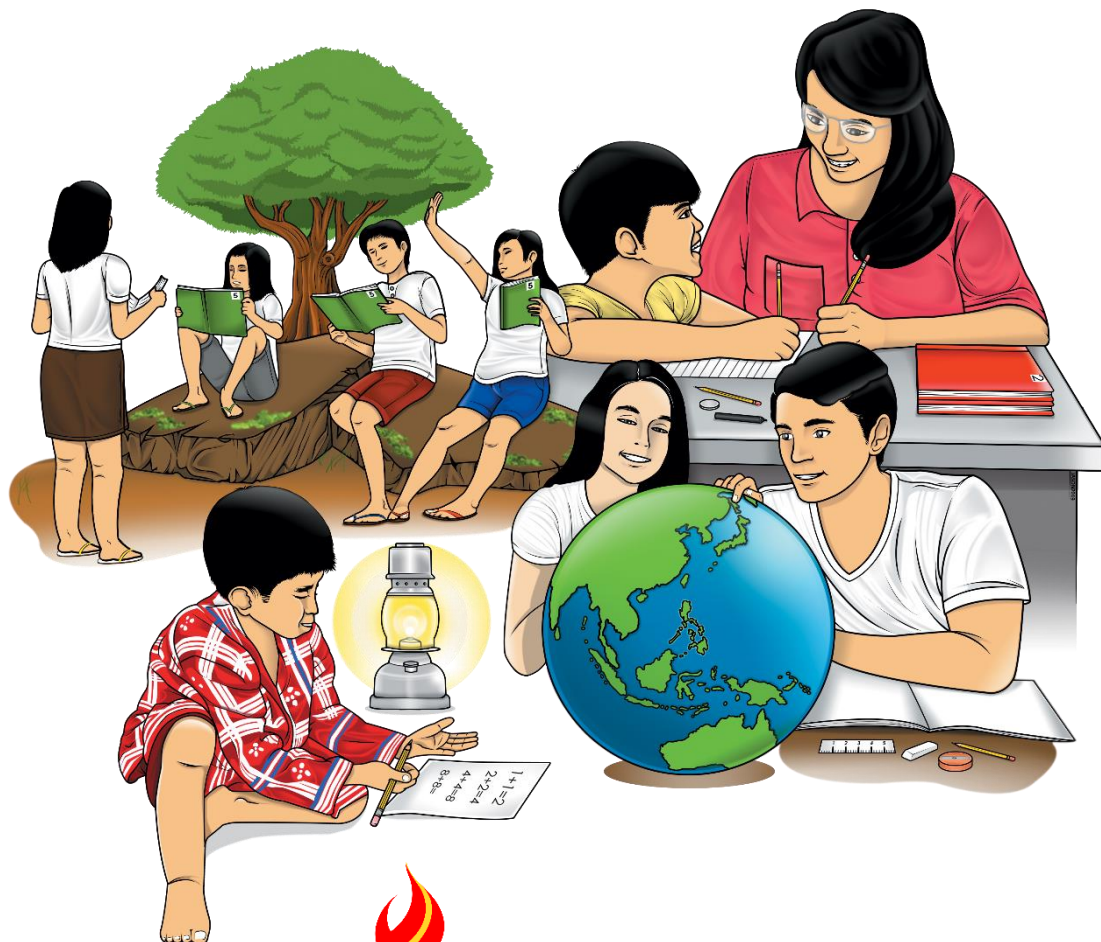


Technology and Livelihood Education

# Agri-Fishery Arts

## Module 3: Management of Orchard



**TLE – Agri-Fishery Arts – Grade 6**  
**Alternative Delivery Mode**  
**Module 3: Management of Orchard**  
**First Edition, 2020**

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**Development Team of the Module**

**Writer:** Kim T. Campaner

**Editors:** Reynaldo P. Evangelio

Romar V. Tiapes

**Reviewer:** Roselyn V. Geñega

**Illustrator and Layout Artist:** Learesa G. Amban

Jarrett Irvin C. Gayosa

Alfaith G. Poblete

**Management Team:** Ramir B. Uytico

Pedro Escobarte, Jr.

