Teaching & Learning Template: Plumbing by Learning Type and Style

Jeff Ruigrok
Sheridan College

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Integration Framework for College of Trades Curriculum and Ministry Standards

Teaching & Learning Template

Plumbing by Learning Type and Style

Jeff Ruigrok
3/31/2017
<table>
<thead>
<tr>
<th>Leadership in Learning</th>
<th>Mechanical Technician Program Standard</th>
<th>Apprenticeship Curriculum Standard</th>
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<td>S00021.0 Workplace Safety, Rigging and Hoisting</td>
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<td>21.4 - Control Hazards</td>
<td>7--Interpret, prepare &amp; modify mechanical drawings &amp; other related technical documents.</td>
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<td>21.9 - Read and Interpret Specifications &amp; Shop Drawings</td>
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<td>2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.</td>
<td>10--Contribute to the planning, implementation &amp; evaluation of projects</td>
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<td>21.3 - Recognize &amp; assess hazardous conditions</td>
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<td>3--Comply with current health &amp; safety legislation, as well as organizational practices &amp; procedures.</td>
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<td>11--Select, use &amp; maintain machinery, tools &amp; equipment for the installation, manufacturing &amp; repair of basic mechanical components</td>
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**Communication**
- Reading
- Writing
- Speaking
- Listening
- Presenting
- Visual literacy

**Numeracy**
- Understanding & applying math concepts & reasoning
- Analyzing & using numerical data

**Information Management**
- Gathering & managing information
- Selecting & using appropriate tools & technology for a task or a project
- Computer literacy
- Internet skills

**Critical Thinking & Problem Solving**
- Analyzing
- Synthesizing
- Evaluating
- Decision making
- Creative & innovative thinking

**Personal**
- Managing self
- Managing change & being flexible & adaptable
- Engaging in reflective practices
- Demonstrating personal responsibility

**Interpersonal**
- Teamwork
- Relationship management
- Conflict resolution
- Leadership
- Networking

**Physical Literacy**
- Performance activity or task
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- Tactic and kinetic
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22.13 – Drainage Terms and Definitions
22.14 – Cleanouts and Locations
22.15 – Prohibited Fittings and Connections
22.16 – Purpose of a Drain Plan
22.17 – How to Draw a Drain Plan
22.18 – Foundation Drains
22.19 – Floor Drains
22.20 – Hub Drains and Funnel Floor Drains
22.21 – Trap Seal Primers
22.22 – Drain System Design
22.23 – Building Traps
22.24 – Purpose of a Stack Elevation
22.25 – How to Draw a Stack Elevation
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<th>Directive Cognitive Structure</th>
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- **Communication**
  - Reading
  - Writing
  - Speaking
  - Listening
  - Presenting
  - Visual literacy

- **Numeracy**
  - Understanding & applying math concepts & reasoning
  - Analyzing & using numerical data

- **Information Management**
  - Gathering & managing information
  - Selecting & using appropriate tools & technology for a task or a project

- **Critical Thinking & Problem Solving**
  - Analyzing
  - Synthesizing
  - Evaluating
  - Decision making
  - Creative & innovative thinking

- **Personal**
  - Managing self
  - Managing change & being flexible & adaptable
  - Engaging in reflective practices
  - Demonstrating personal responsibility

- **Interpersonal**
  - Teamwork
  - Relationship management
  - Conflict resolution
  - Leadership
  - Networking

- **Physical Literacy**
  - Performance activity or task
  - Knowledge utilization
  - Tactic and kinetic

- **22.40 Code, Regulations & Standards**

- **1--Complete all work in compliance with current legislation, standards, regulations and guidelines.**
### Leadership in Learning

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#### Critical Thinking & Problem Solving

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#### Personal

| Managing self |                                       |
| Managing change & being flexible & adaptable | |
| Engaging in reflective practices | |
| Demonstrating personal responsibility | |

#### Interpersonal

| Teamwork |                                       |
| Relationship management |                                        |
| Conflict resolution |                                        |
| Leadership |                                       |
| Networking |                                       |

#### Physical Literacy

| Performance activity or task |                                       |
| Knowledge utilization |                                       |
| Tactic and kinetic |                                       |

<p>| 23.2 – Identify &amp; Use Various Hand Tools | 8–Perform technical measurements accurately using appropriate instruments &amp; equipment |
| 23.3 – Identify &amp; Use Various Power Tools | 9–Manufacture, assemble, maintain &amp; repair mechanical components according to required specifications. |
| 23.4 – Steel Pipe Joining Methods | 11–Select, use &amp; maintain machinery, tools &amp; equipment for the installation, manufacturing &amp; repair of basic mechanical components |
| 23.5 – Cast Iron Pipe Joining Methods |                                      |
| 23.6 – Copper Pipe Joining Methods |                                      |</p>
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### Directive Cognitive Structure

