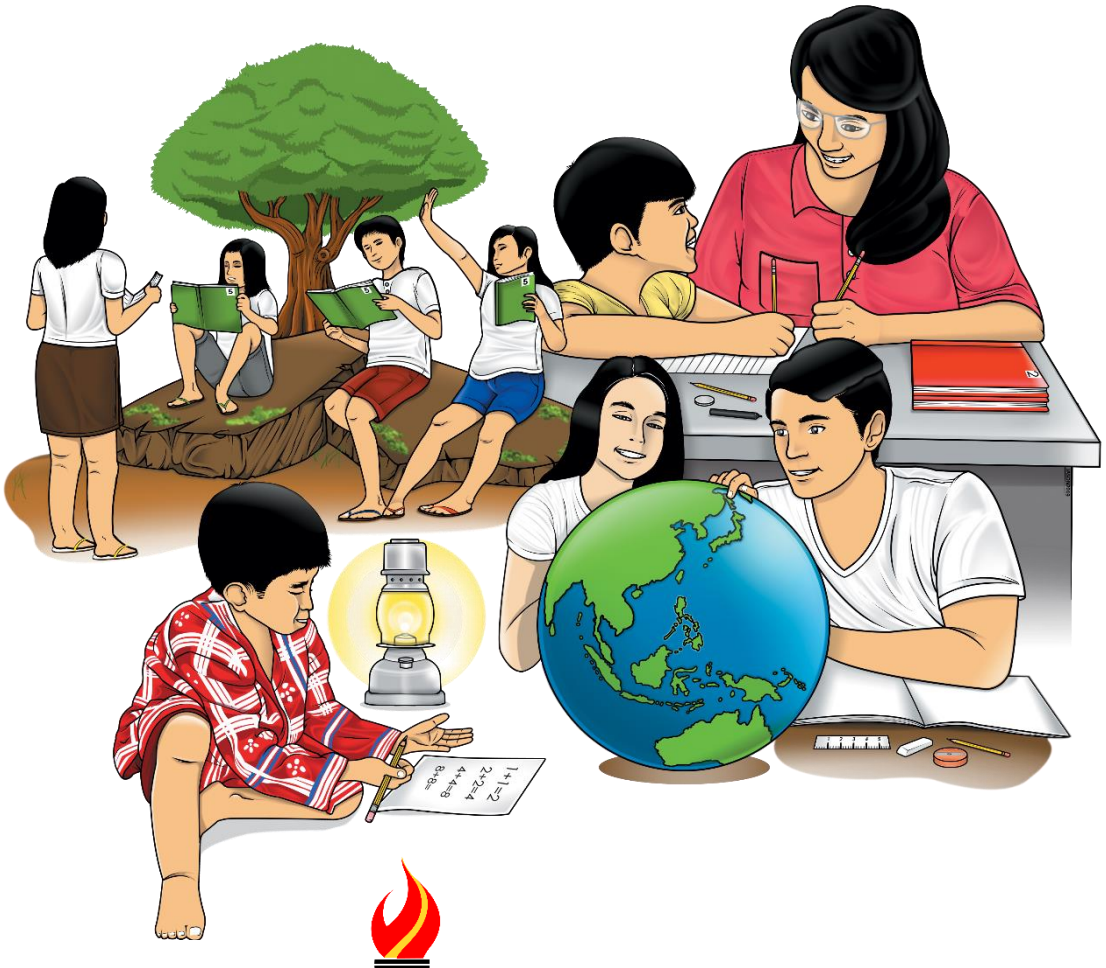
7/8

DepED
DEPARTMENT OF EDUCATION

Technology and Livelihood Education

Quarter 1 – Module 1: Applying Quality Standards (AQS)



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ADM

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Quarter 0 – Module 1: Applying Quality Standards (AQS)
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Introductory Message

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

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

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

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

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

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

Thank you.

What I Need to Know

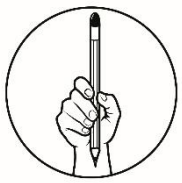
This module was designed and written with you in mind. It is here to help you master the (Exploratory of Electronic Products Assembly and Servicing). The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

This module consists of one learning outcome:

- LO1 – Assess quality of received materials or components
  (Code: TLE_IAEPAS9-12AQS-Ia-1)

After going through this module, you are expected to:

1. obtain work instructions in accordance with standard operations;
2. carry out work in accordance with standard operation procedure;
3. check received materials or component parts against workplace standards and specifications;
4. isolate faults and faulty materials to the supervisors concerned in accordance with workplace procedure;
5. record and/or report faults and faulty materials to the supervisor concerned in accordance with workplace procedure; and
6. replace faulty materials and components in accordance with workplace procedures.



What I Know

Directions: Read and choose the letter of your answer. Use the activity sheet for your answer.

