Skilled Trades Student Work Book

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Checklist:

* Do you have your safety pledge passed in to me?
* Do you have a Gmail account set up for each of you?
* Have you passed all of your safety tests?
* Do you know the course breakdown and grading scheme?
* Have each of you submitted your own research?

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| **Module 1** Floor Construction |

## Module Overview

This module will introduce students to the principles of floor construction. Students will learn floor construction terminology, measuring practices, floor construction techniques, proper building techniques and proper building practices. They will draw on knowledge gained in Unit 2 in relation to reading blueprints and technical drawings. They will have to interpret a technical drawing, develop a work plan, select proper materials, layout and cut their materials, and then assemble their materials to create a finished floor. They will employ the safe cutting and construction practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing activity will give them real life experience with building projects.

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| Theory of Floor Construction |

Answer the following questions using the textbook Modern Carpentry. Answers may be submitted on paper or can be presented in the form of a PowerPoint presentation

1. What are floor joists? What are they most commonly made of in residential construction? Why are manufactured joists gaining in popularity?
2. Why is it important for all “crowns” in floor joist to be all turned up?
3. List and describe two types of bridging and the advantages of each.
4. If it is necessary to cut holes in floor joists where should they be cut and explain why.
5. What are the advantages of using plywood for sub flooring? Explain.
6. Calculate the amount of material need to frame out a floor for a 2400mm x 3000mm (8’ x 10’) shed. Be sure to include the floor covering as well. Provide a rough sketch to show your calculations.

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| Labeling and Defining Floor Components |

Using the grid paper below sketch a diagram of a floor section with the proper layout for a floor opening. Label each floor member properly and give a brief description of each.

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| Materials Pricing Activity |

Using the technical drawing below, provide a cost breakdown for each of the materials used to construct the floor provided. These prices can be obtained using local suppliers, business flyers, or online quotes. Ensure that the total price is comprised of an itemized breakdown for each different material used.



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| Reflection: Carpentry-Floor |

Read each of the following questions and provide a written response to each.

1. If doing the floor project again what would you do differently?
2. What are the advantages provided by using power tools as opposed to non-power tools?
3. How could you have divided your duties differently to make the project be more effective?
4. Discuss the advantages of working inside in a shop environment as opposed to outside on a typical jobsite. Give at least three advantages and disadvantages of each.
5. Collate your blueprints and your work plan (completed in Topic 2) to be submitted for grading.

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| Work Log: Carpentry |

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| **Record of Workplace Skills (LOG)**  **Names:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | |
| **Workplace Skills Required For Successful Completion of Carpentry Module** | Date | Initials of Instructor |
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| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Interpret specifications |  |  |
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| **Floor Framing** |  |  |
| Select proper lumber |  |  |
| Measure and layout material |  |  |
| Cut material to proper lengths |  |  |
| Prepare and install floor framing |  |  |
| Prepare and install floor covering |  |  |
|  |  |  |
| **Wall Framing** |  |  |
| Select proper lumber |  |  |
| Measure and layout material |  |  |
| Cut material to proper lengths |  |  |
| Frame exterior walls |  |  |
| Install wall sheathing |  |  |
| Erect exterior walls |  |  |
| Install top plate |  |  |
|  |  |  |
| **Roof Truss Construction** |  |  |
| Select proper lumber |  |  |
| Measure and layout material |  |  |
| Cut material to proper lengths |  |  |
| Assemble roof truss |  |  |
| Attach roof truss |  |  |
| Install roof sheathing |  |  |

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| **Module 2** Wall Construction |

## Module Overview

This module will introduce students to the principles of wall construction. Students will learn about wall construction terminology, measuring, wall construction techniques, proper building techniques and proper building practices. They will draw on knowledge gained in Unit 2 in relation to reading blueprints and technical drawings. They will have to interpret a technical drawing, develop a work plan, select proper materials, and layout and cut their materials, and then assemble their materials to create a finished wall. They will employ the safe cutting and construction practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing will give them real life experience with building projects.

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| Theory of Wall Construction |

Answer the following questions using the textbook Modern Carpentry.

1. What is the most common material used for wall studs? What are the common stud spacing used in residential construction?
2. What are *headers*? Where are they used and what purpose do they serve?
3. What is the advantage of installing wall sheathing before the wall is erected?
4. What purpose does the double top plate serve?
5. Explain the difference between bearing and nonbearing partitions.
6. List three common types of sheathing, the nominal sizes, and the advantages of each.
7. What is the formula for estimating the number of studs needed for a wall of a given length? Using this formula, calculate the number of studs needed to construct a 12000mm (40’) wall with one door and two windows.

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| Labeling and Defining Wall Components |

Using the grid paper below sketch, a diagram of a wall section with the proper layout for a door opening. Label each member properly and give a brief description of each.

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| Materials Pricing Activity |

Using the technical drawing below, provide a cost breakdown for each of the materials used to construct the wall provided. These prices can be obtained using local suppliers, business flyers, or online quotes. Calculate the price using lumber, plywood and OSB for wall sheathing. Ensure that the total price is comprised of an itemized breakdown for each different material used.

