

W1	Learning Area	TVL – ICT – TECHNICAL DRAFTING	Grade Level	10 / 12
	Quarter	4th	Date	Week 1
I. LESSON TITLE		Drafting Sanitary and Plumbing Layout and Details using CAD (SC)		
II. MOST ESSENTIAL LEARNING COMPETENCIES (MELCs)		LO1. Draft water distribution system		
III. CONTENT/CORE CONTENT		1.1. Draft hot and cold-water distribution systems according to Plumbing and Water Code Indicate signs and symbols according to sanitary and plumbing requirements. TLE ICTTD9-12SC-IVa-1		

IV. LEARNING PHASES AND LEARNING ACTIVITIES

A. Introduction (Time Frame: 30 minutes)

<https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical>

1. How important it is to identify the proper fitting and fixture in a house?
2. What will happened if there are no proper plumbing fittings and fixture in the house?

FITTINGS AND FIXTURES

Plumbing fittings & fixtures are the means for safely using water in the home. These are the valves, faucets, toilets, shower heads, drain stoppers and basins of your plumbing system.

Over time, fittings & fixtures can wear out so they are usually made to be replaceable. They are not buried in the structure so they are much easier to access for repairs, servicing and replacement.

FIXTURES TYPES

Fixtures are intended for long, durable use exposed to water on a constant basis, so they tend to be made of materials that resist rust, erosion and water staining. Porcelain is such a material as is plastic, fiberglass, tile, marble, glass and stainless steel or copper. Fixtures have drains in the bottom for the water to evacuate and stoppers to hold the water in place if desired.

EXAMPLES

Toilets
Sinks
Bathtubs
Showers
Bidets

FIXTURES TYPES

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EXAMPLES

Toilets
Sinks
Bathtubs
Showers
Bidets

IV. LEARNING PHASES AND LEARNING ACTIVITIES

B. Development (Time Frame: 1 hour)

DEFINITIONS

BACKFLOW- the flow of water or other liquids, mixtures or substances into the distributing pipes of a potable supply of water from any source other than from its intended source.
BATHROOM- a room equipped with a shower stall or bathtub.
BIBB- synonymous with faucet, cock, tap, plug, etc. The word "faucet" is preferred.
BIDET - A plumbing fixtures used for washing the middle private part of the body, especially the genitals. Also called a "sitz" bath.
CATCH BASIN - a receptacle in which liquids are retained for a sufficient period of time to allow settleable material to deposit.
DEAD-END - the extended portion of a pipe that is closed at one end to which no connections are made on the extended portion, thus permitting the stagnation of liquid or air therein.

DEFINITIONS

DRAIN - a pipe, which carries ground and surface waters, storm water or wastewater into a building drainage system.
DRAINAGE SYSTEM - includes all the pipings within public or private premises which convey sewage or other liquid wastes to a legal point of disposal but does not include the mains of a public sewer system or a public sewage treatment or disposal plant.
FAUCET- a valve located at the end of a water pipe through of which water can be drawn from or held within the pipe.
FIXTURE - a receptacle other than a trap attached to a plumbing system in which water or wastes may be collected or retained for ultimate discharge into the plumbing system.

DEFINITIONS

FLOOD LEVEL - the level in a fixture at which water begins to overflow over the top or rim of the fixture.
FLOODED - a fixture is flooded when the liquid therein rises to the flood level rim.
HORIZONTAL PIPE - is any pipe or fitting installed in a horizontal position or which forms an angle of not more than forty-five (45) degrees with the horizontal plane.
LAVATORY - a fixture designed for the washing of the hands or face. Sometimes called a wash basin.
LIQUID WASTE - is the discharge from any fixture, appliance or appurtenance in connection with a plumbing system which does not receive fecal matter.

DEFINITIONS

MASTER PLUMBER - a person technically and legally qualified and licensed to practice the profession of Master Plumbing without limitations in accordance with Republic Act 1378, having passed the examination conducted by the Professional Regulation Commission, has received a Certificate of Registration from the Board of Master Plumbing and possesses the current license to practice.
PIPE - a cylindrical conduit or conductor conforming to the particular dimensions commonly known as pipe size, and is denoted by its interior diameter.

DEFINITIONS

POTABLE WATER - water satisfactory for drinking, culinary and domestic purposes and meets the requirements of the Philippine National Standards for Drinking Water.
SEPTIC TANK- a water-tight receptacle which receives the discharge of a sanitary plumbing system or part thereof, designed and constructed to retain solids, digest organic matter through a period of detention and to allow the liquids to discharge into the soil outside of the tank through a system of open-jointed sub-surface pipings or a seepage pit meeting the requirements of this Code.

DEFINITIONS

SERVICE PIPE - the pipe from the street water main or other source of water supply to the building served.
SEWAGE - any wastewater containing animal or vegetable matter in suspension or solution and may include liquids containing chemicals in solution.
SEWER- a pipe or conduit for carrying sewage and wastewater.
SOIL STACK PIPE - a vertical soil pipe conveying fecal matter and wastewater.
SOIL PIPE - any pipe, which conveys the discharge of water closet, urinal or fixtures having similar functions, with or without the discharges from other fixtures to the building drain or building sewer.

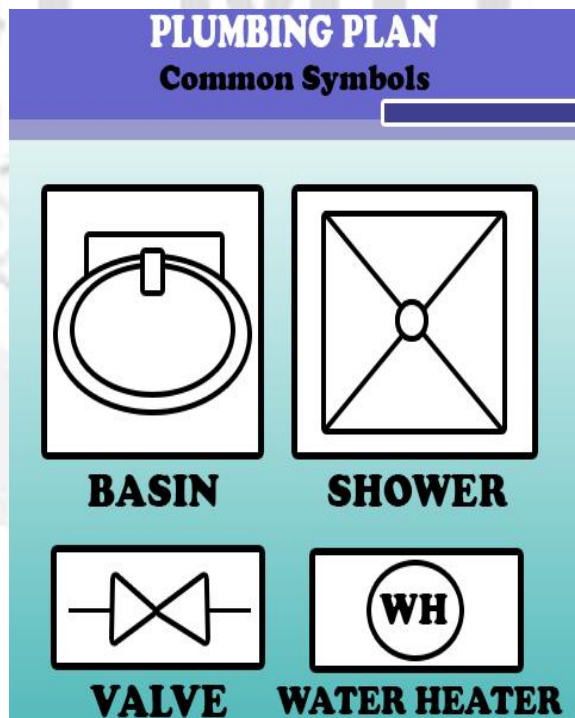
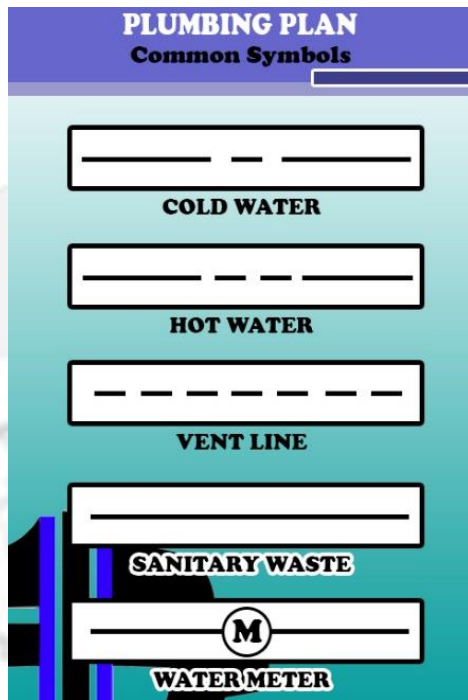
DEFINITIONS

VENT PIPE - a pipe or opening used for ensuring the circulation of air in a plumbing system and for relieving the negative pressure exerted on trap seals.
VENT SYSTEM - pipes installed to provide flow of air to or from a drainage system or to provide a circulation of air within such system to protect trap seals from siphonage and back pressure.
VERTICAL PIPE - any pipe or fitting installed in a vertical position or which forms an angle of not more than forty-five (45) degrees with the vertical line.
WATER MAIN - or street main is the water-supply pipe for public or community use.

How important it is to know the definitions in the plumbing code?

