K to 12 BASIC EDUCATION CURRICULUM

TECHNOLOGY AND LIVELIHOOD EDUCATION

TEACHER'S GUIDE

Exploratory Course on

FOOD (FISH) PROCESSING

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

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Introduction

This Teacher's Guide is intended for you, the TLE teacher, who teaches any of the more than 24 TLE exploratory courses in the Grades 7 and 8 of the K to 12 curriculum. To ensure that you teach the TLE exploratory courses the way they were intended to be taught, you must see the big picture of the K to 12 curriculum and the teaching of TLE. Some background information is necessary.

Background Information

1. **The Overall Goal of the K to 12 Curriculum**
   The K to 12 Curriculum has as its overarching goal *the holistic development of every Filipino learner with 21stcentury skills who is adequately prepared for work, entrepreneurship, middle level skills development and higher education.* The overarching goal of the K to 12 curriculum, tells you that the teaching of TLE plays a very important role in the realization of the overall goal of the curriculum. Whether or not the K to 12 graduate is skilled and ready for work, entrepreneurship and middle skills development depend to a great extent on how effectively you taught TLE.

2. **The Conceptual Framework of the Teaching of TLE**
   Below is a schematic diagram of Technology and Livelihood Education (TLE) framework in general secondary schools. This should guide you in the teaching of the TLE exploratory courses.
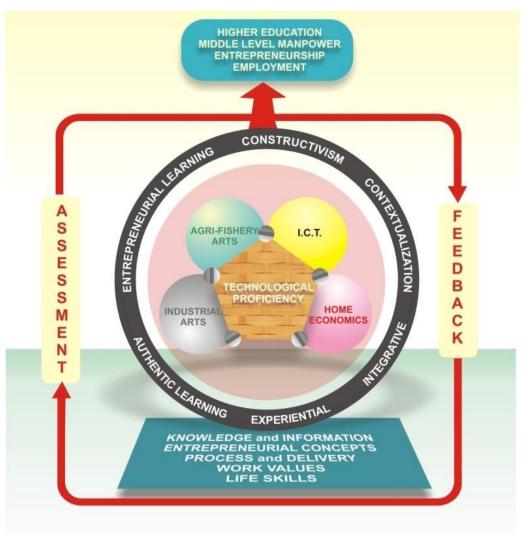
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Figure 1.TLE Framework

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The diagram shows that Technology and Livelihood Education encompasses the field of Home Economics, Industrial Arts, Agri-Fishery Arts and ICT. The 24 TLE courses can be categorized under any of these fields.

TLE is geared towards the development of technological proficiency and is anchored on knowledge and information, entrepreneurial concepts, process and delivery, work values and life skills. K to 12 TLE is one that…

    a. is built on adequate mastery of knowledge and information, skills and processes, acquisition of right work values and life skills;
    b. equips students with skills for lifelong learning; and
    c. is founded on cognitive, behavioral or psychomotor and affective dimensions of human development.

The diagram likewise shows that entrepreneurial concepts also form part of the foundation of quality TLE. It is expected that your TLE students, after using the Learning Module on Entrepreneurship, imbibe the entrepreneurial spirit and consequently set up their own businesses in the areas of Agri-Fishery Arts, Industrial Arts, Home Economics, and Information and Communication Technology.

TLE by its nature is dominantly a skill subject and so you must engage your students in an experiential, contextualized, and authentic teaching-learning process. It is a subject where your students learn best by doing. It is integrative in approach. For instance, it integrates entrepreneurship with all the areas of TLE. It integrates concepts, skills and values.

3. The TLE Exploratory Courses

TLE in Grades 7 and 8 are exploratory in nature. Your school will choose at least 4 from the list of 24 courses for which 23 Learning Modules have been prepared.[1]Your school's choice is determined by the availability of its resources (faculty and facilities) as well as the local needs and resources of the community.

The 24 TLE exploratory courses focus on four basic common competencies: 1) use and maintenance of tools and equipment; 2) mensuration and calculation; 3) occupational health and safety procedures, and 4) preparation and interpretation of technical drawing. Why are these competencies described basic? Because they are competencies that students must acquire in order that they can do higher level competencies. They are also described common because these are true to all TR-based TLE courses.

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[1] There are 24 TLE courses but there are only 23 Learning Modules because there is only one Learning Module for Tailoring and Dressmaking.

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4. Time allotment for Technology and Livelihood Education is four hours per week.

