The Children’s Participation in Integrated Production and Pest Management (CP IPPM) Program

World Education (INGO) Philippines, Inc.
World Education-Philippines’ involvement in education and literacy work in the Philippines started in 1988 under the five-year, UNICEF-funded Area Based Child Survival and Development (ABCSD) project. From thereon it has developed, implemented and sustained a number of major national projects.

For many years World Education has initiated and sustained projects in Integrated Production and Pest Management, has established field schools, has created instructional materials, and has provided extensive training of trainers. Since 2001, under the auspices of the Royal Netherlands Embassy and in partnership with the Department of Education Bureau of Elementary Education and Bureau of Secondary Education, World Education has managed a national project in Integrated Production and Pest Management (IPPM) in selected elementary and secondary schools in three provinces: Antique, Camarines Sur, and Davao del Norte.

Within the purview of the CP IPPM Project, a series of training and learning instruments were developed and published by World Education (INGO) Philippines, Inc. to support the implementation of its literacy and educational programs. One of these resource books is the "CURRICULUM GUIDE." This guide is a compilation of all the output of program implementers during the pilot testing of the project. The curriculum guide contains the competencies, objectives, lesson plans, and assessment instruments that can be used in integrating rice and vegetable production in the basic education curriculum. This was developed primarily as a reference for the IPPM facilitators and is intended as supplementary material to facilitate learning in the SFS/FS.

I hope that this resource book will be a useful guide to students and educators alike and will help make basic education more responsive to the needs of the learners.

David Kahler
Vice President
World Education, Inc.
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- The Royal Netherlands Embassy for the financial grant they have provided to develop and publish this resource book;

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The Children’s Participation in Integrated Production and Pest Management (CP IPPM) Program is a project of World Education (INGO) Philippines, Inc. in collaboration with the Department of Education and other institutions. This project aims to educate school children on environment-friendly approaches in rice and vegetable production while they learn scientific inquiry and lifelong learning skills. The project advocates the School Field School (SFS) Approach in teaching knowledge, skills, values and desirable attitudes in rice and vegetable production using the field as the laboratory of learning.

The CP IPPM Program was managed and pilot tested by World Education in three provinces in the Philippines namely Camarines Sur (Luzon), Antique (Visayas) and in Davao Del Norte (Mindanao). Pilot testing ran from December 2001 to March 2005. The results of the pilot testing reveal that local government, school administrators, teachers, students, and parents warmly accepted the project. The project was also found significant in making the Filipino children nurture and protect their natural resources for their own future. It was also viewed as a good prospect in improving the economic condition of Filipino families particularly those living in agricultural areas. Thus, to benefit a greater number of Filipinos, the CP IPPM competencies and objectives have been recommended for integration in the Basic Education Curriculum through its partner institution the Department of Education.

To facilitate the smooth implementation of the project, World Education prepared this Curriculum Guide, which compiles all the output of program implementers during the pilot testing. The curriculum guide contains the competencies, objectives, lesson plans, and assessment instruments that can be used to integrate rice and vegetable production in the basic education curriculum.

Chapter 1 provides background information about the CP IPPM program, while Chapter 2 contains the competencies and objectives pertaining to rice and vegetable production. Chapter 3 shows the suggested budget of work for the topics in the CP IPPM Curriculum, which is based on the different stages in crop production. Chapter 4 shows sample lesson plans that teachers could use as guide in teaching the objectives relevant to rice and vegetable production. Chapter 5 shows the suggested methods of assessment for the CP IPPM objectives, which include the use of ballot box, an authentic pen-and-paper test and the use of alternative assessment methods such as performance-based and portfolio assessment complete with suggested grading system. The last part, Chapter 6 provides strategies of integrating CP IPPM in other subject areas.
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CHAPTER 1
The CP IPPM Program

1.1. Preamble

The Children's Participation in Integrated Production and Pest Management (CP IPPM) Program, with funding support from the Netherlands Government, is a collaborative project between the World Education (INGO) Philippines, Inc. and other institutions namely: Department of Education (DepEd), Local Government Units (LGUs) and Non-Government Organizations (NGOs). The program aims to provide rural youth in the Philippines, through School Field Schools (SFS), with both environmental knowledge and appropriate skills that will contribute to a safer environment, develop sustainable agriculture and increase rural livelihood. Within the framework of the program, teachers, students and the community in general work together toward the objective of greater local ownership of meaningful education. The CP IPPM program is a 3.5-year project that commenced in December 2001 and will run up to March 2005.

1.2. Project Goals and Objectives

Project Goals

- Promote and improve more sustainable agricultural practices that lead to increased standard of living for people in rural areas
- Enhance environmental stewardship
- Improve health standards in rural areas
- Integrate the CP IPPM SFS curriculum in the DepEd Basic Education Curriculum
- Address the specific employability needs of rural youth

Project Objectives

- Promote environmental awareness and transfer practical skills that lead to better environmental management, improved farming practices and increased food security.
- Reform educational delivery including pedagogy and school governance.
1.3. Institutional Arrangements

Inter-Agency collaboration is strongly pursued as the core of the overall project implementation. World Education (INGO) Philippines, Inc., being the lead organization in the implementation of the project, will work closely with the Department of Education (DepEd) Central Office, its different Divisions of City Schools and Districts, and the local partner NGOs to ensure not only the timely and efficient implementation of the program, but also the integral part of the sustaining and expanding the program. Implementation teams are organized at different levels: e.g., the Program Steering Committee at the national level; the Division Management Team at the provincial level, the District Implementation Team at the municipal level and finally the IPPM Field School Implementation Team to encourage active participation of the different agencies involved and to ensure sustainability of the program.

1.4. Project Sites

The Children's Participation in IPPM Program is being pilot tested in three pilot provinces - Camarines Sur, Antique and Davao del Norte. These provinces were selected based on the following criteria:

- Has previously been an IPM FFS project site
- With an experienced core team of IPM Trainers
- Strong support of DA, LGU and DepEd officials
- Presence of participating schools within rice growing community
- Availability of credible NGO partners

1.5. Target Beneficiaries

The project is implemented with Grades 5 and 6 pupils and 1st and 2nd year students of the participating elementary and secondary schools. For the entire duration of the program (2001-2005), a total number of 6,150 elementary pupils and high school students have been trained in IPPM, and eighteen elementary and six secondary school teachers have developed skills for conducting IPPM SFS

1.6. The Learning Process in IPPM

The School Field School (SFS)

The Children's Participation in IPPM Program is implemented through a learning activity known as the School Field School (SFS). This training approach is characterized by a training strategy achieved through direct training in season-long School Field School (SFS). The SFS brings pupils/students together to carry out an intensive training on IPPM methods and issues over the life cycle of the crop. Teachers, IPM trainers from LGU and NGO facilitate the learning activities in an SFS.
The IPPM SFS curriculum integrated in the Basic Education Curriculum and the instructional materials package were developed and utilized during the 1st cycle (June-October 2002) SFS. The curriculum and materials package will undergo a series of field-testing, review and validation during the remaining three cycles of IPPM SFS of the program.

Each field school meets once a week for 16-18 weeks. This duration typically covers the growing season for a crop so that learners have the opportunity to observe a crop in each growth stage. The following are the main activities in an SFS for specific days.

1.7. Major Program Components

For sustainability of an innovative and robust program, CP IPPM Program implementation is anchored in following components. These will further be discussed in the next chapter.

- Development of Innovative CP IPPM Curriculum
- Project Benefit Monitoring & Evaluation System
- Social Mobilization and Advocacy
- Inter-Agency Collaboration

1.8. The Basic Education Curriculum (BEC) of the Department of Education (DepEd)

Philosophy of the 2002 Curriculum

- Empowerment of learners who are competent in learning how to learn and have life skills so that students become self-developed persons who are makabayan (patriotic), makatao (mindful of humanity), makakalikasan (respectful of nature), and maka-Diyos (godly).
- Attainment of functional literacy among Filipino learners.
- Development of multiple intelligences among learners.

Curriculum is an interactive and collaborative one. Hence, it is based on the principle that there are two main sources of reliable and meaningful knowledge for contemporary basic education: expert systems of knowledge and the learner’s experience in his/her context.

In such a curriculum, the teacher is not the authoritarian instructor but a facilitator or manager of the learning process. Thus, the teacher helps students to learn not primarily the answers but the processes on how to reflect, how to identify and discuss problems, and how, on their initiative, find valid answers to various problems.

Every teacher of the 2002 curriculum is a values educator; s/he can identify and contextualize the values inherent in her/his discipline, and serves as a role model of the learners.
Features of the Restructured Curriculum

The following are the main features of the 2002 Basic Education Curriculum for elementary and secondary education:

- Restructuring of learning areas to five (Filipino, English, Science, Mathematics, and Makabayan).
- Stronger integration of competencies and values within and across the learning areas.
- Greater emphasis on the learning process and integrative modes of teaching
- Increased time for tasks to gain mastery of competencies of the basic tool subjects.

1.9. The IPPM and the BEC

The CP IPPM program is being integrated in the Makabayan subject in the participating elementary and secondary schools in the three provinces. The IPPM curriculum complements and supports the learning of basic subjects as experienced by teachers as well as children during the 1st cycle implementation of the program (June to October 2002). The following are features of the IPPM curriculum that uphold the philosophy of the BEC 2002:

- Empower and develop among learners life skills
- Enhance facilitating skills of teachers as values educator.
- Promote a learning process that basically integrates all subject areas and at the same time reinforces the learning experiences of learners.
CHAPTER 2
The CP IPPM Learning Competencies

The development of CP IPPM competencies and objectives was anchored on five important learning principles. These principles are as follows:

1. **The field is the primary source of information about crop production.** There is so much information that students could gain from actually seeing in the actual field the things they read in books or hear from the teacher’s lectures on crop production.

2. **Learning is more effective if students are immersed in the field, which serves as the laboratory for learning.** Actual immersion and participation in crop production activities results to deeper learning. As the Old Chinese adage says, to hear is to forget, to see is to remember, but to do is to understand.

3. **Decision making skill is necessary to participate in making crop management decisions.** Students’ decision-making skills should be developed as early as possible since this is a lifelong learning skill that can be applied not only in the classroom but also in many real-life situations.

4. **Learning crop production should take place during the cropping season.** Learning the technical know-how in crop production should take place during the actual cropping season so that the students could concretize the ideas they learned.

5. **The curriculum should be tailored-fit to the local conditions.** A good curriculum is relevant and responsive to the needs and concerns of the students, their families, and their community.
2.1. CP IPPM Learning Competencies on Rice Production

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<td>Demonstrate knowledge, understanding, interest, and interpersonal skills in the CP IPPM program.</td>
<td>1. Explain how the CP IPPM Program started&lt;br&gt;2. Discuss the CP IPPM program’s components, vision, mission, goals and objectives&lt;br&gt;3. Give the importance of the CP IPPM program to the learners, parents, teachers, farmers, and other stakeholders&lt;br&gt;4. Express one’s willingness to participate in the program&lt;br&gt;5. State one’s expectations from participating in the program&lt;br&gt;6. Formulate guidelines and standards to follow when participating in the program&lt;br&gt;7. Accept individual differences of the members of the group&lt;br&gt;8. Perform one’s role/responsibility in any group work **&lt;br&gt;9. State the importance of teamwork in group activities</td>
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<td>Flyer of the CP IPPM Program&lt;br&gt;Mind map&lt;br&gt;A statement of one’s expectations from the program&lt;br&gt;Results of the pretest&lt;br&gt;Set of norms for the students in the CP IPPM Program&lt;br&gt;List of the members of the group, their personal data, and a few descriptions of their interests, hobbies, etc.</td>
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<td>Simple Scientific Researches in the CP IPPM Program</td>
<td>Demonstrate knowledge, skills, and desirable attitudes in conducting a simple research related to the topics in the CP IPPM Curriculum, which is a vehicle in understanding effective production and management of crops.</td>
<td>1. Explain the importance of conducting research in the CP IPPM Program.&lt;br&gt;2. Explain each step in the research process&lt;br&gt;3. Conduct a research survey to determine the farming practices in the community. **&lt;br&gt;4. Plan a research investigating the effects of any of the following variables on the growth of rice: insects, weeds, mollusks, predators, defoliators, rodents, spiders, plant diseases/pathogens, soil structure, soil fertility, others&lt;br&gt;5. Formulate questions for investigations.&lt;br&gt;6. Gather data to answer the research problems e.g. conducting research survey, observation, experimentation using insect</td>
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<td>Seed selection and testing</td>
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<td>Illustrating the parts of the seed with description of their functions.</td>
<td>Illustration of a rice seed with its parts and their functions</td>
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- Organize data gathered
- Analyze the data gathered
- Interpret data gathered
- Draw conclusions based on the data gathered
- Suggest recommendations appropriate to the given conclusions
- Utilize research results for effective and increased rice production

1. Identify the provinces that are major producers of rice in the Philippines
2. Describe the status of rice production in the Philippines
3. Explain the importance of rice to humans, animals, and industries
4. Analyze the rate of production vis-à-vis the rate of consumption of the population
5. Infer that rice production is a good prospect in improving the economic condition of the Philippines

6. Identify the components of the soil system
7. Name the different types of soil
8. Describe the different types of soil according to color, texture, structure, composition and water holding capacity
9. Describe the soil type that is best for rice production
10. Practice precautionary measures when conducting experiments on soil properties **
11. Explain the procedures in determining soil properties.
12. Perform an experiment in determining soil properties, e.g., soil texture, soil composition, water holding capacity, fertilizer requirement **
13. Explain the importance of knowing the qualities of soil in rice production
14. Suggest ways to improve the condition of soil for better rice production

1. Name the parts of a seed
2. Give the function/s of each part of a seed
3. Identify the characteristics of a good seed
4. Select good rice seeds
5. Explain seed dormancy and viability
6. Describe the different methods in testing seed viability e.g. rag doll, seedbed and seed box
7. Perform the methods in testing seed viability **
8. Compute the percentage of germination
9. Determine the adjusted amount of seeds/new seeding rate (NSR)

1. Illustrating the parts of the seed with description of their functions.
2. Examining/selecting good rice seeds
3. Performing any of the methods in testing seed viability.
4. Result of the computation
5. Experiment report with emphasis on the result of the computation*
| Crop Morphology | Acquire knowledge and understanding on rice morphology | 1. Define morphology  
2. Observe the parts of the plant at different stages**  
3. Describe the parts of rice at different stages  
4. Give the function of each part of the plant at different stages | Illustrating the parts of a rice plant in all stages and their functions  
Conducting field observation | Drawing of the different stages of development of rice plant* |
| Seedbed preparation and Seed Sowing | Demonstrate knowledge, skills, and interest in seedling preparation, care, and management | 1. Enumerate the steps in seedbed preparation  
2. Perform the actual seedbed preparation **  
3. Explain the importance of seedbed preparation  
4. Explain the importance of soil treatment  
5. Discuss the different soil treatments  
   - Hot water treatment  
   - Roasting  
   - Solarization  
   - Burning of rice hulls, rice straws, cut grasses & dried leaves  
6. Perform the different soil treatments **  
7. Explain the importance of seed sowing  
8. Differentiate broadcasting from drilling  
9. Perform seed sowing **  
10. Discuss the ways of caring seedlings e.g. pricking, thinning, roguing, and hardening  
11. Perform the different ways of caring seedlings**  
12. Observe precautionary measures in seed bed preparation, soil treatment and care of seedlings** | Preparing a Seedbed  
Using different soil treatment practices  
Sowing seeds | Reflections in performing seedbed preparation  
Pictures on seedbed preparation, soil treatment and seed sowing |
| Record Keeping | Demonstrate knowledge, skills, and appreciation in record keeping | 1. Identify farm records like farm inventory, production record, expense record, and cost-and- benefit analysis.  
2. Explain the use of the different farm records  
3. Keep accurate farm records**  
4. Analyze data from farm records  
5. Give the importance of record keeping | Filling up of farm records  
Keeping accurate farm records | A farm record showing cost-and-benefit analysis of rice production  
Insights on the value of record keeping* |
| Land Preparation for Rice Growing | Demonstrate knowledge, skills, and desirable attitude in land preparation for rice planting | 1. Identify the tools/equipments used in land preparation  
2. Explain the uses of each tool/equipment  
3. Use appropriate tools and equipment in land preparation for rice growing  
4. Follow the proper procedures/steps in actual land preparation  
5. Perform the actual land preparation  
7. Explain the importance of thorough land preparation in the control of weeds, insect pests and diseases. | Preparing the field for planting | Photos documenting the actual land preparation of students  
Reflections/insights of their experiences |
| Composting | Demonstrate understanding, skills, and desirable attitude in composting | 1. Give the importance of composting  
2. Identify the materials needed in composting  
3. Explain the steps in composting  
4. Observe precautionary measures while making a compost ** | Composting | Reflections/insights of one’s experiences in making a compost |
| Concept of Ecosystem and AESA | Demonstrate knowledge, skills, and appreciation of Agro-Ecological System Analysis (AESA), which is a vehicle in understanding a balanced ecosystem | 1. Discuss the meaning and importance of ecosystem  
2. Describe the components of an ecosystem  
3. Describe the level of interaction and relationship of the components of a balanced ecosystem  
4. Differentiate food chain from food web  
5. Give the meaning of AESA  
6. Explain the importance of AESA  
Perform the steps in AESA ** | Visiting the field to observe the ecosystem  
Conducting weekly AESA from 14 days after planting to 1 week before harvest | Concept map of the components of the ecosystem  
Illustration of the ecosystem  
Weekly report of AESA  
A summary of the AESA for the whole cropping season* |
| Weeds Management | Demonstrate knowledge and skills on weeds management | 1. Define weeds  
2. Identify weeds present in the rice field  
3. Classify weeds according to types  
4. Explain how weeds affect the growth of the plant  
5. Describe the methods in controlling weeds  
Use a specific method in controlling weeds in the ricefield ** | Collecting weeds | Scrapbook on weeds* |
| Fertilizer Management | Demonstrate knowledge, skills, and desirable attitudes on fertilizer management | 1. Define fertilizer  
2. Differentiate organic from inorganic fertilizers  
3. Classify fertilizers as organic and inorganic  
4. Give the advantages and disadvantages of organic and inorganic fertilizers  
5. Identify the macro- and micro-nutrients needed by the plants  
6. Give the functions of Nitrogen, Phosphorous and Potassium, (NPK) on the growth of the plant  
7. Identify NPK deficiency symptoms of the plant  
8. Use Soil Test Kit (STK) and Minus One Element Technique (MOET) for soil analysis **  
9. Utilize the results of soil analysis in determining the amount of fertilizer needed in a given area  
10. Demonstrate the different methods of fertilizer application **  
Observe proper timing of fertilizer application** | Collecting samples of organic and inorganic fertilizers used in rice production  
Collecting soil samples  
Computing fertilizer requirement of the soil  
Doing actual fertilizer application | Scrapbook of organic and inorganic fertilizers*  
Written report on the result of the experiment  
Written reflections on fertilizer management |
| Water Management | Demonstrate knowledge and skills on water management | 1. Define irrigation  
2. Give the importance of proper water management  
3. Compare the types of irrigation  
4. Perform the different types of irrigation **  
Identify the right time when rice plants need water | Performing actual irrigation | Pictures showing irrigation practices |
| Natural Enemies of Rice | Acquire knowledge, skills, and desirable attitudes on the biological control of pests | 1. Define biological control  
2. Define natural enemies  
3. Give the importance of natural enemies  
4. Identify Natural Enemies (NE) as to:  
  ● Predators  
  ● Parasitoids | Collecting insects  
Field walk | Insect collection  
Insights |
### Children’s Participation in IPPM Program, World Education (INGO) Philippines, Inc.

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<td>4. Illustrate the life cycle of insects present in the rice field</td>
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<td>Scrapbook of insects*</td>
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<td>Damage</td>
<td>5. Explain the life cycle of insects present in the rice field</td>
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<td>Control</td>
<td>6. Differentiate complete from incomplete metamorphosis</td>
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<td>7. Identify insects in the rice field that undergo complete and incomplete metamorphosis</td>
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<td>8. Classify beneficial and harmful insects</td>
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<td>9. Differentiate harmful from beneficial insects</td>
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<td>10. Explain how harmful insects damage the rice plant</td>
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<td>11. Suggest ways in controlling harmful insects</td>
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<td>12. Suggest ways in conserving beneficial insects</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Kuhol and Kuhol Management</th>
<th>Develop knowledge and understanding on the life cycle and management of mollusks in the rice field.</th>
<th>1. Describe mollusks</th>
<th>Illustration of life cycle of mollusks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Explain the life cycle of mollusks</td>
<td>2. Explain at what stage in the growth of a rice plant when mollusks are most damaging/destructive</td>
<td>Report of AESA #2</td>
</tr>
<tr>
<td></td>
<td>3. Identify at what stage in the growth of a rice plant when mollusks are most damaging/destructive</td>
<td>4. Suggest ways on how to control mollusks from damaging the rice plant</td>
<td>Illustration of mollusks</td>
</tr>
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<td>4. Suggest ways on how to control mollusks from damaging the rice plant</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Defoliators</th>
<th>Develop knowledge and understanding on defoliators as well as skills in managing them</th>
<th>1. Identify defoliators in the rice field</th>
<th>Conducting defoliation simulation study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Explain at what stage in the growth of a rice plant when defoliators are most damaging</td>
<td>2. Conduct simulation study on defoliation **</td>
<td>Results of the simulation study</td>
</tr>
<tr>
<td></td>
<td>3. Conduct simulation study on defoliation **</td>
<td>5. Enumerate effective management practices for the control of defoliators.</td>
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<td>4. Suggest ways on how to control defoliators from damaging the rice plant</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Predators</th>
<th>Develop knowledge and understanding on the life cycle and conservation of predators</th>
<th>1. Identify common predators of insects in the rice field</th>
<th>Conducting study on predators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Give the characteristics of predators</td>
<td>2. Conduct simulation study on defoliation **</td>
<td>Results of the study</td>
</tr>
<tr>
<td></td>
<td>3. Describe the life cycle of predators</td>
<td>5. Enumerate effective management practices for the control of defoliators.</td>
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<tr>
<td></td>
<td>4. Describe the feeding and mating habits of some predators</td>
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<td></td>
<td>5. Suggest ways on how to conserve predators in the field</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Aquatic Organisms and Neutrals</th>
<th>Gain knowledge &amp; understanding on the functions of aquatic organisms &amp; neutrals</th>
<th>1. Identify aquatic organisms and neutrals in the rice field</th>
<th>Conducting a study on the feeding habits of aquatic organisms &amp; neutrals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Explain the functions of aquatic organisms and neutrals in the rice field</td>
<td>2. Conduct simulation study on defoliation **</td>
<td>Results of study</td>
</tr>
<tr>
<td></td>
<td>3. Suggest ways on how to conserve aquatic organisms</td>
<td>5. Enumerate effective management practices for the control of defoliators.</td>
<td>Insights*</td>
</tr>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Sap Feeders</th>
<th>Acquire knowledge &amp; understanding on the management of sap feeders</th>
<th>1. Describe the life cycle of rice bugs, GLH and BPH</th>
<th>Conducting studies on sap feeders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Discover at what stage in the growth of a rice plant when rice bugs, GLH, and BPH attack</td>
<td>2. Conduct simulation study on defoliation **</td>
<td>Results of studies</td>
</tr>
<tr>
<td></td>
<td>3. Describe the damage caused by rice bugs, GLH and BPH</td>
<td>5. Enumerate effective management practices for the control of defoliators.</td>
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<td></td>
<td>4. Suggest ways on how to manage sap feeders</td>
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</tbody>
</table>

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*Curriculum Guide* 10
| Parasites and Parasitoid | Obtain knowledge & understanding on the life of parasites & parasitoids | 1. Identify the different parasites and parasitoids in the rice field  
2. Differentiate parasites from parasitoids  
3. Explain the function of parasitoids and parasites in the rice field  
4. Propose ways on how to conserve parasitoids and parasites in the rice field | Conducting studies | Results of study |
|-------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|
| Rodent Management       | Demonstrate knowledge, understanding, and skills on rodent management | 1. Identify the different species of rats  
2. Explain how rats multiply  
3. Identify the stage in the growth of the rice plant when rats attack  
4. Describe the damaged caused by rats  
5. Control rats infestation in rice ** | Interviewing Farmers  
Illustrating the life cycle of rodents  
Rat Trap Making | Illustration of the life cycle of rats |
| Spiders                 | Acquire knowledge and understanding on the importance of spiders in the ricefield. | 1. Describe spiders  
2. Explain the life cycle of a spider  
3. Differentiate spiders from insects  
4. Discuss the importance of spiders  
5. Suggest ways to conserve spiders | Conducting study on the feeding habits of spiders. | Result of study |
| Disease Ecology         | Gain knowledge, understanding and skills in managing plant diseases  
- Diseases  
- Disease Defined  
- Disease Triangle  
- Causal Organisms/Pathogens  
- Control | 1. Define plant disease  
2. Explain disease triangle  
3. Identify causal organisms of rice diseases  
4. Classify diseased plants according to causal organisms e.g. fungi, bacteria, virus and nematodes  
5. Describe the signs and symptoms of common rice diseases  
6. Suggest ways on how to prevent and control rice diseases | Collecting samples of diseased plants | |
| Pest Management         | Demonstrate knowledge, skills, and desirable attitudes in pest management  
- Methods of Pest Management  
- Pesticides | 1. Describe the cultural, indigenous, botanical, biological & chemical methods in controlling pests.  
2. Identify the most environmental friendly methods in controlling pests.  
3. Perform the environmental-friendly methods in controlling pest **  
4. Define pesticides  
5. Classify pesticides according to level of toxicity  
6. Differentiate signs from symptoms of pesticide poisoning  
7. Identify the signs and symptoms of pesticide poisoning  
8. Explain the harmful effects of pesticides to humans, animals, plants, air, water and soil  
9. Observe precautionary measures while disposing pesticide containers and storing pesticides **  
10. Participate in the campaign against the prevalent use of pesticides ** | Conducting the different environmental-friendly methods of controlling pests.  
Poster/slogan making (illustrating the harmful effects of pesticides)  
Disposing pesticide containers and storing pesticides | Insights on the different methods used in controlling pests*  
Campaign posters/slogans *  
News clippings and articles or pictures about environmental degradation |
| Physiological Disorder | Types of Physiological Disorders | Acquire knowledge and understanding of the physiological disorder in plants | 1. Explain physiological disorder  
2. Describe the different physiological disorders of plants  
3. Identify factors that cause physiological disorders of plants  
4. Explain how these factors cause physiological disorder in plants  
5. Suggest ways on how to prevent physiological disorder in plants | Field walk/field observation | Insights * |

| Harvesting and Post harvest Operations | Demonstrate knowledge, skills, and desirable attitudes in harvesting and post harvesting practices | 1. Describe the harvesting and post harvesting operations in rice production  
2. Identify tools needed in harvesting  
3. Observe precautionary measures when harvesting rice **  
4. Perform the pre-harvesting operations such as roguing, draining the field **  
5. Perform the post harvesting operations such as threshing, cleaning, drying, storing, milling ** | Observing and participating in harvesting operations  
Evaluating one’s learning by examining one’s portfolio and grade it using the scoring rubric  
Actual post harvest operations  
Post test | Results of cost and benefit analysis | |

| Marketing | Acquire knowledge, skills, and desirable attitudes in marketing products | 1. Define marketing  
2. Differentiate marketing schemes such as wholesale, retail and contracting  
3. Observe pointers to consider in marketing products ** | Brainstorming | Reflections on the insights gained | |

| Graduation and Field Day  
Folk Media | Participate actively in the graduation and culminating activities | Organizing a field day | Copy of Graduation and field program  
Portfolio exhibit | |

*Note:  * Required evidence in the portfolio  ** Performance based-assessment
## 2.2. CP IPPM Learning Competencies on Vegetable Production

<table>
<thead>
<tr>
<th>Topics/Sub-topics</th>
<th>Learning Competencies</th>
<th>Learning Objectives</th>
<th>Suggested Learning Activities</th>
<th>Suggested Entries for Portfolio Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction of the Children’s Participation in Integrated Production and Pest Management (CP IPPM) Program</td>
<td>Demonstrate knowledge, understanding, interest, and interpersonal skills in the CP IPPM program.</td>
<td>1. Explain how the CP IPPM Program started</td>
<td>Orientation Program</td>
<td>Flyer of the CP IPPM Program (teacher’s portfolio)</td>
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<tr>
<td></td>
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<td>2. Discuss the CP IPPM program’s components, vision, mission, goals and objectives</td>
<td>Setting of expectations, guidelines, and standards</td>
<td>Mind map</td>
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<td>3. Give the importance of the CP IPPM program to the learners, parents, teachers, farmers, and other stakeholders</td>
<td>Pre-testing using the Ballot Box</td>
<td>A statement of one’s expectations from the program</td>
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<td>4. Express one’s willingness to participate in the program.</td>
<td>Groupings and Group dynamics</td>
<td>Results of the pretest</td>
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<tr>
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<td>5. State one’s expectations from participating in the program.</td>
<td></td>
<td>Set of norms for the students in the CP IPPM Program</td>
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<td></td>
<td></td>
<td>6. Accept individual differences of the members of the group</td>
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<td>List of the members of the group, their personal data, and a few descriptions of their interests, hobbies, etc.</td>
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<td>7. State the importance of teamwork in group activities</td>
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<td>8. Perform one’s role/responsibility in any group work</td>
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<td></td>
<td>9. State the importance of teamwork in group activities</td>
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<tr>
<td>Simple Scientific Researches in the CP IPPM Program</td>
<td>Demonstrate knowledge, skills, and desirable attitude in conducting a simple research related to the topics in the CP IPPM Curriculum, which is a vehicle in understanding effective production and management of crops</td>
<td>1. Explain the importance of conducting research in the CP IPPM Program.</td>
<td>Conducting Field Survey</td>
<td>• Questionnaire used in the community survey</td>
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<td></td>
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<td>2. Explain each step in the research process</td>
<td>Conducting a simple research</td>
<td>• Written report of the results and analysis of the field survey *</td>
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<tr>
<td></td>
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<td>3. Conduct a research survey to determine the farming practices in the community.**</td>
<td></td>
<td>• Written report of the simple research conducted *</td>
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<td>4. Plan a research investigating the effects of any of the following variables on the growth of vegetable:</td>
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<td>o insects</td>
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<td>o weeds</td>
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<td>o predators</td>
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<td>o defoliators</td>
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<td></td>
<td></td>
<td>o spiders</td>
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<td>o plant diseases/pathogens</td>
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<td>o soil structure</td>
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<td></td>
<td>o soil fertility</td>
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<td></td>
<td>o others</td>
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<td>5. Formulate questions for investigations.</td>
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<td>6. Gather data to answer the research problems e.g. conducting research survey, observation, experimentation using insect zoos, etc.</td>
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</tbody>
</table>
### 7. Organize data gathered
8. Analyze the data gathered
9. Interpret data gathered
10. Draw conclusions based on the data gathered
11. Suggest recommendations appropriate to the given conclusions
12. Utilize research results for effective and increased vegetable production

### Importance of Vegetable Production in the Philippines
Explain the economic importance of vegetable production in the Philippines

1. Identify the provinces that are major producers of vegetables in the Philippines
2. Describe the status of vegetable production in the Philippines
3. Explain the importance of vegetable to humans, animals, and industries
4. Analyze the rate of production vis-à-vis the rate of consumption of the population
5. Infer that vegetable production is a good prospect in improving the economic condition of the Philippines

### Brainstorming activities
- Reflections on the gathered information about the status of vegetable production in the Philippines

### Soil System
- Types of soil
- Properties of Soil

Demonstrate knowledge, skills, and desirable attitude in the study of the soil system

1. Identify the components of the soil system
2. Name the different types of soil
3. Describe the different types of soil according to color, texture, structure, composition and water holding capacity
4. Describe the soil type that is best for vegetable production
5. Practice precautionary measures when conducting experiments on soil properties
6. Explain the procedures in determining soil properties
7. Perform an experiment in determining soil properties, e.g., soil texture, soil composition, water holding capacity, fertilizer requirement
8. Explain the importance of knowing the qualities of soil in vegetable production
9. Suggest ways to improve the condition of soil for better vegetable production

### Conducting experiments on soil types e.g., soil texture, soil composition and water holding capacity
- Soil samples and report on the experiments conducted

### Seed selection and testing
- Seed Morphology
- Seed Dormancy and Viability
- Methods of Testing Seed
- Viability
- Percentage of Germination
- Adjusted Amount of Seeds

Demonstrate knowledge, skills, and desirable attitudes in determining good vegetable seeds

1. Name the parts of a seed
2. Give the function of each part of a seed
3. Identify the characteristics of a good seed
4. Select good vegetable seeds
5. Explain seed dormancy and viability
6. Describe the different methods in testing seed viability e.g., rag doll, seedbed and seed box
7. Perform the methods in testing seed viability
8. Compute the percentage of germination
9. Determine the adjusted amount of seeds/new seeding rate (NSR)

### Illustrating the parts of the seed with description of their functions.
- Examining/selecting good vegetable seeds
- Performing any of the methods in testing seed viability.