IV. LEARNING PHASES AND LEARNING ACTIVITIES

C. Engagement (Time Frame: 1 hours)



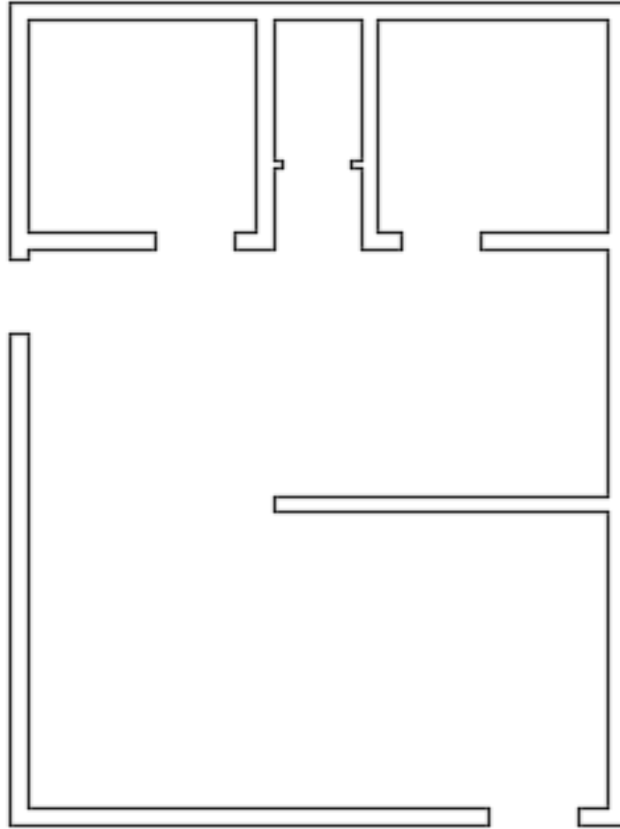
PLUMBING PLAN Common Symbols		
NAME	ILLUSTRATION	SYMBOL
90°ELBOWS		
STRAIGHT TEE		
REDUCING TEE		
SANITARY TEE		
P-TRAP		

IV. LEARNING PHASES AND LEARNING ACTIVITIES

D. Assimilation (Time Frame: 1 hour)

Learning Task:

Using the floor plan insert the common symbols and use the hot and cold symbols in constructing the water distribution system



See the attached Rubrics for grading

V. ASSESSMENT (Time Frame: 30 minutes)

(Learning Activity Sheets for Enrichment, Remediation, or Assessment to be given on Weeks 3 and 6)

Explain the importance of the following

1. Fixtures
2. Master Plumber
3. Drainage System
4. Water main
5. Potable Water

VI. REFLECTION (Time Frame: _____)

- Write your personal insights about the lesson using the prompts below.
I understand that _____.
I realize that _____.
I need to learn more about _____.

VII. REFERENCES

<https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical>
National Building Code

Prepared by:

GODFRED M. VELARDE

Checked by:

FREDERICK B. ZAIDE
MAURA N. TACDERAS
DR. RHODA M. MANUAL

W2	Learning Area	TVL – ICT – Technical Drafting	Grade Level	10/12
	Quarter	4th	Date	Week 2
I. LESSON TITLE		Drafting Sanitary and Plumbing Layout and Details Using CAD (SC)		
II. MOST ESSENTIAL LEARNING COMPETENCIES (MELCs)		LO2. Draft sanitary and storm drainage		
III. CONTENT/CORE CONTENT		2.1. Draw sewerage plan layout according to Plumbing Code		
		TLE_ICCTD9-12SC-IVb-c-2		
IV. LEARNING PHASES AND LEARNING ACTIVITIES				
A. Introduction (Time Frame: 30 minutes)				
https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical				
<div><div>1. How important it is to have a clean water?</div><div>2. Any Idea where does our waste go?</div></div>				

CLEAN WATER ACT

The Philippine Clean Water Act of 2004 (Republic Act No. 9275) aims to protect the country's water bodies from pollution from land-based sources (industries and commercial establishments, agriculture and community/household activities). It provides for a comprehensive and integrated strategy to prevent and minimize pollution through a multi-sectoral and participatory approach involving all the stakeholders.

B. Development (Time Frame: 30 mins.)

NATIONAL BUILDING CODE

SANITATION

Section 902. Water Supply System.

(a) Whenever available, the potable water requirements for a building used for human habitation shall be supplied from existing municipal or city waterworks system.

(b) The quality of drinking water from meteoric, surface or underground sources shall conform to the criteria set in the latest approved National Standards for Drinking Water.

(c) The design, construction and operation of deepwells for the abstraction of groundwater shall be subject to the provisions of the Water Code of the Philippines.

NATIONAL BUILDING CODE

SANITATION

Section 903.

Wastewater Disposal System.

(a) Sanitary sewage from buildings and neutralized or pretreated industrial wastewater shall be discharged directly into the nearest street sanitary sewer main of existing municipal or city sanitary sewerage system in accordance with the criteria set by the Code on Sanitation and the National Pollution Control Commission.

(b) All buildings located in areas where there are no available sanitary sewerage system shall dispose their sewage "Imhoff" or septic tank and subsurface absorption filed.

(c) Sanitary and industrial plumbing installations inside buildings and premises shall conform to the provisions of the National Plumbing Code.

NATIONAL BUILDING CODE

SANITATION

(d) The design, construction and operation of independent waterworks, systems of private housing subdivisions or industrial estates shall be governed by existing laws relating to local waterworks system.

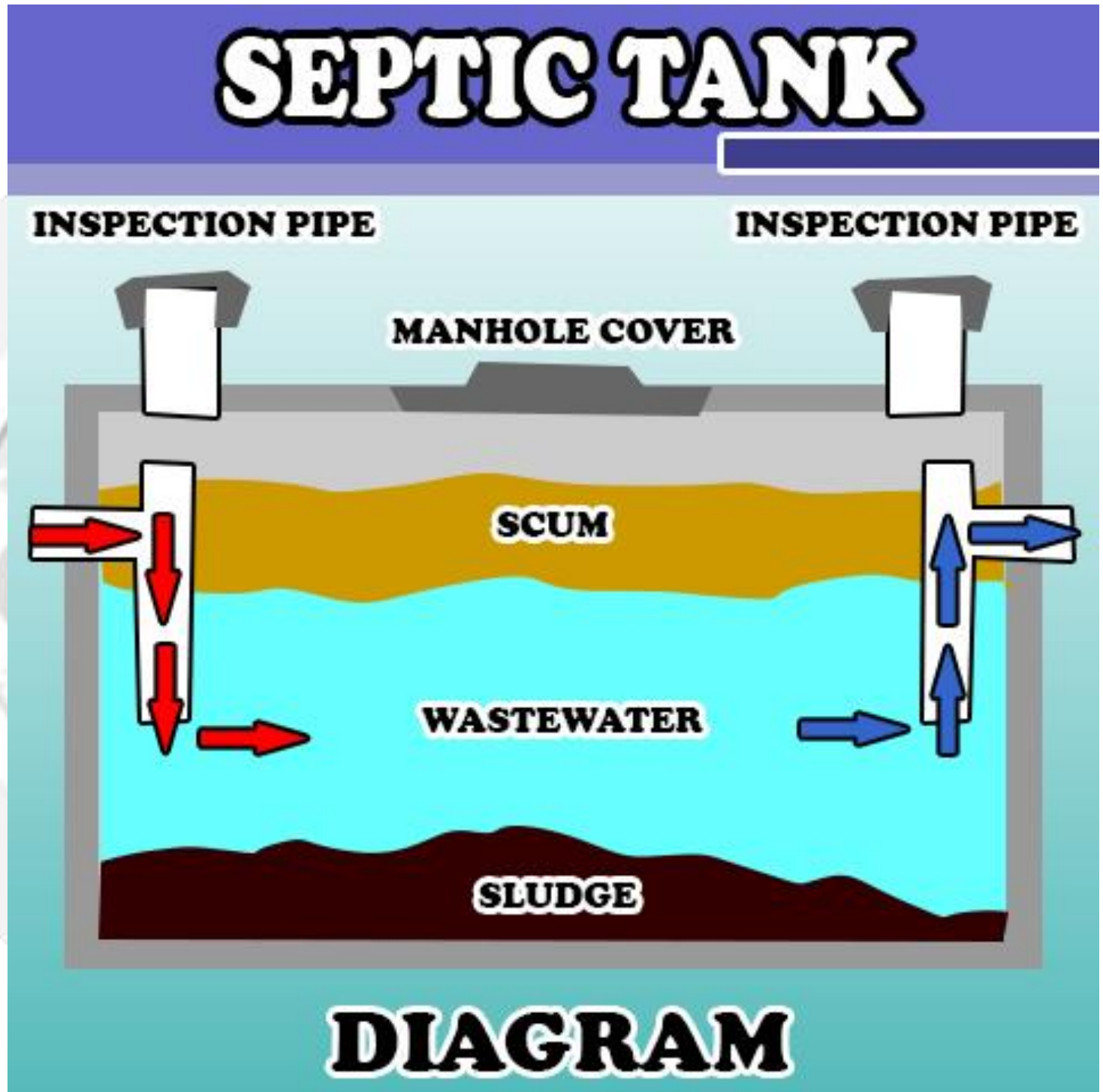
(e) The water piping installations inside buildings and premises shall conform to the provisions of the National Plumbing Code of the Philippines.

