PENANG SANGAM HIGH SCHOOL
P.O.BOX 44, RAKIRAKI

WEEK 14 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

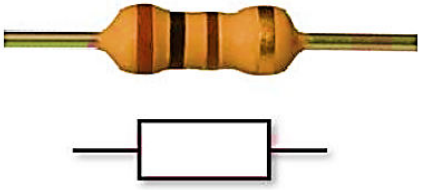
Continued from week 13 Lesson notes….

Resistors

Resistors are devices which are manufactured to a predetermined resistance value. They are made in many shapes and sizes and from a range of materials including:

- carbon
- metal film
- nichrome.

A resistor can be used in a circuit to restrict the amount of current flow or decrease the voltage.



Colour codes - The colour bands on carbon and metal film resistors are used to identify the resistance value (in ohms) and tolerance (accuracy in percentage) of the resistor. The resistance value colour bands are crowded towards one end of the resistor and the last band is for the tolerance.

- Four colour bands have three value colour bands and then a fourth for the tolerance. Some have nofourth tolerance band, therefore the resistor has a tolerance of plus or minus 20.

- Five colour bands have four value colour bands and then the fifth band for tolerance.

The following table can be used to identify the value of a resistor. Read the table:

- from the top down for a four band resistor
- from the bottom up for a five band resistor.

Example

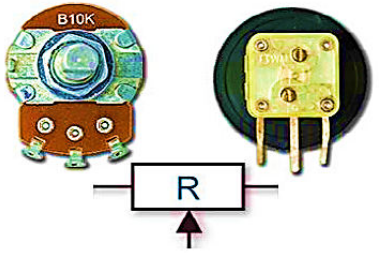
The resistor shown has four bands. Using the table allows us to work out the value.

1. The first band is brown so the first digit is one.
2. The second band is black, so the second digit is zero. Putting the two and the zero together gives a value of ten.
3. The third band, which is the multiplier, is brown so it has a value of one. This means that one extra zero will be added to the value.
   The resistor is rated at one hundred ohms.
4. The fourth band is gold which indicates that the resistor has a tolerance of plus or minus five percent.

The resistor is rated at 100Ω but would have an actual resistance between 95Ω and 105Ω.

Variable resistors

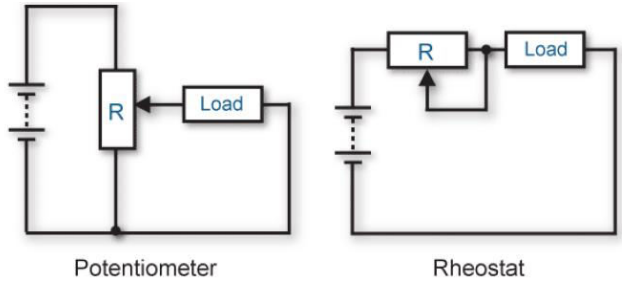
As the name suggests, a variable resistor is a device that allows a user to vary the amount of resistance. An example of this is the volume control on a radio. Variable resistors come in a variety of shapes, sizes and current carrying capacities. They have three terminals and one is joined to a wiper that can be moved along the resistance material.



Variable resistors are either:

- potentiometer – used for voltage adjustment
- rheostat – used to vary current flow.

They are shown in the following circuit diagrams.



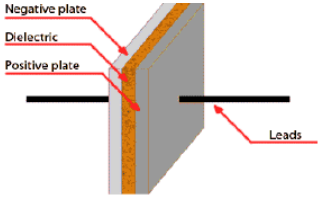
Potentiometer and rheostat circuits

Capacitance

Capacitance is the ability of a device to store an electrical charge.

The unit of capacitance is the farad.

Quantity	Symbol	Unit	Abbreviation	Meaning
capacitance	C	farad	F	ability to store a charge



The capacitor - A capacitor ia a device capable of storing an electrical charge. This is done by separating conductive plates with an insulating material. The insulator material is called a dielectric.

Factors affecting the capacitance value of a capacitor:

- area of the plates (bigger plates, more capacitance)
- distance between the plates (bigger distance, lower capacitance)
- material used as dielectric (higher insulative qualities, morecapacitance).

Types of capacitors

Dangers of capacitors

Capacitors will hold their charge until they are discharged. If a capacitor is not discharged before it is touched, it can cause electric shock.

Polarity sensitive capacitors can explode if they are not connected correctly.

Types of capacitors

Various capacitor types are used for specific purposes.

Electrolytic capacitor

These capacitors have aluminums or tantalum and the dielectric rolled together then enclosed. They are polarity sensitive and if connected incorrectly will explode.

Ceramic capacitor

A ceramic disc is silver plated on both sides. They are often used where a capacitor of high values is required. Ceramic capacitors are not polarity sensitive.

Variable capacitor

A variable capacitor is made up so that one plate can be moved in or out to change the capacitance.

Stacked plate capacitor

Stacked plate capacitors have the plates and dielectric stacked alternately. Each alternate plate is connected together to form one plate. These are often used where it is important not to have any self-inductance.

STUDENT ACTIVITY

1. Briefly explain the term capacitance.

   _____

   _____

2. Identify different type's capacitors?

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THE END