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| Wall Section for Shed |



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| Wall Section 2 for Shed |



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| Wall Section 3 for Shed |

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| Shed Wall with Door Opening |



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| Reflection: Carpentry-Walls |

Read each of the following questions and provide a written response to each.

1. What problems did you encounter when building your wall? What would you do differently?
2. What are the advantages provided by using power tools as opposed to non-power tools?
3. How could you have divided your duties differently to make the project be more effective?
4. Discuss the advantages of working inside in a shop environment as opposed to outside on a typical jobsite. Give at least three advantages and disadvantages of each.
5. Collate your blueprints and your work plan (completed in Topic 2) to be submitted for grading.

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| Work Log: Carpentry |

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| **Record of Workplace Skills (LOG)**  **Names:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | |
| **Workplace Skills Required For Successful Completion of Carpentry Module** | Date | Initials of Instructor |
|  |  |  |
| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Interpret specifications |  |  |
|  | | |
| **Floor Framing** |  |  |
| Select proper lumber |  |  |
| Measure and layout material |  |  |
| Cut material to proper lengths |  |  |
| Prepare and install floor framing |  |  |
| Prepare and install floor covering |  |  |
|  |  |  |
| **Wall Framing** |  |  |
| Select proper lumber |  |  |
| Measure and layout material |  |  |
| Cut material to proper lengths |  |  |
| Frame exterior walls |  |  |
| Install wall sheathing |  |  |
| Erect exterior walls |  |  |
| Install top plate |  |  |
|  |  |  |
| **Roof Truss Construction** |  |  |
| Select proper lumber |  |  |
| Measure and layout material |  |  |
| Cut material to proper lengths |  |  |
| Assemble roof truss |  |  |
| Attach roof truss |  |  |
| Install roof sheathing |  |  |

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| **Module 3** Roof Construction |

## Module Overview

This module will introduce students to the principles of roof construction. Students will learn about roof truss terminology, measuring, roof construction techniques, proper building techniques and proper building practices. They will draw on knowledge gained in Unit 2 in relation to reading blueprints and technical drawings. They will have to interpret a technical drawing, develop a work plan, select proper materials, and layout and cut their materials, and then assemble their materials to create a finished truss. They will employ the safe cutting and construction practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing will give them real life experience with building projects.

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| Theory of Roof Truss Construction |

Answer the following questions using the textbook Modern Carpentry. The answers can be typed as a document or presented using a PowerPoint presentation.

1. Explain the difference between a truss and a rafter system.
2. Draw and label a proper rafter using the appropriate terminology.
3. Using graph paper design a rafter for the snow blower shed. Check with your teacher for the exact measurements of the shed.
4. Using graph paper design a standard w truss for the snow blower shed. Check with your teacher for the exact measurements of the shed.
5. What purpose does roof sheathing serve? What materials are available to be used as roof sheathing?
6. Define the following terminology:

* Framing Square
* Slope
* Bird’s Mouth
* Tail Cut
* Truss Plates
* Panel Clips

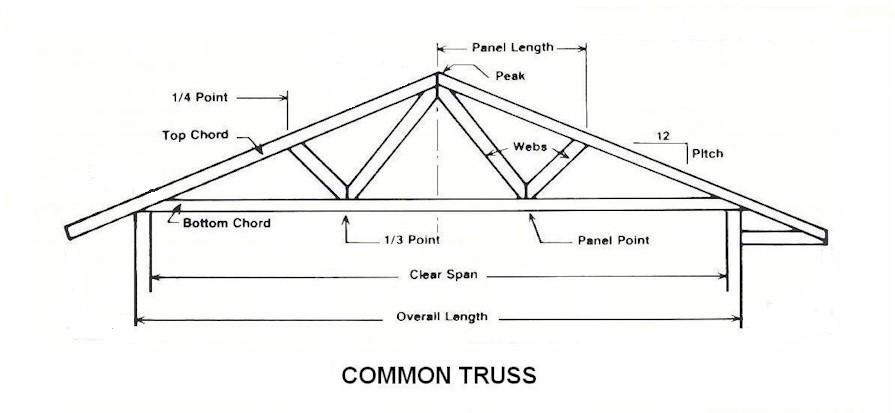
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| Labeling and Defining Roof Truss Components |

Using the grid paper below, sketch a diagram of a standard W or Fink roof truss with the proper layout for a roof truss. Label each member properly and give a brief description of each.

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| Materials Pricing Activity |

Using the available resource materials (books and Internet sources), determine the number of standard W trusses needed to complete the roof for a 2400mm x 3000mm (8’ x 10’) shed. Then contact local suppliers, business flyers, or online quotes to determine the total cost to build the number of trusses needed. Ensure that the total price is comprised of an itemized breakdown for each different material used (50mm x 100mm (2” x 4”) lumber, 13mm (1/2”) plywood). After you have priced the cost to build the trusses then price the cost of having the trusses supplied by a local truss company. Use the sample truss below as a guide.



|  |
| --- |
| Roof Truss |



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| --- |
| Roof Truss With Wall |



|  |
| --- |
| Reflection: Carpentry-Trusses |

Read each of the following questions and provide a written response to each.