#### Communication
- Reading
- Writing
- Speaking
- Listening
- Presenting
- Visual literacy

#### Numeracy
- Understanding & applying math concepts & reasoning
- Analyzing & using numerical data

#### Information Management
- Gathering & managing information
- Selecting & using appropriate tools & technology for a task or a project
- Computer literacy
- Internet skills

#### Critical Thinking & Problem Solving
- Analyzing
- Synthesizing
- Evaluating
- Decision making
- Creative & innovative thinking

#### Personal
- Managing self
- Managing change & being flexible & adaptable
- Engaging in reflective practices
- Demonstrating personal responsibility

#### Interpersonal
- Teamwork
- Relationship management
- Conflict resolution
- Leadership
- Networking

#### Physical Literacy
- Performance activity or task
- Knowledge utilization
- Tactic and kinetic

#### Vocational Learning Outcomes

2. Apply quality control and quality assurance procedures to meet organizational standards and requirements.

6. Analyze & solve mechanical problems by applying mathematics & fundamentals of mechanics.
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<td>25.3 – Identify and Interpret Construction Drawings</td>
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<td>7--Interpret, prepare &amp; modify mechanical drawings &amp; other related technical documents</td>
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### Leadership in Learning

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#### Directive Cognitive Structure

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<tr>
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<tr>
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### Achievement Role-Play

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| 26.1 – Oxy-Acetylene Cutting and Welding Equipment and Accessories |
| 26.2 – Oxy-Acetylene Cutting Theory, Cutting and Welding Safety Requirements |
| 26.4 – Lay Down Beads, Prepare, Tack & Weld a Butt Joint |

<p>| 8--Perform technical measurements accurately using appropriate instruments &amp; equipment |
| 9--Manufacture, assemble, maintain &amp; repair mechanical components according to required specifications. |
| 11--Select, use &amp; maintain machinery, tools &amp; equipment for the installation, manufacturing &amp; repair of basic mechanical components |</p>
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### Directive Cognitive Structure

#### Communication
- Reading
- Writing
- Speaking
- Listening
- Presenting
- Visual literacy

#### Numeracy
- Understanding & applying math concepts & reasoning
- Analyzing & using numerical data

#### Information Management
- Gathering & managing information
- Selecting & using appropriate tools & technology for a task or a project
- Computer literacy
- Internet skills

#### Critical Thinking & Problem Solving
- Analyzing
- Synthesizing
- Evaluating
- Decision making
- Creative & innovative thinking

#### Personal
- Managing self
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- Engaging in reflective practices
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#### Interpersonal
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- Networking

#### Physical Literacy
- Performance activity or task
- Knowledge utilization
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### Leadership in Learning

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### Directive Cognitive Structure

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### Information Management

| Critical Thinking & Problem Solving | | |
|-------------------------------------| | |
| ● Analyzing                         | | |
| ● Synthesizing                      | | |
| ● Evaluating                        | | |
| ● Decision making                   | | |
| ● Creative & innovative thinking    | | |

### Personal

| Personal | | |
|----------| | |
| ● Managing self                      | | |
| ● Managing change & being flexible & adaptable | | |
| ● Engaging in reflective practices   | | |
| ● Demonstrating personal responsibility | | |

### Interpersonal

| Interpersonal | | |
|---------------| | |
| ● Teamwork    | | |
| ● Relationship management | | |
| ● Conflict resolution | | |
| ● Leadership  | | |
| ● Networking  | | |

### Physical Literacy

| Physical Literacy | | |
|-------------------| | |
| ● Performance activity or task | | |
| ● Knowledge utilization | | |
| ● Tactic and kinetic | | |

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<td>2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.</td>
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</table>
| Skill Category - Defined | 27.13 – Wet Venting  
27.14 – Vent Stacks  
27.15 – Circuit Vent | 27.12 – Branch Vents  
27.16 – Yoke, Auxiliary Stacks, & Offset Relief Vents | 2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.  
10--Contribute to the planning, implementation & evaluation of projects |

