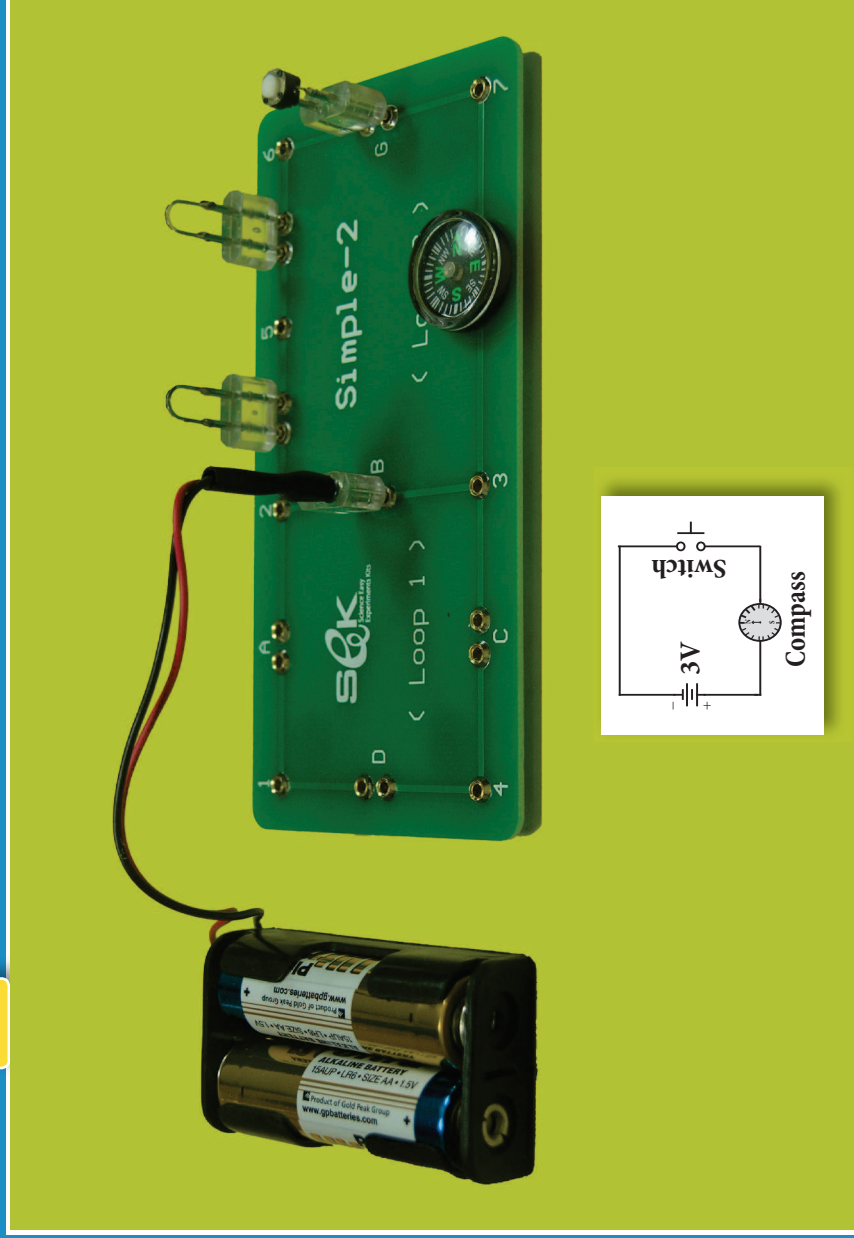


Experiment

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The Magnetic Field of a Current-Carrying Wire (Oersted's Experiment)



Objectives

1. The student will investigate the magnetic field of a Current-Carrying Wire by experiment (Oersted's Experiment).
2. The student will verify that the direction of the magnetic field due to a long straight wire can be determined by the right-hand rule.

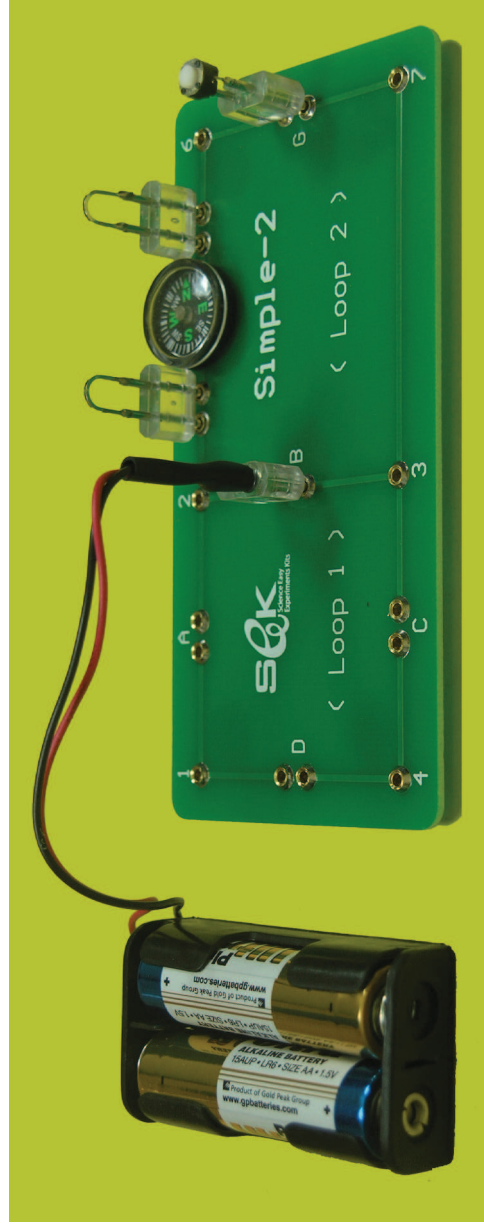
Apparatus

- Experiments Board (Simple-2)
- 2xAA Battery Holder w/AA batteries
- Compass
- Switch
- Jumpers

Procedure & Conclusions

1. Build a simple circuit consists of 3V battery and switch, as shown in the photo.
2. Place the compass on the green line (wire) between points (3) and (7).
3. Set the Experiments board in a way that the compass will point north-south.
4. Press the switch button for few seconds while watching the deflection of the compass needle.

- When you close the circuit, the needle of the compass deflects ... clockwise / counter clockwise ...
5. Place the compass on the point (5) as shown in the below photo.



6. Repeat step 4.
- In this case, the needle of the compass deflects ... clockwise / counter clockwise ...
7. Invert the polarity of the voltage source through reversing the connection wire of the battery holder at the pair (B) and watch at what direction the compass needle points.
8. Repeat step 4.

- When the electric current is reversed, the compass needle is deflected in the ... same / opposite ... direction, this indicates that the direction of the magnetic field around the wire is reversed.

Note1: Oersted's Principle: "A charge moving through a straight conductor produces a circular magnetic field around the conductor"

Note2: Right hand rule: To determine the direction of the magnetic field around a straight current-carrying conductor, use the right-hand rule: if you hold a straight conductor in your right hand with your right thumb pointing in the direction of the conventional current, your curled fingers will point in the direction of the magnetic field lines.