### Soil samples and report on the experiments conducted
- Illustration of a vegetable seed with its parts and their functions
- Sample of vegetable seeds and their descriptions
- Result of the computation
- Experiment report with emphasis on the result of the computation
<table>
<thead>
<tr>
<th>Component</th>
<th>Objectives</th>
<th>Methods/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Crop Morphology</strong></td>
<td>Acquire knowledge and understanding on vegetable morphology</td>
<td>1. Define morphology&lt;br&gt;2. Observe the parts of the plant at different stages&lt;br&gt;3. Describe the parts of a vegetable at different stages&lt;br&gt;4. Give the function of each part of the plant at different stages</td>
</tr>
<tr>
<td><strong>Seedbed preparation and Seed Sowing</strong></td>
<td>Demonstrate knowledge, skills, and interest in seedling preparation, care and management</td>
<td>1. Enumerate the steps in seedbed preparation&lt;br&gt;2. Perform the actual seedbed preparation **&lt;br&gt;3. Explain the importance of seedbed preparation&lt;br&gt;4. Explain the importance of soil treatment&lt;br&gt;5. Describe the different soil treatments&lt;br&gt; - Hot water treatment&lt;br&gt; - Roasting&lt;br&gt; - Solarization&lt;br&gt; - Burning of rice hull, rice straws, cut grasses &amp; dried leaves&lt;br&gt;6. Perform the different soil treatments **&lt;br&gt;7. Explain the importance of seed sowing&lt;br&gt;8. Differentiate broadcasting from drilling&lt;br&gt;9. Perform seed sowing **&lt;br&gt;10. Explain the ways of caring seedlings e.g. pricking, thinning, roguing, and hardening&lt;br&gt;11. Perform the different ways of caring seedlings **&lt;br&gt;12. Observe precautionary measures in seed bed preparation, soil treatment and care of seedlings **</td>
</tr>
<tr>
<td><strong>Record Keeping</strong></td>
<td>Gain knowledge, skills, and appreciation in record keeping</td>
<td>1. Identify farm records like farm inventory, production record, expense record, cost-and-benefit analysis&lt;br&gt;2. Explain the use of the different farm records&lt;br&gt;3. Keep accurate farm records **&lt;br&gt;4. Analyze data from farm records&lt;br&gt;5. Give the importance of record keeping</td>
</tr>
<tr>
<td><strong>Land Preparation for Vegetable Growing</strong></td>
<td>Demonstrate knowledge, skills, and desirable attitude in land preparation for vegetable planting</td>
<td>1. Identify the tools/equipments used in land preparation&lt;br&gt;2. Explain the uses of each tool/equipment&lt;br&gt;3. Use appropriate tools and equipment in land preparation for vegetable growing **&lt;br&gt;4. Follow the proper procedures/steps in actual land preparation **&lt;br&gt;5. Perform the actual land preparation **&lt;br&gt;6. Practice precautionary measures in land preparation, **&lt;br&gt;7. Explain the importance of thorough land preparation in the control of weeds, insect pests and diseases.</td>
</tr>
<tr>
<td><strong>Composting</strong></td>
<td>Demonstrate understanding, skills and desirable attitude in composting</td>
<td>1. Give the importance of composting&lt;br&gt;2. Identify the materials needed in composting</td>
</tr>
</tbody>
</table>
| Concept of Ecosystem and AESA | Demonstrate knowledge, skills, and appreciation of Agro-Ecological System Analysis (AESA) which is a vehicle in understanding a balanced ecosystem | 1. Discuss the meaning and importance of ecosystem  
2. Describe the components of an ecosystem  
3. Describe the level of interaction and relationship of the components of a balanced ecosystem  
4. Differentiate food chain from food web  
5. Give the meaning of AESA  
6. Explain the importance of AESA  
7. Perform the steps in AESA ** | Visiting the field to observe the ecosystem  
Conducting weekly AESA from 14 days after planting to 1 week before harvest |  
- Concept map of the components of the ecosystem  
- Illustration of the ecosystem  
- Weekly report of AESA  
A summary of the AESA for the whole cropping season * |
| Weeds Management | Demonstrate knowledge and skills on weeds management | 1. Define weeds  
2. Identify weeds present in the vegetable field  
3. Classify weeds according to types  
4. Explain how weeds affect the growth of the plant  
5. Describe the methods in controlling weeds  
6. Use a specific method in controlling weeds in the vegetable field** | Collecting weeds |  
- Scrapbook on weeds *
| Fertilizer Management | Demonstrate knowledge, skills, and desirable attitudes in fertilizer management | 1. Define fertilizer  
2. Differentiate organic from inorganic fertilizers  
3. Classify fertilizers as organic and inorganic  
4. Give the advantages and disadvantages of organic and inorganic fertilizers  
5. Identify the macro- and micro- nutrients needed by the plants  
6. Give the functions of Nitrogen, Phosphorous and Potassium, (NPK) on the growth of the plant  
7. Identify NPK deficiency symptoms of the plant  
8. Use Soil Test Kit (STK) and Minus One Element Technique (MOET) for soil analysis **  
9. Utilize the results of soil analysis in determining the amount of fertilizer needed in a given area  
10. Demonstrate the different methods of fertilizer application **  
11. Observe proper timing of fertilizer application ** | Collecting samples of organic and inorganic fertilizers used in vegetable production  
Collecting soil samples  
Computing fertilizer requirement of the soil  
Doing actual fertilizer application |  
- Scrapbook of organic and inorganic fertilizers *  
- Written report on the result of the experiment  
- Written reflections on fertilizer management |
| Water Management | Demonstrate knowledge and skills on water management | 1. Define irrigation  
2. Give the importance of proper water management  
3. Compare the methods of irrigation e.g. furrow or sprinkler method  
4. Perform actual irrigation using either furrow or sprinkler method**  
5. Identify the right time when the rice plants need water | Performing actual irrigation |  
- Pictures showing irrigation practices |
| Natural Enemies of Vegetables | Acquire knowledge, skills, and desirable attitudes on the biological control of pests | 1. Define biological control  
2. Define natural enemies  
3. Give the importance of natural enemies  
4. Identify Natural Enemies (NE) as to: | Collecting insects  
Field walk |  
- Insect collection  
Insights |
<table>
<thead>
<tr>
<th><strong>Biological Control</strong></th>
<th><strong>Natural Enemies</strong></th>
<th><strong>Parasites and parasitoids</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parasitoids</td>
<td>Pathogens</td>
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<td></td>
<td>Predators</td>
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<td></td>
<td>5. Differentiate parasitism from parasitoids in the vegetable field</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Insects in the Vegetables Field</strong></th>
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<tbody>
<tr>
<td><strong>Cycle</strong></td>
</tr>
<tr>
<td><strong>Characteristics</strong></td>
</tr>
<tr>
<td><strong>Mode of attack</strong></td>
</tr>
<tr>
<td><strong>Damage Control</strong></td>
</tr>
<tr>
<td><strong>Gain knowledge and understanding on the life of insects present in the vegetable fields as well as skills on how to conserve/manage them</strong></td>
</tr>
<tr>
<td>1. Describe insects</td>
</tr>
<tr>
<td>2. Describe the different parts of an insect</td>
</tr>
<tr>
<td>3. Name insects present in the rice field</td>
</tr>
<tr>
<td>4. Illustrate the life cycle of insects present in the rice field</td>
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<td>5. Explain the life cycle of insects present in the rice field</td>
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<td>6. Differentiate complete from incomplete metamorphosis</td>
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<tr>
<td><strong>Illustrate life cycle of insects</strong></td>
</tr>
<tr>
<td><strong>Specimen collection</strong></td>
</tr>
<tr>
<td><strong>Scrapbook of insects</strong></td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th><strong>Disease Ecology</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Diseases</strong></td>
</tr>
<tr>
<td><strong>Disease Triangle</strong></td>
</tr>
<tr>
<td><strong>Causal Organisms/ Pathogens</strong></td>
</tr>
<tr>
<td><strong>Control</strong></td>
</tr>
<tr>
<td><strong>Gain knowledge, understanding, and skills in managing plant diseases</strong></td>
</tr>
<tr>
<td>1. Define plant disease</td>
</tr>
<tr>
<td>2. Explain the disease triangle</td>
</tr>
<tr>
<td>3. Identify causal organisms of vegetable disease</td>
</tr>
<tr>
<td>4. Classify diseased plants according to causal organisms e.g. fungi, bacteria, virus and nematodes</td>
</tr>
<tr>
<td>5. Describe the signs and symptoms of common vegetable diseases</td>
</tr>
<tr>
<td>6. Suggest ways on how to prevent and control vegetable diseases</td>
</tr>
<tr>
<td><strong>Collecting samples of diseased plants</strong></td>
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<table>
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<tr>
<th><strong>Pest Management</strong></th>
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<tbody>
<tr>
<td><strong>Methods of Pest Management</strong></td>
</tr>
<tr>
<td><strong>Demonstrate knowledge, skills, and desirable attitudes in pest management</strong></td>
</tr>
<tr>
<td>1. Describe the cultural, indigenous, botanical, biological &amp; chemical methods in controlling pests.</td>
</tr>
<tr>
<td>2. Identify the most environmental friendly methods in controlling pests.</td>
</tr>
<tr>
<td>3. Perform the environmental-friendly methods in controlling pest</td>
</tr>
<tr>
<td>4. Define pesticides</td>
</tr>
<tr>
<td>5. Classify pesticides according to level of toxicity</td>
</tr>
<tr>
<td>6. Differentiate signs from symptoms of pesticide poisoning</td>
</tr>
<tr>
<td>7. Identify the signs and symptoms of pesticide poisoning</td>
</tr>
<tr>
<td>8. Explain the harmful effects of pesticides to humans, animals, plants, air, water and soil</td>
</tr>
<tr>
<td>9. Observe precautionary measures while disposing pesticide containers and storing pesticides**</td>
</tr>
<tr>
<td>10. Participate in the campaign against the prevalent use of pesticides**</td>
</tr>
<tr>
<td><strong>Conducting the different environmental-friendly methods of controlling pests.</strong></td>
</tr>
<tr>
<td><strong>Poster/slogan making (illustrating the harmful effects of pesticides)</strong></td>
</tr>
<tr>
<td><strong>Disposing pesticide containers and storing pesticides</strong></td>
</tr>
<tr>
<td><strong>Insights on the different methods used in controlling pests</strong></td>
</tr>
<tr>
<td><strong>Campaign posters/slogans</strong></td>
</tr>
<tr>
<td><strong>News clippings and articles or pictures about environmental degradation</strong></td>
</tr>
<tr>
<td>Topic</td>
</tr>
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<td>-------------------------------------------</td>
</tr>
</tbody>
</table>
| Physiological Disorder                   | Acquire knowledge and understanding of the physiological disorder in plants | 1. Explain physiological disorder  
2. Describe the different physiological disorders of plants  
3. Identify factors that cause physiological disorder of the plants  
4. Explain how these factors cause physiological disorder in plants  
5. Suggest ways on how to prevent physiological disorder in plants | Field walk/field observation | Insights * |
| Harvesting and Post Harvesting Practices  | Demonstrate knowledge, skills, and desirable attitudes in harvesting and post harvesting practices | 1. Identify maturity indicators of vegetables based on purpose  
2. Describe the harvesting and post harvesting operations in vegetable production  
3. Identify tools needed in harvesting  
4. Observe precautionary measures when harvesting vegetable**  
5. Perform the post harvesting operations ** | Observing and participating in harvesting and post harvesting operations  
Ballot Box (Post-test) | * Insights in harvesting and post harvesting operations |
| Marketing                                 | Acquire knowledge, skills, and desirable attitudes in marketing products  | 1. Define marketing  
2. Differentiate marketing schemes such as wholesale, retail and contracting  
3. Observe pointers to consider in marketing products** | Brainstorming | Reflections on insights gained |
| Graduation and Field Day Folk Media       | Participate actively in the graduation and culminating activities | Organizing a field day | * Copy of Graduation and field program  
Portfolio exhibit | ** Performance based-assessment |

Note: * Required evidence in the portfolio  
** Performance based-assessment
CHAPTER 3
Proposed Budget of Work

The proposed budget of work is organized based on the different stages in crop production. It commences with the introduction of the program to its stakeholders and the getting-to-know-activities. Then, weekly timetable for the different topics in crop production follows. This continuum starts from pre-harvest up to post-harvest operations in crop production. The weekly activities include the agro-ecosystem analyses (AESA) which students have to do weekly to monitor the changes that happen to the plant and all the other living things that interact with it. Special topics related to specific stages in plant growth have also been included to prepare students for their experience in the field.
### 3.1. CP IPPM Curriculum on Rice Production

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC/S</th>
<th>WEEK</th>
<th>TOPIC/S</th>
</tr>
</thead>
</table>
| 1    | - Introduction of IPPM  
|      |   o Briefing  
|      |   o Expectations and Norms  
|      |   o Group & group dynamics  
|      |   Brainstorming on rice production in the barangay  
|      |   Community Survey  | 2    | - Ballot Box Pre Test  
|      |                   |      | - Field Community Survey  
|      |                   |      | - Soil Sampling and Analysis  
|      |                   |      | - Importance of Soil  
|      |                   |      | - Cropping Calendar  
|      |                   |      | - Varietal Selection  
|      |                   |      | - Seed Soaking  | 3    | - Land Preparation  
|      |                   |      | - Field Experiment design and layout  
|      |                   |      | - Fertilizer computation  
|      |                   |      | - Fertilizer Management  
|      |                   |      | - Composting  | 4    | - Methods of Planting  
|      |                   |      |   o Direct seeding  
|      |                   |      |   o Transplanted rice  
|      |                   |      | - Parts of the Seed  
|      |                   |      | - Record Keeping  | 5    | - Growth stages of the rice plant  
|      |                   |      | - Concept of Ecosystem  
|      |                   |      | - Food web and food chain  | 6    | - Concept of Agro-ecosystem Analysis (AESA)  
|      |                   |      | - Insect collection & identification  
|      |                   |      | - Kuhol and kuhol Management  | 7    | - AESA 1  
|      |                   |      | - Weeds & Weed Management  
|      |                   |      | - Defoliators  | 8    | - Rice Plant Diseases  
|      |                   |      | - Concept of Insect Zoo  
|      |                   |      | - Aquatic Organisms  | 9    | - AESA 3  
|      |                   |      | - Tungro  
|      |                   |      | - Leaffoppers and planthoppers  
|      |                   |      | - Parasitoids  
|      |                   |      |   o Behavior of different parasitoids  | 10   | - AESA 4  
|      |                   |      | - Panicle Initiation in relation to N  
|      |                   |      | - Stem borer  | 11   | - AESA 5  
|      |                   |      | - Rodent Management  
|      |                   |      | - Leaffolders  | 12   | - AESA 6  
|      |                   |      | - Predators  
|      |                   |      |   o Life Cycle of Predators  
|      |                   |      | - Behavior of Predators  | 13   | - AESA 7  
|      |                   |      | - Spiders  
|      |                   |      |   o Life Cycle of Spiders  
|      |                   |      | - Behavior of spiders  | 14   | - AESA 8  
|      |                   |      | - Rice Bugs  
|      |                   |      | - Use of scientific name  | 15   | - AESA 9  
|      |                   |      | - Folk Media  
|      |                   |      | - Field Trip  | 16   | - AESA 10  
|      |                   |      | - Pesticides  
|      |                   |      |   o Harmful effects  
|      |                   |      |   o Classification  
|      |                   |      |   o Categories  
|      |                   |      | - Roguing  | 17   | - Harvesting  
|      |                   |      | - Post-harvest practices  
|      |                   |      | - Selecting quality seeds  
|      |                   |      | - Dormancy and seed viability  
|      |                   |      | - Ballot box (post test)  | 18   | - Graduation and Field Day  
|      |                   |      | - Folk Media Presentation  |
### 3.2. CP IPPM Curriculum on Vegetable Production

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC/S</th>
</tr>
</thead>
</table>
| 1    | • Introduction of IPPM  
|      | o Briefing  
|      | o Expectations and Norms  
|      | o Group & group dynamics  
|      | o Brainstorming on vegetable production in the barangay  
|      | • Community Survey  
|      | • Soil sampling  |
| 2    | • Ballot Box Pre Test  
|      | • Soil System  
|      | • Seed selection  
|      | • Seedbed preparation  
|      | • Seed sowing  
|      | • Land preparation  
|      | • Group dynamics/team building activity  |
| 3    | • Concept of Ecosystem  
|      | • Concept of AESA  
|      | • Field experiment design & layout  
|      | • Composting  
|      | • Group dynamics/team building activity  |
| 4    | • Transplanting  
|      | • Crop morphology (seedling stage)  
|      | • Weed management  
|      | • Fertilizer management  
|      | • Insect collection  
|      | • Group dynamics/team building activity  |
| 5    | • AESA 1 (seedling stage)  
|      | • Water/irrigation management  
|      | • Natural enemies of vegetable plants (predators and parasites)  
|      | • Group dynamics/team building activity  |
| 6    | • AESA 2  
|      | • Insect zoo  
|      | • Spiders  
|      | • Life cycle  
|      | • Food web/food chain  
|      | • Group dynamics/team building activity  |
| 7    | • AESA 3  
|      | • Crop morphology (vegetative stage)  
|      | • Disease Ecology  
|      | • Group dynamics/team building activity  |
| 8    | • AESA 4  
|      | • Defoliators  
|      | • Effects of pesticides on natural enemies, human health and environment  
|      | • Group dynamics/team building activity  |
| 9    | • AESA 5  
|      | • Hoppers  
|      | • Fungal diseases  
|      | • Plant roots/vessels  
|      | • Group dynamics/team building activity  |
| 10   | • AESA 6  
|      | • Bacterial diseases  
|      | • Leaf miner  
|      | • Group dynamics/team building activity  |
| 11   | • AESA 7  
|      | • Sucking insect  
|      | • Viral diseases  
|      | • Group dynamics/team building activity  |
| 12   | • AESA 8  
|      | • Crop morphology (flowering stage)  
|      | • Disease culture  
|      | • Group dynamics/team building activity  |
| 13   | • AESA 9  
|      | • Fruit and shoot borer  
|      | • Group dynamics/team building activity  |
| 14   | • AESA 10  
|      | • Physiological disorder  
|      | • Nematodes  
|      | • Group dynamics/team building activity  |
| 15   | • Harvesting  
|      | • Record Keeping  
|      | • Post-harvest practices  
|      | • Group dynamics/team building activity  |
| 16   | • Marketing  
|      | • Economic Analysis  
|      | • Folk media  
|      | • Ballot box (post test)  |
| 17   | • Field Trip  |
| 18   | • Graduation and Field Day  
|      | • Folk Media Presentation  |
Lesson plans are useful for teachers in their day-to-day teaching. They serve as the blueprint or the guide of teachers in determining what learning objectives are targeted for the day or the entire week; the materials or resources needed; the activities most effective to attain the objectives; and the method of assessment appropriate for the given objectives.

Thus, lesson plans are included in this curriculum guide to give the teachers an idea on how the pilot teachers implemented the CP IPPM curriculum. However, not all objectives in the CP IPPM curriculum have corresponding plans because World Education believes that better plans could be made in the future. Included in this curriculum guide are just sample plans to give teachers an idea on the learning process that World Education advocates.

The first set of lesson plans can be used for topics common to rice and vegetable production. The second set contains sample plans for special topics in rice production, while the third set includes sample plans for the special topics in vegetable production. These plans have been designed following the 4 As Approach (i.e. activity, analysis, abstraction and application). They can be modified to address the particular needs of the students.
4.1. For Topics Common to Rice and Vegetable Production

4.1.1. Introduction to the CP IPPM Program

I. Objectives

A. Explain how the CP IPPM Program started.
B. Discuss the CP IPPM program’s components, vision, mission, goals and objectives.
C. Give the importance of the CP IPPM program to the learners, parents, teachers, farmers, and other stakeholders.
D. Express one’s willingness to participate in the program.
E. State one’s expectations from participating in the program.
F. Formulate guidelines and standards to follow when participating in the program.
G. Accept individual differences of the members of the group.
H. Perform one’s role/ responsibility in any group work.
I. State the importance of teamwork in group activities.

II. Subject Matter

A. Topic: CP IPPM Program
B. Value Focus: teamwork, respect to individual differences, acceptance of responsibilities, environmental awareness
C. References: Curriculum Guide, WE flyers
D. Materials: flyers or any document about the program history, its mission, vision, goals, objectives and components; pictures showing activities in the CP IPPM program, strips of Manila paper

III. Learning Activities

A. Activity

1. Mood Setting: Teach any action song that could set the mood of the students and that could introduce the topic. You may consider the song given below.

\[\text{It’s I Who Builds Community}\]
\[\text{It’s I, it’s I, it’s I who build community (4x)}\]
\[\text{La la la}\]
\[\text{Roll over the ocean}\]
\[\text{Roll over the sea}\]
\[\text{Go over the mountain}\]
\[\text{And the deep blue sea. (2x)}\]

Note: Change I, to you, then we, then God, then say all of the four
2. Ask the following questions:
   - If you are to build a community, how will it look like?
   - If you live in a farming community, how would you like it to be?
3. Show pictures of two communities. The first picture shows a community participating in the CP IPPM program while the other one is not. Ask the students to describe and compare the picture of the two communities. Inform the students that one of the communities shown participates in the CP IPPM program.
4. Let the students formulate questions that they would like to know about the CP IPPM program. Guide them in constructing good questions and as much as possible, lead them in asking questions that have to do with the history, vision, mission, components, goals and objectives of the CP IPPM program. Examples of questions that should be elicited from the students are the following:
   - How did CP IPPM start?
   - Why was the program conceived?
   - What are the goals/objectives of the program?
   - What does the community gain from participating in the program?
   - How does the program improve the life of the people in the community?
   - What does the program expect from those who participate in it?
5. Write on the board all questions that can be answered by the program. Check those questions that could be answered in the day’s lesson. If there are no questions about the history, vision, mission, components, goals and objectives of the CP IPPM program, formulate questions on these and write them on the board. Those questions raised by the students which could be answered in future lessons could be written on strips of paper and be posted on the board as guide for future investigations.
6. Form the students into groups. Distribute to all the groups all the questions raised for investigation in today’s lesson. Let the students decide on a specific role they want to play to be able to answer the question assigned to them. Some roles that could be assigned are the following:
   - Researcher - the one who will look for possible sources of information
   - Gopher - the one who will prepare the materials needed for the presentation of ideas
   - Facilitator - the one who will facilitate the discussion of the answers to the question assigned to the group
   - Recorder/Writer - the one who will write the answers to the question assigned to the group in Manila papers for the whole class presentation
   - Presenter - the one who will present the group’s ideas to the whole class.
7. Let the students start working on their assigned task.
8. Let each group present their work to the whole class.
B. Analysis

1. Ask the following questions to guide the students in evaluating the group presentations.
   - Whose group has the best presentation? Why?
   - Did all the members of the group perform their task/role?
   - What should group members do to have the best presentation?
   - How important is teamwork in performing your group task?

2. Facilitate the whole class discussion. Throw all the questions chosen for the day’s discussion to the whole class to ensure that all the students have understood the history, mission, vision, goals, objectives and components of the CP IPPM program.

3. Ask the following additional questions:
   - If you are chosen to participate in the CP-IPPP program, will you participate? Why?
   - What do you expect to gain from participating in the program?
   - What will your parents gain from allowing you to participate in the program?
   - How will the program help your community?
   - What could the program expect from participants like you?

C. Abstraction

1. Let each student make a mind map showing how well s/he understood the program.

2. Make a whole-class mind map on the board reflecting some important ideas about the CP IPPM program such as its history, mission, vision, components, goals and objectives. This could be done by asking each member of the class to contribute in the making of the whole class mind map.

D. Application

Let the students make a statement of their goals when participating in the CP IPPM program. Encourage them to present their targets in different formats. For example, they could make a poem, a story, a caricature, a dialogue or in any form that will show their creativity.

IV. Evaluation

A. Test

Answer the following questions:
1. What does CP IPPM mean?
2. Why was the program created?
3. What are the goals of the program?
4. What are the objectives of the program?
5. How important is the program to the people of the community?
B. Performance Assessment

Ask the students to check those activities where they were able to participate actively.

- Doing the action song
- Formulating questions
- Doing my role in the group work
- Interacting with my classmates during discussions
- Making a mind map
- Stating my goals in participating in the CP IPPM program

C. Portfolio Assessment

1. Let the students work on the following as entries in their CP IPPM portfolio:
   a. Autobiography
   b. List of the members of the group and few descriptions about each

2. Ask them to also include in their portfolio the following outputs for the day:
   a. Their statement of goals in participating in the program
   b. Their individual mind map
   c. Other outputs from the day’s lesson, which they find significant.

3. Let them conduct a self-evaluation of their outputs using the rubric in rating portfolios in Chapter 5.

V. Assignment

Let the students introduce the program to their parents and to at least one farmer. Let them record what feedback they got from their parents and from the farmer to whom they introduced the program.
4.1.2. Simple Scientific Research

I. Objectives

A. Explain the importance of conducting research in the CP IPPM Program.
B. Explain each step in the research process.
C. Identify possible problems that can be investigated through a research study.
D. Plan a simple research study.
E. Formulate questions for investigation.
F. Gather data to answer research problems.
G. Conduct community survey on farming practices.
H. Organize data gathered.
I. Interpret data gathered.
J. Draw conclusions based on the data gathered.
K. Suggest recommendations appropriate to the given conclusions.
L. Utilize research results.

II. Subject Matter

A. Topic: Simple Scientific Research in CP IPPM Program
C. Materials: Marker pens, notebook, pens, measuring stick, ruler, masking tape, manila paper, survey form, hand lens, net, plastic container, observation guide
D. Value Focus: self-discovery and interpersonal skills

III. Learning Activities

A. Activity

1. Mood Setting:

   - Show the following pictures: children catching insects in the field, students setting up an insect zoo study, children interviewing farmers, children studying tiny insects using a hand lens, and other pictures doing and investigatory work
   - Ask the following questions:
     - What do the pictures show? (They show students doing some investigations)
     - How do the children investigate?
     - Do you like to be little scientists like those children in the pictures? Why?
   - Instruct the students that they will be little scientists in the next few days because they will investigate the relationship of animals, plants, soil and all the elements in the rice or vegetable ecosystem.

2. Introduce the parts/elements of a simple scientific research. Let the students look for sample research reports of studies conducted on rice or vegetable production to get an idea on how to conduct a research and write the research
report. An alternative activity is for the teacher to explain the research process and give examples for each part of the research report. The steps in the Inquiry Approach or Problem-Based Learning could be the components of the simple research that could be conducted by the students. The steps are as follows:

- Purpose of the Study
- Statement of the Problem/Research Questions
- Hypothesis
- Data Gathering Procedure: conducting a community survey, experimenting using the insect zoos, recording field observations, interviewing farmers, etc.
- Data Analysis
- Conclusions
- Recommendations

3. Community Survey

- Group the pupils. Let each group plan a community survey to know the farming tools and practices in the community. All groups should do the same task. Let them construct their own questionnaire and encourage them to ask all that they want to know about rice or vegetable production. Let them gather their own data, organize them and present it to the whole class.
- Let each group identify the roles that each member should play in this task and plan how they will rate each other based on their work. You can help them plan their rubric in rating each other in the group.

B. Analysis

Ask the following questions after the group’s presentation of the result of their community survey:

1. Affective
   - Did you enjoy doing a community survey? Why?
   - How did your group work?
   - Was there anyone in the group who did not work or perform his role? Why is that so? What should he have done? (It would be better if the last question is directly asked to the person concerned).
   - Who among your group mates do you like working with? Why?
   - Did you enjoy talking to the farmers? Why?
   - Do you like the idea of you finding out for yourself the farming practices in the community? Why?

2. Cognitive
   - What were your most common questions during the community survey?
   - What are the answers to these questions you asked?
What conclusions can you draw from these answers you got?
What recommendations would you like to give to the farmers in your community based on the data you gathered from your community survey?
What are the other questions raised by a certain group which are interesting to know?
What information did you learn from the group presentation regarding the data they have gathered to answer this question?
What will you do now with the information you gathered from this community survey?
What other questions should you have asked if you were given more time to talk to the farmers?
Is doing a community survey necessary? Why?

C. Abstraction

Ask the following questions to all the students. It would be better for the teacher to write the answers to these questions on the board. This is important to ensure that all the students have the same information at the conclusion of the lesson.

- What are the things to do when conducting a community survey?
- What did you learn from doing a simple community survey?