| Directive Cognitive Structure | Critical Thinking & Problem Solving | 27.12 – Branch Vents  
27.16 – Yoke, Auxiliary Stacks, & Offset Relief Vents | 2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.  
10--Contribute to the planning, implementation & evaluation of projects |
| Communication | Analyzing  
Synthesizing  
Evaluating  
Decision making  
Creative & innovative thinking | 27.12 – Branch Vents  
27.16 – Yoke, Auxiliary Stacks, & Offset Relief Vents | 2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.  
10--Contribute to the planning, implementation & evaluation of projects |
| Numeracy | Understanding & applying math concepts & reasoning  
Analyzing & using numerical data  
Conceptualizing | 27.12 – Branch Vents  
27.16 – Yoke, Auxiliary Stacks, & Offset Relief Vents | 2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.  
10--Contribute to the planning, implementation & evaluation of projects |
| Information Management | Gathering & managing information  
Selecting & using appropriate tools & technology for a task or a project | 27.12 – Branch Vents  
27.16 – Yoke, Auxiliary Stacks, & Offset Relief Vents | 2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.  
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| Participative Meta-Cognition Structures | Critical Thinking & Problem Solving | 27.12 – Branch Vents  
27.16 – Yoke, Auxiliary Stacks, & Offset Relief Vents | 2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.  
10--Contribute to the planning, implementation & evaluation of projects |
| Personal | Managing self  
Managing change & being flexible & adaptable  
Engaging in reflective practices  
Demonstrating personal responsibility | 27.12 – Branch Vents  
27.16 – Yoke, Auxiliary Stacks, & Offset Relief Vents | 2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.  
10--Contribute to the planning, implementation & evaluation of projects |
| Supportive Collaborative | Interpersonal | Teamwork  
Relationship management  
Conflict resolution  
Leadership  
Networking | 27.12 – Branch Vents  
27.16 – Yoke, Auxiliary Stacks, & Offset Relief Vents | 2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.  
10--Contribute to the planning, implementation & evaluation of projects |
| Physical Literacy | Performance activity or task  
Knowledge utilization  
Tactic and kinetic | 27.12 – Branch Vents  
27.16 – Yoke, Auxiliary Stacks, & Offset Relief Vents | 2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.  
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<td>● Writing</td>
<td>27.18 – Location of Valves</td>
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<tr>
<td>● Speaking</td>
<td>27.19 – Water Distribution Terms &amp; Definitions</td>
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<td>● Listening</td>
<td>27.21 – Hot Water Thermostatic Mixing Valves</td>
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<td>● Presenting</td>
<td>27.22 – Temperature &amp; Pressure relief Valves</td>
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<td>● Visual literacy</td>
<td>27.23 – Water Meters</td>
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| Numeracy                   | ● Understanding & applying math concepts & reasoning |
|                           | ● Analyzing & using numerical data |
| Conceptualizing           | ● Gathering & managing information |
|                           | ● Selecting & using appropriate tools & technology for a task or a project |
|                           | ● Computer literacy |
|                           | ● Internet skills |

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Participative Meta-Cognition

Supportive Collaborative

Achievement Role-play
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### Communication
- Reading
- Writing
- Speaking
- Listening
- Presenting
- Visual literacy

### Numeracy
- Understanding & applying math concepts & reasoning
- Analyzing & using numerical data

### Information Management
- Gathering & managing information
- Selecting & using appropriate tools & technology for a task or a project
- Computer literacy
- Internet skills

### Critical Thinking & Problem Solving
- Analyzing
- Synthesizing
- Evaluating
- Decision making
- Creative & innovative thinking

### Personal
- Managing self
- Managing change & being flexible & adaptable
- Engaging in reflective practices
- Demonstrating personal responsibility

### Interpersonal
- Teamwork
- Relationship management
- Conflict resolution
- Leadership
- Networking

### Physical Literacy
- Performance activity or task
- Knowledge utilization
- Tactic and kinetic

### Directive Cognitive Structure
- Conceptualizing

### Participative Meta-Cognition
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<tr>
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### Directive Structure

- **Communication**
  - Reading
  - Writing
  - Speaking
  - Listening
  - Presenting
  - Visual literacy

  27.29 – Heat Transfer
  27.30 – Latent & Sensible Heat

- **Numeracy**
  - Understanding & applying math concepts & reasoning
  - Analyzing & using numerical data
  - Conceptualizing

  27.31 – British Thermal Units
  27.32 – Properties of Water

- **Information Management**
  - Gathering & managing information
  - Selecting & using appropriate tools & technology for a task or a project
  - Computer literacy
  - Internet skills

- **Critical Thinking & Problem Solving**
  - Analyzing
  - Synthesizing
  - Evaluating
  - Decision making
  - Creative & innovative thinking

- **Personal**
  - Managing self
  - Managing change & being flexible & adaptable
  - Engaging in reflective practices
  - Demonstrating personal responsibility

