Resistance and Ohm's Law
SPH4C

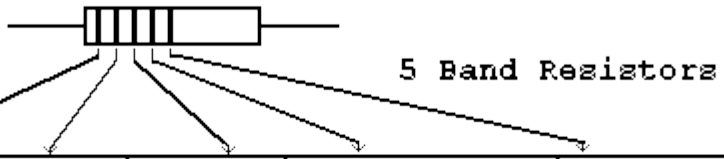
Resistance is the property of substances that _____ the free flow of electrons.

It is measured in units of _____ (____).

_____ such as lights and heating elements have a resistance: they impede the flow of electrons and _____ the energy of the electrons into another form of energy such as _____ or _____.

A _____ is a load placed in a circuit simply to impede the flow of electrons and thus _____ to the rest of the circuit.

The resistance of a resistor is typically indicated by _____:



BAND 1	BAND 2	BAND 3	BAND 4 MULTIPLIER	BAND 5 TOLERANCE
0 BLACK	0 BLACK	0 BLACK	BLACK X 1	NONE + or - 20%
1 BROWN	1 BROWN	1 BROWN	BROWN X10	SILVER + or - 10%
2 RED	2 RED	2 RED	RED X 100	GOLD + or - 5%
3 ORANGE	3 ORANGE	3 ORANGE	ORANGE X 1,000	RED + or - 2%
4 YELLOW	4 YELLOW	4 YELLOW	YELLOW X 10,000	BROWN + or - 1%
5 GREEN	5 GREEN	5 GREEN	GREEN X 100,000	
6 BLUE	6 BLUE	6 BLUE	BLUE X 1,000,000	
7 VIOLET	7 VIOLET	7 VIOLET	SILVER X .01	
8 GRAY	8 GRAY	8 GRAY	GOLD X .1	
9 WHITE	9 WHITE	9 WHITE		

Example: Yellow - Violet - BLACK - BLACK - Brown
4 + 7 + 0 x 1 = 470 Ohms 1% Tolerance

The current that flows through a resistor will be equal to:

This is called Ohm's Law and is often written:

Example:
If a 50-Ω resistor is connected to a 1.5 V battery, what is the current through the resistor?

More Practice

1. Match each term on the left to the most appropriate description of the term on the right.

_____ circuit	A. a measure of the opposition to current flow
_____ current	B. the energy stored per coulomb of charge in a circuit
_____ load	C. the rate of flow of charge
_____ potential difference	D. the path of electric current flow
_____ resistance	E. a device that converts electric energy to other forms

2. To measure the current through a component, an ammeter should be connected:

   A. in series B. in parallel
   C. either A or B D. neither A nor B

3. To measure the potential difference across a component, a voltmeter should be connected:

   A. in series B. in parallel
   C. either A or B D. neither A nor B

4. A student connects a 5 Ω resistor to a 10 V power supply. What will be the current in the circuit?

   A. 0.5 A B. 2 A C. 50 A D. 250 A

5. If the resistance in a circuit is decreased, the potential difference supplied to the circuit will:

   A. increase B. decrease C. remain the same

6. What is the resistance of each of the following 5-band resistors?

   (A) Orange – Blue – Black – Black – Gold

   (B) Red – Violet – Green – Orange – Silver

   (C) Brown – White – Red – Black – Brown