Elena P. Gonzaga

Donald T. Genine

Reynaldo G. Gico

Michell L. Acoyong

Grace T. Nicavera

Mylene D. Lopez

Reynaldo P. Evangelio

Jarrett Irvin C. Gayosa

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**Department of Education – Region VI**

Office Address: Duran St., Iloilo City  
Telefax: (033) 336-2816; (033) 509-7653  
E-mail Address: region6@deped.gov.ph

**Technology and Livelihood Education**

# **Agri-Fishery Arts**

**Module 3: Management of  
Orchard**

# **Introductory Message**

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.



## ***What I Need to Know***

This module will cover the types of orchard farm, trees appropriate for orchard gardening based on location, climate and market demands, proper way of planting or propagating trees and fruit-bearing trees (Cutting, Budding, Marcotting & Grafting), sources for fruit-bearing trees and how to care for seedlings.

After going through this module, you are expected to conduct a survey to identify:

1. types of orchard farm;
2. trees appropriate for orchard gardening based on location, climate and market demands;
3. proper way of planting or propagating trees and fruit-bearing trees (Cutting, Budding, Marcotting and Grafting);
4. sources of fruit-bearing trees; and
5. how to care for seedlings



## ***What I Know***

Directions: In this activity, you are asked to answer the following statements by putting a check ( ✓ ) if you **AGREE** and cross (X) if you **DON'T AGREE** before the given item number. Write your answer in a separate sheet of paper.

- \_\_\_ 1. Seed Orchard is where nut trees are grown for a massive production of nut.
- \_\_\_ 2. Mango, Lanzones, Marang, Rambutan, Chico and Guyabano are fruit trees grown for the purpose of nut production.
- \_\_\_ 3. Most of the people prefer to plant fruit-bearing trees on the cold weather place.
- \_\_\_ 4. Citrus fruit like lemon, pomelo, and mandarin has high market demands and it is best grown in orchard garden.
- \_\_\_ 5. Plant propagation is a method of reproducing, increasing or multiplying plant species.
- \_\_\_ 6. Sexual reproduction involves taking a part of one parent plant and causing it to regenerate itself into a new one.
- \_\_\_ 7. Agricultural Institution is considered as one of the sources of fruit – bearing trees and managed by private individuals. It usually offers landscaping services including the materials needed.
- \_\_\_ 8. Department of Agriculture is responsible for any agricultural activities in terms of producing seeds of vegetable and fruit for planting.
- \_\_\_ 9. Application of fungicide to seedlings in order to avoid infestation is one way to care for it.
- \_\_\_ 10. Seedlings should be allowed to grow preferably in a partially shaded area.



*A picture of Rambutan Plantation taken by Dolores C. Parcon at Barangay. Carabalan, Himamaylan City, Negros Occidental*

Investing in the establishment of an orchard needs thorough planning. You should be knowledgeable on how to provide care and maintenance for your trees and your orchard. Choosing the varieties, construction of plant nursery, planting system to use and having the right location are some of the factors to ensure a higher production.

---

<sup>1</sup> Dolores C. Parcon, Rambutan Plantation, August 17, 2019



## What's In

Directions: From the given puzzle, find the word or words being described by the statements below it. Please write your answer in separate sheet of paper.

P	O	M	E	L	O	F	Q	M
L	R	A	M	C	R	R	C	A
A	C	N	A	O	A	U	H	N
N	H	D	R	C	N	I	I	G
T	A	A	A	O	G	T	C	O
T	R	R	N	N	E	E	O	S
R	D	I	G	U	S	A	L	L
E	O	N	U	T	T	R	E	E
E	L	A	N	Z	O	N	E	S
S	T	R	O	P	I	C	A	L

