SCIENTIFIC PRINCIPLES

UNIT CODE:CON/CU/PL/CC/04/4/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply Scientific principles.

Duration of Unit: 50 Hours

Unit Description

This unit describes the competence in applying scientific principles. It involves applying principles of: units of measurements, force, work, energy and power, friction, heat, pressure in fluids, electrical and mechanical properties of materials

Summary of Learning Outcomes

1. Apply principles of units of measurements
2. Apply principles of Force, work, energy and power
3. Apply principles of Friction
4. Apply principles of heat
5. Apply principles of pressure in fluids
6. Apply mechanical properties of materials

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply principles of units of measurements	• Terms and concepts • Selection of units of measurement • Conversion of units	• Written tests • Oral questions

2. Apply principles of Force, work, energy and power	• Terms and concepts
	• Laws
	  ○ Force
	  ○ Energy
	• Basic calculations of force, work, energy and power
	• Application of force, work, energy
		• Written tests
		• Oral questions
		• Practical tests

	and power	
3. Apply principles of Friction	• Terms and concepts • Types of friction • Laws of friction • Causes of friction • Advantages and disadvantages of friction • Application of friction	• Written tests • Oral questions • Practical tests
4. Apply principles of heat	• Terms and concepts • Sources of heat • Effects of heat on matter • Change of matter as heat varies • Methods of heat transfer • Water heating	• Written tests • Oral questions • Practical tests
5. Apply principles of pressure in fluids	• Terms and concepts • Units of measurements of pressure • Definition of density • Variations of pressure • Laws • Solving simple problems involving liquids of different densities • Application of air pressure in relation to objects in everyday life e.g. Air lock in pipe work	• Written tests • Oral questions • Practical tests
6. Apply mechanical properties of materials	• Terms and concepts • Properties of materials • Tests • Advantages and disadvantages of materials	• Written tests • Observation • Oral questions • Practical tests

Suggested Instruction Methods

- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Trainee group discussions

Recommended Resources

Tools and equipment

- Laboratory testing equipment
- Laboratory apparatus
- Hand tools
- Machine tools

Materials and supplies

- Stationery
- Material samples
- Oils
- Pins
- Electrical cables and accessory

Personal protective equipment (PPEs)

- Safety boots
- Gloves
- Dust coats
- First aid kit
- Ear muffs
- Dust masks
- Overalls
- Helmet
- Goggles