1. If doing the roof truss project again what would you do differently?
2. What are the advantages of buying trusses from a truss company as opposed to making your own?
3. How could you have divided your duties differently to make the project be more effective?
4. Discuss the advantages of working inside in a shop environment as opposed to outside on a typical jobsite. Give at least three advantages and disadvantages of each.
5. Collate your blueprints and your work plan (completed in Topic 2) to be submitted for grading.

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| Work Log: Carpentry |

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| **Record of Workplace Skills (LOG)**  **Names:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | |
| **Workplace Skills Required For Successful Completion of Carpentry Module** | Date | Initials of Instructor |
|  |  |  |
| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Interpret specifications |  |  |
|  | | |
| **Floor Framing** |  |  |
| Select proper lumber |  |  |
| Measure and layout material |  |  |
| Cut material to proper lengths |  |  |
| Prepare and install floor framing |  |  |
| Prepare and install floor covering |  |  |
|  |  |  |
| **Wall Framing** |  |  |
| Select proper lumber |  |  |
| Measure and layout material |  |  |
| Cut material to proper lengths |  |  |
| Frame exterior walls |  |  |
| Install wall sheathing |  |  |
| Erect exterior walls |  |  |
| Install top plate |  |  |
|  |  |  |
| **Roof Truss Construction** |  |  |
| Select proper lumber |  |  |
| Measure and layout material |  |  |
| Cut material to proper lengths |  |  |
| Assemble roof truss |  |  |
| Attach roof truss |  |  |
| Install roof sheathing |  |  |

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| **Module 4** Electrical Wiring/Bench |

## Module Overview

This module will introduce students to the principles of residential electrical wiring. Students will learn about wiring terminology, electrical theory, tools, proper wiring techniques, proper electrical safety, and proper wiring practices. They will draw on knowledge gained in Unit 2 in relation to reading blueprints and technical drawings. They will have to interpret a technical drawing (electrical wiring diagram), develop a work plan, select proper materials, and then layout and install their materials. They will employ the safe shop (workplace) practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing will give them real life experience with building projects.

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| Theory of Residential Electrical Construction |

Go to the following web site and answer the questions that follow. Answers can be submitted as a word document or as a PowerPoint presentation.

http://www.hometime.com/Howto/projects/electrical.htm

1. List four electrical safety steps.
2. Define the following:
3. circuit breakers
4. hot wire
5. neutral wire
6. tester
7. What purpose does an electrical panel serve?
8. Explain the difference between a circuit breaker and a fuse.
9. What is "fish tape"? Where is it used?
10. How do you calculate minimum box size when choosing electrical boxes?
11. What is the difference between a single pole switch and a three-way switch?
12. Give one electrical code for each of the following:
13. kitchens
14. appliances
15. outlets
16. Switches

|  |
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| Electrical Wiring Tools |

Using the Internet or the resource books provided find a picture of, and a description of the use for each of the following electrical tools.

* Linesman’s Pliers
* Needle-nose pliers
* Wire Strippers
* Cable cutters
* Multimeter
* Robertson Screwdriver
* Utility Knife
* Wire Ripper
* Slotted Screwdriver

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| Electrical Theory |

Using the resource books provided or the Internet, answer the following questions.

1. Define Ohms Law. Briefly define the three parts of Ohms law and explain the correlation between the three of them

2. Briefly explain the difference between conductors and insulators.

3. What is a circuit? Give a description of a parallel circuit and a series circuit.

4. What are the two types of current? Explain the difference between the two.

5. What is the difference between a fuse and a circuit breaker?

6. What are the three basic types of circuits used in house wiring? Briefly describe each.

1. Describe each of the following types of cable:
   * + Nonmetallic Sheathed Cable Wiring
     + Armored Cable
     + Rigid Metal or Plastic Conduit

|  |
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| Reflection: Residential Electrician |

Read each of the following questions and provide a written response to each.

1. If doing the residential electrical wiring project again what would you do differently?
2. What are the advantages of wiring at the workbench as opposed to running the wires in an actual wall?
3. How could you have divided your duties differently to make the project be more effective?
4. Discuss the advantages of working inside in a shop as opposed to working on a typical jobsite. Give at least three advantages and disadvantages of each.
5. Finalize your work plan (completed in Topic 2) to be submitted for grading.

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| Work Log: Residential Electrician |

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| **Record of Workplace Skills (LOG)**  **Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | |
| **Workplace Skills Required For Successful Completion of Residential Electrical Wiring Module** | Date | Initials of Instructor |
|  |  |  |
| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Interpret specifications |  |  |
|  | | |
| **Electrical Wiring** |  |  |
| Select proper wire |  |  |
| Measure and cut wire |  |  |
| Select proper electrical boxes |  |  |
| Select proper electrical components |  |  |
| Feed wire through boxes |  |  |
| Strip wire |  |  |
| Attach electrical components |  |  |
| Properly install marettes |  |  |
|  |  |  |
| Testing Circuits |  |  |
| Properly hook circuits to power supply |  |  |
| Properly use multimeter |  |  |

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| **Module 5** Electrical Wiring/Wall |

## Module Overview

This module will introduce students to the principles of residential electrical wiring. Students will learn about wiring terminology, electrical theory, tools, proper wiring techniques, proper electrical safety, and proper building practices. They will draw on knowledge gained in Unit 2 in relation to reading blueprints and technical drawings. They will have to interpret a technical drawing, develop a work plan, select the proper materials and then layout and install their materials. They will employ the safe shop (workplace) practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing will give them real life experience with building projects.