1. a piece land devoted to the cultivation of fruit or nut trees;  
O \_\_\_\_ H \_\_\_\_ D
2. citrus fruits that have high market demands and best grown in orchard garden; \_\_\_\_ R A \_\_\_\_ G \_\_\_\_
3. a kind of fruit-bearing tree planted as additional income of the family;  
\_\_\_\_ G \_\_\_\_
4. fruit product planted in your garden or farm that is a good source of fresh juice; \_\_\_\_ C \_\_\_\_ U \_\_\_\_
5. global movement to save Mother Earth; P \_\_\_\_ N \_\_\_\_ T \_\_\_\_ E S
6. the climate we have in our country; T \_\_\_\_ O \_\_\_\_ C \_\_\_\_ L





## ***What's New***

### **“JACKFRUIT SEEDS”**

One Saturday morning, Ana's best friend, Bea, went to their home to do their project in TLE. She introduced Bea first to her mother. After this, Ana's mother named Elsa prepared sandwiches for a snack while Ana was helping her. As they were busy preparing in the kitchen Ana smelled something. It was the ripe jackfruit wrapped in the sack under the table. Ana couldn't wait to eat as she smelled the ripe jackfruit. When her mother permitted her, she then took a knife and sliced it. She made four slices and spared one slice for Bea. The rest of the slices were shared with her siblings. Ana went to their small sala with a slice of jackfruit to be shared with her classmate, but Bea refused to take it because she was eating a sandwich, so Ana got a piece of jackfruit. While they were eating Ana has noticed that the seeds of jackfruit on her hand were cracked and the roots were sprouted. Then, she got another one and continued eating but the same things happened. Bea also tried to pick one piece but the seed she got was different from Ana. It was a healthy seed. After their snacks, Ana and Bea cleaned the table to start doing their project.

When Bea left after they were done with their project, Ana threw the jackfruit peel and she buried the healthy seeds on the potted plant. After three weeks she was amazed that the seeds she buried have started to germinate.

Ana prepared a space for transplanting the seedlings. She chose a shed or partially shaded place for seedlings. The seedlings grew healthy because she watered it every day. Ana had a new friend to be taken care of and protected to grow and bear more fruits, these were the “Jackfruit seedling”.

From the story you have read, answer the following questions to better understand the content of this module as we go along:

1. What did Ana do with the healthy jackfruit seed after eating the fruit?
2. After a couple of weeks, what was Ana had observed with the jackfruit seed?
3. What method of planting did Ana do with the seed?
4. How did Ana care for her jackfruit seedling?
5. What do you think is the method of propagating trees is being told in the short story?
6. What type of Orchard Farm do you consider jackfruit seedlings are suited to be planted?



## ***What is It***

At this time, you are going to study deeper the lessons included in this module. You are going to learn the following:

1. types of orchard farm;
2. trees that are appropriate for orchard gardening based on location, climate and market demands;
3. proper way of planting or propagating trees and fruit-bearing trees (Budding, marcotting and grafting);
4. sources of fruit-bearing trees; and
5. how to care for seedlings

### **I. Types of Orchard Farm**

Type of Orchard	Description	Planted Trees
1. Fruit Orchard	A farm where trees are planted for the purpose of fruit production	Seasonal fruit-trees like: Lanzones, Mango, Santol Marang, Avocado, Chico, Mangosteen, Rambutan, Guyabano, Jackfruit, Durian etc.
2. Nut Orchard	Planted in this farm are nut trees for massive production of nuts	Trees planted are: Coconut, Pili Nuts, Cashew Nuts etc.
3. Seed Orchard	An intensively- managed or maintained plantation of trees to produce genetically improved seeds resulting in mass production	Most popular seeds that are produced are coffee and cacao. Also, Woody plants that are needed to produce lumber & other wood by-products

### **II. Trees appropriate for orchard gardening based on the location, climate, and market demands.**

In putting-up an orchard, some important factors are to be considered such as location, climate and market demands. Some trees tend to grow well on wet season while others are on dry season. The location or topography of the land is also important whether it is a plain, slope, hillside or mountainous area. Market demands for fruits and other trees by – products play a vital role in deciding what trees are to be planted.

