DEPARTMENT OF EDUCATION
REGION X - NORTHERN MINDANAO
DIVISION OF CAGAYAN DE ORO CITY
Fr. William F. Masterson, SJ Avenue, Upper Balulang, Cagayan de Oro City

Learning Activity Sheets

Plumbing

SHARED OPTIONS

Senior High Alternative Responsive Education Delivery

Preface

It has been elaborated in research and literature that the highest performing education systems are those that combine quality with equity. Quality education in the Department of Education (DepEd) is ensured by the learning standards in content and performance laid in the curriculum guide. Equity in education means that personal or social circumstances such as gender, ethnic origin or family background, are not obstacles to achieving educational potential and that inclusively, all individuals reach at least a basic minimum level of skills.

In these education systems, the vast majority of learners have the opportunity to attain high-level skills, regardless of their own personal and socio-economic circumstances. This corresponds to the aim of DepEd Cagayan de Oro City that no learner is left in the progression of learning. Through DepEd's flexible learning options (FLO), learners who have sought to continue their learning can still pursue in the Open High School Program (OHSP) or in the Alternative Learning System (ALS).

One of the most efficient educational strategies carried out by DepEd Cagayan de Oro City at the present is the investment in FLO all the way up to senior high school. Hence, Senior High School Alternative Responsive Education Delivery (SHARED) Options.

Two secondary schools, Bulua National High School and Lapasan National High School, and two government facilities, Bureau of Jail Management and Penology-Cagayan de Oro City Jail and Department of Health-Treatment and Rehabilitation Center-Cagayan de Oro City, are implementing the SHARED Options.

To keep up with the student-centeredness of the K to 12 Basic Education Curriculum, SHARED Options facilitators are adopting the tenets of Dynamic Learning Program (DLP) that encourages responsible and accountable learning.

This compilation of DLP learning activity sheets is an instrument to achieve quality and equity in educating our learners in the second wind. This is a green light for SHARED Options and the DLP learning activity sheets will continually improve over the years.

Ray Butch D. Mahinay, PhD
Jean S. Macasero, PhD

Acknowledgment

The operation of the Senior High School Alternative Responsive Education Delivery (SHARED) Options took off with confidence that learners with limited opportunities to senior high school education can still pursue and complete it. With a pool of competent, dedicated, and optimistic Dynamic Learning Program (DLP) writers, validators, and consultants in Senior High School Technical Vocational Livelihood Learning activity Sheets , the SHARED Options is in full swing.

Gratitude is due to the following:

- Schools Division Superintendent, Cherry Mae L. Limbaco, PhD, CESO V, Assistant Schools Division Superintendent Alicia E. Anghay, PhD, for buoying up this initiative to the fullest;
- CID Chief Lorebina C. Carrasco, and SGOD Chief Rosalio R. Vitorillo, for the consistent support to all activities in the SHARED Options;
- School principals and senior high school teachers from Bulua NHS, Lapasan NHS, Puerto NHS and Lumbia NHS, for the legwork that SHARED Options is always in vigor;
- Stakeholders who partnered in the launching and operation of SHARED Options, specifically to the Bureau of Jail Management and Penology-Cagayan de Oro City Jail and the Department of Health-Treatment and Rehabilitation Center-Cagayan de Oro City;
- Writers: Jemary S. Balgos, Hazel Engracia and validators of the DLP learning activity sheets, to which this compilation is heavily

attributable to, for their expertise and time spent in the workshops;

- Alternative Learning System implementers namely Willy P. Calo Ailiene P. Libres, Rubeneth V. Salazar and Metocila O. Agbay, Puerto National High School, Leneth G. Udarbe, Lapasan National High School and Pinky B. Dela Calzada, for the technical assistance given to the sessions;
- Reproduction (LRMDS) Gemma P. Pajayon and Lanie M. Signo
- To all who in one way or another have contributed to the undertakings of SHARED Options.

Mabuhay ang mga mag-aaral! Ito ay para sa kanila, para sa bayan!

Jean S. Macasero, PhD
Juan A. Mingo

MONITORING OF ACCOMPLISHED LEARNING ACTIVITY SHEETS

PLUMBING NCI

ACTIVITY NUMBER	LEARNING ACTIVITY TITLE	DATE	SCORE	ITEM
1	Observe procedure, specification and manual of instruction(Chop Saw)			10
2	Observe procedure, specification and manual of instruction((Chop Saw -Skills)			5
3	Observe procedure, specification and manual of instruction(Pipe Threader)			5
4	Observe procedure, specification and manual of instruction(Pipe Threader-Skills)			15
5	Observe procedure, specification and manual of Instruction (Angle Grinder)			10
6	Observe procedure, specification and manual of Instruction (Angle Grinder-Skills)			100
7	Relevance of the course			5
8	Career Opportunities			5
	LO 1. PREPARE FOR PLUMBING WORKS. LO1.1 Interpret work plans and isometric drawings in accordance with the job specifications			
9	Interpreting Isometric Drawing(Alphabets of Line)			7
10	Orthographic View			100
11	Orthographic View			100
12	Plumbing Symbols			10
13	Plumbing Symbols (Definition of Terms)			5
14	Plumbing Symbols(How to read blueprint)			5
15	Plumbing Symbols			10
16	Plumbing Symbols			10
17	Plumbing Symbols			25
	LO 1.2. Prepare materials, tools, and equipment according to the job requirements .			
18	Boring Tools			100
19	Cutting Tools			100
20	Driving Tools			100
21	Holding Tools			100
22	Measuring Tools			100
23	Testing Tools			100
24	Types of Pipe			100
25	PVC Pipe			30

26	PE Pipe			15
27	GI Pipe			15
28	PPR Pipe			15
29	uPCV Pipe			15
30	Connection Materials			5
	LO 2. INSTALL PIPES AND FITTINGS. 2.1 Install pipes and fittings for branches based on job specifications following the Revised National Plumbing Code of the Philippines (RNPCP) and venting requirements and procedures.			
31	Revised National Plumbing Code of the Philippines(Plumbing Code)			5
32	Revised National Plumbing Code of the Philippines(Plumbing Code)			5
33	Revised National Plumbing Code of the Philippines(Plumbing Code)			5
34	History of Plumbing			5
35	Revised National Plumbing Code of the Philippines (Section 1)			10
36	Revised National Plumbing Code of the Philippines (Section2)			5
37	Revised National Plumbing Code of the Philippines (Section3)			5
38	Elements of Plumbing System (Journey of Plumber)			5
39	Water Cycle			5
40	Elements of Plumbing System			5
41	Elements of Plumbing System			5
42	Elements of Plumbing System			5
43	Elements of Plumbing System			10
	LO 2.2 Align drainage, sewer, and vent piping systems in the required locations as prescribed in the approved work plan.			
44	Installation of drainage /sewer/vent /piping system			5
45	Installation of drainage /sewer/vent /piping system			5
	2.4 Use appropriate Personal Protective Equipment (PPE)			
46	Proper types of PPE			10
	LO 3. INSTALL HOT AND COLD WATER SUPPLY. 3.1 Use pipes and fittings in accordance with the job specifications.			

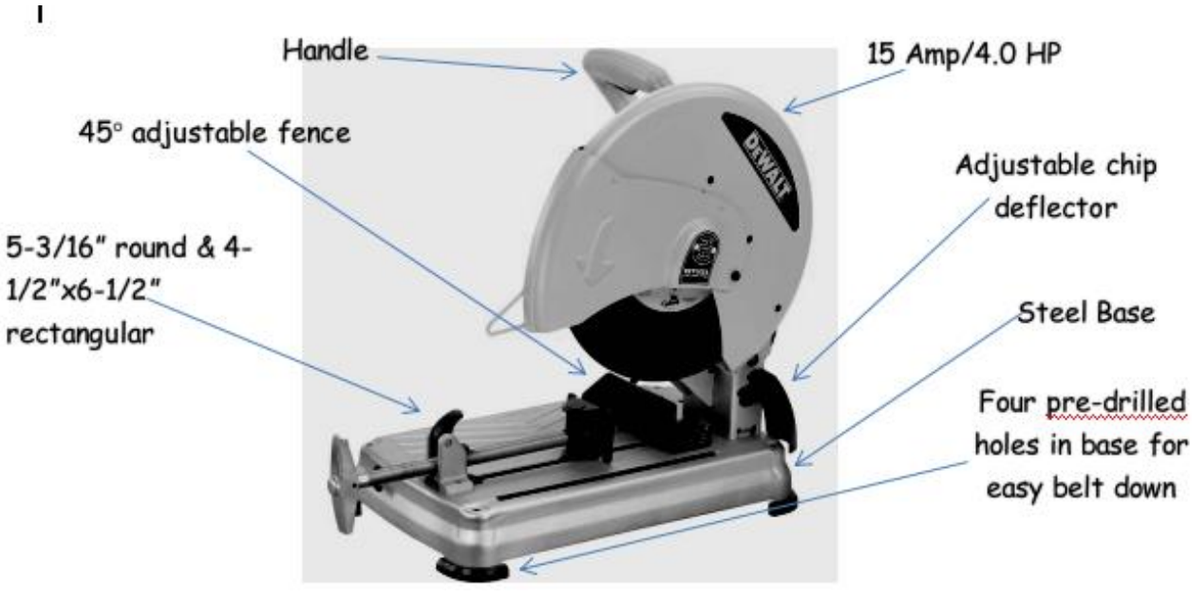
47	Procedure in cutting cast iron (Galvanized Steel)			100
48	Procedure in cutting cast iron (Galvanized Steel)			12
49	Procedure in cutting cast iron (Galvanized Steel)			15
50	Procedure in cutting cast iron (Galvanized Steel)			10
	3.2 Install hot and cold water supply according to the approved work plan and specifications.			
51	Procedure in caulking cast iron pipe			5
52	Procedure in caulking cast iron pipe			10
	3.3 Install water pipes free of leak and contamination.			
53	Table for amount of lead and oakum in caulking CI pipes			10
54	Table for amount of lead and oakum in caulking CI pipes			10
	LO 4. INSTALL AND ASSEMBLE PLUMBING FIXTURES. 4.1 Use pipes and fittings in accordance with the work plan			
55	Procedures in setting-up plumbing fixtures (Faucet)			15
56	Procedures in setting-up plumbing fixtures (Faucet)			100
57	Procedures in setting-up plumbing fixtures (Lavatory)			100
58	Procedures in setting-up plumbing fixtures (KITCHEN SINK)			10
	4.2 Install plumbing fixtures according to the rough-in specifications.			
59	Plumpness of plumbing fixtures (Water Closet)			5
60	Plumpness of plumbing fixtures (Lavatory)			5
61	Plumpness of plumbing fixtures(KITCHEN SINK)			5
	4.5 Perform proper housekeeping (5S)			
62	Proper housekeeping			5
63	Proper housekeeping			15
64	Proper housekeeping			100

Name:	Date:	Score:
Subject : PLUMBING NCI		
Lesson Title : Observe Procedure, Specification and Manual of Instruction(Chop Saw)		
Learning Competency : Interpret Manuals Enabling Skills: Identify its Parts		
References : https://www.northerntool.com/images/product/2000x2000/242/24287_2000x2000.jpg		LAS No.: 1

CONCEPT NOTES

CHOP SAW

A chop saw is a power tool which straights cut in pipes and wood. It may have features that allow it to cut angles of a pipe Below are the parts of a chop saw.



EXERCISES. Fill in the blanks with appropriate answer.

1. Chop saw is used to cut _____ and _____.
2. It allows to cut _____ of a pipe.
3. These are the parts of the chop saw.1. _____, 2._____, 3._____, 4._____, 5. _____, 6_____,7. _____.

Name:	Date:	Score:
Subject: PLUMBING NC I		
Lesson Title : Observe Procedure, Specification and Manual of Instruction(Chop Saw)		
Learning Competency : Interpret Manuals Enabling Skills: Changing Disc of Chop Saw		
References : https://sawsonskates.com/how-to-change-blade		LAS No.: 2

CONCEPT NOTES

FOR SAFE OPERATION READ THE INSTRUCTION MANUAL. DO NOT USE TOOTHED BLADES. USE ONLY REINFORCED WHEELS RATED 4100 RPM OR HIGHER. WHEN SERVICING, USE ONLY IDENTICAL REPLACEMENT PARTS. ALWAYS WEAR EYE PROTECTION, USE EAR GUARDS, CLAMP WORK IN VISE, USE MASK FOR RESPIRATORY PROTECTION. DO NOT EXPOSE THE TOOL TO RAIN AND DO NOT USE IT IN DAMP AREAS.

STEPS ON HOW TO CHANGE THE DISC

1. Disconnect the miter saw plug from the outlet.
2. Press the spindle lock and loosen the bolt.
3. Remove the chop saw blade.
4. Install the new chop saw blade.
5. Press the spindle lock and tighten the bolt

THE TEACHER WILL SHOW VIDEO CLIPS ON HOW TO CHANGE THE DISC ON CHOP SAW.

EXERCISES Change the disc of the Chop Saw by following the steps.

RUBRIC FOR CHANGING THE DISC OF CHOP SAW

	YES	NO
1. The parts of the chop saw were classified correctly.		
2. The parts being changed were demonstrated correctly.		
3. The safety measures in changing the disc (PPE) were applied.		
4. The damages of the disc were recorded accurately		
5. The damaged disc was changed entirely.		
Total		

RATING SCALE
1 YES SCORE = 5 points
2 YES SCORE = 10 points
3 YES SCORE = 15 points
4 YES SCORE = 20 points
5 YES SCORE = 25 points

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Observation Procedure, Specifications and Manual Of Instruction (Pipe Threader)		
Learning Competency : Interpret Manuals		
References : https://www.wisegeek.com/what-is-a-pipe-threader.htm	LAS No.: 3	

CONCEPT NOTES

The plumbers will use a pipe-cutting tool before threading in order to cut the pipe to the desired length. Then the end of the pipe is inserted into the pipe threader. Special cutting tools, or disc, within the threader can be used to create the proper thread profile and depth. Manual pipe threaders are operated by using a ratcheting motion; while larger units include a motor to automatically cut the threads. The pipe threader must be lubricated with special oil to ensure a smooth cut and to maximize the life of equipment.

After cutting threads, the users must clean the threads using a tool known as a thread reamer. This device smooths out the edges of the threads and removes burs or debris. Without the thread reamer, the user will have difficulty in screwing the pipe into the connector.

EXERCISES: Direction: The teacher will provide a manual of instructions for the students to interpret in forty (40) minutes. The students will be evaluated based upon the teacher's observations.

RUBRICS ON INTERPRETING THE PIPE THREADER MANUAL

TEACHER'S CHECKLIST	YES	NO
1. The student demonstrated correct parts being changed.		
2. The student applied safety measures in changing the disc set.		
3. The student manipulated the pipe threader properly.		
4. The student removed the burs in the pipe threader.		
5. The student applied lubricant in the pipe threader.		
TOTAL		

RATING SCALE: 5 Yes- 100% 4 Yes- 95% 3 Yes -90% 2 Yes-85% 1 Yes -80%

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Observe Procedure, Specifications and Manuals of Instruction		
Learning Competency: Interpret manuals (Pipe Threader)		
References : https://www.wisegeek.com/what-is-a-pipe-threader.htm		LAS No.: 4

CONCEPT NOTES

A pipe threader is a device to cut grooves or threads into the end of a metal pipe. These grooves are similar to those found on a traditional screw. A pipe threader allows plumbers or builders to fasten a length of pipe securely to a coupling or connector. The threads on the pipe fit into a pattern of threads in the connector, it allows users to screw the two components together by hand. Besides; it allows installers to complete plumbing projects quickly. It serves as a handy tool for emergency and repair work.