1. How important it is to know the Water Supply System?
2. How necessary it is to have a Water Waste Disposal System?

IV. LEARNING PHASES AND LEARNING ACTIVITIES

C. Engagement (Time Frame: 1 hour)

Draw the Septic Tank



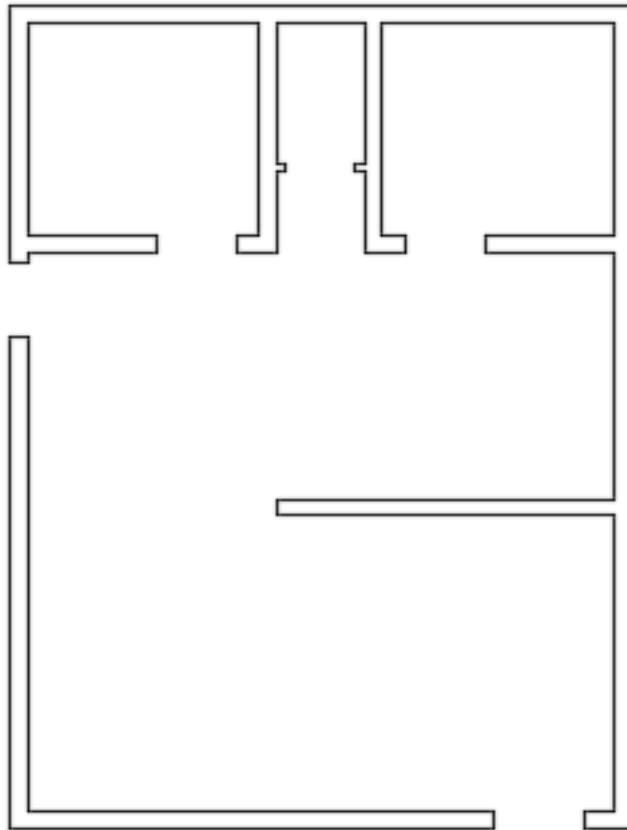
See the attached Rubrics for grading

IV. LEARNING PHASES AND LEARNING ACTIVITIES

D. Assimilation (Time Frame: 1 hour and 30 minutes)

Learning Task:

Using the floor plan insert the sewage plan that include the water waste disposal system by placing the Septic tank.



See the attached Rubrics for grading

V. ASSESSMENT (Time Frame: 30 minutes)

(Learning Activity Sheets for Enrichment, Remediation, or Assessment to be given on Weeks 3 and 6)

Explain importance of the following

1. Clean Water Act
2. Septic Tank
3. Water Supply System
4. Water Waste Disposal System

VI. REFLECTION (Time Frame: _____)

- Write your personal insights about the lesson using the prompts below.
I understand that _____.
I realize that _____.
I need to learn more about _____.

VII. REFERENCES

<https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical>
National Building Code
Clean Water Act

Prepared by:

GODFRED M. VELARDE

Checked by:

FREDERICK B. ZAIDE
MAURA N. TACDERAS
DR. RHODA M. MANUAL

W3	Learning Area	TVL –ICT – Technical Drafting	Grade Level	10/12
	Quarter	4 th	Date	Week 3
I. LESSON TITLE		Drafting Sanitary and Plumbing Layout and Details Using CAD (SC)		
II. MOST ESSENTIAL LEARNING COMPETENCIES (MELCs)		LO2. Draft sanitary and storm drainage		
III. CONTENT/CORE CONTENT		2.2. Draft storm drainage plan according to plumbing code 2.3. Draw details and symbols according to sanitary plumbing requirements TLE ICTTD9-12SC-IVb-c-2		

IV. LEARNING PHASES AND LEARNING ACTIVITIES

A. Introduction (Time Frame: 30 minutes)

PLUMBING

PLUMBING- the art and technique of installing pipes, fixtures and other apparatuses in buildings for bringing in the supply, liquids, substances and/or ingredients and removing them~ and such water, liquid and other carried wastes hazardous to health, sanitation, life) property~ also the pipes and fixtures after installation i.e., the plumbing system.

<https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical>

1. How important is plumbing plan in a house?
2. Who is in-charge in planning the plumbing fixtures in a house?

B. Development (Time Frame: 30 mins.)

Prohibited acts under R.A. 9275

1. Discharging or depositing any water pollutant to the water body, or such which will impede natural flow in the water body.
2. Discharging, injecting or allowing to enter into the soil, anything that would pollute groundwater.
3. Operating facilities that discharge regulated water pollutants without the valid required permits.
4. Disposal of potentially infectious medical waste into sea by vessels.
5. Unauthorized transport or dumping into waters of sewage sludge or solid waste.
6. Transport, dumping or discharge of prohibited chemicals, substances or pollutants listed under Toxic Chemicals, Hazardous and Nuclear

Prohibited acts under R.A. 9275

7. Wastes Control Act (Republic Act No. 6969).
8. Discharging regulated water pollutants without the valid required discharge permit pursuant to this Act.
9. Noncompliance of the LGU with the Water Quality Framework and Management Area Action Plan.
10. Refusal to allow entry, inspection and monitoring as well as access to reports and records by the DENR in accordance with this Act.
11. Refusal or failure to submit reports and/or designate pollution control officers whenever required by the DENR in accordance with this Act.

Prohibited acts under R.A. 9275

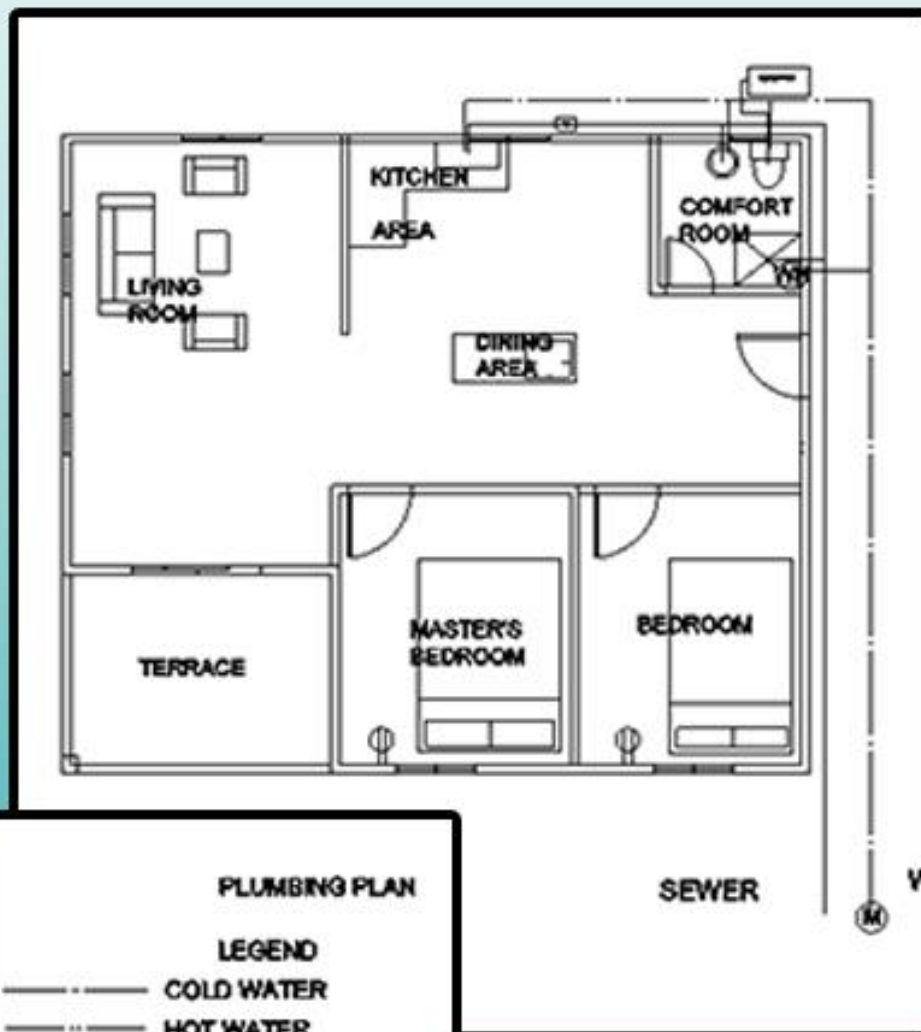
12. Directly using booster pumps in the distribution system or tampering with the water supply in such a way to alter or impair the water quality
13. Operate facilities that discharge or allow to seep, willfully or through grave negligence, prohibited chemicals, substances, or pollutants listed under R.A. No. 6969, into water bodies.
14. Undertake activities or development and expansion of projects, or operating wastewater treatment/sewerage facilities in violation of P.D.1586 and its IRR.