D. Application

1. Field Walk

- Group the students into 5. Instruct them that they will have a field walk where they will go to the field to record all their observations or collect any object in the field that caught their attention. As they go to the field, let them have a partner within the group. Let them ask question to each other every time they see a strange object in the field. If there are questions that the partner could not answer, let them write these questions and present them to the group as part of their research questions. If there is any object that the partner could not identify, tell them to collect that object and include it as part of their group investigation. Inform the students of the time limit of their field walk and then instruct them to go back to the classroom after the time limit. To avoid, waste of time in the field, prepare an observation guide like the one shown below:

<table>
<thead>
<tr>
<th>Observation Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activity:</strong> Field Walk</td>
</tr>
<tr>
<td><strong>Materials to bring:</strong> hand lens, plastic container, net</td>
</tr>
<tr>
<td><strong>Answer these:</strong></td>
</tr>
<tr>
<td>1. What questions do you have which your partner was not able to answer?</td>
</tr>
<tr>
<td>2. What strange objects/living things in the rice field caught your attention? Put the specimen of that object in a container or draw that object.</td>
</tr>
</tbody>
</table>
2. Group Discussion and Planning

- Let the students go back to the classroom and present their questions or collected specimen to their group mates. Then let them list all the questions that the group members were not able to answer. Let them present their questions to the whole class.
- Identify all the questions that the students have raised that require an investigation using the insect zoo. Explain to the students how to set up an insect zoo as well as its use. Select questions that require insect zoo studies and let each group select the questions that they would like to investigate.
- Let each group plan their research proposal to the whole class. The parts of their research proposal could be as simple as having these parts: Purpose of the study, questions for investigations, hypotheses, and data gathering procedure.
- Let each group present their proposal and give suggestions particularly on their data gathering procedure. It is important that the students have a clear idea on how they will set-up their insect zoo study.
- Give the duration of the study. Take note that the investigation does not have to be just for one meeting. It could be an ongoing investigation as the students learn important ideas and skills about rice and vegetable production. This work could be done after class meetings.
- Develop with the students the rubric that will be used in rating the group members' performance in setting up the insect zoo study.

IV. Evaluation

A. Performance-Based

Let the students rate their participation in the actual conduct of the community survey and later on in setting their insect zoo studies using the rubric they have agreed upon.

B. Portfolio Assessment

Instruct the students to put all their significant outputs in their portfolio. Inform them of the criteria in evaluation. The possible criteria are those indicated in the portfolio rubric in Chapter 5.

V. Assignment

Let the students set up their research work that requires the use of an insect zoo.
4.1.3. Soil System

I. Objectives

A. Identify the components of the soil system.
B. Name the different types of soil.
C. Describe the different types of soil according to color, texture, structure, composition and water-holding capacity.
D. Describe the soil type that is best for rice/vegetable production.
E. Practice precautionary measures when conducting experiment on soil properties.
F. Explain the procedures in determining soil properties.
G. Perform an experiment in determining soil properties (ex. Soil texture, soil composition, water-holding capacity, and fertilizer requirement).
H. Explain the importance of knowing the qualities of soil in rice production.
I. Suggest ways to improve the condition of soil for better rice production.

II. Subject Matter

A. Topic: Soil System
B. References: ToT Materials
C. Materials: types of soil, jars, waters, manila paper, pentel pen, gloves
D. Value Focus: teamwork

III. Learning Activities

A. Activities

1. Mood setting:
   - Show rice plants in three pots with different types of soil. Label each pot A, B, and C. Inform the students that the rice plants are all exposed to sunlight, have enough water, and air but they differ in soil type.
   - Then ask the following:
     Which pot has a healthy rice plant? Why kind of soil do you think this plant has to be this healthy?
     Which pot has an unhealthy plant? What kind of soil do you think this plant has to be this unhealthy?
   - Inform the students that they are going to do an experiment in order to find out the kind of soil that is good for better rice or vegetable production.

2. Raising of Questions:
   Let the students pose some questions that they want to know about soil. Write their questions on the board to determine the questions for investigation. Guide the students for you to be able to elicit the following questions:
   - What are the elements of a living soil?
   - What are the different kinds of soil?
   - How are these kinds of soil alike?
   - How do these types of soil differ?
3. Formulating of Hypotheses
Let the students give their tentative answers to all the questions they raised. It would be better to write these hypotheses so that they could reflect on their initial answers after conducting an experiment.

4. Conducting an Experiment
- Divide the class into 5 and let each group do an experiment to find out the characteristics of the different types of soil. Let them draw randomly the focus of their group investigation.

  Group 1  Describe the soil texture by following the procedure in the Field Session Guide for IPPM in Rice
  Group 2  Describe the soil structure by following the procedure in the Field Session Guide for IPPM in Rice
  Group 3  Describe the soil composition by following the procedure in the Field Session Guide for IPPM in Rice
  Group 4  Describe the soil water holding capacity by following the procedure in the Field Session Guide for IPPM in Rice
  Group 5  Describe the living soil and the soil types according to color

- Guide them in setting up their experiment so that each group will be able to identify the common elements of soil and the distinguishing characteristics of each soil type. It would be better if each group is given an observation guide based on the activity suggested in the session guide for the facilitators.
- Let the members in each group decide on the roles and function of everyone in the group. Previous rubric on group work could be used for this purpose.
- Remind the students to observe the precautionary measures when conducting an experiment on soil properties.
- Let each group present the information they gathered to the whole group.

B. Analysis

Ask the following questions to ensure that students have understood well the ideas they are supposed to learn not just from their group investigation but also from the other group’s presentation.

Affective:
- Which group was able to finish the assigned task? What did you do to finish your work?
- Which group did not finish the assigned work? Why did you not finish your work? What should you do next time?

Cognitive
- What are the kinds of soil that you examined?
- What are the common elements of soil you examined?
- How do the types of soil differ?
- What did you do to discover their differences?
- What kind of soil is best for rice/vegetables?
- Why is this soil best for rice/vegetables?
- What should be done to rice fields with poor quality of soil?
- What will be the effect of rice fields with good quality of soil?
- What should be done to ensure good harvest?
- How important is it to know the properties of soil?

C. Abstraction

- Let the students organize in table the characteristics of the different types of soil.

<table>
<thead>
<tr>
<th>Types of Soil</th>
<th>color</th>
<th>texture</th>
<th>structure</th>
<th>composition</th>
<th>Water holding capacity</th>
<th>Quality of Rice Plant Produced by the Soil Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clayey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loamy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandy</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

D. Application

Let the students collect soil samples from at least three rice fields and analyze the type of soil of the rice field. Teach them how to use the soil test kit (STK). Give the precautionary measures when analyzing soil samples and let the students follow these strictly when doing a soil analysis. Let them suggest ways to improve the quality of the soil of the given rice field to increase rice or vegetable production.

IV. Evaluation

- Give a short test about the types of soil.
- Let the students rate their performance during their group investigation. The rubric should be presented to the students before the actual conduct of the experiment. The rubric could include criteria that will rate interpersonal skills and contribution of the members in the work.
- Portfolio Assessment- let the students put their soil samples in their portfolio. Ratings could be based on the rubric included in the Portfolio Rubric in Chapter 5.

V. Assignment

Let the students talk to at least one farmer in the community and let them describe the location of their rice field. Let them identify the type of soil for the given place but they have to justify their basis in identifying the type of soil without necessarily examining the sample of the soil.
4.1.4. Seed Testing and Germination

I. Objectives

A. Name the parts of a seed.
B. Give the function/s of each part of a seed.
C. Identify the characteristics of a good seed.
D. Select good rice seeds.
E. Explain seed dormancy and viability.
F. Describe the different methods in testing seed viability e.g. rag doll, seedbed and seed box.
G. Perform the methods in testing seed viability.
H. Compute the percentage of germination.
I. Determine the adjusted amount of seeds/new seeding rate (NSR).

II. Subject Matter

A. Topic: Methods of Testing Seed Germination
B. Reference: Training of Trainers (ToT) lectures and outputs
C. Materials: Rag doll, water, tissue paper, tray, vegetable seeds, soil, and plastic
D. Value Focus: Cooperation and safety

III. Procedure

A. Activity

1. Prepare samples of rice seeds that are both filled and unfilled with grain. Let the students identify in groups which of the jumbled seeds given to their group are filled or unfilled with grain by just touching the seeds. Let this be a competition among groups. Check their work.
2. Let each member of the group get all the rice seeds that are filled with grain. Let them examine the parts of the rice seed. Let them illustrate what they see and give the name of the parts and their functions. If students have no idea at all, then introduce the parts of the seed and their functions.
3. Let each group soak and incubate seeds following the procedure in Facilitators Guide for IPPM in Rice. It would be better if each group is asked to germinate seeds following a given method of germination. For the groups to perform their task well, they should be given an activity card that gives directions on the materials and the procedure in germination they will use. When the seeds have germinated, let them compute the percentage of germination of the seeds soaked. Teach them the formula in computing seed germination. Finally, discuss the new seeding rate.
4. Let each group present their computation to the whole class and explain their procedure in germinating seeds.
B. Analysis
   Ask the following questions:
   1. Did all the seeds that you soak germinate?
   2. What do you call the seeds that germinate?
   3. What do you call the seeds that did not germinate?
   4. What are the characteristics of those seeds that germinated?
   5. What are the characteristics of those seeds that did not germinate?
   6. How long should seeds be soaked before they germinate?
   7. How do you determine the percentage of germination of seeds?
   8. How do you determine the new seeding rate?
   9. What do you call the method you used in germinating seeds?
   10. What are the steps in doing this method?
   11. Which among the methods of seed germination is the easiest to do? Why?
   12. Is it necessary to test seeds? Why?

C. Abstraction
   Complete the table below showing the methods of seed germination, their procedure, advantages, and disadvantages. Let this be done by group.

<table>
<thead>
<tr>
<th>Method of Germination</th>
<th>Procedure</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

D. Application
   Let each group dramatize what they will do when they prepare the rice seeds for planting given is the area of their rice field.

IV. Evaluation
   1. Give a short quiz to cover objectives 1 p to 3.
   2. Let the students do peer evaluation of the performance of the members of their group during the group activities. Present the rubric to the students before the actual performance of their task.
   3. Let the students put their group outputs in their portfolio. Let them reflect on the significance of these entries in their portfolio.

V. Assignment
   Let the students talk to at least two farmers and ask how they prepare the rice seeds for planting. Let them identify the procedure the farmers use and the effects of their method.
4.1.5. **Seedbed Preparation**

I. **Objectives:**
   
   A. Enumerate the steps in seedbed preparation.
   B. Perform the actual seedbed preparation.
   C. Explain the importance of seedbed preparation.

II. **Subject Matter**

   A. Topic: Seedbed Preparation
   B. Reference: Training of Trainers Materials
   C. Materials: Shovel, bolos, measuring tape, and bamboo sticks
   D. Value Focus: Cooperation

III. **Learning Activities**

   A. Motivation: Ask the students where plants come from. Ask if they know any method that farmers use in preparing their rice seedlings.
   B. Activity
      - Divide the class into 5 groups.
      - Let each group identify the steps of seedbed preparation.
      - Let each group present their ideas to class.
      - Discuss the correct steps or demonstrate these steps if possible.
   C. Analysis
      - Ask the following:
         - What is a seedbed?
         - How important is a seedbed?
         - How do we prepare a seedbed?
         - What precautionary measures should be observed when preparing a seedbed?
   D. Abstraction: Let the students make a flowchart of the steps in seedbed preparation
   E. Application: Actual seedbed preparation of the students by group.

IV. **Evaluation**

   Observe the students as they do the seedbed. Use rubrics in rating their works. Encourage within-group evaluation.

V. **Assignment**

   Ask the students to bring the seeds they have to plant in their seedbed.
4.1.6. **Seed Sowing**

I. Objectives

A. Identify the types of seed sowing.
B. Differentiate the types of seed sowing.
C. Perform actual seed sowing.

II. Subject Matter

A. Topic: Seed Sowing
B. References: CP IPPM ToT Hand-Outs in Vegetables
C. Materials: Metacards, chart, pentel pen, seed box, seeds, plastic cover
D. Value Focus: Cooperation

III. Learning Activities

Activity

A. Review:
   1. When do you say that seed box is ready for planting?
   2. What are the different methods/ steps in soil treatment?
B. Motivation: Sharing of experiences
C. Unlocking of Difficulties: Line sown, broadcasting
D. Divide the class into groups using the activity cards. Each group will answer the questions stated in the activity card.
E. Reporting by groups

Analysis

A. What are the different types of seed sowing?
B. How are they alike?
C. How do they differ?

Abstraction

- Draw a flowchart showing the steps in seed sowing

Application

- Perform the actual seed sowing in a prepared seed box

Infusion of Values

- Who among the group finished first? Why?
- Who finished last? Why?
- What should you do next time?
IV. Evaluation/ Assessment

Rate the students’ performance in the actual seed sowing and seed box preparation. The rubric in Chapter 5 could be used.

V. Assignment

1. Make your own observations on your seed box.
2. Each group will bring a seed tomorrow.
4.1.7. Record Keeping

I. Objectives

A. Identify the farm records like inventory, production and expense record being kept in the farm.
B. Explain the use of different farm records.
C. Keep accurate farm records.
D. Analyze data from farm records e.g. the cost and benefits.
E. Give the importance of record keeping.

II. Subject Matter

A. Topic: Farm Record Keeping
B. References: Resources Manual on IPPM in Rice, Rice Production Manual in the Philippines, Vegetable Production in the Philippines
C. Materials: Pentel pen, manila paper, pen, notebook, samples of farm records
D. Value Focus: Interest in keeping record.

III. Learning Activities

A. Activity
   1. Ask the students the following questions:
      a. Do you keep records? Why?
      b. What records do you keep?
      c. Do you know any record farmers keep? What do you thing are the records farmers keep?
      d. Why do you think they keep these records?
   2. Present sample farm records.
   3. Group the students and give each group one farm record to examine.
   4. Let each group identify what are reported in each farm record that they examined and to brainstorm on the importance of the record to farmers.
   5. Let each group present their ideas to the whole group.

B. Analysis

Ask the following questions to guide the students in analyzing the group's activity:
A. What are the different kinds of farm records?
B. What are the uses of farm records?
C. Should a farmer keep farm records? Why?
D. What records should be kept to know if the farmer is gaining or losing?
E. How will you know the earnings per peso investment in your project?

C. Abstraction

Let the students synthesize the lesson using a graphic organizer.
D. Application

Let the students keep expense and production record of their project in a notebook. Let the students compute the cost and benefit analysis of the project using the formula.

\[
\text{Return of Investment (ROI)} = \frac{\text{Gross Production} - \text{Total Production}}{\text{Total Expenses}}
\]

Example:

\[
\text{ROI} = \frac{10,000 - 5,000}{5,000}
\]

\[
\text{ROI} = \frac{P 10,000}{5,000} = P 2 \text{ return per peso investment}
\]

IV. Evaluation

Check the expense record and production record kept by the students based on the portfolio assessment rubrics in record keeping.

V. Assignment

Let the students have an updated farm record in every activity that they perform in their project.
4.1.8. Composting

I. Objectives

A. Give the importance of composting.
B. Identify the materials needed in composting.
C. Explain the steps in composting.
D. Observe precautionary measures while making compost.

II. Subject Matter

A. Topic: Composting
B. References: Resource Manual for IPPM in Rice, Learning Competencies on CP IPPM in Rice
C. Materials: rice straw, nitrogen fertilizer, manure, ash, hoe or spade, plastic sheet, bamboo, sprinkler or pail, meta cards, pens
D. Value Focus: Observe precautionary measures in making compost.

III. Learning Activities:

A. Activity

1. Preliminary Activities
   - Singing of the song "Kapaligiran"
   - What is the message of the song?
2. Motivation
   - Who among you here has a father who is a farmer? Does your father use fertilizer? What kind does he use?
3. Presentation:
   - Call 10 pupils to form a new word out of these letters: G N I O P S T O M C. These letters should be written in the metacards.
   - What word can you form? Do you have any idea what composting is?
4. The teacher presents the materials needed in composting. The materials that will be presented are real. These are:
   - Farm wastes (fresh and dried): leaves, rice straw, hull, grasses, weeds
   - Fresh animal manure: carabao, cow, chicken, horse, etc.
   - Kerosene can or basket
   - Eight pieces post from ipil-ipil, about 2-3 inches diameter and 5 feet high.
   - Bamboo poles
   - Shovel, garden fork, bolo
   After presenting the materials needed in compost making, the teacher demonstrates how to prepare compost.
5. The teacher will demonstrate as she explains to the students the different steps in making compost. The steps are as follows:
   - Make the soil firm and dig a trench around for excess water to flow into.
   - Stack up about six inches high of grass, do not compress.
- Put over the grass about 1-2 inches thick of animal manure. Urea or ammonium sulfate, about 1-2 kilos may also be used if available.
- Put one inch thick of rich soil mixed with wood ashes, lime over the pile.
- Repeat the process over the pile until about 1 ½ meters high.
- Water the pile to make it moist.
- Thrust a pipe/s or bamboo pole/s with holes to allow air to penetrate the bottom of the pile.
- After three weeks, turn the compost over with the aid of a garden fork. This is easily done by transferring into another pile so that the bottom layer will now be on the top, etc.
- Turn the compost again bottom up after 5 weeks. Wait for 4 weeks more to allow complete composting.
- In hot weather, the compost must be watered. In rainy days, cover the compost pile with banana leaves.
- The pile of compost will be hot. This means that the bacteria in it are working.
- Composting can also be hastened with chemicals.

B. Analysis

Ask the students the following questions:
1. What is compost?
2. What are the materials needed in making compost?
3. What are the steps in making compost?
4. What will you observe while performing the activity? Why?
5. How important is compost?

C. Abstraction

Let the students draw a flowchart in making compost.

D. Application

Every group will make compost following the correct procedure/steps which students will monitor weekly for evaluation purposes. Remind them of the precautionary measures that they should observe in making compost. (The performance of the group will be rated using the performance assessment rubric reflected in this Curriculum Guide)

IV. Evaluation
A. Test: Answer the following questions
- What are the materials needed in making compost?
- What are the steps in compost making? Explain each briefly?
- How will you observe precautionary measures in making compost?

B. Performance Based Assessment

The group will monitor their own compost pile and there will be assigned group to serve as evaluator (peer evaluation. See Scoring Rubric reflected in this Curriculum Guide)
C. Portfolio Assessment

Let the students write their reflections/insights in making compost. This will serve as additional entry in their portfolio. The rating for this output is reflected in the scoring rubric in this Curriculum Guide.

V. Assignment

Interview 5 farmers in the area. Ask them about the advantages and disadvantages of using compost in their crops.
4.1.9. **Concept of Ecosystem and Agro-ecosystem Analysis**

**I. Objectives**

A. Give the meaning and importance of ecosystem.
B. Describe the components of an ecosystem.
C. Describe the level of interaction and the components of a balanced ecosystem.
D. Differentiate food web from food chain.
E. Give the meaning of Agro-Ecological System Analysis (AESA).
F. Explain the importance of AESA.
G. Perform the steps in AESA.

**II. Subject Matter**

A. Topic: Agro-Ecological System Analysis
B. References: Field Guide
C. Materials: Record book, meter stick, actual specimen, manila paper
D. Value Focus: Patience and love of work, cooperation and collaborative effort towards achieving a given activity and accuracy in measuring and recording data gathered.

**III. Learning Activities**

A. Activity

1. Mood Setting

   Form 5 groups. Tell each group to paint a picture of any ecosystem using just their bodies. Give each group 5 minutes to plan how they will show their present understanding of the concept ecosystem. Then let them freeze and one member will explain what each member in the group represents in an ecosystem. Judge who among the groups have a correct schema of the ecosystem and inform them that their lesson is about this.

2. Activity Proper

   a. Show a picture of an ecosystem highlighting the food web and food chain relationships. Make sure the pictures reflect keywords such as ecosystem, food web and food chain.
   
   b. Let them identify the concepts that they do not understand and explain the meaning of these words.
   
   c. Introduce the concept Òagro-ecosystem analysisÓ or AESA. Explain what this concept means.
   
   d. Group the students and let each group go to the field to study the rice ecosystem. In particular, they will do an agro-ecosystem analysis to gather the following information and data from a given crop in the field and recording them in their notebook.
B. Analysis

Ask the following:

- What is ecosystem?
- What are the components of an ecosystem?
- What do we mean by a balanced ecosystem?
- When is an ecosystem imbalanced?
- What are the different levels of interaction in a balanced ecosystem?
- How does food web differ from food chain?
- Can you give an example of a food web? Food chain?
- What do you call the analysis you did in the rice field?
- What information do you get in the rice field when doing AESA?
- Why is there a need to obtain this information?
- Is doing an AESA necessary? Why?
- Did you enjoy doing an AESA? Why?
- If you will be asked to do AESA for 10 weeks, will you do it? Why?
- What insights have you gained from doing AESA?

C. Abstraction

Let the students do a graphic organizer to show their understanding about ecosystem. Set the graphic organizer below as an example.

```
Rice Ecosystem

Food Web

Example

Food Chain

Data Needed in Agro-ecosystem Analysis
```
D. Application

Let each group post their AESA Report on the walls. Then allow the students to look around their reports and draw some conclusions about the rice field. Then each group should come up with some suggestions on how to maintain or improve the situation of the rice field.

IV. Evaluation

A. Give a short quiz about the concepts learned in this lesson.
B. Rate the students’ AESA report using the rubric in Chapter 5 of this guide. You could also develop your own rubric by considering the following criteria with 4 performance levels:
   - Completeness of the recorded information/data
   - Correctness/accurateness of the recorded information/data
   - Effectiveness of the presentation
   - Teamwork
   - Time management
   - Accuracy

V. Assignment

Let the students continue doing AESA for 10 weeks to be able to monitor the growth of the rice plant in all stages of development. Provide them guide questions in doing AESA in each stage of the plant. These questions could be found in the Facilitators Guide for Rice.
4.1.10. Fertilizer Management

I. Objectives

1. Define fertilizer.
2. Differentiate organic from inorganic fertilizer.
3. Classify fertilizers as organic and inorganic.
4. Give the advantages and disadvantages of organic and inorganic fertilizer.

II. Subject Matter:

A. Topic: Fertilizer Management
B. Reference: Let’s Produce More Rice (A Training Manual) DA Ê IRRI, pp.74-98
C. Materials: Samples of animal manure; commercial fertilizers
D. Value Focus: Awareness of the essential nutrients for plant growth and development.

III. Learning Activities

A. ACTIVITY

1. Motivation: What fertilizers do farmers use in their ricefields?
2. Present samples of animal manure and commercial fertilizer.
3. Let the students classify these fertilizers and compare and contrast them.

B. ANALYSIS

Ask the following questions during the discussion:

1. What are fertilizers?
2. What are the examples of fertilizers?
3. How many kinds of fertilizers are there?
4. What are some examples of organic fertilizers? What about inorganic fertilizers?
5. How do these two kinds of fertilizers differ?
6. What are the advantages of using organic fertilizers? What about the advantages of using inorganic fertilizers?
7. What are the disadvantages of using organic fertilizers? What about the disadvantages of using inorganic fertilizers?

C. ABSTRACTION

Let the students complete the graphic organizer below.
D. APPLICATION

Collect samples of fertilizers in individual plastic bags and label them.

IV. Evaluation

1. Give a short test about fertilizers
2. Let the students put their samples of fertilizers in their portfolio and encourage them to evaluate their own work using the rubric in rating portfolios that was included in Chapter 5 of this guide.

V. Assignment

Interview some farmers to know what kind of fertilizers they commonly use.
4.1.11. Water Management

I. Objectives

1. Define irrigation.
2. Give the importance of irrigation.
3. Compare the two types of irrigation.
4. Perform the different types of irrigation.
5. Identify the right time when rice plants need water.

II. Subject Matter

A. Topic: Water Management
B. References: Hand outs on Water Management
C. Materials: Meta cards, things needed for watering plants.
D. Value Focus: caring for plants

III. Learning Activities

A. Activity

1. Motivation
   - Do a water relay.
   - Do you know how long it takes a man to live without water?
   - How about plants, can it live without water?
2. Lesson Proper
   - Divide the class into groups.
   - Members of the group shall discuss among themselves the importance of water to rice plants and how water should be managed to increase rice production. Let them also discuss the different ways that farmers do to have water in the ricefield.
   - Let each group present to the whole class a synthesis of their group discussion.
   - Discuss the different ways in irrigating the ricefield.

B. Analysis

1. What do rice plants need besides air, sunlight and good soil?
2. How important is water to the rice plant?
3. At what stage in the rice production is water most needed? Why?
4. How do farmers get water for their ricefield?
5. What do we mean by irrigation?
6. What are the different types of irrigation?
7. How are the things to do for each type of irrigation?
8. How do these types differ?
9. Which type of irrigation is most convenient to farmers? Why?
C. Abstraction
   Let the students synthesize the lesson. Encourage the use of graphic organizers in synthesizing the lesson.

D. Application
   Let the students go to the field and perform the types of irrigation

IV. Evaluation
   1. Give a short quiz
   2. Rate the students as they perform the types of irrigation. Use a rubric in rating their performance.

V. Assignment
   I. Interview farmers and ask how they manage the water needs of their rice field.
4.1.12. Insects

I. Objectives

A. Describe insects.
B. Describe the different parts of an insect.
C. Name insects present in the rice/vegetable field.
D. Illustrate the life cycle of insects present in the rice/vegetable field.
E. Explain the life cycle of insects present in the rice/vegetable field.
F. Differentiate complete from incomplete metamorphosis.
G. Identify insects in the rice/vegetable field that undergo complete and incomplete metamorphosis.
H. Classify beneficial and harmful insects.
I. Differentiate harmful from beneficial insects.
J. Explain how harmful insects damage the rice plant.
K. Suggest ways in controlling harmful insects.
L. Suggest ways in conserving beneficial insects.

II. Subject Matter

A. Topic: Insects
B. References: CP IPPM Resource Manual, TOT lectures
C. Materials: Insect net, plastic, manila paper, pentel pen

III. Learning Activities

A. Activity

1. Mood Setting: Show different pictures of insects and let the students identify those insects that could be seen in the rice/vegetable field. Do this through a contest between groups.
2. Group Activity
   - Group the students into 5. Instruct them to visit the field and catch or collect insects that they could see in the field. Let them put these insects in plastics. Give them time limit in doing the work.
   - Let them go back to the room and identify all the insects they have collected. Let them prepare in manila papers a table similar to the one shown below to guide them in analyzing their collection.

<table>
<thead>
<tr>
<th>Insect Collected (tape the specimen)</th>
<th>Name of the Insect</th>
<th>Place/part where it was caught</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
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</table>
- Let each group present their work to the class.
- Then come up with a list of insects that students found in the rice field.
- Let each group study the metamorphosis or life cycle of a certain insect. Each group should come up with a report of the body parts of the insect, its metamorphosis or life cycle and its function in the field.

B. Analysis

Ask the following during discussions:

1. What are the insects that are usually found in the field?
2. How do these insects look like?
3. What are their body parts?
4. How many life stages do the insects have?
5. How do you call insects with three stages in their life cycle?
6. What are the examples of insects that have incomplete metamorphosis?
7. What do you call insects with four stages in their life cycle?
8. What are the examples of this kind of insects?
9. How do you differentiate insects with incomplete metamorphosis from insects with complete metamorphosis?
10. Which insects are harmful to the rice/vegetable plants?
11. Why are they harmful?
12. How should they be controlled?
13. What insects are friendly to the rice/vegetable plants?
14. Why are they friendly?
15. What should be done to conserve them?
16. Is it necessary to know these insects? Why?

C. Abstraction

Let the students synthesize the ideas they learned from the lesson using the graphic organizer below. They will identify the insects that are friendly or harmful to the rice plant and write descriptions about each insect and the ways to conserve or control them. Do this by group.
D. Application

Make a compilation of the different species and life cycle of beneficial and harmful insects.

IV. Evaluation

1. Give a short test about the concepts introduced in this lesson.
2. Rate using rubrics all the outputs of the students in their group activities. Let them put their most-liked output in their portfolio and reflect on the importance of their work.

V. Assignment

1. Interview farmers in your locality on the following questions:
   - What are the insect pests attacking their rice field?
   - How do they control these insect pests?
2. Set up an insect zoo study.
4.1.13. Disease Ecology

I. Objectives

A. Define plant disease.
B. Explain the disease triangle.
C. Describe the signs and symptoms of common rice diseases.
D. Identify the causal organisms/pathogens causing diseases.
E. Classify diseased plants according to causal organisms.
F. Propose ways of preventing and controlling rice diseases.

II. Subject Matter

A. Topic: Diseases
B. Reference: TOT lectures
C. Materials: Manila paper, pentel pen, notebooks, infected plant

III. Learning Activities

A. Activity
1. Show samples or pictures of plants with diseases. Let the students describe what was shown. Ask what happened to the plants. Tell them that they will go to the field to look for plants with similar damage.
2. Divide the class into three groups and let the students visit the rice field to collect plants, which they suspect, have been infected with diseases. Give the students time limit in collecting their specimen.
3. Let them go back to the classroom and examine closely the infected plant they found.
4. Discuss the different causal organisms of plant diseases.
5. Let the students identify which of the plants they collected these causal organisms infect.
6. Let the students classify the diseased plants according to their causal organisms then describe the signs and symptoms of plants infected by these causal organisms.
7. Let them present their classifications to the class following the table below.

<table>
<thead>
<tr>
<th>Causal Organisms</th>
<th>Specimen of Plant infected by this organism</th>
<th>Signs of plants infected by this organism</th>
<th>Symptoms of plants infected by this organism</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

8. Let the group present their output to the class.
B. Analysis

Ask the following questions during the whole class discussion:
1. How does a plant infected with diseases look like?
2. What are the organisms that cause diseases to plants?
3. What are the signs and symptoms of plants infected by these organisms?
4. What will happen if plants have diseases?
5. How could we prevent plants from being infected by diseases?

C. Abstraction

Let the students synthesize the lesson by completing the graphic organizer below.

```
Diseased Plants

  - Signs
  - Symptoms
  - Causal Organisms
```

D. Application

List down ways to prevent/control the occurrence of rice diseases.

IV. Evaluation

A. Give a short quiz about the lesson.
B. Let the students include in their portfolio their most significant output from this lesson. Ask them to reflect on the importance of their lesson.

V. Assignment

Interview farmers on how they could prevent and control rice diseases.
4.1.14. Pest Management

I. Objectives

A. Describe the cultural, indigenous, biological, botanical and chemical methods in controlling pests.
B. Identify the most environment-friendly method in controlling pests.
C. Perform the environment-friendly methods in controlling pests.

II. Subject Matter

A. Topic: Pest Management
B. References: CP IPPM Resource Manual on Rice
C. Materials: manila paper, pentel pens, crayons, masking tape
D. Value Focus: resourcefulness, creativity, environmental awareness, teamwork

III. Learning Activities:

A. Activity

1. Group Competition: Let the students form groups. In groups, ask them to body paint the picture of what they will do if they see pests in the rice field. Let one member of the group explain the idea shown by the group. The one with the best idea of how to control pests will be declared winner.

2. Show samples of methods in controlling pest that will be used during this activity.
   o Indigenous – dead animals
   o Botanical – mixture of beer, garlic, sugar or any botanical product used to control pest
   o Cultural – picture of a farmer doing sanitation or thorough land preparation
   o Biological – spiders, wasps
   o Chemical – empty bottles of pesticides

3. Regroup the class into 5 and let each group describe the things used in controlling pest. Provide them with a copy of the table below for them to record their observations.

<table>
<thead>
<tr>
<th>Method being Described</th>
<th>Item Examined</th>
<th>Characteristics of the Item</th>
<th>How the item controls pest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>
4. Let each group present their work in the class as springboard for discussion.