The Learning Modules and Lessons

There is a Learning Module for each exploratory course. If there are 24 exploratory courses then you have 24 Learning Modules in your hands. But you will use 4 Modules only for the entire year in Grade 7 and another 4 Modules in Grade 8. In these exploratory courses, you are expected to integrate Income Generating Projects (IGP) to help your students earn while they learn.

Each Learning Module consists of 4 to 5 Lessons[2]. The Lessons are focused on the 4 to 5 common competencies. To avoid meaningless repetition of the teaching of the 5 common competencies, we have to teach them in the context of the TLE course. For example, you teach "use and maintenance of tools" in beauty care when you are teaching the course on Beauty Care. You teach the same competencies - use and maintenance of tools-in Food (Fish) Processing but in the context of Food (Fish) Processing and so your tools will not be entirely the same. Definitely, there are some tools that are common to all the courses.

New Feature on the Teaching of TLE

What's new in the teaching of TLE in the K to 12 curriculum? In the K to 12 curriculum, the TLE courses are taught based on the learning outcomes and performance criteria stated on the Training Regulations (TR) from Technical Education and Skills Development Authority (TESDA). They are TR-based.

Why is this necessary? To prepare the K to 12 graduate for lucrative work, he/she must earn a National Certificate (NC) I, II or even an NC of a higher level that is required by industries. This he/she earns after passing an assessment given by TESDA.

How can you ensure that the K to 12 high school student (Grade 9 to 12) pass TESDA assessment and obtain an NC? By seeing to it that you teach the TLE course in accordance with the performance criteria and learning outcomes laid down in the TESDA Training Regulations.

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[2] Some Learning Modules combined use and maintenance of tools to make one Lesson, so the number of Lessons amount to 4; others made separate Lessons for use of tools and for maintenance of tools, thus the total is 5 Lessons.

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Do the exploratory courses enable the high school student to earn already an NC? Not yet. Completion of the exploratory courses may not yet qualify a high school student to take an assessment for an NC. Instead, it helps him/her earn a Certificate of Competency (COC) at least in Grade 9 that will lead eventually him/her to an NC. In short, the COC paves the way to the earning of an NC.

Student's choice of TLE specialization begins in Grade 9. After having been exposed to an array of TLE courses during the exploratory phase in the first two years, the student will be most benefited, if in Grades 10, 11, or 12 he/she continues with a TLE course in which he/she already has a COC. In that way, he/she will get an NC faster.

About the Learning Module

1. Design of the Module

   a. The Module is designed to be a teacher-assisted learning kit or a self-learning kit on competencies that a Grade 7 TLE ought to possess. It explores the course on Animal Production which helps your student earn a Certificate of Competency in Grade 9 which leads to a National Certificate Level I / II (NCI / II) in Grades 10, 11 or 12.

   b. The Learning Module is made up of 4 to 5 Lessons based on the competencies. Each Lesson contains the following:
      1) Learning Outcomes
      2) Performance Standards
      3) Materials/Resources
      4) Definition of Terms
      5) What Do You Already Know?
      6) What Do You Need to Know?
      7) How Much Have You Learned?
      8) How Do You Apply What You Learned?
      9) What Is Your Score?
      10) References

      There are some TLE Modules which have a section on "How Do You Extend Your Learning?" This section is meant for enrichment. It is usually given as an assignment for not everything can be taught and done in the classroom given the limited time.

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     c.   The **Self-check** given after the pretest and information sheet/s can also serve as the posttest of the lesson.

  2.   Parts of the Lesson. -The following explain the parts of each Lesson and describe what your students'- as well as your tasks are.

Part of the Lesson	Students' Task	Teacher's Task
1. **Learning outcomes** are what your TLE student is supposed to know and be able to do after using the module. Since our TLE courses are TR-based, all learning outcomes are lifted from the TESDA TR. In the Curriculum Guide (the matrix which contains Content Standard, Performance Standard, Learning Competencies, Projects/Activities, Assessment, Duration), the identified Learning Outcomes are written in the column of Learning Competencies.	Students acquaint themselves with the learning outcomes and performance standards and make them their personal goals.	You introduce the learning outcomes to your students and make sure that they understand them and make these learning targets their own. Make these your goals for instruction.
2. **Performance Standards** are referred to as "performance criteria" in the TESDA TR. They are more specific descriptions of the student's behavior that serve as evidence that the expected learning outcomes have been realized with the expected level of proficiency or in accordance with established standards. The learning outcomes and performance standards set the direction of your lessons.	Students clearly understand the performance standards and make them their own learning goals.	You introduce the performance standards to your students and make sure that they understand them and make these performance standards their own. Let these standards give your lesson its specific direction.