(Figure 1). Cutting End of Pipe

EXERCISES: Essay (5 points each)

1. What will happen to the operator if he will not read the manual of instructions?
2. Why does the plumber need to ream the pipe after cutting?
3. Can he use a one-half (1/2"Ø) pipe threader if he use one - half (1/2"Ø) pipe? Why?

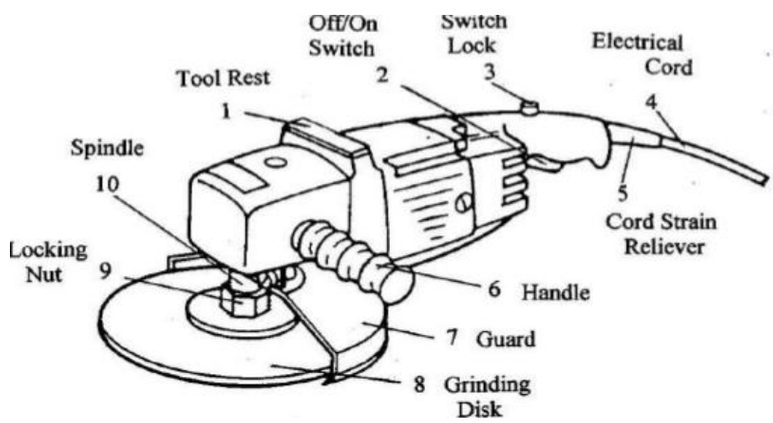
Name:	Date:	Score:
Subject: PLUMBING NC1		
Lesson Title : Observe Procedure, Specifications And Manuals Of Instruction		
Learning Competency: Interpret Manual		
References : https://www.makita.ca/data/upload/owners_manuals/9564,%209565%20-%20ENG_owner_English.pdf?tm=1537305708 https://en.wikipedia.org/wiki/Angle_grinder		LAS No.: 5

CONCEPT NOTES

An **angle grinder**, also known as a **side grinder** or **disc grinder**, is a handheld power tool used for grinding (abrasive cutting) and polishing. Although; developed originally as tools for rigid abrasive discs, the availability of an interchangeable power source has encouraged their uses with a wide variety of cutters and attachments.

Angle grinders can be powered by an electric motor, petrol engine or compressed air. The motor drives a geared head at a right-angle on which is mounted an abrasive disc or a thinner cut-off disc, either of which can be replaced when worn. Angle grinders typically have an adjustable guard and a side-handle for two-handed operation.

Parts of Angle Grinder



EXERCISES: Identify each parts of angle grinder (10 points).

:

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Observe Procedure, Specifications And Manuals Of Instructions		
Learning Competency: Interpret Manuals Enabling Skills: Manipulate the Angle Grinder by removing the disc		
References: https://www.makita.ca/data/upload/owners_manuals/9564,%209565%20-%20ENG_owner_English.pdf?tm=1537305708		LAS No.: 6

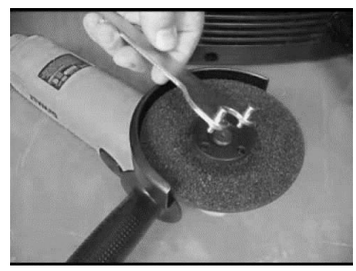
CONCEPT NOTES

Installing or removing damaged center grinding disc

WARNING: • Always use supplied guard when damaged center grinding disc is attached on the tool. Wheel can shatter during use and guard helps to reduce chances of personal injury.

Procedures

Mount the inner flange onto the spindle. Fit the wheel/disc on the inner flange and screw the lock nut onto the spindle.



To tighten the lock nut, press the shaft lock firmly so that the spindle cannot revolve, then use the lock nut wrench and securely tighten clockwise. To remove the wheel, follow the installation procedure in reverse.

EXERCISES: Direction: Given the rubrics below, the students are tasked to remove damaged center grinding disc.

RUBRICS ON Installing or Removing Damaged Center Grinding Disc

Accuracy	30%
Speed	30%
Safety Measures	20%
Knowledge	20%
TOTAL	**100%**

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Relevance of The Course		
Learning Competency :Discuss the relevance of the course		
References : https://www.bls.gov/ooh/construction-and-extraction/plumbers-pipefitters-and-steamfitters.htm#tab-2		LAS No.: 7

CONCEPT NOTES

Plumbers, pipe fitters, and steam fitters install and repair pipes that carry liquids or gases to, from, and within businesses, homes, and factories.

Duties

Plumbers, pipefitters, and steamfitters typically do the following:

Prepare cost estimates for clients
Read blueprints and follow state and local building codes
Determine the material and equipment needed for a job
Install pipes and fixtures
Inspect and test installed pipe systems and pipelines
Troubleshoot malfunctioning systems
Repair and replace worn parts

Although plumbers, pipe fitters, and steam fitters perform three distinct and specialized roles, their duties are often similar.

Plumbers -install and repair water, drainage, gas, and other piping systems in homes, businesses, and factories. Plumbers install plumbing fixtures such as bathtubs and toilets, and appliances, such as dishwashers and water heaters. Plumbers also maintain septic systems—the large, underground holding tanks that collect waste from houses that are not connected to a sewer system.

Pipefitters- install and maintain pipes that carry chemicals, acids, and gases. These pipes are used mostly in manufacturing, commercial, and industrial settings. Fitters install and repair pipe systems in power plants, as well as; heating and cooling systems in large office buildings. Some pipefitters specialized as gasfitters, sprinklerfitters, or steamfitters.

EXERCISES: Essay (5 points each).

1. What are the similarities of plumbers, pipefitters, and steamfitters?
2. Why do plumbers, pipefitters, and steamfitters prepare cost of estimates for their clients?

Name:	Date:	Score:
Subject: PLUMBING NC1		
Lesson Title : Career Opportunities		
Learning Competency: Explore on Opportunities for Plumbing as a Career		
References : https://www.thebalancecareers.com/plumber-job-description-and-duties-4107383		LAS No.: 8

CONCEPT NOTES

Plumber Duties & Responsibilities

Plumbers must be able to perform the following tasks:

- Install pipes and plumbing fixtures
- Visually inspect equipment and operate test equipment such as pressure and vacuum gauges to determine the cause and location of trouble.

Plumber Salary

Plumbers' earnings vary based on their experiences and locations. They receive a median salary that is higher than that of other construction trade workers and other workers in general.

Median Annual Salary: $53,910
Top 10% Annual Salary: $93,70
Bottom 10% Annual Salary: $32,100
Source: U.S. Bureau of Labor Statistics, 2018.

Many plumbers belong to labor unions that negotiate wages on their behalf. Those that do must pay membership fees.

Education, Training, & Certification

Most plumbers receive their training by doing an apprenticeship, which combines classroom instruction with paid on-the-job training. Most states also require a license to work independently.

License: Plumbers are required to have a license to work in most states and municipalities in the U.S. In addition to needing two to five years of experience, depending on where the license is issued, you must also pass an exam.

EXERCISES: Essay (5pts. Each)

1. Why is plumbing certificate needed in applying a job?
2. How is to become an effective plumber?

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Interpreting Isometric Drawing		
Learning Competency : LO1 Interpret work plans and isometric drawing in accordance with the job specification TLE_IAPB11PI_Ia-j-1		
References : http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf http://4.bp.blogspot.com/-pidBETjsqtk/TaMMp8rGrqI/AAAAAAAAAKc/QlM42ZePiYg/s1600/Alphabet%2Bof%2BLines%2B1.jpg		LAS No.: 9

CONCEPT NOTES

ALPHABETS OF LINES

In sketching orthographic drawing, certain conventional lines are used for a definite purpose. These lines are commonly called Alphabet of Lines.

USES OF ALPHABET OF LINES

Construction line involves very light line used to "block in" an object. These lines are made so light that little or no erasure is needed. They serve as bases for darkening in the permanent line.

Borderline involves heavy, solid line used to frame in the drawing.

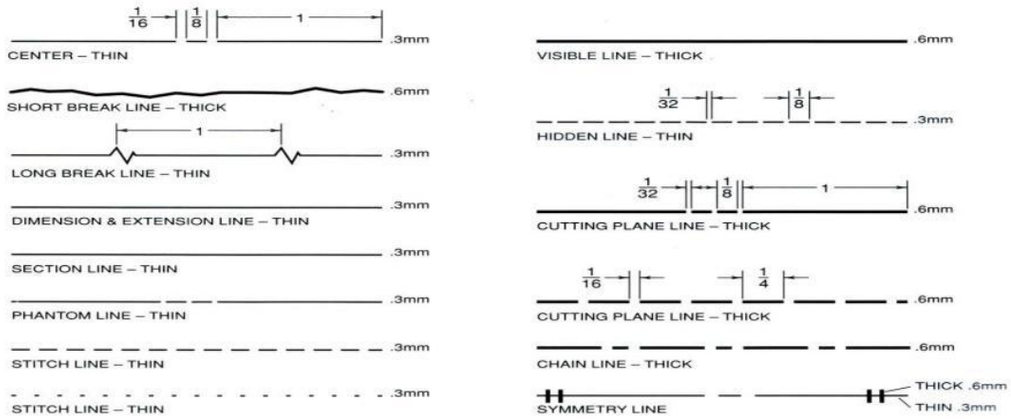
Visible line is a medium line used to show edges and contours that are visible to the eyes.

Invisible line is a medium line used to show edges and contours that are not visible to the eyes.

Centerline is a light line used as axis of symmetry. Used for center of circle and arcs. Sometimes the symbol is shown.

Dimension lines are light thin lines used to show the sizes of the object. Extension lights start about 1/16" from visible or object line. The dimension lines are broken near the center for the dimension.

Long break line is wavy line which draws freehand for same purposes as long break.



Name:	Date:	Score:
Subject: PLUMBING NCI		
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Learning Competency : LO1 Interpret work plans and isometric drawing in accordance with the job specification TLE_IAPB11PI_Ia-j-1		
References : http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf http://4.bp.blogspot.com/-pidBETjsqtk/TaMMp8rGrqI/AAAAAAAAAKc/QlM42ZePiYg/s1600/Alphabet%2Bof%2BLines%2B1.jpg		LAS No.: 9

EXERCISES: Directions: Match Column A with Column B

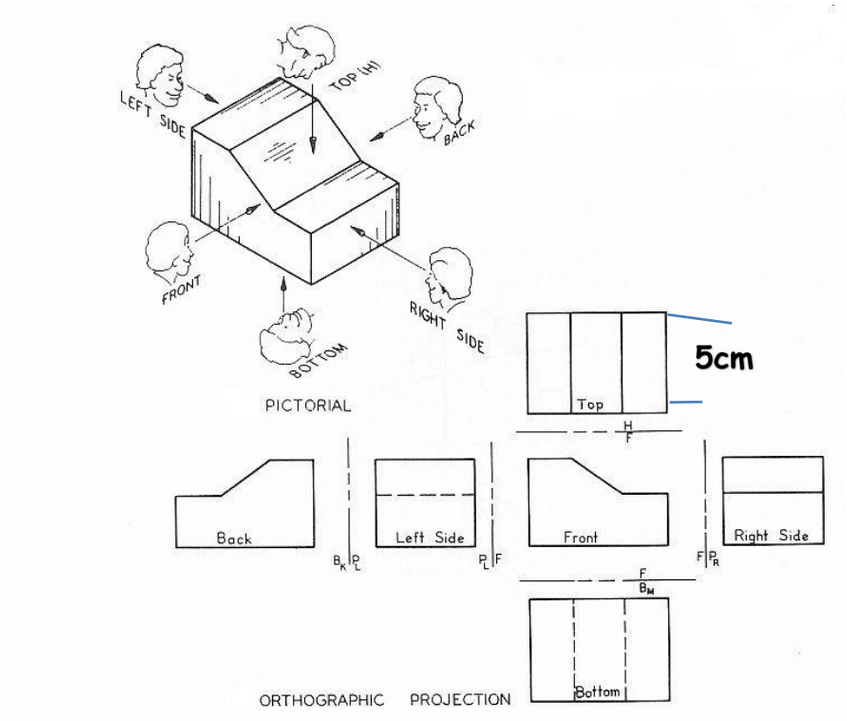
COLUMN A	COLUMN B
_____1. Construction line	**a.** Very light line used to "block in" an object. These lines are made so light that no erasure is needed. They serve as base for darkening in the permanent line .
_____2. Dimension line	**b.** Heavy, solid line used to frame in the drawing
_____3. Centerline	**c.** A medium line used to show edges and contours visible to the eyes.
_____4. Invisible line	**d.** A medium line used to show edges and contours not visible to the eyes.
_____5. Visible line	**e.** A light line used as axis of symmetry. Used for center of circle and arcs.
	f. Light thin lines used to show the sizes of the object. Extension lights start about 1/16" from visible or object line. The dimension line is broken near the center for the dimension.

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Interpreting Isometric Drawing(Orthographic View)		
Learning Competency : LO 1.1.1 Interpret Work Plans and Isometric Drawing in Accordance With the Job Specification TLE_IAPB11PI_Ia-j-1		
References : https://i.pinimg.com/originals/b6/43/7e/b6437e4677e9413af3408ad08af2c2a6.jpg		LAS No.: 10

CONCEPT NOTES

ORTHOGRAPHIC VIEW

Orthographic View represents a three-dimensional object using several two-dimensional views of the object. The figure illustrates such concept.



EXERCISES:

Directions: Using forty-five degrees (45°) ruler and a straight ruler, draw a sample object. Utilize the orthographic view's rubrics.

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Interpreting Isometric Drawing(Orthographic View)		
Learning Competency : LO 1.1.1 Interpret Work Plans and Isometric Drawing in Accordance With the Job Specification TLE_IAPB11PI_Ia-j-1		
References : https://i.pinimg.com/originals/b6/43/7e/b6437e4677e9413af3408ad08af2c2a6.jpg		LAS No.: 10

Scoring Rubric for Drawing Activity

Criteria	5points	3points	1point
Accuracy	The orthographic view was drawn according to standard.	The orthographic view was somehow drawn according to standard	The orthographic view was NOT drawn according to standard
Line Technique/ Application	Application of (all) various lines was appropriately done	At least three lines were used inappropriately	More than three lines were used inappropriately
Neatness	Finished output was neatly done, no erasures/ smudges	Erasures/ smudges are observable on the finished output	Finished output has so many erasures/ smudges
Time Management	Finished the task 10 minute before the given time	Finished the task on the day	Unable to finished the given task
Use of Drawing Materials	Use complete set of materials	Use ruler and pencil only.	Borrowed material from others

Rating Scale:

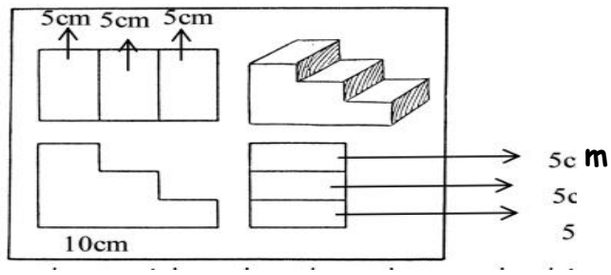
Points Earned	Numerical Rating	Descriptive Rating
20-25	94 – 100	Very Good
14-19	88- 93	Good
8-13	82 – 87	Fair
0-7	75 - 81	Needs Improvement

Name:	Date:	Score:
Subject : PLUMBING NCI		
Lesson Title : Interpreting Isometric Drawing(Orthographic View)		
Learning Competency : LO1.1.2Interpret Work Plans and Isometric Drawing in Accordance with the Job Specification TLE_IAPB11PI_Ia-j-1		
References :https://i.pinimg.com/originals/b6/43/7e/b6437e4677e9413af3408ad08af2c2a6.jpg	LAS No.: 11	

CONCEPT NOTES

ORTHOGRAPHIC VIEW

Another Orthographic View represents a three-dimensional object using several two-dimensional views of the object. It is known as orthographic projection. The given figure illustrates this concept.



