



Republic of the Philippines
DEPARTMENT OF EDUCATION



K to 12 BASIC EDUCATION CURRICULUM

TECHNOLOGY AND LIVELIHOOD EDUCATION

TEACHER'S GUIDE

Exploratory Course on

SHIELDED METAL ARC WELDING

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION
INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)

TABLE OF CONTENTS

Introduction.....	3
Background Information	
The Overall Goal of the K to 12 Curriculum	3
The Conceptual Framework of the Teaching of TLE.....	3
The TLE Exploratory Courses	5
The Learning Modules and Lessons	6
New Feature of the Teaching of TLE	6
About the Learning Module	
Design of the Module.....	7
Parts of the Lesson	8
Reflection	11
Curriculum Guide.....	12

**INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)**

Teacher’s Guide for TLE Exploratory Course on SHIELDED METAL ARC WELDING

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 21st century skills who is adequately prepared for work, entrepreneurship, middle level skills development and higher education*. The over arching 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.

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION
**INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)**

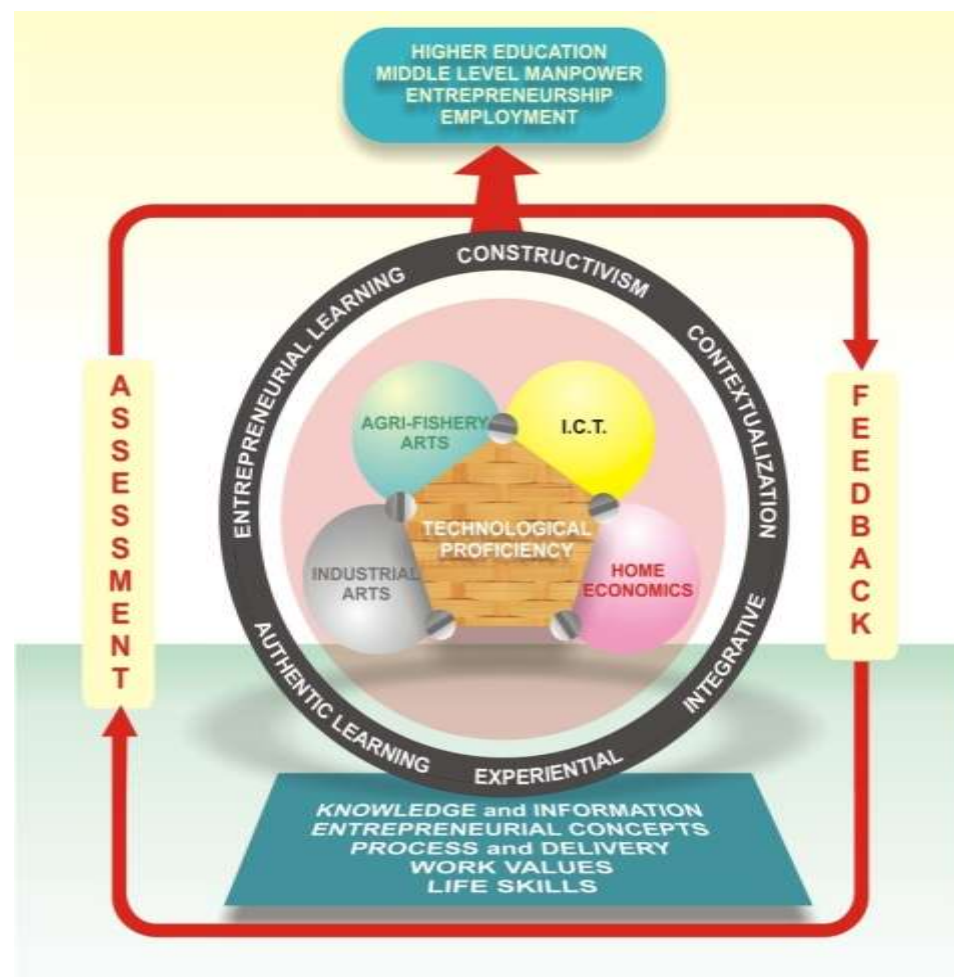


Figure 1.TLE Framework

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.

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING (Exploratory)

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...

- a. one that is built on adequate mastery of knowledge and information, skills and processes, acquisition of right work values and life skills;
- b. one that equip students with skills for lifelong learning; and
- c. one that 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. ¹Your 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 called basic? Because they are competencies that you must acquire in order that you can do higher level competencies. They are also described common because these are true to all TR-based TLE courses.