1. How many cable pairs are there in a Cat 5e cable?
   a.) 2
   b.) 4
   c.) 6
   d.) 8
2. What standard cable is used to connect a computer to a monitor?
   a. IDE
   b. VGA
   c. LCD
   d. SATA
3. What is the most common power connector is used for hard drives and optical drives?
   a.) IDE
   b.) LCD
   c.) UTP
   d.) SATA
4. Why is HDMI known as a high-quality multimedia interface?
   a. because it sends both audio and video signal
   b. because it is compatible with older version
   c. because it is used to connect storage devices into motherboard
   d. because it is used to set up local area network
5. What form is sometimes use as an invoice when working with external customers.
   a. work order form
   b. electronic work instruction
   c. job order form
   d. Form 137
6. What document should be given to the customer describing the work to be completed or the products to be manufactured?
   a. job order form
   b. work order form
   c. purchase order
   d. electronic work instruction
7. What type of wire is commonly used in building wiring installation?
   a. THHN/THWN
   b. UTP
   c. AGP
   d. STP

8. Why is stranded conductor cable easily bent?
    a. because of its conductor ampacity.
    b. because of its insulating material.
    c. because of its flexibility
    d. because of its temperature coefficient.
9. What is safety checklist?
    a. a document used during safety inspections for the identification of potential hazards.
    b. a set of printed or written questions with a choice of answers
    c. a list of yes-no questions
    d. a question-and-answer fact sheet covering a wide range of workplace
10. How do you troubleshoot electronic components in the circuit?
    a. Check for the exploded or burnt parts of the circuit by seeing and smelling them.
    b. Use the principle of Ohm's law.
    c. Read the user's manual.
    d. All of the above.
11. what do safety precautions checklist provide?
    a. practical training in safety awareness
    b. maximize hazard at the workplace
    c. references the commitment to work practices
    d. provide method for supervisors
12. A product has a safety defect if.
    a. it does not meet the standard
    b. it does not meet the level of safety the public is entitle to expert
    c. if the user is uncomfortable
    d. if the customer complains
13. which is a possible defect of a product?
    a. promotion defect
    b. art defect
    c. manufacturing defect
    d. line defect
14. what is a defect in manufacturing?
    a. when the product did meet customer expectation
    b. when the product did meet customer satisfaction
    c. when the product fades
    d. when the product defect from its interested design
15. what is the common fault of a capacitor?
    I. oil leakage
    II. internal sound is abnormal
    III. expansion of the shell
    IV. temperature rise of the shell is 60^{o} Celsius

    a. I, II & III
    b. I, III & IV
    c. II, III & IV
    d. I, II & IV

Lesson 1 Applying Quality Standards (AQS)

This lesson was designed and written with you in mind. It is here to help you in Electronic Product Assembly and Servicing acquire the important knowledge and skills in obtaining work instructions in accordance with standard operations and become acquainted with specification of materials and components this will serve as your tool in performing actual applying quality standard on materials and components and its specification needed to complete the work and transfer the skill/knowledge gained into real life situation.

What's In

Activity 1. "Logo Loco"
Directions: Name the following logos shown below. Write your answer on the activity sheet.





Activity 2. Name My Products!

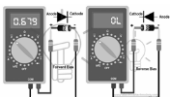
Direction: Give at least 3 products of the following manufacturing companies.
Write your answer on the activity sheet.

UNILEVER	PROCTOR & GAMBLE	SAN MIGUEL FOOD PRODUCTS	JOLLIBEE	SAMSUNG
1. _____	1. _____	1. _____	1. _____	1. _____
2. _____	2. _____	2. _____	2. _____	2. _____
3. _____	3. _____	3. _____	3. _____	3. _____

What's New

Activity 3: **"Matching Galing"**

Directions: Match the pictures in column A with their names in column B. Write only the letter of your answer in your activity sheet.

Column A	Column B
1. 	a) IDE
2. 	b) Resistor
3. 	c) Diode Checking
4. 	d) DVI
5. 	e) Damaged Resistor
6. 	f) Work Order Template
7. 	g) AGP
8. 	h) Coaxial Cable
9. 	i) UTP
10. 	j) Damaged Capacitor

What is It

Electronic Work Instructions

Clear work instructions are instrumental in improving the efficiency of your shop floor. Traditionally, workers have followed printed lists of step-by-step directions, but these are often cumbersome and difficult to keep current.

There is a better way. It's called electronic work instructions (EWI) software. Unlike the paper-based method, EWI software includes visual tools in the form of videos, images, and even 3D visualization and simulation software to make learning more interactive and pleasant.

How do electronic work instructions (EWI) help?

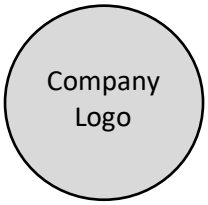
- Manufacturers in various industries use EWI to:
  - provide clear and repeatable instructions;
  - improve collaboration between the shop floor and engineering teams;
  - communicate changes immediately upon approval;
  - adopt culture of continuous improvement;
  - correct errors in real time;
  - save considerable time creating and modifying documents;
  - ensure the latest instructions are being used;
  - collect and consolidate data more effectively;
  - easily create training material;
  - reduce training time; and
  - reduce waste, errors and delays.

How does electronic work instructions (EWI) work?

Electronic Work Instruction (EWI) solutions replace paper versions of work instructions with digital files.
Engineers and supervisors document the best way to do each job. Then, they upload documents, pictures, videos and 3D illustrations to share best practices. If needed, they can also customize the approval process.
All machine operators and other shop floor workers have to do is access them on a computer, tablet or mobile device.

Data source: https://www.bdc.ca/en/articles-tools/technology/operations-management-software/electronic-work-instructions#:~:text=Clear%20work%20instructions%20are%20instrumental,work%20instructions%20(EWI)%20software.

