

Experiment No. 7: Ampere's Right Hand Grip Rule

1. Objective

The objective of this experiment is to verify the ampere's right grip hand rule.

2. Apparatus

- IT-100 and IT-100D Trainer
- 2mm Patch Cords

3. Theory

Since the magnetic field around an electron forms a loop, the fields of the electrons combine to form a series of loops around the wire. The direction of the magnetic field depends on the direction that the current flows. This can be examined by using a compass. The compass moved around the wire will align itself with the flux lines.

A right-hand rule, also called Ampere's rule, can be used to determine the direction of the magnetic field. If you wrap your fingers around the wire with your thumb pointing in the direction of conventional current flow, your fingers will point in the direction of the magnetic field.

If a number of wire loops are wound in the same direction to form a coil, more fields will add to make the flux lines through the coil even denser. The magnetic field through the coil becomes even stronger. The more loops there are, the stronger the magnetic field becomes.

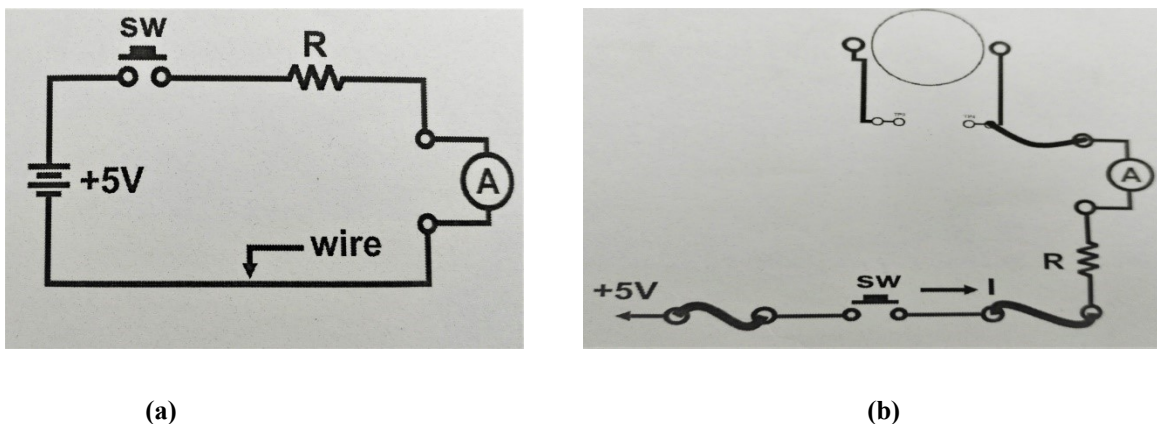
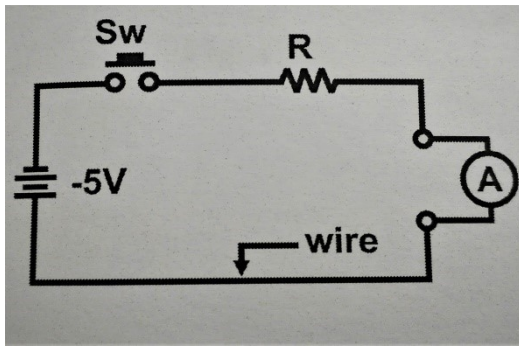
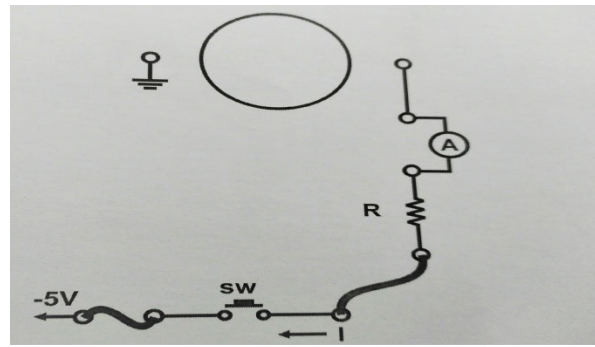


Figure 7.1: (a) Circuit Diagram (b) Connection Diagram using Single Wire

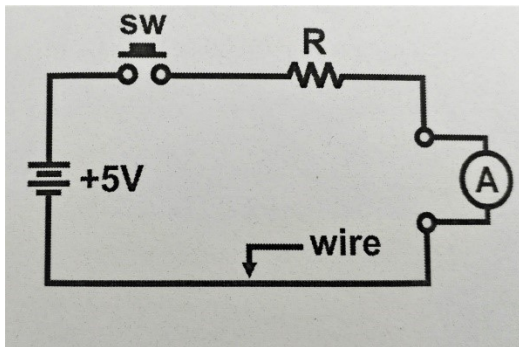


(a)

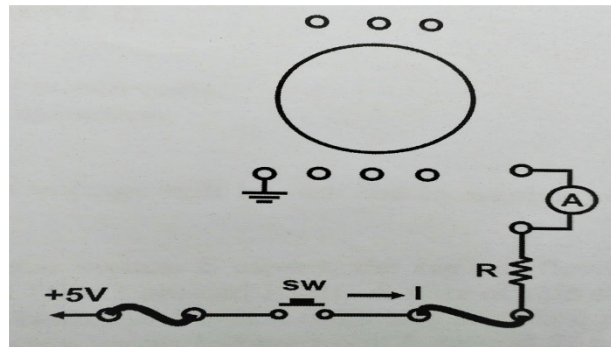


(b)

Figure 7.2: (a) Circuit Diagram (b) Connection Diagram using Single Wire



(a)



(b)

Figure 7.3: (a) Circuit Diagram (b) Connection Diagram using Coil

4. Procedure

1. Set the module IT-100D and locate the Ampere's law block.
2. Complete the experiment circuit according to Figure 7.1 (a) and (b) with short-circuits clips.
3. Where $R = 10\Omega$
4. Apply +5V to one end of the switch SW1.
5. Approach the compass to single wire.
6. Press SW1 (for short time) and observe the deflection of the compass needle and write the observation in the table 7.1.
7. Complete the experiment circuit according to Figure 7.2 (a) and (b) with short-circuits clips.
8. Apply -5V to one end of the switch SW1.
9. Approach the compass to single wire.

10. Press SW1 (for short time) and observe the deflection of the compass needle and write the observation in the table 7.1.
11. Again locate the Ampere's law block and connect the circuit according to Figure 7.3 (a) and (b) with short-circuits clips.
12. Repeat the steps 4 to 6.
13. Compare the results of step 12 with those of steps 4 through 6 and conclude your observations.

Table 7.1

S. No.	Cases	Deflection Direction of Compass
1	Figure 7.1 (a) and (b)	
2	Figure 7.2 (a) and (b)	
3	Figure 7.3 (a) and (b)	

5. Lab Task:

1. Apply the -5V to one end of the switch SWI 1 of Figure 7.3 (b) and discuss the deflection of compass?

6. Conclusions