Why is it important to determine the prohibited act under R.A. 9275?

IV. LEARNING PHASES AND LEARNING ACTIVITIES

C. Engagement (Time Frame: 30 minutes)

SAMPLE PLUMBING PLAN



PLUMBING PLAN

LEGEND

- COLD WATER
- HOT WATER
- SANITARY WASTE
- (M) — WATER METER
- (WH) — WATER HEATER

Learning Task

Draw the different legends to be used in creating a plumbing plan

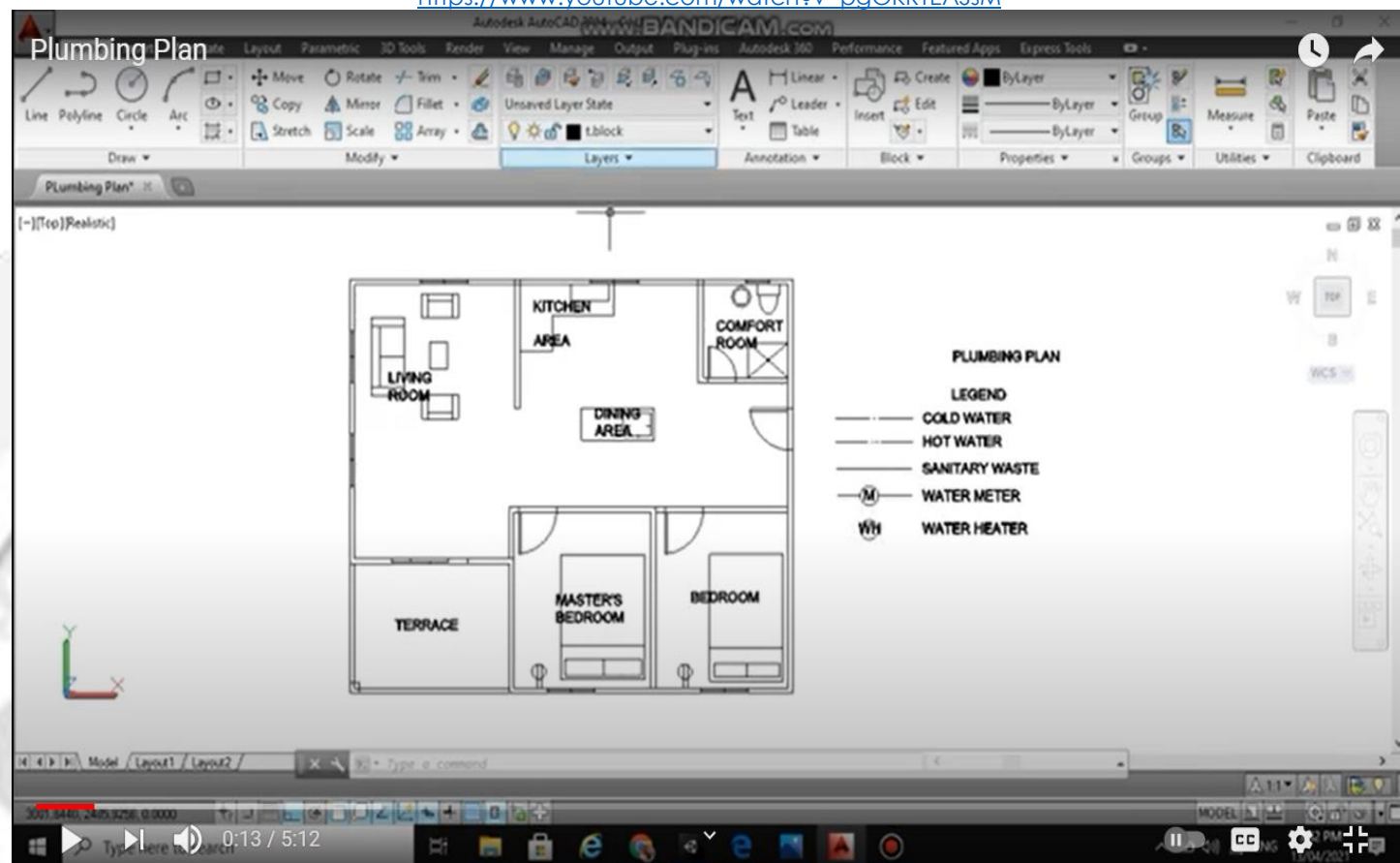
IV. LEARNING PHASES AND LEARNING ACTIVITIES

D. Assimilation (Time Frame: 2 hours)

Learning Task:

Create your own plumbing plan by following the procedures in the National Building Code and Plumbing Code

<https://www.youtube.com/watch?v=pgOKRTEASsM>



See the attached Rubrics for grading

V. ASSESSMENT (Time Frame: 30 minutes)

(Learning Activity Sheets for Enrichment, Remediation, or Assessment to be given on Weeks 3 and 6)

Explain importance of the following

1. Plumbing Plan
2. Prohibited Act 9275

Install using mobile phone then open plumbing and answer the quiz.

<https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical>

VI. REFLECTION (Time Frame: _____)

- Write your personal insights about the lesson using the prompts below.
I understand that _____.
I realize that _____.
I need to learn more about _____.

VII. REFERENCES

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National Building Code
Clean Water Act

Prepared by:

GODFRED M. VELARDE

Checked by:

FREDERICK B. ZAIDE
MAURA N. TACDERAS
DR. RHODA M. MANUAL

W4	Learning Area	TVL – ICT – TECHNICAL DRAFTING	Grade Level	10 / 12
	Quarter	Fourth	Date	

I. LESSON TITLE	Mechanical plan symbols
II. MOST ESSENTIAL LEARNING COMPETENCIES (MELCs)	Draft HVAC systems according to Mechanical Code TLE_ICTTD9-12DCIVd-e-1
III. CONTENT/CORE CONTENT	HVAC layout standards

IV. LEARNING PHASES AND LEARNING ACTIVITIES

A. Introduction (Time Frame: 30 minutes)

<https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical>

The cover sheet for mechanical drawings should contain appropriate notes, legends (chart or table of symbols and abbreviations), and details. The mechanical plan specifies the design of or the modifications to the mechanical system, ductwork layout and dimensions, mechanical equipment location, damper locations, design air-delivery rates, diffuser locations, thermostat locations, and supplemental cooling systems if required. Mechanical plans are normally identified as M-1, M-2, M-3, etc. Some consultants prefer the heating, ventilating, and air-conditioning drawings, commonly referred to as the HVAC drawings.

Mechanical systems deal with the heating and cooling of buildings or spaces. The two primary methods of heating and cooling use air or water. In an all-air system hot or cold air is transported to the space with supply and return air ducts. A typical example is a residential forced-air furnace. The furnace uses gas or oil to heat the air.

HVAC stands for heating, ventilation, and air conditioning. This system provides heating and cooling to residential and commercial buildings. You can find HVAC systems anywhere from single-family homes to submarines where they provide the means for environmental comfort. Becoming more and more popular in new construction, these systems use fresh air from outdoors to provide high indoor air quality. The V in HVAC, or ventilation, is the process of replacing or exchanging air within a space. This provides a better quality of air indoors and involves the removal of moisture, smoke, odors, heat, dust, airborne bacteria, carbon dioxide, and other gases as well as temperature control and oxygen replenishment.

The three main functions of an HVAC system are interrelated, especially when providing acceptable indoor air quality and thermal comfort. Your heating and air conditioning system is often one of the most complicated and extensive systems in your home, but when it stops working, you'll know soon enough! There are nine parts to your HVAC system that you should be familiar with the air return, filter, exhaust outlets, ducts, electrical elements, outdoor unit, compressor, coils and blower.

Air Return

Your air return is the part of your system that marks the starting point of the ventilation cycle. This return sucks in air, draws it through a filter, and then passes it into the main system. Pro tip: Make sure to dust your returns frequently as debris and dust can easily build up on your filters.

Filter

Your filter is the second part of the air return in which the air is drawn through. Pro tip: Make sure to change your filters regularly to keep your system in tip-top shape.

Exhaust Outlets

Another part of your system is the exhaust outlets where the exhaust created by the heating system is expelled. Pro tip: Check your chimney flue or vent stack annually and tune it up if necessary.

Ducts

Your ducts are the channels in which the heated or cooled air passes through. Pro tip: Get your ducts cleaned every 2 to 5 years in order to keep everything in working condition.

Electrical Elements

This part of your system can be a bit trickier, but often problems originate here first. Pro tip: If something isn't working right check for a tripped breaker or dead batteries in your thermostat.

Outdoor Unit

This is likely the part of your system you think of when someone mentions an HVAC system. The outdoor unit houses the fan which provides air flow. Pro tip: Keep your unit clear of debris and vegetation as it can cause serious problems if plants are sucked into your fan.

