

SHEET 1

**PENANG SANGAM HIGH SCHOOL
P. O. BOX 44, RAKIRAKI
LESSON NOTES - 15**

SCHOOL: PENANG SANGAM HIGH

SUBJECT: TECHNICAL DRAWING

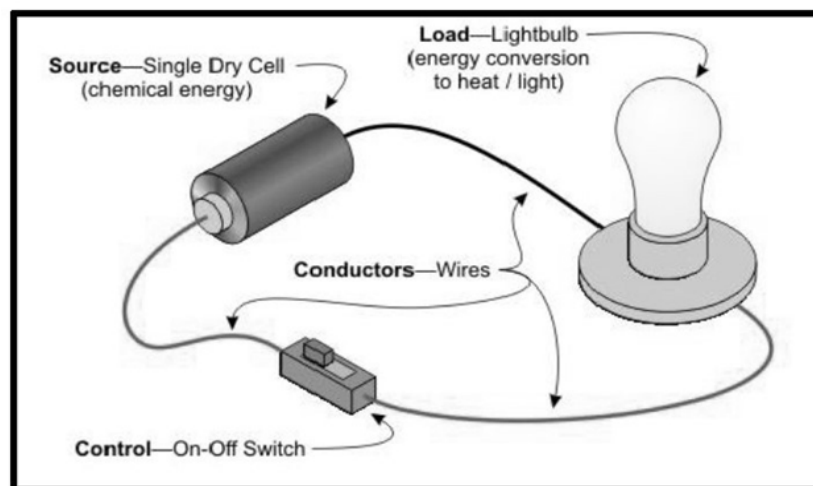
YEAR/ LEVEL: 13 A/B

Strand	TD 13.3 APPLIED DRAWING
Sub - Strand	TD13.3.1 Applied Drawing
Content Learning Outcome	TD13.3.1.1 Demonstrate basic skills in drawing simple electrical circuit diagrams and floor plans.

An electric circuit is a closed path that electrons can flow through. All electric circuits have four basic components

- EMF source - Electricity requires EMF. The source can be a battery, a photovoltaic panel, or the electric outlet in your room.
- Load - The load refers to the device that consumes the energy (converts it to another form). Examples are lights (converts electricity to heat and light) and electric motors (converts electricity to heat and rotary motion).
- Conductors - Conductors are the pathway that electrons follow through the circuit. Examples are wires and copper traces on circuit boards.
- Control - Control is the mechanism that is used to start, stop, and regulate the electric current. Examples are switches and variable resistors (i.e. volume controls).

Drawing Circuits – Pictorial Drawings and Schematic Drawings
A pictorial drawing of a simple circuit is shown below:



Using schematic symbols, the circuit drawn above as a pictorial would look like the figure below. As you can see, the drawing is much simpler. It is also easier to draw, and easier to read.

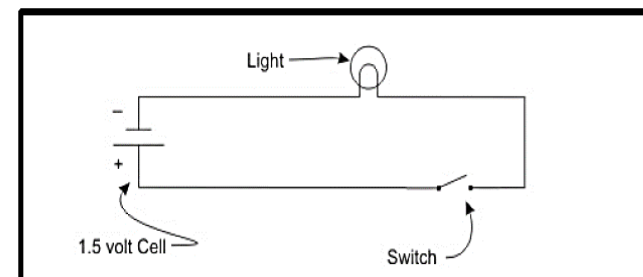


Figure: Schematic of Light Circuit

Look at the next schematic. Can you identify the components in the circuit?