EXERCISES: Directions: Using forty-five degrees (45°) ruler and a straight ruler, draw a sample object using orthographic projection.

Scoring Rubric for Drawing Activity

Criteria	5points	3points	1point
Accuracy	The orthographic view was drawn according to standard.	The orthographic view was somehow drawn according to standard.	The orthographic view was NOT drawn according to standard.
Line Technique/ Application	Application of (all) various lines was appropriately done.	At least three lines were used inappropriately.	More than three lines were used inappropriately.
Neatness	Finished output was neatly done, no erasures/smudges.	Erasures/smudges are observable on the finished output.	Finished output has many erasures/ smudges.
Time Management	Finished the task in ten (10) minutes before the given time.	Finished the task on the day.	Unable to finish the given task.
Use of Drawing Materials	Used complete set of materials.	Used ruler and pencil only.	Borrowed material from other students.

Rating Scale:

Points Earned	Numerical Rating	Descriptive Rating	Points Earned	Numerical Rating	Descriptive Rating
20-25	94 - 100	Very Good	8-13	82 - 87	Fair
14-19	88- 93	Good	0-7	75 - 81	Needs Improvement

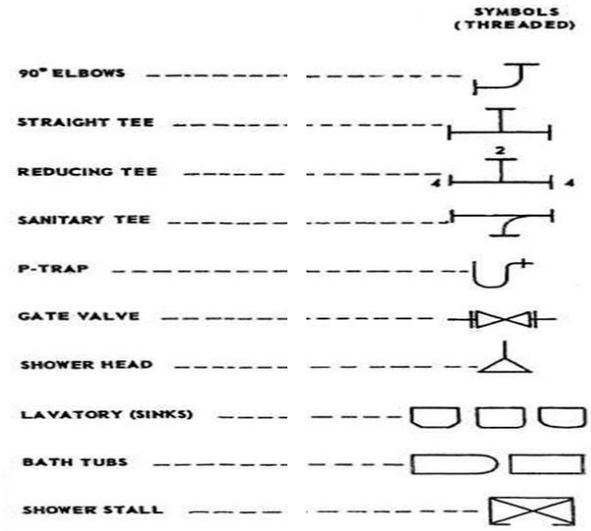
Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Interpreting Isometric Drawing/Plumbing Symbols		
Learning Competency : LO 1.1.3Interpret Work Plans and Isometric Drawing in Accordance with the Job Specification TLE_IAPB11PI_Ia-j-1		
References :http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf sideplayer.com		LAS No.: 12

CONCEPT NOTES

PLUMBING SYMBOLS

Symbols- it represents abstraction with the names of plumbing components.
Blueprint- a photographic print of technical drawing with white lines and blue backgrounds.

COMMON PLUMBING SYMBOLS FOR SANITARY



EXERCISES. Directions: Using a straight line, match the following verbal description to their symbols.

Column A	Column B
1. 90°	
2. Shower Stall	
3. P-Trap	
4. Shower Head	
5. Reducing Tee	
6. Straight Tee	
7. Gate Valve	
8. Lavatory	
9. Bath Tub	
10. Sanitary Tee	

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Interpreting Isometric Drawing/Plumbing Symbols		
Learning Competency :LO1.1.4 Interpret Work Plans and Isometric Drawing in Accordance with the Job Specification TLE_IAPB11PI_Ia-j-1		
References :http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf sideplayer.com	LAS No.: 13	

CONCEPT NOTES

DEFINITION OF TERMS IN BLUEPRINT READING

1. **Analyze** refers to examine something in great detail in order to understand it better.
2. **Block Diagram** shows the basic form or lay-out of plumbing diagram in block form labeled.
3. **Blueprint** is a photographic print of technical drawing with white lines and blue background.
4. **Construct** means to build or assemble something by putting together.
5. **Data** refers to factual information obtain from experiments or survey.
6. **Dimension** is a measurement of one or more direction such as lengths, width, and height.
7. **Interpret** is to ascribe particular meaning of significance to something.
8. **Pictorial Diagram** shows the basic form or lay-out of pictures of actual component.
9. Execution of Contract is the complete document to follow to carry out the task as per job requirements.
10. Extra Labor is the service rendered beyond what is provided for the contract.
11. Bids provide basis for a contract of one's right to reject or accept proposals based on the specification or drawings.The plumber may accept any bid proposals in part or whole.
12. Scope of the Work refers to the range of the works that the contractor shall complete for a plumbing system, as shown in the drawing specifications in accordance to building and plumbing codes.

EXERCISES. Directions: Encircle the letter of the correct answer. One (1) point each.

1. It is a process in which a construction firm joins a group in a competition to undergo a project or to supply materials needed in a work.

A. Bid B. Scope of the Work C. Merchandise D. Advertisement

2. It is a service in plumbing given beyond what is needed.

A. Scope of the work B. Execution of Contract C. Bid D. Extra Labor

3. This is to ascribe particular meaning of significance to something..

A. Define B. Interpret C. Analyze D. Install

4. It is a photographic print of technical drawing with white lines and blue background.

A. Pictorial Diagram B.Orthographic C. Isometric D. Blueprint

5. Shows the basic form or lay-out of pictures of actual component.

A Pictorial Diagram B.Orthographic C. Isometric D. Blueprint

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Interpreting Isometric Drawing/Plumbing Symbols		
Learning Competency : LO1.1.5Interpret Work Plans and Isometric Drawing in Accordance with the Job Specification TLE_IAPB11PI_Ia-j-1		
References :http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf sideplayer.com		LAS No.: 14

CONCEPT NOTES

HOW TO READ A BLUEPRINT

Blueprints provide a map in building a house. The symbols on the blueprints tell carpenters, plumbers and electricians all they need to know about the structure's design and the building materials. Plumbing blueprints detail everything from the type and size of sinks to the location of gas lines, drains and vents. Plumbers may take extensive courses to learn to read all the details of a plumbing blueprint. As a homeowner, familiarity with the symbols of plumbing blueprints may help in troubleshooting or making repairs.

These are the following steps in reading a blueprint:

1. Obtain a guide to the plumbing symbols on a blueprint. You will find legends online, or you may obtain books from the library that list the hundreds of symbols that might be used in a plumbing blueprint.
2. Spread the blueprint on a table, counter or other flat surface that will allow you to read the entire page at once. The plumber familiarizes himself with the general layout of the house, focusing on the kitchen, bathrooms and laundry rooms, where plumbing is concentrated.
3. Read the schedules that accompany the blueprint. A schedule is a guide to the various symbols used in the blueprints. The schedule will specify the type of materials to be used in the particular job.
4. Identify the symbols for major plumbing fixtures such as sinks, showers, bathtubs and toilets. From these symbols, trace the drain lines and vents. Consult the plumbing symbol guide if unsure of the meaning of any symbols.
5. Look for other symbols for gas lines, sewer connections or water piping for radiant heating. Plumbers handle these aspects of home building, too, and they are included in the blueprints.

EXERCISES. Arrange the following steps on how to read blueprints by ordering the numbers from 1-5.

_____Identify the symbols for fittings and fixtures.
_____A schedule is a guide to symbols.
_____Add for other symbols like gas lines, water piping.
_____Find for legends in the blueprint.
_____Read the entire page and familiarize the lay out of the house.

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Interpreting Isometric Drawing/Plumbing Symbols		
Learning Competency :LO1.1.6Interpret Work Plans and Isometric Drawing in Accordance with the Job Specification TLE_IAPB11PI_Ia-j-1		
References :https://www.slideshare.net/gilbertbautista3/module-6-module-4-draft-sanitary-and-plumbing-layout-and-details	LAS No.: 15	

CONCEPT NOTES

PLUMBING SYMBOLS

Water distribution systems, whether hot or cold, are distributed by pipes from the source to our houses The architectural designer used symbols to indicate the distribution system and the different fixtures and fittings. Some architects use abbreviation to identify the fittings and fixtures.

SANITARY & PLUMBING SYMBOLS	LEGEND/ ABBREVIATION	SANITARY & PLUMBING SYMBOLS	LEGEND/ ABBREVIATION
Water Closet	WC	Junction Box	JB
Vent at Ceiling	VAC	Water Meter	WM
Vent Stack through Roof	VSTR	Galvanized Iron Pipe Water Line	GIPWL
Cold Water Line	CWL	Cold Water Riser	CWR
Concrete Drain Pipe	CDP	Cold Water Down Feed	CWDF
Cast Iron Soil Pipe	CISP	Fire Line	FL
Down Spout	DS	Deck Drain	DD
Cast Iron Vent Stack	CIVS	Canopy Drain	CD
Cast Iron Vent Stack	CISS	Sprinkle Riser	SPR
Vent At Ceiling	VAC	Dry Stand Pipe Riser	DSPR
Catch Basin	CB	Fire Hose Cabinet	FHC
Clean Out	CO	Lavatory	LAV
Floor Drain	FL		

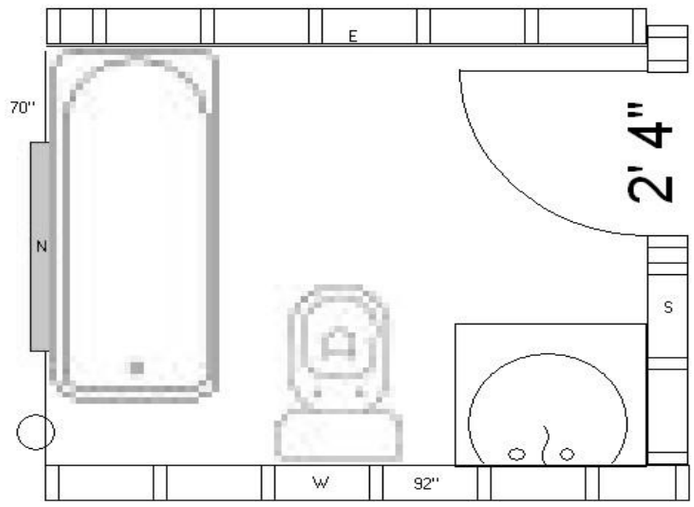
EXERCISES: Direction. Enumerate at least ten (10) plumbing signs and symbols.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Interpreting Isometric Drawing/Plumbing Symbols		
Learning Competency :LO1.1.7 Interpret Work Plans and Isometric Drawing in Accordance with the Job Specification TLE_IAPB11PI_Ia-j-1		
References :https://www.askmehelpdesk.com/attachments/plumbing/986d1149303654-plumbing-layout-tight-squeeze-bath-plan-1-jpeg.jpg	LAS No.: 16	

CONCEPT NOTES

Plumbing Symbols



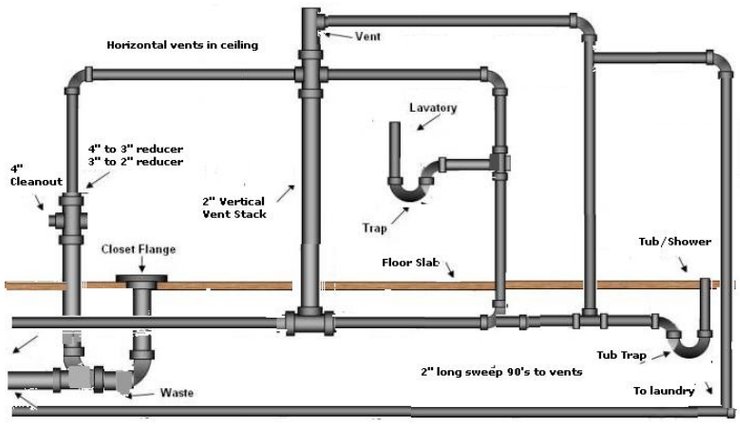
EXERCISES: Directions. From a given plan of a Toilet and Bath, indicate the location of bathroom fixtures by drawing the symbols of each.

Note: Use the same scoring rubrics from the previous LAS.

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Interpreting Isometric Drawing/Plumbing Symbols		
Learning Competency : LO1.1.8 Interpret Work Plans and Isometric Drawing in Accordance with the Job Specification TLE_IAPB11PI_Ia-j-1		
References : http://blog.twinsprings.com/wp-content/uploads/2012/11/Family-Bath-Plumbing-Layout.png		LAS No.: 17

CONCEPT NOTES

PLUMBING SYMBOLS



EXERCISES: Direction. From the given plan, draw an isometric layout by using plumbing symbols.

Note: Use the same scoring rubrics from the previous LAS.

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title: BORING TOOLS		
Learning Competency :LO1.2.1 Prepare materials, tools, and equipment according to the job requirement		
References : Plumbing Module (EXPLORATORY COURSE Grade 7 and Grade 8) p.77		LAS No.: 18

CONCEPT NOTES

Boring Tools

1. **Cold Chisel** is a tool made from hexagon or octagon-shaped steel and is commonly called cold chisel steel. Its convenient size is for handling. One end is shaped for cutting operations.

2. **Electric Drill** is a power tool that rotates a replaced drill bit to make a hole in wood, plastic or metal. Alternately, a screw driver tip can be installed to turn screw.

EXERCISES:

Direction. Students are requested to manipulate the boring tools.

RUBRICS ON ACTUAL PERFORMANCE

Use of tools	40%
Safety precautions	20%
Attitude at Work	15%
PPE	15%
Housekeeping	10%
TOTAL	100%

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title: Cutting Tools		
Learning Competency : LO1.2.2Prepare materials, tools and equipment according to the job requirements		
References : Plumbing Module (EXPLORATORY COURSE Grade 7 and Grade 8) p.78-79		LAS No.: 19

CONCEPT NOTES

Cutting Tools

Crosscut Saw is a type of cutting tool used to cut the grain of the wood.
Hacksaw is a tool used for cutting metal, plastic or pipe.
Pipe Cutter is a tool used for cutting pipe and tube.
Pipe Reamer is a tool used for cleaning the inside portion of the pipe and tube to remove the burst and chips.
Pipe Threader is a tool used for threading the pipe.

EXERCISES: Direction. The students are requested to manipulate the cutting tools.

RUBRICS ON ACTUAL PERFORMANCE

Use of tools	40%
Safety precautions	20%
Attitude at Work	15%
PPE	15%
Housekeeping	10%
TOTAL	100%

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Driving Tools		
Learning Competency : LO1.2.3Prepare materials, tools, and equipment according to the job requirement		
References : Plumbing Module (EXPLORATORY COURSE Grade 7 and Grade 8) p.80-81		LAS No.: 20

CONCEPT NOTES

Driving Tools

Claw Hammer is a tool used for pulling and driving the nails from some other object. Generally, a hammer is associated with woodworking but; it is not limited to use for any purpose.

Crow Bar is a tool consisting of a metal bar with a single curved end and flattened points; often, with a small fissure on one or both ends for removing nails.

Screw Driver is a tool used to insert and tighten, or to loosen and remove screw.

EXERCISES: Direction. Students are requested to manipulate the driving tools.