Sample template of Work Order



WORK ORDER

XYZ Company
123 Company Address Drive
Second Floor, Suite 215
Company City, Company Province
Contact No.: xxxxxxxxxxxxxxx

ORDER DATE	ORDER NUMBER
EXPECTED START DATE	EXPECTED END DATE

JOB / TERMS OF SERVICE	BILL TO	WORK LOCATION
(Write brief description of the job including terms of service, if possible)	[Name] [Company Name] [Street Address] [City, Province, ZIP] [Contact Number]	[Name] [Company Name] [Street Address] [City, Province, ZIP] [Contact Number]

SERVICE/LABOR DESCRIPTION	HOURS	RATE PER HOUR	AMOUNT
	15	150.00	2,250.00
	5	50.00	250.00
		LABOR TOTAL	2,500.00

MATERIAL DESCRIPTION	QUANTITY	PRICE PER UNIT	AMOUNT
	4	110.00	440.00
	12	90.00	1,080.00
		MATERIAL TOTAL	1,520.00

WORK ORDER COMPILED BY	

CLIENT APPROVAL NAME AND TITLE	
APPROVING PARTY SIGNATURE	
DATE OF APPROVAL	

SUBTOTAL	4,020.00
TAX RATE	0%
TOTAL TAX	0.00
OTHER	150.00
TOTAL	4,170.00

Data source: https://www.vertex42.com/ExcelTemplates/work-order-form.html

The work order template captures customer and job information and summarizes labor and materials used to complete the jobs. Totals and taxes are calculated automatically; all you have to enter are quantities, unit costs, tax rates and other charges.

A **work order**, also known as a *job order*, *job ticket*, *work ticket* or *service ticket* is a document received by an organization from an external customer, or another department internal to that organization, describing work to be completed and/or products to be purchased or manufactured. **Work order forms** are usually customized to include more details than a basic purchase order. A work order is sometimes used as an invoice when working with external customers.

Below are descriptions of some fields used in work orders:

[Company Name / Logo]: Enter your company name and/or insert an image for your logo.

Bill To: The name and address of the customer that will be billed for this work. This information is usually tied to a specific Customer ID, while the Ship To field may be different.

Ship To: The name and address where the finished products will be shipped to.

W.O.#: A unique Work Order number used to identify the job. You should indicate on your work order form that all correspondence should include the WO #.

Job: A description of the issue or job with enough details to complete the job. In the Advanced work order form, you can enter a short general description, followed by a more detailed description that might identify the brand/make/model of the item to be serviced.

Qty (Quantity): This column can be used to enter the number of hours or amount of parts or materials used for the job.

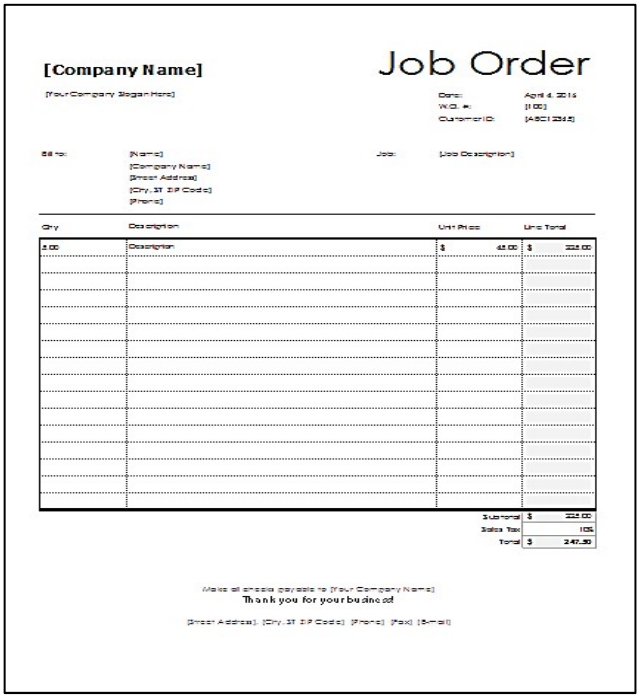
Taxed: The basic work order form includes a column for indicating (by entering an "x") which line items are taxable.

Tax Rate: Consult your local and state tax laws to determine how labor and/or sales should be taxed. The advanced work order template lets you set a different tax rate for labor and materials.

Taxable: The basic work order template calculates the sum of the amounts that are taxable. The tax is then calculated by multiplying the Taxable amount by the Tax Rate.

Other: The last field before the total can be used for including a discount or other types of charges. You should change the label to "Discount" or something that describes what the charge is for.

Sample of Job Order Template:



[Company Name]

[Your Company Slogan Here]

Job Order

Date: April 4, 2016
W.O. #: [100]
Customer ID: [ABC1234]

Bill to: [Name] [Company Name] [Street Address] [City, ST ZIP Code] [Phone]

Job: [Job Description]

Qty	Description	Unit Price	Line Total
5.00	Description	$ 45.00	$ 225.00
		Subtotal	$ 225.00
		Sales Tax	10%
		Total	$ 247.50

Make all checks payable to [Your Company Name]
Thank you for your business!