IV. LEARNING PHASES AND LEARNING ACTIVITIES

Compressor

As a part of the outdoor unit, the compressor is responsible for converting refrigerant from a gas to liquid and sends it to the coils. Pro tip: If something isn't working quite right, check your compressor. It is often the cause of many system failures.

Coils

Usually, another part of the outdoor unit, coils cool the air as it passes through with a little help from the refrigerant. Pro tip: Check your coils annually. If they freeze up you may want to check your filter and/or refrigerant levels.

Blower

The blower draws in warm air through the main section of the unit. Pro tip: The more efficiently this air moves through, the more durable your system will be.

B. Development (Time Frame: 30 mins.)

- How important it is to identify the mechanical system of a house?
- Sketch a mechanical system of a house by putting air condition and exhaust fan in it.

Rubric:

Creativity – 5
Accuracy – 5
Legibility – 5
Cleanliness – 5

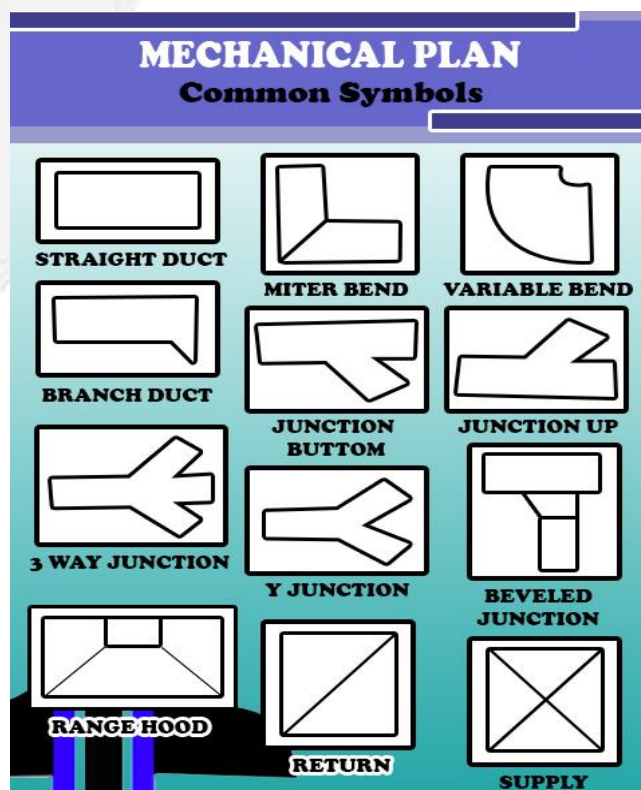
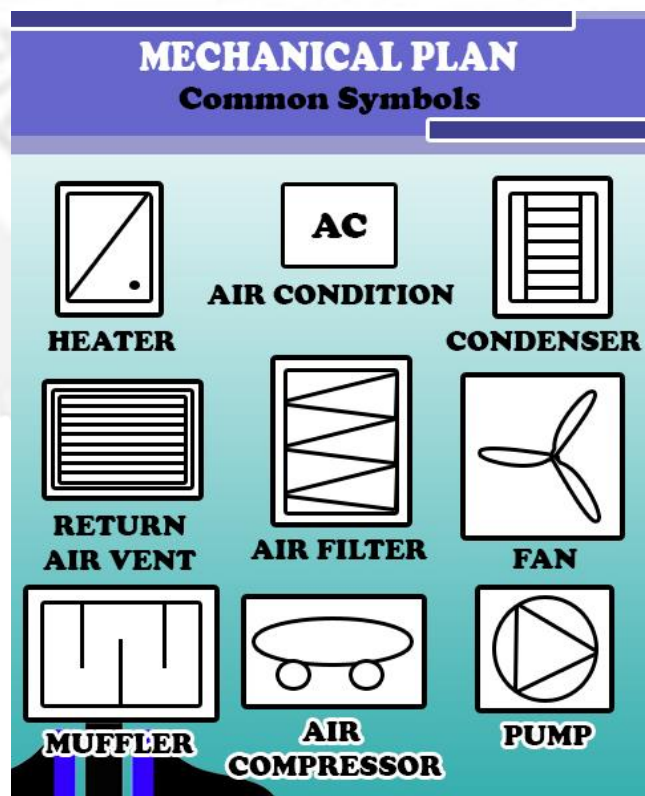
Indicator

5 – Excellent
4 – Very Good
3 – Good
2 – Fair
1 – Poor

- What will have happened if there are HVAC System in a house?
- How important it is to know the proper position for the HVAC system?

C. Engagement (Time Frame: 1 hour)

Draw the different mechanical plan symbols.

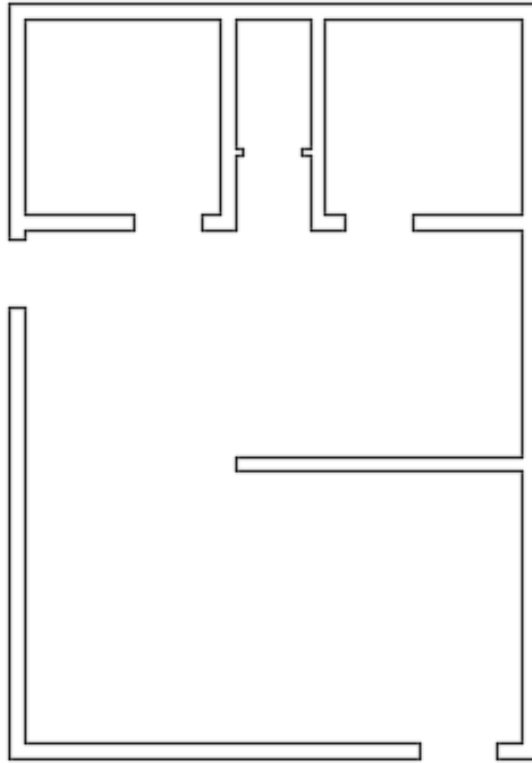


IV. LEARNING PHASES AND LEARNING ACTIVITIES

D. Assimilation (Time Frame: 1 hour)

Learning Task:

Using the floor plan insert the common symbols and use the mechanical symbols in constructing the HVAC system



See the attached Rubrics for grading.

V. ASSESSMENT (Time Frame: 30 minutes)

(Learning Activity Sheets for Enrichment, Remediation, or Assessment to be given on Weeks 3 and 6)

Explain the importance of the following

1. HVAC
2. Duct
3. Compressor
4. Filter

VI. REFLECTION (Time Frame: _____)

- Write your personal insights about the lesson using the prompts below.
I understand that _____.
I realize that _____.
I need to learn more about _____.

VII. REFERENCES

<https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical>
<https://www.northernarchitecture.us/building-codes/mechanical-drawings.html>
<https://brennanheating.com/how-does-hvac-system-work>
 National Building Code

Prepared by:

Godfred M. Velarde, Ed.D.

Checked by:

MAURA N. TACDERAS
 RHODA N. MANUAL, Ed.D
 FREDERICK B. ZAIDE
 TLE-ICT-TD10/12-w4

Technical Drafting

RUBRICS												
	Indicators											
Creativity	Unique and original artwork											
Accuracy	Attractive and has an eye-catching effect											
Legibility	Accurate placement of lines and image											
Cleanliness	Complete detail based on the topic											
Speed	Easy to understand and determine the work											
	Giving emphasis on the main object											
	Having a very clean work											
	Having an organize position of work											
	Completing the details early											
	Observing time of placement											
TOTAL												
NAME												
Generic Coding												
5 = Impressively meet the												
indicator												
4 = Meet the indicator												
3 = Slightly meet the												
indicator												
2 =Does not meet the												
indicator												
1 = Does not have the												
indicator												
0 = No Evidence												