- **Interpersonal**
  - Teamwork
  - Relationship management
  - Conflict resolution
  - Leadership
  - Networking

- **Physical Literacy**
  - Performance activity or task
  - Knowledge utilization
  - Tactic and kinetic

- **Participative Meta-Cognition**

- **Supportive Collaborative**

- **Achievement Role-play**

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6—Analyze & solve mechanical problems by applying mathematics & fundamentals of mechanics.
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<td>28.2 – Perform Various Services, Maintenance and Repairs Labs</td>
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<td>8--Perform technical measurements accurately using appropriate instruments &amp; equipment</td>
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<td>9--Manufacture, assemble, maintain &amp; repair mechanical components according to required specifications.</td>
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<td>11--Select, use &amp; maintain machinery, tools &amp; equipment for the installation, manufacturing &amp; repair of basic mechanical components</td>
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**Numeracy**

- Understanding & applying math concepts & reasoning
- Analyzing & using numerical data

- Area Calculations
- Surface Area Calculations
- Volume Calculations
- Percentages and Ratios

- Analyze & solve mechanical problems by applying mathematics & fundamentals of mechanics.

**Information Management**

- Gathering & managing information
- Selecting & using appropriate tools & technology for a task or a project
- Computer literacy
- Internet skills

**Critical Thinking & Problem Solving**

- Analyzing
- Synthesizing
- Evaluating
- Decision making
- Creative & innovative thinking

**Personal**

- Managing self
- Managing change & being flexible & adaptable
- Engaging in reflective practices
- Demonstrating personal responsibility

**Interpersonal**

- Teamwork
- Relationship management
- Conflict resolution
- Leadership
- Networking

**Physical Literacy**

- Performance activity or task
- Knowledge utilization
- Tactic and kinetic
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<td>30.2 – Read &amp; Interpret Job Specifications</td>
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<td>30.3 – Produce Various Plumbing Drawings</td>
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<td>30.6 – Write Job-Related Documents</td>
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<tr>
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<td>● Demonstrating personal responsibility</td>
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<td>Interpersonal</td>
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<tr>
<td>● Teamwork</td>
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<td>30.4 – Demonstrate Effective Interpersonal Relations</td>
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<tr>
<td>● Relationship management</td>
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<td>30.5. – Receive and React to Instructions</td>
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<tr>
<td>● Conflict resolution</td>
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<td>● Tactic and kinetic</td>
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</table>

1--Complete all work in compliance with current legislation, standards, regulations and guidelines.

2--Apply quality control and quality assurance procedures to meet organizational standards and requirements.

6--Analyze & solve mechanical problems by applying mathematics & fundamentals of mechanics.

7--Interpret, prepare & modify mechanical drawings & other related technical documents.

10--Contribute to the planning, implementation & evaluation of projects.
<table>
<thead>
<tr>
<th>Leadership in Learning</th>
<th>Mechanical Technician Program Standard</th>
<th>Apprenticeship Curriculum Standard</th>
<th>Mechanical Technician Program Standard</th>
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<tbody>
<tr>
<td>Essential Employability Skills</td>
<td>Plumber Level Two</td>
<td>Vocational Learning Outcomes</td>
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<tr>
<td>Skill Category - Defined</td>
<td>S00031.0 Welding</td>
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</tbody>
</table>

- **Communication**
  - Reading
  - Writing
  - Speaking
  - Listening
  - Presenting
  - Visual literacy

- **Numeracy**
  - Understanding & applying math concepts & reasoning
  - Analyzing & using numerical data

- **Information Management**
  - Gathering & managing information
  - Selecting & using appropriate tools & technology for a task or a project
  - Computer literacy
  - Internet skills

- **Critical Thinking & Problem Solving**
  - Analyzing
  - Synthesizing
  - Evaluating
  - Decision making
  - Creative & innovative thinking

- **Personal**
  - Managing self
  - Managing change & being flexible & adaptable
  - Engaging in reflective practices
  - Demonstrating personal responsibility

- **Interpersonal**
  - Teamwork
  - Relationship management
  - Conflict resolution
  - Leadership
  - Networking

- **Physical Literacy**
  - Performance activity or task
  - Knowledge utilization
  - Tactic and kinetic

31.1 – Arc Welding Theory, Terminology, Equipment, Procedures & Safety Precautions

31.2 – Arc Welding Procedures

8--Perform technical measurements accurately using appropriate instruments & equipment

9--Manufacture, assemble, maintain & repair mechanical components according to required specifications.

11--Select, use & maintain machinery, tools & equipment for the installation, manufacturing & repair of basic mechanical components