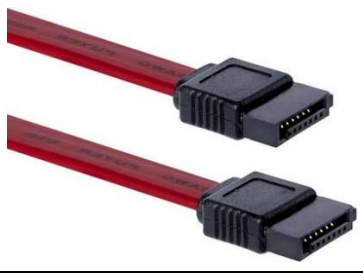
[Street Address], [City, ST ZIP Code] [Phone] [Fax] [E-mail]

Template and Data source: https://www.doxhub.org/job-order-templates/

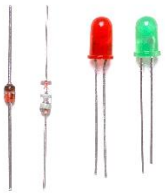
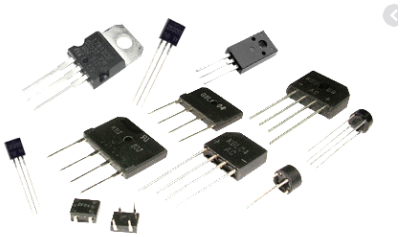
A **job order** contains information about a certain task to be completed by an organization. It may refer to the manufacture of products. Alternatively, it may also be for the services of a company. It is also known as a **work order form**. The document may be provided by a client or external customer. On the other hand, it may also be generated internally by another department of an organization. It contains all the required information about the demanded task. For instance, it mentions the required labor and material for the completion of the job. Moreover, the financial details are also mentioned including taxes and the total cost. For external clients, the form may also be used an invoice.

SPECIFICATION OF MATERIALS AND COMPONENTS

VGA (VIDEO GRAPHICS ARRAY) A VGA cable is a device used to transfer video signals. It does this by acting as a link between the computer and the monitor or between the computer and the television screen or a laptop and a projector. The video graphic cable comes in two types, male and female connector.	

DVI (DIGITAL VISUAL INTERFACE) DVI is a video display interface. The DVI connection became the successor to VGA as technology moved away from analog towards digital. It was developed to be an industry standard for transmitting digital video content to display devices at resolutions as high as 2560 x 1600. Common devices that utilize the DVI connection are computer monitors and projectors.	
HDMI (HIGH DEFINITION MULTIMEDIA INTERFACE) In the past decade, high-definition broadcasts became the new standard of what it means to be high quality. Unlike VGA and DVI, HDMI sends both video and audio signals together. The signals are digital only; thus, HDMI is only compatible with newer devices and is the most frequently used HD signal for transferring both high definition audio and video over a single cable	
USB (UNIVERSAL SERIAL BUS) USB cables, also known as USB leads, provide connection from computers to peripherals such as keyboards, printers, portable media players, network adaptors and pointing devices. They are also used to provide electrical power to portable devices via a wall adaptor or computer. "USB" stands for Universal Serial Bus. USB 1.0/1.1 can transmit data at speeds up to 12 Mbps. USB 2.0 can transmit data at speeds up to 480 Mbps and is compatible with older versions of USB. At the time of this article, USB 2.0 is the most common type found in the market. USB 3.0 can transmit data at speeds up to 4.8 Gbps.	
IDE (INTEGRATED DRIVE ELECTRONICS) IDE IDE, an acronym for Integrated Drive Electronics, is a standard type of connection for storage devices in a computer. Generally, IDE refers to the types of cables and ports used to connect some hard drives and optical drives to each other and to the motherboard.	
SATA (SERIAL ADVANCED TECHNOLOGY ATTACHMENT) Newer hard drives will likely use SATA ports over IDE ports. In fact, SATA was designed to succeed IDE, and it has. Compared to IDE, SATA provides higher data transfer speeds. Your motherboard needs to be compatible with SATA, and nowadays most of them are. A standard SATA cable can be	

identified by two connectors, each having 7 pins and an empty notch. It looks like a subtle L-shape.	
ESATA (EXTERNAL SERIAL ADVANCED TECHNOLOGY ATTACHMENT) - **eSATA** technology is an extension of, or improvement on, the SATA cable — it makes SATA technology available in an external form. In reality, eSATA is not much different from SATA, but it allows connections to devices like external hard drives and optical drives. This is useful because eSATA offers speeds much faster than most FireWire and USB alternatives.	
FIREWIRE- The purpose of FireWire is similar to that of USB: high speed data transfer for computer peripherals. High bandwidth devices, like printers and scanners, will benefit from FireWire. For whatever reason, FireWire is not as widespread as USB. FireWire cables come in two forms: 1394a (which has a transfer speed of 400 Mbps) and 1394b (which has a transfer speed of 800 Mbps). Data source: https://blog.techsteppers.com/computer-cables/	
ETHERNET cables are used to set up local area networks. In most cases, they're used to connect routers to modems and computers. If you've ever tried to install or fix a home router, you've likely dealt with an Ethernet computer cable.	
RESISTOR A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.	
CAPACITOR Its function is to store the electrical energy and give this energy again to the circuit when necessary. In other words, it charges and discharges the electric charge stored in it. Besides this, the functions of a capacitor are as follows: It blocks the flow of DC and permits the flow of AC.	

INTEGRATED CIRCUIT (IC) An integrated circuit (IC), sometimes called a chip or microchip, is a semiconductor wafer on which thousands or millions of tiny resistors, capacitors, and transistors are fabricated. An IC can function as an amplifier, oscillator, timer, counter, computer memory, or microprocessor.	
DIODE The most common function of a diode is to allow an electric current to pass in one direction (called the diode's forward direction), while blocking current in the opposite direction (the reverse direction). Thus, the diode can be viewed as an electronic version of a check valve.	
TRANSISTOR is a semiconductor with a solid and non-moving part to pass a charge. It can amplify and switch electrical power and electronic signals. Transistors are made of semiconductor material with three or more terminals used to connect to an external circuit.	