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

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING (Exploratory)

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 (plus a fifth one on Entrepreneurship) and another 4 Modules in Grade 8 (plus a fifth one on Entrepreneurship).

Each Learning Module consists of 4 to 5 Lessons². The Lessons are focused on the 4 to 5 basic competencies. To avoid meaningless repetition of the teaching of the 5 common competencies, you 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 Horticulture but in the context of Horticulture and so your tools will not be entirely the same.

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 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.

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.

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.

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING (Exploratory)

Student's choice of TLE specialization begins in Grades 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 Aquaculture 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 a limited time.

- c. The **Self-check** can also serve as the posttest of the lesson.

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

**INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)**

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
<p>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.</p>	<p>Students acquaint themselves with the learning outcomes and performance standards and make them their personal goals.</p>	<p>You introduce the learning outcomes to your students and make sure that they understand them and make these learning targets their own.</p> <p>Make these your goals for instruction.</p>
<p>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.</p> <p>The learning outcomes and performance standards set the direction of your lessons. These are what you should teach and, in turn, what you should assess. They are identified and are written for you in the</p>	<p>Students clearly understand the performance standards and make them their own learning goals.</p>	<p>You introduce the performance standards to your students and make sure that they understand them and make these performance standards their own.</p> <p>Let these standards give your lesson its specific direction.</p>

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

**INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)**

Curriculum Guide.		
<p>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.</p>	<p>Get to know the materials. They are part of the Lesson.</p> <p>By all means, read the references for lesson mastery.</p>	<p>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.”</p> <p>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.</p> <p>For effective teaching, your lesson preparation should include reading the list of references.</p> <p>Do not limit yourself to the list of references. If you discover good reference material/s, add to the list of references.</p> <p>Introduce the references to your students. Motivate them to read these references as they go through the module for mastery of the lesson.</p>
<p>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 ensure that the key terms in your lesson mean one and the same for everyone in class and so avoid misunderstanding.</p>	<p>Refer to the definition of terms for greater understanding of the lesson.</p>	<p>Remind your students to refer to the definition of terms and acronyms for clearer understanding of the lesson.</p>

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

**INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)**

<p>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.</p>	<p>Take the test honestly.</p> <p>Check answers against the answer key provided.</p>	<p>Tell your students to accomplish the pretest. 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.</p> <p>Make it clear to them that their scores will not be recorded for grading purposes and will not be taken against them.</p> <p>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.</p>
<p>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.</p>	<p>Read and understand the Information Sheet/s and /or Operation Sheet.</p> <p>Be prepared For a Self-check which serves as a posttest.</p> <p>Correct answers by referring to the answer key.</p>	<p>Make sure students are engaged in reading the Information Sheet/Observation Sheet and in answering the self-check.</p> <p>Give assistance to your students where needed.</p>

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

**INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)**

The self-check functions as a pretest.		
<p>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.</p>	<p>Do the Activity.</p> <p>To determine level of performance, use the scoring rubrics or check answers against the answer key, which ever is applicable.</p> <p>Reflect on assessment results.</p>	<p>Find a way to test real life application of what your students have learned.</p> <p>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.</p> <p>Reflect on assessment results. Use assessment results in planning your instruction.</p>
<p>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.</p>	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 .

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.

Curriculum Guide for the Exploratory Course on SHIELDED METAL ARC WELDING

For you to get a complete picture of the complete TLE exploratory course on Computer Hardware Servicing, you are hereby provided with the Curriculum Guide on Computer Hardware Servicing.

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

**INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)**

Content Standard	Performance Standard	Learning Competencies	Project/ Activities	Assessment	Duration
LESSON 1: USE BASIC HAND TOOLS AND EQUIPMENT					
<p><i>Demonstrate understanding of/on:</i></p> <ul style="list-style-type: none"> • Hand tools and their uses • Defective and non-defective hand tools 	<ol style="list-style-type: none"> 1. Hand tools selected are appropriate to the requirements of the task. 2. Unsafe or defective tools are identified and marked for repair according to procedure. 	LO1. Select and classify hand tools and equipment		<ul style="list-style-type: none"> • Written exam • Performance test 	6 hours
<ul style="list-style-type: none"> • Performing tasks <ul style="list-style-type: none"> ○ Adjusting ○ Dismantling ○ Assembling ○ Finishing of item or components • Procedure on using different hand tools and equipment 	<ol style="list-style-type: none"> 1. Task is performed in accordance with company or industry safety procedure. 	LO2. Use hand tools and equipment	<ol style="list-style-type: none"> 1. Students demonstration on the proper use and care of tools 	<ul style="list-style-type: none"> • Written Exam 	
<ul style="list-style-type: none"> • Routine maintenance <ul style="list-style-type: none"> ○ Lubricating ○ Tightening ○ Repairing simple tool ○ Hand sharpening ○ Cleaning • Proper storage of hand tools equipment 	<ol style="list-style-type: none"> 1. Routine maintenance of hand tools is undertaken according to standard operating procedures, principles and techniques. 2. Hand tools are stored in designated location in accordance with manufacturer's instruction/standard operating procedure. 	LO3. Maintain hand tools.		<ul style="list-style-type: none"> • Written Exam 	