W5	Learning Area	TVL – ICT – TECHNICAL DRAFTING	Grade Level	Ten / Twelve
	Quarter	Fourth	Date	
I. LESSON TITLE		Mechanical plan		
II. MOST ESSENTIAL LEARNING COMPETENCIES (MELCs)		Indicate signs and symbols according to mechanical layout and detail requirements TLE_ICTTD9-12DCIVd-e-1		
III. CONTENT/CORE CONTENT		Mechanical System		
IV. LEARNING PHASES AND LEARNING ACTIVITIES				
A. Introduction (Time Frame: <u>30 minutes</u>)				
https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical				
<p>Mechanical systems drawing is a type of technical drawing that shows information about heating, ventilating, air conditioning and transportation around the building (Elevators or Lifts and Escalator).[1] It is a powerful tool that helps analyze complex systems. These drawings are often a set of detailed drawings used for construction projects; it is a requirement for all HVAC work. They are based on the floor and reflected ceiling plans of the architect. After the mechanical drawings are complete, they become part of the construction drawings, which is then used to apply for a building permit. They are also used to determine the price of the project.</p> <p>An all-water heating system uses a type of coil through which hot water is circulated. The most common example is the fin-tube radiator found in older homes, typically located in front of a window. Today the most common system is the radiant floor heating panel.</p> <p>An all-electrical heating system uses electricity to heat elements within a radiator. The most common is the baseboard heater. It is used when a furnace is not installed. For example, many small cottages use baseboard heaters. Smaller, older commercial buildings rely on a baseboard installation. This system can also be found in larger commercial buildings as an addition to other systems. An electric radiator with a built-in fan might be located at an exterior entrance door to provide extra heat on the inside.</p> <p>The mechanical drawings provide the client, the builder, and the permit department with the complete HVAC layout for the job. These drawings are typically part of the construction-drawing set. They are submitted with the construction drawings for a building-permit application. They are also part of the package for pricing the project. They are used for construction. All ducting, venting, exhaust fans, and heating and/or cooling units must be supplied and installed as per the approved drawings.</p> <p>The following are typically included in a set of mechanical drawings:</p> <ul style="list-style-type: none">• Plans showing the size, type, and layout of ducting• Diffusers, heat registers, return-air grilles, and dampers• Turning vanes and ductwork insulation• HVAC unit types, quantities, and location• Thermostat types, quantities, and location• Electrical, water, or gas connections• Ventilation and exhaust fans• Symbol legend, general notes, and specific key notes• Heating and/or cooling load summary <p>Other information, depending on the complexity of the project, may include:</p> <ul style="list-style-type: none">• Connection to existing systems• Demolition of part or all of existing systems• Smoke detector and firestat for ducting• Thermostat programming				
B. Development (Time Frame: <u>30 mins.</u>)				
Learning task 1				
<ol style="list-style-type: none">1. How important it is to have a mechanical plan?2. Enumerate the steps in constructing a mechanical plan.<ol style="list-style-type: none">a.b.c.d.e.				

IV. LEARNING PHASES AND LEARNING ACTIVITIES

3. How important it is to know the steps in constructing a mechanical drawing?
4. What will happen if a house didn't have a proper mechanical plan? Cite some instances.
 - a.
 - b.
 - c.
 - d.
 - e.
5. Draw 5 symbols that can be used in a mechanical plan.

C. Engagement (Time Frame: 1 hours)

Download the app and do the drag and drop activity.

<https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical>

ACTIVITY

Instructions

Identify the appropriate location of the following mechanical symbols.

- 1. Drag and drop the mechanical symbols inside the floor plan.**
- 2. Input your name.**
- 3. Screen shot your work then send it to your teacher.**

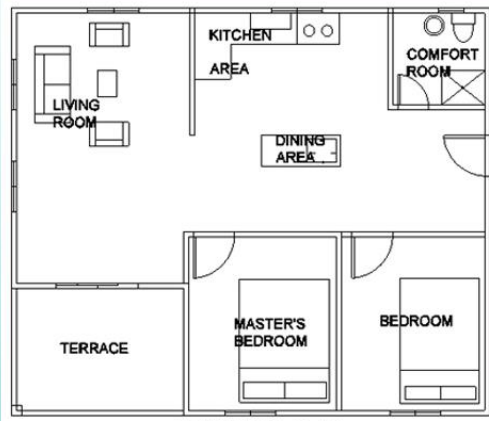
Note: A common mechanical plan of a house in the Philippines only includes Aircon, Exhaust Fan, and Range hood.

D. Assimilation (Time Frame: 1 hour)

Learning Task:


Draw a mechanical plan of your house


ACTIVITY




MECHANICAL PLAN

LEGEND

 EXHAUST FAN

 AIR CONDITION

 RANGE HOOD

V. ASSESSMENT (Time Frame: 30 minutes)

(Learning Activity Sheets for Enrichment, Remediation, or Assessment to be given on Weeks 3 and 6)

Explain the importance of the following

1. Heating System
2. Air Conditioning
3. Exhaust Fan
4. Range Hood

VI. REFLECTION (Time Frame: _____)

- Write your personal insights about the lesson using the prompts below.
I understand that _____.
I realize that _____.
I need to learn more about _____.

VII. REFERENCES

<https://play.google.com/store/apps/details?id=com.Elements.TechnicalDraftingElectrical>
<https://www.northernarchitecture.us/building-codes/mechanical-drawings.html>
 National Building Code

Prepared by:

Godfred M. Velarde, Ed.D.

Checked by:

MAURA N. TACDERAS
 RHODA N. MANUAL, Ed.D
 FREDERICK B. ZAIDE
 TLE-ICT-TD10/12-w5

Technical Drafting

RUBRICS												
	Indicators											
Creativity	Unique and original artwork											
Accuracy	Attractive and has an eye- catching effect											
Legibility	Accurate placement of lines and image											
Cleanliness	Complete detail based on the topic											
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	Having an organize position of work											
	Completing the details early											
	Observing time of placement											
TOTAL												
NAME												
Generic Coding												
5 = Impressively meet the												
indicator												
4 = Meet the indicator												
3 = Slightly meet the												
indicator												
2 =Does not meet the												
indicator												
1 = Does not have the												
indicator												
0 = No Evidence												

W6-7	Learning Area	TVL – ICT – TECHNICAL DRAFTING	Grade Level	Ten / Twelve
	Quarter	Fourth	Date	

I. LESSON TITLE	Types of Conveyor System
II. MOST ESSENTIAL LEARNING COMPETENCIES (MELCs)	Draw details of mechanical conveyor system according to mechanical layout and detail requirements TLE ICTTD9-12DC-IVf-g-2
III. CONTENT/CORE CONTENT	Conveyor System

IV. LEARNING PHASES AND LEARNING ACTIVITIES

A. Introduction (Time Frame: 2 hours)

A conveyor system is a fast and efficient mechanical handling apparatus for automatically transporting loads and materials within an area. This system minimizes human error, lowers workplace risks and reduces labor costs — among other benefits. They are useful in helping to move bulky or heavy items from one point to another. A conveyor system may use a belt, wheels, rollers, or a chain to transport objects.

How do conveyor systems work?



Typically, conveyor systems consist of a belt stretched across two or more pulleys. The belt forms a closed loop around the pulleys so it can continually rotate. One pulley, known as the drive pulley, drives or tows the belt, moving items from one location to another.

The most common conveyor system designs use a rotor to power the drive pulley and belt. The belt remains attached to the rotor through the friction between the two surfaces. For the belt to move effectively, both the drive pulley and idler must run in the same direction, either clockwise or counterclockwise.

While conventional conveyor systems such as moving walkways and grocery store conveyors are straight, sometimes, the unit needs to turn to deliver the items to the proper location. For the turns, there are unique cone-shaped wheels or rotors which allow the belt to follow a bend or twist without getting tangled.

Benefits of conveyor systems

The main purpose of a conveyor system is to move objects from one location to another. The design allows for movement of objects that are too heavy or too bulky for humans to carry by hand.

Conveyor systems save time when transporting items from one location to another. As they can be inclined to span multiple levels, they make it simpler to move items up and down floors, a task that, when performed manually by humans, causes physical strain. Inclined belts can automatically unload material, eliminating the need for someone to be on the opposite end to receive pieces.

Parts and Functions of Conveyor Systems

The conveyor belt support: this is a simplified component that assists the conveyor belt to swiftly draw itself. It also works as a firm support for the belt to ensure that it does not sag when the weight of an item is placed on the belt.

The pulley: The main function of the pulleys in the extremity unit is to control the movement of the belt. As such, the pulleys are strategically positioned to turn the belt around and cause it to return back, the empty belt is turned around ready for loading by the tail pulleys.

The driving unit: These mechanical units assist the conveyor system to run continuously, reverse, and adjust direction repeatedly. The counter bearing helps with efficient rotation between parts of the system. The driving unit is ideal in providing the required motion support for the belt to function effectively.

Types of Conveyors

Belt

Belt Conveyors are material handling systems that use continuous belts to convey products or material. The belt is extended in an endless loop between two end-pulleys. Usually, one or both ends have a roll underneath. The conveyor belting is supported by either a metal slider pan for light loads where no friction would be applied to the belt to cause drag or on rollers. Power is provided by motors that use either variable or constant speed reduction gears.

Roller Conveyor Systems

Roller Conveyors use parallel rollers mounted in frames to convey product either by gravity or manually. Key specifications include the roller diameter and axle center dimensions. Roller conveyors are used primarily in material handling applications such as on loading docks, for baggage handling, or on assembly lines among many others. The rollers are not powered and use gravity, if inclined, to move the product, or manually if mounted horizontally. The conveyors can be straight or curved depending on the application and available floor space.