Other types of wires/cable use in electronics

1. **Shielded Twisted-Pair Cable**

Shielded twisted-pair cable encases the signal-carrying wires in a conducting shield as a means of reducing the potential for electromagnetic interference. How effective the shielding is depends on the material used for the shield--its thickness and frequency, the type of electromagnetic noise field, the distance from the noise source to the shield, any shield discontinuity and the grounding practices. Also, crosstalk and signal noise can increase if the effects of the shield are not compensated for.

2. **Unshielded Twisted-Pair Cable**

Unshielded twisted-pair cable does not rely on physical shielding to block interference. It relies instead on balancing and filtering techniques using media filters, baluns or both. Noise is induced equally on two conductors and is canceled out at the receiver. With properly designed, manufactured and installed UTP cable (like CAT6 UTP cable), the network is easier to maintain than one in an STP cable plant, with its shielding continuity and grounding issues.

3. Phone and Data Wire

Telephone and data wiring are low-voltage wires used for "landline" telephones and internet hookups. Telephone cable may contain four or eight wires. Category 5 (Cat 5) cable, the most common type of household data wiring, contains eight wires wrapped together in four pairs. It can be used for both phone and data transmission and offers greater capacity and quality than standard phone wire.

Data source: https://www.thespruce.com/common-types-of-electrical-wiring-1152855

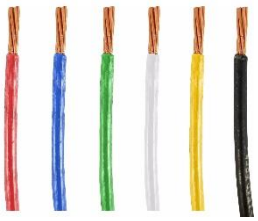
4. Coaxial Cable

Coaxial cable is beginning to grow less common, thanks to the use of other forms of data wiring, such as HDMI, for television data transmission. Coaxial cable is a round jacketed cable that features an inner conductor surrounded by a tubular insulating layer, surrounded by a tubular conducting shield made of braided wire. It can be identified by the threaded connectors that are used to make unions and device hookups.

Coaxial cable was once the standard for connecting televisions to antenna or cable service delivery and is still often used to connect satellite dishes or to bring subscription television service to an in-home distribution point.

5. THHN/THWN Wire

THHN and THWN are codes for the two most common types of insulated wire used inside the conduit. Unlike NM cable, in which two or more individual insulated conductors are bundled inside a plastic sheathing, THHN and THWN wires are single conductors, each with its color-coded insulation. Instead of being protected by NM cable sheathing, these wires are protected by tubular metal or plastic conduit.



Conduit is often used in unfinished areas, such as basements and garages, and for short exposed runs inside the home, such as wiring connections for garbage disposers and hot water heaters. The letters indicate specific properties of the wire insulation:

- T: Thermoplastic
- H: Heat-resistant; HH means highly heat-resistant
- W: Rated for wet locations
- N: Nylon-coated, for added protection

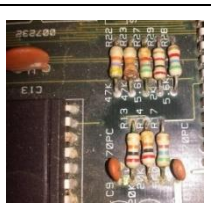
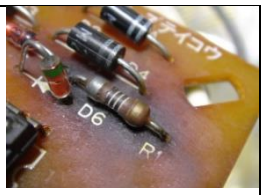
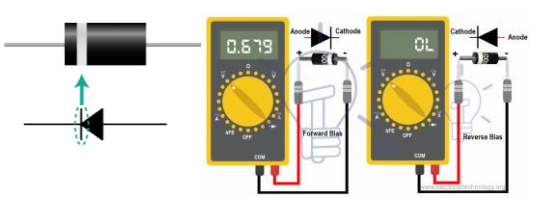
THHN and THWN wires have colored sheathings that are generally used to identify their function in a circuit:

- Hot wires: Black, red, orange
- Neutral wires: White, brown
- Ground wires: Green, yellow-green

THHN and THWN wires are circuit wires that should never be handled when the circuits are turned on.

ISOLATING FAULTS AND FAULTY MATERIALS

Different types of faulty electronic components or materials

Common fault in Resistor Resistors are reliable components and their rate of failure is very low. Still, faults do occur. The most common faults in resistors are an open and producing noise.	 
Common fault of capacitor. When the capacitor is found to be one of the following conditions, the power shall be cut off immediately. a.) The expansion of the capacitor shell or oil leakage. b.) the internal sound of the capacitor is abnormal. c.) the temperature rise of the shell is higher than 55 degree Celsius.	 
Common fault of diode. If it happened in a power supply, a large current can flow and obvious damage occurs such as “cooked” diodes and/or blown fuses. Short circuit diodes that are not obviously damaged show 0Ω or very low resistance in both forward and reverse directions.	

What is the difference between nonconformity and defect?

- Nonconformity represents a failure to meet an intended state and specification
- Defect represents a failure to meet fitness for use/normal usage requirements

Data source: https://wikidiff.com/defect/nonconformity

Two important considerations included in the requirements for nonconformity.

1. Corrective action is that the actions taken need to be appropriate to the magnitude of the problems and the environmental impacts encountered. This means that you must consider the actions in light of how detrimental the impacts are to the environment.
2. Preventive action is that the documentation in place for the environmental management system needs to be changed, if necessary, due to the outcomes of the corrections, corrective actions, and preventive actions.

What is a Defect in Manufacturing?

A defect in manufacturing is one that the manufacturer did not intend. A manufacturing defect as occurring when "the product departs from its intended design even though all possible care was exercised in the preparation and marketing of the product."

Manufacturing defects are relatively uncommon in product liability law. While a design defect affects every product made and a warning defect affects every product sold, a manufacturing defect generally affects a limited number of united produced.