RUBRICS ON ACTUAL PERFORMANCE

Use of tools	40%
Safety precautions	20%
Attitude at Work	15%
PPE	15%
Housekeeping	10%
TOTAL	100%

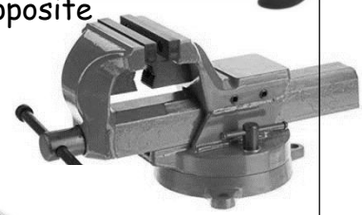
Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title: HOLDING TOOLS		
Learning Competency : LO1.2.4Prepare materials, tools, and equipment according to the job requirement TLE_IAPB11PI-Ia-j-1		
References : Plumbing Module (EXPLORATORY COURSE Grade 7 and Grade 8) pp.82-84		LAS No.: 21

CONCEPT NOTES

Holding Tools

Adjustable Spanner/wrench, Adjustable angle head wrench is a tool used to loosen and tighten a nut or bolt. It has a "jaw" of adjustable-size, which allows different sizes of nut and bolt.

Basin Wrench is a specialized tool which allows one to reach tight spot under sink and basin. The jaw of the basin wrench can not only be adjusted to accommodate nuts of different sizes, but it can also be flipped over the opposite side to keep it turning without removing the wrench



Bench Vise is a tool with a mechanical screw apparatus used for holding or clamping a work piece to allow work to be performed on it which uses an anchor. Bench vise has one fixed jaw and parallel jaw which is moved towards or away from the fixed jaw by the screw.

Clamp is a tool used to grip and hold an object firmly such as wood, paper, plastic and some metals for a short period time.

Pipe Wrench is an adjustable wrench used for turning soft iron pipes fittings with a rounded surface.

EXERCISES: Direction. Using the rubrics below, manipulate the holding tools precisely.

RUBRICS ON ACTUAL PERFORMANCE

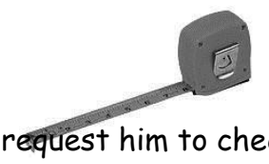
Use of tools	40%
Safety precautions	20%
Attitude at Work	15%
PPE	15%
Housekeeping	10%
TOTAL	**100%**

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title:Measuring Tools		
Learning Competency :LO1.2.5 Prepare materials, tools, and equipment according to the job requirement TLE_IAPB11PI-Ia-j-1		
References : Plumbing Module (EXPLORATORY COURSE Grade 7 and Grade 8) p.84-86		LAS No.: 22

CONCEPT NOTES

Measuring Tools

Inside Caliper is a tool used to measure the internal size of an object.
Outside Caliper is a tool used to measure the external size of an object.
Steel Square is a tool used by carpenters and other tradesman.
It consists of a large arm and a smaller arm that meet at an angle of 90°.
Try Square is a woodworking or a metal working tool used for marking or measuring a piece of wood.
Pull Push Rule (Tape Measure) is a flexible tape measure which is available in lengths up to fifty (50) feet. Other tapes that are twelve (12) to twenty- five(25) feet are usually considered adequate.



EXERCISES: Direction. The student will call his teacher and request him to check if his work is executed. He will be evaluated based on the teacher's observations.

The student will have forty (40) minutes to manipulate how to use the measuring tools.

	Acceptability	
Teacher's Checklist	**YES**	**NO**
1. The student was able to identify the tools.		
2. The student was able to demonstrate the correct use of tools.		
3. The student was able to apply safety measures in holding tools.		
4.The student was able to store the tools properly.		

Rating Scale

4- 100 % 3-95% 2- 85% 1- 75%

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title: Testing Tools		
Learning Competency : LO1.2.6 Prepare materials, tools, and equipment according to the job requirement TLE_IAPB11PI-Ia-j-1		
References : Plumbing Module (EXPLORATORY COURSE Grade 7 and Grade 8) p. 87		LAS No.: 23

CONCEPT NOTES

Testing Tools

Plumb Bob is a tool used for testing and surveying to position a point on the ground that is not readily visible. Plumb bob is a weight with a pointed tip at the bottom that is suspended from a string and used as a vertical reference line.

Carpenter's Square- a steel square used by carpenters; larger than a try square. Square is a hand tool consisting of two straight arms at right angles.

Spirit Level is a device for determining true horizontal or vertical directions by the centering of a bubble in a slightly curved glass tube or tubes filled with alcohol or ether.

EXERCISES: Direction. The student will call the teacher and request him to check if he had executed the task. He will be evaluated based upon the teacher's observations as he is given forty (40) minutes to demonstrate the use of testing tool.

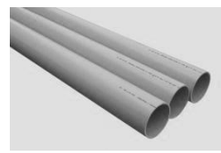
	Acceptability	
Teacher's Checklist	**YES**	**NO**
1. The student was able to identify the tools.		
2. The student was able to demonstrate the correct use of tools.		
3. The student was able to apply the safety measures in holding tools.		
4. The student was able to store the tools properly.		
TOTAL		

Rating Scale 4- 100% 3-95% 2- 85% 1- 75%

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : PIPES		
Learning Competency :LO1.2.7 Prepare materials, tools, and equipment according to the job requirements. TLE_IAPB11PI_Ia-j-1 Enabling Skills: Identifying Types of Tools		
References :http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf		LAS No.: 24

CONCEPT NOTES

Different Types of Pipes

PVC Pipe is the most common pipe for plumbing system, refers to Poly Vinyl Chloride Plastic material.	
PE Pipe refers to Polyethylene Plastic material intended for long span water system installation.	
CI Pipe is a heavy metal made of casting on molds to make fixtures such as sink, tubs and lavatories, covered with a porcelain enamel coating.	
GI Pipe is a galvanized iron pipe which is better fitted for plumbing installation than steel pipe. It is constructed of rough iron, dipped in molten zinc and maybe identified by its dull grayish color.	
PPR Pipe is mainly used in the industries that need to work with high pressure and hot or cold fluid transmission.	
UPVC Pipe is a thermoplastic material derived from common salt and fossil fuels. The pipe material has the longest track record of all plastic materials. It is commonly used for its cheaper and light material.	

EXERCISES: Directions. Shop Work.
Measure and Cut at least ten (10) cm. of different pipes.
Put them in a frame with proper label.

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : PVC Pipe		
Learning Competency : :LO1.2.8 Prepare materials, tools, and equipment according to the job requirements. TLE_IAPB11PI_Ia-j-1 Enabling Skills: Identifying Types of PVC Fittings		
References :http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf		LAS No.: 25

CONCEPT NOTES

PVC Pipe

refers to Poly Vinyl Chloride Plastic material, the most common pipe for plumbing system. It is the world's third-most widely produced synthetic plastic polymer after polyethylene and polypropylene.

PVC FITTINGS

1. **Elbows** are used to change direction of a pipeline either 90 degrees or 45 degrees
   2" PVC 45° Elbow, 3"PVC 45° Elbow, 4" PVC 45° Elbow
   2" PVC 90° Elbow, 3"PVC 90° Elbow,, 4" PVC 90° Elbow


2. **Tee connects three pipes**
   2"x 2" PVC Tee, 3"x3" PVC Tee, 4"x4" PVC Tee
   4"x2" Reducing Tee, 3"x2" Reducing Tee


3. **Couplings are used to connect straight section pipes.**
   2" PVC Coupling, 3" PVC Coupling, 4" PVC Coupling

4. **Wye**
   2"x 2" PVC Wye, 3"x3" PVC Wye, 4"x4" PVC Wye
   4"x2" Reducing Wye, 3"x2" Reducing Wye

EXERCISES: Directions. Shop Work. The students will have group work by preparing the different types of PVC fittings and identifying their sizes and specification, three (3) points each.

Name:	Date:	Score:
Subject		
Lesson Title : PE Pipe		
Learning Competency : :LO1.2.9 Prepare materials, tools, and equipment according to the job requirements. TLE_IAPB11PI_Ia-j-1 Enabling Skills: Identifying Types of PE Fittings		
References :http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf		LAS No.: 26

CONCEPT NOTES

PE PIPE & Its Fittings

refers to Polyethylene Plastic material intended for long span water system installation. It is a type of flexible plastic pipe used for fluid and gas transfer and is often; used to replace ageing concrete or steel mains pipelines.

PE FITTINGS

1. **Elbows- are used to change direction of a pipeline either 90 degrees .**
   1/2" PE 90° Elbow, 1" 90° PE Elbow, 2" 90° PE Elbow
2. **Tee connects three pipes**
   1/2" PE Tee, 1" PE Tee, 2" PE Tee
3. **Couplings**
   1/2" PE 90° Coupling, 1" 90° PE Coupling, 2" 90° PE Coupling
4. **Nipples are short pieces of pipes threaded on both ends and classified as close nipple and short nipple.**
   1/2" PE , 1" PE, 2" PE
5. **Gate Valve**
   1/2" PE , 1" PE, 2" PE
6. **Adaptor- Female and Male**
   1/2" PE , 1" PE, 2" PE

EXERCISES: Directions. Shop Work. The students will have a group work by preparing the different types of PE fittings and identifying their sizes and specifications, three (3) points each.

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : GI Pipe		
Learning Competency : :LO1.2.10 Prepare materials, tools, and equipment according to the job requirements. TLE_IAPB11PI_Ia-j-1 Enabling Skills: Identifying Types of GI Fittings		
References :http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf		LAS No.: 27

CONCEPT NOTES

GI Pipe & Its Fittings

GI Pipe is better fitted for plumbing installation than steel pipe. It is constructed of rough iron, dipped in molten zinc and may be identified by its dull grayish color.

Galvanized steel can be made into a strong plumbing or tubing material -- it resists corrosion from exposure to water or the elements. It has been used for water-supply pipes or as a strong tubing for outdoor applications.

.

AVAILABLE SIZES

1/2" , 1", 2", 4" GI TEE
1/2" , 1", 2", 4"GI 90° Elbow
1/2", 1", 2", 4" GI Coupling
1/2", 1", 2", 4" GI Female and Male Adaptor
1/2", 1", 2", 4" GI Union
1/2", 1", 2", 4" GI Cross
1/2", 1", 2", 4" GI Bushing
1/2", 1", 2", 4" GI Reducer

EXERCISES. Direction. :Shop Work. The students will have a group work by preparing the different types of GI fittings and identifying their sizes and specifications, three (3) points each.

Name:	Date:	Score:
Subject		
Lesson Title : PPR Pipe		
Learning Competency ::LO1.2.11 Prepare materials, tools, and equipment according to the job requirements. TLE_IAPB11PI_Ia-j-1 Enabling Skills: Identifying Types of PPR Fittings		
References :http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf		LAS No.: 28

CONCEPT NOTES

PPR PIPE & Its Fittings

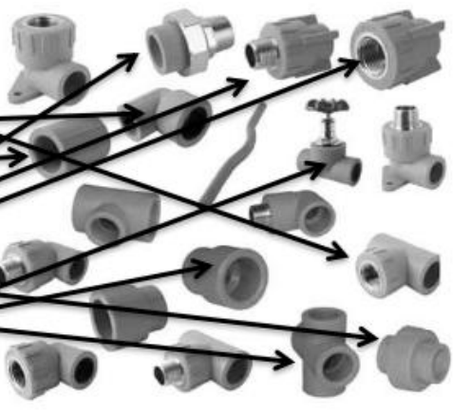
PPR Pipes are mainly used in the industries to work with high pressures of hot or cold fluid transmission.

Other useful applications of the PPR Pipes are:

Potable water pipe networks for hot & cold water installations, for residential buildings hospitals, hotels, schools, office buildings, and shipbuilding

Pipe networks for rainwater utilization systems
Pipe networks for compressed air plants
Pipe networks for swimming pool facilities
Pipe networks for solar plants
Pipe networks in agriculture and horticulture
Heating pipes for residential housing
Pipe networks for the industry, transport of aggressive fluids (acids, alkali)
Transport of liquid food

AVAILABLE SIZES
1/2" , 1", 2", 4" PPRTEE, PPR Tee Adaptor
1/2" , 1", 2", 4"PPR 90° Elbow
1/2", 1", 2", 4" PPR Coupling
1/2", 1", 2", 4" PPR Female and Male Adaptor
1/2", 1", 2", 4" PPR Union
1/2", 1", 2", 4" PPR Cross
1/2", 1", 2", 4" PPR Bushing
1/2", 1", 2", 4" PPR Reducer
1/2", 1", 2", 4" PPR Gate Valve



EXERCISES. Direction. Shop Work. The students will have a group work by preparing the different types of PPR fittings and identifying their sizes and specifications, three (3) points each.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : UPVC Pipe		
Learning Competency ::LO1.2.12 Prepare materials, tools, and equipment according to the job requirements. TLE_IAPB11PI-Ia-j-1 Enabling Skills: Identifying types of uPVC		
References :http://depedbataan.com/resources/9/k_to_12_plumbing_learning_module.pdf		LAS No.: 29

CONCEPT NOTES

uPVC PIPE & Its Fittings

uPVC is a thermoplastic material derived from common salt and fossil fuels. The pipe material has the longest track record of all plastic materials.

AVAILABLE SIZES

1/2" , 1", 2", 4" uPVC TEE, PPR Tee Adaptor
1/2" , 1", 2", 4"uPVC 90° Elbow
1/2", 1", 2", 4" uPVC Coupling
1/2", 1", 2", 4" uPVC Female and Male Adaptor
1/2", 1", 2", 4" uPVC Union
1/2", 1", 2", 4" uPVC Cross
1/2", 1", 2", 4" uPVC Bushing
1/2", 1", 2", 4" uPVC Reducer

EXERCISES: Directions. Shop Work. The students will have a group work by preparing the different types of UPVC fittings and identifying their sizes and specifications, three (3) points each.

:

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Connection Materials		
Learning Competency : :LO1.2.13 Prepare materials, tools, and equipment according to the job requirements. TLE_IAPB11PI-IIa-j-2		
References :https://www.slideshare.net/gilbertbautista3/module-6-module-4-draft-sanitary-and-plumbing-layout-and-details		LAS No.: 30

CONCEPT NOTES

Connection Materials

Pipes are connected by methods dependent upon the materials and the demands of services. Fittings are used to join different lengths and different sizes in different directions.

The following are types of materials to be used in connecting pipes:

1. Threaded Connections

Teflon Tape is used to seal pipe and fittings that has thread , it is also used to reduce leak. This is used in materials such as PE fitting, GI Pipes, CI pipe and UPVC fittings.

2. Solvent Cement Connections

Solvent Cement is used in bonding one material to another. This is used in materials such as uPVC, PVC and PE.

EXERCISES: Directions. TRUE OR FALSE. Write T if the statement is True and F if it is false.

_____1. Solvent Cement is not used in PVC pipe.
_____2. Teflon tape is a connection material.
_____3. Concrete Cement is a connection material.
_____4. In reducing leak, teflon tape is not a good material.
_____5. Teflon tape is applicable in GI and CI materials.

Name:	Date:	Score:
Subject: The Plumbing Code		
Lesson Title : Revised National Plumbing Code of the Philippines		
Learning Competency : LO 2. INSTALL PIPES AND FITTINGS. 2.1.1 Install pipes and fittings for branches based on the job specifications following the RNPCP and venting requirements and procedures.TLE_IAPB11PI-IIa-j-2		
References :https://www.slideshare.net/gilbertbautista3/module-6-module-4-draft-sanitary-and-plumbing-layout-and-details		LAS No.: 31

CONCEPT NOTES

The Plumbing Code

The basic goal of the National Plumbing Code of the Philippines is to ensure the qualified observance of the latest provision of the plumbing and environmental laws.