The table below shows the trees appropriate for orchard gardening based on the identified factors:

Factors to Consider in Planting Trees	
1. Location	Trees Appropriate for Orchard Gardening
1.1 Plain	Citrus Fruits, Mango, Duhat, Rambutan
1.2 Slope	Mango, Coconut, Cashew, Jackfruit
1.3 Hillside	Pili Nut, Mango, Coconut, Lanzones, Santol
2. Climate	Trees Appropriate for Orchard Gardening
2.1 Dry Season	Cashew, Guava, Makopa, Jackfruit, Chico
2.2 Wet Season	Durian, Duhat, Mango, Santol, Lanzones, Rambutan
3. Market Demands	Trees Appropriate for Orchard Gardening
3.1 Year - round	Coconut, Mango, Citrus, Duhat
3.2 Seasonal	Jackfruit, Guava, Avocado, Tar Apple, Santol, Rambutan

### III. Proper Way of Planting or Propagating Trees and Fruit-Bearing Trees

Planting trees need the skill on how to increase the number of species and spreading or maintaining such species for them to multiply. This process is called *plant propagation*. It is both an art and science: requiring knowledge, skill, and experience for success.

Sexual and asexual plant propagation are the two general methods of multiplying plant species. Sexual plant propagation has two types, the direct and indirect planting while asexual plant propagation has the following type: cutting, marcotting, budding, and grafting.

**A. Sexual Plant Propagation** is a way of multiplying plant species by seeds through pollination and fertilization of the parents' genetic materials. This involves the floral parts of the plant to create an offspring different from each parent plant.

*Seed germination of a dicot seedling*



Illustration done by: Learesa G. Amban

### A.1 Two Methods of Sexual Plant Propagation

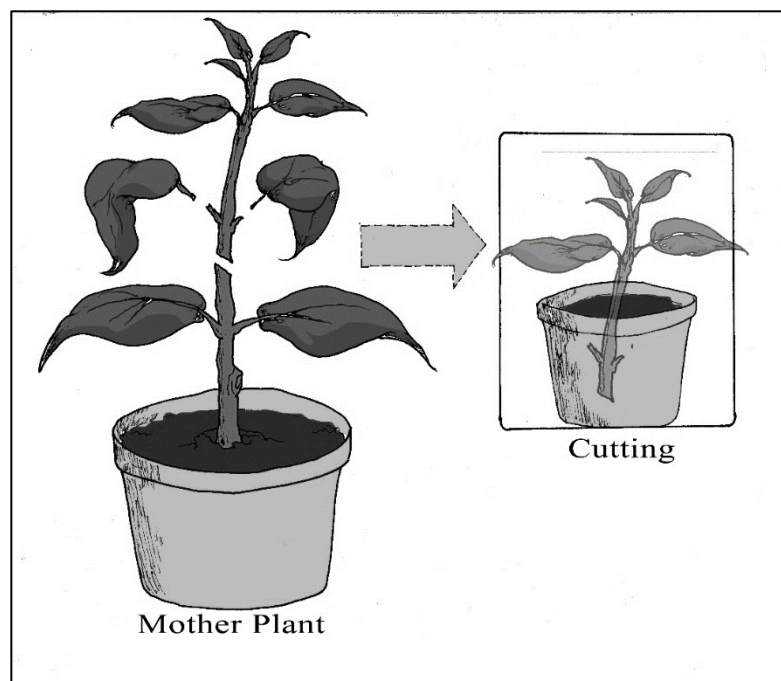
- a. **Direct Planting** is a method of planting where the seeds or parts of a plant are directly planted in the soil where it will germinate and grow.
- b. **Indirect Planting** is a method of planting where seeds are allowed to germinate in the seed box or tray before transplanting to its final location to grow.

**A. Asexual Plant Propagation** is the process of taking vegetative part of a desirable plant to produce new plants from these tissues. Asexual propagation permits cloning of plants of which the resulting plants are genetically identical to the parent plant. The major methods of asexual propagation are cutting, marcotting, grafting and budding.

### B.1 Types of Asexual Plant Propagation of Trees and Fruit-Bearing Trees

#### a. Cutting

Cutting propagation is growing a plant from a stem or root that has been cut from another plant. This is the simplest way of multiplying plant species that are used in ornamental landscaping. Example of fruit-tree that can be planted by cutting is Siniguelas.