B. Analysis

Ask the following questions:
- What are the different methods in controlling pests?
- How do you do each method?
- What are the advantages and disadvantages of each management strategy?
- Which among these methods is the most environmental-friendly? Why?

Abstraction

Let the students complete the graphic organizer below

B. Application

Let each group go to the field and perform the most-environmental friendly method in controlling pests.

IV. Evaluation

1. Give a short test
2. Rate the students in the actual control of the pest in the rice field. Use a rubric in rating their participation.
3. Encourage the students to document in their portfolios their most significant output from this lesson. Tell them to reflect on the importance of this entry in their portfolio. Rate their work using the portfolio rubric.

V. Assignment

Let the students interview farmers on how they control pests in their ricefield.
4.1.15. Pesticides

I. Objectives

A. Define pesticides.
B. Classify pesticides according to level of toxicity.
C. Differentiate signs from symptoms of pesticide poisoning.
D. Identify the signs and symptoms of pesticide poisoning.
E. Explain the harmful effects of pesticides to human, animals, air, water, plants and soil.
F. Observe precautionary measures when disposing pesticide containers and storing pesticides.

II. Subject Matter

A. Topic: Pesticides
B. References: The Pestilence of Pesticides, ToT Manuals
C. Materials: manila paper, pentel pens, crayons, masking tape, empty bottles, sachet pf pesticides, labels of pesticides
D. Value Focus: environmental awareness, saving the mother earth

III. Learning Activities

A. Activity

1. Mood setting: Teach any action song that could set the mood of the students. You may consider the song given below:

   O Kay Liit Ng Mundo

   Ito ay mundo ng isa
   Kasiyahan, kalungkutan at pagmamahalan
   Pangamba, pag-asa, pagbibigayan
   Dapat ay isaalang-alang

   O kay liit ng mundo (3x)
   Kay liit ng mundo

   • How do you describe our world based on the song?
   • What will you do with your world?

2. Explain to the students the experiment on the effects of pesticides on pests and natural enemies. See the Facilitators Guide for Rice for you to know how you will guide your students in conducting their experiment. Ask them to conduct the experiment. Have a whole group discussion on the results of the experiment.
3. Let the students bring out the previously assigned disposed of containers of pesticides. Group the students into 5 and let each group study the information about the pesticides written in the container label. Let them get information about the pesticide using the matrix below as their guide. Then let them present their work to the class.

<table>
<thead>
<tr>
<th>Brand of Pesticide</th>
<th>Formulation</th>
<th>Mode of Action</th>
<th>Toxicity level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B. Analysis

Ask the following questions during the whole group discussion:
1. What are pesticides?
2. What are the examples of pesticides that you found?
3. What is the level of toxicity of the pesticides you examined?
4. How are these pesticides used in the field?
5. What do you think will happen to the plant when these pesticides are applied?
6. So what are the signs and symptoms of plants sprayed with pesticides?
7. Who are the other living things who could be affected by the application of these pesticides?
8. How could they be affected?
9. So what should be done when using pesticides?

C. Abstraction

Let the students prepare a graphic organizer to synthesize the ideas they learned from this activity.

D. Application

Let the students do the activity in determining the effects of pesticides on human health and environment. This activity can be found in the Facilitators Guide for
IPPM Rice. Since this activity requires the students to simulate spraying of pesticides in the field using a red dye dissolved in water, remind them to observe precautionary measures when applying these fake pesticides.

IV. Evaluation

1. Give the students a short quiz about the lesson.
2. Rate their performance during the group activities and the actual spraying of pesticides using a rubric that should have been developed earlier and presented to the students before the actual performance of their task.
3. Let the students identify a possible entry in their portfolio from the day’s lesson and let them reflect on the importance of this entry.

V. Assignment:

Let the students make campaign posters against the use of pesticides in the farm.
4.1.16. Physiological Disorders

I. Objectives

A. Explain physiological disorder.
B. Describe the different physiological disorder of plants.
C. Identify factors that cause physiological disorders of plants.
D. Explain how these factors cause physiological disorder in plants.
E. Suggest ways on how to prevent physiological disorder in plants.

II. Subject Matter

A. Topic: Physiological Disorder
B. References: Resources Manual on IPPM, Curriculum Guide, Flyers
C. Materials: Actual specimen, Magnifying lens, ruler, bond paper, pencil, tape, folder
D. Value Focus: Perseverance and awareness on the damages and effect of physiological disorder in the yield and growth performance of the crops.

III. Learning Activities

A. Activity

1. Unfreezing

   Post on the board the prepared song entitled "Apat na Pulubi" then let everybody sing and dance in unison.

   ŐSayaw Pulubi”
   (Cha-cha)

   Paano ba and sayaw ng bulag?
   Ganito, ganito and sayaw ng bulag (2x)
   Pilay?
   Lasing?
   Buntis?

2. Ask them how such abnormalities affect their way of living.
3. Relate the activity to the topic.
4. Ask them to form a group and let them brainstorm on the factors that cause physiological disorders in plants.
5. Let them present their work in the form of mind map, web or matrix.
6. Present actual specimen of plants with physiological disorders. The specimens should have been pre-assigned so that the students will examine enough specimens.
7. Let them identify the causes of the physiological disorders by group.
B. Analysis

Ask the following questions to guide the students in analyzing the group's activity:

1. What do we mean by physiological disorders?
2. How do you describe plants with physiological disorders?
3. What are the natural factors that could cause these disorders?
4. Is it possible that these disorders are also caused by chemicals? What could these chemicals be?
5. Could the disorder be caused by mechanical factors? Explain your answer.
6. So what are the common factors that cause physiological disorders to plants?
7. What will happen if plants have physiological disorders?
8. How does this problem of plants affect the yield production?
9. So what should you do to plants to free them from having physiological disorders?

C. Abstraction

Guide them to come-up wit this presentation.

D. Application

Go to your field and identify plants with physiological disorders. Do what you are supposed to do to these plants so that you will have a good yield.
IV. Evaluation

1. Give this as a test to your students: What are the causes of physiological disorder in plants and give two examples for each?

Ex.

<table>
<thead>
<tr>
<th>A. Natural</th>
<th>B. Chemical</th>
<th>C. Mechanical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood</td>
<td>Spraying</td>
<td>Machine</td>
</tr>
<tr>
<td>Typhoon</td>
<td>Fertilizing</td>
<td>Animal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Man</td>
</tr>
</tbody>
</table>

2. Let the students put in their portfolio their most significant output from the day's lesson. Let them reflect on the importance of this entry in their portfolio.

V. Assignment

Make a poem suggesting prevention of physiological disorders in plants.
4.1.17. Marketing

I. Objectives:

A. Define Marketing.
B. Propose pointers to be considered in marketing farm products.
C. Differentiate the kinds of marketing schemes.
D. Simulate the different kinds of marketing schemes.

II. Subject Matter

A. Topic: Marketing
C. Materials: Baskets/ sacks, make-believed production/ vegetable
D. Values: Entrepreneurship

III. Learning Activities

A. Activity
   1. Group Dynamics (Grandmother went to the market)
   2. Introduce the day's topic and let the students share their experiences when marketing farm products. They could also relate their observations when farmers market their products.
   3. Group the students into 5 and let each group role play/ mimic a seller-consumer situation in the market, or the different kinds of marketing. (They will be given 5 minutes to prepare their script and rehearse.)

B. Analysis

Ask the following questions after the role-playing session:
   1. What did you feel during the activity?
   2. What are the things farmers have to consider when marketing their products?
   3. What are the different ways in marketing products?
   4. Which of these ways is the most effective? Why?
   5. Which of these ways is the least effective? Why?
   6. If you are a farmer and you have a bountiful harvest, what will you do? (market some of my harvest)
   7. Why will you do this?
   8. If you market your farm products, how will you do it?
   9. Why did you choose this scheme in marketing your product?

C. Abstraction

Let the students synthesize the lesson by coming up with a graphic organizer. Let them present their work to the class for comments and suggestions.
D. Application

Let each group role play the three kinds of marketing.

IV. Evaluation

1. Give a short quiz about the lesson.
2. Rate the group’s performance during the simulation or role-playing sessions. Use a rubric in rating their performance and have this rubric presented to them before their actual performance.

V. Assignment

Conduct interview on how farmers market their produce.
4.2. For Topics Specific to Rice Production

4.2.1. Importance of Rice Production

I. Objectives:

A. Identify the provinces that are major producers of rice in the Philippines.
B. Describe the status of rice production in the Philippines.
C. Explain the importance of rice to humans, animals, and industries.
D. Analyze the rate of production vis-à-vis the rate of consumption of the population.
E. Infer that rice production is a good prospect in improving the economic condition of the Philippines.

II. Subject Matter

A. Topic: Importance of Rice Production in the Philippines
B. Value Focus: Love for work, dignity of labor, responsibility
C. References: Curriculum Guide, WE Flyers
D. Materials: CP IPPM document on project mission, vision, goals & objectives, fact sheets on rice production in the Philippines, manila paper, pentel pen

III. Learning Activities

A. Activity

1. Preparatory

Ask from the group if they could still remember the song “Planting Rice”. If they don’t, request the assigned group to lead the song in front.

Ask the following questions:
- How do you describe planting rice in relation to the song?
- Is there reality in it?
- How do you relate the message of the song to present rice production shortage of the country?

2. Brainstorming

Request students to proceed to their assigned small groups. Then, the leaders will draw by lots regarding the question for the group:

- Group 1 - Explain why the Philippines is an agricultural country.
- Group 2 - Identify the provinces that are major producers of rice in the Philippines.
- Group 3 - Describe the status of rice production in the Philippines.
- Group 4 - Explain how rice production could be a good prospect in improving the economic status of the country.
• Group 5 - Give the importance of the CP IPPM Program in Rice in response to the economic crisis the country is facing today.

3. After the small group brainstorming, students have to go back to the big group for discussion.

B. Analysis

Ask the following during the whole group discussion:

1. How do you describe the Philippines based on the primary source of living of the Filipinos?
2. Why is farming the most common form of living?
3. What provinces in the Philippines are known as major producers of rice?
4. What is the status of rice production in the Philippines?
5. Is the rice produced in the Philippines enough to feed all the Filipinos? Why?
6. Why do we import rice from our neighboring countries?
7. Is it still appropriate for our country to be identified as an agricultural one? Why?
8. How could rice production be a good prospect in improving the economic status of the country?
9. What values should Filipinos develop to avoid shortage of rice or probably make money from rice?
10. How important is rice production in the Philippines?

C. Abstraction/Generalization

Let the students come up with a synthesis of what has been discussed in the class.

D. Application

1. Cite suggestions/recommendations on how to increase the production of rice in the Philippines.
2. How does the CP IPPM Program respond to the significance of rice production in the Philippines?

IV. Evaluation

A. Paper and Pencil Test

1. What provinces in the Philippines are major producers of rice?
2. Cite important factors that made these provinces major producers of rice in the country.
3. How important is the CP IPPM Program to the people in the community?
B. Portfolio Assessment

Let them include in their portfolio any of the following outputs:

1. An essay with the title:
   - Wanted: Young Blood in Agriculture
   - Farmer: The Backbone of the Nation

2. A drawing about a farmer within a rice ecosystem.

V. Assignment

Interview your Municipal Agriculturist and find out the different problems in rice production in your locality. Then, suggest possible solutions to the problems identified.
4.2.2. Crop Morphology

I. Objectives

A. Define Morphology.
B. Observe the parts of the plant at different stages.
C. Illustrate the parts of rice at different stages.
D. Describe the rice plant at different phases and stages of growth and development.

II. Subject Matter

A. Topic: Crop Morphology (Rice)
B. References: Learning Competencies for Rice, p.2, Resources Manual on IPPM in Rice pp. 61-63
C. Materials: Manila Paper, crayons, pentel pens, actual specimen of rice plant at different stages, strips of Manila paper
D. Value Focus: Cleanliness, Cooperation, Creativity

III. Learning Activities

A. Activity

1. Preliminary Activity

- The teacher presents ready-made pictures of the different growth stages of a rice plant. The students will arrange them chronologically (from germination to mature grain). Let them check their work after the discussion.

  - 1st Picture - Germination to Emergence
  - 2nd Picture - Seedling Stage
  - 3rd Picture - Tillering Stage
  - 4th Picture - Stem Elongation Stage
  - 5th Picture - Panicle Initiation to Booting Stage
  - 6th Picture - Heading or Panicle Stage
  - 7th Picture - Flowering Stage
  - 8th Picture - Milk Grain Stage
  - 9th Picture - Dough Grain Stage
  - 10th Picture - Mature Grain Stage

- Ask the questions: If you were a rice plant, what stage would you want to be? Why?
- Present the actual specimen of rice plant at different stages. Group the class and assign each group to examine the specimen/s of rice plants at a specific stage.
- Let the students observe the specimen using the table.
<table>
<thead>
<tr>
<th>Growth Stages</th>
<th>Estimated Age of the Plant</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Germination to Emergence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Seedling Stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Tillering Stage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Stem Elongation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Panicle Initiation to Booting</td>
<td></td>
<td></td>
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<tr>
<td>6. Heading or Panicle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Flowering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Milk Grain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Dough Grain</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Let each group present their work to the whole class:

2. Unlocking the Difficulties

- Let the students define these words through their observations and also with the aid of the teacher.
  - **Morphology** — is the study of external structure of organisms for example, the arrangement of leaves on a plant
  - **Vegetative Phase** — covers germination to panicle initiation
  - **Reproduction Phase** — covers panicle initiation to flowering; in the tropics, it lasts for almost 35 days
  - **Ripening Phase** — it covers flowering stage to development of mature grains; this phase takes about 30 days

B. Analysis

1. Ask the following questions to guide the students in analyzing the group activity:

- What term refers to study of the external structure of an organism?
- So how do you define morphology?
- What are the different growth stages of a rice plant?
- What do you call the phase in the development of the rice plant which covers germination to panicle initiation?
- So how many days does the vegetative stage of the rice plant last?
- What do you call the phase of the rice plant that includes the panicle initiation up to the flowering stage?
- How many days is the rice plant in its reproductive phase?
- What do you call the phase in the development of the rice plant that covers the flowering stage to the development of mature grains?
- How long is the rice plant in this phase of its development?
- How many phases of development are there in the life cycle of a rice plant?
- How many stages are there in all?
C. Abstraction

Let the students finish the graphic organizer that is given below:

![Diagram of Growth Stages of the Rice Plant]

D. Application

Draw and label the parts of a rice plant at different stages. (The output could be placed in student's portfolio. See scoring rubric for this in the Curriculum Guide)

IV. Evaluation

1. Give the students a short quiz about the lesson.
2. Let the students put in their portfolio their most significant output from the day's lesson. Let them reflect on the importance of this entry in their portfolio.

V. Assignment

Let each student interview 5 nearby farmers about what stage in the development of a rice plant needs extra care.
4.2.3. **Land Preparation for Rice Growing**

**I. Objectives**

A. Identify the tools/equipments used in land preparation.
B. Explain the uses of each tool/equipment.
C. Use appropriate tools and equipment in land preparation for rice growing.
D. Follow the proper procedures/steps in actual land preparation.
E. Perform the actual land preparation.
F. Practice precautionary measures in land preparation.
G. Explain the importance of thorough land preparation in the control of weeds, insect pests and diseases.

**II. Subject Matter**

A. Topic: Land Preparation
B. References: Resource Manual on IPPM in Rice, Rice Production in the Philippines, ToT Lecture
C. Materials: Plow, harrow, hoe, shovel, bolo, hand tractor, picture of other farm equipment used in land preparation
D. Value Focus: Love of work, skills development, and industry

**III. Learning Activities**

A. Activity

1. Mood Setting: Teach the students to perform the "Let's Go Clap" to land preparation.
   
   12 123 1234 12 (4x)

2. Display in front of the class the actual tools in land preparation. Let the students name each tool. Try to ask if they know the uses of the tools.

3. Show pictures of other equipment for land preparation not available in the classroom. Find out if they know the function of this equipment.

4. Invite a farmer to explain to the class the procedure and importance of thorough land preparation. In the absence of a farmer, the teacher will be the one to explain using the Resource Manual on IPPM in rice as guide.

B. Analysis

Ask the following questions:

1. What are the tools and equipment used in land preparation?
2. What are the steps in land preparation?
3. Is it necessary to prepare the land thoroughly? Why?
C. Abstraction

Prepare paper strips or metacards with a written procedure in land preparation to be arranged by the students chronologically by group.

D. Application

The teacher will first demonstrate the procedures in land preparation together with the proper position and handling of tools being used. This will be followed by the students working in groups on assigned area by the rice field.

IV. Evaluation

Performance Assessment Ň Give instruction to the students that they will be graded following the rubrics for land preparation. (See rubrics in Chapter 5 of this guide)

V. Assignment

Reflect on your experience in land preparation.

1. What do you like in it?
2. What don’t you like in it?
3. Is it necessary for the students to learn how to prepare the land for rice production? Why?
4.2.4. Weeds Management

I. Objectives

A. Define weeds.
B. Identify weeds present in the rice field.
C. Classify weeds according to morphology.
D. Explain how weeds affect the growth of the plant.
E. Describe the methods of controlling weeds.

II. Subject Matter

A. Topic: Weed Management
B. References: Resources Manual on IPPM in Rice, Rice Production Manual in the Philippines
C. Materials: Weed collection, pentel pen, manila paper, masking tape
D. Value Focus: Interest, Creativity, Resourcefulness, Neatness of work

III. Learning Activities

A. Activity

- Group Dynamics: The Boat is Sinking
  - How did you find the activity?
  - How will you relate our group dynamics activity to our lesson for today on weeds?
- Based on their permanent groupings, let them visit the rice field and collect as many weeds as possible within a 15-minute time frame.
- Let them sort out and classify the weeds according to their morphology and assist them in identifying the local names of the weeds.
- Paste the sample weeds on a Manila paper and group according to the ff:

```
WEEDS

GRASSES
(with nodes and internodes)

SEDGES
(w/ triangular stem)

BROADLEAVES
(2 or more leaf/ves in a petiole)

1.
2.
3.
```

```
1.
2.
3.
```
B. Analysis

Ask the following questions to guide the students in analyzing the group’s activity:

- How did you find the activity?
- What have you collected in the field?
- Why are they called weeds?
- What weeds have you collected?
- What is their local name?
- How could weeds be classified?
- What is the basis in classifying weeds?
- Should weeds be pulled out from the field? Why?
- So how could we control weeds in the ricefield?

C. Abstraction

Let the students synthesize the lesson in form they want.

D. Application

Let the students make a herbarium of weeds by collecting small weeds placed in a folder with local name, English name and scientific name. Press the folder in a wood and wait until it becomes fully dried.

IV. Evaluation

Check the herbarium of weeds following rubrics on portfolio assessment for scrapbook of weeds.

V. Assignment

Interview 5 farmers in your community to know how they control and manage weeds in their rice field.
4.2.5. Predators

I. Objectives

A. Identify common predators of insect in the field.
B. Give the characteristics of predators.
C. Describe the life cycle of predators.
D. Describe the feeding and mating habits of some predators.
E. Discuss the important role of predators in the rice field.
F. Suggest ways on how to conserve predators in the field.

II. Subject Matter

A. Topic: Predators
B. References: Curriculum Guide, Fact sheets, encyclopedia
C. Materials: Manila paper, pentel pen, lens, plastic jar, crayons, aspirator
D. Value Focus: Conservation of Natural Enemies

III. Learning Activities

A. Activity

1. Review: Ask one student to recap the past activities and discussions made.
   (A field walk was made to collect live specimen of spiders. Each group answered questions during the brainstorming activity followed by presentation of outputs about spiders. We have learned that spiders differ from insects in many ways. That we need to conserve spiders because they help maintain ecological balance, etc.)

2. Presentation:
   Today we are going to identify another natural enemy in the rice field aside from spiders. In the rice field, there are insects that eat other insects for their food. They are called predators. Examples of these are lady beetles, dragonflies, damselflies and even birds.

3. Field Walk (Time limit 25 minutes)
   Group the students and let each group do these when they visit the rice field:
   - Bring magnifying lens, plastic jar, record books, and pens.
   - Look for an area around the rice field where predators may be found.
   - Collect at least one predator after recording its behavior.
   - Observe the predators by considering the following questions:
     Where did you find the predators?
     In what particular part of the rice plant did you find them?
     What are they doing?

4. Let the students go back to the classroom and give them few minutes to answer the questions given. Then, let them present their answers to the whole class.
5. Let each group study one life cycle, mating and feeding habits of a predator they found in the rice field and present this to the class. Encourage them to use all possible resources available in the school in determining the life cycle of these predators. Then let them present their work to the class.

B. Analysis

Ask the following questions during the whole group discussion:
1. What are predators?
2. How do they look like?
3. What are the predators of insects that you found in the rice field?
4. How does each predator look like?
5. What are the stages in the life cycle of each predator?
6. What is the feeding habit of each predator?
7. What about its mating habit?
8. Is it important to have predators in the rice field? Why?
9. How could we conserve predators in the rice field?

C. Abstraction

Let the students complete the table below based on what were discussed in the class.

<table>
<thead>
<tr>
<th>Predator</th>
<th>Description</th>
<th>Life Cycle</th>
<th>Feeding Habit</th>
<th>Mating Habit</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>

D. Application

You saw children catching predators particularly dragonflies or damselflies in the rice field for fun. What will you do?

IV. Evaluation

2. Rate the students based on their performance in group activities. Use rubric in doing this.
3. Let the students put in their portfolio their most significant output. Let them reflect on the importance of this output. Use a rubric in rating the students portfolio entry.

V. Assignment

Write a poem, a story, or a jingle on how to conserve predators in the rice field.
4.2.6. Natural Enemies

I. Objectives

A. Define biological control
B. Define natural enemies
C. Give the importance of natural enemies
D. Collect insects
E. Identify natural enemies as to predators, parasites and pathogens
F. Differentiate parasitism from parasitoids

II. Subject Matter

A. Topic: Natural Enemies of Rice
B. References: Resources Manual on
C. Materials: sweep nets, empty vials, alcohol, magnifying lens, syringe
D. Value Focus: Conservation of natural resources

III. Learning Activities

A. Activity

1. Mood Setting:
   - Show to the class specimen of insects and spiders preserved in vials. Suggested specimen are the following:
     - An adult wasp
     - A lynx spider
     - An adult rice bug
     - A leaf folder larva
     - Adult green leaf hopper
   - Have it passed around the class for them to see.
   - Ask them where can these specimens be found.

2. Activity Proper
   - Group students into 5. Ask them to choose their leader, secretary, gopher, illustrator, etc.
   - Let them go to the rice field and observe the behavior and characteristics of insects, spiders and other organisms both in land and in water
   - Ask them also to collect insects, spiders other organisms through the use of sweepnet.
   - Regroup inside the classroom and let each group make a report.

B. Analysis

Ask the following questions to guide the students in analyzing the group's activity:
- What are the organisms that you have seen in the rice field?
- Where are they usually found?
- What are they doing in the rice field?
- What do you call insects that inflict damage to the rice plants?
- What about organisms that kill or destroy the harmful insects?
- Based on their behavior and characteristics, how do we classify the natural enemies of pest?
- Why are they called predators, parasitoids and pathogens?

C. Abstraction

Complete the graphic organizer by supplying examples under each of the following: predators, parasitoids and pathogens

![Graphic Organizer]

D. Application

- Ask students to make a scrapbook of the natural enemies of insect pests of rice.
- Let them classify the predators, parasitoids and pathogens.
IV. Evaluation

1. Let the students do a self-evaluation of their scrapbook by comparing the specimen to the CP IPPM resource book. Let students make necessary corrections when necessary.
2. Using rubrics in rating portfolio that is appended in this guide let the students do a self-evaluation of their final output.

V. Assignment

Let the students investigate on the farming practices of farmers that will help conserve the natural enemies of the rice plant. Ask them to make a report the following day.
4.2.7. **Kuhol and Its Management**

I. **Objectives**

   A. Describe mollusks (kuhol).
   B. Explain the life cycle of mollusks.
   C. Identify the stages in the growth of rice plant when mollusks are most destructive.
   D. Suggest ways to prevent and control mollusks from damaging the rice plant.

II. **Subject Matter**

   A. Topic: Kuhol and Kuhol Management
   B. References: CP IPPM Curriculum Guide, ToT Training handouts
   C. Materials: Pentel pens, manila paper, crayons, empty bottles, jars, live specimen of kuhol
   D. Value Focus: Awareness, teamwork and cooperation

III. **Learning Activities**

A. **Activity**

   1. Group students into 5.
      - Ask each student to draw from the box a previously prepared piece of rolled paper with letters K U H O L. Each of the letters should have equal numbers corresponding to the ToTal number of students.
      - Students who have drawn the same letters will be in the same group.
   2. Let each group choose their leader, secretary, reporter and illustrator.
   3. Ask the students to go to the rice field and observe closely the feeding habits and damage caused by kuhol. Let them collect at least one specimen per stage of kuhol.
   4. Regroup students inside the classroom. Ask each group to prepare a report of their observations.
   5. Let each group present their output to the whole class. Students should be encouraged to ask questions for further clarification.

B. **Analysis**

   Ask the following questions to guide the students in analyzing the group’s activity:

   1. How did you find the activity?
   2. Did it help you understand more about mollusk? Explain your answer.
   3. Did all the members of the group perform their task in the activity?
   4. What should group members do to make a good presentation?
   5. What is the importance of teamwork and cooperation in accomplishing group goals and objectives?
6. What are the different stages in the life cycle of mollusks?
7. At what stage in the growth of the rice plant when you see mollusks in the ricefield?
8. What is the effect of the presence of mollusks in the ricefield?
9. How does Golden Kuhol inflict damage to rice plants?
10. What stage in the lifecycle of mollusks when they are most destructive to the rice plant? Why?
11. So how should mollusks be managed when they already attacked the ricefield?
12. What should be done to control mollusks from attacking the ricefield?

C. Abstraction

Ask students to make a concept map on kuhol and its management. Suggested concept map may look like this:

![Concept Map]

D. Application

Let the students dramatize what they will do in this given situation below.

*Mang Kardo is a rice farmer of Barangay Mabuhay. He grows two rice croppings a year because of abundant water supply. One day, he noticed that his rice plants are attacked by Golden Kuhol. His rice plants are only 7 days old after sowing. If you are Mang Kardo, what will you do?*
IV. Evaluation

A. Paper & Pencil test - Give the students a short pen-and-paper test about the life cycle of mollusks and their management

B. Portfolio Assessment

1. Let the students do the following to be included in their portfolio:
   - Illustration of the life cycle of kuhol
   - Insights on kuhol and kuhol management.

2. Let the students do a self-evaluation of their outputs using the rubric in rating portfolio that is appended in this guide.

V. Assignment:

Let the students Interview farmers on their practices in controlling mollusks in the locality. Ask them to present to the class tomorrow the result of your interview.
4.2.8 Defoliators

I. Objectives

A. Identify defoliators in the rice field.
B. Explain at what stage in the growth of a rice plant when defoliators are most damaging.
C. Conduct simulation study on defoliators.
D. Enumerate effective management practices for the control of defoliators.

II. Subject Matter

A. Topic: Defoliators
C. Materials: live specimen of defoliators, insect net, plastic, manila paper, vials, alcohol, crayons, pentel pens
D. Value Focus: Cooperation, Awareness on the managements practices of defoliators

III. Learning Activities

A. Activity

1. Mood Setting

   The teacher prepares questions written on pieces of paper. Then the pieces of paper will be placed together. Crumple them to form a ball. The teacher will pass the paper ball to the students while singing any lively song (if possible related to CP IPPM). When the song stops, the student who is caught holding the paper ball will get a letter from the ball (Required letters in the ball are E D E F O I A L O T R). Now, let us form a word from the letters that you got. What word can you form? Do you have any idea what defoliator is? This time, we will be learning more about defoliators.

2. The teacher presents specimen of defoliators (such as army worm, cut worm, case worm, whorl maggot, etc.) Ask the students about their feeling while watching the specimen. Let them describe the specimen they saw.

3. Let the students identify the defoliators presented with the aid of the teacher. Pupils will write their answers on strips of Manila paper.

4. Let the pupils formulate questions that they would like to know about defoliators. Help them in framing questions that have to do with which growth stage of a rice plant are defoliators most damaging and enumerate effective management practices for the control of defoliators. The following are questions that should be elicited from the students:

   - What are the defoliators in the rice field?
   - Why do we call them defoliators?
At what stage in the growth of rice plants are defoliators most destructive?
How would you prove that those management practices are effective in controlling defoliators?

5. Form the students into groups (groupings will depend on class size).

- Setting up standards/norms in doing the activity (should be solicited from the students)
- Field observation
  - Each group will bring sweep net and collect defoliators in the rice field. The collection may be added or placed in their portfolio.
  - Each group will observe/record the age of the rice plants and its growth stage and effects of defoliators in that particular stage.
- Let the pupils start working on their assigned task.

6. Let each group present their work to the whole class.

B. Analysis

1. Ask the following questions to guide the students in evaluating the group’s presentation:
   - Whose group was able to finish ahead of time? Why?
   - How important is cooperation in performing group task?

2. Let the pupils answer the questions in Activity 4:
   - What are the defoliators in the rice field?
   - Why do we call them defoliators?
   - At what stage in the growth of a rice plant are defoliators most destructive?
   - How do they affect the rice plant?
   - What are the good practices in controlling defoliators?
   - Which of these practices is the most effective in controlling defoliators and why?

C. Abstraction

1. At what stage in the growth of the rice plant are defoliators most destructive?
2. Every group will be given strips of manila paper with management practices for the control of defoliators. There will be a contest in posting those management practices on the board. The group who finishes first will be declared the winner.

D. Application

The group will role play the effects of defoliators on a specific growth stage of a rice plant.
IV. Evaluation

1. Give the students a short quiz about the concepts learned in the lesson.
2. Rate the students’ simulation study of the effect of defoliators. Prepare this rubric ahead so that the students will know the scoring guide before they perform the task.
3. Let the students put in their portfolio any of their most significant outputs in today’s lesson. Let them reflect on the importance of their portfolio entry.

V. Assignment

Each group will conduct a simulation study on defoliators. The scoring rubric is reflected in the Curriculum Guide.
4.2.9 Aquatic Organisms and Neutrals

I. Objectives

A. Identify aquatic organisms and neutrals in the rice field.
B. Explain the function of aquatic organisms and neutrals
C. Collect samples of aquatic organisms.
D. Suggest ways on how to conserve aquatic organisms
E. Show appreciation of the role of aquatic organisms in maintaining a balanced rice field ecosystem.

II. Subject Matter

A. Topic: Aquatic Organisms and Neutrals
C. Materials: live specimen, plastic bottles, rubber band, nylon mesh
D. Value Focus: Awareness, teamwork, appreciation and conservation

III. Learning Activities

A. Activity

1. Group Dynamics/Mood Setting: Let the pupils/students sing the action song written below. You may choose variety of tunes such as: Bulaklak, Sampung Mga Daliri, etc.

   Sampung Organismo
   Sampung Organismo
   Microvella at Mesovella
   Dalawang isda, dalawang palaka
   Lamok na maganda
   Tra-la-la (3x)
   Tral-la-la-la-la-la
   Repeat all

2. Ask these questions:
   • If you are a frog, how do you like to live your life?
   • Have you seen already samples of Microvella and Mesovella?