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| Theory of Residential Electrical Construction |

On the floor plan provided below, plan and sketch out the following electrical wiring components. The plan should include light switches, light fixtures, receptacles, phone jacks, and thermostats. Use the symbols provided to complete the floor plan.

|  |  |
| --- | --- |
| Component | Symbol |
| Receptacle |  |
| Phone Jack |  |
| Light Fixture |  |
| Thermostat |  |
| Light Switch | **S** |



|  |
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| Electrical Wiring Components |

Using the Internet or the resource books provided find a picture of, and a description of the use for each of the following electrical components that you will use in this module.

* Octagon Box
* Receptacle Box
* Light Fixture
* Single-Pole Switch
* 3-Way Switch
* Receptacle
* Marrette
* Wiring Staple

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| Electrical Theory |

Using the space provided sketch the wiring diagram needed to wire a lighting circuit that is controlled at one location, with the 120-volt source entering at the switch. You will need to use your available resources to determine the correct codes for the location of the switch box, the wiring specifications and the proper location of wiring staples. Be sure to include all of this information on your sketch.

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| Reflection: Residential Electrician |

Read each of the following questions and provide a written response to each.

1. If doing the residential electrical construction project again what would you do differently?
2. What are the advantages of wiring circuits in properly studded walls?
3. How could you have divided your duties differently to make the project be more effective?
4. Discuss the advantages of working inside in a shop environment as opposed to working on a typical jobsite. Give at least three advantages and disadvantages of each.
5. Finalize your work plan (completed in Topic 2) to be submitted for grading.

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| Work Log: Residential Electrician |

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| **Record of Workplace Skills (LOG)**  **Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | |
| **Workplace Skills Required For Successful Completion of Residential Electrical Wiring Module** | Date | Initials of Instructor |
|  |  |  |
| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Interpret specifications |  |  |
|  | | |
| **Electrical Wiring** |  |  |
| Select proper wire |  |  |
| Measure and cut wire |  |  |
| Select proper electrical boxes |  |  |
| Select proper electrical components |  |  |
| Feed wire through boxes |  |  |
| Strip wire |  |  |
| Attach electrical components |  |  |
| Properly install marettes |  |  |
|  |  |  |
| Testing Circuits |  |  |
| Properly hook circuits to power supply |  |  |
| Properly use multimeter |  |  |

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| **Module 6** Plumber: Toilet Installation |

## Module Overview

This module will introduce students to the principles of residential plumbing. Students will learn about plumbing terminology and tools, different plumbing technologies, proper plumbing techniques and proper plumbing practices. They will draw on knowledge gained in Unit 2 in relation to reading blueprints and technical drawings. They will have to interpret technical drawings, develop a work plan, select and identify toilet parts, assemble and install a toilet, install the water supply and the install the drain/waste/vent system. Students will use Pex pipe for the water supply and use current plumbing techniques to install the water supply complete with appropriate shut-offs. They will then use ABS pipe and the proper drain components to complete the drain system. The drain system will be dry-fit to save on materials and reduce cost. They will employ the safe shop and construction practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing will give them real life experience with building projects

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| Theory of Residential Electrical Construction |

Using the resource materials below answer the following questions.

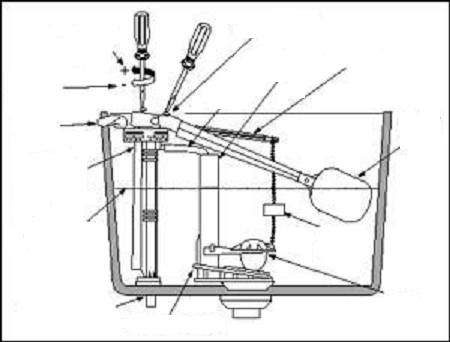
Blankenbaker, Keith E. 2005. Modern Plumbing. Tinley Park, Illinois. The Goodheart-Willcox Company, Inc.

Smith, Lee. 2000. Plumbing Technology: Design & Installation. Albany, New York. Delmar Thompson Learning.

1. What are two main things that must be considered when designing a plumbing system?
2. How is pressure maintained in a water supply system? (Municipal and well)
3. What is the purpose of valves in a water system?
4. Describe two types of valves used in a plumbing system
5. Why is selecting the right size pipe important in a DWV system?
6. Explain the various venting methods.
7. What is the difference between a Sanitary Tee and a Vent Tee?
8. What is the difference between a Wye and a TY?

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| Labeling Toilet Components |

Label the diagram provided below and give a brief description of each of the parts.



Descriptions: (please do this online)

|  |
| --- |
| Materials Pricing Activity |

Using your components kit provided with this module, calculate the cost of doing a typical toilet installation for a bathroom. Be sure to include the cost of the components, materials, and labor cost for a licensed plumber. You can get these cost estimates using an online quote or by calling the local hardware store and getting the prices. Put your information in the table below and then calculate a total cost.

|  |  |
| --- | --- |
| Cost of Toilet Installation | |
| Materials Cost | |
| Material | Cost |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| Total |  |
| Components Cost | |
| Components | Cost |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| Total |  |
| Plumbers Cost | |
| Rate per hour | # Of hours |
|  |  |
| Total |  |
|  |  |
| **Total cost** |  |
|  | |

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| Reflection: Plumber-Toilet |

Read each of the following questions and provide a written response to each.