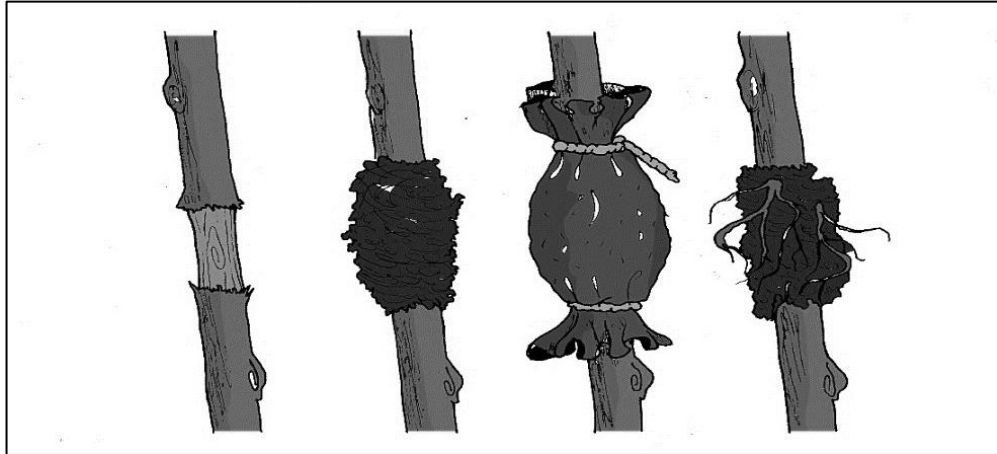


*Illustration done by: Learesa G. Amban*

### **b. Marcotting**

An asexual method of propagating plants by rooting a part of the stem while still attached to the parent plant is called marcotting.

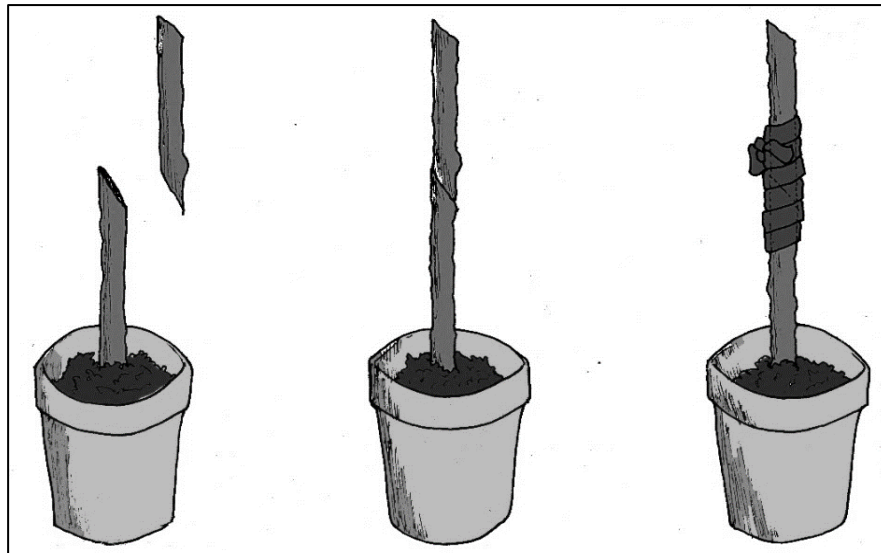
Example: Rambutan, Lanzones, and Santol.



### **c. Grafting**

Grafting is the process of getting the bud or scion of one plant to be placed into or on a stem, a root, or a branch of another plant (rootstock) to form a union of two partner plants that will continue to grow. The part where the roots are found is the stock while the added portion is the scion.

Example: Mango, Guava, Santol, Chico, Rambutan, Makopa, Durian and Lanzones.



*All Illustrations done by: Learesa G. Amban*

#### d. Budding

Budding is the union of one bud and a small piece of bark from the scion with a rootstock. A method which a patch of bark with a bud is inserted into a similar dispatched root stock. Example: citrus family like Pomelo, Calamansi, and Dalandan.