THE BASIC PRINCIPLES GOVERNING THE NATIONAL PLUMBING CODE

1. All premises intended for human use or habitation shall be provided with a supply of pure and wholesome water, neither connected to unsafe water supply nor subject to backflow or back-siphonage.
2. Plumbing fixtures, devices and appurtenances shall be supplied with water in sufficient volume and pressure adequate to function satisfactorily and without undue noise.
3. Plumbing shall be designed and adjusted to use the minimum quantity of water consistent with proper performance and cleaning.
4. Devices for heating and storing water shall be so designed and installed as to prevent dangers from explosion through overheating.
5. Every building abutting on a street, alley or easement with a public sewer shall connect its plumbing fixtures to the sewer system.
6. Each family dwelling unit shall have at least one water closet, one kitchen type sink, a lavatory and a bathtub or shower to meet the basic requirements of sanitation and personal hygiene.
7. Plumbing fixtures shall be made of smooth non-absorbent material, free from concealed fouling surfaces and shall be located in ventilated enclosures.

EXERCISES: Directions.TRUE OR FALSE. Write T if the statement is True and F if it is false.

_____1. All plumbing fixtures shall be supplied with water in not sufficient volume to prevent backflow.

_____2. To explosion, devices shall be designed and installed.

_____3. Water closet, kitchen type sink, lavatory, shower are in one unit.

_____4. Plumbing fixtures shall be made of smooth absorbent material.

_____5. Plumbing system should be provided with clean water.

Name:	Date:	Score:
Subject		
Lesson Title : Revised National Plumbing Code of the Philippines		
Learning Competency : LO 2. INSTALL PIPES AND FITTINGS. 2.1.2 Install pipes and fittings for branches based on the job specifications following the RNPCP and venting requirements and procedures.TLE_IAPB11PI-IIa-j-2		
References :https://www.slideshare.net/gilbertbautista3/module-6-module-4-draft-sanitary-and-plumbing-layout-and-details		LAS No.: 32

CONCEPT NOTES

The Plumbing Code

The basic goal of the National Plumbing Code of the Philippines is to ensure the qualified observance of the latest provision of the plumbing and environmental laws.

THE BASIC PRINCIPLES GOVERNING THE NATIONAL PLUMBING CODE

8. The drainage system shall be designed, constructed and maintained to safeguard against fouling, depositing of solids, clogging and with adequate cleanouts so arranged that the pipes may be readily cleaned.
9. All piping shall be of durable NAMPAP-approved materials, free from defective workmanship, designed and constructed by Registered Master Plumbers to ensure satisfactory service.
10. Each fixture directly connected to the drainage system shall be equipped with a water-sealed trap.
11. The drainage pipes piping system shall be designed to provide adequate circulation of air free from siphonage, aspiration or forcing of trap seals under ordinary use.
12. Vent terminals shall be extended to the outer air and shall be installed to prevent clogging and the returning of foul air to the building.
13. Plumbing systems shall be subjected to such tests to effectively disclose all leaks and defects in the workmanship.
14. Substance which will clog the pipes, produce explosive mixtures, destroy the pipes or their joints or interfere unduly with the sewage-disposal process shall not be allowed to enter the building drainage system.
15. Proper protection shall be provided to prevent contamination of food, water,sterile goods and similar materials by backflow of sewage. When necessary, the fixture,device or appliance shall be connected indirectly with the building drainage system.

EXERCISES. Directions: Fill in the blanks with the correct answer.

1. All materials should be approved by _____.
2. Draining piping system should provide with vents to avoid _____.
3. After installing pipes, it should be _____ to find
4. Plumbing fixtures shall be made of smooth absorbent material.
5. Plumbing system should be provided with_____.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Revised National Plumbing Code of the Philippines		
Learning Competency : LO 2. INSTALL PIPES AND FITTINGS. 2.1.3 Install pipes and fittings for branches based on the job specifications following the RNPCP and venting requirements and procedures. TLE_IAPB11PI-IIa-j-2		
References :https://www.slideshare.net/gilbertbautista3/module-6-module-4-draft-sanitary-and-plumbing-layout-and-details		LAS No.: 33

CONCEPT NOTES

THE PLUMBING CODE

The basic goal of the National Plumbing Code of the Philippines is to ensure the qualified observance of the latest provision of the plumbing and environmental laws.

THE BASIC PRINCIPLES GOVERNING THE NATIONAL PLUMBING CODE

16. No water closet shall be located in a room or compartment which is not properly lighted and ventilated.
17. If there is no sewer system in the area, suitable provision shall be made for the disposal of building sewage by some accepted method of sewage treatment and disposal, such as a septic tank.
18. Where a plumbing drainage system may be subject to backflow of sewage, suitable provision shall be made to prevent its overflow in the building.
19. Plumbing systems shall be maintained in serviceable condition by Registered Master Plumbers.
20. All plumbing fixtures shall be installed properly spaced, to be accessible for their intended use.
21. Plumbing shall be installed with due regard to the preservation of the strength of structural members and the prevention of damage to walls and other surfaces through fixture usage.
22. Sewage or other waste from plumbing systems, which may be deleterious to surface or sub-surface waters shall not be discharged into the ground or into any waterway, unless first rendered innocuous through subjection to some acceptable form
of treatment.

EXERCISE: Directions: Fill in the blanks.

_____1. All materials should approved by _____.
_____2. Draining piping system should provide with vents to avoid _____.
_____3. After installing pipes, it should be _____ to find
_____4. Plumbing fixtures shall be made of smooth absorbent material.
_____5. Plumbing system should provided with clean water.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : History of Plumbing		
Learning Competency LO 2. INSTALL PIPES AND FITTINGS. 2.1.4 Install pipes and fittings for branches based on the job specifications following the Revised National Plumbing Code of the Philippines and venting requirements and procedures. TLE_IAPB11PI-IIa-j-2		
References : REVISED NATIONAL PLUMBING CODE OF THE PHILIPPINES		LAS No.: 34

CONCEPT NOTE

The Philippine History of Plumbing Practices

Plumbing originated in the 18th and 19th centuries, wherein maintaining, repairing, re-modeling in pueblos or towns, churches, convents and government buildings were done.

In the 20th century, Gov. Gen. Allan Harrison focused on Health and Hygiene for the prevention against cholera, leprosy, schistosomiasis and other diseases; as well on proper waste disposal.

Meanwhile; in 1902, Master Plumber John F. Hass-, was the first chief of the division of Plumbing Construction and Inspection. Plumbing Code based on Plumbing Code of US was incorporated by the Building Code for the City of Manila.

In 1935, Francisco Geronimo, Mariano de Ocampo, lgmidio Suarez, Eusebio Mina. Jose Rivera, Raymundo Reyes, Sr.,Roberto Feliciano, Gregorio Lazaro, Raymundo Gumapac, John Jones, Trinitario Ortiz, Valentin Casupanan, Catalino Casupanan.Crispin Francisco, Teodoro Pastor, Cornelio Odvina and Jesus Tangbal Dera associated the NationalMaster Plumbers Association of the Philippines (NAMP AP) and had it registered with the Securities and Exchange Commission.

In 1954, the Third Congress of the Republic of the Philippines in its Second Session, approved after the third reading House Bill No. 962. This became Republic Act No.l378.

June 18, 1955, R.A. 1378, otherwise known as the "PLUMBING LAW OF THE PHILIPPINES" was signed by President Ramon Magsaysay.

On January 28, 1959, the National Plumbing Code of the Philippines prepared by the NAMPAP was promulgated and approved by Malacanang. NAMPAP also assisted in the passage of the law creating the National Waterworks and Sewerage Authority (NAWASA). In 1966-1969, the Board of Examiners for Master Plumbers and the NAMPAP prepared a curriculum for Plumbing Engineering that was approved by the Department of Education and was first introduced at the Feati University. ·

On November 28, 1967, the First Amendment to the National Plumbing Code was approved, which effected the inclusion of "Asbestos·Cement Pipe" as an approved plumbing material.

Before Martial Law in 1972, Republic Act No. 6541 otherwise known as the Building Code of the Philippines" was passed with the "National Plumbing Code of 1959" as referral code in full text.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : History of Plumbing		
Learning Competency LO 2. INSTALL PIPES AND FITTINGS. 2.1.4 Install pipes and fittings for branches based on the job specifications following the Revised National Plumbing Code of the Philippines and venting requirements and procedures. TLE_IAPB11PI-IIa-j-2		
References : REVISED NATIONAL PLUMBING CODE OF THE PHILIPPINES		LAS No.: 34

In 1996, NAMPAP President JAIME M. CABASE spearheaded the updating of the Revised National Plumbing Code. Finally, in October 1999, NAMPAP submitted the Draft Code to the Board of Master Plumbers (BOMP) chaired by Engr. FORTIJNATO H. AMOSCO. After careful review, the Professional Regulation Commission under Chairman HERMOGENES POBRE adopted the Revised Plumbing Code of 1999 .

President JOSEPH EJERCITO ESTRADA approved last December 21, 1999 pursuant to Section 4 of R.A. 1378 known as the Plumbing Law.

EXERCISES: Directions: Multiple Choice. Circle the correct answer of your choice.

1. Allan Harrison focused on Health and Hygiene and _____.
a. Building Permit b. Proper Disposal c. Fixtures to be used d. House Repair
2. The President who approved 1999 the Plumbing Code of the Philippines
a.Corazon Aquino b. Ramon Magsaysay c. Ejercito Estrada d. Gloria Arroyo
3. When does first Amendment to the National Plumbing Code was approved?
a.1967 b. 1999 c. 1955 d. 1975
4. Roberto Feliciano, Gregorio Lazaro, Raymundo Gumapac, and John Jones associated with the NAMPAP except _____.
a.Jaime M. Cabase b. Francisco Geronimo c. Mariano de Ocampo d. lgmidio Suarez
5. The law signed by President Ramon Magsaysay.
a.RA No. 6541 b. RA No. 1999 c. RA No. 1967 d. R.A. 1378

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Revised National Plumbing Code of the Philippines		
Learning Competency :LO 2. INSTALL PIPES AND FITTINGS. 2.1.5 Install pipes and fittings for branches based on the job specifications following the Revised National Plumbing Code of the Philippines and venting requirements and procedures. TLE_IAPB11PI-IIa-j-2		
References : REVISED NATIONAL PLUMBING CODE OF THE PHILIPPINES		LAS No.: 35

CONCEPT NOTES

ADMINISTRATION

Section 100- PERMIT REQUIRED
Section 101 -TO WHOM PERMITS MAY BE ISSUED
Section 102- APPLICATION FOR PERMIT
Section 103- PERMIT ISSUANCE -Retention of Plans, Validity of Permit, Expiration, Suspension or Revocation
Section 104- APPLICATION FOR EXISTING PLUMBING SYSTEM- Additions, Alterations or Repair, Changes in Building Occupancy, Maintenance , Moved buildings must have the permit in connecting water.
Section 105 - INSPECTIONS - All connection must be inspected and approved by the authorities.
Section 106- CONNECTION APPROVAL
106.1 Permanent Connections - All connection must have permit.
106.2 Temporary Connections - It must be endorsed by the authorities
Section 107- SPECIAL PROVISIONS -Master Plumbers shall registered in PRC
107. 1. I Registered and Licensed Master Plumber at upper portion of the round seal.
107.1 .2 Name of Registered and Licensed Master Plumber at the upper center.
107.1.3 The registration number shall appear at the center below the name.
107.1.4 Philippines, appearing at the lower portion of the round seat

Section 108- PLUMBING FIXTURES REQUIRED
Each building shall provide with plumbing fixture.

EXERCISES. Directions: Essay. Answer the following questions. Five (5) points each.
1. Can we make a repair work in our connection with out permit? Why?
2. Does a plumber can operate even he is not a licensed? Why?

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Revised National Plumbing Code of the Philippines		
Learning Competency : LO 2. INSTALL PIPES AND FITTINGS. 2.1.6 Install pipes and fittings for branches based on the job specifications following the Revised National Plumbing Code of the Philippines and venting requirements and procedures. TLE_IAPB11PI-IIa-j-2		
References : REVISED NATIONAL PLUMBING CODE OF THE PHILIPPINES		LAS No.: 36

CONCEPT NOTE

DEFINITIONS

Section 201 - GENERAL- It is to define all the terminologies being used in plumbing.
These are the commonly used in plumbing

ALTER or ALTERATION - any change, addition or modification of construction or occupancy.

AIRBREAK- a physical separation.

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- A faucet

BIDET - Used for washing the middle private part of the body, especially the genitals.

BRANCH -- any part of the piping system other than a main, riser or stack.

EXERCISES: Directions: Essay. Answer the following questions. Five (5) points each.

1. Can we make a repair work in our connection with out permit? Why?
2. Does a plumber can operate even he is not a licensed? Why?

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Revised National Plumbing Code of the Philippines		
Learning Competency : LO 2. INSTALL PIPES AND FITTINGS. 2.1.7 Install pipes and fittings for branches based on the job specifications following the Revised National Plumbing Code of the Philippines and venting requirements and procedures.		
References : REVISED NATIONAL PLUMBING CODE OF THE PHILIPPINES		LAS No.: 37

CONCEPT NOTES

The plumber is the one who works or engages in the business of installing in buildings the pipes and fixtures, and other apparatus for bringing in the water supply and removing liquid and waterborne wastes.There are three categories of plumbers based upon their graces of experiences.

These are:

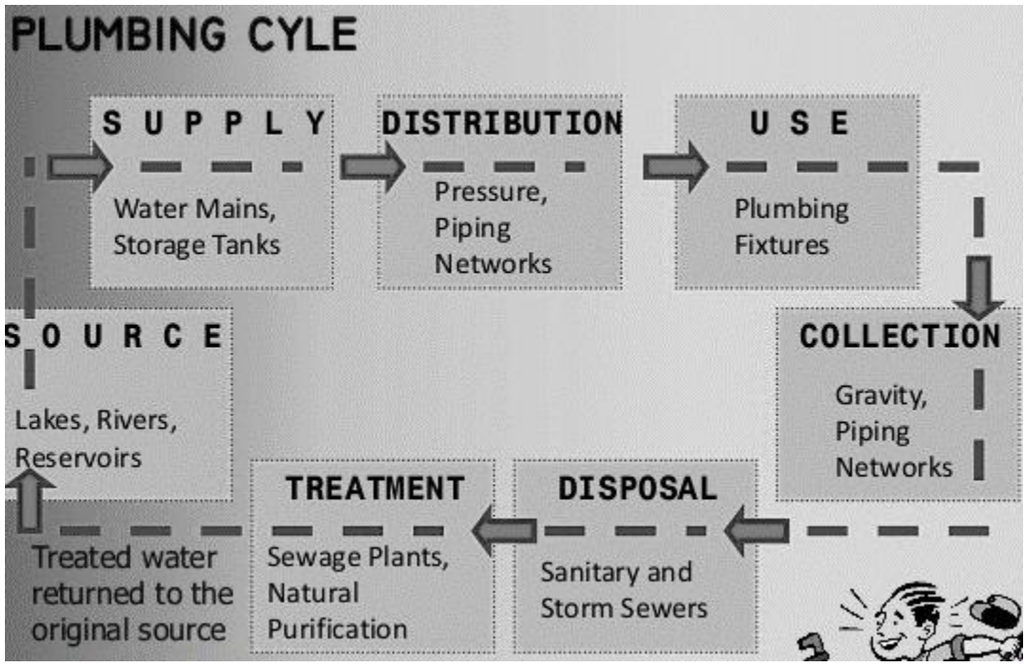
1. Apprentice plumber- is a beginner at the trade who usually serves for three(3) to five (5) years as helper to a journeyman.
2. Journeyman plumber- has served his apprenticeship and is competent to perform the tasks of installing and repairing plumbing.
3. Master plumber- a person who is technically and legally qualified and licensed to practice the profession of master plumbing without limitations in accordance with Republic Act 1378, having passed the examinations conducted by the Professional Regulation Commission (PRC), has received a certificate of registration from the board of master plumbing and possesses the current license to practice.

