


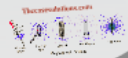
# Malaysia: The Economic Transformation Program (B)

**Magnetic Field**  
Thecasesolutions.com  
Magnetic fields are produced by electric currents, which can be microscopic currents in wires, or macroscopic currents associated with electrons in atomic orbits.



**Magnetic field Source**  
When we introduced the electric field it was apparent that electric charges were the source of such a field. Experiments in the 19th century showed that the source of a magnetic field was a moving charge, or current.

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**Gravitational Field**  
There is a gravitational field, whose attractive or repulsive force depends on the mass and on the distance between the bodies.

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Just as the mass is responsible for the existence of a gravitational field, there is a responsible for the magnetic field which is caused by electric currents



**Danish scientist Hans Christian Oersted**  
Thecasesolutions.com

Hans Christian Oersted is the first person that found that electric current produced a magnetic field. In XIX century, he discovered that the flow of a current passing through a wire caused the deviation of a compass. He found that the electric current was the source of the magnetic field and that it produced a torque over the compass needle.



**Oersted's Experiment**  
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The above observations of the experiment suggest that a current carrying wire produces a magnetic field around it and the magnetic field, as it experiences a torque in this magnetic field, so it deflects to align it in the direction of the magnetic field. On reversing the direction of the current in the wire, the direction of the magnetic field reverses and so the direction of deflection of magnetic needle also reverses.


This we can say that a current in moving charge generates a magnetic field around it. This is called the magnetic effect of current.



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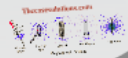
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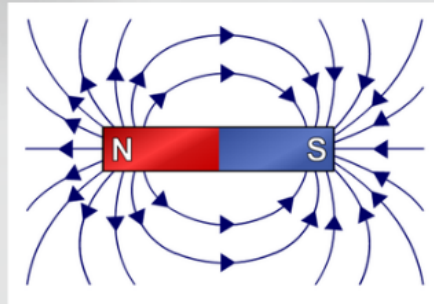


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# Magnetic Field

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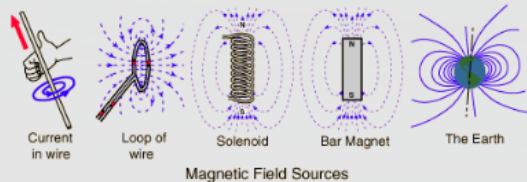
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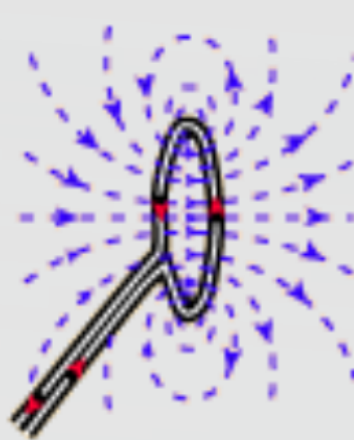
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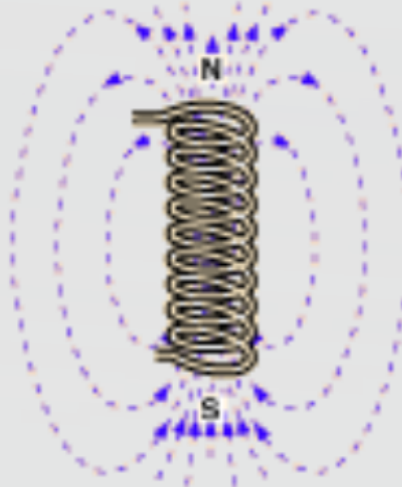
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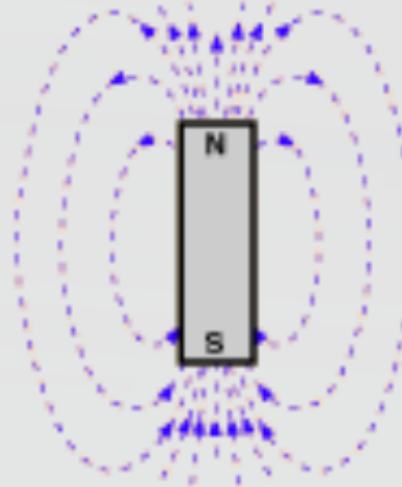
Current  
in wire



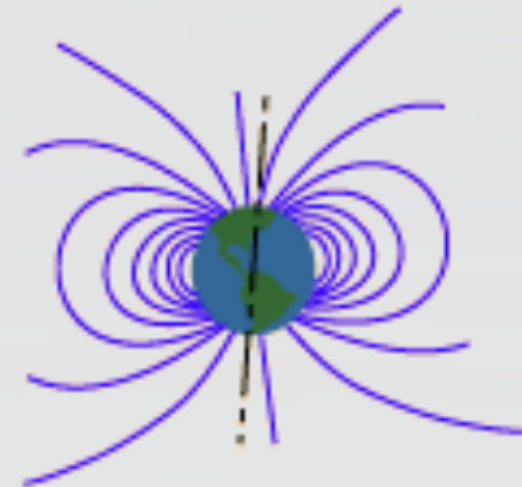
Loop of  
wire



Solenoid



Bar Magnet



The Earth

Magnetic Field Sources

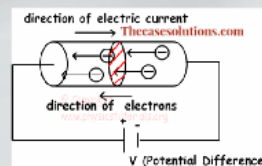


# Gravitational Field

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direction of electrons

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V (Potential Difference)

# Oersted's Experiment

## Thecasesolutions.com

The above observations of the experiment suggests that a current carrying wire produces a magnetic field around it and the magnetic needle of compass experiences a torque in this magnetic field, so it deflects to align it in the direction of the magnetic field. On reversing the direction of the current in the wire, the direction of the magnetic field reverses and so the direction of deflection of magnetic needle also reverses.

Thus we can say that a current (or moving charge) produces a magnetic field around it. This is called the magnetic effect of current.





# Danish scientist Hans Christian Oersted [Thecasesolutions.com](http://Thecasesolutions.com)

Hans Christian Oersted is the first person that found that electric current produced a magnetic field, in XIX century; he discovered that the flow of a current passing through a wire caused the deviation of a compass. He found that the electric current was the source of the magnetic field and that it produced a torque over the compass needle.



The above shows that a current in a wire produces a magnetic field around it. A compass needle experiences a force and deflects to align with the field. On reversing the current in the wire, the direction of the magnetic field and so the deflection of the needle also reverses.

Thus we can conclude that an electric current produces a magnetic field around it.