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

**INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)**

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LESSON 2: PERFORM MENSURATION AND CALCULATION					
<i>Demonstrate understanding of/on:</i>					
<ul style="list-style-type: none"> • Fundamental Operations <ul style="list-style-type: none"> ○ Subtraction ○ Addition ○ Multiplication ○ Division 	1. Simple calculations involving whole numbers, mixed numbers, fraction and decimal are performed using the four fundamental operations.	LO1. Perform four fundamental operations.	1. Computation involving the four fundamental operations (2-3 digits)	<ul style="list-style-type: none"> • Written/oral • Performance test 	
<ul style="list-style-type: none"> • Conversion of English to metric (vice versa) <ul style="list-style-type: none"> ○ English and metric system of measurements • Measurement Systems • Unit conversion 	1. Units are converted to the required figure using the given formulae. 2. English measurements are converted to metric measurements according to procedure.	LO2. Convert English Unit of measurement to Metric System		<ul style="list-style-type: none"> • Written Exam 	
<ul style="list-style-type: none"> • Ratio and proportion • Area and volume 	1. Percentages are computed using appropriate formula. 2. Precise and accurate formulas for computing area needed in metal trade are used.	LO3. Perform basic ration and proportion area and volume calculations		<ul style="list-style-type: none"> • Written Exam 	
LESSON 3: APPLY SAFETY PRACTICES					
<i>Demonstrate understanding of/on:</i>					
<ul style="list-style-type: none"> • Identifying hazard to be 	1. Hazards are identified correctly	LO1. Identify hazardous		<ul style="list-style-type: none"> • Written exam 	6 hours

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

**INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)**

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<ul style="list-style-type: none"> avoided in welding safety signs and symbols types of hazards occupational safety and health standards 	<ul style="list-style-type: none"> in accordance with OHS(occupational health and safety) procedures. 2. Safety signs and symbols are identified and adhered to in accordance with workplace safety procedure. 	area.			
<ul style="list-style-type: none"> Using personal protective equipment (PPE) and its proper uses 	<ul style="list-style-type: none"> 1. Personal protective clothing/equipment (PPE) as per job requirements are identified. 2. Proper wearing of PPE is properly observed in accordance with workplace safety policies. 	LO2. Use personal protective clothing and devices.		<ul style="list-style-type: none"> Written exam 	
<ul style="list-style-type: none"> Pre-use inspection and checking procedures 	<ul style="list-style-type: none"> 1. Safe handling of tools, equipment and materials is properly observed in accordance with OHS requirements and industry/ company policies. 2. Safety label and tag of tools and equipment are strictly followed. 	LO3. Identify safety and health requirements and policy	<ul style="list-style-type: none"> 1. Proper use and care of power tools 	<ul style="list-style-type: none"> Written exam 	
LESSON 4: INTERPRETING PLANS AND DRAWINGS					
<i>Demonstrate understanding of/on:</i> <ul style="list-style-type: none"> Alphabet of lines 	<ul style="list-style-type: none"> 1. Alphabet of lines are identified according to ISO(International Standard Organization). 	LO1. Identify standard alphabet of lines.		<ul style="list-style-type: none"> Written Exam Performance test 	6 hours
<ul style="list-style-type: none"> Supplementary symbols 	<ul style="list-style-type: none"> 1. Welding joints and symbols are 	LO2. Interpret standard		<ul style="list-style-type: none"> Written Exam 	

K to 12 TECHNOLOGY AND LIVELIHOOD EDUCATION

**INDUSTRIAL ARTS – SHIELDED METAL ARC WELDING
(Exploratory)**

Content Standard	Performance Standard	Learning Competencies	Project/ Activities	Assessment	Duration
	interpreted according to drawing standard	drawing symbols.			

“By three methods we may learn wisdom: First, by reflection, which is noblest; second, by imitation, which is easiest; and third by experience, which is the bitterest.”

- Confucius