EXERCISES. Directions: Answer the following question in the provided space.

1. Apprentice plumber usually serves how many years?_____
2. A plumber that is legally qualifies to practice the profession. _____
3. These are the categories of plumbers. 1_____, 2. _____3. _____

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Elements of Plumbing System		
Learning Competency: LO 2. INSTALL PIPES AND FITTINGS. 2.1.8 Install pipes and fittings for branches based on the job specifications ff. the RNPCP & venting requirements & procedures.TLE_IAPB11PI-IIa-j-2		
References : https://www.slideshare.net/Liguidliguid/presentation-plumbing?from_action=save		LAS No.: 38

CONCEPT NOTES



EXERCISES: Direction. Write T if the statement is correct and F if the statement is false.

__1. The main source of the water is water district.
__2. The used water will be treated naturally.
__3. The waste water will pass through the upvc pipe.
__4. All plumbing fixtures need water supply.
__5. The treated water will not return to the original source.

Name:	Date:	Score:
Subject: PLUMBING 11		

Lesson Title : Elements of Plumbing System

Learning Competency: LO 2. INSTALL PIPES AND FITTINGS.

2.1.9 Install pipes and fittings for branches based on the job specifications ff. the RNPCP & venting requirements & procedures.TLE_IAPB11PI-IIa-j-2

References : https://www.slideshare.net/Liguidliguid/presentation-plumbing?from_action=save	LAS No.: 39

CONCEPT NOTES

The Water Cycle

The cycle basically consists of water entering the atmosphere through evaporation and returning through condensation in which is these processes result in natural water purification. When water evaporates, only water molecules leave the surfaces; salts and other solids in solution remain behind. The condensed water is; thus, purified water- except in so far as it picks up pollutants in the air. Thus, evaporation and condensation of water vapor is the source of all natural fresh water on earth. Fresh water from precipitation falling on the ground gradually make its way through streams, rivers and lakes to oceans or seas as a result.

Purified Water- water that undergoes a process where the pollutants are removed or rendered harmless.

Polluted Water- water that contains one or more impurities that make the water unsuitable for a desired use.

Gray Water- water drained from lavatories, sink, laundry trays and showers; contains minor pollutants.

Black Water- water drained from water closets and urinals; carries body wastes and contains major pollutants.

Storm Water- rainwater drained from roof gutters and downspouts.

EXERCISES. Direction: Write T if the statement is correct and F if the statement is false.

__1. When water evaporates, only water molecules leave the surfaces.
__2. Condensation of water vapor is the source of all natural fresh water on earth.
__3. Salts and other solids will leave the surfaces.
__4. Fresh water from precipitation falling on the ground gradually through streams.
__5. Water from laundry and lavatory are examples of gray water.

Name:	Date:	Score:
Subject: PLUMBING 11		

Lesson Title : Elements of Plumbing System

Learning Competency: LO 2. INSTALL PIPES AND FITTINGS.

2.1.10 Install pipes and fittings for branches based on the job specifications ff. the RNPCP & venting requirements & procedures.TLE_IAPB11PI-IIa-j-2

References : https://www.slideshare.net/Liguidliguid/presentation-plumbing?from_action=save

LAS No.: 40

CONCEPT NOTES

WATER QUALITY PROBLEMS AND THEIR CORRECTION

PROBLEM	CAUSE	EFFECT	CORRECTION
1. Acidity	Contains carbon dioxide. Cistern and pond waters containing decaying vegetation are likely to be acidic	Corrosion of non-ferrous pipes, rusting and clogging of steel pipes.	Passing the water through a bed of crushed marble or limestone to achieve alkalinity, or adding sodium silicate.
2. Hardness	Presence of Magnesium and Calcium	Clogging of pipes. Impaired laundering and food preparation.	Introduction of water softeners made up of Zeolite (a greenish granular material)
3. Turbidity	Silt or suspended matters picked up in surface or near surface flow.	Discoloration and bad taste.	Filtration
4. Color	Presence of Iron and Manganese	Discoloration of fixtures and Laundr	Precipitation by filtration through manganese zeolite (oxidizing filter)
5. Pollution	Contamination by organic matter or sewage	Disease	Chlorination

S

EXERCISES. Direction: Write T if the statement is correct and F if the statement is false.

__1. Disease is the effect of pollution.
__2. The presence of iron and manganese are the examples of color problem.
__3. Water softener is the way in removing acidity.
__4. The cause of hardness is suspended maters picked up in the surface.
__5. Discoloration and bad taste are causes of acidity.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Elements of Plumbing System		
Learning Competency:LO 2. INSTALL PIPES AND FITTINGS. 2.1.11 Install pipes and fittings for branches based on the job specifications ff. the RNPCP & venting requirements & procedures.TLE_IAPB11PI-IIa-j-2		
References : https://www.slideshare.net/Liguidliguid/presentation-plumbing?from_action=save		LAS No.: 41

CONCEPT NOTES

Water Treatment and Purification

1.Aeration- Water is sprayed into the air to release any trapped gases and absorb additional oxygen for better taste.

2.Coagulation- Flocculation- This is the process by which small sediment particles which do not settle will combine together to form larger particles which can be removed by sedimentation. This process includes physical and chemical process.

Coagulation- is the chemical process in which the coagulant reacts with the sediment to make it capable of combining into larger particles. This is called **destabilization**.

Flocculation- is the physical process in which the sediment particles collide with each other and stick together.

3. Sedimentation- This is the process by which suspended solids are removed from the water by gravity settling and deposition.

4.Filtration- Passage of fluid through a porous medium suspended matter which did not settle by gravity.

5.Disinfection/ Chlorination- This is the most important process used in the production of water of a safe and sanitary quality.

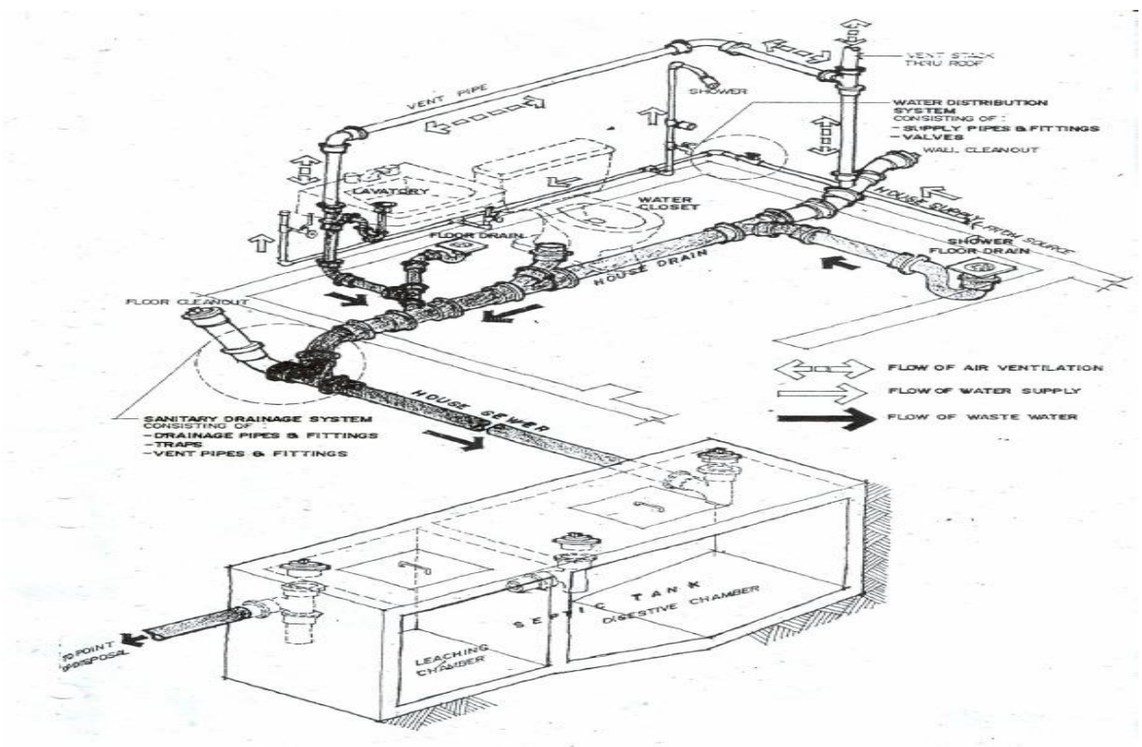
EXERCISES. Directions: Write T if the statement is correct and F if the statement is false.

__1. Water is sprayed into the air to release any trapped gases and absorb additional oxygen for better taste.
__2. Filtration is the physical process in which the sediment particles collide with each other and stick together.
__3. Chlorination is used in the water in order to attain a desired degree of disinfection.
__4. Sedimentation is the process by which suspended solids are removed from the water by gravity settling and deposition.
__5. In water purification, matter to be removed includes bacteria, and viruses.

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Elements of Plumbing in the Philippines		
Learning Competency : LO 2. INSTALL PIPES AND FITTINGS. 2.1.12 Install pipes and fittings for branches based on the job specifications ff. the RNPCP & venting requirements & procedures.TLE_IAPB11PI-IIa-j-2		
References :		LAS No.: 42

CONCEPT NOTES

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



EXERCISES. Directions: Identify the plumbing fixtures and fittings used in the piping system based on the diagram above. (10 points)

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Waste Water		
Learning Competency : LO 2. INSTALL PIPES AND FITTINGS. 2.1.12 Install pipes and fittings for branches based on the job specifications ff. the RNPCP & venting requirements & procedures.TLE_IAPB11PI-IIa-j-2		
References :https://www.slideshare.net/gilbertbautista3/module-6-module-4-draft-sanitary-and-plumbing-layout-and-details		LAS No.: 43

CONCEPT NOTES

Waste water is discharged by gravity through the disposal system. All pipes in this system therefore must slant in a downward direction so; the weight of the waste will cause it to move down. Due to gravity flow, waste lines are larger than water lines. The stacks are the vertical lines while; the branches are the horizontal lines. Vents are also provided for air circulation and to permit sewer gases to escape through the roof. This equalizes the air pressure in the drainage system. The waste water flows starting at the fixture trap, which is provided to stop gases from entering the building and each fixture has a separate trap or seal to prevent backflow of sewer gas, through the fixture branches to the main sewer line. Waste stacks carry only waste water while; solid wastes runs through the soil lines, which are the largest in the system and are flushed with water after each use. Piping systems are vital to modern society. Some systems may be complex; others may be simple such as in a residential dwelling unit. But, they share some common elements, whether they are steel, plastic, copper pipes or tubing.

Sanitary and storm drainage for residential dwelling are either wrought- iron pipes, Polyvinylchloride (PVC) pipes and for drainage is either concrete pipe or PVC pipe. The more common today, is the unplasticized Polyvinylchloride (uPVC) pipe. Polyvinyl pipe and fittings are available in commercial length of 3.0 meters and also available in schedule 40 and 80. They are usually assembled with slip joint fittings and solvent, both PVC and chlorinated Polyvinylchloride (cPVC) pipes are commonly available in sizes ranging from ½' to 4" inside diameter.

EXERCISES. Direction: Identification

1. The two (2) materials being used in waste water are _____ and _____.
2. The length of the PVC Pipe available _____.
3. This should be provided in all fixture to avoid _____.
4. It is discharged through disposal system_____
5. Stacks are in _____line and branches are in _____line.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Sewage Disposal System		
Learning Competency : LO2. INSTALL PIPES AND FITTINGS LO2.2.1 Align drainage, sewer, and vent piping systems in the required location such as prescribed in the work plan. TLE_IAPB11PI-IIa-j-2		
References :https://www.slideshare.net/gilbertbautista3/module-6-module-4-draft-sanitary-and-plumbing-layout-and-details https://www.merriam-webster.com/dictionary/cesspool		LAS No.: 44

CONCEPT NOTES

Sewage Disposal System

Absence of a good sewage disposal system can result to contamination and water-borne diseases.

The following are types of sewage disposal system from old to new.

1. Cesspool-an underground reservoir for liquid waste (such as household sewage)	
2. Privy- a separate toilet.	
3. Septic Tank- an underground chamber made of concrete with two division.	
4. Public Sewer Line -is an underground pipe or tunnel system. Waste water from individual house that convey to sewer line.	

EXERCISES. Directions: True or False. Write T if the statements is true and F if the statement is false.

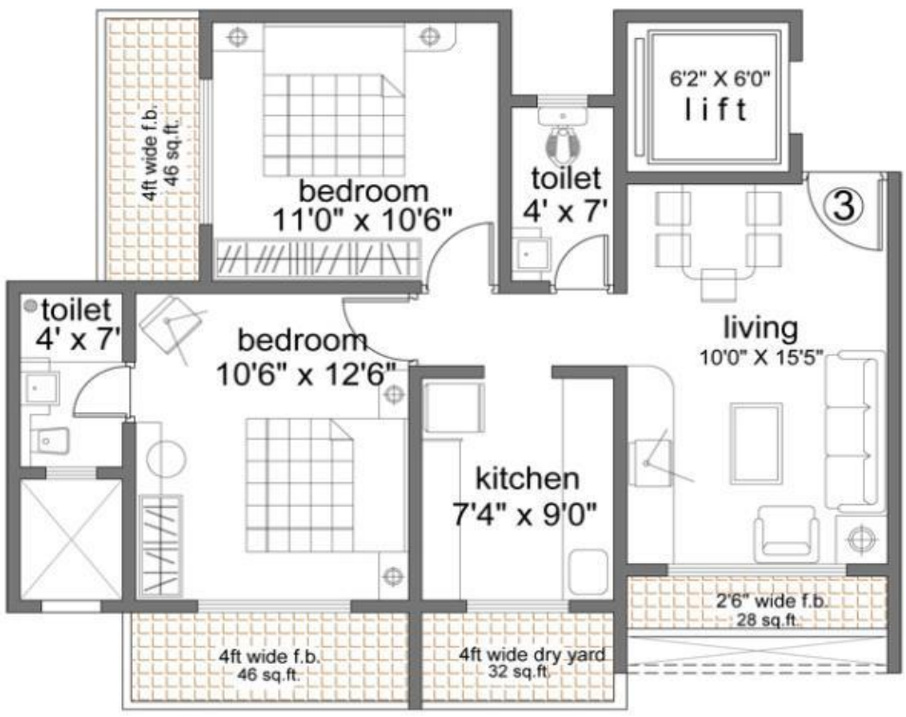
_____1. Septic tank is an underground tunnel from individual to public sewer.
_____2. Absence of a sewer causes contamination and disease.
_____3. Privy is a private toilet.
_____4. Cesspool is an underground hole to catch waste water.
_____5. Public Sewer Line is connected from household to public sewer line.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Sanitary Installation		
Learning Competency : LO2. INSTALL PIPES AND FITTINGS LO2.2.2 Align drainage, sewer, and vent piping systems in the required location such as prescribed in the work plan. TLE_IAPB11PI-IIa-j-2 Enabling Skills: Layout Making		
References :https://www.slideshare.net/gilbertbautista3/module-6-module-4-draft-sanitary-and-plumbing-layout-and-details		LAS No.: 45

CONCEPT NOTES

Sanitary Installation

The sanitary installation is referred to as "the network of pipes and fittings that carry off wastes and each plumbing fixtures," it is titled with the appropriate pipe and fitting. The discharges are conveyed to the septic vault. The storm drainage system, on the other hand, consists of pipes, fittings, catch basins, area drain and is intended for getting rid of water from the building roof and its surrounding and conveys to the street sewer. The storm drainage is considered part of the plumbing system.



