutton), pigs (pork), poultry, and horses.
Excercise  Exercises	1. Name a post-harvesting process. 2. Describe post-harvest processes, including: quality control/grading and sorting; packaging and handling; storage as steps in the schedule of operations 3. Explain the significance of post-harvest processes (quality control/grading and sorting; packaging and handling; storage) in the schedule of operations 4. Evaluate the contribution of post-harvest processes (quality control/grading and sorting; packaging and handling; storage) to production quality and suggest ways of minimising negative impacts
	➢ www.fao.org/3/a0185e/a0185e0a.htm ➢ https://eqap.moodle.school/

References	

Week / Lesson	**Wk - 8** Lesson number : 3/4
	Strand : **PRODUCTION MANAGEMENT** Sub-Strand 3.1 : Schedule of Operations in Primary Production ➢ **Marketing**
Learning outcomes	1. *Be able to define marketing* 2. *List the steps in the schedule of operations for marketing of one primary product.* 3. *Understand the significance of marketing as a step in the schedule of operations* 4. *Discuss and recommend optimal conditions for marketing*
Introduction	**Agricultural marketing** covers the services involved in moving an **agricultural** product from the farm to the consumer. These services involve the planning, organizing, directing and handling of **agricultural produce** in such a way as to satisfy farmers, intermediaries and consumers. An important aspect is the process of assessing the price of a commodity at the point that it gets to the consumer. The assessment process includes market research, test marketing, and advertising. Some of the agents involved with the marketing agricultural produce are: the producer, middlemen, and marketing boards.

	Marketing is the process of teaching consumers why they should choose your product or service over those of your competitors. If you're not doing that, then you're not marketing.
 Learners notes	**Marketing** **Producer marketing** This is where the producer sells his own farm produce such as eggs, vegetables, and maize, directly to the consumer. The price of the commodity at this level is called the "farm-gate" price. Such direct selling has a great advantage in that the producer and the consumer exchange the commodity at a mutually agreed price. **Marketing via middlemen** Middlemen are the people who form the link between the producer of a commodity and the consumer. The link may be of two types: □ Farmer to middleman. The farmer sells to the middleman who is not the ultimate consumer. The middleman either sells the produce on the spot at a higher price or transports it to another market where he can sell at inflated prices depending on the demand situation. □ Farmer through many middlemen. Some farm produce such as yams, peanuts, kava pass through many middlemen such as retailers, wholesalers before they ultimately reach the consumers. **Roles of the middlemen** The intension of the middleman is to make a profit. When there are too many middlemen between the producer and the consumer, the cost of the commodity to the consumer will be very high without any increase in the income of the producer. For the farmer to benefit adequately from his output, the number of middlemen in the marketing channel should be minimal. On the other hand, the middlemen fulfil many useful functions which enhance the marketing of agricultural produce: □ They link producers with consumers who may be hundreds of kilometres away. □ They have the financial ability to give loans to the farmers to aid their production and to buy the commodities from them. □ They have transport facilities to collect the produce from many farmers living in scattered villages. □ They establish distribution channels to wholesalers, retailers, and consumers. □ They supply relevant information to the producers on market trends and prices of necessary inputs. **Marketing Boards/Companies** These are agencies which are set up by the government to handle the marketing of export commodities. In Vanuatu such commodities such as copra, cocoa, kava. The name of the exporter of such commodities is the

	Vanuatu Commodities Marketing Board (VCMB). **Functions of marketing** The whole process of marketing is a complex one in modern times. There are many aspects or „functions" of marketing. Below shows the main ones: 1. **Buying** from the producers. There are many farmers each producing small quantities (eg. of copra or sugarcane). 2. **Collection and Transport** of the products to a central store. 3. **Storage** of the produce, where it will be kept dry and safe. **4. Grading** to separate the best produce that brings the higher price. **5. Processing:** Some types of produce have to be processed. eg.tomatoes are canned. 6. **Packaging:** sacks, cans or boxes may be needed to present the produce to the customer. **7. Selling** to the customer, who may live far away. Transport again is needed. 8. **Financing** to pay the producer while waiting for the customer to pay.
Excercise  Exercises	1. Define marketing. 2. List the steps in the schedule of operations for the marketing of a primary product. 3. Explain the significance of marketing as a step in the schedule of operations 4. Discuss and recommend optimal conditions for marketing as a step in the schedule of operations
References 	> https://www.thebalancesmb.com/what-is-marketing-2296057 ➢ https://eqap.moodle.school/

Week / Lesson	**Wk - 8** Lesson number : 5
	Strand : **PRODUCTION MANAGEMENT** Sub-Strand 3.1 : Schedule of Operations in Primary Production REVIEW
Learning outcomes	*Students are able to demonstrate an understanding of the steps in the schedule of operations.*
Assessment	**STRAND 3 : PRODUCTION MANAGEMENT** Read the questions and answer on the spaces provided.

Select a locally produced **farm animal product** and its specific market.

Locally produced farm animal product: ……

Specific market for the farm animal product: ……..

Farmers follow a sequence of steps of management practices in order to produce a farm animal product that meets the requirements of different markets. Listed in the box below are eleven management practices carried out in a calendar of operations in the production of an animal product.

- supplementary feeding
- mating
- disease control
- culling
- post harvesting grading
- post harvesting packing
- breed selection
- marketing
- slaughtering
- rearing young
- pest control

From the list above, identify a management practice in the production of your chosen farm animal product, which occurs right at the beginning.

_____

_____

_____

Select **one** management practice from the list above that must be carried out throughout the management period.

Management Practice 1: _____

_____

_____

Select **another** management practice and state the key difference from the management practice you selected in **question 3.1b**.

Management Practice 2: _____

Key Difference:_____

_____

_____

a

Explain why the management practice stated in **question 3.1b** contributes more to the production of your chosen animal product.

Explain how the timing of the following management practice contributes to the production of your chosen animal product.

Slaughtering:

Describe **one** issue in labour availability that influences the production of your chosen animal product.

Evaluate how the amount of capital that a farmer has influences supplementary feeding for your chosen animal product, and suggest ways of maximising return for capital invested.

Evaluation: _____

Recommendations: _____

/ **33**

WEEKLY CHECKLIST For Parents:

Term: 2 Week number 6 Date: 22/06 to 26/06 Month: June

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				

Term: 2 Week number 7 Date: 29/06 to 3/07 Month: June - July

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature

	1				
	2				
	3				
	4				
	5				

Term: 2 Week number 8 Date: 6/07 to 10/07 Month: July

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				