1. If doing the toilet installation project again what would you do differently?
2. What are the advantages of using a certified plumber as opposed to doing it yourself?
3. How could you have divided your duties differently to make the project be more effective?
4. Discuss the advantages of working inside in a shop environment as opposed to a typical jobsite. Give at least three advantages and disadvantages of each.
5. Finalize your work plan (completed in Topic 2) to be submitted for grading.

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| Work Log: Plumber-Toilet |

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| **Record of Workplace Skills (LOG)**  **Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | |
| **Workplace Skills Required For Successful Completion of Residential Plumbing Module** | Date | Initials of Instructor |
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| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Interpret specifications |  |  |
|  | | |
| **Residential Plumbing** |  |  |
| Layout floor for flange |  |  |
| Drill hole and cut flange hole |  |  |
| Install flange |  |  |
| Attach toilet bowl |  |  |
| Attach flush box |  |  |
| Install Pex supply line |  |  |
| Install shut-off and water supply (using Teflon tape) |  |  |
| Install elbow |  |  |
| Measure, cut and install abs pipe |  |  |
| Check all connections |  |  |
| Test |  |  |

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| **Module 7** Plumber: Sink Installation |

## Module Overview

This module will involve the proper setup and installation of a sink (can be either a kitchen or bathroom sink). The students will be expected to measure and layout the vanity top and then prepare the top for cutting. After the top is cut and the sink is in place students will install the faucets, install the drain kit using plumbers putty, install supply lines using Pex tubing, and install shut-offs and the water supply lines to the faucets. Students will follow accepted practice using the proper tools at each stage of the installation. Once the water supply is complete students will then complete the drain/waste/vent system for the sink. This will involve the use of ABS pipe using all appropriate parts. These include a p-trap, sanitary t, and the cutting of ABS pipe to connect each part. Students will dry fit most of these parts in order to reduce cost but it would be prudent to have student do a glue-up so they can experience the set times related with ABS cement. They will employ the safe shop and construction practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing will give them real life experience with building projects.

|  |
| --- |
| Theory of Residential Plumbing |

Using the resource materials below answer the following questions.

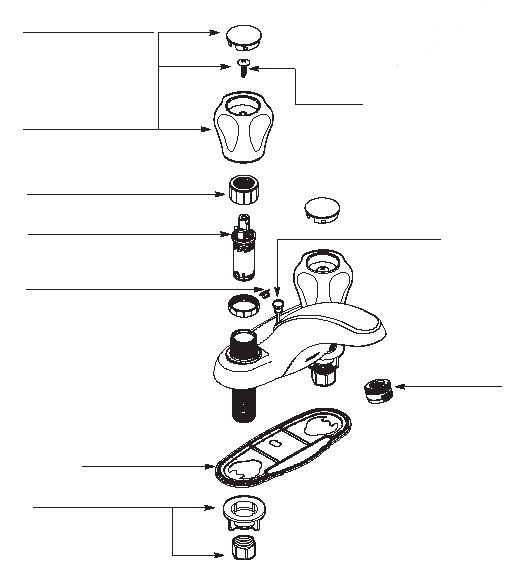
Blankenbaker, Keith E. 2005. Modern Plumbing. Tinley Park, Illinois. The Goodheart-Willcox Company, Inc.

Smith, Lee. 2000. Plumbing Technology: Design & Installation. Albany, New York. Delmar Thompson Learning.

1. What are the two types of pipes involved in a plumbing system? Explain.
2. Briefly describe the six types of plastic material used to make 90% of all plastic pipe.
3. What does the term *outside diameter* refer to in relation to plastic pipe? Why is it important?
4. Discuss the differences between copper pipe and Pex pipe. Include the advantages and disadvantages of each.
5. Give a brief description of each of the following fittings and their uses:
   * Reducer
   * Elbow
   * Sanitary Tee
   * Vent Tee
   * P-Trap with Cleanout
   * P-Trap with Slip Joint

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| Labeling Sink Components |

Label the parts of the faucet below. Give a brief description of how these parts work together to make a faucet work.



Descriptions: (do this online)

|  |
| --- |
| Materials Pricing Activity |

Using your components kit provided with this module, calculate the cost of doing a typical sink installation for a bathroom. Be sure to include the cost of the components, materials, and labor cost for a licensed plumber. You can get these cost estimates using an online quote or by calling the local hardware store and getting the prices. Put your information in the table below and then calculate a total cost.

|  |  |
| --- | --- |
| Cost of Sink Installation | |
| Materials Cost | |
| Material | Cost |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| Total |  |
| Components Cost | |
| Components | Cost |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
| Total |  |
| Plumbers Cost | |
| Rate per hour | # Of hours |
|  |  |
| Total |  |
|  |  |
| **Total cost** |  |
|  | |

|  |
| --- |
| Reflection: Plumber-Sink |

Read each of the following questions and provide a written response to each.