TYPICAL 2BHK LAYOUT

EXERCISES. Direction: Given the layout above, draft the isometric diagram of toilet and bath using standard height. (10 points)

Name:	Date:	Score:
Subject: PLUMBING NCI		
Lesson Title : Types of PPE		
Learning Competency: LO2. INSTALL PIPES AND FITTINGS LO2.4 Align drainage, sewer, and vent piping systems in the required location such as prescribed in the work plan. TLE_IAPB11PI-IIa-j-2		
References : http://www.safety.uwa.edu.au/topics/physical/protective-equipment#ppe		LAS No.: 46

CONCEPT NOTES

Personal protective equipment is worn to protect the eyes, face, head, body, arms, hands, legs, and feet from hazards.

Types of Personal Protective Equipment

PPE can be considered in the following categories, based on the type of protection afforded by the equipment:

- Respiratory protection - for example, disposable, cartridge, airline, half or full face
- Eye protection – for example, spectacles/goggles, shields, visors
- Hearing protection – for example, ear muffs and plugs
- Hand protection – for example, gloves and barrier creams
- Foot protection – for example, shoes/boots
- Head protection – for example, helmets, caps, hoods, hats
- Working from heights - for example, harness and fall arrest devices
- Skin protection – for example, hats, sunburn cream, long sleeved clothes

EXERCISES: Direction: Part 1. Identify the plumbing PPE .

Part II: Essay (5 points.)

1. Why is PPE important?

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Procedure in cutting cast iron		
Learning Competency : LO3. INSTALL HOT AND COLD WATER LO3.1.1 Use pipes and fittings in accordance with the job specifications.		
References : https://www.abifoundry.com/upl/downloads/resources/product-literature/cutting-instructions-0fbcfd3a.pdf		LAS No.: 47

CONCEPT NOTES

There are several methods which work well to cut Cast Iron Soil Pipe. When using the Twin-Lever Snap Cutter or ratchet-type cutter equipped with a chain and cutter wheels, make sure that they are sharp and the wheels will rotate in the chain. When using a cutoff-type abrasive saw, make sure to follow all safety procedures recommended by the manufacturer. At all times, read the safety instructions on any tool that is used to cut Cast Iron Pipe.

Cutting Procedure

1. Position chain around pipe so that the maximum number of wheels are in contact with the pipe. Too much space between the first and last wheel in contact with the pipe will produce a poor quality cut, so be careful when positioning the chain around the pipe.

2. Score the pipe before making the final cut, applying only enough pressure to make the cutter wheel create a deep scratch in the pipe.

3. Release the pressure and rotate the tool slightly; then apply a quick final pressure to complete the cut. To produce the best result, it may be necessary to score the pipe several times before making the final cut.

Note: If the cutter wheels become flattened or dull, it will be very difficult (if not impossible) to obtain a satisfactory cut. The life of the chain can be extended by reversing the chain to obtain equal use of all the wheels. It is also important to keep the mechanical features of a cutter in good working order. Proper safety equipment and attire is required.

EXERCISES: Essay (5 points each).

1. Why a dull cutter wheel can not be used?
2. Why there is need to apply pressure in cutting the pipe?
3. Why is it necessary to score the pipe several times in making a cut?

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Procedure in cutting cast iron (Galvanized Steel)		
Learning Competency :LO3. INSTALL HOT AND COLD WATER LO3.1.2 Use pipes and fittings in accordance with the job specifications.		
References : https://www.wikihow.com/Cut-Galvanized-Pipe#Using_a_Tube_Cutting_Tool_sub		LAS No.: 48

CONCEPT NOTES

Galvanized pipe is steel pipe that is coated in zinc, which minimizes rust and corrosion inside the pipe. It is very strong and has historically been used for running water in homes.

Using a Tube Cutting Tool

1. Measure for your cut. Making a precise cut is important when installing new galvanized pipe. For example, if planning on threading pipe, there is a need to take the length required for adding threads to the ends of the pipe into consideration when marking the cuts.

2.Choose to use a tube cutting tool when cutting new or old pipe. Tube cutters are often used by plumbers for cutting copper and steel pipe, these are installing or removing.

3.Rotate the tube cutter around the pipe. Tube cutters typically have two rollers and a cutting wheel. These three points are rotated around the pipe by turning the handle on the tool. After every few rotations, the tool is tightened so that the cutting wheel cuts deeper into the pipe.

4. Ream the pipe after cutting to remove burrs. When cutting galvanized pipe with a pipe cutter a burr of steel will be created on the inside edge of the pipe. To get rid of this, file the entire inside edge with a rounded file or it can also use a specialized tool that is made to remove these burrs, which is called a reamer.

EXERCISES:Essay. (5 points each)

1. What will be done after every rotation of the pipe cutter?
2. What is the substitute use in the absence of pipe reamer? Why ?

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Procedure in cutting cast iron (Galvanized Steel)		
Learning Competency :LO3. INSTALL HOT AND COLD WATER LO3.1.3 Use pipes and fittings in accordance with the job specifications.		
References : https://www.wikihow.com/Cut-Galvanized-Pipe#Using_a_Tube_Cutting_Tool_sub		LAS No.: 49

CONCEPT NOTES

Using a Reciprocating Saw or Angle Grinder

1.Choose to use a reciprocating saw or angle grinder in tight spaces. There are several power tools that are great for cutting galvanized pipe that is located in tight spaces. To remove a piece of galvanized pipe from a tight space, it can either use a reciprocating saw or angle grinder, depending on the space worked on and the tool available.

2.Put on personal protective equipment. When cutting through steel pipe with a power tool it is important to protect oneself from hazards. Put on safety glasses to protect the eyes from flying pieces of steel. Wear gloves to protect the hands from the heat of the pipe (produced by the grinder) in addition to a slipping saw blade or sharp pipe edge.

3.Mark for cut around the pipe. When cutting a round piece of pipe, it is a good idea to mark the correct length around the whole circumference of the pipe.

4. Make sure that the saw or grinder has a metal cutting blade or wheel on it. When cutting galvanized pipe it is important to use the right kind of blade of wheel. A blade for cutting a different material, such as wood, will not work well for cutting through galvanized pipe

5.Start power saws or grinders before touching the pipe. When starting to cut, the blade of the power saw or grinder should not be touching the surface of the pipe. If it is, the blade or cutting disc can snag on the pipe and make controlling the tool difficult. It can also damage cutting disc or blade.

EXERCISES. Directions: Write T if the statement is true and write F if the statement is false.

_____1. We can use a reciprocating saw or angle grinder from a tight space.
_____2. Personal Protective Equipment is necessary in cutting galvanized steel.
_____3. It is not a good idea to mark the correct length around the whole circumference of the pipe.
_____4. It is important to use the right kind of blade of wheel.
_____5. The blade of the power saw or grinder should not be touching the surface of the pipe.

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DepED DEPARTMENT OF EDUCATION
K TO 12 PROGRAM

SHARED OPTIONS
SENIOR HIGH ALTERNATIVE RESPONSIVE EDUCATION DELIVERY
DLP LEARNING ACTIVITY SHEET

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Procedure in Cutting Galvanized Iron		
Learning Competency :LO3. INSTALL HOT AND COLD WATER LO3.1.4Use pipes and fittings in accordance with the job specifications.		
References : https://www.wikihow.com/Cut-Galvanized-Pipe#Using_a_Tube_Cutting_Tool_sub		LAS No.: 50

CONCEPT NOTES

Using a Hacksaw

1.Secure the pipe. In order to cut a pipe successfully with a hacksaw, there is a need to secure it so it does not move while, it is being cut. This can be done by having someone else hold it, by placing it in a vise, or by clamping it to a workbench.

Support long pieces of pipe. If cutting a long piece of new pipe, one should have the longer end supported. This will make holding the pipe still while cutting it easier and it will stop the pipe pieces from falling once the pipe is cut. Wrap a pipe strap around the pipe and screw the other end into a secure overhead joist or beam.

3.Cut the pipe with a hacksaw. If one does not have a motorized saw and needs to cut a piece of galvanized pipe, one can use a hacksaw. This tool will take a bit of time and effort to use, but it will get the job done eventually.

A hack saw works better for cutting steel than other types of hand saws because it typically has small teeth that are designed for cutting metal.

4.Use gentle pressure and let the tool do the work. When cutting through galvanized pipe with a saw or grinder should let the tool do the work. There is no need to apply a ton of pressure, as this can hurt hands and use up a lot of energy needlessly. Instead, be patient and let the tool gradually cut through the steel.

5.File the cut edge. Once the pipe is cut will need to clean up the cut. When cutting with a hacksaw one will leave a lot of burrs of metal on the pipe.

EXERCISES. Direction: Answer the following and fill in the blanks with appropriate answer.

1. Wrap a _____ around the pipe and _____ the other end into a secure overhead joist or beam.
2. A _____ works better for _____ than other types of hand saws because it typically has _____ that are designed for cutting _____.
3. There is no need to apply a ton of _____, as this can hurt the _____ and use up a lot of energy needlessly.
4. _____ is cut needed need to _____the cut. When cutting with a hacksaw will leave a lot of _____ of metal on the pipe.

Name:	Date:	Score:

Subject: PLUMBING 11

Lesson Title : Procedure in caulking cast iron pipes

Learning Competency: LO3. INSTALL HOT AND COLD WATER
3.2 Install hot and cold water supply according to the approved work plan and specifications.

References :https://www.tylerpipe.com/upl/downloads/catalog/products/10-caulking-cast-iron-538bc8cd.pdf	LAS No.: 51

CONCEPT NOTES

Caulking Procedure

1. Insert the spigot end of pipe or fitting into the hub of pipe or fitting to be joined after wiping the hub and spigot with a clean cloth to assure the hub and spigot are clean and dry.

2. Yarn the oakum into the joint using a yarn iron. Some oakum comes in twisted lengths and may need to be separated into individual strands before yarning. Yarn and pack the oakum tightly using a packing iron to a depth of one inch below the top of the joint. Tightly packed oakum is essential for a leak free joint.

NOTE: After packing, make sure that no oakum fibers are sticking up into the area the lead will occupy. Fibers in the lead area can cause leaks.

3. After heating lead pot to a cherry red color, clean the dross of the top of the lead and fill the ladle with clean, molten lead. Quickly pour the lead into the joint with one continuous pour, filling the joint completely.

4. After the lead has solidified, the joint must be caulked to "set" the lead. Using the outside caulking iron, place the iron against the inner edge of the hub and caulk the lead completely around the circumference of the joint. After caulking with the outside iron, ready to caulk using the inside iron. The inside iron should be placed against the pipe. Caulk the lead completely around its circumference.

EXERCISES. Essay. (5 points each)

1. Why the hub and spigot should be wiped with a clean cloth?
2. What will happen if the oakum fiber stick to the lead?

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Procedure in caulking cast iron pipes		
Learning Competency: Install water pipes free of leak and contamination		
References: http://www.lawsupply.net/lawsupply/cast_iron/spec/chapter4c.htm	LAS No.: 52	

CONCEPT NOTES

Joining Methods for Cast Iron Soil Pipe (*Compression Gaskets)*

1. Clean the hub and spigot so these are reasonably free from dirt, mud, sand, gravel or other foreign materials. When installing pipe that has been cut, make sure the sharp edge is removed. The sharp edge may jam against the gasket's seals making joining very difficult.

2. Fold and insert the gasket into the hub. The gasket must be inserted into the hub completely.

3. Lubricate the joint following the manufacturer's recommendations. Sizes 2" through 15" may be lubricated using a manufacturer's recommended lubricant. Some manufacturers recommend using an adhesive lubricant on large diameter pipe and fittings (5"-15"). It should be noted that use of the adhesive lubricant does not take the place of proper join restraint when required.

4. Align the pipe so that it is straight. Using the tool of choice, push or pull the spigot through all of the sealing rings of the gasket. One will feel the spigot end of the pipe bottom out in the hub. Fittings may be installed by using the tool of one's choice or by driving the fitting home by using a lead maul. To do this, strike the fitting on the driving lug or across the full hub. Hit it as hard as necessary, the lead will deform without harming the fitting. Using the lead maul is the fastest and easiest way to install fittings on hub and spigot cast iron soil pipe.

EXERCISES. Essay. (5 points each)

1. What will happen if the sharp edge is not removed?
2. How will one install the fittings?

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Tables for amount of lead and oakum in caulking CI pipes		
Learning Competency :Install water pipes free of leak and contamination TLE_IAPB11PI-IIIa-j-3		
References : http://www.lawsupply.net/lawsupply/cast_iron/spec/chapter4c.htm	LAS No.: 53	

CONCEPT NOTES

Lead and Oakum Required to Caulk Cast Iron Soil Pipe Joints

Oakum is made from a vegetable fiber and used for packing hub and spigot joints. Cotton and hemp can also be used. These materials are usually twisted loosely into strands or braided and formed into a circular or rectangular cross section. A rough rule-of-thumb method for estimating oakum requirements is to take 10 percent of the weight of the lead required for caulking. Table 5 provides a more accurate method for estimating oakum requirements.

TABLE 5
Quantity of Oakum Packing Required Per Joint in Standard Hub and Spigot Cast Iron Soil Pipe

Pipe Size	Tarred or Untarred (Oiled) Twisted Oakum Packing, Pounds	Dry Unoiled Twisted Oakum Packing Pounds (Approx.)	Sq. Braided Oakum Packing Pounds (Approx.) Using 1 ring
2″	.14	.09	.07
3″	.16	.10	.08
4″	.18	.13	.10
5″	.20	.15	.12
6″	.21	.16	.13
8″	.44	.33	.17
10″	.53	.40	.20
12″	.61	.46	.24
15″	.94	.71	.45

EXERCISES. Essay (5 points each)

1. What is oakum?
2. How does rule-of-thumb method used?

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Tables for amount of lead and oakum in caulking CI pipes		
Learning Competency :Align water pipes with the drainage, vent, and waste piping TLE_IAPB11PI-III-j-3		
References : http://www.lawsupply.net/lawsupply/cast_iron/spec/chapter4c.htm		LAS No.: 54

CONCEPT NOTES

Lead quantities can be roughly estimated by rule-of-thumb as twelve (12) ounces per inch of diameter as a minimum. Thus, a four (4) inch diameter pipe would require three (3) pounds of lead as a minimum. An eight (8) inch diameter pipe would require six (6) pounds of lead. This allows for skimming-off and for a reasonable loss due to spillage in pouring. Table 6 lists suggested lead quantities for various pipe and fitting

TABLE 6
Lead Required to Caulk Cast Iron Soil Pipe Joints

Pipe Size	Lead Ring Depth Inches	Service SV		Extra heavy XH	
		Cu. Ins.	Wt. Lbs.	Cu. Ins.	Wt. Lbs.
2"	1	2.81	1.15	2.91	1.19
3"	1	3.90	1.6	4.17	1.71
4"	1	4.98	2.04	5.25	2.15
5"	1	6.06	2.49	6.24	2.56
6"	1	7.15	2.93	7.42	3.04
8"	1.25	15.06	6.17	15.49	6.35
10"	1.25	18.90	7.75	19.34	7.93
12"	1.25	25.53	10.47	26.02	10.67
15"	1.5	43.09	17.67	43.38	17.8

diameters. The amounts shown apply only to cast iron soil pipe and fittings made according ASTM Standard A-74.