These are what you should teach and, in turn, what you should assess. They are identified and are written for you in the Curriculum Guide.		
3. **Materials/Resources and References** To teach effectively, you need **materials** and **references**. Materials may include equipment, hand tools or consumables. The **references** are the books, magazines, articles, websites you yourself and your students will read or refer to in order to gain greater understanding of the lesson. They are either in soft copy or hard copy.	Get to know the materials. They are part of the Lesson. By all means, read the references for lesson mastery.	Prepare the materials you need in advance. For gadget, tool or equipment, it is always wise to prepare, check and try them in advance to ensure that they function when you use them. As the saying goes "forewarned is forearmed." Be resourceful in the preparation of materials. You are strongly encouraged to use appropriate local materials as substitute for listed materials that are not available. For effective teaching, your lesson preparation should include reading the list of references. Do not limit yourself to the list of references. If you discover good reference material/s, add to the list of references. Introduce the references to your students. Motivate them to read these references as they go through the module for mastery of the lesson.
4. The **definition of terms** and **acronyms** will help you understand the meaning of key words in your lesson. Defining key words as they are used in your lesson will	Refer to the definition of terms for greater understanding of the lesson.	Remind your students to refer to the definition of terms and acronyms for clearer understanding of the lesson.

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ensure that the key terms in your lesson mean one and the same for everyone in class and so avoid misunderstanding.		
5. The section **"What Do You Already Know"** is intended to determine entry knowledge and skills of your students to find out if you have to teach the lesson, teach some parts of the lesson or skip it entirely because your students already know it. This is done by way of a pretest.	Take the test honestly. Check answers against the answer key provided.	Tell your students to accomplish the pretest. Ask your students to use a separate sheet of paper for their answers. Explain that the purpose of the pretest is to find out how much they already know about the lesson in order to determine your next steps. It is, therefore, necessary that they take the test honestly, if they want to learn or want to be helped. Make it clear to them that their scores will not be recorded for grading purposes and will not be taken against them. If you find out that your students already know what you are about to teach, logic dictates that you do not need to teach it anymore. You may as well proceed to the next lesson. If, however, you find out that they do not yet know what you are about to teach, then by all means teach. Or if you discover that your students have some erroneous concepts, then teach and correct their misconceptions. To know what your students already know and do not yet know will guide you in adjusting your instruction. This means that you always start your lesson presentation with the results of the pretest

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		because you are going to teach them what they do not yet know and correct whatever wrong concepts they have at the beginning of the lesson.
6. **"What Do You Need To Know?"- This section contains** one or more Information Sheets and for some modules an Operation Sheet. These are important notes for the TLE student to read after which he/she is asked to do a Self-check to determine how much he/she has learned. The self-check functions as a pretest.	Read and understand the Information Sheet/s and /or Operation Sheet. Be prepared For a Self-check which serves as a posttest. Correct answers by referring to the answer key.	Make sure students are engaged in reading the Information Sheet/Observation Sheet and in answering the self-check. Give assistance to your students where needed.
7. **"How Do You Apply What You Learned?"** – In this section, you give your student the opportunity to transfer what he/she has learned in another activity or in real life situation. Ideally, this should be a performance test, what you usually call practical test. If "the proof of the pudding is in the eating", then your student must be able to apply what she/he learned in real-life setting or must be able to come up with a product as an evidence of learning.	Do the Activity. To determine level of performance, use the scoring rubrics or check answers against the answer key, whichever is applicable. Reflect on assessment results.	Find a way to test real life application of what your students have learned. Do not hesitate to use ways of determining how your students can apply learned facts and concepts which are more authentic and realistic than that/those given in the Module. Reflect on assessment results. Use assessment results in planning the next steps for instruction.
8. **How Do You Extend Your Learning?** – As the word implies, this activity is done outside class hours for enrichment purposes. This can reinforce lesson mastery.	Do the task assigned outside class hours.	Motivate the students to do the task by making clear what the enrichment activity is about –why it is given, how it is done, how it relates to the class lesson .

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Reflection

It is a good habit to reflect on your teaching for the day – what went well, what did not go well, why this activity went well with this group, why it didn't work well with the other group. What are your realizations? What are lessons learned? Jot them down in your diary. Commit them to your memory. If you do this consistently, you will find your delivery improve substantially.