When a product is defective and causes an injury, there are three types of defects possible.

1) Design Defect: This basically means the whole product was designed poorly or not properly tested, in which case all the products will likely be defective and dangerous.

2) Manufacturing Defect: The product was designed fine, but the error or dangerous aspect was introduced during the making of the product. Often not all the products will be dangerous, just those with the problem caused during manufacturing.

3) Marketing Defect: The name of this is a little misleading because the problem may not be contained within the scope of what most people consider marketing. Instead, this defect is often seen in the warnings and instructions included with a product - if the manufacturer fails to provide proper warning labels or clear instructions to help consumers avoid injuries, they can be held liable.

Safety defects

A product has a safety defect if it does not meet the level of safety the public is generally entitled to expect. While the expected level of safety will vary from case to case, it is ultimately for a court to determine whether a product has a safety defect.

The court will take various factors into account when determining whether a product has a safety defect, including:

- how and for what purposes the product has been marketed
- product packaging
- the use of any mark in relation to the product
- instructions and warnings for assembly and use
- what might reasonably be expected to be done with the product
- the time when the product was supplied.

Record and/or report materials to the supervisor concerned in accordance with workplace procedures

Take a look at this sample safety inspection checklist.

SAMPLE SAFETY INSPECTION CHECKLIST

NAME OF AGENCY/OFFICE: _

Area(s) Inspected: _____ **Inspected by:** _____ **Date:** _____

	ITEM	YES	NO	CORRECTIVE ACTION – DATE
1.	Is there litter or spilled liquid on the floor?			
2.	Are floor surfaces chipped: does carpeting show worn spots or holes?			
3.	Are warning signs posted near cleaning areas, repair work or redecorating efforts?			
4.	Are aisles free of boxes, wastebaskets, chairs, and other obstacles that impede traffic?			
5.	Are restrooms kept clean and floors dry?			
6.	Do cords present a tripping hazard?			
7.	Do cords look frayed?			
8.	Are cords draped over hot pipes and/or appliances?			
9.	Are flimsy extension cords in use?			
10.	Are all appliances connected with three-pronged plugs?			
11.	Are electrical outlet boxes or bonnets exposed so that they present a hazard?			
12.	Are cover plates for electrical switches or receptacles cracked or broken?			
13.	Do employees stand on chairs, desks, boxes, drawers, or other improvised ladders?			
14.	Do employees lean way back in chairs with their feet off the floor?			
15.	Do employees put tops on cups of coffee or other liquids while carrying them through the office?			

Safety Inspection Checklists

Even if safety inspections were not strongly recommended, they are an excellent way for the department to reference the commitment to safe work practices, provide practical training in safety awareness and minimize hazards at the workplace. These inspections provide a systematic method for involving supervisors, employees, safety coordinators, and/or safety committees in the process of eliminating workplace hazards.

General Knowledge Safety Inspections

This method keeps you from getting stuck looking at the same things every time. However, the effectiveness of this inspection method is dependent on the individual's level of knowledge about workplace related safety practices.

Risk Mapping Safety Inspections

This technique uses a map/drawing of the workplace or a list of steps in a process. People in the group then tell the leader the hazards they recognize and where they are located in the workplace or process. The leader uses different colors or symbols to identify different types of hazards on the map or list of steps. This type of inspection is valuable for involving all employees in identifying and resolving safety hazards.

