PENANG SANGAM HIGH SCHOOL
P.O.BOX 44, RAKIRAKI
WEEK 10 WORKSHEET

Subject: Applied Technology **Year/Level:** 13

Strand: 4	**Basic Home Improvement**
Sub Strand	General Trade Skills
Content Learning Outcome	Demonstrate Knowledge of general trade skills.

LESSON NOTES

Chapter 4: Basic Home improvement.

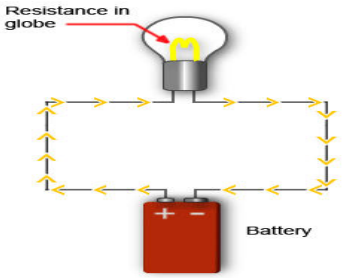
Electricity
Introduction

Electricity is the most versatile energy source that we have; it is also one of the newest: homes and businesses have been using it for not much more than a hundred years.

Current - Current is the movement or flow of electrons along a conductor. The unit of measurement of current is the **ampere** (or amp).

Voltage - Voltage in the battery. Voltage is the term used to describe electrical pressure or electromotive force **(EMF).** The unit of measurement for voltage is the **volt.**

If 9V is marked on an electrical globe or other component, this means that the component is designed to operate on nine volts of electrical pressure (voltage).



Resistance

The filament of the globe contains resistance.

In an electrical circuit, resistance means opposition to current flow. The unit for measurement of resistance is the **ohm**.

Electrical basics

One way to help understand how current, voltage and resistance work is to use an analogy. This means using something you already know and understand to help explain something new.

The diagrams show how water can be a useful analogy to help understand electricity.

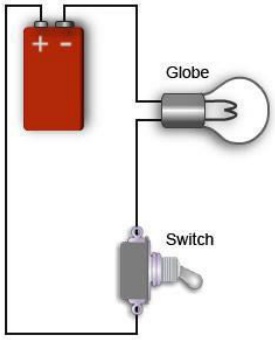


Figure 1: Electrical

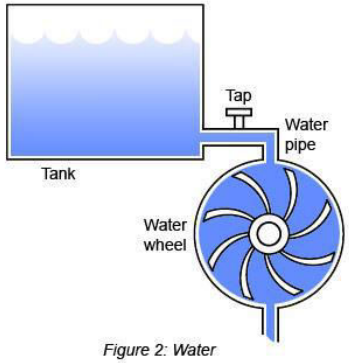


Figure 2: Water

Pressure – voltage

Figure 2 shows a full water tank. This is where the water pressure is stored. The greater the amount of water in the tank, the greater the water pressure. The water tank in Figure 2 can be compared to the battery in Figure 1, where a battery in an electrical circuit stores the electrical pressure (voltage).

An empty tank of water with no pressure is similar to a flat battery with no electrical pressure.

Flow – current

Turning on the tap in Figure 2 allows water, pushed out of the tank by pressure, to flow through the pipe and water wheel. This causes the wheel to rotate. Similarly, in Figure 1, turning on the switch allows current flow, pushed out of the battery due to electrical pressure, through the wire and globe.

The flow of water is similar to the flow of current (amps).

Restriction – resistance

The pipe size and wheel construction cause a restriction to the water flow. The restriction of water flow is similar to resistance in an electrical circuit. In Figure 1 the wire and globe offer a resistance to current flow. The size of the wire and the globe affect the amount of current flowing.

Summary

- Water pressure stored in the tank is similar to **voltage** (electrical pressure) stored in a battery.
- The flow of water through a pipe is similar to the flow of **current** through a wire.
- The path the water flows along causes a restriction to flow.
- The path the current flows through has a certain amount of resistance.

Units of measure

There are seven base units in the International System (SI) for measuring physical quantities.

The units are:

- ampere – unit of electric current (symbol for ampere is A, symbol for current is I)
- newton – unit of force (symbol N)
- metre – unit of length (symbol m)
- kelvin – unit of thermodynamic temperature (symbol K)
- kilogram – unit of mass (symbol kg)
- pascal – unit of pressure (symbolPa)
- second – unit of time (symbol s).

Derived units

Derived units			
Unit	**Unit for**	**Symbol**	**Description**
coulomb	electrical charge	**C**	The quantity of electric charge transferred each second by a current of one ampere (nominally equal to 6.24 x 1018 electrons)
farad	capacitance	**F**	The capacity that exists between two plates of a capacitor if the transfer of one coulomb from one plate to the other creates a potential difference of one volt
henry	inductance	**H**	If the rate of change of current in a circuit is one ampere per second, and the resulting electromotive force is one volt, then the inductance of the circuit is one henry
hertz	frequency	**Hz**	The number of periodic oscillations per second
joule	energy and work	**J**	One joule of work is required to move one coulomb through an electrical potential difference of one volt
ohm	resistance	**Ω**	If a device dissipates one watt of power with one ampere of current flowing through, it has a resistance of one ohm ($R = P/I^2$)
volt	potential difference or voltage	**V**	The potential difference existing between two points on a conductor carrying a current of one ampere when the power dissipated is one watt
watt	power	**W**	The power used when energy is expended at the rate of one joule per second

STUDENT ACTIVITY
Define the following terms:
Electricity

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Current

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Voltage

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Resistance

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