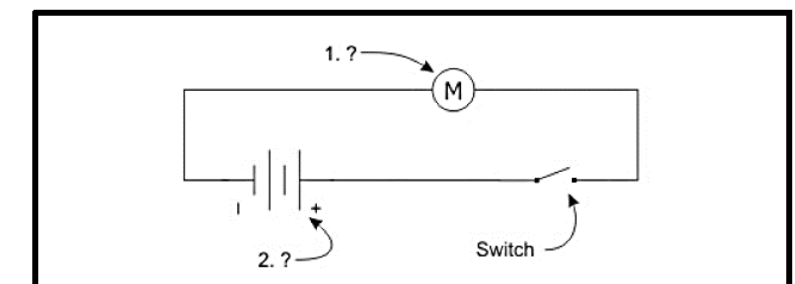


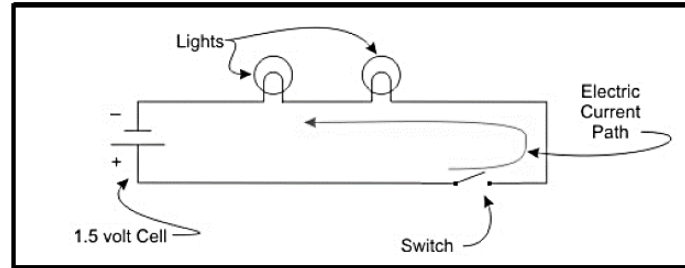
Figure: Schematic — Can you identify Item 1 and Item 2?

Symbols	Description
	Dry cell. A single cell, with a potential of 1.5 volts. A source of chemical energy that is converted to electricity. AA, AAA, C, and D cells are 1.5 volts.
	Battery. Two or more cells, with a potential of 3 or more volts. 9 volt batteries have six 1.5 volt cells.
	Light or lamp. A device that converts electricity into heat and light. Incandescent bulbs have an element that gets hot enough to emit light.
	Electric motor. An electric motor converts electricity into rotary motion and heat. Heat is a byproduct.
	On-Off Switch. A switch is a control element that starts and stops the flow of electrons.

Circuits with Components connected in Series

The following pictorial shows two lights connected in series. Components connected in series means that electrons flow through one and then the other, losing some of its energy to each one. In the case of the lights, each light will be less bright than if there was only one light in the circuit.

As the schematic below shows, the electrons flowing through the circuit have to pass through the two lights in sequence.



Series

Electrons flow

for current flow

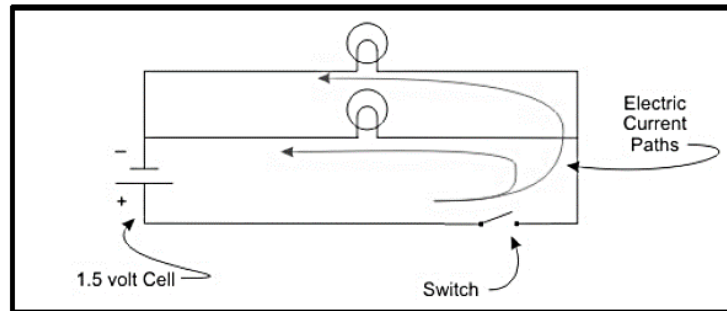


Figure: Circuit with Lights connected in Parallel

Parallel

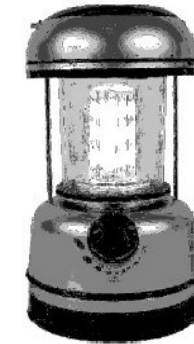
EXERCISE 1

GIVEN : A 1.5V BATTERY IS CONNECTED TO TWO BULBS.
REQUIRED: DRAW THE CIRCUIT DIAGRAM OF THIS SETUP.



EXERCISE 2

GIVEN : A LED EMERGENCY LANTERN IS POWERED BY FOUR 3 V BATTERIES.
WHEN SWITCHED ON THE BRIGHTNESS OF THE LEDS CAN BE ADJUSTED WITH AN ADDITIONAL ROTATING SWITCH.
REQUIRED: DRAW THE CIRCUIT DIAGRAM FOR THE LANTERN.



EXERCISE 3

GIVEN : A STANDARD TORCH THAT IS POWERED BY TWO 1.5V BATTERIES.
REQUIRED: DRAW THE CIRCUIT DIAGRAM OF THE TORCH.



EXERCISE 4

GIVEN : THE CEILING LIGHT FOR A STAIRCASE NEEDS TWO SWITCHES TO ALLOW A USER TO SWITCH ON AT ONE END AND THEN SWITCH OFF AT THE OTHER END.
THE LIGHT IS CONNECTED TO 240 V POWER SUPPLY.
REQUIRED: DRAW THE CIRCUIT DIAGRAM.