3. Give description of Microvella and Mesovella making use of the pictures from the brochure

4. Present drawing showing aquatic organisms and neutrals.

5. Inform the students that they will go to the ricefield to collect aquatic organisms and neutrals.

6. Orient them as to how they will collect aquatic organisms in the rice field.

7. Divide the pupils into groups and let each group do the following tasks
- Task 1 – Each group will go to the rice field with 1 cm. water
- Task 2 – Prepare/bring the pre-assigned tools needed in collecting aquatic organisms and neutrals
- Task 3 – Carefully collect aquatic organisms, neutrals and earthworms
- Task 4 – Put it into plastic bottles and seal it for future use.

8. Let the students go back to the classroom for discussion.

B. Analysis

1. Ask the following questions:
   - How did you find your activity in the rice paddies? Did all the members have the experience of identifying and describing aquatic organisms and neutrals?
   - What aquatic organisms did you collect? How do they look like?
   - What do they do in the ricefield?
   - How do we/you conserve aquatic organisms?
   - What is the function and importance of aquatic organisms and neutrals?

2. Guide them in formulating questions as to what they wanted to know about aquatic organisms and neutrals
   - How do these aquatic organisms and neutrals help maintain a balanced ecosystem?
   - How do aquatic organisms serve as food for natural enemies?

C. Abstraction

1. Let each group make a diagram showing the role, importance and function of aquatic organism to the rice field.

   ![Diagram](https://via.placeholder.com/150)

   1. Neutralize soil fertility
   2. Maintain balance ecosystem

   ![Benefits](https://via.placeholder.com/150)

   1. Eat some larva and insect pest
   2. Serve as food for natural enemies

   1. Increase yield
   2. Reduce cost of production

2. Let them do the presentation by group.
D. Application

Mang Felipe is a poor farmer. He cannot afford to apply fertilizers and pesticides to his farm. After every harvest, he just manually spread out the rice straws on the field instead of burning them. He maintained the water level of the rice field to promote the growth of aquatic organisms and neutrals. During harvest time his yield is far better than his co-farmers who are engaged in burning rice straw and spraying pesticides.

1. Let the pupils/students make suggestions as to how they will conserve aquatic organisms and neutrals
2. Require them to state this in literary form such as: poem, jingle, yell or song.

IV. Evaluation

A. Give a short test on the topics discussed.

B. Portfolio Assessment: Let the students put in their portfolio their most significant output about aquatic organisms and let them reflect the reasons for choosing them as entries in their portfolio.

V. Assignment: (Retell the story of Mang Felipe)

A. Make a paragraph on the benefits derived from conserving aquatic organisms and neutrals.
B. Ask your parent to affix his/her signature at the bottom right corner of your paragraph to provide feedback. (this will serve also as individual portfolio)
4.2.10 Sap Feeders

I. Objectives

A. Describe the life cycle of plant sap-feeders
B. Discover at what growth stage of a rice plant the sap-feeders attack.
C. Describe the damage caused by plant sap-feeders
D. Suggest ways on how to manage plant sap-feeders

II. Subject Matter

A. Topic: Plant Sap-Feeders (e.g. GLH, BPH, White-backed plant hopper, black bug)
B. References: Resources Manual on IPPM in Rice, ToT Lecture
C. Materials: Magnifying lens, rice plant damaged by sap-feeders, insect nets, sap-feeders
D. Value Focus: Awareness on the ways to control sap-feeders

III. Learning Activities

A. Activity

1. Mood Setting: Teach any action song that could set the mood of the students. You may consider the song given below.

   There is Love that We Fly

   There is love that we fly
   In the castle of my heart
   There is love that we fly
   In the castle of my heart

   When the king is in residence there
   Fly it high in the sky (2x)
   Let the whole world know (2x)
   When the king is in residence there.

   • Do you think all insects are flyers?
   • How do you know that they are insects?

2. Group Activity

   • Show to the class a picture or specimen of sap feeders.
   • Divide the class into 5 equal groups and let each group collect this kind of specimen in the rice field. Let them also observe the plant where these specimens were found. Then let them record their observation using the table below.
Let them present their work to the class.
Then discuss the lifecycle of sap feeders. You can assign each group one sap feeder to study. Let them present their lifecycle to the whole class.

B. Analysis

Ask the following questions during the whole class discussion:
1. What specimens did you collect in the field at this stage of the crop?
2. How do they look like?
3. What are the stages in the life cycle of sap feeders?
4. How do bugs and hoppers differ? What are their similarities?
5. At what stage of the plant do sap-feeders attack?
6. At what part of the plant where you found them?
7. How do sap-feeders damage the rice plant?
8. What should be done to control sap feeders from attacking the plants?

C. Abstraction: Complete the table below:

<table>
<thead>
<tr>
<th>Sap-feeders</th>
<th>Characteristics</th>
<th>Control Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bugs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Hoppers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D. Application

Let each group roll play what they will do when their rice field was attacked by sap feeders.

IV. Evaluation

Place the table done in the activity on the portfolio. Below the table, write your learnings about the topic/session on sap-feeders.

V. Assignment

Let each pupil list the natural enemies of sap-feeders.
4.2.11 Parasites and Parasitoids

I. Objectives

A. Identify the different parasites and parasitoids in the rice field
B. Differentiate parasites from parasitoids
C. Explain the functions of parasites and parasitoids in the rice field
D. Propose ways on how to conserve parasites and parasitoids in the rice field.

II. Subject Matter

A. Topic: Parasites and Parasitoids
B. References: Resource Manual for IPPM in Rice
C. Materials: Insect net/tulle, sweep net, plastic, empty vials, denatured alcohol, magnifying lens
D. Value Focus: Awareness of the role of parasites and parasitoids, conservation of the natural resources

III. Learning Activities

A. Activity

1. Mood Setting

- Show to the class specimens or pictures of parasites and parasitoids in the rice field. Let the students identify these and let them share what they know about these insects.

2. Activity Proper:

- Group the students into 5 and let each group go to the rice field to observe the behavior and characteristics of these insects.
- Before leaving the classroom, explain first to them the roles that each member should play to accomplish the task.
  Suggested roles are:
  - Leader: the one who will facilitate in accomplishing the group task
  - Gopher: the one who will prepare the materials needed in doing the activity
  - Recorder/writer: the one who will record their observations
  - Writer/Illustrator: the one who will consolidate and prepare the report.
- Guide them in making their field observations. Provide each group a copy of this observation guide that follows. Explain to them how to use the observation guide.
After all questions were clarified, let the students go to the field and do the activity. Give them a timeframe in doing this activity. Inform them to present their observations in the class. Tell them to also collect parasitoids that they found using sweepnets.

B. Analysis

Ask the students the following questions after the group presentation:
- How did you find your field observation?
- What did you do to finish your task?
- What parasites did you find in the rice field? Where did you find them?
- How do they move? How do they feed?
- Why are they called parasites? Are parasites needed in the ricefield? Why? So what do parasites do in the rice field?
- What parasitoids did you find in the field?
- Where did you find them?
- How do they move? How do they feed?
- Why are they called parasitoids? Are they needed in the ricefield? Why?
- So what do parasitoids do in the ricefield?
- How are parasites and parasitoids similar? How are they different?
- What should be done to conserve parasites and parasitoids in the ricefield?

C. Abstraction

Let students summarize their ideas using a graphic organizer suggested below. Let them indicate the distinguishing characteristics of parasites and parasitoids in their corresponding circle and their common characteristics in the rectangle including their conservation methods.
D. Application

1. Using the same grouping, ask students to preserve the specimens they collected in empty vials filled with denatured alcohol.
2. Have the preserved specimens mounted on any durable material and properly labeled or presented in a scrapbook form. Group output will be one of the entries in their portfolio.

IV. Evaluation

Paper and Pencil Test

- What is the difference between parasites and parasitoids?
- What are the common parasitoids in the rice field?
- What are organisms that live in or on other organisms in order to survive?

Portfolio Assessment

- Let them do a self-evaluation of their scrapbook or collection and results of studies conducted using rubric in rating portfolios that are included in the CP IPPM Curriculum Guide.

V. Assignment

1. Let the students conduct studies about parasites and parasitoids using the insect zoo. Studies may focus on the life cycle, mode of parasitism and insects they parasitize.
2. Ask students to record their observations and make a written report of their study.
4.2.12 Rodent Management

I. Objectives

A. Identify the different species of rats
B. Explain how rats multiply
C. Explain the stages in the growth of the rice plant when the rats usually attack
D. Describe the damage caused by rats
E. Control rat infestation in rice

II. Subject Matter

A. Topic: Rodent Management
B. References: CP IPPM Resource Book
C. Materials: manila paper, pentel pens, masking tape, spade, crow bar, sacks, empty bottles, alcohol
D. Value Focus: teamwork and cooperation

III. Learning Activities

A. Activity

1. Mood Setting:
   - Let the students name an animal that causes damage to their things at home. Let them continue naming animals until you elicit from them the answer “rats.” Once they gave this as an answer, let them describe how rats damage their things at home. Then tell them that rats also do damage in the rice field.

2. Group Activity:
   - Group the class into 4.
   - Instruct each group to move around the four IDEA STATIONS (a piece of manila paper posted on the wall with a question written on it) previously prepared inside the room. Each station has one of the following questions:
     - What are the different species of rats?
     - How do rats multiply?
     - How can you determine rat damage compared to damage caused by other pests?
     - How can you control rat infestation in rice?
   - Let each group stay in one idea station. At the signal of the teacher, the group has to think of the answer posed in their idea station.
   - Then the teacher will signal again to indicate that they have to move to another idea station to answer another question. The round robin will continue until the group has reached the last idea station.
   - Give another signal to indicate the end of the answering of questions.
   - Then instruct the group to study all the answers written in the last idea station they worked on and try to synthesize them and present them to
the class. They should also be able to judge the accuracy of the responses given.
- Check the students' work and take the opportunity to give additional inputs about the question if necessary.

B. Analysis

Ask the following questions during the whole group discussion:
- How did you find the activity?
- Which question did you find easy to answer?
- Which question was difficult for you?
- What species of rats is most prevalent in the rice field?
- At what stage in the growth of the rice were rats seen?
- Is the presence of this species of rats in the field alarming? Why?
- What will happen if these rats multiply in the field?
- How fast do these rats multiply?
- If they multiply, what harm will this cause to the farmers?
- So what should be done to these rats when they are there in the field?
- What are the different ways in controlling them to be there in the field?

C. Abstraction

Using the information on the reproductive potential of rats, compute for the potential number of rats produced by one pair and their offspring in one year.
• Fill-in the following table.

<table>
<thead>
<tr>
<th>Month</th>
<th>Subtotal</th>
<th>Accumulated total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>7</td>
<td>(     )</td>
<td>126</td>
</tr>
<tr>
<td>10</td>
<td>192</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>768</td>
<td>2046</td>
</tr>
</tbody>
</table>

D. Application

Using the same grouping, let students do the physical method of controlling rats in the school farm.

• Let students go to the rice field and look for rat burrows.
• Using the crowbar or any tool for digging provided by the teacher let each group dig the burrows and capture/kill the rat/s. (Note: One group, one burrow is enough.)

IV. Evaluation

A. Give a short pen and paper test about the topic discussed.
B. Performance Assessment:

Using a rubric in rating performance, let students do a self-evaluation of their activity in controlling rats. Suggested criteria are:

• Time management
• Workmanship
• Teamwork

V. Assignment:

Let the students interview farmers on the extent of damage caused by rats in their locality. Let them also interview the Municipal Agriculturist regarding the status of rat infestation and their rodent management programs/campaign in the municipality.
4.2.13 Rice Bug

I. Objectives

A. Describe the life cycle of rice bug.
B. Describe damage caused by rice bugs.
C. Identify at what stage in the growth of rice plant when rice bugs attack.
D. Suggest strategies for effective management of rice bug.

II. Subject Matter

A. Topic: Rice Bug
C. Materials: Rice bug specimen, damaged grains, insect nets, Pentel pens, manila paper, crayons, empty bottles, jars
D. Value Focus: Awareness of methods of controlling rice bugs

III. Learning Activities

A. Activities

1. Mood Setting: Motivate the pupils by asking the questions:

   - Have you seen a rice bug?
   - How does it look like? Give their characteristics.
   - Let the students bring out their insect collection and examine closely the appearance of rice bugs.
   - Tell them that they will go again to the field to study how these insects affect the growth of the rice plant.

2. Activity Proper

   - Group the class into 5 equal groups.
   - Give the following instructions to all the groups before you send them to the field using an Activity Card like the one below:

   **ACTIVITY CARD: Rice Bug**

   1. What to bring: insect net, cutter, jars or any available container.
   2. Things to do in the field: Collect the following specimen:
      - A part of the rice plant with black or brown scaly eggs in a line or row. These eggs are usually on the leaves of the rice plant.
      - An insect with slender body and odorous.
      - Spikelets with damage
      - Spikelets without damage
Let them fill up the tables below:

### Table 1:

<table>
<thead>
<tr>
<th>SPECIMEN</th>
<th>DESCRIPTION</th>
<th>GROWTH STAGE OF THE PLANT</th>
<th>PART OF THE PLANT WHERE IT IS FOUND</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>COLOR</td>
<td>APPEARANCE</td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insects</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2:

<table>
<thead>
<tr>
<th>SPECIMEN</th>
<th>DESCRIPTION</th>
<th>ANY INSECT FOUND DURING COLLECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>COLOR</td>
<td>APPEARANCE</td>
</tr>
<tr>
<td>Spikelets w/ damage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spikelets w/o damage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Let each group present their observations in the class.
Take the opportunity to give inputs regarding the life cycle of rice bugs.

### B. Analysis

Ask the following questions:

1. What kind of insect did you collect in field?
2. What are the stages in the life cycle of a rice bug?
3. At what stage in the growth of the rice plant when rice bugs attack the field?
4. How do you know that rice bugs attacked the rice plant?
5. How does a healthy grain look like? How about the unhealthy grains?
6. What is the appearance of a damaged spikelet/rice grain?
7. What causes damage to the grains?
8. So what should be done to control rice bugs from attacking the rice field?

### C. Abstraction

Let the students complete the graphic organizer below:

RICE BUG

- STAGES
- DAMAGE
- CONTROL MEASURES
D. Application

Let each group role play the situation incorporating their own ideas on how to control rice bugs.

**Mang Anton noticed that there are many rice bugs present in his rice field during:**
- Ripening stage
- Milking stage
- Booting stage
- Hard dough stage
- Soft dough stage

*If you were Mang Anton, what will you do in each stage?*

IV. Evaluation

1. Give a short test about the topics discussed.
2. Let the students illustrate on a sheet of bond paper the life cycle of a rice bug using the specimen they have collected and let them label their work. Let them put their output in their portfolio and reflect on the learning they gained about rice bugs. Present the rubric in rating their work as their guide in doing their portfolio entry.

V. Assignment:

Interview a farmer within your community to find out what different methods do they use in controlling rice bugs.
4.2.12 Stem Borers

I. Objectives:
   A. Identify the different species of stem borers.
   B. Describe the life cycle of stem borer.
   C. Illustrate the mode of attack and damage characteristics of stem borers.
   D. Formulate ways to prevent and control stem borers.
   E. Identify natural enemies of stem borers.

II. Subject Matter
   A. Topic: Stem borers
   B. Value Focus: Teamwork, acceptance of responsibilities, environmental awareness
   D. Materials: Insect net, plastic, live specimen of stem borer in different stages (egg, larva, pupa, adult), manila paper pentel pen

III. Learning Activities
   A. Activity
      1. Mood Setting: Teach the students to song ṢButterfly to the tune of ṢParu-parong Bukid Ṣ
         B Ṣ U Ṣ I Ṣ T Ṣ I Ṣ E Ṣ İ Ṣ R Ṣ İ Ṣ F Ṣ İ Ṣ L Ṣ İ Ṣ Y, Butterfly (4x)
      2. Let the students look at their insect collections and review the appearance of the different species of stem borers or refer to the Resource Manual on IPPM in rice.
      3. Group the students into 5 equal groups and let them visit the rice field and collect the different species of stem borers found in the field.
      4. Assign guide questions for them to answer, to be written on a manila paper and to be reported to class:
         Group 1 Ṣ Identify the different species of stem borers and be able to describe their characteristics.
         Group 2 Ṣ Illustrate and explain the life cycle of stem borers
         Group 3 Ṣ Discuss the mode of attack/feeding habits and the damage characteristics of stem borers (If possible, present damaged rice plant to the whole class).
         Group 4 Ṣ Identify natural enemies of stem borers and collect samples of these.
         Group 5 Ṣ Identify ways to control stem borers.
      5. Give inputs if there are ideas which the students failed to present.
B. Analysis

Ask the following questions during the whole group discussion.
1. How did you find your group activity?
2. What are the different species of stem borers that you have collected?
3. How many stages are there in their life cycle?
4. At what stage in the growth of the rice plant do stem borers attack the rice field? How do they attack the rice field?
5. What happens when they attack the rice field?
6. What should be done to keep them from attacking the rice field?
7. When is the best time to control them?
8. What insects could help control stem borers from attacking the rice field?

C. Abstraction

Let the students summarize the lesson through a graphic organizer just like the one shown below:

```
STEM BORERS
        /\       \\
   Life Cycle  How They  How to Control
                Attack the Ricefield Them to Attack
```

D. Application

Using the same grouping. Let the students dramatize what they will do if they are in the situation below.

**Situation:** Your father is a farmer. He informed you of the presence of stem borers in your rice field. What should you do?

IV. Evaluation

1. Give a short test about the topics discussed.
2. Performance Assessment: Rate the performance of the students during group presentations. Use a rubric in doing this.
3. Portfolio Assessment: Let the students put in their portfolio their most significant output and let them reflect on the significance of this portfolio entry. Rate their work based using the portfolio rubric.

V. Assignment

Let the students have an insect zoo study (refer insect zoo procedures) on the life cycle of the different species of stem borers. Let them put the results of their study in their portfolio and inform them of the rubric in rating their work.
4.2.13 Spiders

I. Objectives

A. Describe spiders.
B. Explain the life cycle of a spider.
C. Differentiate spiders from insects.
D. Give the importance of spiders in the rice field.
E. Suggest ways of conserving spiders.

II. Subject Matter

A. Topic: Spiders
B. References: Curriculum guide, WE flyers, encyclopedia, internet
C. Materials: manila paper, pentel pen, crayons, lens, plastic jars
D. Value Focus: Conservation of spiders for ecological balance.

III. Learning Activities

A. Activity

1. Preparatory Ï Ice breaker (Action Song, Battle of Insects)
2. Motivation
   • How many of you have seen spiders?
   • Where do you usually find spiders?
   • How many legs do spiders have?
3. Let the students write on the board their tentative answers to the questions given. Let them check their own answers after the discussion.
4. Conduct field walk
   • Group the students and let each group go to the field to observe spiders' behavior in the rice field for 20 minutes. Provide them a guide for observations:

   Guide for Observation
   o Look for spiders on the rice plant
   o Record the part of the rice plant where you found the spiders.
   o Find out if the spider has a web. If there is, describe what you see in the web.

5. Let each group present their observations in the class.
6. Discuss the life cycle of spider. Show illustration of the life cycle if possible.
B. Analysis

Ask the following questions during the whole class discussion:
- How does a spider look like?
- What are its body parts?
- What are the stages in its life cycle?
- Is it an insect? Why?
- So how does a spider differ from an insect?
- Where did you find the spiders?
- What were they doing at the rice field at the time you found them?
- Do they harm the rice plant?
- Did you find spider webs in the rice field?
- Is it good to have spider webs in the rice field? Why?
- Are spiders needed in the field? Why do you think so?
- What should be done to conserve the spiders in the field?

C. Abstraction

Let the students fill in the diagram on the board to distinguish a spider from an insect. Then, have them go back to their previous answers on the board by letting them check their guesses about spiders.

D. Application

You have noticed that many children have been searching for spiders for betting games. What should you do?
IV. Evaluation

b. Give a short quiz about the life cycle of spiders and its difference from a spider.

c. Portfolio Assessment: Draw and label the parts of a spider. Then, below write your insight about one’s role in the conservation of spiders in order to maintain a balanced ecology.

V. Assignment:

Each group will make a slogan and explain it briefly using the theme, “Spiders: Valuable Friends of the Farmers.”
4.2.14 Harvesting and Post Harvest Operations

I. Objectives

A. Describe the pre-harvest and post harvest operations in rice.
B. Identify the tools needed in harvesting.
C. Perform the pre-harvest operations like roguing and draining the field.
D. Perform the post-harvest operations such as threshing, winnowing, drying, storing and milling.
E. Observe precautionary measures when harvesting rice.

II. Subject Matter

A. Topic: Pre-harvest and Post-harvest Operations in Rice
C. Materials: scythe, sacks, thresher, drying pavement, rice mill
D. Value Focus: safety, industry, cooperation

III. Learning Activities

A. Activity

1. Present to the class a potted rice plant at harvesting stage (marked Specimen A) and a handful of milled rice (marked Specimen B).
2. Group the class into 5. Ask them to select their leader, secretary, reporter, etc.
3. Ask them to brainstorm on the processes that Specimen A passes through before it becomes Specimen B.
4. Let each group make a creative presentation of their output to be presented to the class such as skit, pantomime, etc.
5. After all the groups have presented, let the class agree on the pre and post harvest processes in rice.

B. Analysis

Ask the following questions during the whole group discussion:

1. Why do we need to drain the field 7 to 10 days before harvesting?
2. What is the importance of roguing?
3. What are the tools used in harvesting?
4. Is it possible for palay to be milled right after threshing? Why?
5. What is the desired moisture content of palay that is suited for milling? How can you determine it?
6. What are the ways in determining the moisture content of palay for milling?
7. What are the factors affecting the milling recovery of palay?
8. What are the processes in milling?
9. Is it important to know all these pre and post harvest processes? Why?
10. What are the precautionary measures when harvesting rice?
C. Abstraction

1. Let the students count from 1 to 8. All number 1’s will form Group 1; all number 2’s will form Group 2 and so on.
2. Give each group an envelope containing scrambled pre and post harvest processes written in separate sheets of paper (one process, one paper).
3. After a signal from the teacher, each group will open the envelope and arrange the processes in proper sequence.
4. Teacher will then check the correct sequencing of the processes.

D. Application

1. Remind the students of the precautionary measures in harvesting.
2. Let the students perform some of the pre and post harvest processes in the school farm like roguing, draining of the field, harvesting, threshing, winnowing, storing, and milling whenever possible.

IV. Evaluation

1. Paper and pencil Test: Identification.
   
   ____________ The process of cutting and removing unwanted plants like weeds and off-types before harvesting.
   ____________ A farm tool commonly used by farmers in harvesting.
   ____________ The process of removing the rice hull and rice bran with the use of two or more units to making it fit for human and animal consumption.
   ____________ The process of separating the grains from the panicle.
   ____________ The cheapest and most common method of drying the palay.

2. Performance Assessment:
   
   Using a scoring rubric, rate the students while they perform the pre and post harvest processes in rice in the application stage. Suggested criteria for scoring are the following:
   • Appropriate use of tools and equipment
   • Proper execution of the steps and processes

V. Assignment:

Ask students to collect pictures and make a scrapbook of the pre and post harvest processes in rice. Let them put these in their portfolio and reflect on the importance of these entries in their portfolio.
4.3 For Topics Specific to Vegetable Production

4.3.1. Importance of Vegetable Production

I. Objectives

A. Identify the provinces that are major producers of vegetables in the Philippines
B. Describe the status of vegetable production in the Philippines
C. Explain the importance of vegetable to humans, animals, and industries
D. Analyze the rate of production vis-à-vis the rate of consumption of the population
E. Infer that vegetable production is a good prospect in improving the economic condition of the Philippines

II. Subject Matter

A. Topic: Importance of Vegetable Production in the Philippines
C. Materials: Visual aids, Manila paper, pentel pens
D. Value Focus: Self-interest in vegetable production, teamwork

III. Learning Activities

A. Activity

1. Mood Setting:
   Let the students sing the song “Bahay Kubo” for them to recall at least 18 common vegetables grown in the Philippines.

2. Brainstorming:
   Group the students into 4 equal groups and let them have a group discussion on the following topics:

   Group 1: Vegetables that are eaten raw and cooked by human beings
   Group 2: Vegetables that are given to animals as feeds
   Group 3: Vegetables that are processed for industrial purposes
   Group 4: Identify provinces that are major producer of vegetables in the Philippines

3. Let the students present to the whole class the result of their group discussion.
4. Provide inputs if the students fail to give the information needed from their assigned topic. If there is a book or any material that they could read to learn ideas about the topic, then let them read this and present what they learned from it during the whole group discussion.
B. Analysis

Ask the following questions during the whole class discussion:
1. What vegetables do you know?
2. Which of these vegetables do you eat?
3. Why do you eat these vegetables?
4. What provinces in the Philippines are known as the producers of the vegetables we eat in the Philippines?
5. What is the capability of our country to produce all the vegetables that Filipinos eat?
6. Considering the present population of 86 Million Filipinos, and if the average Filipino can consume 5-10 kilos of vegetables per year, how many tons of vegetables is our annual consumption?
7. Is there a need for us to plant vegetables? Why?
8. Is vegetable planting a possible source of living? How could this be?
9. Is it possible to plant vegetables and have them exported to other countries? How could this be?
10. What vegetables do you think can be preserved in factories so that they could be exported?
11. What else can be done to vegetables besides using them for food of humans?
12. So how important is vegetable production in the Philippines?
13. If you are a farmer and you have a vast land for farming, what will you do to prosper from vegetable production?

C. Abstraction

Let the students synthesize the lesson using graphic organizers like the one shown below:
D. Application

Using the same grouping let each group dramatize what they will do in one of the following situations:
1. You have an idle land in the backyard. What will you do to utilize this land?
2. You live in a mountainous place, what will be your source of living?
3. Your business is to produce vegetables in many places in the Philippines. What should you do so that your business could expand?
4. It is harvest time and you produced so many tons of vegetables. What will you do with your harvest?

IV. Evaluation

1. Give a short test about the lesson.
2. Performance Assessment: Rate the students in their performance during group activities. Use a rubric in rating them.
3. Portfolio Assessment: Let the students put in their portfolio their most significant output in today’s lesson. Let them reflect on the importance of their portfolio entry. Use a rubric in rating their portfolio entry.

V. Assignment

Conduct a baseline survey on vegetable production in your respective locality (Barangay). Make a report on the result of your survey.
4.3.2. **Crop Morphology**

I. **Objectives**

A. Define morphology.
B. Observe the parts of the plant at different stages.
C. Illustrate the parts of vegetables at different stages.
D. Give the function of each part of the plant at different stages.

II. **Subject Matter**

A. Topic: Crop Morphology (vegetable)
C. Materials: manila paper, pentel pens, crayons, masking tape, real specimen of vegetable plants at different stages, magnifying glass
D. Value Focus: cooperation, punctuality

III. **Learning Activities**

A. **Activity**

1. **Motivation:** Teacher presents the live specimens of vegetable plants at different stages to the class. Let the students observe small specimens using the magnifying glass.
2. **Unlocking of Difficulties:** Help the students to define these words:
   - Morphology, Seedling stage, Vegetative stage, Recovery stage, Flowering stage, Fruiting stage, Maturity
3. **Presentation:**
   - Let the students arrange the specimens chronologically from seedling to maturity. The student who has arranged the specimen correctly is the winner.
   - Group the students into 6. Each group will be given the chance to describe the stages in the growth and development of a vegetable plant. The topics that will be posted on the wall inside the classroom are as follows: seedling stage, vegetative stage, recovery stage, flowering stage, fructifying stage and maturity.
   - The teacher signals and the groups rotate to six topics (seedling stage, vegetative stage, recovery stage, flowering stage, fructifying stage and maturity) and write the description of each stage. The activity continues until the last topic has been answered. The last group to write their answers will be the ones to report to the class. Following is an example of the output that is expected from the students.
- Group Report: Ask each group to present their work to the whole class.
- Provide input if there are information that should be known by the students, which they failed to learn from the group presentations.

B. Analysis

Ask the following questions to guide the students in evaluating the activity:
- Which group was able to finish on time? Did all the members of the group cooperate?
- What should group members do to have the best presentation?
- Throw these questions to the class for thorough understanding of the study.
  - What is morphology?
  - What are the different growth stages of vegetable plants?
  - What are the parts of vegetable plants and their functions in every stage of their growth?
  - How does one stage differ from other stages?

C. Abstraction

1. Let each student define morphology.
2. Make a whole class mind map on the board reflecting the parts of vegetables and their functions at different stages of growth.

D. Application

In some identified areas in school, let the students observe some vegetable crop and identify parts and functions of these parts.
IV. Evaluation

1. Give a short pen-and-paper test about what has been emphasized during discussions.
2. Portfolio Assessment: Let the students put in their portfolio their most significant output from the day’s lesson and then instruct them to reflect on the importance of this portfolio entry. Use a rubric in rating their work.

V. Assignment:

Let the students conduct field observation (in some identified areas) and record the common vegetables with almost the same growth stage with other vegetables.
4.3.3. Land Preparation for Vegetable Growing

I. Objectives:

A. Identify the tools/equipments used in land preparation
B. Explain the uses of each tool/equipment
C. Use appropriate tools and equipment in land preparation for vegetable growing
D. Follow the proper procedures/steps in actual land preparation
E. Perform the actual land preparation
F. Practice precautionary measures in land preparation.
G. Explain the importance of thorough land preparation in the control of weeds, insect pests and diseases.

II. Subject Matter:

A. Topic: Land Preparation
B. References: CP IPPM ToT handouts in Vegetables
C. Materials: Picture of Farm Tools and Equipment
D. Value Focus: Wise use of resources

III. Learning Activities

A. Activity

1. Motivation:
   - Show pictures of farm tools and equipment for vegetable growing
   - Let the students identify the tools and equipment they see in the pictures and let them explain how to use the farm tools and equipment identified.
2. Group the students into 4 or 5 groups and let each group list down the steps of land preparation they have observed and experienced.
3. Let each group report the result of their group discussions to the whole class.
4. Provide inputs if there are other ideas that the students should learn, which were not taken up in the small group discussion.
5. Let them view videotape on land preparation if this available. If not, talk to a farmer to demonstrate land preparation using an idle land at the back of the school. If this not possible, demonstrate before the class the use of the tools and equipment in land preparation.

B. Analysis

Ask the following:

1. What are the tools and equipment needed in the preparation of the land for vegetable growing?
2. What is their use?
3. How are they used?
4. What are the methods in land preparation?
5. What are the steps in each method?
6. Is it necessary to prepare the land for vegetable growing? Why?
7. What does thorough land preparation do in the control weeds, pests, and diseases?

C. Abstraction

1. How important is proper land preparation?
2. What are the steps to follow in preparing land for planting?

D. Application

1. Group the students and assign a piece of land for their vegetable growing.
2. Give them possible vegetables that could be planted on the kind of soil they have. Let the students decide on the vegetable they will plant. Let them prepare the land using a method appropriate to the kind of soil they have.