Powered Roller

Powered Roller Conveyors use powered rollers mounted in frames to convey products. Key specifications include the drive type, roller diameter and material, and the axle center dimension. Powered roller conveyors are used primarily in material handling applications that require the powered conveyance of the product. Various drive types include belts, chains/sprockets, and motorized rollers. Some of the uses of powered roller conveyors are food handling, steelmaking and, packaging.

Slat Belt Conveyor/Apron

Apron/Slat Conveyors use slats or plates made of steel, wood, or other materials typically mounted on roller chains to convey product. The slats are not interlocked or overlapping. Apron/slat conveyors are used primarily in material handling applications for moving large, heavy objects including crates, drums, or pallets in heavy-industry settings such as foundries and steel mills. The use of slats in heavy duty use cases prolongs the service life of the conveyor over other conveyor types that employ belts, which would wear out quicker under the exposure to heavy loads. These conveyor systems are usually powered and come in many sizes and load capacities.

Ball Transfer Conveyor

Ball Transfer tables or conveyors use a series of mounted ball casters to allow for unpowered, multi-directional conveyance of the product. Key specifications include the ball material and size. Ball transfer conveyors are used in material handling applications such as assembly lines and packaging lines, among others. When positioned where multiple conveyor lines meet, they are used to transfer products from one line to another and are often used in sorting systems. Many sizes and load carrying capacities are available. Ball transfer conveyors are not powered and rely on external forces to move the product along the conveyor.

Magnetic

Magnetic Conveyors use moving magnets mounted beneath stationary plates, tables, or other kinds of non-magnetic slider beds, to move magnetic (ferrous) materials, often in the form of machining scrap. Magnetic conveyors are commonly used as chip conveyors to remove ferrous chips from machining centers. Systems can be configured to use horizontal motion, vertical motion, or combinations. They can be beltless or may use a conveying belt instead of a slider bed. Underneath the conveying belt, a rail containing an electromagnet is used to attract ferrous materials to the belt. Because of the magnetic attraction of the product to the conveyor, these systems can also be used upside down.

Bucket

Bucket Conveyors or bucket elevators use multi-sided containers attached to cables, belts, or chains to convey products or materials. The containers remain upright along the system and are tipped to release material. Bucket conveyors are used in applications such as parts, bulk material, or food processing and handling. The conveyed material can be in liquid form or dry such as sludge, sand, manure, sugar, and grain. The systems can be used horizontally or can be inclined or vertical to change levels of the delivered products. Many sizes and load carrying capacities are available depending on the application.

Chute

Chute or Trough Conveyors are material handling systems that use gravity to convey product along smooth surfaces from one level to another. Key specifications include the chute material and the physical dimensions such as length and chute width. Chute conveyors are used for scrap handling, packaging, postal service package or mail handling, etc. Chutes are designed to have a low coefficient of dynamic friction, allowing the product or material to slide easily, and can be straight or curved depending on the needs of the application.

Chain/Tow/Drag Line Conveyor

Drag/Chain/Tow Conveyors use mechanical devices attached to moving members, usually chains or cables, to drag or tow products. Drag conveyors are used for moving bulk materials in bins, flights, or other attachments and can have multiple discharge or loading points. Tubular drag conveyors use a fully enclosed system of chains to convey product in any direction. Chain conveyors use a chain, or multiple chains to move pallets or other hard-to-convey products. Tow conveyors use a towline such as cables or chains, usually in the floor or just above it, to tow product directly or to tow wheeled carts or dollies.

Overhead

Overhead Conveyors are mounted from ceilings that use trolleys or carriers moved by chains, cables, or similar connections. Overhead conveyors are primarily used in material handling applications where the product needs to be hung, such as dry-cleaning garment lines, paint lines, or parts handling systems, or for cooling and curing. Various types of overhead conveyor

IV. LEARNING PHASES AND LEARNING ACTIVITIES

systems configurations are available including electric track, monorail, trolley, as well as inclined or ramped. Depending on the application, the load-carrying capacity may be critical. Most overhead conveyors systems are powered and controlled, while others are hand-operated conveyor belts.

Pneumatic/Vacuum

Pneumatic/Vacuum Conveyors use air pressure or vacuum to transport materials or items in or through closed tubes or ducts or along surfaces. Pneumatic/vacuum conveyors are used primarily in materials handling applications such as dust collection, paper handling, ticket delivery, etc. and in processes such as chemical, mineral, scrap, and food. Materials for the conveyors can be metallic or non-metallic depending on the media being conveyed. Various sizes are available depending on the load and throughput requirements.

Screw/Auger

Screw conveyors, sometimes known as spiral, worm, or auger conveyors use helical elements to move materials. They consist of a helical screw element or steel auger that rotates around a central shaft, driving the work material according to the screw design and rotational direction. The helical screw functions within a casing, trough or compartment to take full advantage of the rotational force. Manufacturers use screw conveyors to transport materials such as flakes, grains, powders, seeds, and granules. Alternatively, these devices can be used to mix, agitate or blend such materials, or to maintain solutions. They are used widely in agricultural applications, from use in farm machinery like threshers and balers to factory-based grain and crop movers. A mini screw conveyor can also transport wet, non-flowing and caking materials that might otherwise be difficult to move, such as concrete. Other applications for screw conveyors are the conveying of various mechanical parts or to function as a bottling system conveyor. The screw can be of a paddle or ribbon design depending on the application and can be driven via a chain and sprocket, gears, or direct drive.

Vertical

Vertical Conveyors move products vertically between levels of conveying lines. Key specifications include the lift speed and maximum load height. Vertical conveyors move material or product to higher levels within a facility. They are further classified as continuous lifting or reciprocating. Various sizes and load capabilities are available depending on the application.

Vibrating

Vibrating Conveyors use rotary or linear vibration to move material along their system beds. Vibrating conveyors are used for moving dry, bulk materials such as aggregate, gravel, coal, etc. The bed of the conveyor vibrates to move the material along its length. The conveyor can be a trough, a tube, or a flat table top. Many sizes are available depending on the application.

Walking Beam

Walking Beam Conveyors use a combination of static supports and moving supports to index workpieces through manufacturing cells. Walking beam conveyors are used on automation and assembly lines, where items need to be placed in specific locations in a sequential manner. The item being supported at a stationary position is picked up by the walking beam and indexed to its next position, where another manufacturing step takes place. This movement repeats over the length of the conveyor. Walking beam conveyors can have single or multiple lines depending on the product.

Wheel Conveyor

Wheel Conveyors use unpowered wheels to move objects along their lengths by gravity or manual power. Wheel conveyors are used for item or package handling and are commonly employed for loading and unloading trucks and moving packages, pallets, etc. through facilities or along assembly lines. The conveyors are configured by the number of wheels and wheel spacing, depending on the load requirements and the application.

B. Development (Time Frame: 30 mins.)

Learning Task 1

1. How important is the conveyor system in mechanical engineering?
2. What are the benefits having a conveyor system? Enumerate
 - a.
 - b.
 - c.
3. What are the functions of the different types of conveyor system?

C. Engagement (Time Frame: 3 hour)

Learning Task 2

Draw the different conveyor types.

Belt Conveyor

Belt conveyors are the most commonly used powered conveyor due to their economical cost and simplicity.



Versatile in what products they can transport
Used to carry loads over long distances with a single AC drive motor.
Convey products to different elevations (incline or decline)
Plastic belt conveyors are used in food and beverage markets.

Roller Conveyor

Roller conveyor encompasses many designs for a wide variety of applications.



Simple product transportation from point A to B (live roller conveyor)
Used to accumulate product with minimum or zero pressure.
Used to convey large, heavy loads such as pallets with chain driven roller.

Gravity Conveyor

Non-powered conveyors, commonly referred to as gravity conveyor, are an economical choice for unit handling.



Loads are conveyed on rollers or skate wheels.
Installed with a 4 degree to 7-degree decline for product to flow.
Widely used within pick modules, work stations, and truck loading/unloading

Zero Pressure Roller Conveyor

Zero Pressure Roller Conveyor is essential for heavy and light / fragile products mixed.



Roller or Belt Conveyors
Products do not touch
Keeps products safe from crushing on the conveyor line

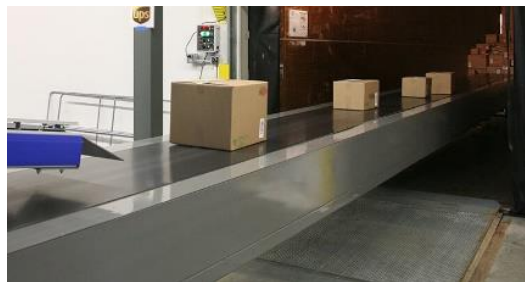
24 Volt Roller or Belt Conveyor



Energy efficient, low profile 24V motors power individual accumulating zones.
Modular for easier system modifications
Quiet Operation

IV. LEARNING PHASES AND LEARNING ACTIVITIES

Extendable & Flexible Conveyor



Extendable conveyors are often used to load or unload shipping trailers or containers.