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Curriculum Guide for the Exploratory Course on Food (Fish) Processing

For you to get a complete picture of the complete TLE exploratory course on Food (Fish) Processing, you are hereby provided with the Curriculum Guide on Food (Fish) Processing.

Content Standard	Performance Standard	Learning Competencies	Project / Activities	Assessment	Duration
Unit of Competency : USE FOOD PROCESSING TOOLS, EQUIPMENT AND UTENSILS					
• Food(fish) processing tools and equipment/ instruments • Food (fish)processing methods • Faults and defects of tools, equipment and instruments in food (fish) processing equipment • Reporting procedures .	1. Appropriate tools, equipment and utensils are selected according to food (fish) processing methods. 2. Faults and defects of tools, equipment and utensils are explained. 3. Defective tools, equipment and utensils are reported in accordance with farm procedures.	LO1. Select tools, equipment and utensils	1. Demonstrate on calibrating refractometer 2. Demonstrate using salinometer 3. Demonstrate using blender 4. Demonstrate stowing equipment and instruments.	• Written test • Performance test	3 hours
1. Procedures in using the standard measuring devices and instruments • Sanitizing procedures (include topics on sanitizing agents) 2. Calibrating measuring devices and instruments • Using the appropriate	1. Printed procedures/ brochures/ catalogues are consulted and reviewed according to specified food processing methods. 2. Standard procedures in using tools, equipment and instruments are recalled and strictly followed according to manufacturer's specifications 3. Devices and instruments for	LO2. Use tools, equipment and instruments following standard procedures		•	3 hours

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Content Standard	Performance Standard	Learning Competencies	Project / Activities	Assessment	Duration
food(fish) processing tools ,equipment and instruments	measuring are properly checked, sanitized and calibrated prior to use. 4. Tools, equipment and instruments are safely used according to job requirements and manufacturers' specifications.				

• Procedures in cleaning, sanitizing equipment and instruments prior to storage
• Switching off and unplugging food (fish) processing equipment
• Cleaning and sanitizing procedures
• Storing food processing tools, equipment and instruments
• Procedures in minor preventive machine maintenance
• Various condition of machine
   ➤ serviceable
   ➤ repairable
   ➤ defective
	1. Switching off/unplugging procedures of food (fish) processing equipment is described in accordance with manufacturer's specifications.
	2. Food processing tools are cleaned, sanitized and stored as required according to manufacturer's specifications and workplace policies and regulations.
	3. Procedures in cleaning, sanitizing and storing food processing equipment and instruments are described according to manufacturer's specifications and workplace policies and regulations.
	4. Minor preventive maintenance procedures on equipment and instruments are discussed in line with organization's maintenance system.
		LO3.Perform post-operation activities.	1. Perform preventive maintenance of can sealer and pressure cooker.	•	3 hours

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Content Standard	Performance Standard	Learning Competencies	Project / Activities	Assessment	Duration
• Disposal of defective tools, equipment and instruments relating to environmental laws (DENR, LGU, etc.)and waste management procedures	5. Defective tools, equipment and instruments are disposed according to environmental procedures.				
Unit of Competency: PERFORM MATHEMATICAL COMPUTATIONS					
• Weights and measurements ➢ Gravimetric ➢ Volumetric ➢ Lengths, diameter, widths ➢ Seam measurements • Hotness/coldness temperature • Concentrations of solutions *Demonstrate understanding on:*	1. Records of weights and measurements of raw materials and ingredients are gathered and summarized according to workplace standard operating procedure. 2. Records of weights and measurements of finished processed products are gathered and summarized according to workplace standard operating procedures. 3. Summarized data are tabulated according to enterprise requirements.	LO1. Gather and tabulate the recorded data relevant to processed food production.	Present data in textual form	• Written test • Performance test	3 hours
• Basic Mathematical Skills: • Ingredient formulations	1. Raw materials and ingredients and percentage formulations are checked/counter checked according to approved	LO2. Review various formulations.	Exercise or drill on computations of various formulations used for raw ingredients and finished	• Written test • Performance test	3 hours