IV. Evaluation

A. Give a short pen-and-paper test.
B. Performance Assessment: Rate how the students prepared their land and use rubric in rating them.
C. Portfolio Assessment: You can encourage the students to document how they prepared their land by taking pictures during their actual work. This experience will be memorable if the pictures are placed in their portfolio with captions about what were captured.

V. Assignment

Supply information needed for land preparation:

<table>
<thead>
<tr>
<th>COMPARISON</th>
<th>UPLAND</th>
<th>IRRIGATED LAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Differences</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.3 4. Weeds Management

I. Objectives

A. Define weeds.
B. Identify weeds present in the vegetable fields.
C. Classify weeds according to types.
D. Explain how weeds affect the growth of the plant.
E. Describe the methods in controlling weeds.

II. Subject Matter:

A. Topic: Weeds and Weed Management
B. References: CP 1 IPPM Curriculum for Technical Refresher Training on IPPM Vegetables
C. Materials: Weed specimen, chalk board, activity card
D. Value Focus: Cleanliness/ Industry

III. Learning Activities

A. Activity:

1. Motivation: Ask the pupils: What other plants can you see in your garden aside other than the plants you planted?
2. Unlocking of difficulties through contextual clues: Weeds, Management
3. Instruct the pupils to go to the field by group to gather different kinds of weeds. Each group will be given an activity card to guide them in their fieldwork.

**ACTIVITY CARD**

Visit your vegetable garden/field and pull out all the strange plants that grew there besides those which you planted. These are called weeds. Get different varieties of these weeds and then classify them according to their common characteristics. Put your collection in a manila paper and be ready to present it to the class with all the weeds labeled. Set the time limit for students to do this work.

B. Analysis

Ask the following questions during the whole group discussion:
1. Based on your collection, what are the different weeds that could be seen in a vegetable field/garden?
2. Why are they called weeds?
3. What are the common characteristics of weeds?
4. How do they differ?
5. Into how many ways can the weeds be classified?
6. How did you classify them?
7. What do you call the types or classifications of weeds?
8. Should the weeds be allowed to grow in your vegetable garden? Why?
9. What should be done to the weeds that grow in your garden?
10. What are the ways in controlling weeds?

C. Abstraction

Let the students synthesize the lesson by doing a graphic organizer below:

```
WEEDS

DEFINITION

CLASSIFICATION & EXAMPLES
```

D. Application

Let the students go back to the vegetable field and continue controlling the weeds that grow in their vegetable field.

IV. Evaluation

2. Performance assessment: Rate the students performance during the group work. Use a rubric in doing this.
3. Portfolio Assessment: Let the students put their herbarium of weeds in their portfolio and let them reflect on the importance of this entry. Rate their work using the portfolio rubric.

V. Assignment

A. Interview farmers how they control weeds.
B. Ask them the value of weeds in their ways of farming.
C. Prepare an oral report about your interview with farmers.
4.2.5 Harvesting and Post Harvest Operations

I. Objectives

A. Identify maturity indicators of vegetables based on purpose
B. Describe the harvesting and post harvesting operations in vegetable production
C. Identify tools needed in harvesting
D. Observe precautionary measures when harvesting vegetable
E. Perform the post harvesting operations

II. Subject Matter

A. Topic: Harvesting
   Sub-topic: Post harvest operation
C. Materials: Baskets/sacks
D. Value: Cooperation

III. Learning Activities

A. Activity

   1. Group Dynamics ŒSnake LadderÓ (refer to Manual on Team Building Exercises)
      • How did you find the activity?
      • How did you feel winning the game?
      • (for losers) Why do you think did you lose in this game? What difficulties did you encounter?
   2. Show pictures of harvesting and post-harvesting operations in vegetable production. Let the students describe these operations. Allow them to also share their experiences in this aspect.

B. Analysis

Ask the following questions during the discussion:
• How do farmers know that it is time for them to harvest their crop?
• What tools or equipment do they use when they harvest their crop?
• How do they usually harvest their crops?
• What do they usually do after harvesting their crops?
• Why should they do these?

C. Abstraction

Let the students synthesize what has been discussed using the graphic organizer below:
D. Application

Let the students perform the actual harvesting and post-harvesting operations.

IV. Evaluation

2. Performance Assessment: Rate the students’ performance in the actual harvesting and post-harvesting operations. Use a rubric in rating their performance.
3. Portfolio Assessment: Encourage the students to take pictures as they do the actual harvesting and post-harvesting operations and have their pictures be included in their portfolios. Let them put creative captions when displaying their pictures in their portfolio. Use the portfolio rubric when rating these entries in their portfolio.

V. Assignment

Let the students plan what they will do with their harvest.
CHAPTER 5
Assessment Methods in the CP IPPM Program

The CP IPPM program promotes an assessment that is balanced. Balanced assessment means assessing students using three modes of assessment such as the objective test using the ballot box, performance-based tests, and portfolio. The use of a ballot box is an improved or modified objective test where the students just select their answer among the given choices using authentic materials or real specimens. The use of performance-based assessment requires the students to actually demonstrate their skills with or without a product and this is where rubrics, either holistic or analytic in format, are used in rating the students’ performance. Portfolio assessment is done to allow the students to document all the evidences and their reflections on their own learning. Rubrics are also used in this mode of assessment to rate the quality of students’ works and as a form of feedback on students’ strengths and weaknesses.
5.1. Using a Ballot Box

A. What is a Ballot Box?

A ballot box is a field test, which is similar to an objective test in format. Its unique characteristic is the presence of real specimens instead of just using pictures or descriptions as the stimuli in the test.

B. How to Prepare a Ballot Box Test

1. Use the multiple choice test format where the stems or the choices of the items require an examination of real specimens.
2. The items should be based on the specimens available in the field at the time the test is given.
3. All questions should be written to allow the students to review their answers anytime.
4. The written questions should be placed near the specimen in its natural habitat.
5. Use a string tied to where the question is written and connect it to the specimen that has to be examined in order to answer the question.
6. Set up the test early in the field and give the test preferably in the morning to avoid exposing the students to too much heat from the sun.
7. Each item should have a specific box with a hole as a place for the students’ answers.
8. Let the students answer, using color coded strips of paper to represent the letter of their chosen answer and written on these strips are their identification number.
9. Come up with a system on how to administer the test that will prohibit the students from sharing their answers.
10. Inform the students the time limit in answering each item.
11. Get the result of the test immediately and preferably in front of the students so that they will know the result of their test.
12. Do an item analysis to determine the level of difficulty and discrimination of each item that was included in the test.

C. Sample Ballot Box Test Items

Note: All those enclosed in parenthesis indicate real specimens are required.

1. Alin sa mga kulisap na ito ang hindi kaibigan?
   a. (gagamba)
   b. (tipaklong na maiksi ang antenna)
   c. (real spetipaklong na mahaba ang antenna)

2. Alin sa mga kulisap na ito ang nagiging dahilan para magkaroon ng uban (white heads) ang palay?
a. (uod)  
b. (stemborer)  
c. (suhong)  

3. Ano ang iyong gagawin kung ang iyong palay ay ganito (butas-butas ang dahon)?  
a. mag-aabono  
b. may susumpit ng pestisidyo  
c. pag-aaralan muna at oobserbahan  

4. Ano ang parte ng palay na kinakain ng kulisap na ito (tipaklong)?  
a. ugat  
b. dahon  
c. katawan ng palay  

5. Saan makukuha ang nymph ng (tutubi) kulisap na ito?  
a. sa tubig  
b. sa dahon  
c. sa katawan ng palay  

6. Anong uri ng chemical ang ginagamit bilang pamatay ditto (damo)?  
a. pesticide  
b. herbicide  
c. fungicide  

7. Sa anong stage of development ng palay umaatake ito (tayangaw)?  
a. vegetative  
b. milking  
c. harvest  

8. Ano ang stage ng lady beetle na ito (show insect)?  
a. egg  
b. nymph  
c. adult  

9. Ang pagka-sira ng dahon na ito (show actual damage) ay maiiwasan kung marami ang kaibigang kulisap na ____  
a. wasp  
b. atangya (tayangaw)  
c. kayumangging ngusong kabayo  

10. Anong kulisap ang gumawa nito (butas sa katawan ng palay)?  
a. gagamba  
b. stem borer
11. Anong kulisap ang nagdadala nito (tungro)?
   a. stem borer
   b. green leafhopper
   c. brown planthopper

12. Ang bacterial blight ay isang sakit na dala ng hangin at tubig lalo na kung ang pataba ay sobra sa nitrogen. Anong nangyayari sa dahon ng palay?
   a. (pumupula ang dahon)
   b. (dilaw ang dahon)
   c. (luntian ang dahon)

13. Anong damo itong (damong may mahabang ugat) nagiging balakid sa paglaki ng palay?
   a. broad leaves
   b. grasses
   c. sedges

14. Nasa anong yugto na ang palay na ito (palay na buntis)?
   a. booting initiation
   b. beading stage
   c. milking stage

15. Alin ang makapagpipigil sa pagdami nito (stem borers)?
   a. wasp
   b. cricket
   c. long grasshopper
5.2. Performance Assessment and Rubrics

5.2.1. What is a Performance-Based Learning Assessment?

- A process of gathering information about students’ learning through:
  - actual demonstration of essential and observable skills; and
  - creation of products that are grounded in real world contexts and constraints.

- An assessment that has the following essential attributes:
  - open to many possible answers;
  - judged using multiple criteria or standards of excellence that are prespecified and public.

5.2.2. Why Performance-Based Learning Assessment?

There have been many reasons why emphasis is now given to performance-based learning assessment. These include the following:

- Dissatisfaction of the limited information obtained from selected-response tests.
- Influence of cognitive psychology, which demands not only the learning of declarative but procedural knowledge as well.
- The sometimes negative impact of conventional tests e.g., high-stake assessment, teaching for the test
- It is appropriate in experiential, discovery-based, integrated, problem-based learning approaches.

5.2.3. How to Assess a Performance

The process in conducting performance-based assessment is just like any method of assessment, which starts from knowing the competency or objective to be measured before developing the assessment instrument. However, in performance-based assessment, one has to determine the performance task that could best gauge the attainment of the identified competency or objective before developing the instrument that would be used in scoring or judging the performance.

1. Identify the competency or objective that has to be demonstrated by the students with or without a product. The competency or objective to be tested should lend itself to performance-based assessment. Otherwise, use a more efficient method of assessment like giving pen-and-paper test.
Examples:

**Competency:** Demonstrate knowledge, skills, and desirable attitudes in conducting a simple research related to the topics in the CP IPPM Curriculum, which is a vehicle in understanding effective production and management of crops.

**Specific Objectives:**
- Explain the importance of conducting research in the CP IPPM Program
- Conduct a survey to determine the farming practices in the Community
- Utilize research results for effective and increased production of crops

2. Describe the **task** to be performed by the students either individually or as a group, the resources needed, time allotment and other requirements to be able to assess the focused competency. In selecting the task that is best in gauging the attainment of a given competency or objective, one could consider the seven criteria (Burke, 2000) that follows:

- **Generalizability.** This refers to the likelihood that the students’ performance on the task will generalize to comparable tasks.
- **Authenticity.** The task is similar to what the students might encounter in the real world as opposed to encountering only in the school.
- **Multiple Foci.** The task measures multiple instructional outcomes.
- **Teachability.** The task allows one to master the skill that one should be proficient in.
- **Feasibility.** The task is realistically implementable in relation to its cost, space, time, and equipment requirements
- **Scorability.** The task can be reliably and accurately evaluated
- **Fairness.** The task is fair to all the students regardless of their social status or gender.

**Examples of Possible Tasks for a Given Competency and Objective**

**Competency:** Demonstrate knowledge and skills on weeds management

**Objectives:**
1. Define weeds
2. Identify weeds present in the rice field
3. Classify weeds according to types
4. Explain how weeds affect the growth of the plant
5. Describe the methods in controlling weeds
6. Use a specific method in controlling weeds in the ricefield
Note: Objectives 1-3 are best measured using pen-and-paper test while Objectives 4-6 are best measured using performance assessment. However, the first three objectives could also be subsumed when doing performance assessment.

Possible Learning Activity 1: Interviewing Farmers
Possible Assessment Tasks:

a. Interview farmers to identify ways in controlling weeds then do a written report of the information gathered
b. Interview farmers to identify ways in controlling weeds then make a graphic organizer of the information gathered
c. Interview farmers to identify ways in controlling weeds then do an oral presentation of the information gathered
d. Interview farmers to identify ways in controlling weeds then role play the information gathered in the classroom.
e. Interview farmers to identify ways in controlling weeds then show in the field the method to control weeds that works well in a given situation

Possible Learning Activity 2: Reading Text
Possible Assessment Tasks:

a. Read the text to identify ways in controlling weeds then prepare a graphic organizer showing the different methods, their advantages and limitations
b. Read the text then do an oral presentation on the methods in controlling weeds, their advantages and limitations using a graphic organizer

Possible Learning Activity 3: Viewing a Documentary Tape of Ways in Controlling Weeds
Possible Assessment Task: Write a reflective journal indicating personal insights about the tape viewed or personal analysis of the different methods in controlling weeds, their advantages and limitations.

Possible Learning Activity 4: Community Survey
Possible Assessment Task: Let the students develop their own survey form to gather information about the different ways that the people in the community use to control weeds then do an oral presentation of the data gathered.

Note: Although there are many possible tasks for the given objectives, choose the one that satisfies the majority if not all of the criteria in the selection of assessment tasks.

3. Develop a rubric or a scoring guide in distinguishing the different levels of performance or quality of products. A rubric reflects the criteria, levels of performance, and the weight or number of points that corresponds to each criterion or performance level. It is considered the “key to corrections” of a performance assessment task. There are two kinds or rubrics. These are the as follows:

a. Holistic Rubric. It has a set of indicators describing the overall quality of a performance or product.
Example of a Holistic Rubric

**Objective:** Describe the parts of a rice plant at different stages

**Task:** A Bar Graph of the Recorded Data about Growth of the Rice Plant

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4     | Excellent such that the work satisfies all of the following:  
- presents complete information  
- uses indigenous materials  
- is neatly done |
| 3     | Very Satisfactory such that the work satisfies only 2 of the following indicators:  
- presents complete information  
- uses indigenous materials  
- is neatly done |
| 2     | Satisfactory such that the work satisfies only 1 of the following indicators:  
- presents complete information  
- uses indigenous materials  
- is neatly done |
| 1     | Needs Improvement such that the work falls to satisfy any of the following:  
- presents complete information  
- uses indigenous materials  
- is neatly done |

b. **Analytic Rubric.** It describes the quality of a performance or product in relation to a specific criterion.

Example of an Analytic Rubric

**Objective:** Describe the methods in controlling weeds

**Task:** A Group Oral Presentation using any graphic organizer showing the methods in controlling weeds, and at least one advantage and one limitation of each method

- When to do the work: after listening to a resource person (e.g. farmer, invited expert, teacher)
- Where to do the work: inside the classroom
- Duration of the work: 30 minutes (preparation), 10 minutes (oral presentation)
- Materials needed: manila paper and any other available and affordable resources needed to complete the work.

**Scoring Rubric (Analytic):**

*Step 1: Identify the possible criteria that could describe an excellent product (i.e. an oral presentation using a graphic organizer).* You can also specify the
weight of each criterion especially if the criteria vary in their degree of importance. In this task, the criteria could be as follows:

a. Group Performance (80%)
   1. Completeness of the Work (20%)
   2. Accuracy of the Given Information (20%)
   3. Organization of Thoughts (10%)
   4. Neatness of Work (5%)
   5. Resourcefulness (10%)
   6. Audience Impact (10%)
   7. Time Management (5%)

b. Individual Accountability (20%)

**Step 2:** Determine the number of performance levels and the qualitative and quantitative descriptions for each level. An ideal number of a performance level is an even number to avoid the central tendency source of error.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Performance Levels</th>
<th>Weight</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group Performance (80%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Completeness of the Graphic Organizer</td>
<td>Exceptional: given are all the three methods +2 or more advantages +2 or more limitations of each</td>
<td>Complete: given are all the three methods +1 advantage +1 limitation of each</td>
<td>Partially Complete: lacks 1-2 needed information</td>
</tr>
<tr>
<td>2. Accuracy of the Given Information</td>
<td>Exceptional: all information given are true and acceptable based on the input of the resource person with additional information taken from other sources</td>
<td>Accurate: all information given are true or acceptable based on the input of the resource person</td>
<td>Somewhat accurate: 1-2 information is/are unacceptable based on the input of the resource person</td>
</tr>
<tr>
<td>3. etc</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Individual Accountability</td>
<td>Excellent: all the members of the group have a clear role in the work</td>
<td>Satisfactory: one member of the group has no clear role in the work</td>
<td>Fair: two members of the group have no clear role in the work</td>
</tr>
</tbody>
</table>

5.2.4. Performance Rubrics

Rubric for AESA Report

A. Learning Objectives:

1. Perform the steps in conducting AESA
2. Demonstrate teamwork, good workmanship and time management

B. Assessment Task: A Group Written and Oral Presentation of the AESA Report

C. Descriptions of the Task:

Learners in groups are asked to visit their experimental plot within a time frame and record their observations and data gathered following the attached format. When they are back in the training hall, they are expected to prepare their written AESA report, which they have to present orally to the big group.

D. Scoring Rubric

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Performance Levels</th>
<th>Evaluators</th>
<th>WP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Written Presentation (60%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Time Management</td>
<td>4: Work completed ahead of time&lt;br&gt;3: Work completed just on time&lt;br&gt;2: Work completed 1-2 minutes late&lt;br&gt;1: Work completed 3 or more minutes late</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>2. Completeness of the needed information</td>
<td>4: Provided all the needed information&lt;br&gt;3: Missed 1 needed information&lt;br&gt;2: Missed 2 needed information&lt;br&gt;1: Missed 3 or more needed information</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>3. Correctness of the recorded information</td>
<td>4: All recorded information are correct&lt;br&gt;3: 1 recorded information is incorrect&lt;br&gt;2: 2 recorded information are incorrect&lt;br&gt;1: 3 or more recorded information are incorrect</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>4. Accuracy of illustration</td>
<td>4: All illustrations resemble the specimen&lt;br&gt;3: One illustration does not resemble the specimen&lt;br&gt;2: Two illustrations do not resemble the specimen&lt;br&gt;1: 3 or more illustrations do not resemble the specimen</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>5. Workmanship</td>
<td>4: Satisfied all of the ff: - artistically made - well-written - neat - consistent with the given format&lt;br&gt;3: Satisfied only 3 of the ff: - artistically made - well-written - neat - consistent with the given format&lt;br&gt;2: Satisfied only 2 of the ff: - artistically made - well-written - neat - consistent with the given format&lt;br&gt;1: Satisfied only 1 of the ff: - artistically made - well-written - neat - consistent with the given format</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>6. Appropriateness of Recommendations</td>
<td>4: All recommendations are based on observations&lt;br&gt;3: Recommendation was not based on observation&lt;br&gt;2: 2 or more recommendations were not based on observation&lt;br&gt;1: No observation and for recommendation given</td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>
### B. Oral Presentation (20%)

<table>
<thead>
<tr>
<th>Effectiveness of the Presentation</th>
<th>Satisfied all indicators</th>
<th>Satisfied only 5 or 6 of the indicators</th>
<th>Satisfied only 3 or 4 of the indicators</th>
<th>Satisfied only 2 or less of the indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Has clear analysis and explanation</td>
<td>a. Has clear analysis and explanation</td>
<td>a. Has clear analysis and explanation</td>
<td>a. Has clear analysis and explanation</td>
<td>a. Has clear analysis and explanation</td>
</tr>
<tr>
<td>b. Has answered satisfactorily when questions are raised</td>
<td>b. Has answered satisfactorily when questions are raised</td>
<td>b. Has answered satisfactorily when questions are raised</td>
<td>b. Has answered satisfactorily when questions are raised</td>
<td>b. Has answered satisfactorily when questions are raised</td>
</tr>
<tr>
<td>c. Has captured the attention of the whole class</td>
<td>c. Has captured the attention of the whole class</td>
<td>c. Has captured the attention of the whole class</td>
<td>c. Has captured the attention of the whole class</td>
<td>c. Has captured the attention of the whole class</td>
</tr>
<tr>
<td>d. Has correct grammar</td>
<td>d. Has correct grammar</td>
<td>d. Has correct grammar</td>
<td>d. Has correct grammar</td>
<td>d. Has correct grammar</td>
</tr>
<tr>
<td>e. Uses consistent language</td>
<td>e. Uses consistent language</td>
<td>e. Uses consistent language</td>
<td>e. Uses consistent language</td>
<td>e. Uses consistent language</td>
</tr>
<tr>
<td>f. Has loud and clear voice</td>
<td>f. Has loud and clear voice</td>
<td>f. Has loud and clear voice</td>
<td>f. Has loud and clear voice</td>
<td>f. Has loud and clear voice</td>
</tr>
<tr>
<td>g. Has clear pronunciation</td>
<td>g. Has clear pronunciation</td>
<td>g. Has clear pronunciation</td>
<td>g. Has clear pronunciation</td>
<td>g. Has clear pronunciation</td>
</tr>
</tbody>
</table>

### C. Both indoor and outdoor activities (20%)

<table>
<thead>
<tr>
<th>Teamwork</th>
<th>Satisfied all members</th>
<th>1 member did not cooperate</th>
<th>2 members did not cooperate</th>
<th>3 or more members did not cooperate</th>
</tr>
</thead>
<tbody>
<tr>
<td>All members have cooperated in the group work</td>
<td>1 member did not cooperate</td>
<td>2 members did not cooperate</td>
<td>3 or more members did not cooperate</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Grade</th>
<th>100</th>
</tr>
</thead>
</table>
Rubric in Rating Actual Transplanting (Rice & Vegetable)

A. Learning Objectives:

1. Perform the actual planting of rice/vegetable using the appropriate method.
2. Demonstrate teamwork and good time management.

B. Assessment Task: Actual planting in the field using transplanting method

C. Description of the Task:

1. Let facilitator demonstrate the appropriate method of planting in a given area within a given time frame.
2. Assign participants to do the actual planting in their respective areas.

D. Scoring Rubric

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Performance Levels</th>
<th>Evaluators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 Outstanding</td>
<td>3 Very Satisfactory</td>
</tr>
<tr>
<td>1. Time Management</td>
<td>• Work completed ahead of time</td>
<td>• Work completed just on time</td>
</tr>
<tr>
<td>2. Workmanship</td>
<td>Satisfies all the ff.</td>
<td>Satisfies only 3 of the ff.</td>
</tr>
<tr>
<td></td>
<td>a. Proper planting of seedlings</td>
<td>a. Proper planting of seedlings</td>
</tr>
<tr>
<td></td>
<td>b. Proper alignment of seedlings</td>
<td>b. Proper alignment of seedlings</td>
</tr>
<tr>
<td></td>
<td>c. Proper distance in transplanting seedlings</td>
<td>c. Proper distance in transplanting seedlings</td>
</tr>
<tr>
<td></td>
<td>d. Even distribution of seedlings per hill</td>
<td>d. Even distribution of seedlings per hill</td>
</tr>
<tr>
<td>3. Cooperation</td>
<td>• All the members of the group cooperated in the activity</td>
<td>• One member of the group did not cooperate in the group</td>
</tr>
</tbody>
</table>

Final Grade: 100
Rubric in Rating Direct Seeding (Rice & Vegetable)

A. Learning Objective:
   1. Perform the actual planting of rice/vegetable using the appropriate method.
   2. Demonstrate teamwork and good time management

B. Assessment Task: Actual planting in the field using direct seeding method

C. Descriptions of Task:
   1. Let facilitator demonstrate the appropriate method of planting in a given area within a given time frame.
   2. Assign participants to do the actual planting in their respective areas.

D. Scoring Rubric

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Performance Levels</th>
<th>Evaluators</th>
<th>Ave</th>
<th>W (%)</th>
<th>WP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 Outstanding</td>
<td>3 Very Satisfactory</td>
<td>2 Satisfactory</td>
<td>1 Needs Improvement</td>
<td></td>
</tr>
<tr>
<td>1. Time Management</td>
<td>• Work completed ahead of time</td>
<td>• Work completed just on time</td>
<td>• Work completed 1-30 minutes late</td>
<td>• Work completed more than 30 minutes after the time frame</td>
<td>25</td>
</tr>
<tr>
<td>2. Workmanship</td>
<td>The whole area was planted with the required seeding rate</td>
<td>About 1/16 of the area was not planted with the required seeding rate</td>
<td>About 1/8 of the area was not planted with the required seeding rate</td>
<td>About 1/4 of the area was not planted with the required seeding rate</td>
<td>50</td>
</tr>
<tr>
<td>3. Cooperation</td>
<td>• All the members of the group cooperated in the activity</td>
<td>• One member of the group did not cooperate in the group</td>
<td>• Two members of the group did not cooperate in the group</td>
<td>• Three or more members of the group did not cooperate in the group</td>
<td>25</td>
</tr>
</tbody>
</table>

Final Grade

100
Rubric in Rating the Report of Observations on Methods of Planting

A. Learning Objectives:
1. Observe and compare the 2 methods of planting.
2. Give the advantages and limitations of each method of planting.
3. Demonstrate teamwork and good time management.

B. Assessment Task: Reporting of observations in an actual demonstration of the different methods of rice planting.

C. Descriptions of Task:
- Assign participants in a group to observe and record their observations in the actual demonstration of the methods of planting rice in the field. Back in the training hall, they are expected to present orally their observations to the big group.
- Set the time frame for the preparation/planning the report and the duration of the actual oral report.

D. Scoring Rubric

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Performance Levels</th>
<th>Evaluators</th>
<th>Ave</th>
<th>W (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Time Management</td>
<td>Work completed ahead of time</td>
<td>1 2 3 4</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2. Clarity of the comparison of the 2 methods</td>
<td>Has one statement either on difference or similarity</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Acceptability of the advantages and limitations cited</td>
<td>Has cited the advantages and limitations of one method</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Effectiveness of the presentation</td>
<td>Satisfied all of the following: a. Has a modulated voice</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Evaluators, please specify the letter/s of the indicators that you have observed)</td>
<td>b. Has a good command of medium of the instruction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Questions raised by the class are well answered</td>
<td>d. Audience listens attentively</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Persuasive communication skills</td>
<td>Satisfied only 4 of the following: a. Has a modulated voice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Work completed just on time</td>
<td>1 2 3 4</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>3. Cooperation</td>
<td>All the members of the group cooperated in the activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Effectiveness of the presentation</td>
<td>Satisfied only 2 or 3 of the following: a. Has a modulated voice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Evaluators, please specify the letter/s of the indicators that you have observed)</td>
<td>b. Has a good command of medium of the instruction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Questions raised by the class are well answered</td>
<td>d. Audience listens attentively</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Persuasive communication skills</td>
<td>Satisfied only 1 or none of the following: a. Has a modulated voice</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Work completed 1-2 minute/s late</td>
<td>1 2 3 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Needs Improvement</td>
<td>Work completed 3 or more minutes late</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Clarity of the comparison of the 2 methods</td>
<td>Has one statement either on difference or similarity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Acceptability of the advantages and limitations cited</td>
<td>Has cited either one advantage or limitation of one method</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Effectiveness of the presentation</td>
<td>Work completed 3 or more minutes late</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Evaluators, please specify the letter/s of the indicators that you have observed)</td>
<td>No statement of difference and similarity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Cooperation</td>
<td>No advantage or limitation cited</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Grade</td>
<td></td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Rubric in Rating an Actual Demonstration of Land Preparation (Rice)

#### A. Learning Objectives:

1. Use the appropriate equipment in land preparation
2. Execute the steps in land preparation
3. Practice precautionary measures in land preparation

#### B. Assessment Task: Demonstration of the Actual Land Preparation

#### C. Descriptions of the Task

1. Students should first observe the procedures of land preparation being demonstrated by the teacher/farmer facilitator before they do the actual preparation of land.
2. Assign participants in groups to prepare the land in their assigned area within a time frame.