1. If doing the sink installation project again what would you do differently?
2. What are the advantages of using Pex pipe instead of the traditional copper tubing?
3. How could you have divided your duties differently to make the project be more effective?
4. Discuss the advantages of working inside in a shop environment as opposed to outside on a typical jobsite. Give at least three advantages and disadvantages of each.
5. Finalize your work plan (completed in Topic 2) to be submitted for grading.

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| Work Log: Plumber-Sink |

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| --- | --- | --- |
| **Record of Workplace Skills (LOG)**  **Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | |
| **Workplace Skills Required For Successful Completion of Residential Plumbing Module** | Date | Initials of Instructor |
|  |  |  |
| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Interpret specifications |  |  |
|  | | |
| **Residential Plumbing** |  |  |
| Layout vanity top for sink |  |  |
| Drill hole and cut sink hole |  |  |
| Install sink |  |  |
| Install drain kit using plumbers putty |  |  |
| Install faucets |  |  |
| Install Pex supply lines (hot and cold) |  |  |
| Install shut-offs and water supply (use Teflon tape) |  |  |
| Install p-trap |  |  |
| Install sanitary-t |  |  |
| Measure, cut and install abs pipe |  |  |
| Check all connections |  |  |
| Test |  |  |

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| **Module 8** Lather |

## Module Overview

This module will introduce students to the principles of drywall installation and plastering. Students will use modern materials and building techniques as they relate to drywall installation and plastering. They will employ the safe cutting and construction practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing will give them real life experience with building projects.

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| Lather Theory |

Go to the http://www.hometime.com website and under the Drywall Section answer the following questions. The appropriate topics are listed below.

**Tools and Materials**

**Preparations**

**Cutting Drywall**

**Hanging Drywall on Ceilings and Walls**

**Finishing Drywall Joints: Tape Coat**

1. Give a brief description of the following types of drywall.

* Drywall
* Greenboard
* Concrete backerboard

1. Explain how to estimate materials for dry walling.
2. Explain how to layout and cut drywall using a utility knife.
3. Explain how to hang drywall on a wall. Why do you hang drywall on the ceiling before the walls?
4. Define:

|  |  |
| --- | --- |
| * Factory Edge | * Butt joint |
| * Lifter | * Ripper |

1. What is corner bead used for? How do you install it?
2. Explain how to embed joint tape.

8. Explain how to tape inside corners.

|  |
| --- |
| Drywall Tools |

Using the resources you have available to you, find a picture, and the uses for each of the following drywall tools.

Drywall Tools

Wall Board Lifter

Hand Sander

Drywall Saw

Stud Finder

Drywall Square

Drywall Corner Tool

Plaster Hawk

Pole Sander

Drywall Hammer

Outside Corner Tool

Utility Knife

Taping Knives

Putty Knife

Finishing Knife

Plastering Trowels

|  |
| --- |
| Materials Pricing Activity |

Using the floor plan specifications listed below; calculate the amount of drywall, screws, and drywall compound needed to complete the drywall and plastering of the room including the ceiling. After you have done your calculations, determine the cost based on local building supply prices. This can be done using flyers, online quotes, or by contacting a local building supplies company.

**Floor plan Specifications**:

Room is 3000mm x 300omm x (10’ x 10’)

Room Height is 2400mm (8’)

Room has one window 1200mm x 1200mm (4’ x 4’)

Room has one door 1950mm x 800mm (6’ 6” x 32”)



|  |
| --- |
| Reflection: Lather |

Read each of the following questions and provide a written response to each.

1. If doing the drywall/plastering project again what would you do differently?
2. What advantages are there to using drywall screws and screw guns instead of hammer and nails?
3. How could you have divided your duties differently to make the project be more effective?
4. Discuss the advantages of working inside in a shop environment as opposed to outside on a typical jobsite. Give at least three advantages and disadvantages of each.
5. Finalize your work plan (completed in Topic 2) to be submitted for grading.

|  |
| --- |
| Work Log: Lather |

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| **Record of Workplace Skills (LOG)**  **Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | |
| **Workplace Skills Required For Successful Completion of Lather Module** | Date | Initials of Instructor |
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| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Interpret specifications |  |  |
|  | | |
| **Cutting Drywall** |  |  |
| Layout drywall |  |  |
| Cut drywall to fit wall specifications |  |  |
| Install drywall |  |  |
|  | | |
| **Plastering** |  |  |
| Apply compound to screw heads |  |  |
| Apply joint tape to corners |  |  |
| Sand where needed |  |  |
| Apply more compound where needed |  |  |
| Sand and apply finish coat |  |  |
| Test (check for imperfections) |  |  |

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| **Module 9** Masonry: Ceramic Wall Tile |

## Module Overview

This module will introduce students to the principles of residential ceramic tile. Students will learn about ceramic tile terminology, measuring, installation techniques, proper building techniques and proper building practices. They will draw on knowledge gained in Unit 2 in relation to reading blueprints and technical drawings. They will have to interpret a technical drawing, develop a work plan, select proper tiles and layout and cut their tiles, install and then grout their tiles. They will employ the safe cutting and construction practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing will give them real life experience with building projects.

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| Ceramic Tile Theory |

Using the reference books provided and sources available on the Internet complete the following questions.