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Content Standard	Performance Standard	Learning Competencies	Project / Activities	Assessment	Duration
• Percentage formulations • Conversions • Ratios and proportions	specifications and enterprise requirements. 2. Finished products and percentage formulations are reviewed according to approved specifications and enterprise requirements.		products of fish processing.		
• Spoilage and rejects and corresponding percentages • Recoveries and yields and corresponding percentages	1. Data on actual spoilage and rejects and corresponding percentage equivalents are calculated according to enterprise requirements. 2. Data on actual yields and recoveries and corresponding percentage equivalents are calculated according to enterprise requirements. 3. All calculated data are recorded according to enterprise requirements.	LO3.Calculate the production input and output.		• Written test • Performance test	3 hours
Demonstrate understanding on: • Ingredient formulations • Percentage formulations • Conversions	1. Costs of production are computed according to standard procedures 2. Computed costs of production are reviewed and validated according to	LO4.Compute the costs of production.	Prepare paper on costs of production.	• Written test • Performance test	3 hours

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Content Standard	Performance Standard	Learning Competencies	Project / Activities	Assessment	Duration
• Ratios and proportions • Spoilage and rejects and corresponding percentages • Recoveries and rejects and corresponding percentages • Simple record keeping	enterprise production requirements.				
Unit of Competency: INTERPRET PLANS AND DRAWINGS					
Demonstrate understanding on: • • Fish processing activities • Lay-out plan of fish processing area • Signs and symbols in lay-out plan and processing area	1. Lay –out plans of fish processing area are interpreted based on set standards. 2. Signs and symbols are translated according to established standards.	LO1. Interpret lay-out plan.	Project on flow chart in manufacturing smoked bangus.	• Written test • Performance test	3 hours
• Different packaging for fish products • Designing packaging materials • Proper labeling (signs, symbols, content, ingredients, etc.)	1. Fish products are packaged according to requirements and packaging standard procedures. 2. Packaged fish products are labeled according to quality control standards	LO2. Perform outer packaging procedures.	Make a label for canned fishery product	• Written test • Performance test	3 hours
Unit of Competency: APPLY FOOD SAFETY AND SANITATION					

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Content Standard	Performance Standard	Learning Competencies	Project / Activities	Assessment	Duration
- GMP Requirements on Personal Hygiene - Personal protective equipment - Parts and functions of personal protective equipment - Workplace health and safety requirements - Good grooming and personal hygiene (ex. Washing of hands,etc.) - Sanitizing PPE	1. Personal hygiene and good grooming is practiced in line with workplace health and safety requirements. 2. Personal protective equipment is cleaned, checked and sanitized.	LO1.Observe personal hygiene and good grooming.	Perform the operation sheet on Hand Washing Techniques As A Means Of Practicing Hygiene And Good Grooming	- Written test - Performance test	3 hour
- Safety measures and practices - First aid procedures - ood safety principles and practices - Good food manufacturing practices - TQM and other food quality system principles - Codes and regulations	1. Sanitary practices in food safety are implemented in line with workplace safety regulations. 2. Cleanliness and sanitation should be strictly observed. 3. Safety measures are applied according to workplace rules and regulations. 4. First aid procedures are applied and coordinated with concerned personnel according to workplace standard operating procedures.	LO2. Implement food safety practices.		- Written test - Performance test	3 hours

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Content Standard	Performance Standard	Learning Competencies	Project / Activities	Assessment	Duration
• HACCP, • Proper waste disposal • Environmental protection and concerns • Monitoring practices • Record keeeping procedures •	1. Food safety hazards must have and implemented HACCP plan. 2. Monitoring procedures are strictly followed. 3. Record keeping systems to document monitoring and corrective actions are developed.	LO3. Conduct work in accordance with environmental policies and procedures	Demonstrate different ways of disposing liquid wastes	•	3 hours
• Environmental hazards • Procedures used to prevent or control environmental risks • Mitigation procedures • Disaster preparedness • Basic concepts of hazard identification risk assessment and control options. • Identifying and responding to hazards • Investigating incidents and improving environmental management and resource utilization • Impact of work practices on resource utilization and wastage	1. Preparedness and mitigation activities. 2. Response activities during a chemical spill. 3. Rehabilitation activity after a chemical spill.	LO4. Participate in improving environmental practices at work.	Conduct a drill on what to do in an accidental chemical spill in a food processing plant	•	4 hours

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Content Standard	Performance Standard	Learning Competencies	Project / Activities	Assessment	Duration
• Handling requirements for hazardous waste • Procedures for responding to unplanned incidents such as spills and leaks as relevant to the work area • Rehabilitation procedures					
					40 Hours