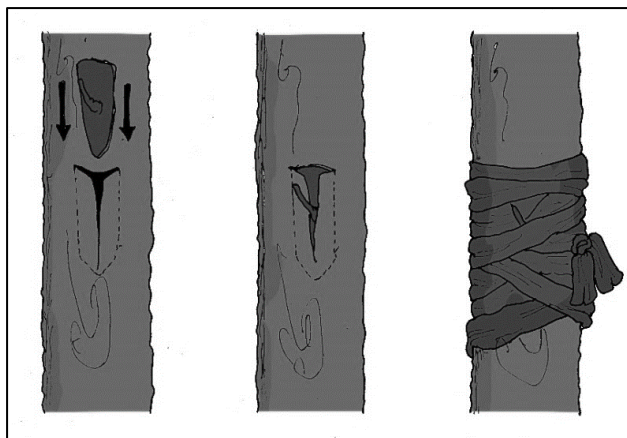


Illustration done by: Learesa G. Amban

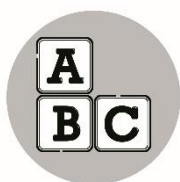
#### B. Sources for Fruit-bearing Trees

Fruit-bearing trees are available and sold as seedlings ready to be transplanted to farm growers or individuals who are tree planting lovers. Among their sources are

Sources of Fruit-bearing Trees	Description
Orchard Nursery	A wide plantation of fruit trees/nut trees for food production
School Nursery	Provides variety of seedlings of fruit trees for pupils' practical training in school.
Commercial Nursery	An area where plants grown for transplanting, use as stocks for budding, grafting for sale.
Community	Provide variety fruit tree seedlings situated within the barangay
Department of Agriculture (Bureau of Plant Industry)	Provide bearing tree seedlings, vegetable seeds, leaflets and other printed materials that would help fruit tree growers, organic pesticides and fertilizers. Conduct seminars and tutorials.

#### C. Caring of Fruit Tree Seedlings

- Water the sown seeds thoroughly. It is important to keep the soil moist to speed up the germination process.
- Grow the seedlings preferably in a propagating shed or a partially shaded area.
- Apply fungicide to avoid infestation. This can be done once a week. Mix the fungicide with water in a proportion of two tablespoons to a gallon or as directed in the label of the bottle.
- Remove the grass or weeds around the base and cultivate the soil around the base. The size of cultivation should match the tip of the branches of the tree.



## What's More

### Independent Activity 1

Conduct a survey to complete the table by filling out name of fruit trees and type of orchard.

Production focused on	Name of Fruit trees	Type of Orchard
Growing fruit trees		
Growing nut trees		
Growing genetically improved seeds to create woody plants		

### Independent Assessment 1

Based on your survey, answer the following questions. Then write it on your answer sheet.

1. What type of orchard farm does Rambutan, Durian, Lanzones, Jackfruit and Guyabano are commonly grown?
2. For what reason seeds have been managed intentionally in an orchard?
3. What groups of trees are usually grown in a nut orchard?
4. Where do genetically improved seeds resulting in mass production usually found in?
5. What type of orchard in which Pili nut, coconut, cashews are commonly grown?

### Independent Activity 2

Conduct a survey how fruit-trees are propagated or planted in your community and fill-in the needed information below to complete the table.

Types of Asexual Propagation of fruit bearing trees as observed in the community	Description of the type of Asexual Propagation used	Example of fruit-trees grown using the type of asexual propagation as observed

## Independent Assessment 2

Based on your survey, answer the following questions. Then write it on your answer sheet.

1. What type of asexual propagation does calamansi commonly used?
2. A process where a stem is inducted to develop roots while it is still growing on the mother plant.
3. Aside from seed germination, Siniguelas fruit can be propagated through what type of asexual propagation?

Grafting is the act of placing a portion of one plant into or on a stem, root or branch of another plant in such a way that a union will be formed while the partners continue to grow.

4. & 5. What do you call the part of the combination that provides the roots and the added piece?

## Independent Activity 3

In this activity, you are tasked to conduct a survey of sources of fruit-bearing trees that are planted in your community. Ask the farmer/owner where they got the fruit-bearing tree (source), number of seedlings taken or bought and what seed or seedling is it. Gathered data are to be used in completing the table below.