Ergonomic Loading

D. Assimilation (Time Frame: 2 hour)

Learning Task 3:

Create your own design of conveyor system.



SAMPLE ONLY

See the attached Rubrics for grading.

V. ASSESSMENT (Time Frame: 30 minutes)

(Learning Activity Sheets for Enrichment, Remediation, or Assessment to be given on Weeks 3 and 6)

Explain the importance of the following

1. Conveyor System
2. Belt Conveyor
3. Roller Conveyor
4. Gravity Conveyor

VI. REFLECTION (Time Frame: _____)

- Write your personal insights about the lesson using the prompts below.
I understand that _____.
I realize that _____.
I need to learn more about _____.

VII. REFERENCES

<https://6river.com/what-is-a-conveyor-system/>
<https://www.bastiansolutions.com/solutions/technology/conveyor-systems/>

Prepared by:

Godfred M. Velarde, Ed.D.

Checked by:

MAURA N. TACDERAS
RHODA N. MANUAL, Ed.D
FREDERICK B. ZAIDE
TLE-ICT-TD10/12-w6-7

Technical Drafting

[illegible]

W8	Learning Area	TVL – ICT – TECHNICAL DRAFTING	Grade Level	Ten / Twelve
	Quarter	Fourth	Date	

I. LESSON TITLE	Fire Protection System
II. MOST ESSENTIAL LEARNING COMPETENCIES (MELCs)	Draw signs and symbols of fire protection systems according to fire protection requirements TLE ICTD9-12DC-IVf-g-2
III. CONTENT/CORE CONTENT	Fire Protection Symbols

IV. LEARNING PHASES AND LEARNING ACTIVITIES

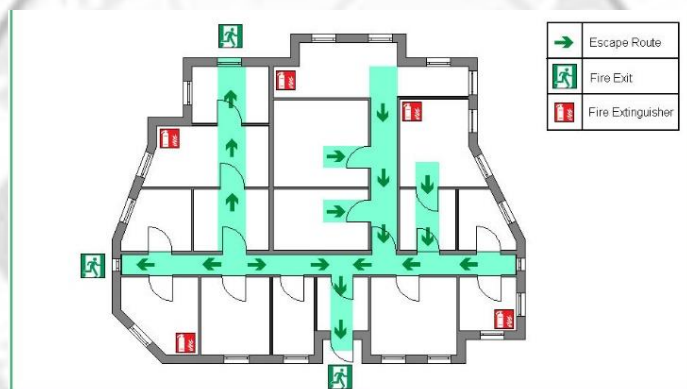
A. Introduction (Time Frame: 30 minutes)

Fire protection systems include fire suppression, sprinklers, smoke detectors, and other fire protection equipment that works in tandem to protect against fire. It is best to work with a fire protection company that understands the needs of your property and provides a variety of integrated protection systems.

Active fire suppression systems require some kind of action to undergo their intended purpose whether it be to trigger an alarm or release a clean suppression agent. Fire detection systems may seem passive but are actually considered active fire protection and can be combined with a suppression or sprinkler system to extend protection.

Passive fire protection is often forgotten but equally as important and must be combined with active fire protection systems for full fire protection. Passive fire protection systems are those systems put in place within the structure of the building and require no human interaction to do what they were intended to do.

Fire Exit Plan



Steps to consider in making a fire evacuation plan.

1. Imagine various scenarios

When planning your business fire evacuation plan, start with some basic questions to explore the primary threats your business may face in the case of a fire.

2. Establish roles and responsibilities

When a fire emerges and your business must evacuate, employees will look to their leaders for reassurance and guidance. Create a clear chain of command with backups that states who has the authority to order an evacuation.

3. Determine escape routes and nearest exits

A good fire evacuation plan for your business will include primary and secondary escape routes. Clear signs should mark all the exit routes and fire escapes. These exit routes should be kept clear of furniture or other objects that could impede a direct means of egress for your employees.

4. Create a communication plan

During a fire drill, designate someone (such as the assistant fire warden) whose primary job is to call the fire department and emergency responders as well as disseminate information to key stakeholders, including employees, customers, and the news media. As applicable, assess whether your crisis communication plan also should include community outreach, suppliers, transportation partners, and government officials.

5. Know your tools and inspect them

Make sure to always have your fire system check.

6. Rehearse fire evacuation procedures

Conduct a drill.

7. Follow-up and reporting

Your company's leadership needs to be communicating and tracking progress in real-time. Fires move quickly, and seconds could make a difference.

IV. LEARNING PHASES AND LEARNING ACTIVITIES

B. Development (Time Frame: 30 mins.)



























































Learning Task 1:

1. Why do we need fire protection system?
2. How important it is to have a fire evacuation plan?
3. What are common symbols used in a fire protection system?

C. Engagement (Time Frame: 1 hour)

Learning Task 1:

Draw the different fire symbols.

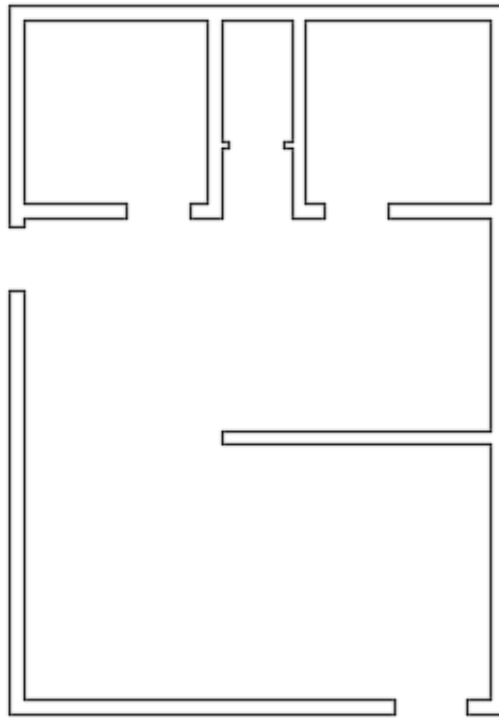
	Direction arrow		Fire blanket		You are here		Danger compressed gas		Exits and entrances
	Stairs		Fire alarm, black		Entrance		Flammable material		Water supplies
	Double stairs		Fire alarm, red		Fire barrier		Oxidant material		Elevator shaft
	Elevator		Fire extinguisher 1		Underfloor hydrant		Harmful chemicals		Nearest fire hydrant
	Emergency exit		Fire extinguisher 2		Transformer		Non ionising radiation		Electric shut off
	Handicapped emergency exit		Fire hose		Fire alarm systems		Corrosive material		Knock box location
	Use stairs in fire		Fire hose with black text		Fire alarm control panel		High voltage		Water shut off
	Fire escape / fire exit		Fire hose with red text		Fire department key depot		Dangerous chemical		Other vertical openings
	Assembly point		First aid		Biohazard		Danger of death		Roof access
	Emergency phone 1		Direction		Radiation hazard		Sprinkler connections		Gas shut off
	Emergency phone 2		Left arrow		Obstructions		Private fire detection system		
	Emergency contact information		Right arrow		Fire escape				
					Hazardous materials storage				

IV. LEARNING PHASES AND LEARNING ACTIVITIES

D. Assimilation (Time Frame: 1 hour)

Learning Task 2:

Using the floor plan create and fire exit plan include symbols and arrows.



See the attached Rubrics for grading.

V. ASSESSMENT (Time Frame: 30 minutes)

(Learning Activity Sheets for Enrichment, Remediation, or Assessment to be given on Weeks 3 and 6)

Explain the importance of the following:

1. Fire Protection System
2. Fire Evacuation Plan
3. Fire extinguisher

VI. REFLECTION (Time Frame: _____)

- Write your personal insights about the lesson using the prompts below.
I understand that _____.
I realize that _____.
I need to learn more about _____.

VII. REFERENCES

<https://www.keystonefire.com/blog/what-is-a-fire-protection-system>
<https://www.securityalarm.com/blog/does-my-business-need-a-fire-escape-plan/>
<https://www.alertmedia.com/blog/fire-evacuation-plan-for-your-business/>

Prepared by:

Godfred M. Velarde, Ed.D.

Checked by:

MAURA N. TACDERAS
RHODA N. MANUAL, Ed. D
FREDERICK B. ZAIDE
TLE-ICT-TD10/12-w8

Technical Drafting

RUBRICS												
	Indicators											
Creativity	Unique and original artwork											
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Accuracy		Accurate placement of lines and image										
			Complete detail based on the topic									
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					Giving emphasis on the main object							
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