Data source: https://www.engr.washington.edu/files/mycoe/safety/Workplace_A.PDF

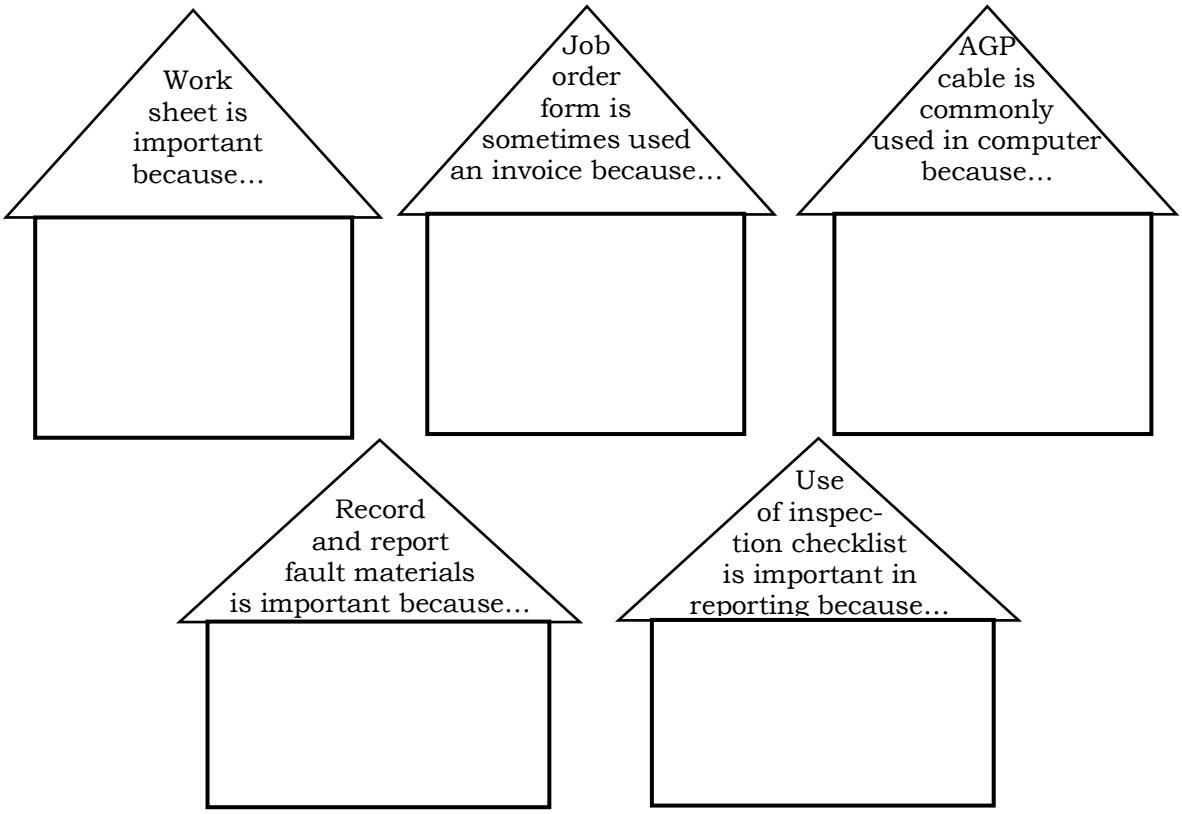
What's More

Cable to Be Able". Direction: Using the activity sheet, complete the table below by writing the name of the cable and its function.

Types of Cable	Name	Usage or Function
		
		
		
		
		

Activity 5: "Build Me Up"

Directions: Every triangle below contains a premise. Fill in every square with a reason to completely build a figure of a house and to come up with a sensible statement. Write your answer in your activity notebook.

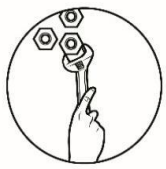


What I Have Learned

Activity No. 6: "Circuit of Life"

Directions: Below are different <u>key words</u> in an integrated circuit (IC) from the lesson presented in this module. Choose five keys and briefly discuss each word you choose. Write your answer in your activity sheet.

Job Order	Work Sheet	Inspection Checklist	Safety Inspection
Safety Inspection	Resistor	Integrated Circuits	THHN/THWN Wire
Cable	Transistor	Ethernet	Diode



What I Can Do

Activity No. 7: "Electronic SOS"

Directions: Imagine yourself as an electronic technician. Mrs. Dela Cruz called you up to fix or troubleshoot problems of her electronic appliances. Record your findings/actions in your activity sheet.

PROBLEMS	FINDINGS/ACTIONS
1) You find out that the extension wire of the washing machine becomes hot. What do you think is the root cause of this problem?	
2) You find out that a worn-out transmission cable affects the reception of Mrs. Dela Cruz's television set? Why is this so?	
3) You find out that some of the components you purchased for Mrs. Dela Cruz's TV are damaged. What steps will do?	

OUTPUT RUBRIC

CRITERIA	**5**	**4**	**3**	**2**	**1**
Content	complete, accurate, clearly explained, expert and very knowledgeable	complete, accurate, clearly explained, advanced and knowledgeable	complete, accurate, clearly explained, intermediate and fairly knowledgeable	incomplete, not so accurate, not so clearly explained, beginner and not so knowledgeable	incomplete, inaccurate, not clearly explained, novice and not knowledgeable
Process	very well-coordinated, strongly efficient, and precise	well-coordinated, moderately efficient, and fairly precise	fairly-coordinated, efficient, and less precise	less coordinated, less efficient, and not precise	poorly coordinated, inefficient, and not precise
Impact	very informative, very persuasive, and very satisfying	moderately informative, moderately persuasive, and moderately satisfying	fairly informative, fairly persuasive, and fairly satisfying	less informative, less persuasive, and less satisfying	not informative, not persuasive, and unsatisfying

NOTE: This **RUBRIC** will be used by teachers only in evaluating/scoring your output.

Assessment

Directions: Read each question carefully. Choose the letter of the best answer. Write your chosen letter on a separate sheet of paper.

1. What is safety checklist?
    a. a document used during safety inspections for the identification of potential hazards.
    b. a set of printed or written questions with a choice of answers
    c. a list of yes-no questions
    d. a question-and-answer fact sheet covering a wide range of workplace
2. How do you troubleshoot electronic components in the circuit?
    a. Check for the exploded or burnt parts of the circuit by seeing and smelling them.
    b. Use the principle of Ohm's law.
    c. Read the user's manual.
    d. Replace the unit.
3. What type of metallic cable can be used as power rate cable?
    a. nonmetallic sheathed cable
    b. coaxial cable
    c. THHN/THWN
    d. UTP cable
4. What device stores electrical charge?
    a. Resistor
    b. Capacitor
    c. Transistor
    d. Diode
5. It is a device used to reduce current flow.
    a. Capacitor
    b. Transistor
    c. Resistor
    d. Diode
6. What device is used to allow an electric current to pass in one direction?
    a. Diode
    b. Capacitor
    c. Resistor
    d. Integrated Circuit
7. What device is used to amplify electronic signals and electrical power?
    a. Diode
    b. Capacitor
    c. Transistor
    d. Resistor
8. Why is transistor important?
    a. because it makes excellent electronic switches.
    b. because it reduces current flow.
    c. because it allows an electric current to pass in one direction.
    d. because it stores electrical charge.
9. What small chip can function as an amplifier, oscillator, timer, microprocessor, or even computer memory?
    a. Transistor
    b. Integrated Circuit

c. Diode
d. Resistor

10. How many cable pairs are there in a Cat 5e cable?
    a.) 2
    b.) 4
    c.) 6
    d.) 8

11. What do safety precautions checklist provide?
    a. maximizes hazards at the workplace
    b. practical training in safety awareness
    c. provide method for supervisors
    d. references the commitment to work practices