Sources of fruit bearing trees	No. of Seedlings Taken/Bought	Name of fruit seeds/seedlings

## Independent Assessment 3

Based on your survey, answer the following questions. Then write it on your answer sheet.

1. What are the possible sources of fruit bearing trees where you can take or buy your plant seedlings?
2. It is considered as a source that provides variety of fruit tree seedlings situated within the barangay
3. What variety of fruit trees does a school nursery may offer?
4. An area where plants grow for transplanting, use as stocks for budding, grafting for sale and has the second highest number of seedlings taken/bought is called \_\_\_\_\_.
5. What do tree seedlings provide in an Orchard nursery?





## ***What I Have Learned***

- Orchard farm has three types namely: \_\_\_\_\_, \_\_\_\_\_ & \_\_\_\_\_.
- In putting up an orchard, we must also consider some important factors such as \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.  
Some trees tend to grow well on \_\_\_\_\_ location while others on a \_\_\_\_\_ area. The topography of the land has also to be considered whether in a \_\_\_\_\_, \_\_\_\_\_ or \_\_\_\_\_ area. The \_\_\_\_\_ for some fruits may also be considered so that the ease or marketing will be guaranteed.
- \_\_\_\_\_ is the process of multiplying the number of species, perpetuating species or maintaining the youthfulness of a plant.
- The reproduction of plants by seeds. The genetic material of two parents is combined by pollination and fertilization to create offspring that are different from each parent it is called \_\_\_\_\_.
- The two methods of planting are the: \_\_\_\_\_ and \_\_\_\_\_.
- \_\_\_\_\_ is a method of planting where the seeds or parts of a plant are directly planted in the soil where it will germinate and grow. Example of which are Chico, Guyabano, Rambutan, Avocado and the like.
- Seeds grow first in the seed box or tray before transplanting. Most common seeds for this method of planting are woody trees, it is called \_\_\_\_\_.
- \_\_\_\_\_ is the process of taking vegetative part of a desirable plant and reproducing new plants from these tissues.
- The types of asexual plant propagation of trees and fruit bearing trees are: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, & \_\_\_\_\_.
- \_\_\_\_\_ is growing a plant from a stem or root that has been cut from another plant.
- A process where a stem is inducted to develop roots while it is still growing on the mother plant called \_\_\_\_\_.
- \_\_\_\_\_ is the act of placing a portion of one plant (bud or scion) into or on a stem, root, or branch of another plant in such a way that a union will be formed and the partners will continue to grow. The part of the combination that provides the root is called the \_\_\_\_\_; the added piece is called the \_\_\_\_\_.
- \_\_\_\_\_ is the union of one bud and a small piece of bark from the scion with a rootstock. A method which a patch of bark with a bud is inserted into a similar dispatched root stock.
- The sources of fruit- bearing trees are: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ & \_\_\_\_\_.
- What are the factors to be considered in caring of fruit tree seedling?



## ***What I Can Do***

Conduct a survey in your locality to identify the fruit trees suited for Orchard gardening based on climate, location and market demands. Use survey form to gather data.

<b>CLIMATE</b>	
<b>Trees suited during Dry Season</b>	<b>Trees suited during Wet Season</b>

<b>LOCATION</b>		
<b>Trees planted on Hill Side</b>	<b>Trees planted on Slope Areas</b>	<b>Trees planted on Plain Areas</b>

<b>MARKET DEMANDS</b>	
<b>Trees Grown Year-Round</b>	<b>Trees Grown on Seasonal</b>



## **Assessment**

Choose the letter of the correct answer then write it on your answer sheet.