Lead for caulking purposes should contain not less than 99.73 percent of lead and no more than the following maximum allowable impurities: .08 percent copper, .002 percent zinc, .002 percent iron, .25 per cent bismuth, .02 percent silver, and a total of not more than 0.15 percent arsenic, antimony and tin. The melting point for caulking lead is 621 degrees F, and the proper pouring temperature is 790 - 830 degrees F. The lead is ready for pouring when it becomes a cherry red. After cooling, there is a shrinkage of approximately 5.8 percent from the liquid state.

EXERCISES. Essay: (5 points each)

1. How will one know that the lead is ready for pouring?
2. Why do you need to follow the lead requirements in caulking CISP joints?

Name:	Date:	Score:
~~Subject: PLUMBING 11~~		
Lesson Title : Procedures in setting-up plumbing fixtures (Faucet)		
Learning Competency :INSTALL AND ASSEMBLE PLUMBING FIXTURES TLE_IAPB11PI-IV-j-4		
References : https://www.diynetwork.com/how-to/skills-and-know-how/plumbing/how-to-install-a-single-handle-kitchen-faucet		LAS No.: 55

CONCEPT NOTES

How to Connect a Faucet to a PVC Pipe Outside

1.Turn off the water supply. One will not be able to work on a pipe if water is flowing through it. Open a faucet or an indoor tap to allow any pressure in the system to bleed off, so one does not get sprayed when he cut into the pipe.

2.Cut a section out of the existing PVC line. The amount one cut out will depend on the size of the "T" piece that is going to install, but usually one will need to remove between 1/2 inch and 1 inch to allow the new piece to fit properly. Wear eye protection for this step.

3.Trim any burrs on the cut ends of the pipe with a sharp utility knife. Sand the exposed ends of the PVC so it has no snags or rough places on it. Wipe the inner and outer surfaces with a clean, dry cloth to remove any dust.

4. Coat all surfaces to be glued with PVC primer. Use the dauber that is built into the lid of the primer to thoroughly cover the outside of the cut pipe and the inside of the "T" joint where it will touch the pipe.

5. Apply glue to all surfaces one previously primed. The priming cleans the surfaces and prepares them for gluing; the glue ensures that the pieces will stay together and not leak. Fit the "T" over both ends of the cut pipe with the threaded neck facing where the faucet will go.

6. Wrap Teflon tape in a clockwise direction around the threaded neck of the "T." This prevents this connection from leaking. Screw the threaded opening of the faucet snugly onto the "T" to complete the installation of the new faucet. Turn the water supply back on.

EXERCISES. Essay (5 points each)

1. Why need to turn off the water supply before working?
2. Why is it the pipe should be wipe in a clean cloth?
3. Why there is a need to turn back on the water supply after the connection?

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Procedures in setting- up plumbing fixtures (Faucet)		
Learning Competency: Use tools, materials, and equipment in accordance with the job specifications TLE_IAPB11PI-IVa –j-4		
References : https://www.diynetwork.com/how-to/skills-and-know-how/plumbing/how-to-install-a-single-handle-kitchen-faucet		LAS No.: 56

CONCEPT NOTES

A **faucet** is a device that controls the flow of a liquid or gas from a pipe or container. Sinks and baths have faucets attached to them.

EXERCISES. Directions: Install a faucet outside the classroom and request the teacher to check the executed task. It will be evaluated based upon her observation. 40 minutes is given to complete this exercise.

Teacher's Checklist	Acceptability	
	YES	NO
1. Prepare materials and tools		
2. Applied safety measures in installing the faucet		
3. Follow the steps in installing faucet correctly		
4. Proper tools manipulation		
5. Proper behavior was observed while working		
6.Apply the correct standard height based on the plumbing standards		
7. Apply proper housekeeping		
TOTAL		

Rating Scale

6-7 Excellent 100%	5 - Very Good 95%	4- Good 90%
3 Fair 80%	2 – Poor 75%	1 – Needs Improvement 70%

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Procedures in setting- up plumbing fixtures (Lavatory)		
Learning Competency: Install and Assemble Plumbing Fixtures TLE_IAPB11PI-IVa –j-4		
References : https://www.diynetwork.com/how-to/skills-and-know-how/plumbing/how-to-install-a-single-handle-kitchen-faucet		LAS No.: 57

CONCEPT NOTES

Lavatory is just a **toilet fixture**, and its earliest **meaning** was "washbasin," from a bathroom **sink** that is permanently installed and connected to a water supply.

Exercise

Directions: Install a faucet outside the classroom and request the teacher to check if the task is executed and be evaluated based upon her observation. 40 minutes is given to complete this exercise.

Teacher's Checklist	Acceptability	
	YES	NO
1. Prepare materials and tools		
2. Applied safety measures in installing the faucet		
3. Follow the steps in installing faucet correctly		
4. Proper tools manipulation		
5. Proper behavior was observed while working		
6.Apply the correct standard height based on the plumbing standards		
7. Apply proper housekeeping		
TOTAL		

Rating Scale

6-7 Excellent 100%	5 - Very Good 95%	4- Good 90%
3 Fair 80%	2 – Poor 75%	1 – Needs Improvement 70%

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Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Procedures in setting- up plumbing fixtures (Sink)		
Learning Competency: Assemble Plumbing Fixtures TLE_IAPB11PI-IVa –j-4		
References : https://www.diynetwork.com/how-to/skills-and-know-how/plumbing/how-to-install-a-single-handle-kitchen-faucet		LAS No.: 58

CONCEPT NOTES

The rough installation for a sink involves putting in all the pipes, which one would be able to see once the sink is installed. These include the hot and cold water supply pipes, the drainpipe and the vent, which is part of the drain. Once these pipes are properly routed and secured to the room's framing, the only parts of them one can see after covering the wall are the stub-outs -- the short sections that protrude from the walls in the vicinity of the sink. These stub-outs are usually capped until the sink is installed.

Things One Will Need

Pencil	2-inch drainpipe	Hacksaw	2-by-4-inch lumber
Tape measure	Sanitary tees	Vent tee	5/8-inch spade bit
Spirit level	Plastic pipe cement	2" cap	Drill	1/2-inch water pipe
2 ¼ & 1 5/8" hole saws	2 drop-ear elbows		2 1/2-inch caps

EXERCISES. (The teacher will provide handouts to students).

Direction: Fill in the blank with the correct answers.

1. _____ where one puts the sink drain on the stud behind the sink.
2. Drill _____ holes in the studs and floor plate, as needed, to route a 2-inch drainpipe.
3. Locate the nearest connection points for the _____ pipes.
4. Turn _____ for the house, and cut into the _____ main pipes from which to draw water.
5. _____ the 1/2-inch hot and cold _____, terminating each one at the point _____ on the framing with a _____, which a fitting screw can frame.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Plumpness of plumbing fixtures (Water Closet)		
Learning Competency: Use tools, materials, and equipment in accordance with the job specifications TLE_IAPB11PI-IVa –j-4		
References : https://homeguides.sfgate.com/plumb-toilet-start-pipe-34476.html	LAS No.: 59	

CONCEPT NOTES

How to Plumb a Toilet from Start to Pipe?

The start of a toilet waste system is the toilet's own waste outlet, while the main pipe is the soil stack. The stack is a 3-inch or 4-inch length of vertical pipe that drops to the sewer and is connected to a 2-inch pipe that rises through the roof to provide venting. To connect a new toilet to an existing stack, one needs three basic fittings. The first holds the toilet down and seals it, the second directs the water flow toward the stack, and the third ties the new toilet into the stack.

Things One Will Need

Tape measure	Screw or Bolt	Handsaw	PVC cement
Reciprocating saw	PVC closet bend	Sanitary tee	
Toilet flange	Spirit Level	3 " PVC pipe	

EXERCISES. (The teacher will provide handouts to the students).

Direction: Write T if the statement is correct and F if the statement is false.

___1. Reciprocating saw is used in cutting a hole.
__2. Toilet hole should be three (3) inches in diameter to accommodate 3-inch waste pipes.
__3. Spirit level is used in measuring the distance of the pipe.
__4. The hole of the toilet should be twelve (12) inches from the back to the center of the pipe.
__5. Solvent cement is not necessary in installing the toilet.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Plumpness of plumbing fixtures (Lavatory)		
Learning Competency: Use tools, materials, and equipment in accordance with the job specifications TLE_IAPB11PI-IVa –j-4		
References : https://homeguides.sfgate.com/install-lavatory-sink-drains-51969.html	LAS No.: 60	

CONCEPT NOTES

How to Remove Kitchen Sink Drain Holes?

A bathroom lavatory sink, whether free-standing or enclosed in a vanity, has a sink drain that connects with an S-trap beneath the sink. Within the tailpiece before the drain connects to the S-trap, the sink also has a pop-up lever to stop water from going down the drain. The pop-up lever from the drain connects to an arm between the handles of the lavatory. One can install lavatory sink drains in about 15 minutes -- no specialty tools or plumbing experience is required.

Things One Will Need

Non-scratch scouring pad
Plastic putty knife
Plumber's putty
Adjustable wrench

EXERCISES. (The teacher will provide handouts to students).

Direction: Write T if the statement is correct and F if the statement is false.

__1. The items underneath the cabinet should not be removed in installing the kitchen.
__2. The slip nut holds the tailpiece to the drain.
__3. Screw driver is used to loosen the strainer nut.
__4. Rubber gasket and washer are used in assembling the kitchen sink.
__5. Putty knife is use to remove putty.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Plumpness of plumbing fixtures (Kitchen Sink)		
Learning Competency: TLE_IAPB11PI-IVa –j-4 Use tools, materials, and equipment in accordance with the job specifications		
References : https://homeguides.sfgate.com/plumb-toilet-start-pipe-34476.html		LAS No.: 61

CONCEPT NOTES

kitchen sink a sink in a kitchen for washing dishes, vegetables, etc

How to Plumb a Kitchen Sink?

If this is a new installation, it is best to install the faucets before placing the sink in the counter top. Do not undertake this project if one is a beginner. One needs to have plumbing knowledge, expertise and experience in order to plumb a kitchen sink.

Exercise: (The teacher will provide handouts to the students).

Direction: Fill in the blank with the correct answers.

1. Remove everything from under the _____.
2. Remove the _____ from the end of the pipe that connects this sink drain with the one that has _____. Next, _____ directly under the sink hole and pull down on the pipes. If there is a little water in the pipe, _____ to prevent damage to the cabinet floor.
3. Install the new _____. Place the new pipe on the floor in the work area.
4. Hold one of the _____ next to the drain that aligns with the house _____. Cut it shorter if it is too long. Keep in mind that one wants to install a Tee here for the other sink.
5. _____all the nuts to be certain these are tight. Place the bowl under the P-trap and check for _____.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Proper Housekeeping (5S)		
Learning Competency :TLE_IAPB11PI-IVa-j-a Use appropriate personal protective Equipment (PPE)		
References		LAS No.: 62

CONCEPT NOTES

5S is the acronym for five Japanese words: Seiri, Seiton, Seiso, Seiketsu and Shitsuke and these represent the five steps for a systematic technique for good housekeeping.

The five steps of Japanese 5 S

Step	**Corresponding action**
Seiri (Sort)	Distinguish between necessary and unnecessary items. Remove the latter.
Seiton (Set in order)	Enforce the dictum a place for everything and everything in its place.
Seiso (Shine)	Clean up the workplace and look for ways to keep it clean.
Seiketsu (Standardize)	Maintain and monitor adherence to the first three Ss.
Shitsuke (Sustain)	Follow the rule to keep the workplace 5S-right. Hold the gain.

EXERCISES. Direction: Write T if the statement is true and F if the statement is false.

_____1. Walk ways should be free and clear from clutters.

_____2. Seire is removing unnecessary items.

_____3. Housekeeping is keeping the house safe and sound.

_____4. If the workplace is cleaned, the workers will not anymore clean.

_____5. Clutters can cause accidents to the workers.

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Proper Housekeeping (5S)		
Learning Competency :Use appropriate personal protective Equipment (PPE) TLE_IAPB11PI-IVa-j-4		
References:https://www.ccohs.ca/oshanswers/hsprograms/cklstcon.html		LAS No.: 63

CONCEPT NOTE

Workplace Housekeeping - Checklist for Construction Sites

DO

- Gather up and remove debris to keep the work site orderly.
- Plan for the adequate disposal of scrap, waste and surplus materials.
- Keep the work area and all equipment tidy.
- Keep stairways, passageways, ladders, scaffold and, supplies and obstructions.
- Secure loose or light material that is stored on roofs or on open floors.
- Keep materials at least 2m (5 ft.) from openings, roof edges, excavations or trenches.
- Remove or bend over nails protruding from lumber.
- Keep hoses, power cords, welding leads, etc. from laying in heavily travelled areas.

DO NOT

- Do not permit rubbish to fall freely from any level of the project.
- Do not throw tools or other materials.
- Do not raise or lower any tool or equipment by its own cable or supply hose.

EXERCISES. Essay (5 points each)

1. Why should a debris must be removed?
2. What will happen if you missed to clean your workplace?
3. Why we can't throw our rubbish anywhere?

DepED DEPARTMENT OF EDUCATION K TO 12 PROGRAM

SHARED OPTIONS

SENIOR HIGH ALTERNATIVE RESPONSIVE EDUCATION DELIVERY

DLP LEARNING ACTIVITY SHEET

Name:	Date:	Score:
Subject: PLUMBING 11		
Lesson Title : Proper Housekeeping (5S)		
Learning Competency :Perform proper housekeeping (5s) TLE_IAPB11PI-IVa-j-4		
References: https://www.apotokyo.org/publications/p_glossary/5s-or-good-housekeeping-3/	LAS No.: 64	

CONCEPT NOTES

Housekeeping refers to construction site management measures that are designed and implemented to minimize discharge of pollutants from the site.

EXERCISE. Direction: Given the rubrics below: You are going to perform housekeeping (5s) in the plumbing shop.

Evaluation Rubric for 5S					
	Level 1	Level 2	Level 3	Level 4	Level 5
Sorting Separates the necessary from the unnecessary.	Necessary and unnecessary items are mixed together in the work area	Necessary and unnecessary items are separated (including excess inventory)	All unnecessary have been removed from the work area	A method has been established to maintain work area free of unnecessary items	Employees continually seek improvement opportunities
Simplifying Puts everything in its place and organizes it.	Tools, supplies, and materials are randomly located	A designated location has been established for all items	Designated locations are marked to make organization more visible	A method has been established to recognize with visual sweep if items are out of place or exceed quantity limits	Vehicle developed to provide continual evaluation and process in place to implement improvements
Sweeping Makes everything neat and clean.	Tools, supplies, and material are randomly located	Work/break areas are cleaned on a regularly scheduled basis	Work/break areas, machinery and office equipment are cleaned daily	Housekeeping tasks are understood and practiced daily	Area employees have devised a method of preventive cleaning and maintenance
Standardizing Defines how a task should be done.	No attempt is made to document or improve current processes	Methods are being improved but changes haven't been documented	Changes are being incorporated and documented	Information on process improvements and reliable methods is shared with employees	Employees are continually seeking the elimination of waste with all changes documented and information shared with all
Self-discipline Ensures that all 5S policies are adhered to in daily work.	Minimal attention is spent on housekeeping and safety	A recognizable effort has been made to improve conditions in the work area	Housekeeping and safety policies have been developed and are utilized	Follow-through of housekeeping and safety policies is evident	General appearance of a confident understanding of, and adherence to the 5S program