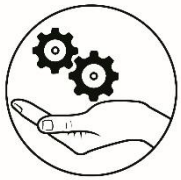
12. A product has a safety defect if.
    a. if the user is uncomfortable
    b. if the customer complains
    c. it does not meet the level of safety the public is entitle to expert
    d. it does not meet the standard

13. which is a possible defect of a product?
    a. art defect
    b. manufacturing defect
    c. line defect
    d. promotion defect

14. what is a defect in manufacturing?
    a. when the product defect from its interested design
    b. when the product did meet customer expectation
    c. when the product did meet customer satisfaction
    d. when the product fades

15. what is the common fault of a capacitor?
    I. oil leakage
    II. internal sound is abnormal
    III. expansion of the shell
    IV. temperature rise of the shell is 60 ◦ Celsius

    a. I, II & III
    b. I, II & IV
    c. I, III & IV
    d. II, III & IV



Additional Activities

Activity No. 8: "Have a Knack for These"

Directions: Answer the following questions as skillfully as you can. Write your answer in the activity sheet provided.

1.) How do you troubleshoot electronic components?
_____
_____

2.) How will you identify an electronic component for replacement?
_____
_____

3.) What form will you have used when accepting electronic job?
_____
_____

Answer Key

What I Know

1. B
2. B
3. A
4. A
5. C
6. B
7. A
8. A
9. A
10. A
11. A
12. B
13. C
14. D
15. A

What's More

1. Coaxial cable.
   Use for connecting televisions to antenna or cable service delivery and is still often to used to connect satellite dishes.
2. UTP Cable.
   Use for both phone and data transmission.
3. Ethernet Cable.
   Use to set local area
4. SATA Cable.
   Provides higher data transfer cable.
5. IDE Cable.

Used to connect storage devices to the motherboard.

Assessment

1. A
2. A
3. C
4. B
5. C
6. A
7. C
8. A
9. B
10. A
11. B
12. C
13. B
14. A
15. A

References

Logo source at page 4:
https://www.designrush.com/best-designs/logo/procter-gamble
https://primer.com.ph/business/2017/03/08/from-booze-to-food-to-everything-else-san-miguel-corporation/
https://1000logos.net/jollibee-logo/
https://www.logotaglines.com/samsung-logo-tagline/
https://www.logodesignlove.com/unilever-icons

https://www.designrush.com/best-designs/logo/procter-gamble
https://primer.com.ph/business/2017/03/08/from-booze-to-food-to-everything-else-san-miguel-corporation/
https://1000logos.net/jollibee-logo/
https://www.logotaglines.com/samsung-logo-tagline/
https://www.logodesignlove.com/unilever-icons
https://www.bdc.ca/en/articles-tools/technology/operations-management-software/pages/electronic-work-instructions.aspx Date Accessed- July 08, 2020
https://www.how-to-wire-it.com/romex-cable.html Date Accessed- July 08, 2020
https://www.slideshare.net/Rhyzen28/specification-of-materials-and-components?from_action=save Date Accessed- July 08, 2020
https://www.vertex42.com/Files/download2/themed.php?file=work-order-template.xlsx Date Accessed- July 08, 2020
https://www.doxhub.org/job-order-templates/ Date Accessed- July 08, 2020
file:///C:/Users/admin/Desktop/EPAS%20Exemplar/Common%20Types%20of%20Electrical%20Wire%20Used%20in%20Homes.html Date Accessed- July 08, 2020
https://shopdelta.eu/twisted-pair-cable-utp-pfm920i-5eun-dahua_l2_p14647.html Date Accessed- July 10, 2020
https://www.indiamart.com/proddetail/multi-pair-telephone-wire-9423928155.html Date Accessed- July 10, 2020
https://hscable.en.alibaba.com/product/731926568-212855450/Nylon_Jacket_THHN_THWN_Electrical_Wire.html Date Accessed- July 10, 2020
https://www.cablewholesale.com/support/technical_articles/coaxial_corner.php Date Accessed- July 11, 2020
https://www.alibaba.com/product-detail/Unshielded-Twisted-Pair-UTP- cable_143870299.html Date Accessed- July 10, 2020
http://computernetworkingtopics.weebly.com/shielded-twisted-pair-stp-cable.html Date Accessed- July 11, 2020
https://www.hg.org/legal-articles/three-types-of-product-defects-for-product-liability-lawsuits-24105 Date Accessed- July 12, 2020
https://injury.findlaw.com/product-liability/defects-in-manufacturing.html Date Accessed- July 12, 2020
https://www.robomart.com/blog/common-faults-resistors/ Date Accessed- July 11, 2020
https://blog.techsteppers.com/computer-cables/- Date Accessed- July 12, 2020
The Ultimate Guide to USB Cables - Consolidated Electronic Wire & Cable (conwire.com)- Date Accessed- July 12, 2020
https://www.lifewire.com/- Date Accessed- July 12, 2020
https://studylib.net/doc/7634410/sample-safety-inspection-checklist- Date Accessed- July 12, 2020

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