#### D. Scoring Rubric:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Performance Levels</th>
<th>Evaluators</th>
<th>Ave W (%)</th>
</tr>
</thead>
</table>
| 1. Appropriate Use of Tools/Equipment (Evaluators, please specify the letter/s of the tools that you have observed) | 4 Outstanding:
- All necessary tools/equipment were used appropriately
  - a. plow
  - b. tractor
  - c. harrow
  - d. plainer (of any kind)
  - e. rake
  - f. shovel/bolo/ho

  1. necessary tool/equipment were improperly used:
    - a. plow
    - b. tractor
    - c. harrow
    - d. plainer (of any kind)
    - e. rake
    - f. shovel/bolo/ho

2. Very Satisfactory:
- 2 necessary tools/equipment were improperly used:
  - a. plow
  - b. tractor
  - c. harrow
  - d. plainer (of any kind)
  - e. rake
  - f. shovel/bolo/ho

3. Satisfactory:
- 3 or more necessary tools/equipment improperly used:
  - a. plow
  - b. tractor
  - c. harrow
  - d. plainer (of any kind)
  - e. rake
  - f. shovel/bolo/ho

<table>
<thead>
<tr>
<th></th>
<th>4 Outstanding:</th>
<th>3 Very Satisfactory:</th>
<th>2 Satisfactory:</th>
<th>1 Needs Improvement:</th>
<th>Ave</th>
<th>W (%)</th>
</tr>
</thead>
</table>
| 2. Proper execution of steps and procedures (Evaluators, please specify the letter/s of the steps that you have observed) | Followed all the steps properly:
  - a. clearing
  - b. repair of dikes
  - c. irrigating
  - d. plowing
  - e. 1st harrowing 7 days after plowing
  - f. 2nd harrowing 7 days after 1st
  - g. 3rd harrowing 7 days after 2nd
  - h. leveling

  Missed one of the steps:
  - a. clearing
  - b. repair of dikes
  - c. irrigating
  - d. plowing
  - e. 1st harrowing 7 days after plowing
  - f. 2nd harrowing 7 days after 1st
  - g. 3rd harrowing 7 days after 2nd
  - h. leveling

  Missed 2 of the steps:
  - a. clearing
  - b. repair of dikes
  - c. irrigating
  - d. plowing
  - e. 1st harrowing 7 days after plowing
  - f. 2nd harrowing 7 days after 1st
  - g. 3rd harrowing 7 days after 2nd
  - h. leveling

  Missed 3 or more steps:
  - a. clearing
  - b. repair of dikes
  - c. irrigating
  - d. plowing
  - e. 1st harrowing 7 days after plowing
  - f. 2nd harrowing 7 days after 1st
  - g. 3rd harrowing 7 days after 2nd
  - h. leveling

| Final Grade                                                          | 100                                                                                       |                                            |                                        |                                       |      |       |
Rubric in Rating an Actual Demonstration of Land Preparation (Vegetable)

A. Learning Objectives:

1. Use the appropriate equipment in land preparation
2. Execute the steps in land preparation
3. Practice precautionary measures in land preparation

B. Assessment Task: Demonstration of the Actual Land Preparation

C. Descriptions of the Task

1. Students should first observe the procedures of land preparation being demonstrated by teacher/farmer facilitator before they do the actual preparation of land
2. Assign participants in groups to prepare the land in their assigned area within a time frame

D. Scoring Rubric:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Performance Levels</th>
<th>Evaluators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 Outstanding</td>
<td>1 2 3 4 Ave</td>
</tr>
<tr>
<td></td>
<td>3 Very Satisfactory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Satisfactory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Needs Improvement</td>
<td></td>
</tr>
<tr>
<td>1. Appropriate Use of Tools/Equipment</td>
<td>All necessary tools or equipment were used appropriately</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• plow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• tractor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• harrow</td>
<td></td>
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<tr>
<td></td>
<td>• rake</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• shovel/bolo/hoe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 necessary tool/equipment inappropriately used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• plow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• tractor</td>
<td></td>
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<tr>
<td></td>
<td>• harrow</td>
<td></td>
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<td></td>
<td>• rake</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• shovel/bolo/hoe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 necessary tool/equipment inappropriately used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• plow</td>
<td></td>
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<td></td>
<td>• tractor</td>
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<td></td>
<td>• harrow</td>
<td></td>
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<td></td>
<td>• rake</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• shovel/bolo/hoe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 or more necessary tools/equipment inappropriately used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• plow</td>
<td></td>
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<tr>
<td></td>
<td>• tractor</td>
<td></td>
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<tr>
<td></td>
<td>• harrow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• rake</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• shovel/bolo/hoe</td>
<td></td>
</tr>
<tr>
<td>2. Proper execution of steps and procedures</td>
<td>Followed all the steps properly</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. clearing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. irrigating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. plowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. 1st harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. 2nd harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f. 3rd harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>g. construction of furrows or ridge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Missed one of the steps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. clearing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. irrigating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. plowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. 1st harrowing</td>
<td></td>
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<tr>
<td></td>
<td>e. 2nd harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f. 3rd harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>g. construction of furrows or ridge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Missed 2 of the steps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. clearing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. irrigating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. plowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. 1st harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. 2nd harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f. 3rd harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>g. construction of furrows or ridge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Missed 3 or more steps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. clearing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. irrigating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. plowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. 1st harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. 2nd harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>f. 3rd harrowing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>g. construction of furrows or ridge</td>
<td></td>
</tr>
</tbody>
</table>

Final Grade
Rubric in Rating an Actual Composting

A. Learning Objectives:

1. Perform the steps of composting.
2. Show workmanship and teamwork in composting.

B. Assessment Task: Actual composting

C. Descriptions of the Task:

- Students in group perform composting within in a given time frame in a given area
- Each group should collect materials and prepare tools needed in composting

D. Scoring Rubric

<table>
<thead>
<tr>
<th>Criteria</th>
<th>4 Outstanding</th>
<th>3 Very Satisfactory</th>
<th>2 Satisfactory</th>
<th>1 Needs Improvement</th>
<th>Evaluators</th>
<th>Ave</th>
<th>W (%)</th>
<th>WP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Completeness of the Needed Materials</td>
<td>Performs all of the required materials</td>
<td>Lacks any 1 of the needed materials</td>
<td>Lacks any 2 of the needed materials</td>
<td>Lacks 3 or more of the needed materials</td>
<td>1 2 3 4</td>
<td>Ave</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>b. Poultry dung or animal manure</td>
<td>b. Poultry dung or animal manure</td>
<td>b. Poultry dung or animal manure</td>
<td>b. Poultry dung or animal manure</td>
<td>b. Poultry dung or animal manure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Fertilizer</td>
<td>d. Fertilizer</td>
<td>d. Fertilizer</td>
<td>d. Fertilizer</td>
<td>d. Fertilizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Bamboo tubes</td>
<td>e. Bamboo tubes</td>
<td>e. Bamboo tubes</td>
<td>e. Bamboo tubes</td>
<td>e. Bamboo tubes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Execution of the Steps in composting</td>
<td>Performs all the steps in composting</td>
<td>Performs only 8 of the steps in composting</td>
<td>Performs only 7 of the steps in composting</td>
<td>Performs only 6 or less of the steps in composting</td>
<td>1 2 3 4</td>
<td>Ave</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>b. Clearing the site for file</td>
<td>b. Clearing the site for file</td>
<td>b. Clearing the site for file</td>
<td>b. Clearing the site for file</td>
<td>b. Clearing the site for file</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Spread plastic matting on the area</td>
<td>c. Spread plastic matting on the area</td>
<td>c. Spread plastic matting on the area</td>
<td>c. Spread plastic matting on the area</td>
<td>c. Spread plastic matting on the area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Pile evenly a foot thick of cut grass/straw and degradable materials</td>
<td>d. Pile evenly a foot thick of cut grass/straw and degradable materials</td>
<td>d. Pile evenly a foot thick of cut grass/straw and degradable materials</td>
<td>d. Pile evenly a foot thick of cut grass/straw and degradable materials</td>
<td>d. Pile evenly a foot thick of cut grass/straw and degradable materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Spread poultry dung/animal manure/ashes on the pile</td>
<td>e. Spread poultry dung/animal manure/ashes on the pile</td>
<td>e. Spread poultry dung/animal manure/ashes on the pile</td>
<td>e. Spread poultry dung/animal manure/ashes on the pile</td>
<td>e. Spread poultry dung/animal manure/ashes on the pile</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Add another layer of cut grass etc. alternately with the animal manure until it is highly embedded</td>
<td>f. Add another layer of cut grass etc. alternately with the animal manure until it is highly embedded</td>
<td>f. Add another layer of cut grass etc. alternately with the animal manure until it is highly embedded</td>
<td>f. Add another layer of cut grass etc. alternately with the animal manure until it is highly embedded</td>
<td>f. Add another layer of cut grass etc. alternately with the animal manure until it is highly embedded</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Place bamboo tubes vertically for aeration</td>
<td>g. Place bamboo tubes vertically for aeration</td>
<td>g. Place bamboo tubes vertically for aeration</td>
<td>g. Place bamboo tubes vertically for aeration</td>
<td>g. Place bamboo tubes vertically for aeration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Water the pile and cover with plastics</td>
<td>h. Water the pile and cover with plastics</td>
<td>h. Water the pile and cover with plastics</td>
<td>h. Water the pile and cover with plastics</td>
<td>h. Water the pile and cover with plastics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Turn the pile</td>
<td>i. Turn the pile</td>
<td>i. Turn the pile</td>
<td>i. Turn the pile</td>
<td>i. Turn the pile</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Converting Scales to Grades in Percent

The table below is the suggested conversion of ratings in the form of scale into percent as the symbol of grades in most schools in the Philippines.

<table>
<thead>
<tr>
<th>Outstanding</th>
<th>Very Satisfactory</th>
<th>Satisfactory</th>
<th>Needs Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>100</td>
<td>94</td>
<td>84</td>
</tr>
<tr>
<td>3.9</td>
<td>99</td>
<td>93</td>
<td>83</td>
</tr>
<tr>
<td>3.8</td>
<td>98</td>
<td>92</td>
<td>82</td>
</tr>
<tr>
<td>3.7</td>
<td>97</td>
<td>91</td>
<td>81</td>
</tr>
<tr>
<td>3.6</td>
<td>96</td>
<td>90</td>
<td>80</td>
</tr>
<tr>
<td>3.5</td>
<td>95</td>
<td>89</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>88</td>
<td>79</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>87</td>
<td>78</td>
<td>of the task</td>
</tr>
<tr>
<td></td>
<td>86</td>
<td>77</td>
<td></td>
</tr>
<tr>
<td></td>
<td>85</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>75</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

The scale 0 – this is the score that indicates that the task was not performed. The grade equivalent to this could be the lowest possible failing grade observed in the school. However, this should be done only when the teacher has given all the chances to the students to make-up for their non-compliance to the task.
5.3. Portfolio Assessment and Rubrics

5.3.1. What is Portfolio Assessment?

Portfolio Assessment is a purposeful, ongoing, dynamic, and collaborative process of gathering multiple indicators of the learner’s growth and development.

5.3.2. Why Portfolio Assessment?

- It tests what is really happening in the classroom.
- It offers multiple indicators of students’ progress.
- It gives the students the responsibility of their own learning.
- It offers opportunities for students to document reflections of their learning.
- It demonstrates what the students know in ways that encompass their personal learning styles and multiple intelligences.
- It affords teachers a new role in the assessment process.
- It allows teachers to reflect on the effectiveness of their instruction.
- It provides teachers freedom of gaining insights into the student’s development or achievement over a period of time.

5.3.3. Principles Underlying Portfolio Assessment

- **Content Principle**: It reflects the subject matter that is important for the students to learn.
- **Learning Principle**: It enables students to become active and thoughtful learners.
- **Equity Principle**: It allows students to demonstrate their learning styles and multiple intelligences.

5.3.4. Types of Portfolio

1. **Working Portfolio**: is a collection of a student’s day-to-day works which reflect one’s learning (process oriented)
2. **Show Portfolio**: is a collection of a student’s best works (product oriented).
3. **Documentary Portfolio**: is a working and a show portfolio (process and product oriented)
5.3.5. The Portfolio Process

1. Set Goals

This is the first step in portfolio assessment in which the students set their goals in developing a learning portfolio. To guide the students in stating their goals, the teachers may articulate first the goals of the course, his/her expectations to students. Students could also ask what their parents expect from them. They could also be given goal-setting planners.

<table>
<thead>
<tr>
<th>Goal-Setting Planner</th>
</tr>
</thead>
<tbody>
<tr>
<td>I participate in the CP IPPM program because:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>I am doing this work because:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>What I target to accomplish are:</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

2. Collect

In this stage, the students should start collecting all possible entries in their portfolio. They should be told to have a temporary container for all their entries and this should be placed in the school so that keeping of entries will be part of the daily activities of the students. A good practice in collecting the portfolio entries is to
have a log of all entries with a few descriptions how they were obtained and why they were kept in the portfolio.

3. Select

This is the stage where the students are asked to select what will finally be used to gauge their success from all their collections of possible entries in a portfolio. The selection usually depends on what the teacher requires them to do, their parents’ choice and the entries that they personally chose as the best gauge of their accomplishment in the program. Selections could include evidences that show in- and out-of class activities participated in by the students in relation to the program.

4. Organize

This is the stage where the students decide on how they will organize their entries. The teachers should guide them by telling them to make a table of contents for their portfolio entries and a direction on where to find them. The organization of the portfolio could vary depending on the style of the students. Some teachers take this stage as the opportunity for the students to develop or hone their creativity and resourcefulness. The organizer could also be of any material but it is suggested that the container is something flexible that it could allow one to add, modify or delete any entry anytime. Examples of materials used in making portfolios are clearbook, album, accordion bag, box with dividers, envelopes, and colored magazines.

5. Reflect

An important trait of a portfolio is the presence of student’s reflections of his/her experiences. Making reflective journals, log of entries, and labeling an evidence in a portfolio are just some of the different ways to show one’s knowledge, understanding, attitudes, values, writing skills and creativity of ideas of the students. This is the opportunity for the students to reflect on the meaningfulness of their experiences as well as the impact of their teacher’s styles and methodology in teaching.

6. Evaluate

This is the stage where the students, their peers and teachers, or even the parents are involved in rating the achievement of the students based on their evidences of learning, their reflections of their experiences, and the organizations of their portfolio. Rubrics are often used in rating students performance using their portfolios. Rubrics in rating portfolios should be given to the students even at the beginning of the portfolio process so that they are guided on what to put in their portfolio and how to organize them based on the criteria and indicators of a quality product or excellent performance. Evaluation of the portfolio could be done by individual entry on a specified date or when the development is completed. However, most teachers prefer rating the students required evidences when they are expected to be there in the portfolio so that the students can be given immediate feedback on their work. What are usually rated at the end when the portfolio development is completed are the students’ selected evidences of their learning as
well as the packaging of the portfolio from which the teacher could infer the personal traits of the students.

7. **Confer**

This is the stage when the teachers confer with the students or parents to discuss the performance of the students. This is also the time to congratulate the students for their accomplishment or to help the students identify areas for improvement.

8. **Exhibit**

This is the time to celebrate success in the form of an exhibit of students’ portfolios. In the CP IPPM program, the highlight of the exhibit is the awarding of the best students’ portfolio, best teacher’s portfolio, and best school’s portfolio in the district, division and national level.

### 5.3.6. Portfolio Rubric

#### TARGETS

In this portfolio, the students should be able to show evidences of knowledge, skills, attitudes and values gained from participating in the CP IPPM Program. In particular, they should be able to document attainment of the following competencies:

<table>
<thead>
<tr>
<th>COMPETENCIES</th>
<th>REQUIRED EVIDENCES</th>
<th>OPTIONAL EVIDENCES</th>
</tr>
</thead>
</table>
| Demonstrate knowledge, understanding, interest, and interpersonal skills in the CP IPPM program. | • Flyer of the CP IPPM Program  
• Mind map  
• A statement of one’s expectations from the program  
• Results of the pretest  
• Set of norms for the students in the CP IPPM Program  
• List of the members of the group, their personal data, and a few descriptions of their interests, hobbies, etc | |
| Demonstrate knowledge, skills, and desirable attitude in conducting a simple research related to the topics in the CP IPPM program which is a vehicle in understanding effective production and management of crops | • Written report of the results and analysis of the field survey  
• Written report of the simple research conducted | • Questionnaire used in the community survey |
<p>| Explain the economic importance of rice/vegetable production in the Philippines | | • Reflections on the gathered information about the status of rice/vegetable production in the Philippines |
| Demonstrate knowledge, skills, and desirable attitude in the | • Soil samples and report on the experiments conducted | |</p>
<table>
<thead>
<tr>
<th>Study of the soil system</th>
<th>Acquire knowledge, skills, and desirable attitudes in determining good seeds</th>
<th>Acquire knowledge and understanding on crop morphology</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Experiment report with emphasis on the result of the computation</td>
<td>- Illustration of a rice/vegetable seed with its parts and their functions</td>
<td>- Illustration of a rice/vegetable seed with its parts and their functions</td>
</tr>
<tr>
<td>- Sample of rice/vegetable seeds and their descriptions</td>
<td>- Result of the computation</td>
<td>- Result of the computation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Demonstrate knowledge, skills, and interest in seedling preparation, care, and management</th>
<th>Gain knowledge, skills, and appreciation in record keeping</th>
<th>Demonstrating knowledge, skills, and desirable attitudes in composting</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Reflections in performing seedbed preparation</td>
<td>- Photos documenting the actual land preparation of students</td>
<td>- Reflections/insights from one’s experiences in making a compost</td>
</tr>
<tr>
<td>- Pictures on seedbed preparation, soil treatment and seed sowing</td>
<td>- A farm record showing cost-and-benefit analysis of the vegetable production</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gain knowledge and skills and appreciation in record keeping</th>
<th>Acquire knowledge, skills, and desirable attitude in land preparation for rice/vegetable planting</th>
<th>Demonstrate knowledge, skills, and appreciation of Agro-Ecological System Analysis (AESA), which is a vehicle in understanding a balanced ecosystem</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Insights on the value of record keeping</td>
<td>- Photos documenting the actual land preparation of students</td>
<td>- Concept map of the components of the ecosystem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Illustration of the ecosystem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Weekly report of AESA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Acquire knowledge and skills on weeds management</th>
<th>Gain knowledge, skills, and desirable attitudes in fertilizer management</th>
<th>Acquire knowledge and skills on water management</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Scrapbook on weeds</td>
<td>- Scrapbook of organic and inorganic fertilizers</td>
<td>- Pictures showing irrigation practices</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gain knowledge and skills on the biological control of pests</th>
<th>Gain knowledge and understanding on the life of insects as well as skills on how to conserve/manage them</th>
<th>Gain knowledge, understanding, and skills in managing plant diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Scrapbook of insects</td>
<td>- Drawing of the life cycle of insects</td>
<td>- Reflections/insights from one’s learning experiences</td>
</tr>
<tr>
<td></td>
<td>- Insights/Reflections</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Demonstrate knowledge, skills, and desirable attitudes in pest management</th>
<th>Demonstrate knowledge, skills, and desirable attitudes in pest management</th>
<th>Gain knowledge and skills on pest management</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Insights on the different methods used in controlling pests</td>
<td>- Campaign posters/slogans</td>
<td>- News clippings and articles or pictures about environmental degradation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gain knowledge and understanding, and skills in managing plant diseases</th>
<th>Demonstrating knowledge, skills, and desirable attitudes in pest management</th>
<th>Gain knowledge and understanding, and skills in managing plant diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Reflections/insights from one’s learning experiences</td>
<td>- News clippings and articles or pictures about environmental degradation</td>
<td>- News clippings and articles or pictures about environmental degradation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Feedback / Products</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Acquire knowledge and understanding of the physiological disorder in plants</td>
<td>Reflections/ Insights from one’s learning experiences</td>
<td></td>
</tr>
<tr>
<td>Acquire knowledge, skills, and desirable attitudes in harvesting and post harvesting practices</td>
<td>Insights on harvesting and post harvesting operations</td>
<td></td>
</tr>
<tr>
<td>Acquire knowledge, skills, and desirable attitudes in marketing products</td>
<td>Reflections / insights gained from one’s learning experiences</td>
<td></td>
</tr>
</tbody>
</table>
| Participate actively in the graduation and culminating activities | Copy of Graduation and field program  
|                                                                  | Portfolio exhibit                                                                    |
## THE SCORING RUBRIC

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Performance Levels</th>
<th>Evaluators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 Outstanding</td>
<td>3 Very Satisfactory</td>
</tr>
<tr>
<td><strong>A. Time Management (5%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Promptness in the submission of the whole portfolio</td>
<td>• Submitted before deadline</td>
<td>• Submitted on the deadline</td>
</tr>
<tr>
<td><strong>Partial Grade</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>B. Visual Appeal (15%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Completeness of the portfolio Expected Entries</td>
<td>Contains all the expected entries in a portfolio.</td>
<td>Lacks only 1 of the expected entries in a portfolio.</td>
</tr>
<tr>
<td>• Cover Page</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Table of Contents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Introduction/Statement of Expectations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Required Evidences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Reflections</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Choice of materials used</td>
<td>More than ½ of the materials used are indigenous/recycled ones</td>
<td>Less than ½ of the materials used are indigenous/recycled ones</td>
</tr>
<tr>
<td>3. Workmanship</td>
<td>Satisfies all of the ff: • artistically made</td>
<td>Satisfies only 2 of the ff: • artistically made</td>
</tr>
<tr>
<td>• well-written</td>
<td>• well-written</td>
<td>• well-written</td>
</tr>
<tr>
<td>• neat</td>
<td>• neat</td>
<td>• neat</td>
</tr>
<tr>
<td>4. Others (pls. specify)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Partial Portfolio Grade</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### C. Evidences of Learning (80%)

<table>
<thead>
<tr>
<th>Evidences/and Weight</th>
<th>Scale Indicators</th>
<th>Evaluators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4 Outstanding</td>
<td>3 Very Satisfactory</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

#### 1. Required Evidences (65%)

a) Diagram showing the growth stages of the rice plant (Please check indicators observed)

<table>
<thead>
<tr>
<th>All indicators are met:</th>
<th>Satisfies only 4 of the ff. indicators:</th>
<th>Satisfies only 2 to 3 of the ff. indicators:</th>
<th>Satisfies only 1 or none of the ff. indicators:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Complete information</td>
<td>a. Complete information</td>
<td>a. Complete information</td>
<td></td>
</tr>
<tr>
<td>c. Well illustrated</td>
<td>c. Well illustrated</td>
<td>c. Well illustrated</td>
<td></td>
</tr>
<tr>
<td>d. Correctly labeled</td>
<td>d. Correctly labeled</td>
<td>d. Correctly labeled</td>
<td></td>
</tr>
<tr>
<td>e. Submits on time</td>
<td>e. Submits on time</td>
<td>e. Submits on time</td>
<td></td>
</tr>
</tbody>
</table>

b) Scrapbook of weeds (Please check indicators observed)

<table>
<thead>
<tr>
<th>Meets all of the following:</th>
<th>Meets only 4 or 5 of the ff indicators:</th>
<th>Meets only 2 to 3 of the ff indicators:</th>
<th>Meets only one or none of the ff indicators:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Submits work on time</td>
<td>a. Submits work on time</td>
<td>a. Submits work on time</td>
<td></td>
</tr>
<tr>
<td>b. Presents minimum number of specimens</td>
<td>b. Presents minimum number of specimens</td>
<td>b. Presents minimum number of specimens</td>
<td></td>
</tr>
<tr>
<td>c. Classifies all specimens accurately</td>
<td>c. Classifies all specimens accurately</td>
<td>c. Classifies all specimens accurately</td>
<td></td>
</tr>
<tr>
<td>d. Labels correctly all specimens</td>
<td>d. Labels correctly all specimens</td>
<td>d. Labels correctly all specimens</td>
<td></td>
</tr>
<tr>
<td>e. Uses indigenous/recycled materials</td>
<td>e. Uses indigenous/recycled materials</td>
<td>e. Uses indigenous/recycled materials</td>
<td></td>
</tr>
<tr>
<td>f. Well-written/neat/all entries displayed artistically</td>
<td>f. Well-written/neat/all entries displayed artistically</td>
<td>f. Well-written/neat/all entries displayed artistically</td>
<td></td>
</tr>
</tbody>
</table>

c) Scrapbook of Insects (Please check indicators observed)

<table>
<thead>
<tr>
<th>Meets all of the following:</th>
<th>Meets only 4 or 5 of the ff indicators:</th>
<th>Meets only 2 to 3 of the ff indicators:</th>
<th>Meets only one or none of the ff indicators:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Submits work on time</td>
<td>a. Submits work on time</td>
<td>a. Submits work on time</td>
<td></td>
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<tr>
<td>b. Presents minimum number of specimens</td>
<td>b. Presents minimum number of specimens</td>
<td>b. Presents minimum number of specimens</td>
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<tr>
<td>c. Classifies all specimens accurately</td>
<td>c. Classifies all specimens accurately</td>
<td>c. Classifies all specimens accurately</td>
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<tr>
<td>d. Labels correctly all specimens</td>
<td>d. Labels correctly all specimens</td>
<td>d. Labels correctly all specimens</td>
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<tr>
<td>e. Uses indigenous/recycled materials</td>
<td>e. Uses indigenous/recycled materials</td>
<td>e. Uses indigenous/recycled materials</td>
<td></td>
</tr>
<tr>
<td>f. Well-written/neat/all entries displayed artistically</td>
<td>f. Well-written/neat/all entries displayed artistically</td>
<td>f. Well-written/neat/all entries displayed artistically</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Collection of soil types</td>
<td>f) Results of field studies conducted/Summary of AESA Report</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------</td>
<td>----------------------------------------------------------</td>
<td></td>
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<tr>
<td></td>
<td>(Please check indicators observed)</td>
<td>(Please check indicators observed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meets <strong>all</strong> of the following:</td>
<td>Satisfies 13-14 of the ff:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Submits works on time</td>
<td>a. Has an introductory statement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Presents 3 types of soil w/ descriptions</td>
<td>b. Has clear objectives/problem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Labels soil types correctly</td>
<td>c. Describes clearly the materials used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Presents neat/well - written/ artistic work</td>
<td>d. Describes clearly the procedures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meets <strong>only 3</strong> of the following:</td>
<td>e. Has complete graph of insect pests</td>
<td></td>
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<tr>
<td></td>
<td>a. Submits works on time</td>
<td>f. Has complete graph of natural enemies</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Presents 3 types of soil w/ descriptions</td>
<td>g. Has a complete graph of the # of tillers</td>
<td></td>
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<tr>
<td></td>
<td>c. Labels soil types correctly</td>
<td>h. Has a complete graph of plant height</td>
<td></td>
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<tr>
<td></td>
<td>d. Presents neat/well - written/artistic work</td>
<td>i. Has a complete graph of water level</td>
<td></td>
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<tr>
<td></td>
<td>Meets only <strong>2</strong> of the following:</td>
<td>Contains only <strong>9-12</strong> of the ff:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Submits works on time</td>
<td>a. Has an introductory statement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Presents 3 types of soil w/ descriptions</td>
<td>b. Has clear objectives/problem</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Labels soil types correctly</td>
<td>c. Describes clearly the materials used</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Presents neat/well - written/artistic work</td>
<td>d. Describes clearly the procedures</td>
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<tr>
<td></td>
<td>Meets only <strong>1</strong> or none of the following:</td>
<td>e. Has complete graph of insect pests</td>
<td></td>
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<tr>
<td></td>
<td>a. Submits works on time</td>
<td>f. Has complete graph of natural enemies</td>
<td></td>
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<tr>
<td></td>
<td>b. Presents 3 types of soil w/ descriptions</td>
<td>g. Has a complete graph of the # of tillers</td>
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<tr>
<td></td>
<td>c. Labels soil types correctly</td>
<td>h. Has a complete graph of plant height</td>
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<tr>
<td></td>
<td>d. Presents neat/well - written/artistic work</td>
<td>i. Has a complete graph of water level</td>
<td></td>
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<tr>
<td></td>
<td>Meets only one or none of the ff indicators:</td>
<td>Contains only <strong>6-8</strong> of the ff:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Submits work on time</td>
<td>a. Has an introductory statement</td>
<td></td>
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<tr>
<td></td>
<td>b. Presents minimum number of specimens</td>
<td>b. Has clear objectives/problem</td>
<td></td>
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<tr>
<td></td>
<td>c. Classifies all specimens accurately</td>
<td>c. Describes clearly the materials used</td>
<td></td>
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<tr>
<td></td>
<td>d. Labels correctly all specimens</td>
<td>d. Describes clearly the procedures</td>
<td></td>
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<tr>
<td></td>
<td>e. Uses indigenous/recycled materials</td>
<td>e. Has complete graph of insect pests</td>
<td></td>
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<tr>
<td></td>
<td>f. Well-written/neat/all entries displayed artistically</td>
<td>f. Has complete graph of natural enemies</td>
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<tr>
<td></td>
<td>Meets only <strong>4 or 5</strong> of the ff indicators:</td>
<td>g. Has a complete graph of the # of tillers</td>
<td></td>
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<tr>
<td></td>
<td>a. Submits work on time</td>
<td>h. Has a complete graph of plant height</td>
<td></td>
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<tr>
<td></td>
<td>b. Presents minimum number of specimens</td>
<td>i. Has a complete graph of water level</td>
<td></td>
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<tr>
<td></td>
<td>c. Classifies all specimens accurately</td>
<td>j. Has a complete graph of #</td>
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<td></td>
<td>d. Labels correctly all specimens</td>
<td>k. Has a complete graph of #</td>
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<td></td>
<td>e. Uses indigenous/recycled materials</td>
<td>l. Has a complete graph of #</td>
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<td></td>
<td>f. Well-written/neat/all entries displayed artistically</td>
<td>m. Has a complete graph of #</td>
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<tr>
<td></td>
<td>Meets only <strong>2 or 3</strong> of the ff indicators:</td>
<td>n. Has a complete graph of #</td>
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<tr>
<td></td>
<td>a. Submits work on time</td>
<td>o. Has a complete graph of #</td>
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<tr>
<td></td>
<td>b. Presents minimum number of specimens</td>
<td>p. Has a complete graph of #</td>
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<td></td>
<td>c. Classifies all specimens accurately</td>
<td>q. Has a complete graph of #</td>
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<td></td>
<td>d. Labels correctly all specimens</td>
<td>r. Has a complete graph of #</td>
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<td></td>
<td>e. Uses indigenous/recycled materials</td>
<td>s. Has a complete graph of #</td>
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<td>f. Well-written/neat/all entries displayed artistically</td>
<td>t. Has a complete graph of #</td>
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<tr>
<td></td>
<td>Meets only one or none of the ff indicators:</td>
<td>u. Has a complete graph of #</td>
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<td></td>
<td>a. Submits work on time</td>
<td>v. Has a complete graph of #</td>
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<td>b. Presents minimum number of specimens</td>
<td>w. Has a complete graph of #</td>
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<td></td>
<td>c. Classifies all specimens accurately</td>
<td>x. Has a complete graph of #</td>
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<td></td>
<td>d. Labels correctly all specimens</td>
<td>y. Has a complete graph of #</td>
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<td>e. Uses indigenous/recycled materials</td>
<td>z. Has a complete graph of #</td>
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<td>Program one</td>
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<td>Program one</td>
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<tr>
<td></td>
<td>i) Written Reflections about observed)</td>
<td>observed)</td>
<td>observed)</td>
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<td>(Please check indicators conducted)</td>
<td>(Please check indicators conducted)</td>
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<td>of leaves</td>
<td>of leaves</td>
<td>of leaves</td>
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<tr>
<td>k.</td>
<td>Performs a cost- and benefit- analysis</td>
<td>Performs a cost- and benefit- analysis</td>
<td>Performs a cost- and benefit- analysis</td>
</tr>
<tr>
<td>l.</td>
<td>Presents results of observations</td>
<td>Presents results of observations</td>
<td>Presents results of observations</td>
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<tr>
<td>m.</td>
<td>Draws conclusions based on the results of observations</td>
<td>Draws conclusions based on the results of observations</td>
<td>Draws conclusions based on the results of observations</td>
</tr>
<tr>
<td>n.</td>
<td>Has given recommendations based on the observations</td>
<td>Has given recommendations based on the observations</td>
<td>Has given recommendations based on the observations</td>
</tr>
<tr>
<td>g)</td>
<td>Report of the observations/ Experiments/ Researches conducted</td>
<td>Satisfies all of the ff:</td>
<td>Satisfies only 6 of the ff:</td>
</tr>
<tr>
<td></td>
<td>(Please check indicators observed)</td>
<td>a. Has an introductory statement</td>
<td>a. Has an introductory statement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Has clear objectives/problem</td>
<td>b. Has clear objectives/problem</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Describes clearly the materials used</td>
<td>c. Describes clearly the materials used</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. Describes clearly the procedures</td>
<td>d. Describes clearly the procedures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e. Presents complete results of the experiment</td>
<td>e. Presents complete results of the experiment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>f. Draws conclusions based on the results of the experiment</td>
<td>f. Draws conclusions based on the results of the experiment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>g. Has given appropriate recommendations</td>
<td>g. Has given appropriate recommendations</td>
</tr>
<tr>
<td>h)</td>
<td>Campaign Poster</td>
<td>Satisfies all of the ff:</td>
<td>Satisfies only 4 of the ff:</td>
</tr>
<tr>
<td></td>
<td>(Please check indicators observed)</td>
<td>a. Submits work on time</td>
<td>a. Submits work on time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>b. Illustration communicates the effects of pesticides to the environment</td>
<td>b. Illustration communicates the effects of pesticides to the environment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>c. Artistically done</td>
<td>c. Artistically done</td>
</tr>
<tr>
<td></td>
<td></td>
<td>e. With written reflections at the back of the poster</td>
<td>e. With written reflections at the back of the poster</td>
</tr>
<tr>
<td>i)</td>
<td>Written Reflections about one’s experiences in CP IPPM Program</td>
<td>Satisfies all of the ff:</td>
<td>Satisfies only 4 of the ff:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>a. Identified at least 5 most liked activities in</td>
<td>a. Identified at least 5 most liked activities in</td>
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</tbody>
</table>
Note: Since this is a group portfolio, every member should make individual reflections.