1. Explain the differences between thin set adhesive and organic mastics.

2. Give the use for each of the following tools:

* Tile Cutter
* Tile Nipper
* Notched trowel
* Grout Float
* Rod Saw
* Grind Stone

3. Explain the advantages of using concrete backerboard.

4. Explain the advantages of using a mortar bed.

5. What is a jury stick? Explain its use.

6. Explain how to layout and set wall tile.

7. What is back buttering? Where is it used?

8. Explain the difference between sanded and non-sanded grout. What is the best application for each?

9. Where should you use caulking when using ceramic tile?

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| Ceramic Tile Layout |

Using the space below sketch a diagram of a wall section with the proper layout for the symmetrical installation of 150mm x 150mm (6” x6”) ceramic wall tile. Wall section should represent a 300mm (5’) long bathtub.

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| Materials Pricing Activity |

Using the information provided below and a rough sketch that you will draw, determine the number of tiles, the amount of mortar (adhesive), and grout needed to complete the project. Be sure to make allowances for breakage and defective material. Finally, calculate the cost of the material using flyers, online quotes, or by calling a local building supplies company.

Typical bathtub size: 1500mm x 675mm x 375mm (60” x 27” x 15”)

You will be tiling three sides of the bathtub with 150mm x 200mm (6” x 8”) tile. These tiles should extend up the wall at least 1800mm (72”). You should also include a row of trim tiles around the top of the tiled sections. Your grout lines will be 3mm (1/8”).

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| Reflection: Ceramic Tile |

Read each of the following questions and provide a written response to each.

1. If doing the ceramic tile project again what would you do differently?
2. What are the advantages of installing ceramic tile in a bathroom? What are the disadvantages?
3. How could you have divided your duties differently to make the project be more effective?
4. Discuss the advantages of working inside in a shop environment as opposed to outside on a typical jobsite. Give at least three advantages and disadvantages of each.
5. Collate your blueprints and your work plan (completed in Topic 2) to be submitted for grading.

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| Work Log: Ceramic Tile |

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| **Record of Workplace Skills (LOG)**  Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | |
| **Workplace Skills Required For Successful Completion of Ceramic Tile Module** | Date | Initials of Instructor |
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| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Interpret specifications |  |  |
|  | | |
| **Cutting Ceramic Tile** |  |  |
| Layout ceramic tile |  |  |
| Cut ceramic tile to fit wall specifications |  |  |
|  |  |  |
| **Wall Preparations** |  |  |
| Layout wall using symmetrical layout |  |  |
| Apply tile adhesive |  |  |
| Install tile |  |  |
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| **Grouting Tile** |  |  |
| Prepare tile for grouting |  |  |
| Mix non-sanded grout |  |  |
| Apply non-sanded grout |  |  |
| Clean-up grout |  |  |
| Apply waterproof caulking in corners |  |  |
| Apply grout sealer |  |  |

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| **Module 10** Masonry: Ceramic Floor Tile |

## Module Overview

This module will introduce students to the principles of residential ceramic tile. Students will learn about ceramic tile terminology, measuring, installation techniques, proper building techniques and proper building practices. They will draw on knowledge gained in Unit 2 in relation to reading blueprints and technical drawings. They will have to interpret a technical drawing, develop a work plan, select proper tiles and layout and cut their tiles, install and then grout their tiles. They will employ the safe cutting and construction practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing will give them real life experience with building projects.

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| Ceramic Tile Theory |

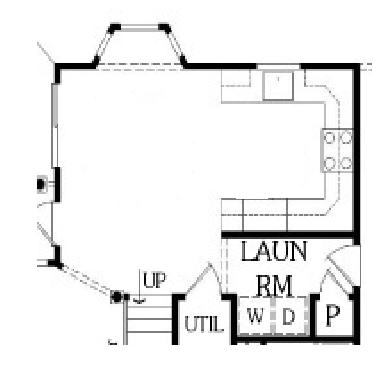
<http://www.hometime.com/Howto/projects/ctile/tile_6.htm>

<http://www.easy2diy.com/cm/easy/diy_ht_3d_index.asp?page_id=35750428>

1. What is the difference between glazed tile and unglazed tile? Why are glazed tile better for flooring?
2. Describe the composition of concrete backerboard. What feature makes it so good for use in bathrooms?
3. Fully explain how to cut concrete backerboard. Describe how you would attach backerboard to an existing plywood floor.
4. What do professional tile setters often use for underlayment? Why would this not be recommended for do-it-yourself tile installers?
5. Fully describe the process of laying out reference lines for installing floor tile. Use pictures to aid in your description.
6. Describe the proper method of spreading floor adhesive using a notched trowel.
7. How do you set the tiles into the mortar or adhesive? What percentage of coverage would be ideal?
8. How do you ensure that all tiles are evenly spaced and uniform across the surface? Explain.
9. What is back buttering? Where would you use it?
10. What is the difference between sanded and un-sanded grout? Which would you use for floor tiling?
11. Fully explain how to apply grout being sure to reference all tools used in the process.
12. What is the purpose of sealing the grout after it has dried?