1. Which type of orchard farm does Rambutan, Lanzones, Durian and Kamunsil are commonly grown?
  - a. fruit orchard
  - b. nut orchard
  - c. seed orchard
  - d. tree orchard
2. To care for the fruit trees seedling, we should do the following except one.
  - a. Grow the seedlings preferably in a partially shaded area.
  - b. Remove the grass or weeds around the base and cultivate the soil.
  - c. Water the sown seeds thoroughly.
  - d. Use chemical pesticides.
3. What group of fruits are usually grown in a nut orchard?
  - a. Cashew, Coconut, Pili nut
  - b. Guava, Peanut, Pili nut
  - c. Jackfruit, Lanzones, Santol
  - d. Rambutan, Mango, Coconut
4. Seed should have been managed or maintained in seed orchard for what reason?
  - a. to improve seeds
  - b. to gain more profit
  - c. for mass production
  - d. all the above
5. A plant propagation which the reproduction of plants is done through seeds germination.
  - a. asexual propagation
  - b. plant propagation
  - c. sexual propagation
  - d. none of the above

6. It is a process where a stem is inducted to develop roots while it is still growing on the mother plant.
  - a. budding
  - b. cutting
  - c. grafting
  - d. marcotting
7. Young fruit-bearing trees can come from many sources which among these sources is not included.
  - a. Agricultural Institution
  - b. Commercial Nursery
  - c. Department of Agriculture
  - d. Fishery Industry
8. A method of planting where the seeds or parts of a plant are directly planted in the soil where it will germinate and grow.
  - a. direct planting
  - b. indirect planting
  - c. layering
  - d. marcotting
9. A school that offers a course related to agriculture and other plant study is called \_\_\_\_\_.
  - a. Agricultural Institution
  - b. Commercial Nursery
  - c. Department of Agriculture
  - d. Fishery Industry
10. In putting up an orchard, we must also consider some important factors. Which of the following factors is not included?
  - a. climate
  - b. location/topography
  - c. market demands
  - d. plant propagation



## ***Additional Activities***

Read the following situations carefully and give the correct answer. Write your answers in a piece of paper.

\_\_\_\_\_ 1. Mr. Campaner prepares the needed materials like fiber of coconut husk or dried moss, loam soil and plastic wrap. What way of plant propagation will he use for his Chico and Rambutan trees?

\_\_\_\_\_ 2. The Agriculturist has a plastic wrapper, a stem cutting and a knife to make a t-shaped slit on the stem of one plant and a V-shaped edge stem of another plant. What way of plant propagation will he use for his Mango tree?

\_\_\_\_\_ 3. My elder brother propagates citrus fruit like Calamansi and Pomelo. He takes the bud of calamansi and pomelo tree as material for the activity. What way of plant propagation will he use?

\_\_\_\_\_ 4. Mang Ben has a tall and productive Siniguelas at their backyard, during peak season, he found it hard to harvest due to its breakable branches. He decided to cut those unreachable branches, took the leaves and plant directly to the soil. What plant propagation did Mang Ben do?



## Answer Key

<p><b>Assessment</b></p> <p>1. A 2. D 3. A 4. D 5. C 6. D 7. D 8. A 9. A 10. D</p>	<p><b>What I know</b></p> <p>1. X 2. X 3. ✓ 4. ✓ 5. ✓ 6. X 7. X 8. ✓ 9. ✓ 10. ✓</p> <p><b>What's In</b></p> <p>1. Orchard 2. Oranges 3. Mango 4. Coconut 5. Plant Trees 6. Tropical</p>	<p><b>What's More</b></p> <p>Assessment # 1</p> <p>1. Fruit Orchard 2. For mass production 3. Pill Nut, Coconut, and cashew 4. Seed orchard 5. Nut orchard</p> <p>Assessment # 2</p> <p>1. Budding 2. Marcotting 3. Cutting 4. Stock 5. Scion</p> <p>Assessment # 3</p> <p>(Answers may defer depending on the result of the survey conducted)</p>
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**For inquiries or feedback, please write or call:**

Department of Education - Bureau of Learning Resources (DepEd-BLR)

Ground Floor, Bonifacio Bldg., DepEd Complex  
Meralco Avenue, Pasig City, Philippines 1600

Telefax: (632) 8634-1072; 8634-1054; 8631-4985

Email Address: [blr.lrqad@deped.gov.ph](mailto:blr.lrqad@deped.gov.ph) \* [blr.lrpd@deped.gov.ph](mailto:blr.lrpd@deped.gov.ph)