**Partial Grade**

### 2. Optional or Self-Selected Evidences (15%)

<table>
<thead>
<tr>
<th>Scale Indicators</th>
<th>Evaluators</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Outstanding</td>
<td>3 Very Satisfactory</td>
</tr>
</tbody>
</table>

#### Quantity, Workmanship and Relevance

- Satisfies all of the following indicators:
  - a. At least 5 additional entries were placed in the portfolio
  - b. The relevance of all entries is given
  - c. The work is neat and artistic

- Satisfies only 2 of the following indicators:
  - a. At least 5 additional entries were placed in the portfolio
  - b. The relevance of all entries is given
  - c. The work is displayed artistically

- Satisfies only 1 of the following indicators:
  - a. At least 5 additional entries were placed in the portfolio
  - b. The relevance of all entries is given
  - c. The work is displayed artistically

- Satisfies none of the following indicators:
  - a. At least 5 additional entries were placed in the portfolio
  - b. The relevance of all entries is given
  - c. The work is displayed artistically

**Note:** Please write N/A for the criteria that are not applicable.
THE SCORING PROCEDURE

The following are the steps in grading the CP-IPPM Portfolio using this Ana-Holistic Scoring Rubric

1. Part II A and B should be graded upon the submission of the whole portfolio.
2. The required entries in Part II C1 may be graded individually at certain points in the development of the portfolio. It is ideal that they are checked right after the students have accomplished the task. The teacher may discuss to the class the deadline for submission. Since these entries have already been rated even before the submission of the whole portfolio, the ratings should be reflected on the rubric so that they will be included in the computation of the final portfolio grade of the students.
3. The optional entries in Part IIC2 can be rated upon the submission of the final portfolio of the students.
4. The final rating for each dimension or criterion could be based on the average of the ratings given by all the evaluators. However, the teacher can still consult the students if they wish to vary the weights of the ratings given by the evaluators.
5. To get the weighted rating per dimension of portfolio assessment, multiply the average rating given to a dimension of portfolio assessment by its corresponding weight.
6. To get the final level of performance in the 4-pt scale, add all weighted ratings for the three identified dimensions. Take note that the total should not exceed 4 pts. Otherwise, you made a computational error.
7. To get the final grade in percent (%), refer to the table given below.

<table>
<thead>
<tr>
<th></th>
<th>Outstanding</th>
<th>Very Satisfactory</th>
<th>Satisfactory</th>
<th>Needs Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>100</td>
<td>94</td>
<td>84</td>
<td>1.4</td>
</tr>
<tr>
<td>3.9</td>
<td>99</td>
<td>93</td>
<td>83</td>
<td>1.3</td>
</tr>
<tr>
<td>3.8</td>
<td>98</td>
<td>92</td>
<td>82</td>
<td>1.2</td>
</tr>
<tr>
<td>3.7</td>
<td>97</td>
<td>91</td>
<td>81</td>
<td>1.1</td>
</tr>
<tr>
<td>3.6</td>
<td>96</td>
<td>90</td>
<td>80</td>
<td>1.0</td>
</tr>
<tr>
<td>3.5</td>
<td>95</td>
<td>89</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.9</td>
<td>88</td>
<td>78</td>
<td></td>
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<tr>
<td></td>
<td>2.8</td>
<td>87</td>
<td>77</td>
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<tr>
<td></td>
<td>2.7</td>
<td>86</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.5</td>
<td>85</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

8. A portfolio that gets a grade lower than 2.5 is given an option to resubmit but the highest grade on the resubmission is on a grade equivalent to very satisfactory.
This Chapter is included to give future implementers of the CP IPPM Program an idea on how to expand the implementation of the program. The CP IPPM curriculum does not have to be part of the Technology and Livelihood Education (TLE) or Makabayan only. It can also be integrated in other subject areas as shown in the sample matrix in Science. Sample plans in Science and Math were also included to concretize how the integration could be done without sacrificing the objectives of the subject area.
Sample Lesson Plan Integrating CP IPPM Curriculum in Mathematics Grade Five

(Estimated time: 2-3 days)

Prepared by
MARILYN U. BALAGTAS
Faculty, Philippine Normal University

I. Learning Objectives

A. Math Objectives

1. Read and interpret data presented in a line graph
2. Construct a line graph
3. Organize data using a line graph

B. CP IPPM Objectives

1. Describe the rice plant at different phases and stages of its growth and development
2. Give the meaning of Agro-Ecological System Analysis (AESA).
3. Explain the importance of AESA

II. Subject Matter

A. Topic in Math: Line Graph
B. CP IPPM Curriculum Integrated Concepts: Stages in the Growth and Development of a Rice Plant and the Concept of Agro-Ecosystem Analysis (AESA)
C. Value Focus: cooperation and collaborative effort towards accomplishing a given activity and accuracy in measuring and recording data gathered, giving importance to AESA, showing interest towards rice production
E. Materials: charts, weekly AESA Reports for one whole cycle, Manila Paper, markers, crayon

III. Learning Activities

A. Preparatory Activities

Group the students into 4. Instruct each group to make a human sculpture showing a scenario in a rice ecosystem. Give each group 5 to 10 minutes to plan how they will show their present understanding about the concept ecosystem. Then let them freeze and let one member explain what each member in the group represents in their portrayal. Show appreciation to the performance of the students. Inform the students who among them have a correct schema about the things that really exist in the rice ecosystem based on their explanations.
B. Developmental Activities

1. Activity

- Present a line graph showing the age and height of the rice plant at different stages of development.

**Age and Height of A Rice Plant at Different Stages of Development**

2. Analysis

Ask the following questions:

- What kind of graph was shown?
- Why was it called a line graph?
- What are the parts of a line graph?
- What is the line graph all about?
- What part of graph gave you this information I asked for?
- What information is presented along the x-axis?
• So what are the different stages in the growth and development of a rice plant?
• How old is the plant at each stage of its growth and development?
• What information is presented along the y-axis?
• How tall is a rice plant when the 3rd leaf appears?...fifth leaf appears?...before it enters the reproductive stage?...during its milking stage?...when it has reached its final maturation?
• How many days will it take a farmer to wait before harvesting his rice crop?
• How tall is the rice plant when it is ready to harvest?
• If you will make a line graph that provides information just like what was presented in the line graph shown, what should you know first before you could construct it? What should you know next?

3. Abstraction

• What is a line graph?
• What are its parts?
• How is it constructed?
• What are the different stages in growth and development of a rice plant?

C. Application Activities

• Introduce the concept of "agro-ecosystem analysis" or AESA. Explain what this concept means. Then present to the class weekly AESA reports for the whole cycle of rice production so that the students could figure out the things that occur in the rice ecosystem at different stages in the growth and development of a rice plant. (The AESA reports could be a ready-made material produced by the students who participated during the pilot testing of the CP IPPM program. If the material is not available, seek the help of an Agriculturist or any trained teacher by World Education to figure out what information are provided when doing an agro-ecosystem analysis.)
• Group the students into 4 and let each group construct a line graph based on the information presented in all AESA reports. Each group could be given a specific focus for their line graph. The AESA Reports for the whole cycle should be posted on the walls around the room for the students to get the information they need in making their line graph.

  Group 1 ñ prepare a line graph for the average number of tillers per hill for all weekly reports
  Group 2 ñ prepare a line graph for the average number of leaves per tiller for all weekly reports
  Group 3 ñ prepare a line graph for the average size of leaves every week
  Group 4 ñ prepare a line graph for the average height of the plant every week
• Let each group present their work to the whole class. After each group presents, let the other groups ask questions about the graph presented by one group to check if they know how to interpret graphs.

• When all the groups have presented, ask questions to ensure that they have learned some ideas about rice production that were presented in the line graph they constructed. The following questions could be included in the possible questions to ask:
  o Based on the AESA reports, what is done when doing AESA?
  o If you are a farmer, is it necessary to do AESA? Why?
  o What information have you learned from all the line graphs presented to organize all AESA reports?
  o Is doing a line graph necessary? Why?
  o If you will be asked to do AESA for 10 weeks, will you do it? Why?

IV. Evaluation

A. Performance-Based

Rate the students’ line graphs using the holistic rubric below. You can assign corresponding grades for each performance level.

4- Excellent
  The work satisfies all of the following:
  o The line graph has complete information (i.e. it has a title, labels, and legends)
  o All the data in the AESA reports were included in the graph
  o All the data in the AESA reports were presented correctly in the line graph
  o The line graph was neatly prepared

3- Very Satisfactory
  The work satisfies only 3 of the following:
  o The line graph has complete information (i.e. it has a title, labels, and legends)
  o All the data in the AESA reports were included in the graph
  o All the data in the AESA reports were presented correctly in the line graph
  o The line graph was neatly prepared

2- Satisfactory
  The work satisfies only 2 of the following:
  o The line graph has complete information (i.e. it has a title, labels, and legends)
  o All the data in the AESA reports were included in the graph
  o All the data in the AESA reports were presented correctly in the line graph
  o The line graph was neatly prepared
1- Poor
The work satisfies only 1 or none of the following:
- The line graph has complete information (i.e. it has a title, labels, and legends)
- All the data in the AESA reports were included in the graph
- All the data in the AESA reports were presented correctly in the line graph
- The line graph was neatly prepared

B. Objective Pen-and-Paper Test

Choose the best in the line graphs presented and let the students supply the answer to the following questions?
1. What is the graph all about?
2. What is shown along x-axis?
3. What is shown along the y-axis?
4. What week has the lowest value?
5. What week has the highest value?

C. Portfolio Assessment:

Let the students put in their portfolio their most valued output in today’s lesson. Let them log this entry and rationalize its inclusion in their portfolio. You can rate this initial entry based on your portfolio rubric. See sample portfolio rubric in Chapter 5 to know how to rate portfolio entries.

V. Assignment

Let the students make their own graph for any data about rice production in the Philippines or in the world. This can be an additional part of their portfolio entry.
Sample Lesson Plan Integrating CP IPPM Curriculum in Mathematics
First Year High School

(Estimated time: 2-3 days)

Prepared by
Marilyn U. Balagtas
Associate Professor
Philippine Normal University

I. Learning Objectives

A. Math Objectives

1. Review operations on whole numbers
2. Visualize integers and their order on a number line
3. Arrange integers in increasing or decreasing order
4. Use integers to describe positive and negative quantities in real life

B. CP IPPM Objectives

1. Explain the importance of rice to humans, animals, and industries
2. Infer that rice production is a good prospect in improving the economic condition of the Philippines
3. Identify possible problems that can be investigated through a research study
4. Plan a simple research study
5. Gather data to answer research problems
6. Conduct community survey on farming practices
7. Organize data gathered
8. Interpret data gathered
9. Draw conclusions based on the data gathered
10. Suggest recommendations appropriate to the given conclusions

II. Subject Matter

A. Math Topic: Whole Numbers and Integers
B. CP IPPM Integrated Value and Skill: giving importance to rice production as a good prospect in improving the economic condition of our country, teamwork, research skills applied in farming
D. Materials: pictures, charts, survey questionnaires, Manila paper, pen or markers
III. Learning Activities

A. Preparatory Activity

1. Mood Setting: Show the lyrics of the song “Planting Rice.” Let the students sing the song the way they knew it. Then let them rap it for a change.

2. Present pictures showing the following scenarios:
   - Picture 1 showing a bare ricefield
   - Picture 2 showing a man planting rice seedlings at a bare ricefield
   - Picture 3 showing a man harvesting his crop at the ricefield
   - Picture 4 showing an empty stock room
   - Picture 5 showing a woman asking some helpers to take away some sacks of rice grains in her stock room
   - Picture 6 showing a woman asking some helpers to put more sacks of rice grains in her stock room

3. Call on some students to describe each picture.

4. Then ask the following questions:
   - Which pictures show an application of addition?
   - Which pictures show an application of subtraction?
   - What number could represent pictures 1 and 4?

5. Let some students put together pictures that are related.

6. Let the students put ready-made strips with labels of +, -, and 0 opposite the pictures that show applications of these mathematical symbols.

7. Then ask what concept in Mathematics refers to numbers where they can see all these symbols: +, -, and 0.

8. Introduce the concept “integers” if none of your students could give this concept. Then inform the class that their lesson has something to do with integers.

B. Developmental Activities

1. Activity 1
   - Present the table below as your springboard in introducing integers.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cycle</th>
<th>No. of Cavans of Rice Grains Harvested</th>
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<tbody>
<tr>
<td>2001</td>
<td>1st</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>145</td>
</tr>
<tr>
<td>2002</td>
<td>1st</td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>158</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>145</td>
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<tr>
<td>2003</td>
<td>1st</td>
<td>130</td>
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<tr>
<td></td>
<td>2nd</td>
<td>143</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>135</td>
</tr>
<tr>
<td>2004</td>
<td>1st</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>175</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>185</td>
</tr>
</tbody>
</table>
2. Analysis 1

- What was the information in the table all about?
- What is the work of Mang Pedro?
- How many cavans of rice grains was he able to harvest in year 2001? 2002? 2003? 2004?
- What mathematical operations will you use to compute the average number of cavans of rice grain harvested by Mang Pedro every cycle?
- What is the average number of cavans of rice grains that he was able to harvest per cycle in year 2001? 2002? 2003? 2004? in four years?
- Is Mang Pedro’s work a good source of living? Why?
- Is Mang Pedro an intelligent farmer? Why?
- If you are Mang Pedro, will you also till your ricefield and plant rice? Why?
- How important is rice to humans? Animals? Industries?
- Is rice production a good prospect in improving the economic condition of the Philippines? How?
- So what should we do to promote farming as a source of living?

3. Activity 2

- Introduce the idea of integers. Let the average number of cavans per year represent zero in the number line. Illustrate how to represent those whole numbers in the table above in a number line. Show this illustration on the board or prepare this in a chart then explain what integers are and how to use the number line in representing them.

```
+-------+-------+-------+-------+-------+-------+-------+
|       |       |       |       |       |       |       |
|       |       |       |       |       |       |       |
| -3    | -2    | -1    | 0     | 1     | 2     | 3     |
| 125   | 130   | 135   | 140   | 145   | 150   | 155   |
| harvest in the 2nd cycle | harvest in the 1st cycle | harvest in the 3rd cycle |
| average harvest in year 2001 |
```

- Group the students into three and ask each group to represent in a number line with positive and negative numbers just like the example you set, the number of cavans of rice grains harvested by Mang Pedro from year 2002-2004. Let each group work on just one year. Let them prepare their work in Manila papers and present their work to the class.

4. Analysis 2

Ask the following questions after the group presentations.

- What are integers?
- How do they appear in a number line?
- What did you use in the table showing the harvest of Mang Pedro to represent zero integer in a number line?
What are the positive integers among the data shown in the table? Why are they positive integers?
What are the negative integers among the data shown in the table? Why are they negative integers?
How will you arrange the given integers in ascending order? in descending order?

5. Abstraction
- What are integers?
- How are they represented on a number line?
- How are integers applied in rice production?
- What other situations can you see applications of the concept of integers?

C. Application Activities (This part of the lesson is ideal for one day session)

1. Group the students into 5. Let each group prepare a simple survey form to know some information about rice production in their community. Let them construct their own questions for investigation. Let them assign the roles of each member in the groupwork. Instruct them to formulate questions on the following needed information.
   a. Number of farmers in every family
   b. Area of the land cultivated for rice production
   c. Estimated expenses per cropping season
   d. Estimated expenses for fertilizers per cropping season
   e. Estimated cavans of rice that they get every harvest time
   f. Estimated gross income per cropping season
   g. Other concerns in rice production that the students are interested to know

2. Check their survey form before they conduct a survey (You can use the performance rubric that follows in checking this part of the work and the other aspects of this activity).

3. Assign each group a community to survey. Let them interview just 3 families of farmers.

4. Then instruct them to organize their data in a tabular form.

5. Then let them transform their data using positive and negative integers and show them in a number line.

6. Let them know that they should be ready to report their survey results.

7. Show your scoring rubric in this task. It is better if you give them a copy of the rubric (see the performance rubric in the evaluation part) before they begin doing the task.

8. You can let the students do the survey and prepare their report for one day. Arrange their schedule in their other classes so that they will have enough time to do this work.

9. Let them present their work the following day.

10. After the presentations, you can follow-up students understanding of the group presentations by asking the following questions:
    - Did you enjoy doing a community survey? Why?
    - How did your group work?
    - Was there anyone in the group who did not work or perform his role? Why is that so? What should be done by him/her? (It would be better of the last question is directly asked to the person concerned).
    - Who among your groupmates you like working with? Why?
Did you enjoy talking to the farmers? Why?
What were your most common questions in your community survey?
What were the answers to these questions you asked?
How did you organize the data you gathered?
What conclusions can you draw from these data you got?
What recommendations would you like to give to the farmers in your community based on the data you gathered from your community survey?
What are the other questions raised by a certain group, which are interesting to know?
What information did you learn from the presentation of the group of the data they gathered with regard to this question?
If you are a farmer, how will you utilize this information you got from your survey?
What other questions should you have asked if you were given more time to talk to the farmers?
Is doing a community survey necessary? Why?

IV. Evaluation

A. Performance-Based Assessment

Rate the students' performance in doing the community survey and their actual presentation of their survey results representing them using positive and negative integers. You may use or modify the rubric below in rating their actual performance.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Performance Levels</th>
<th>Evaluation Rating</th>
<th>Ave</th>
<th>Weight</th>
<th>Wgt %</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Quantity of Questions Formulated in the Survey Form</td>
<td>Has more than 6 questions</td>
<td></td>
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<td></td>
<td>15</td>
<td></td>
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<tr>
<td></td>
<td>Has exactly 6 questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Has only 3-5 questions</td>
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<tr>
<td></td>
<td>Has only 2 or less number of questions</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>2. Organization of the data gathered in the table</td>
<td>All the data are well organized in a table</td>
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<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data of one of the required questions were not presented in tabular form</td>
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<td></td>
<td>Data of 2-3 of the required questions were not presented in tabular form</td>
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</tr>
<tr>
<td></td>
<td>Data of 4 or more of the required questions were not tabulated</td>
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</tr>
<tr>
<td>3. Correctness of the line graphs showing the data gathered represented by integers</td>
<td>All the line graphs were drawn correctly</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>One line graph was incorrectly drawn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Two-three line graphs were incorrectly drawn</td>
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<tr>
<td></td>
<td>4 or more line graphs were incorrectly drawn</td>
<td></td>
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</tr>
<tr>
<td>4. Effectiveness of their Oral Presentation</td>
<td>Satisfies all of the following; - explanations are clear - voice is clear - captivates audience attention</td>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Satisfies only 2 of the following; - explanations are clear - voice is clear - captivates audience attention</td>
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<td></td>
<td>Satisfies only 1 of the following; - explanations are clear - voice is clear - captivates audience attention</td>
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</tr>
<tr>
<td></td>
<td>Satisfies none of the following; - explanations are clear - voice is clear - captivates audience attention</td>
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<td></td>
</tr>
<tr>
<td>Final Grade</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
B. Objective Pen-and-Paper Test

Refer to the table below in answering the items that follow.

**Mang Pedro’s Net Income in Rice Production in 2004 from a Hectare Ricefield**

<table>
<thead>
<tr>
<th>Cycle</th>
<th>Net Income in Pesos Using Integers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>+ PhP 10 000 of the net</td>
</tr>
<tr>
<td>2nd</td>
<td>- PhP 15 000 of the net</td>
</tr>
<tr>
<td>3rd</td>
<td>+ PhP 5 000 of the net</td>
</tr>
</tbody>
</table>

(Note: Mang Pedro’s average net income per cycle is PhP 40 000.00)

1. What amount is equal to the zero integer?
2. What amount represents a negative integer?
3-4 What amounts represent the positive integers?
5. How will you arrange the net income for the three cycles in ascending order?

C. Portfolio Assessment:

- Let the students put in their portfolio their most significant output from the day’s lesson and let them reflect on the importance of this portfolio entry and on their performance when they worked on this entry.
- Develop a rubric in rating this work (See sample rubric in rating portfolio entries). The scoring rubric should be given to the students before the actual portfolio development and assessment.
- The rubric could focus on the students’ reflections and the display of their entries.
- The reflections could be rated by considering criteria such as: relevance of the entry, accuracy of the content, creativity of the ideas, grammar and punctuations, openness in one’s feelings, objectiveness of self-evaluation, etc.
- The entry could be rated in terms of its visual appeal, which could be rated using criteria such as: creativity in the layout, attractiveness, quality or resourcefulness in the materials used, neatness, etc.
- The portfolio entry could be rated separately from previous or future entries or could be rated as one together with other portfolio entries when submitted finally at the end of the portfolio development.

V. Assignment

Let the students get data pertaining to rice production in the Philippines or in the world from newspapers or any reference materials. Let them present the information in the form of a number line with negative and positive integers. The work of the students could be a review activity for the next day or could be a part of the portfolio entry of the students.
### INTEGRATION MATRIX FOR CP IPPM IN SCIENCE

<table>
<thead>
<tr>
<th>Topics/Sub-topics</th>
<th>Grade 5</th>
<th>Grade 6</th>
<th>First Year</th>
<th>Second Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple Scientific Researches in the CP IPPM Program The Research Process</td>
<td>*Conduct a research survey to determine the farming practices in the community</td>
<td>*Enumerate ways of gathering data to answer research problems</td>
<td>*Formulate questions for investigation</td>
<td>*Explain the importance of conducting research in the CP IPPM Program</td>
</tr>
<tr>
<td></td>
<td>Identify some harmful farming practices in the community</td>
<td>*Conduct a research survey to determine the farming practices in the community</td>
<td>Discuss the importance of scientific values in decision making and problem solving in daily life</td>
<td>Identify the unifying ideas in biology vis-à-vis the importance of conducting research in the CP IPPM Program</td>
</tr>
<tr>
<td></td>
<td>Infer that some common ailments of the reproductive and respiratory systems are caused by some harmful farming practices</td>
<td>Infer that some common ailments of the circulatory system are caused by some harmful practices</td>
<td>Identify the desirable qualities of scientists</td>
<td>Explain each step in the research process</td>
</tr>
<tr>
<td></td>
<td>Describe the causes, symptoms, prevention and treatment of these diseases</td>
<td></td>
<td>Discuss the steps in scientific method: 1. define-problem, hypothesis, experimental design, variables, conclusion, theory and law</td>
<td>Describe the contributions of Filipino and foreign scientists in the development of biology and biotechnology</td>
</tr>
<tr>
<td>Importance of Vegetable Production in the Philippines</td>
<td>*Explain the importance of vegetables to humans, animals and industries</td>
<td>*Analyze the rate of production vis-à-vis the rate of consumption of the population</td>
<td>*Describe the status of vegetable production in the Philippines</td>
<td>*Describe the status of vegetable production in the Philippines</td>
</tr>
<tr>
<td></td>
<td>*Identify provinces that are major producers of vegetables in the Philippines</td>
<td>*Infer that vegetable production is a good prospect in improving the economic condition of the Philippines</td>
<td>*Identify the provinces that are major producers of vegetables in the Philippines</td>
<td>*Explain the importance of vegetables to humans, animals and industries</td>
</tr>
<tr>
<td></td>
<td>Identify plant/plant parts used for food, medicine etc.</td>
<td>Describe</td>
<td>Use diagrams/charts/graphs in the presentation of set of data</td>
<td>Be aware of the similarities and differences of ecosystems</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interpret data in a table or graph</td>
<td></td>
</tr>
<tr>
<td>Topics/Sub-topics</td>
<td>Grade 5</td>
<td>Grade 6</td>
<td>First Year</td>
<td>Second Year</td>
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<td>--------------------------------------</td>
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<td>----------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Soil System</td>
<td>* Identify the components of soil</td>
<td>* Practice precautionary measures when conducting experiments on soil properties</td>
<td>* Perform experiments in determining soil properties, e.g. soil texture, soil composition, water holding capacity, fertilizer requirement</td>
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</tr>
<tr>
<td>Types of Soil</td>
<td>* Name the different types of soil</td>
<td>* Observe safety precautions in handling, storing and disposing certain materials</td>
<td>* Explain and follow the procedures in determining soil properties</td>
<td>* Describe soil type that is best for vegetable production</td>
</tr>
<tr>
<td>Properties of Soil</td>
<td>* Describe the different types of soil according to color, texture, structure, composition and water holding capacity</td>
<td>* Explain that technology improves materials</td>
<td>* Make specific observations on particular events</td>
<td>* Suggest ways to improve the condition of soil for better vegetable production</td>
</tr>
<tr>
<td></td>
<td>* Explain the importance of knowing the soil qualities in vegetable production</td>
<td></td>
<td>* Differentiate between qualitative and quantitative data</td>
<td>Design simple experiments following the scientific method</td>
</tr>
<tr>
<td></td>
<td>Describe how soil is formed through weathering</td>
<td></td>
<td>* Enumerate some apparatus, their uses and safety precautions in the laboratory</td>
<td>Name the special tools in research and technology</td>
</tr>
<tr>
<td></td>
<td>Identify the variables in the experiment using the different kinds of soil</td>
<td></td>
<td>* Use measuring instruments with precision and accuracy</td>
<td></td>
</tr>
</tbody>
</table>
Sample Lesson Plan Integrating CP IPPM Curriculum in Science

Prepared by

JOSEPHINE M. CALAMLAM

1. I. Objectives
   A. Identify the main parts of a monocot seed
   B. Perform an experiment on seed germination
   C. Identify the factors affecting rice seed germination
   D. Maintain a record showing the observations done during the experiment

II. Subject Matter
   A. CP-IPPM Content: Morphology of the Rice-Plant Seed Soaking
   B. Science Skills: Formulating Problem, Generating Hypotheses, Identifying and
      Controlling Variables, Gathering and Interpreting Data, Making Conclusions
   C. References: CP IPPM Resource Book, 2002 BEC Handbook in Science and
      Health (Elementary Level), 2002 BEC Handbook in Science (Secondary
      Level)
   D. Value Focus: Cooperation among group members, Desirable scientific
      attitude
   E. Materials: rice seeds that have been soaked for 24 hours, illustration of
      examples of monocot seeds and their parts, laboratory thermometer, materials
      used for soaking seeds such as sack, string and water

2. III. Procedure
   A. Preparatory Activities

      Show different examples of monocot seeds such as rice seed, coconut and corn.
      Let them examine the seeds closely. Tell them that the seeds are called monocot
      seeds. Show an illustration of these seeds where the different parts are identified.
      Ask:
      • What are the different parts of a monocot seed?
      • What do you think is the function of each part?

   B. Formulating Problems

      Group the class into smaller groups. Tell them that they will be doing
      group thinking by formulating questions about the two cups of rice seeds which
      they will observe.

      Show two cups of rice seeds: Cup A with filled seeds and Cup B with
      unfilled seeds. Ask the class what is inside the seeds. They will discover that
      seeds in Cup B are unfilled. From this activity, guide the class to raise questions
      which they will try to answer in the succeeding activities. List the questions
      raised by the students.
Questions that may probably be raised.

- What are the characteristics of a good seed?
- Why are some seeds filled and some are unfilled?
- How can we prepare good rice seeds for planting?
- What are some of the things we can do to prepare good rice seeds for planting?
- What are the conditions or factors that affect seed germination?

Help students to develop their skills in looking at problems from several perspectives by encouraging them to ask themselves questions such as:

- How can I approach this problem?
- In what way is this problem similar to other problems I have solved?
- What are the pieces of information I have that I can use to solve this problem?

C. Generating Hypotheses

Guide students to formulate hypotheses based from the questions that have been raised. Let each group list their hypotheses so that they can go back to them when they formulate their conclusions.

D. Gathering Data

Discuss what seeds need to be able to germinate. Embryo growth depends on temperature and the availability of water and air. With this input or information, lead the class to design their own experiment making temperature and water level as experimental variables. Let them also identify the controlled variables such as the kind and amount of seed, and sacks. Let them divide the seeds equally into four small sacks. Or they may use the soaked rice seeds they used in their CP-IPPM activity. The groups may come up with four set-ups to investigate on the two variables. They should be able to describe each set up clearly. Although this is a group activity, each member should keep his/her own record. The observation record will become an entry in their portfolio.

Since this activity will take 3 days to complete, input information from the CP IPPM materials to enrich their knowledge about seed germination. The class may have in-depth discussion on the different parts of the seed and the importance of these parts.

Allow the class to discuss also the steps involved in soaking seeds. Discuss why this process is important.

Guide the class in designing an observation sheet that may look like the one below. Use the form in recording their observations. Ask them to draw their observations and write the descriptions on the changes they have observed.
### Set Ups

| A. Rice seeds deeply soaked (about 2 feet high) in water |
| B. Rice seeds soaked (about ½ feet) in water |
| C. Rice seeds exposed directly to the sun |
| D. Rice seeds placed under a shady area |

### Observations

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Remarks</th>
</tr>
</thead>
</table>

Ask questions that will direct their attention to the more important aspect of the experiment. Use these questions to encourage group thinking.

**Guide Questions:**

- What happens to the seed during seed soaking?
- Which set ups show seeds that are correctly prepared for sowing? Describe the seeds that are soaked correctly.
- What conditions increase the growth activities of a seed?
- Which set ups show seeds that are soaked in an improper environment? Describe the seeds that are soaked in an improper environment?
- What conditions hamper the growth activities inside the seed?
- What happens to a seed when it is soaked deeply in water?
- What happens to a seed when it is exposed to very high temperature?
- What conditions are favorable to increase the growth activities inside the seed?

The students should be able to learn from the experiment the following concepts and principles:

- Embryo growth depends on temperature and availability of air and water.
- Uptake of water is the first need of the germination process.
- If the germinated seeds are covered deeply in water, embryos will grow slowly, resulting in tall, weak shoots. Embryos will die in some cases if the water is too deep.
• Warm temperature is needed to increase the activities inside the seed and thus enhance growth. Incubation keeps the seeds warm, increase the growth of the embryo and results in uniform germination. If the temperature is too high (40°C), germination rate decreases and may even kill the germinated seeds. Low temperature (10°C) decreases activities inside the seeds. So, an adequate temperature is needed.
• Germinating seeds need air to live. An adequate aeration is needed during incubation.

E. Verifying the Hypotheses

Go back to the questions and hypotheses given by the students. The class should be able to identify which of these hypotheses can be accepted or rejected based from the results of their experiment. Let students justify their answers.

F. Making Conclusions

Lead the groups to formulate their own conclusions based from the results of the experiment.

G. Application:

Arrange an observation tour to an IPPM farm. Let the children observe how farmers soak seeds for planting. The children may also ask questions to the farmers. In a journal or reflectionnaire, let students write the insights they have gained from the activity. Make this a part of their portfolio.

The following questions may guide them to expand on what they have learned in the classroom.
• What is the importance of seed soaking on the farmer’s perspective?
• What practices does the farmer do that parallel to what we have learned?
• What practices are not congruent or are different from what we have learned? Do these practices help? Why or why not?
• What are the problems does this farmer encounter in the seed soaking process?
• How can these problems be addressed? What approach can we use?

III. Evaluation

With the use of a rubric, evaluate the performance of the students in their participation in the experiment. The evaluation should include the records of observation and the actual performance of seed soaking.