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| Ceramic Tile Layout |

Using the diagram below, sketch a good layout for installing ceramic tile. Be sure to follow the proper layout procedures and keep everything symmetrical. You need to design the floor using 12” tiles and ¼” grout lines.



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| Materials Pricing Activity |

Using the information provided below and a rough sketch that you will draw, determine the number of tiles, the amount of mortar (adhesive), and grout needed to complete the project. Be sure to make allowances for breakage and defective material. Finally, calculate the cost of the material using flyers, online quotes, or by calling a local building supplies company.

NB *Typical kitchen size: 14’ x 20’*

You will be tiling the entire floor with 12” x 12” tile. Your grout lines will be 1/4”.

A good online resource to help is listed below.

http://www.ceramic-tile-floor.info/tileinstallation.htm

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| Reflection: Ceramic Tile |

Read each of the following questions and provide a written response to each.

1. If doing the ceramic tile project again what would you do differently?
2. What are the advantages of installing ceramic tile in a bathroom/kitchen? What are the disadvantages?
3. How could you have divided your duties differently to make the project go more smoothly?
4. Discuss the advantages of working inside in a shop as opposed to outside on a typical jobsite. Give at least three advantages and disadvantages of each.
5. Collate your blueprints and your work plan (completed in Topic 2) to be submitted for grading.

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| Work Log: Ceramic Tile |

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| **Record of Workplace Skills (LOG)**  Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | |
| **Workplace Skills Required For Successful Completion of Ceramic Tile Module** | **Date** | **Initials of Instructor** |
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| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Interpret specifications |  |  |
|  | | |
| **Cutting Ceramic Tile** |  |  |
| Layout ceramic tile |  |  |
| Cut ceramic tile to fit wall specifications |  |  |
|  | | |
| **Wall Preparations** |  |  |
| Layout wall using symmetrical layout |  |  |
| Apply tile adhesive |  |  |
| Install tile |  |  |
|  | | |

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| **Grouting Tile** |  |  |
| Prepare tile for grouting |  |  |
| Mix non-sanded grout |  |  |
| Apply non-sanded grout |  |  |
| Clean-up grout |  |  |
| Apply waterproof caulking in corners |  |  |
| Apply grout sealer |  |  |

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| **Module 11** Finish Carpentry |

## Module Overview

This module will introduce students to the principles of finish carpentry. Students will learn about finish carpentry terminology, measuring, installation techniques, proper building techniques and proper building practices. They will draw on knowledge gained in Unit 2 in relation to reading blueprints and technical drawings. They will have to interpret a technical drawing, develop a work plan, select proper materials and layout, cut and assemble these materials. They will employ the safe cutting and construction practices covered in the earlier safety section and will emulate safe building and workplace guidelines. Students will learn the value of teamwork and the importance of planning ahead to achieve proper results. The work plan and pricing will give them real life experience with building projects.

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| Finish Carpentry Theory |

Answer the following questions using the textbook Modern Carpentry, Finish Carpentry& Trimwork, and Kelleher Window and Door Moulding Installation pamphlet.

1. What is the purpose of window and door jambs?
2. List and describe four types of interior doors.
3. Sketch and identify the four components of an interior window trim.
4. Identify the two types of joints and tell when each should be used?
5. Fully describe the process of installing a basic window casing with a stool and mitered corners.
6. What is a plinth block?
7. What is the difference between a baseboard and a shoe moulding? How do they work together?

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| Interior Door Schedule |

Using the blueprints provided by your teacher, develop a door schedule. Your schedule should include the location, width, thickness, type and design, and kind of material.

Put this together in a MS Word document, print it off and hand it in to your teacher for grading.

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| Materials Pricing Activity |

Using the blueprints provided by your teacher and a rough sketch that you will draw, determine the amount of 3” crown moulding, baseboards, shoe moulding, window and door trim required to complete the project. Be sure to make allowances for waste and defective material. Finally, calculate the cost of the material using flyers, online quotes, or by calling a local building supplies company.

Place rough sketch here:

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| Reflection: Finish Carpentry |

Read each of the following questions and provide a written response to each.

1. If doing the ceramic tile project again what would you do differently?
2. What are the advantages of installing ceramic tile in a bathroom/kitchen? What are the disadvantages?
3. How could you have divided your duties differently to make the project go more smoothly?
4. Discuss the advantages of working inside in a shop as opposed to outside on a typical jobsite. Give at least three advantages and disadvantages of each.
5. Collate your blueprints and your work plan (completed in Topic 2) to be submitted for grading.

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| Work Log: Finish Carpentry |

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| **Record of Workplace Skills (LOG)**  Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Module: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | |
| **Workplace Skills Required For Successful Completion of Ceramic Tile Module** | **Date** | **Initials of Instructor** |
|  | | |
| **Blueprint Reading and Sketching** |  |  |
| Read basic drawings and diagrams |  |  |
| Sketch drawings and diagrams |  |  |
| Presented specifications |  |  |
|  | | |
| **Cutting Materials** |  |  |
| Layout wooden materials |  |  |
| Cut mouldings to fit specifications |  |  |
| **Installing Moulding** |  |  |
| Prepare window for finish work |  |  |
| Cut stool |  |  |
| Cut facings |  |  |
| Created header |  |  |
| Cut apron |  |  |
| Finished surface |  |  |